REVIEW

Naturally Occurring Triterpenoid Saponins

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Dedicated to the memory of Prof. (Mrs) *Asima Chatterjee*, University of Calcutta, for her devotion to set up a School for Natural Products Research in the Department of Chemistry

Naturally occurring new triterpenoid saponins reported from mid-1996 to March, 2007 are reviewed including their physical constants and plant sources, and are compiled in *Table 1*. New saponins are arranged in *Table 1* on the basis of the skeletal structures of their aglycones, *e.g.*, oleanane type, ursane type, lupane type, hopane type, taraxastane type, cycloartane type, lanostane type, tirucallane type, dammarane type, cucurbitane type, and holostane type. The known triterpenoid saponins and prosapogenins of the new saponins, the biological and pharmacological activities of which were published during 1996–2007, are also reviewed together with their plant sources listed in *Table 2* according to the skeletal structures of their aglycones in the same fashion as in *Table 1*. The plant and animal sources of both new and known bioactive triterpenoid saponins are collected in *Table 3* in alphabetical order. The biological and pharmacological activities such as antiallergic, antiatherosclerosis and antiplatelet, antibacterial, anticomplementary, antidiabetic, contraceptive, antifungal, anti-inflammatory, antileishmanial, antimalarial/antiplasmodial, anti-obesity, anti-proliferative, antipsoriatic, antispasmodic, antisweet, antiviral, cytotoxic/antitumor, detoxication, gastroprotective, haemolytic, hepatoprotective, immunomodulatory, anti-enzyme, anti-osteoporotic, insecticidal, insulin-like, membrane-porosity, molluscicidal, neuropharmacological, anti-endothelial dysfunction, snake venom antidote, and sweet activities of these saponins or derived prosapogenins are discussed briefly after *Table 3*.

Contents:

1. Introduction. – Triterpenoid saponins are glycosylated triterpenes which are found in a wide variety of dicotyledonous plant species, but are rare in monocotyledons. These secondary plant metabolites are constituents of the cell membrane, and they play important roles in defence, biological efficiency, and fluidity of the cell membrane. The diversity of skeletal structures, isolation challenge, and several biological and pharmacological activities are the driving forces for research work on these phytochemicals.

Several review articles on new triterpenoid saponins, their structure elucidation, and their biological and pharmacological activities have been published covering the literature up to mid-1996 [1–14]. After this period, there appeared no comprehensive review highlighting new triterpenoid saponins and their bioactivities. This fact encouraged us to prepare this review article. The present review is a compilation of new triterpenoid saponins reported in the literature since mid-1996 up to March, 2007, along with their biological and pharmacological activities published in this period.

The aim of this review is many-sided. It will help the researchers working in this field for rapid identification of isolated triterpenoid saponins by comparison of physical data as well as spectral data, which are provided in the references. It will also help the biologists and pharmacologists to study the bioactivities of the isolated saponins and to rationalize the use of plant extracts as crude drugs in traditional medicines.

It may serve to obtain information for the potent herbal drugs, which may be considered as lead drugs for the design of other potent semi-herbal drugs for treatment of different kind of diseases. It is ironic to comment that the global society needs potent herbal and semi-herbal drugs to replace several existing synthetic drugs from the market, as these synthetic drugs cause much adverse side-effects on the patients rather than curing the disease. It will be useful for botanists to study the phylogeny of angiosperms (flowering plants) for proper botanical classification of these plants in terms of orders and families. Finally, it will provide notions for both the chemical and biological study of unexplored plant species.

2. Results and Discussion. – In this review, the list of new triterpenoid saponins is provided in *Table 1* along with their structures, molecular formulae, texture, physical constants (m.p. and $[\alpha]_D$), plant source, and references. New saponins are arranged in a fashion similar to that of *Schöpke* and *Hiller* on the basis of the skeletal structures of the aglycones, *e.g.*, oleanane type, ursane type, lupane type, hopane type, taraxastane type, cycloartane type, lanostane type, tirucallane type, dammarane type, cucurbitane type, and holostane type. The known triterpenoid saponins and prosapogenins, whose biological activities are reported during 1996–2007, are listed in *Table 2*, along with structures, molecular formulae, plant sources, and references.

The plant and animal sources are listed in alphabetical order with the isolated new and known bioactive saponins (*Table 3*). The sugars are abbreviated (*Tables 1* and *2*) according to the IUB-IUPAC nomenclature, namely, Glc, β-D-glucopyranosyl; Glc A, glucopyranosiduronic acid; Gal, β-D-galactopyranosyl; Rha, α-L-rhamnopyranosyl = 6-deoxymannopyranosyl; Fuc, β-D-fucopyranosyl = 6-deoxygalactopyranosyl; Qui, β-D-quinovopyranosyl = 6-deoxyglucopyranosyl; Man, β-D-mannopyranosyl; Ara, α-L-arabinopyranosyl; Xyl, β-D-xylopyranosyl; Api, β-D-apiofuranosyl; Ara(f), α-L-arabinofuranosyl; GlcNAc, β-D-2-deoxy-2-acetamidoglucopyranosyl; GalNAc, β-D-2-deoxy-2-acetamidogalactopyranosyl; Rib, β-D-ribopyranosyl; and All, β-D-allopyranosyl. The linkage of the sugars are at the anomeric C-atom unless otherwise stated. Other groups are abbreviated as angeloyl, tigloyl, cinnamoyl, menthiafoloyl, geranoyl, neroyl, arginine *etc.* Cinnamoyl, coumaroyl, *etc.* groups are in the (*E*)-configuration unless otherwise stated. Acetylation, and other acylation or alkylation at the OH groups of the sugars are expressed by abbreviation of acyl/alkyl group; *e.g.* $Glc^3 \leftarrow Ac$ means 3-*O*-acetyl-β-D-glucopyranosyl and $Glc^3 \leftarrow Me$ means 3-*O*-methyl ether of β-D-glucopyranosyl. Glc A (Me ester) means glucuronic acid methyl ester.

The available data on physical constants for each saponin (*Table 1*) are listed as follows: the calculated molecular weight rounding second decimal point on the basis of mass spectrum, *i.e.*, from the atomic weights of the most abundant isotopic atoms of C, H, O, *etc.*; texture (powder state means amorphous powder); melting point [°]; optical rotation values expressed as $[\alpha]_D$ rounding to first decimal point (with concentration and solvent); plant source with family. The aglycones in each skeletal structure are named according to the IUPAC nomenclature.

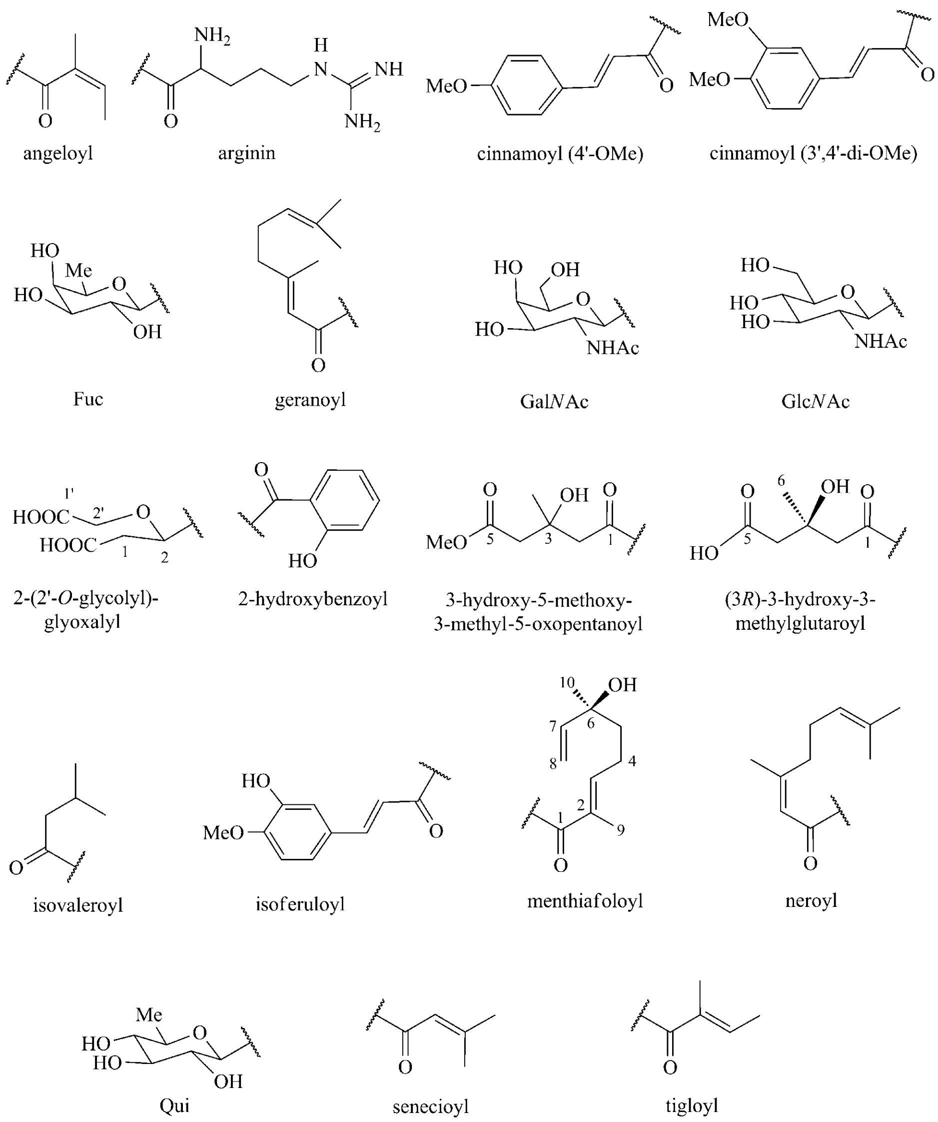
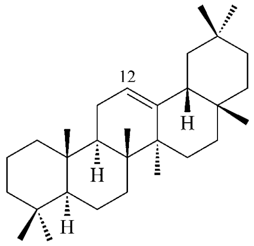


Table 1. *List of New Triterpenoid Saponins with Physical Constants and Plant Sources*

3.1. Δ^{12}-Oleanane Type



*Aglycone: (3β,16α)-3-Hydroxyolean-12-en-16-yl (2*E*)-3-(4-hydroxy-3-methoxyphenyl)prop-2-enoate*		
1	Auriculatusaponin B 3β-*O* ← GlcA	*Aster auriculatus* (Compositae), roots [15]. Amorphous powder. $C_{46}H_{66}O_{11}$: 794.46. M.p. 265–267°. $[\alpha]_D^{21} = -1.8$ (*c* = 0.056, MeOH).
Aglycone: Sophoradiol (= (3β,22β)-Olean-12-ene-3,22-diol)		
2	Baptisiasaponin 1 3β-*O* ← GlcA[2] ← Xyl[2] ← Rha	*Baptisia australis* (L.) R. Br. (Leguminosae), roots [16]. White powder. $C_{47}H_{76}O_{16}$: 896.51. $[\alpha]_D^{28} = -6.5$ (*c* = 0.52, C_5H_5N).
Aglycone: Longispinogenin (= (3β,16β)-Olean-12-ene-3,16,28-triol)		
3	Saponin 1 3β-*O* ← GlcA	*Gymnema sylvestre* R. Br. (Asclepiadaceae), leaves [17]. Amorphous powder. $C_{36}H_{58}O_9$: 634.41. M.p. 198–202°. $[\alpha]_D^{20} = +16.0$ (*c* = 0.10, MeOH).
4	Compound 2 3β-*O* ← GlcA (K salt)[3] ← Glc	*Gymnema sylvestre*, leaves [18]. Amorphous powder. $C_{42}H_{67}O_{14}K$: 834.45. M.p. 305–310°. $[\alpha]_D^{20} = +18.1$ (*c* = 0.08, MeOH).
Aglycone: (3β,15α,16α)-15,16-Epoxyolean-12-ene-3,28,30-triol		
5	Ardisianoside K 3β-*O* ⟵ Ara[2] ⟵ Glc 4↑ Glc[2] ⟵ Rha	*Ardisia japonica* (Thunb) Bl. (Myrsinaceae), whole plant [19]. Amorphous powder. $C_{53}H_{86}O_{22}$: 1074.56. $[\alpha]_D^{22} = -18.6$ (*c* = 1.0, MeOH).
Aglycone: Gliricidogenin A (= 3β,21β,24-Trihydroxyolean-12-en-22-one)		
6	Gliricidoside A 3β-*O* ← GlcA[2] ← Xyl; 21β-*O* ← Glc	*Gliricidia sepium* (Jacq) Steud (Leguminosae), leaves and roots [20]. Amorphous solid. $C_{47}H_{74}O_{19}$: 942.48. $[\alpha]_D^{25} = +5.5$ (*c* = 1.0, MeOH).

Table 1 (cont.)

7	Gliricidoside B 3*β*-*O* ← $GlcA^2$ ← Xyl; 21*β*-*O* ← Glc^6 ← Ac	*Gliricidia sepium* (Leguminosae), leaves and roots [20]. Amorphous solid. $C_{49}H_{76}O_{20}$: 984.49. $[\alpha]_D^{25} = +18.1$ ($c = 1.0$, MeOH).
Aglycone: Gymnemagenol (=(3β,16β)-Olean-12-ene-3,16,28,29-tetrol)		
8	Compound 3 3*β*-*O* ← GlcA (K salt)^3 ← Glc	*Gymnema sylvestre*, leaves [18]. Amorphous powder. $C_{42}H_{67}O_{15}$: 850.45. M.p. 290–293°. $[\alpha]_D^{20} = +10.3$ ($c = 0.12$, MeOH).
Aglycone: 11α-Methoxy-23-hydroxylongispinogenin (=(3β,11α,16β)-11-Methoxyolean-12-ene-3,16,23,28-tetrol)		
9	Saponin 1 3*β*-*O* ← Gal^2 ← Glc	*Atriplex semibaccata* R. Br. (Chenopodiaceae), whole plant [21]. Amorphous powder. $C_{43}H_{72}O_{15}$: 828.49.
Aglycone: 11α-Methoxy-23,29-dihydroxylongispinogenin (=(3β,11α,16β)-11-Methoxyolean-12-ene-3,16,23,28,29-pentol)		
10	Saponin 2 3*β*-*O* ← Gal^2 ← Glc	*Atriplex semibaccata*, whole plant [21]. Amorphous powder. $C_{43}H_{72}O_{16}$: 844.48.
Aglycone: Complogenin (=(2β,22β)-2,22,24-Trihydroxyolean-12-en-11-one)		
11	Saponin 7 3*β*-*O* ← $GlcA^2$ ← Gal^2 ← Rha	*Astragalus suberi* L., aerial parts [22]. White powder. $C_{48}H_{76}O_{19}$: 956.50. M.p. 262–264°. $[\alpha]_D^{20} = -5.0$ ($c = 0.5$, C_5H_5N).
Aglycone: Primulagenin A (=(3β,16α)-Olean-12-ene-3,16,28-triol)		
12	Ternstroemiaside F 3*β*-*O* ⟵ $GlcA^2$ ⟵ Glc; ^{3}↑ Gal^2 ⟵ Rha 28-*O* ⟵ Glc^2 ⟵ Xyl	*Ternstroemia japonica* Thunb. (Theaceae), fruits [23]. Colorless crystals. $C_{65}H_{106}O_{32}$: 1398.67. M.p. 216–222°. $[\alpha]_D^{20} = -39.0$ ($c = 0.5$, MeOH).
*Aglycone: 16-*O*-Acetylprimulagenin A (=(3β,16α)-3,28-Dihydroxyolean-12-en-16-yl acetate)*		
13	Ternstroemiaside E 3*β*-*O* ⟵ $GlcA^2$ ⟵ Glc; ^{3}↑ Gal^2 ⟵ Rha 28-*O* ⟵ Glc	*Ternstroemia japonica*, fruits [23]. Colorless crystals. $C_{62}H_{100}O_{29}$: 1308.63. M.p. 228–230°. $[\alpha]_D^{20} = -38.2$ ($c = 1.6$, MeOH).

Table 1 (cont.)

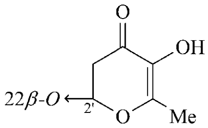
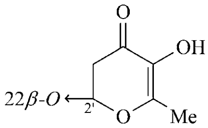
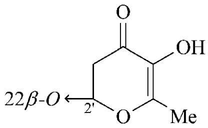
Aglycone: (3β,22β)-Olean-12-ene-3,22,24-triol		
14	Az II 3β-*O* ⟵ GlcA[2] ⟵ GlcA[2] ⟵ Glc; 	*Vigna angularis* (Leguminosae) [24]. Amorphous solid. $C_{54}H_{82}O_{23}$: 1098.56. $[\alpha]_D^{23} = -37.4$ ($c = 0.43$, MeOH).
15	Az III 3β-*O* ⟵ GlcA[2] ⟵ GlcA[2] ⟵ Rha; 	*Vigna angularis* [24]. Amorphous solid. $C_{54}H_{82}O_{22}$: 1082.53. $[\alpha]_D^{23} = -68.3$ ($c = 0.4$, 85% MeOH).
16	Az IV 3β-*O* ⟵ GlcA[2] ⟵ Glc[2] ⟵ Glc; 	*Vigna angularis* [24]. Amorphous solid. $C_{54}H_{84}O_{22}$: 1084.58. $[\alpha]_D^{23} = -80.8$ ($c = 0.4$, 77% MeOH).
Aglycone: (3β,22α)-Olean-12-ene-3,22,24-triol		
17	Saponin 1 3β-*O* ⟵ GlcA[2] ⟵ Glc[3] ⟵ Glc (Glc 2 ↑ Rha)	*Astragalus trigonus* DC (Fabaceae), whole plant [25]. Amorphous powder. $C_{54}H_{88}O_{23}$: 1104.57. $[\alpha]_D^{22} = +22.0$ ($c = 0.20$, MeOH).
Aglycone: (3β,21β)-Olean-12-ene-3,21,28-triol		
18	Compound 1 28-*O* ← Ara[3] ← Ara[3] ← Ara	*Dendrocalamus strictus* Roxb. (Gramineae), seeds [26]. Amorphous solid. $C_{45}H_{74}O_{15}$: 854.50. M.p. 118°.
Aglycone: Soyasapogenol B (= (3β,22β)-Olean-12-ene-3,22,24-triol)		
19	Sigmoside C 22β-*O* ← Glc	*Erythrina sigmoidea* (Hua) (Leguminosae), stem bark [27]. Amorphous powder. $C_{36}H_{60}O_8$: 620.43. M.p. 246–248°. $[\alpha]_D^{25} = -13.0$ ($c = 0.05$, $CHCl_3$).
20	Sigmoside D 22β-*O* ← Rha	*Erythrina sigmoidea*, stem bark [27]. White powder. $C_{36}H_{60}O_7$: 604.43. M.p. 220–222°. $[\alpha]_D^{25} = -19.0$ ($c = 0.02$, $CHCl_3$).

Table 1 (cont.)

21	Lathyrus saponin 3 3β-*O* ← GlcA (Me ester)^2 ← Glc^2 ← Glc	*Lathyrus japonicus* Willd. (Leguminosae), whole plant [28]. Amorphous powder. $C_{49}H_{80}O_{19}$: 972.53. M.p. 273–279°. $[\alpha]_D^{20} = +24.6$ ($c = 0.53$, MeOH).
22	Saponin 4 3β-*O* ← Glc^2 ← Gal^2 ← Rha	*Astragalus suberi* L.(Fabaceae), aerial parts [22]. *Pisum sativum* Linn (Leguminosae) [29]. White powder. $C_{48}H_{80}O_{17}$: 928.54. M.p. 218–220°. $[\alpha]_D^{20} = -8.0$ ($c = 1.0$, MeOH).
23	Compound 1 3β-*O* ← GlcA^2 ← Rha; 22β-*O* ← Api(f)	*Astragalus caprinus* Maire (Fabaceae), roots [30]. Amorphous powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{25} = -38.0$ ($c = 0.1$, MeOH).
24	Saponin 2 3β-*O* ← GlcA^2 ← Gal^2 ← Rha; 22β-*O* ← Glc	*Trifolium resupinatum* L. (Leguminosae), seeds [31]. White needles. $C_{54}H_{88}O_{23}$: 1104.57. $[\alpha]_D^{25} = -13.0$ ($c = 0.4$, MeOH).
25	Saponin 3 3β-*O* ← GlcA^2 ← Gal^2 ← Rha; 22β-*O* ← Glc(α)	*Pisum sativum* (Leguminosae) [29]. $C_{54}H_{88}O_{23}$: 1104.57.
Aglycone: 11-Hydroxysoyasapogenol B (= (3β,22β)-Olean-12-ene-3,11,22,24-tetrol)		
26	Saponin 5 3β-*O* ← Glc^2 ← Gal^2 ← Rha	*Astragalus suberi* L., aerial parts [22]. White powder. $C_{48}H_{80}O_{18}$: 944.53. M.p. 241–243°. $[\alpha]_D^{20} = -7.0$ ($c = 1.0$, C_5H_5N).
Aglycone: Camelliagenin A (= (3β,16α,22α)-Olean-12-ene-3,16,22,28-tetrol)		
27	Ternstroemiaside A 3β-*O* ⟵ GlcA^2 ⟵ Glc (GlcA^3 ↑) Gal^2 ⟵ Rha	*Ternstroemia japonica* Thunb. (Theaceae), fruits [23]. Colorless needles. $C_{54}H_{88}O_{24}$: 1120.57. M.p. 239–242°. $[\alpha]_D^{20} = -29.3$ ($c = 0.3$, MeOH).
*Aglycone: 16-*O*-Acetylcamelliagenin A (= (3β,16α,22α)-3,22,28-Trihydroxyolean-12-en-16-yl acetate)*		
28	Ternstroemiaside B 3β-*O* ⟵ GlcA^2 ⟵ Glc (GlcA^3 ↑) Gal^2 ⟵ Rha	*Ternstroemia japonica* Thunb. (Theaceae), fruits [23]. Colorless needles. $C_{56}H_{90}O_{25}$: 1162.58. M.p. 225–230°. $[\alpha]_D^{20} = -30.9$ ($c = 0.5$, MeOH).

Table 1 (cont.)

*Aglycone: 22-*O*-Angeloylcamelliagenin A (=(3β,16α,22α)-3,16,28-Trihydroxyolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
29	Saponin 4 3β-*O*⟵ GlcA^2 ⟵Gal ^{3}↑ Rha	*Koelreuteria paniculata* LAXM. (Sapindaceae), leaves [32]. $C_{53}H_{84}O_{20}$: 1040.56. M.p. 245–255° (dec).
30	Maetenoside A 3β-*O*⟵ GlcA^2 ⟵Glc ^{3}↑ Gal^2 ⟵ Rha^2 ⟵ Glc	*Maesa tenera* MEZ. (Myrsinaceae), aerial parts [33]. Amorphous solid. $C_{65}H_{104}O_{30}$: 1364.66. $[\alpha]_D^{22} = -15.0$ (c = 0. 7, MeOH).
31	Maetenoside B 3β-*O*⟵ GlcA^2 ⟵Glc ^{3}↑ Gal^2 ⟵ Rha	*Maesa tenera* aerial parts [33]. Amorphous solid. $C_{59}H_{94}O_{25}$: 1202.61. $[\alpha]_D^{22} = -21.3$ (c = 0.6, MeOH).
32	Maelaxin A 3β-*O*⟵ GlcA^2 ⟵Gal ^{3}↑ Gal^2 ⟵ Rha^2 ⟵ Rha	*Maesa laxiflora* PITARD (Myrsinaceae), leaves [34]. Amorphous powder. $C_{65}H_{104}O_{29}$: 1348.67. M.p. 245–248°. $[\alpha]_D^{20} = -24.6$ (c = 1.4, MeOH).
33	Maelaxin B 3β-*O*⟵ GlcA^2 ⟵Glc ^{3}↑ Gal^2 ⟵ Rha^2 ⟵ Rha	*Maesa laxiflora*, leaves [34]. White powder. $C_{65}H_{104}O_{29}$: 1348.67. M.p. 242–245°. $[\alpha]_D^{25} = -16.3$ (c = 1.5, MeOH).
*Aglycone: 16-*O*-Acetyl-22-*O*-angeloylcamelliagenin A (=(3β,16α,22α)-16-(Acetyloxy)-3,28-dihydroxyolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
34	Maelaxin C 3β-*O*⟵ GlcA^2 ⟵Gal ^{3}↑ Gal^2 ⟵ Rha^2 ⟵ Rha	*Maesa laxiflora*, leaves [34]. White powder. $C_{67}H_{106}O_{30}$: 1390.68. M.p. 246–248°. $[\alpha]_D^{25} = -18.2$ (c = 1.4, MeOH).
35	Maelaxin D 3β-*O*⟵ GlcA^2 ⟵Glc ^{3}↑ Gal^2 ⟵ Rha^2 ⟵ Rha	*Maesa laxiflora*, leaves [34]. White powder. $C_{67}H_{106}O_{30}$: 1390.68. M.p. 247–249°. $[\alpha]_D^{25} = -15.6$ (c = 1.6, MeOH).
*Aglycone: 22-*O*-[(*Z*)-Hex-2-enoyl]camelliagenin A (=(3β,16α,22α)-3,16,28-Trihydroxyolean-12-en-22-yl (2*Z*)-hex-2-enoate)*		
36	Maelaxin E 3β-*O*⟵ GlcA^2 ⟵Gal ^{3}↑ Gal^2 ⟵ Rha^2 ⟵ Rha	*Maesa laxiflora*, leaves [34]. White powder. $C_{66}H_{106}O_{29}$: 1362.68. M.p. 256–258°. $[\alpha]_D^{25} = -5.6$ (c = 1.8, MeOH).
37	Maelaxin F 3β-*O*⟵ GlcA^2 ⟵Glc ^{3}↑ Gal^2 ⟵ Rha^2 ⟵ Rha	*Maesa laxiflora*, leaves [34]. White powder. $C_{66}H_{106}O_{29}$: 1362.68. M.p. 258–260°. $[\alpha]_D^{25} = -10.0$ (c = 1.4, MeOH).

Table 1 (cont.)

Aglycone: (3β,15α,16α)-Olean-12-ene-3,15,16,28-tetrol		
38	Ternstroemiaside C 3*β*-*O* ⟵ GlcA[2] ⟵ Glc ↑3 Gal[2] ⟵ Rha	*Ternstroemia japonica* THUNB. (Theaceae), fruits [23]. Colorless needles. $C_{54}H_{88}O_{24}$: 1120.57. M.p. 230–237°. $[\alpha]_D^{20} = -18.3$ ($c = 0.5$, MeOH).
39	Ternstroemiaside D 3*β*-*O* ⟵ GlcA[2] ⟵ Glc; ↑3 Gal[2] ⟵ Rha 28-*O* ⟵ Glc	*Ternstroemia japonica*, fruits [23]. Colorless crystals. $C_{60}H_{98}O_{29}$: 1282.62. M.p. 231°. $[\alpha]_D^{20} = -32.1$ ($c = 1.3$, MeOH).
Aglycone: Pridentigenin E (= Olean-12-ene-3β,16α,28,30-tetrol)		
40	Davuricoside L 3*β*-*O* ⟵ Ara[2] ⟵ Glc; ↑4 Glc 30-*O* ⟵ Glc	*Lysimachia davurica* LEDEB. (Primulaceae), whole plant [35]. White powder. $C_{53}H_{88}O_{23}$: 1092.57. M.p. 243–246°. $[\alpha]_D^{20} = +19.5$ ($c = 0.63$, MeOH).
41	Davuricoside O 3*β*-*O* ← GlcA[2] ← Glc; 30-*O* ← Glc	*Lysimachia davurica*, whole plant [35]. White powder. $C_{48}H_{78}O_{20}$: 974.51. M.p. 238–240°. $[\alpha]_D^{20} = +8.1$ ($c = 0.50$, MeOH).
42	Ardisimamilloside C 3*β*-*O* ⟵ Ara[2] ⟵ Glc ↑4 Glc[2] ⟵ Rha	*Ardisia mamillata* HANCE, roots (Myrsinaceae) [36]. White powder. $C_{53}H_{88}O_{22}$: 1076.58. $[\alpha]_D^{25} = -28.5$ ($c = 0.31$, MeOH).
Aglycone: Soyasapogenol A (= (3β,21β,22β)-Olean-12-ene-3,21,22,24-tetrol)		
43	Saponin 3 3*β*-*O* ⟵ GlcA[2] ⟵ Gal[3] ⟵ Rha ↑2 Rha	*Lupinus angustifolius* L. (Leguminosae), seeds [37]. White amorphous solid. $C_{54}H_{88}O_{23}$: 1104.57. $[\alpha]_D^{25} = -2.9$ ($c = 0.83$, MeOH).
44	Saponin 4 3*β*-*O* ⟵ GlcA[2] ⟵ Gal[3] ⟵ Rha; ↑2 Rha 21*β*-*O* ⟵ Rha	*Lupinus angustifolius* seeds [37]. White amorphous solid. $C_{60}H_{98}O_{27}$: 1250.63. $[\alpha]_D^{25} = -8.4$ ($c = 0.83$, MeOH).
Aglycone: (3β,16β,22β)-Olean-12-ene-3,16,22,24-tetrol		
45	Saponin 1 3*β*-*O* ← GlcA[2] ← Glc[2] ← Rha	*Spartium junceum* L. (Fabaceae), flowers [38]. White powder. $C_{48}H_{78}O_{19}$: 958.51. $[\alpha]_D^{24} = -6.0$ ($c = 0.023$, C_5H_5N).

Table 1 (cont.)

Aglycone: Abrisapogenol C (=(3β,21β,22β)-Olean-12-ene-3,21,22,29-tetrol)		
46	Echinosophoroside B 3β-*O* ← GlcA[2] ← Ara[2] ← Rha; 22β-*O* ← Ara	*Sophora koreensis* (Fabaceae), roots [39]. Isolated as Me ester, amorphous powder. $C_{52}H_{84}O_{22}$: 1060.54. $[\alpha]_D^{20} = +31.4$ ($c = 0.25$, MeOH).
Aglycone: (3β,22α)-Olean-12-ene-3,22,24,29-tetrol		
47	Saponin 2 3β-*O* ← Ara[3] ← Ara	*Acorus calamus* LINN (Araceae), rhizome [40]. Amorphous solid. $C_{40}H_{68}O_{12}$: 740.47. M.p. 270°.
Aglycone: (3β,15α)-Olean-12-ene-3,15,28,30-tetrol		
48	Ardisimamilloside D 3β-*O* ⟵ Ara[2] ⟵ Glc [4]↑ Glc[2] ⟵ Rha	*Ardisia mamillata*, roots [36]. White powder. $C_{53}H_{88}O_{22}$: 1076.58. $[\alpha]_D^{25} = -21.6$ ($c = 0.15$, MeOH).
Aglycone: (3β,16β,21β)-3,16,28-Trihydroxyolean-12-en-21-yl benzoate		
49	Compound 1 3β-*O* ← GlcA[3] ← Glc	*Gymnema sylvestre* R. BR. (Asclepiadaceae), leaves [18]. Amorphous powder. $C_{49}H_{72}O_{16}$: 916.48. M.p. 226–228°. $[\alpha]_D^{20} = +15.4$ ($c = 0.16$, MeOH).
50	Saponin 2 3β-*O* ← GlcA	*Gymnema sylvestre leaves* [17]. Amorphous powder. $C_{43}H_{62}O_{11}$: 754.43. M.p. 192–195°. $[\alpha]_D^{20} = +27.2$ ($c = 0.15$, MeOH).
Aglycone: Kudzusapogenol A (=(3β,21β,22β)-Olean-12-ene-3,21,22,24,29-pentol)		
51	Echinosophoroside A₁ 3β-*O* ← GlcA[2] ← Ara[2] ← Rha; 22β-*O* ← Ara	*Sophora koreensis* NALEAI (Fabaceae), roots [39]. Isolated as Me ester, Amorphous powder. $C_{52}H_{84}O_{23}$: 1076.54. $[\alpha]_D^{20} = +8.6$ ($c = 0.34$, MeOH).
Aglycone: 22-O-Acetylkudzusapogenol A (=(3β,21β,22β)-3,21,24,29-Tetrahydroxyolean-12-en-22-yl acetate)		
52	Acetyl-subproside II 3β-*O* ← GlcA[2] ← Ara[2] ← Rha	*Sophora koreensis* roots [39]. Isolated as Me ester, amorphous powder. $C_{49}H_{78}O_{20}$: 986.51. $[\alpha]_D^{20} = +8.7$ ($c = 0.314$, MeOH).

Table 1 (cont.)

Aglycone: Barringtogenol C (=(3β,16α,21β,22α)-Olean-12-ene-3,16,21,22,28-pentol)		
53	Aesculioside I_c 3β-*O* ⟵ GlcA^{3} ⟵ Ara(f) $^{2}\uparrow$ Gal	*Aesculus pavia* (Hippocastanaceae), fruits [41]. Colorless powder. $C_{47}H_{76}O_{20}$: 960.49. $[\alpha]_D^{25} = -19.3$ ($c = 0.2$, MeOH–H_2O, 6:4).
*Aglycone: 21β-*O*-Angeloylbarringtogenol C (=(3β,16α,21β,22α)-3,16,22,28-Tetrahydroxyolean-12-en-21-yl (2Z)-2-methylbut-2-enoate)*		
54	Aesculioside II_c 3β-*O* ⟵ GlcA^{3} ⟵ Ara(f) $^{2}\uparrow$ Gal	*Aesculus pavia* fruits [41]. Colorless powder. $C_{52}H_{82}O_{21}$: 1042.53. $[\alpha]_D^{25} = -27.3$ ($c = 0.2$, MeOH).
*Aglycone: 21-*O*-Tigloylbarringtogenol C (=(3β,16α,21β,22α)-3,16,22,28-Tetrahydroxyolean-12-en-21-yl (2E)-2-methylbut-2-enoate)*		
55	Berneuxia saponin A 3β-*O* ⟵ GlcA^{2} ⟵ Glc $^{3}\uparrow$ Gal^{2} ⟵ Rha	*Berneuxia thibetica* DECNE (Diapensiaceae), leaves [42]. $C_{59}H_{94}O_{26}$: 1218.60. $[\alpha]_D^{13} = -12.2$ ($c = 1.1$, MeOH).
*Aglycone: 28-*O*-Tigloylbarringtogenol C (=(3β,16α,21β,22α)-3,16,21,22-Tetrahydroxyolean-12-en-28-yl (2E)-2-methylbut-2-enoate)*		
56	Berneuxia saponin B 3β-*O* ⟵ GlcA^{2} ⟵ Glc $^{3}\uparrow$ Gal^{2} ⟵ Rha	*Berneuxia thibetica*, leaves [42]. $C_{59}H_{94}O_{26}$: 1218.60. $[\alpha]_D^{26} = -15.6$ ($c = 1.0$, MeOH).
*Aglycone: 28-*O*-Isovaleroylbarringtogenol C (=(3β,16α,21β,22α)-3,16,21,22-Tetrahydroxyolean-12-en-28-yl 3-methylbutanoate)*		
57	Compound 6 3β-*O* ⟵ GlcA^{2} ⟵ Gal $^{4}\uparrow$ Rha	*Foetidia africana* (Lecythidaceae), stem bark [43]. $C_{53}H_{86}O_{21}$: 1058.57. $[\alpha]_D^{25} = -12.8$ ($c = 0.109$, MeOH).
*Aglycone: 21,22-Di-*O*-angeloylbarringtogenol C (=(3β,16α,21β,22α)-3,16,28-Trihydroxyolean-12-ene-21,22-diyl (2Z,2′Z)-bis(2-methylbut-2-enoate))*		
58	Saponin 1 3β-*O* ← GlcA^{2} ← Gal	*Harpullia austro-caledonica* BAILLON (Sapindaceae), stem bark [44]. $C_{52}H_{80}O_{18}$: 992.53. $[\alpha]_D^{21} = +2.3$ ($c = 0.13$, MeOH).
59	Saponin 2 3β-*O* ⟵ GlcA^{2} ⟵ Gal $^{3}\uparrow$ Rha	*Harpullia austro-caledonica*, stem bark [44]. $C_{58}H_{90}O_{22}$: 1138.59. $[\alpha]_D^{21} = -10.0$ ($c = 0.66$, MeOH).
60	Saponin 3 3β-*O* ⟵ GlcA^{2} ⟵ Gal $^{3}\uparrow$ Ara(f)	*Harpullia austrocaledonica*, stem bark [44]. $C_{57}H_{88}O_{22}$: 1124.58. $[\alpha]_D^{21} = -10.9$ ($c = 0.53$, MeOH).

Table 1 (cont.)

61	Foenumoside A $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Glc}^2 \leftarrow \text{Rha}$ $^4\uparrow$ Glc	*Lysimachia foenumgraecum* Hance (Primulaceae), aerial parts [45]. White powder. $C_{63}H_{100}O_{25}$: 1256.66. $[\alpha]_D^{23} = -10.7$ ($c = 0.14$, MeOH).
62	Foenumoside E $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Glc}^2 \leftarrow \text{Rha}$; $^4\uparrow$ Glc $28\text{-}O \leftarrow \text{Glc}$	*Lysimachia foenumgraecum*, aerial parts [45]. White powder. $C_{69}H_{110}O_{30}$: 1418.71. $[\alpha]_D^{23} = -3.7$ ($c = 0.14$, MeOH).
*Aglycone: 22-*O*-Acetyl-21-*O*-angeloylbarringtogenol C (=(3β,16α,21β,22α)-22-(Acetyloxy)-3,16,28-trihydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
63	Foenumoside B $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Glc}^2 \leftarrow \text{Rha}$ $^4\uparrow$ Glc	*Lysimachia foenumgraecum*, aerial parts [45]. White powder. $C_{60}H_{96}O_{25}$: 1216.62. $[\alpha]_D^{24} = -1.3$ ($c = 0.13$, MeOH).
*Aglycone: 16-*O*-Acetyl-21-*O*-angeloylbarringtogenol C (=(3β,16α,21β,22α)-16-(Acetyloxy)-3,22,28-trihydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
64	Foenumoside C $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Glc}^2 \leftarrow \text{Rha}$ $^4\uparrow$ Glc	*Lysimachia foenumgraecum*, aerial parts [45]. White powder. $C_{60}H_{96}O_{25}$: 1216.62. $[\alpha]_D^{24} = -23.0$ ($c = 0.15$, MeOH).
*Aglycone: 22-*O*-Angeloyl-21-dehydroxybarringtogenol C (=(3β,16α,22α)-3,16,28-Trihydroxyolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
65	Foenumoside D $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Glc}^2 \leftarrow \text{Rha}$ $^4\uparrow$ Glc	*Lysimachia foenumgraecum*, aerial parts [45]. White powder. $C_{58}H_{94}O_{23}$: 1158.62. $[\alpha]_D^{24} = -1.2$ ($c = 0.14$, MeOH).
*Aglycone: 22-*O*-Acetyl-21-*O*-benzoylbarringtogenol C (=(3β,16α,21β,22α)-22-(Acetyloxy)-3,16,28-trihydroxyolean-12-en-21-yl benzoate)*		
66	Petersaponin III $3\beta\text{-}O \leftarrow \text{GlcA}^2 \leftarrow \text{Gal}$; $^3\uparrow$ Xyl $28\text{-}O \leftarrow \text{Rha}$	*Petersianthus macrocarpus* (P. Beauv.) Liben (Barringtoniaceae), bark [46]. White powder. $C_{62}H_{92}O_{26}$: 1252.59. $[\alpha]_D = -8.0$ ($c = 0.7$, MeOH).
*Aglycone: 21-*O*-Furoxyl-22-*O*-tigloylbarringtogenol C (=(3β,16α,21β,22α)-3,16,28-Trihydroxy-22-{[(2*E*)-2-methylbut-2-enoyl]oxy}olean-12-en-21-yl furan-2-carboxylate)*		
67	Petersaponin IV $3\beta\text{-}O \leftarrow \text{GlcA}^2 \leftarrow \text{Gal}$; $^3\uparrow$ Xyl $28\text{-}O \leftarrow \text{Rha}$	*Petersianthus macrocarpus*, bark [46]. White powder. $C_{63}H_{94}O_{27}$: 1282.60. $[\alpha]_D = -14.0$ ($c = 0.5$, MeOH).

Table 1 (cont.)

*Aglycone: 28-*O*-Acetyl-21β-*O*-tigloylbarringtogenol C (=(3β,16α,21β,22α)-28-(Acetyloxy)-3,16,22-trihydroxyolean-12-en-21-yl (2*E*)-2-methylbut-2-enoate)*		
68	Isoescin IIIa 3β-*O* ⟵ GlcA^2 ⟵ Gal ^{4}↑ Glc	*Aesculus chinensis*, seeds [47]. White amorphous powder. $C_{55}H_{86}O_{23}$: 1114.56. $[\alpha]^{23}_{D} = +15.7$ ($c = 1.15$, MeOH).
*Aglycone: 28-*O*-Acetyl-21β-*O*-angeloylbarringtogenol C (=(3β,16α,21β,22α)-28-(Acetyloxy)-3,16,22-trihydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
69	Isoescin IIIb 3β-*O* ⟵ GlcA^2 ⟵ Gal ^{4}↑ Glc	*Aesculus chinensis*, seeds [47]. White amorphous powder. $C_{55}H_{86}O_{23}$: 1114.56. $[\alpha]^{23}_{D} = +3.0$ ($c = 1.00$, MeOH).
*Aglycone: 16,21-Di-*O*-acetyl-22-*O*-isovaleroylbarringtogenol C (=(3β,16α,21β,22α)-16,21-Bis(acetyloxy)-3,28-dihydroxyolean-12-en-22-yl 3-methylbutanoate)*		
70	Compound 4 3β-*O* ← GlcA^4 ← Rha	*Foetidia africana* VERDE (Lecythidaceae), stem bark [43]. $C_{51}H_{80}O_{18}$: 980.53. $[\alpha]^{25}_{D} = -17.0$ ($c = 0.1$, MeOH).
71	Compound 11 3β-*O* ← GlcA^2 ← Gal	*Foetidia africana*, stem bark [43]. $C_{51}H_{80}O_{19}$: 996.52. $[\alpha]^{25}_{D} = -5.2$ ($c = 0.154$, MeOH).
*Aglycone: 16,21-Di-*O*-acetyl-28-*O*-isovaleroylbarringtogenol C (=(3β,16α,21β,22α)-16,21-Bis(acetyloxy)-3,22-dihydroxyolean-12-en-28-yl 3-methylbutanoate)*		
72	Compound 8 3β-*O* ⟵ GlcA^2 ⟵ Gal ^{4}↑ Rha	*Foetidia africana*, stem bark [43]. $C_{57}H_{90}O_{23}$: 1142.59. $[\alpha]^{25}_{D} = -13.3$ ($c = 0.383$, MeOH).
73	Compound 12 3β-*O* ← GlcA^2 ← Gal	*Foetidia africana*, stem bark [43]. $C_{51}H_{80}O_{19}$: 996.52. $[\alpha]^{25}_{D} = -1.6$ ($c = 0.064$, MeOH).
*Aglycone: 16-*O*-Acetylbarringtogenol C (=(3β,16α,21β,22α)-3,21,22,28-Tetrahydroxyolean-12-en-16-yl acetate)*		
74	Compound 5 3β-*O* ⟵ GlcA^2 ⟵ Gal ^{4}↑ Rha	*Foetidia africana*, stem bark [43]. $C_{50}H_{80}O_{21}$: 1016.52. $[\alpha]^{25}_{D} = -10.5$ ($c = 0.095$, MeOH).
*Aglycone: 21-*O*-Acetyl-28-*O*-isovaleroylbarringtogenol C (=(3β,16α,21β,22α)-21-(Acetyloxy)-3,16,22-trihydroxyolean-12-en-28-yl 3-methylbutanoate)*		
75	Compound 7 3β-*O* ⟵ GlcA^2 ⟵ Gal ^{4}↑ Rha	*Foetidia africana*, stem bark [43]. $C_{55}H_{88}O_{22}$: 1100.57. $[\alpha]^{25}_{D} = -4.9$ ($c = 0.183$, MeOH).
76	Compound 10 3β-*O* ← GlcA^2 ← Gal	*Foetidia africana*, stem bark [43]. $C_{49}H_{78}O_{18}$: 954.52. $[\alpha]^{25}_{D} = +0.9$ ($c = 0.109$, MeOH).
*Aglycone: 21-*O*-Acetyl-22-*O*-isovaleroylbarringtogenol C (=(3β,16α,21β,22α)-21-(Acetyloxy)-3,16,28-trihydroxyolean-12-en-22-yl 3-methylbutanoate)*		
77	Compound 9 3β-*O* ← GlcA^2 ← Gal	*Foetidia africana*, stem bark [43]. $C_{49}H_{78}O_{18}$: 954.52. $[\alpha]^{25}_{D} = -9.0$ ($c = 0.1$, MeOH).

Table 1 (cont.)

*Aglycone: 22-*O*-Acetyl-21-*O*-tigloylbarringtogenol C (=(3β,16α,21β,22α)-22-(Acetyloxy)-3,16,28-trihydroxyolean-12-en-21-yl (2*E*)-2-methylbut-2-enoate)*		
78	Jegosaponin A 3β-*O* ⟵ GlcA^2 ⟵ Glc ^{3}↑ Gal^2 ⟵ Rha	*Styrax japonica* Sieb. et Zucc. (Styracaceae), fruits [48]. Colorless needles. $C_{61}H_{96}O_{27}$: 1260.61. M.p. 246–248°. $[\alpha]_D^{25} = -24.6$ ($c = 1.1$, MeOH).
*Aglycone: 28-*O*-Acetyl-21-*O*-tigloylbarringtogenol C (=(3β,16α,21β,22α)-28-(Acetyloxy)-3,16,22-trihydroxyolean-12-en-21-yl (2*E*)-2-methylbut-2-enoate)*		
79	Jegosaponin B 3β-*O* ⟵ GlcA^2 ⟵ Glc ^{3}↑ Gal^2 ⟵ Rha	*Styrax japonica* Sieb. et Zucc., fruits [48]. Colorless needles. $C_{61}H_{96}O_{27}$: 1260.61. M.p. 218–220°. $[\alpha]_D^{25} = -8.2$ ($c = 1.1$, MeOH).
*Aglycone: 28-*O*-Acetyl-22-*O*-tigloylbarringtogenol C (=(3β,16α,21β,22α)-28-(Acetyloxy)-3,16,21-trihydroxyolean-12-en-22-yl (2*E*)-2-methylbut-2-enoate)*		
80	Jegosaponin C 3β-*O* ⟵ GlcA^2 ⟵ Glc ^{3}↑ Gal^2 ⟵ Rha	*Styrax japonica* Sieb. et Zucc., fruits [48]. Colorless needles. $C_{61}H_{96}O_{27}$: 1260.61. M.p. 230–232°. $[\alpha]_D^{25} = -26.6$ ($c = 1.5$, MeOH).
*Aglycone: 28-*O*-Acetyl-21-*O*-[(2*Z*)-hex-2-enoyl]barringtogenol C (=(3β,16α,21β,22α)-28-(Acetyloxy)-3,16,22-trihydroxyolean-12-en-21-yl (2*Z*)-hex-2-enoate)*		
81	Jegosaponin D 3β-*O* ⟵ GlcA^2 ⟵ Glc ^{3}↑ Gal^2 ⟵ Rha	*Styrax japonica* Sieb. et Zucc., fruits [48]. Colorless needles. $C_{62}H_{98}O_{27}$: 1274.63. M.p. 213–215°. $[\alpha]_D^{25} = -12.0$ ($c = 1.5$, MeOH).
*Aglycone: 16,22-Di-*O*-acetyl-21-*O*-tigloyltheasapogenol B (=(3β,16α,21β,22α)-16,22-Bis(acetyloxy)-3,28-dihydroxyolean-12-en-21-yl (2*E*)-2-methylbut-2-enoate)*		
82	Foliatheasaponin I 3β-*O* ⟵ GlcA^2 ⟵ Gal ^{3}↑ Ara^2 ⟵ Xyl	*Camellia sinensis* (L.) O. Kuntze (Theaceae), leaves [49]. Colorless crystals ($CHCl_3$/MeOH). $C_{61}H_{94}O_{27}$: 1258.60. M.p. 214–215°. $[\alpha]_D = -18.3$ ($c = 0.97$, MeOH).
*Aglycone: 22-*O*-Acetyl-21-*O*-[(*E*)-cinnamoyl]theasapogenol B (=(3β,16α,21β,22α)-22-(Acetyloxy)-3,16,28-trihydroxyolean-12-en-21-yl (2*E*)-3-phenylprop-2-enoate)*		
83	Foliatheasaponin II 3β-*O* ⟵ GlcA^2 ⟵ Gal ^{3}↑ Ara^2 ⟵ Xyl	*Camellia sinensis*, leaves [49]. Colorless crystals ($CHCl_3$/MeOH). $C_{63}H_{92}O_{26}$: 1264.59. M.p. 235.5–236.5°. $[\alpha]_D^{27} = -6.3$ ($c = 0.24$, MeOH).

Table 1 (cont.)

*Aglycone: 16,22-Di-*O*-Acetyl-21-*O*-angeloyltheasapogenol B (=(3β,16α,21β,22α)-16,22-Bis(acetyloxy)-3,28-dihydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
84	Foliatheasaponin III 3β-*O*⟵ GlcA^2 ⟵ Gal ^{3}↑ Ara^2 ⟵ Xyl	*Camellia sinensis*, leaves [49]. Colorless crystals ($CHCl_3$/MeOH). $C_{61}H_{94}O_{27}$: 1258.60. M.p. 220.4–220.8°. $[\alpha]_D^{27} = -10.0$ (c=2.40, MeOH).
*Aglycone: 16,22-Di-*O*-acetyl-21-*O*-[(*Z*)-cinnamoyl]theasapogenol B (=(3β,16α,21β,22α)-16,22-Bis(acetyloxy)-3,28-dihydroxyolean-12-en-21-yl (2*Z*)-3-phenylprop-2-enoate)*		
85	Foliatheasaponin IV 3β-*O*⟵ GlcA^2 ⟵ Gal ^{3}↑ Ara^2 ⟵ Xyl	*Camellia sinensis*, leaves [49]. Colorless crystals ($CHCl_3$/MeOH). $C_{65}H_{94}O_{27}$: 1306.60. M.p. 236.5–237°. $[\alpha]_D^{27} = -9.6$ (c=1.0, MeOH).
*Aglycone: 28-*O*-Acetyl-21-*O*-[(*E*)-cinnamoyl]theasapogenol B (=(3β,16α,21β,22α)-28-(Acetyloxy)-3,16,22-trihydroxyolean-12-en-21-yl (2*E*)-3-phenylprop-2-enoate)*		
86	Foliatheasaponin V 3β-*O*⟵ GlcA^2 ⟵ Gal ^{3}↑ Ara^2 ⟵ Xyl	*Camellia sinensis*, leaves [49]. Colorless crystals ($CHCl_3$/MeOH). $C_{63}H_{92}O_{26}$: 1264.59. M.p. 234–235.5°. $[\alpha]_D^{27} = +8.4$ (c=0.68, MeOH).
*Aglycone: 22-*O*-Acetyl-21-*O*-angeloyltheasapogenol B (=(3β,16α,21β,22α)-22-(Acetyloxy)-3,16,28-trihydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
87	Floratheasaponin A 3β-*O* ⟵ GlcA^3 ⟵ Ara^2 ⟵ Xyl ^{2}↑ Gal	*Camellia sinensis*, flowers [50]. Colorless crystals ($CHCl_3$/MeOH). $C_{59}H_{92}O_{26}$: 1216.59. M.p. 201–203°. $[\alpha]_D^{26} = -3.3$ (c=0.50, MeOH).
*Aglycone: 28-*O*-Acetyl-21-*O*-angeloyltheasapogenol B (=(3β,16α,21β,22α)-28-(Acetyloxy)-3,16,22-trihydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
88	Assamsaponin E 3β-*O*⟵ GlcA^2 ⟵ Gal ^{3}↑ Ara^2 ⟵ Xyl	*Camellia sinensis*, var. *assamica*, seeds [51]. Colorless crystals $C_{59}H_{92}O_{26}$: 1216.59. M.p. 189.4–190.4°. $[\alpha]_D^{27} = +23.8$ (c=0.1, MeOH).
*Aglycone: 21,22-Di-*O*-acetylbarringtogenol C (=(3β,16α,21β,22α)-3,16,28-Trihydroxyolean-12-ene-21,22-diyl diacetate)*		
89	Hydrocotyloside VII Ara ↓^{6} 3β-*O*⟵ Glc^2 ⟵ Glc ^{4}↑ Glc	*Hydrocotyle sibthorpioides*, whole plant [52]. Amorphous powder. $C_{57}H_{92}O_{26}$: 1192.59. $[\alpha]_D^{23} = -1.5$ (c=0.81, MeOH).

Table 1 (cont.)

*Aglycone: 21-*O*-Angeloylbarringtogenol C (=(3β,16α,21β,22α)-3,16,22,28-Tetrahydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
90	Aesculioside IV$_a$ 3β-*O* ⟵ GlcA^3 ⟵ Ara(f) ^{2}↑ Gal	*Aesculus pavia* (Hippocastanaceae), fruits [41]. Colorless powder. $C_{57}H_{90}O_{23}$: 1142.59. $[\alpha]_D^{25} = -35.1$ ($c = 0.2$, MeOH).
Aglycone: Barrigenol R$_1$ (=(3β,15α,16α,21β,22α)-Olean-12-ene-3,15,16,21,22,28-hexol)		
91	Aesculioside I$_a$ 3β-*O* ⟵ GlcA^3 ⟵ Ara(f) ^{2}↑ Gal	*Aesculus pavia* L. (Hippocastanaceae), fruits [41]. Colorless powder. $C_{47}H_{76}O_{21}$: 976.49. $[\alpha]_D^{25} = -18.5$ ($c = 0.2$, MeOH-H_2O, 6 : 4).
*Aglycone: 21-*O*-Angeloylbarrigenol R$_1$ (=(3β,15α,16α,21β,22α)-3,15,16,22,28-Pentahydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
92	Aesculioside II$_a$ 3β-*O* ⟵ GlcA^3 ⟵ Ara(f) ^{2}↑ Gal	*Aesculus pavia* (Hippocastanaceae), fruits [41]. Colorless powder. $C_{52}H_{82}O_{22}$: 1058.53. $[\alpha]_D^{25} = -23.5$ ($c = 0.2$, MeOH).
*Aglycone: 21-*O*-Acetyl-22-*O*-angeloylbarrigenol R$_1$ (=(3β,15α,16α,21β,22α)-21-(Acetyloxy)-3,15,16,28-tetrahydroxyolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
93	Saniculasaponin I 3β-*O* ⟵ GlcA^3 ⟵ Gal ^{2}↑ Glc	*Sanicula elata* HAM. var. *chinensis* MAKINO (Apiaceae), whole plant [53]. Amorphous powder. $C_{55}H_{86}O_{24}$: 1130.55. $[\alpha]_D^{23} = -31.5$ ($c = 2.40$, C_5H_5N).
94	Saniculasaponin II 3β-*O* ⟵ GlcA^3 ⟵ Ara ^{2}↑ Glc	*Sanicula elata* var. *chinensis*, whole plant [53]. Amorphous powder. $C_{54}H_{84}O_{23}$: 1100.54. $[\alpha]_D^{23} = -24.5$ ($c = 1.22$, C_5H_5N).
*Aglycone: 22-*O*-Acetyl-21-*O*-angeloylbarrigenol R$_1$ (=(3β,15α,16α,21β,22α)-22-(Acetyloxy)-3,15,16,28-tetrahydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
95	Saniculasaponin III 3β-*O* ⟵ GlcA^3 ⟵ Ara ^{2}↑ Glc	*Sanicula elata* var. *chinensis*, whole plant [53]. Amorphous powder. $C_{54}H_{84}O_{23}$: 1100.54. $[\alpha]_D^{23} = -19.1$ ($c = 2.38$, C_5H_5N).
*Aglycone: 28-*O*-Acetyl-21-*O*-angeloylbarrigenol R$_1$ (=(3β,15α,16α,21β,22α)-28-(Acetyloxy)-3,15,16,22-tetrahydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
96	Saniculasaponin IV 3β-*O* ⟵ GlcA^3 ⟵ Ara ^{2}↑ Glc	*Sanicula elata* var. *chinensis*, whole plant [53]. Amorphous powder. $C_{54}H_{84}O_{23}$: 1100.54. $[\alpha]_D^{23} = +2.2$ ($c = 0.66$, C_5H_5N).

Table 1 (cont.)

*Aglycone: 22-*O*-Angeloylbarrigenol R$_1$ (=(3β,15α,16α,21β,22α)-3,15,16,21,28-Pentahydroxyolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
97	Saniculasaponin V 3β-*O*⟵ GlcA^3 ⟵Gal; ^{2}↑ Glc 21β-*O*⟵ Rha^4⟵ Ac ^{2}↑ Ac	*Sanicula elata* var. *chinensis*, whole plant [53]. Amorphous powder. $C_{63}H_{98}O_{29}$: 1318.62. $[\alpha]_D^{23} = -32.1$ (c=0.93, C_5H_5N).
98	Saniculasaponin VI 3β-*O*⟵ GlcA^3 ⟵Ara; ^{2}↑ Glc 21β-*O*⟵ Rha^4⟵ Ac ^{2}↑ Ac	*Sanicula elata* var. *chinensis*, whole plant [53]. Amorphous powder. $C_{62}H_{96}O_{28}$: 1288.61. $[\alpha]_D^{23} = -33.7$ (c=0.90, C_5H_5N).
99	Saniculasaponin VII 3β-*O*⟵ GlcA^3 ⟵Gal; ^{2}↑ Glc 21β-*O*⟵ Rha^4⟵ Ac ^{3}↑ Ac	*Sanicula elata* var. *chinensis*, whole plant [53]. Amorphous powder. $C_{63}H_{98}O_{29}$: 1318.62. $[\alpha]_D^{23} = -120.5$ (c=0.39, C_5H_5N).
100	Saniculasaponin VIII 3β-*O*⟵ GlcA^3 ⟵Ara; ^{2}↑ Glc 21β-*O*⟵ Rha^4⟵ Ac ^{3}↑ Ac	*Sanicula elata* var. *chinensis*, whole plant [53]. Amorphous powder. $C_{62}H_{96}O_{28}$: 1288.61. $[\alpha]_D^{23} = -10.0$ (c=0.13, C_5H_5N).
101	Compound 2 3β-*O*←GlcA^2←Rha	*Eryngium campestre* L., roots [54]. White amorphous powder. $C_{47}H_{74}O_{17}$: 910.49. $[\alpha]_D^{25} = -10.2$ (c=0.06, MeOH).
102	Saponin 1 3β-*O*⟵ GlcA^2 ⟵ Glc ^{4}↑ Rha	*Eryngium campestre* L. (Apiaceae), roots [55]. White powder. $C_{53}H_{84}O_{22}$: 1072.55. $[\alpha]_D^{25} = -33.0$ (c = 0.03, MeOH).
*Aglycone: 21-*O*-Acetyl-22-*O*-angeloylbarrigenol R$_1$ (=(3β,15α,16α,21β,22α)-21-(Acetyloxy)-3,15,16,28-tetrahydroxyolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
103	Compound 3 3β-*O*←GlcA^2←Rha	*Eryngium campestre*,roots [54]. White amorphous powder. $C_{49}H_{76}O_{18}$: 952.50. $[\alpha]_D^{25} = -30.0$ (c = 0.05,MeOH).

Table 1 (cont.)

*Aglycone: 21-*O*-Acetyl-22-*O*-(β,β-dimethylacryloyl)barrigenol R₁ (=(3β,15α,16α,21β,22α)-21-(Acetyloxy)-3,15,16,28-tetrahydroxyolean-12-en-22-yl 3-methylbut-2-enoate)*		
104	Compound 4 3β-*O* ← GlcA^2 ← Rha	*Eryngium campestre*, roots [54]. White amorphous powder. $C_{49}H_{76}O_{18}$: 952.50. $[\alpha]_D^{25} = -30.1$ ($c = 0.05$,MeOH).
*Aglycone: 28-*O*-Acetyl-22-*O*-angeloylbarrigenol R₁ (=(3β,15α,16α,21β,22α)-28-(Acetyloxy)-3,15,16,21-tetrahydroxyolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
105	Compound 5 3β-*O* ← GlcA^2 ← Rha	*Eryngium campestre*, roots [54]. White amorphous powder. $C_{49}H_{76}O_{18}$: 952.50. $[\alpha]_D^{25} = -6.5$ ($c = 0.06$, MeOH).
*Aglycone: 21,22-Di-*O*-angeloylbarrigenol R₁ (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxyolean-12-ene-21,22-diyl (2*Z*,2′*Z*)-bis(2-methylbut-2-enoate))*		
106	Floratheasaponin B 3β-*O* ← GlcA^3 ← Ara^2 ← Xyl (2↑ Gal)	*Camellia sinensis*, flowers [50]. Colorless crystals ($CHCl_3$/MeOH). $C_{62}H_{96}O_{27}$: 1272.61. M.p. 214–216°. $[\alpha]_D^{26} = -1.4$ ($c = 0.50$, MeOH).
107	Xanifolia Y 3β-*O* ← GlcA^2 ← Gal (3↑ Ara(f))	*Xanthoceras sorbifolia* (Sapindaceae) [56]. $C_{57}H_{88}O_{23}$: 1140.57.
108	Saponin 1 3β-*O* ← GlcA^2 ← Gal (3↑ Ara(f))	*Xanthoceras sorbifolia* BUNGE (Sapindaceae), husks [57]. White needles. $C_{57}H_{88}O_{23}$: 1140.57. M.p. 267–268°. $[\alpha]_D^{20} = +19.1$ ($c = 0.8$, MeOH–H_2O, 1:1).
109	Saponin III C_4 (Ara(f) ↓4) 3β-*O* ← GlcA^3 ← Ara (2↑ Glc)	*Pittosporum tobira* AIT. (Pittosporaceae) [58]. White amorphous powder. $C_{62}H_{96}O_{27}$: 1272.61. M.p. 261–263°. $[\alpha]_D^{25} = -30.0$ ($c = 0.25$, MeCN–H_2O, 7:3).
*Aglycone: 21-*O*-Angeloyl-22-*O*-(2-methylbutanoyl)barrigenol R₁ (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylbutanoyl)oxy]olean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
110	Floratheasaponin C (Ara(f) ↓4) 3β-*O* ← GlcA^3 ← Ara (2↑ Glc)	*Camellia sinensis*, flowers [50]. Colorless crystals ($CHCl_3$/MeOH). $C_{62}H_{98}O_{27}$: 1274.63. M.p. 220–222°. $[\alpha]_D^{25} = +4.6$ ($c = 0.50$, MeOH).

Table 1 (cont.)

Aglycone: 21-O-*Angeloyl-22*-O-*senecioylbarrigenol R*$_1$ *(=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(3-methylbut-2-enoyl)oxy]olean-12-en-21-yl (2Z)-2-methylbut-2-enoate)*		
111	Pittoviridoside Ara(f) ↓ 4 3β-*O* ← GlcA² ← Glc 3 ↑ Ara	*Pittosporum viridiflorum* SIMS (Pittosporaceae) [59]. White powder. $C_{62}H_{96}O_{27}$: 1272.61. M.p. 276° (dec.). $[\alpha]^{25}_{D} = -19.0$ ($c = 0.30$, MeOH).
Aglycone: 22-O-*Acetyl-21*-O-*propanoylbarrigenol R*$_1$ *(=(3β,15α,16α,21β,22α)-22-(Acetyloxy)-3,15,16,28-tetrahydroxyolean-12-en-21-yl propanoate)*		
112	Hydrocotyloside I 3β-*O* ← GlcA² ← Glc	*Hydrocotyle sibthorpioides* LAM. (Apiaceae), whole plant [52]. Amorphous powder. $C_{47}H_{74}O_{19}$: 942.48. $[\alpha]^{23}_{D} = -1.1$ ($c = 0.46$, MeOH).
Aglycone: 22-O-*Acetyl-21*-O-*(2-methylpropanoyl)barrigenol R*$_1$ *(=(3β,15α,16α,21β,22α)-22-(Acetyloxy)-3,15,16,28-tetrahydroxyolean-12-en-21-yl 2-methylpropanoate)*		
113	Hydrocotyloside II 3β-*O* ← GlcA² ← Glc	*Hydrocotyle sibthorpioides*, whole plant [52]. Amorphous powder. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]^{23}_{D} = -1.5$ ($c = 0.91$, MeOH).
114	Hydrocotyloside III 3β-*O* ← GlcA² ← Glc 3 ↑ Glc	*Hydrocotyle sibthorpioides*, whole plant [52]. Amorphous powder. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]^{23}_{D} = -0.8$ ($c = 0.86$, MeOH).
115	Hydrocotyloside IV 3β-*O* ← GlcA² ← Glc² ← Glc	*Hydrocotyle sibthorpioides*, whole plant [52]. Amorphous powder. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]^{23}_{D} = -1.1$ ($c = 0.63$, MeOH).
116	Hydrocotyloside V Ara ↓ 6 3β-*O* ← Glc² ← Glc 4 ↑ Glc	*Hydrocotyle sibthorpioides*, whole plant [52]. Amorphous powder. $C_{59}H_{96}O_{27}$: 1236.61. $[\alpha]^{23}_{D} = -1.5$ ($c = 0.85$, MeOH).
Aglycone:22-O-*Acetyl-21*-O-*(2-methylbutanoyl)barrigenol R*$_1$ *(=(3β,15α,16α,21β,22α)-22-(Acetyloxy)-3,15,16,28-tetrahydroxyolean-12-en-21-yl 2-methylbutanoate)*		
117	Hydrocotyloside VI Ara ↓ 6 3β-*O* ← Glc² ← Glc 4 ↑ Glc	*Hydrocotyle sibthorpioides*, whole plant [52]. Amorphous powder. $C_{60}H_{98}O_{27}$: 1250.63. $[\alpha]^{23}_{D} = -1.2$ ($c = 0.34$, MeOH).

Table 1 (cont.)

*Aglycone: 21-*O*-[(2*Z*)-3,7-Dimethylocta-2,6-dienoyl]-22-*O*-(2-methylbutanoyl)barrigenol R_1 (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylbutanoyl)oxy]olean-12-en-21-yl (2*Z*)-3,7-dimethylocta-2,6-dienoate)*		
118	Symplocososide A 3β-*O*⟵ GlcA (Me ester)^2 ⟵ Glc ^{4}↑ Ara(f)	*Simplocos chinensis* (Lour.) Druce (Symplocaceae), roots [60][61]. White powder. $C_{63}H_{100}O_{23}$: 1224.67. M.p. 189–191°. $[\alpha]_D^{18} = -29.0$ ($c = 0.99$, MeOH).
119	Symplocososide C 3β-*O*⟵ GlcA (Bu ester)^2 ⟵ Glc ^{4}↑ Ara(f)	*Simplocos chinensis* roots [60][61]. White powder. $C_{66}H_{106}O_{23}$: 1266.71. M.p. 217–219°. $[\alpha]_D^{24} = -23.3$ ($c = 1.03$, MeOH).
*Aglycone: 21-O-[(2*E*)-3,7-Dimethylocta-2,6-dienoyl]-22-*O*-(2-methylbutanoyl)barrigenol R_1 (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylbutanoyl)oxy]olean-12-en-21-yl (2*E*)-3,7-dimethylocta-2,6-dienoate)*		
120	Symplocososide B 3β-*O*⟵ GlcA (Me ester)^2 ⟵ Glc ^{4}↑ Ara(f)	*Simplocos chinensis*, roots [60][61]. White powder. $C_{63}H_{100}O_{23}$: 1224.67. M.p. 189–191°. $[\alpha]_D^{18} = -23.0$ ($c = 1.02$, MeOH).
121	Symplocososide D 3β-*O*⟵ GlcA (Bu ester)^2 ⟵ Glc ^{4}↑ Ara(f)	*Simplocos chinensis*, roots [60][61]. White powder. $C_{66}H_{106}O_{23}$: 1266.71. M.p. 213–215°. $[\alpha]_D^{24} = -15.8$ ($c = 0.70$, MeOH).
122	Simplocososide S 3β-*O* ← GlcA^2 ← Glc	*Simplocos chinensis*, roots [62]. Amorphous powder. $C_{57}H_{90}O_{19}$: 1078.61. M.p. 235–236°. $[\alpha]_D^{25} = -19.8$ ($c = 0.97$,MeOH).
*Aglycone: 21-*O*-Cinnamoyl-22-*O*-(2-methylbutanoyl)barrigenol R_1 (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-21-{[(2*E*)-3-phenylprop-2-enoyl]oxy}olean-12-en-22-yl 2-methylbutanoate)*		
123	Symplocososide E 3β-*O*⟵ GlcA (Bu ester)^2 ⟵ Glc ^{4}↑ Ara(f)	*Simplocos chinensis*, roots [60][61]. White powder. $C_{65}H_{98}O_{23}$: 1246.65. M.p. 211–213°. $[\alpha]_D^{24} = -21.4$ ($c = 1.02$, MeOH).
124	Simplocososide N 3β-*O* ← GlcA^2 ← Glc	*Simplocos chinensis*, roots [62]. Amorphous powder. $C_{56}H_{82}O_{19}$: 1058.54. M.p. 268–270°. $[\alpha]_D^{25} = -18.6$ ($c = 0.70$, MeOH).
125	Symplocososide X 3β-*O* ⟵ GlcA^2 ⟵ Glc ^{4}↑ Ara(f)	*Symplocos chinensis*, roots [63]. White powder. $C_{61}H_{90}O_{23}$: 1190.59. M.p. 280–282°. $[\alpha]_D^{19} = -30.5$ ($c = 0.19$, MeOH).

Table 1 (cont.)

126	Symplocososide Y Ac ↓ 3 3*β-O* ⟵ GlcA^2 ⟵ Glc 4 ↑ Ara(f)	*Symplocos chinensis*, roots [63]. White powder. $C_{63}H_{92}O_{24}$: 1232.60. M.p. 272–274°. $[\alpha]_D^{19} = -26.0$ ($c = 0.25$, MeOH).

*Aglycone: 21-*O*-[(2*Z*)-3,7-Dimethylocta-2,6-dienoyl]-22-*O*-(2-methylbutanoyl)barrigenol R$_1$ (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylbutanoyl)oxy]olean-12-en-21-yl (2*Z*)-3,7-dimethylocta-2,6-dienoate)*

127	Symplocososide G Ac ↓ 3 3*β-O* ⟵ GlcA^2 ⟵ Glc 4 ↑ Ara(f)	*Simplocos chinensis* (LOUR) (Symplocaceae), roots [64]. White amorphous powder. $C_{64}H_{100}O_{24}$: 1252.66. M.p. 236–238°. $[\alpha]_D^{25} = +64.2$ ($c = 0.95$, MeOH).
128	Symplocososide I Ac ↓ 3 3*β-O* ⟵ GlcA (Me ester)^2 ⟵ Glc 4 ↑ Ara(f)	*Simplocos chinensis*, roots [64]. White amorphous powder. $C_{65}H_{102}O_{24}$: 1266.68. M.p. 218–220°. $[\alpha]_D^{25} = +220.0$ ($c = 1.00$, MeOH).

*Aglycone: 21-*O*-[(2*E*)-3,7-Dimethylocta-2,6-dienoyl]-22-*O*-(2-methylbutanoyl)barrigenol R$_1$ (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylbutanoyl)oxy]olean-12-en-21-yl (2*E*)-3,7-dimethylocta-2,6-dienoate)*

129	Symplocososide H Ac ↓ 3 3*β-O* ⟵ GlcA^2 ⟵ Glc 4 ↑ Ara(f)	*Simplocos chinensis*, roots [64]. White amorphous powder. $C_{64}H_{100}O_{24}$: 1252.66. M.p. 255–257°. $[\alpha]_D^{25} = +90.3$ ($c = 1.44$, MeOH).

*Aglycone: 21-*O*-[(2*Z*)-3,7-dimethylocta-2,6-dienoyl]-22-*O*-benzoylbarrigenol R$_1$ (=(3β,15α,16α,21β,22α)-21-{[(2*Z*)-3,7-Dimethylocta-2,6-dienoyl]oxy}-3,15,16,28-tetrahydroxyolean-12-en-22-yl benzoate)*

130	Symplocososide J Ac ↓ 3 3*β-O* ⟵ GlcA^2 ⟵ Glc 4 ↑ Ara(f)	*Simplocos chinensis*, roots [64]. White amorphous powder. $C_{66}H_{96}O_{24}$: 1272.63. M.p. 254–256°. $[\alpha]_D^{25} = +135.4$ ($c = 0.96$, MeOH).
131	Symplocososide K Ac ↓ 3 3*β-O* ⟵ GlcA (Me ester)^2 ⟵ Glc 4 ↑ Ara(f)	*Simplocos chinensis*, roots [64]. White amorphous powder. $C_{67}H_{98}O_{24}$: 1286.64. M.p. 220–222°. $[\alpha]_D^{25} = +266.7$ ($c = 1.05$, MeOH).

Table 1 (cont.)

*Aglycone: 21-*O*-[(2*Z*)-3,7-Dimethylocta-2,6-dienoyl]-22-*O*-(2-methylpropanoyl)barrigenol R$_1$ (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylpropanoyl)oxy]olean-12-en-21-yl (2*Z*)-3,7-dimethylocta-2,6-dienoate)*		
132	Simplocososide L Ac ↓ 3 3β-*O* ⟵ GlcA^4 ⟵ Ara(f) 2 ↑ Glc	*Simplocos chinensis* (LOUR) DRUCE (Symplocaceae), roots [62]. Amorphous powder. $C_{63}H_{98}O_{24}$: 1238.64. M.p. 248–250°. $[\alpha]^{25}_{D} = -34.5$ ($c = 0.90$, MeOH).
*Aglycone: 21-*O*-[(2*E*)-3,7-Dimethylocta-2,6-dienoyl]-22-*O*-(2-methylpropanoyl)barrigenol R$_1$ (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylpropanoyl)oxy]olean-12-en-21-yl (2*E*)-3,7-dimethylocta-2,6-dienoate)*		
133	Simplocososide M Ac ↓ 3 3β-*O* ⟵ GlcA^4 ⟵ Ara(f) 2 ↑ Glc	*Simplocos chinensis*, roots [62]. Amorphous powder. $C_{63}H_{98}O_{24}$: 1238.64. M.p. 267–269°. $[\alpha]^{25}_{D} = -25.7$ ($c = 1.05$, MeOH).
*Aglycone: 21-*O*-Benzoyl-22-*O*-(2-methylbutanoyl)barrigenol R$_1$ (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylbutanoyl)oxy]olean-12-en-21-yl benzoate)*		
134	Simplocososide P Ac ↓ 3 3β-*O* ⟵ GlcA^4 ⟵ Ara(f) 2 ↑ Glc	*Simplocos chinensis*, roots [62]. Amorphous powder. $C_{61}H_{90}O_{24}$: 1206.58. M.p. 236–238°. $[\alpha]^{25}_{D} = -36.8$ ($c = 1.16$, MeOH).
*Aglycone: 21-*O*-[(2*Z*)-3,7-Dimethylocta-2,6-dienoyl]-22-*O*-(2-methylbutanoyl)barrigenol R$_1$ (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylbutanoyl)oxy]olean-12-en-21-yl (2*Z*)-3,7-dimethylocta-2,6-dienoate)*		
135	Simplocososide Q Et ↓ 6 3β-*O* ⟵ GlcA^4 ⟵ Ara(f) 2 ↑ Glc	*Simplocos chinensis*, roots [62]. Amorphous powder. $C_{64}H_{102}O_{23}$: 1238.68. M.p. 216–218°. $[\alpha]^{25}_{D} = -18.5$ ($c = 1.02$, MeOH).
136	Simplocososide R 3β-*O* ← GlcA^2 ← Glc	*Simplocos chinensis*, roots [62]. Amorphous powder. $C_{57}H_{90}O_{19}$: 1078.61. M.p. 226–228°. $[\alpha]^{25}_{D} = -26.8$ ($c = 1.06$, MeOH).

Table 1 (cont.)

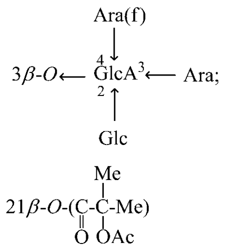
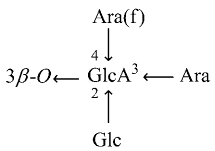
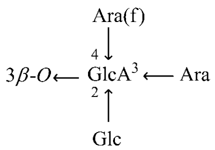
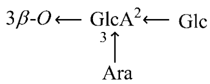
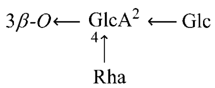
*Aglycone: 21-*O*-(2-Acetoxy-2-methylbutanoyl)-22-*O*-acetylbarrigenol R₁ (=(3β,15α,16α,21β,22α)-22-(Acetyloxy)-3,15,16,28-tetrahydroxyolean-12-en-21-yl 2-(acetyloxy)-2-methylbutanoate)*		
137	Saponin IIIA$_2$ 	*Pittosporum tobira* AIT (Pittosporaceae) [58]. White amorphous powder. $C_{61}H_{96}O_{29}$: 1292.60. M.p. 241–243°. $[\alpha]_D^{25} = -25.5$ ($c = 0.21$, MeOH–H_2O, 1:1).
*Aglycone: 21-*O*-Angeloyl-22-*O*-acetylbarrigenol R₁ (=(3β,15α,16α,21β,22α)-22-(Acetyloxy)-3,15,16,28-tetrahydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
138	Saponin IIIA$_3$ 	*Pittosporum tobira* AIT (Pittosporaceae) [58]. White amorphous powder. $C_{59}H_{92}O_{27}$: 1232.58. M.p. 250–252°. $[\alpha]_D^{25} = -20.3$ ($c = 0.24$, MeOH/H_2O, 1:1).
*Aglycone: 21-*O*-Angeloyl-28-*O*-acetylbarrigenol R₁ (=(3β,15α,16α,21β,22α)-28-(Acetyloxy)-3,15,16,22-tetrahydroxyolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
139	Saponin III B$_2$ 	*Pittosporum tobira* AIT. (Pittosporaceae) [58]. White amorphous powder. $C_{59}H_{92}O_{27}$: 1232.58. M.p. 216–218°. $[\alpha]_D^{25} = -6.4$ ($c = 0.24$, MeOH/H_2O, 1:1).
*Aglycone: 21-*O*-[2-Methylbutanoyl]barrigenol R₁ (=(3β,15α,16α,21β,22α)-3,15,16,22,28-Pentahydroxyolean-12-en-21-yl 2-methylbutanoate)*		
140	Saniculoside R-1 	*Sanicula europaea* L., leaves [65]. White amorphous powder. $C_{52}H_{84}O_{22}$: 1060.55. M.p. 182–185°.
*Aglycone: 22-*O*-(β,β-Dimethylacryloyl)barrigenol A₁ (=(3β,15α,16α,22α)-3,15,16,28-Tetrahydroxyolean-12-en-22-yl 3-methylbut-2-enoate)*		
141	Compound 1 3β-*O* ← GlcA^2 ← Rha	*Eryngium campestre* L. (Apiaceae), roots [54]. White amorphous powder. $C_{47}H_{74}O_{16}$: 894.50. $[\alpha]_D^{25} = -29.3$ ($c = 0.05$, MeOH).
142	Saponin 2 	*Eryngium campestre*, roots [55]. White powder. $C_{53}H_{84}O_{21}$: 1056.55. $[\alpha]_D^{25} = -33.0$ ($c = 0.03$, MeOH).

Table 1 (cont.)

*Aglycone: 22-*O*-[(2*Z*)-3,7-Dimethylocta-2,6-dienoyl]barrigenol A$_1$ (=(3β,15α,16α,22α)-3,15,16,28-Tetrahydroxyolean-12-en-22-yl (2*Z*)-3,7-dimethylocta-2,6-dienoate)*		
143	Symplocososide F 3*β*-*O* ⟵ GlcA (Bu ester)^2 ⟵ Glc 4 ↑ Ara(f)	*Simplocos chinensis*, roots [60] [61]. White powder. $C_{61}H_{98}O_{21}$: 1166.66. M.p. 234–236°. $[\alpha]^{24}_{D} = -24.3$ (*c* = 0.70, MeOH).
144	Simplocososide O Ac 3 ↓ 3*β*-*O* ⟵ GlcA^4 ⟵ Ara(f) 2 ↑ Glc	*Simplocos chinensis*, roots [62]. Amorphous powder. $C_{59}H_{92}O_{22}$: 1152.61. M.p. 258–260°. $[\alpha]^{25}_{D} = -40.0$ (*c* = 1.0, MeOH).
Aglycone: (3β,11α,16β)-Olean-12-ene-3,11,16,23,28-pentol		
145	Craniosaponin A 3*β*-*O* ⟵ Fuc^2 ⟵ Glc 3 ↑ Glc^4 ⟵ Rha	*Craniotome furcata* (LINK) O. KUNTZE (Labiatae), whole plant [66]. White powder. $C_{54}H_{90}O_{23}$: 1106.59. $[\alpha]^{20}_{D} = -4.3$ (*c* = 0.49, MeOH).
*Aglycone: 22-*O*-(2-Methylbutanoyl)barringtogenol B (=(3β,16α,21β,22α)-3,16,28-Trihydroxy-22-[(2-methylbutanoyl)oxy]olean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*		
146	Aesculioside IV$_c$ 3*β*-*O* ⟵ GlcA^3 ⟵ Ara(f) 2 ↑ Gal	*Aesculus pavia* L., fruits [41]. Colorless powder. $C_{57}H_{90}O_{22}$: 1126.59. $[\alpha]^{25}_{D} = -37.3$ (*c* = 0.2, MeOH).
Aglycone: 24-Hydroxybarrigenol R$_1$ (=(3β,15α,16α,21β,22α)-Olean-12-ene-3,15,16,21,22,24,28-heptol)		
147	Aesculioside I$_b$ 3*β*-*O* ⟵ GlcA^3 ⟵ Ara(f) 2 ↑ Glc	*Aesculus pavia*, fruits [41]. Colorless powder. $C_{47}H_{76}O_{22}$: 992.48. $[\alpha]^{25}_{D} = -17.6$ (*c* = 0.2, MeOH-H_2O, 6 : 4).
*Aglycone: 22α-(Angeloyloxy)-16α,21α-epoxyolean-12-ene-3β,15α,28,30-tetrol (=(3β,15α,16α,21α,22α)-3,15,28,30-Tetrahydroxy-16,21-epoxyolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
148	Saniculasaponin IX 3*β*-*O* ← GlcA	*Sanicula elata* var. *chinensis* (Apiaceae), whole plant [53]. Amorphous powder. $C_{41}H_{62}O_{13}$: 762.42. $[\alpha]^{23}_{D} = +17.9$ (*c* = 0.62, C_5H_5N).
*Aglycone: 28-(Angeloyloxy)-16α,21α-epoxyolean-12-ene-3β,15α,22α,30-tetraol (=(3β,15α,16α,21α,22α)-3,15,22,30-Tetrahydroxy-16,21-epoxyolean-12-en-28-yl (2*Z*)-2-methylbut-2-enoate)*		
149	Saniculasaponin X 3*β*-*O* ← GlcA	*Sanicula elata* var. *chinensis*, whole plant [53]. Amorphous powder. $C_{41}H_{62}O_{13}$: 762.42. $[\alpha]^{23}_{D} = 0$ (*c* = 0.15, C_5H_5N).

Table 1 (cont.)

Aglycone: Protoaescigenin (= (3β,16α,21β,22α)-*Olean-12-ene-3,16,21,22,24,28-hexol*)		
150	Aesculioside I_d 3β-*O* ← $GlcA^3$ ← Ara(f) $^2\uparrow$ Glc	*Aesculus pavia*, fruits [41]. Colorless powder. $C_{47}H_{76}O_{21}$: 976.49. $[\alpha]_D^{25} = -20.6$ ($c = 0.2$, MeOH−H_2O, 6 : 4).
151	Aesculioside I_e 3β-*O* ← $GlcA^3$ ← Ara(f)	*Aesculus pavia*, fruits [41]. Colorless powder. $C_{41}H_{66}O_{16}$: 814.44. $[\alpha]_D^{25} = -18.6$ ($c = 0.2$, MeOH−H_2O, 6 : 4).
152	Saponin 1 24-*O* ← Glc^2 ← Rha; 28-*O* ← Glc^2 ← Glc	*Harpullia austro-caledonica* BAILLON (Sapindaceae), stem bark [67]. White powder. $C_{54}H_{90}O_{25}$: 1138.58. $[\alpha]_D^{21} = -13.6$ ($c = 0.45$, MeOH).
Aglycone: 28-O-*Acetylprotoaescigenin*		
153	Assamicin II 3β-*O* ← $GlcA^2$ ← Gal; $^3\uparrow$ Rha 21β-*O* ← 3,4-di-*O*-angeloyl Qui	*Aesculus assamica* GRIFF (Hippocastanaceae), roots [68]. $C_{66}H_{102}O_{28}$: 1342.66.
154	Assamicin III 3β-*O* ← $GlcA^2$ ← Glc; $^4\uparrow$ Glc 21β-*O* ← Qui	*Aesculus assamica* GRIFF (Hippocastanaceae), seeds [69]. Amorphous powder. $C_{61}H_{96}O_{28}$: 1276.60. $[\alpha]_D^{24} = -47.8$ ($c = 0.2$, C_5H_5N).
155	Assamicin IV 3β-*O* ← $GlcA^2$ ← Glc; $^4\uparrow$ Glc 21β-*O* ← Qui^4 ← *O*-angeloyl	*Aesculus assamica*, seeds [69]. Amorphous powder. $C_{59}H_{94}O_{27}$: 1234.60. $[\alpha]_D^{24} = -40.5$ ($c = 0.2$, C_5H_5N).
Aglycone: 21β-O-*Angeloylprotoaescigenin*		
156	Aesculioside II_b 3β-*O* ← $GlcA^3$ ← Ara(f) $^2\uparrow$ Glc	*Aesculus pavia*, fruits [41]. Colorless powder. $C_{52}H_{82}O_{22}$: 1058.53. $[\alpha]_D^{25} = -25.6$ ($c = 0.2$, MeOH).
157	Aesculioside II_d 3β-*O* ← $GlcA^3$ ← Ara(f)	*Aesculus pavia*, fruits [41]. Colorless powder. $C_{46}H_{72}O_{17}$: 896.48. $[\alpha]_D^{25} = -25.1$ ($c = 0.2$, MeOH).
158	Aesculioside B 3β-*O* ← $GlcA^2$ ← Glc $^4\uparrow$ Glc	*Aesculus chinensis*, seeds [70]. Amorphous solid. $C_{53}H_{84}O_{23}$: 1088.54. M.p. 236–237° (dec.). $[\alpha]_D^{25} = -32.0$ ($c = 0.12$, MeOH).

Table 1 (cont.)

*Aglycone: 21-*O*-Tigloylprotoaescigenin*		
159	Aesculioside A 3*β*-*O* ⟵ GlcA^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis* BGE. (Hippocastanaceae), seeds [70]. Amorphous solid. $C_{53}H_{84}O_{23}$: 1088.54. M.p. 254–255° (dec.). $[\alpha]_D^{25} = -23.0$ ($c = 0.12$, MeOH).
*Aglycone: 21,22-Di-*O*-tigloylprotoaescigenin*		
160	Aesculioside C 3*β*-*O* ⟵ GlcA^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis*, seeds [70]. Amorphous solid. $C_{58}H_{90}O_{24}$: 1170.58. M.p. 249–250° (dec.). $[\alpha]_D^{25} = -42.0$ ($c = 0.11$, MeOH).
161	Aesculioside E 3*β*-*O* ⟵ GlcA (Me ester)^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis*, seeds [70]. Amorphous solid. $C_{59}H_{92}O_{24}$: 1184.60. M.p. 217–218° (dec.). $[\alpha]_D^{25} = -20.0$ ($c = 0.40$, MeOH).
*Aglycone: 22-*O*-Angeloyl-21-*O*-tigloylprotoaescigenin*		
162	Aesculioside D 3*β*-*O* ⟵ GlcA^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis*, seeds [70]. Amorphous solid. $C_{58}H_{90}O_{24}$: 1170.58. M.p. 225–226° (dec.). $[\alpha]_D^{25} = -52.0$ ($c = 0.10$, MeOH).
163	Aesculioside F 3*β*-*O* ⟵ GlcA (Me ester)^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis*, seeds [70]. Amorphous solid. $C_{59}H_{92}O_{24}$: 1184.60. M.p. 231–233° (dec.). $[\alpha]_D^{25} = -23.0$ ($c = 0.38$, MeOH).
*Aglycone: 28-*O*-Acetyl-21-*O*-tigloylprotoaescigenin*		
164	Aesculioside G 3*β*-*O* ⟵ GlcA (Me ester)^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis*, seeds [70]. Amorphous solid. $C_{56}H_{88}O_{24}$: 1144.57. M.p. 239–240° (dec.). $[\alpha]_D^{25} = -18.0$ ($c = 0.12$, MeOH).
165	Isoescin IIa 3*β*-*O* ⟵ GlcA^2 ⟵ Xyl 4↑ Glc	*Aesculus chinensis* (Hippocastanaceae), seeds [47]. White amorphous powder. $C_{54}H_{84}O_{23}$: 1100.54. $[\alpha]_D^{23} = -26.6$ ($c = 1.15$, MeOH).
166	Escin IVa 3*β*-*O* ⟵ GlcA^4 ⟵ Glc 2↑ Glc	*Aesculus chinensis* BGE. (Hippocastanaceae), seeds [71], *A. hippocastanum* [72]. White powder. $C_{55}H_{86}O_{24}$: 1130.55.
*Aglycone: 28-*O*-Acetyl-21-*O*-angeloylprotoaescigenin*		
167	Isoescin IIb 3*β*-*O* ⟵ GlcA^2 ⟵ Xyl 4↑ Glc	*Aesculus chinensis*, seeds [47]. White amorphous powder. $C_{54}H_{84}O_{23}$: 1100.54. $[\alpha]_D^{23} = -28.6$ ($c = 1.05$, MeOH).

Table 1 (cont.)

168	Aesculioside H 3β-*O*← GlcA (Me ester)^2← Glc ^{4}↑ Glc	*Aesculus chinensis*, seeds [70]. Amorphous solid. $C_{56}H_{88}O_{24}$: 1144.57. M.p. 230–231° (dec.). $[\alpha]_D^{25} = -17.0$ ($c = 0.18$, MeOH).
169	Escin IVb 3β-*O*← GlcA^4← Glc ^{2}↑ Glc	*Aesculus chinensis* BGE. (Hippocastanaceae), seeds [71], *A. hippocastanum* [72]. White powder. $C_{55}H_{86}O_{24}$: 1130.55.
170	Assamicin I 3β-*O*← GlcA^2← Gal; ^{3}↑ Rha 21β-*O* ← Ang; 28-*O*-Ac	*Aesculus assamica* GRIFF (Hippocastanaceae), roots [68]. White powder. $C_{55}H_{86}O_{23}$: 1114.56.
*Aglycone: 21,28-Di-*O*-acetylprotoaescigenin*		
171	Aesculiside A 3β-*O*← GlcA^2← Glc ^{4}↑ Glc	*Aesculus chinensis* BGE. (Hippocastanaceae), seeds [73]. White powder. $C_{52}H_{82}O_{24}$: 1090.52. $[\alpha]_D^{25} = -11.2$ ($c = 1.25$, MeOH).
*Aglycone: 21,22-Di-*O*-angeloylprotoaescigenin*		
172	Harpuloside 3β-*O*← Glc^2← Xyl ^{3}↑ Rha	*Harpullia ramiflora* RADLLE. (Sapindaceae), stem bark [74]. Colorless powder. $C_{57}H_{88}O_{22}$: 1124.58. M.p. 190°. $[\alpha]_D^{25} = -30.0$ (MeOH).
173	Saponin 4 3β-*O*← GlcA^2← Ara(f)	*Harpullia austro-caledonica*, stem bark [44]. $C_{51}H_{78}O_{18}$: 978.52. $[\alpha]_D^{21} = -25.5$ ($c = 0.11$, MeOH).
174	Saponin 5 3β-*O* ← GlcA^2← Ara(f) ^{3}↑ Ara(f)	*Harpullia austro-caledonica*, stem bark [44]. $C_{56}H_{86}O_{22}$: 1110.56. $[\alpha]_D^{21} = -32.3$ ($c = 0.13$, MeOH).
175	Saponin 6 3β-*O* ← GlcA^2← Xyl ^{3}↑ Ara(f)	*Harpullia austro-caledonica*, stem bark [44]. $C_{56}H_{86}O_{22}$: 1110.56. $[\alpha]_D^{21} = -13.2$ ($c = 0.25$, MeOH).
176	Saponin 7 3β-*O* ← GlcA^2← Glc ^{3}↑ Ara(f)	*Harpullia austro-caledonica*, stem bark [44]. $C_{57}H_{88}O_{23}$: 1140.57.
177	Saponin 8 3β-*O*← GlcA^2← Xyl	*Harpullia austro-caledonica*, stem bark [44]. $C_{51}H_{78}O_{18}$: 978.52. $[\alpha]_D^{21} = -3.8$ ($c = 0.13$, MeOH).

Table 1 (cont.)

Aglycone: 28-Acetyl-22-tigloylprotoaescigenin		
178	Escin IVc 3β-*O* ⟵ GlcA^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis* (Hippocastanaceae), seeds [75][76]. White amorphous powder. $C_{55}H_{86}O_{24}$: 1130.55. $[\alpha]_D^{25} = -11.2$ ($c = 1.25$, MeOH).
Aglycone: 28-Acetyl-22α-angeloylprotoaescigenin		
179	Escin IVd 3β-*O* ⟵ GlcA^2 ⟵ Glc 3↑ Glc	*Aesculus chinensis* (Hippocastanaceae), seeds [75][76]. White powder. $C_{55}H_{86}O_{24}$: 1130.55. $[\alpha]_D^{25} = -26.4$ ($c = 1.25$, MeOH).
Aglycone: 28-Tigloylprotoaescigenin		
180	Escin IVe 3β-*O* ⟵ GlcA^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis* (Hippocastanaceae), seeds [76][77]. White powder. $C_{53}H_{84}O_{23}$: 1088.54. $[\alpha]_D^{25} = +8.6$ ($c = 1.05$, MeOH).
Aglycone: 28-Angeloylprotoaescigenin		
181	Escin IVf 3β-*O* ⟵ GlcA^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis* (Hippocastanaceae), seeds [75][76]. White powder. $C_{53}H_{84}O_{23}$: 1088.54. $[\alpha]_D^{25} = -21.8$ ($c = 1.1$, MeOH).
*Aglycone: 22-*O*-Tigloylprotoaescigenin*		
182	Escin IVg 3β-*O* ⟵ GlcA^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis* BGE (Hippocastanaceae), seeds [78][79]. White amorphous powder. $C_{53}H_{84}O_{23}$: 1088.54. $[\alpha]_D^{25} = -25.0$ ($c = 1.0$, MeOH).
*Aglycone: 22-*O*-Angeloylprotoaescigenin*		
183	Escin IVh 3β-*O* ⟵ GlcA^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis* BGE (Hippocastanaceae), seeds [78][79]. White amorphous powder. $C_{53}H_{84}O_{23}$: 1088.54. $[\alpha]_D^{25} = -60.0$ ($c = 1.05$, MeOH).
*Aglycone: 21-*O*-Acetyl-16-*O*-angeloylprotoaescigenin*		
184	Escin VIb 3β-*O* ⟵ GlcA^2 ⟵ Glc 4↑ Glc	*Aesculus chinensis* Bge (Hippocastanaceae), seeds [78][79]. White powder. $C_{55}H_{86}O_{24}$: 1130.55. $[\alpha]_D^{25} = -55.0$ ($c = 1.0$, MeOH).
Aglycone: 16-Deoxyprotoaescigenin		
185	Saponin 2 24-*O* ← Glc^2 ← Rha; 28-*O* ← Glc^2 ← Glc	*Harpullia austro-caledonica*, stem bark [67]. White powder. $C_{54}H_{90}O_{24}$: 1122.58. $[\alpha]_D^{21} = -7.5$ ($c = 0.25$, MeOH).

Table 1 (cont.)

*Aglycone: 21-*O*-Angeloyltheasapogenol A (=(3β,16α,21β,22α)-3,16,22,23,28-Pentahydroxyolean-12-en-21-yl (2Z)-2-methylbut-2-enoate)*		
186	Theasaponin A_1 3β-*O* ⟵ GlcA³ ⟵ Ara² ⟵ Xyl ²↑ Gal	*Camellia sinensis*, seeds (tea seeds) [80]. $C_{57}H_{90}O_{26}$: 1190.57. Colorless crystals ($CHCl_3$/MeOH). M.p. 219.3–220.4°. $[\alpha]_D^{27} = +6.5$ ($c = 2.50$,MeOH).
*Aglycone: 28-*O*-Acetyl-21-*O*-angeloyltheasapogenol A*		
187	Theasaponin A_2 3β-*O* ⟵ GlcA³ ⟵ Ara² ⟵ Xyl ²↑ Gal	*Camellia sinensis*, seeds [80]. $C_{59}H_{92}O_{27}$: 1232.58. Colorless crystals ($CHCl_3$/MeOH). M.p. 219.6–221.1°. $[\alpha]_D^{27} = +23.2$ ($c = 2.0$, MeOH).
*Aglycone: 16,28-Di-*O*-acetyl-21-*O*-angeloyltheasapogenol A*		
188	Theasaponin A_3 3β-*O* ⟵ GlcA³ ⟵ Ara² ⟵ Xyl ²↑ Gal	*Camellia sinensis*, seeds [80]. $C_{61}H_{94}O_{28}$: 1274.59. Colorless crystals ($CHCl_3$/MeOH). M.p. 228–229.2°. $[\alpha]_D^{27} = -8.9$ ($c = 0.95$, MeOH).
*Aglycone: 22-*O*-Acetyl-21-*O*-angeloyltheasapogenol A*		
189	Assamsaponin D 3β-*O* ⟵ GlcA² ⟵ Gal ³↑ Ara² ⟵ Xyl	*Camellia sinensis* var. *assamica*, seeds [51]. $C_{59}H_{92}O_{27}$: 1232.58. Colorless crystals. M.p. 190.6–191.2°. $[\alpha]_D^{26} = +15.6$ ($c = 0.1$, MeOH).
*Aglycone: 21-*O*-Angeloyltheasapogenol E (=(3β,16α,21β,22α)-3,16,22,28-Tetrahydroxy-23-oxoolean-12-en-21-yl (2Z)-2-methylbut-2-enoate)*		
190	Theasaponin E_3 3β-*O* ⟵ GlcA² ⟵ Gal ³↑ Ara² ⟵ Xyl	*Camellia sinensis* (L.) O. KUNTZE (Theaceae), seeds [81]. $C_{57}H_{88}O_{26}$: 1188.56. Colorless crystals ($CHCl_3$/MeOH). M.p. 214.5–215.5°. $[\alpha]_D^{27} = +17.0$ ($c = 0.95$, MeOH).
*Aglycone: 16-*O*-Acetyl-21-*O*-angeloyltheasapogenol E*		
191	Theasaponin E_4 3β-*O* ⟵ GlcA² ⟵ Gal ³↑ Ara² ⟵ Xyl	*Camellia sinensis*, seeds [81]. $C_{59}H_{90}O_{27}$: 1230.57. Colorless crystals (MeOH). M.p. 223.8–224.3°. $[\alpha]_D^{27} = +17.4$ ($c = 1.0$, MeOH).
*Aglycone: 16,28-Di-*O*-acetyl-21-*O*-angeloyltheasapogenol E*		
192	Theasaponin E_5 3β-*O* ⟵ GlcA² ⟵ Gal ³↑ Ara² ⟵ Xyl	*Camellia sinensis*, seeds [81]. Colorless crystals ($CHCl_3$/MeOH). $C_{61}H_{92}O_{28}$: 1272.58. M.p. 216.2–216.4°. $[\alpha]_D^{25} = +21.5$ ($c = 1.0$, MeOH).

Table 1 (cont.)

*Aglycone: 21-*O*-Tigloyltheasapogenol E*		
193	Theasaponin E_6 3β-*O* ← GlcA^2 ← Gal ^{3}↑ Ara^2 ← Xyl	*Camellia sinensis*, seeds [81]. Colorless crystals ($CHCl_3$/MeOH). $C_{57}H_{88}O_{26}$: 1188.56. M.p. 209.1–210.0°. $[\alpha]_D^{27} = +18.2$ ($c = 1.50$, MeOH).
*Aglycone: 22-*O*-Acetyl-21-*O*-tigloyltheasapogenol E*		
194	Theasaponin E_7 3β-*O* ← GlcA^2 ← Gal ^{3}↑ Ara^2 ← Xyl	*Camellia sinensis*, seeds [81]. Colorless crystals ($CHCl_3$/MeOH). $C_{59}H_{90}O_{27}$: 1230.57. M.p. 196.4–198°. $[\alpha]_D^{27} = +10.9$ ($c = 3.00$, MeOH).
*Aglycone: 16,22-Di-*O*-acetyl-21-*O*-angeloyltheasapogenol E*		
195	Assamsaponin B 3β-*O* ← GlcA^2 ← Gal ^{3}↑ Ara^2 ← Xyl	*Camellia sinensis* var. *assamica*, seeds [51]. Colorless crystals. $C_{61}H_{92}O_{28}$: 1272.58. M.p. 199–200.4°. $[\alpha]_D^{26} = +21.6$ ($c = 0.1$, MeOH).
*Aglycone: 28-*O*-Acetyl-21-*O*-tigloyltheasapogenol E*		
196	Assamsaponin C 3β-*O* ← GlcA^2 ← Gal ^{3}↑ Ara^2 ← Xyl	*Camellia sinensis* var. *assamica*, seeds [51]. Colorless crystals. ($C_{61}H_{92}O_{28}$: 1272.58. M.p. 201–202°. $[\alpha]_D^{28} = +21.0$ ($c = 0.1$, MeOH).
*Aglycone: 21-*O*-Angeloyltheasapogenol F (= Methyl (3β,16α,21β,22α)-3,16,22,28-tetrahydroxy-21-{[(2*Z*)-2-methylbut-2-enoyl]oxy}olean-12-en-23-oate)*		
197	Theasaponin F_1 3β-*O* ← GlcA^3 ← Ara^2 ← Xyl ^{2}↑ Gal	*Camellia sinensis*, seeds [80]. Colorless crystals ($CHCl_3$/MeOH). $C_{58}H_{90}O_{27}$: 1218.57. M.p. 230.4–231.1°. $[\alpha]_D^{27} = +29.8$ ($c = 0.70$, MeOH).
*Aglycone: 22-*O*-Acetyl-21-*O*-angeloyltheasapogenol F*		
198	Theasaponin F_2 3β-*O* ← GlcA^3 ← Ara^2 ← Xyl ^{2}↑ Gal	*Camellia sinensis*, seeds [80]. Colorless crystals ($CHCl_3$/MeOH). $C_{60}H_{92}O_{28}$: 1260.58. M.p. 211.3–212.8°. $[\alpha]_D^{27} = +8.5$ ($c = 2.0$, MeOH).
*Aglycone: 28-*O*-Acetyl-21-*O*-angeloyltheasapogenol F*		
199	Theasaponin F_3 3β-*O* ← GlcA^3 ← Ara^2 ← Xyl ^{2}↑ Gal	*Camellia sinensis*, seeds [80]. Colorless crystals ($CHCl_3$/MeOH). $C_{60}H_{92}O_{28}$: 1260.58. M.p. 216.9–217.7°. $[\alpha]_D^{27} = +25.1$ ($c = 0.95$, MeOH).
Aglycone: (3β,15α)-3,15-Dihydroxyolean-12-en-16-one		
200	Pedunsaponin B 3β-*O* ← GlcA (Me ester)	*Pueraria peduncularis* GRAH. (Leguminosae), roots [82][83]. Colorless powder. $C_{37}H_{58}O_9$: 646.41. $[\alpha]_D^{25} = -13.5$ ($c = 1.0$, MeOH).

Table 1 (cont.)

201	Pedunsaponin C 3β-*O* ← GlcA³ ← Glc	*Pueraria peduncularis*, roots [82] [83]. Colorless powder. $C_{42}H_{66}O_{14}$: 794.45. $[\alpha]_D^{25} = -7.5$ ($c = 1.0$, MeOH).
Aglycone: (3β,21β,22α)-3,21,28-Trihydroxy-16-oxoolean-12-en-22-yl acetate		
202	Saniculasaponin XI 3β-*O* ← Glc² ← Glc² ← Glc	*Sanicula elata* var. *chinensis*, whole plant [53]. Amorphous powder. $C_{60}H_{94}O_{27}$: 1246.60. $[\alpha]_D^{23} = -42.1$ ($c = 0.88$, C_5H_5N).
*Aglycone: 22-*O*-Angeloylcamelliagenin B (=(3β,16α,22α)-3,16,28-Trihydroxy-23-oxoolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
203	Assamsaponin A 3β-*O* ← GlcA² ← Gal ³↑ Ara² ← Xyl	*Camellia sinensis* L. var. *assamica* PIERRE (Theaceae), seeds [51]. Colorless crystals. $C_{57}H_{88}O_{25}$: 1172.56. M.p. 211.7–212.2°. $[\alpha]_D^{26} = +19.6$ ($c = 0.1$, MeOH).
Aglycone: Armillarigenin (=(3β,16α)-3,16,28-Trihydroxyolean-12-en-21-one)		
204	Berneuxia saponin C 3β-*O* ← GlcA² ← Glc ³↑ Gal² ← Rha	*Berneuxia thibetica*, leaves [42]. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]_D^{13} = -6.8$ ($c = 0.75$, MeOH).
Aglycone: Oleanolic acid (=(3β)-3-Hydroxyolean-12-en-28-oic acid)		
205	Saponin 1 3β-*O* ← GlcA⁴ ← Rha	*Schefflera arboricola* (HAYATA) MERR. (Araliaceae), leaves and stems [84]. $C_{42}H_{66}O_{13}$: 778.45. Amorphous powder. $[\alpha]_D^{23} = -8.4$ ($c = 2.34$, MeOH).
206	Saponin 3 3β-*O* ← GlcA⁴ ← Api(f) 28-*O* ← Glc	*Schefflera arboricola*, leaves and stems [84]. $C_{47}H_{74}O_{18}$: 926.49. Amorphous powder. $[\alpha]_D^{23} = -13.1$ ($c = 1.38$, MeOH).
207	Saponin 4 3β-*O* ← GlcA⁴ ← Rha ²↑ Ara	*Schefflera arboricola*, leaves and stems [84]. Amorphous powder. $C_{47}H_{74}O_{17}$: 910.49. $[\alpha]_D^{23} = -4.2$ ($c = 0.91$, MeOH).
208	Saponin 5 3β-*O* ← GlcA⁴ ← Rha; ²↑ Ara 28-*O* ← Glc	*Schefflera arboricola*, leaves and stems [84]. Amorphous powder. $C_{53}H_{84}O_{22}$: 1072.55. $[\alpha]_D^{23} = -10.2$ ($c = 2.06$, MeOH).
209	Saponin 6 3β-*O* ← GlcA⁴ ← Rha ²↑ Gal	*Schefflera arboricola*, leaves and stems [84]. Amorphous powder. $C_{48}H_{76}O_{18}$: 940.50. $[\alpha]_D^{23} = -10.4$ ($c = 1.95$, MeOH).

Table 1 (cont.)

210	Saponin 7 3β-*O* ← GlcA^4 ← Rha; ^{2}↑ Gal 28-*O* ← Glc	*Schefflera arboricola*, leaves and stems [84]. Amorphous powder. $C_{54}H_{86}O_{23}$: 1102.56. $[\alpha]_D^{23} = -12.1$ ($c = 1.28$, MeOH).
211	Saponin 8 3β-*O* ← GlcA^4 ← Api(f) ^{2}↑ Ara	*Schefflera arboricola*, leaves and stems [84]. Amorphous powder. $C_{46}H_{72}O_{17}$: 896.48. $[\alpha]_D^{23} = -3.7$ ($c = 1.06$, MeOH).
212	Saponin 9 3β-*O* ← GlcA^4 ← Api(f); ^{2}↑ Ara 28-*O* ← Glc	*Schefflera arboricola*, leaves and stems [84]. Amorphous powder. $C_{52}H_{82}O_{22}$: 1058.53. $[\alpha]_D^{23} = -13.1$ ($c = 1.38$, MeOH).
213	Scheffarboside A 3β-*O* ← Ara^2 ← Rha^3 ← GlcA	*Schefflera arboricola* (Araliaceae), stem [85]. White amorphous powder. $C_{47}H_{74}O_{17}$: 910.49. $[\alpha]_D^{20} = -6.0$ ($c = 0.12$, C_5H_5N-H_2O, 3 : 1).
214	Scheffarboside B 3β-*O* ← Ara^2 ← Rha^3 ← Ara^4 ← Ara	*Schefflera arboricola*, stem [85]. $C_{51}H_{82}O_{19}$: 998.54. White amorphous powder. $[\alpha]_D^{20} = -12.2$ ($c = 0.31$, C_5H_5N).
215	Scheffarboside D 3β-*O* ← Ara^2 ← Rha^3 ← Ara^4 ← Ara; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Schefflera arboricola*, stem [85]. $C_{69}H_{112}O_{33}$: 1468.71. White amorphous powder. $[\alpha]_D^{20} = -27.8$ ($c = 0.35$, $C_5H_5N-H_2O$, 3 : 1).
216	Lotoidoside D 3β-*O* ← Glc*N*Ac $\overset{3}{\leftarrow}$ Gal ^{4}↑ Glc	*Glinus lotoides* (Molluginaceae), roots [86][87]. $C_{50}H_{81}NO_{18}$: 983.55. $[\alpha]_D = +22.1$ ($c = 0.50$, MeOH).
217	Lotoidoside E 3β-*O* ← Glc*N*Ac $\overset{3}{\leftarrow}$ Gal	*Glinus lotoides*, roots [86][87]. $C_{44}H_{71}NO_{13}$: 821.49. $[\alpha]_D = +18.6$ ($c = 0.50$, MeOH).
218	Subcapitatoside A 3β-*O* ← Gal^2 ← Gal	*Aralia subcapitata* Hoo (Araliaceae), roots [88]. Amorphous powder. $C_{42}H_{68}O_{13}$: 780.47. $[\alpha]_D^{25} = +40.3$ ($c = 0.23$, MeOH).
219	Subcapitatoside B 3β-*O* ← Gal^2 ← Gal ^{3}↑ Glc	*Aralia subcapitata*, roots [89]. Amorphous solid. $C_{48}H_{78}O_{18}$: 942.52.

Table 1 (cont.)

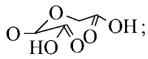
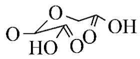
220	Subcapitatoside C 3β-*O* ⟵ Gal^2 ⟵ Gal; ^{3}↑ Glc 28-*O* ⟵ Glc^6 ⟵ Glc	*Aralia subcapitata*, roots [89]. $C_{60}H_{98}O_{28}$: 1266.62.
221	Saponin 4 3β-*O* ⟵ GlcA^2 ⟵ Glc; ^{3}↑ Xyl^2 ⟵ Glc 28-*O* ⟵ Glc	*Pisonia umbellifera* SEEM. (Nyctaginaceae), leaves [90]. $C_{59}H_{94}O_{28}$: 1250.59. $[\alpha]_D = +2.3$ ($c = 0.7$, CD_3OD).
222	Saponin 5 3β-*O* ⟵ GlcA^3 ⟵  ; 28-*O* ⟵ Glc	*Pisonia umbellifera* (Nyctaginaceae), leaves [90]. $C_{46}H_{70}O_{19}$: 926.45. $[\alpha]_D = +6.8$ ($c = 0.3$, CD_3OD).
223	Saponin 6 3β-*O* ⟵ GlcA^3 ⟵ 	*Pisonia umbellifera*, leaves [90]. $C_{40}H_{60}O_{14}$: 764.40. $[\alpha]_D = +10.7$ ($c = 0.2$, CD_3OD).
224	Nudicaucin B 3β-*O* ← Ara^3 ← Gal; 28-*O* ← Glc	*Hedyotis nudicaulis* (Rubiaceae), whole plant [91]. Amorphous solid. $C_{47}H_{76}O_{17}$: 912.51. M.p. 256–259° (dec.). $[\alpha]_D = +34.5$ ($c = 0.22$, MeOH).
225	Nudicaucin C 3β-*O* ⟵ Ara^3 ⟵ Glc; ^{2}↑ Rha 28-*O* ⟵ Glc	*Hedyotis nudicaulis* (Rubiaceae), whole plant [91]. Amorphous solid. $C_{53}H_{86}O_{21}$: 1058.57. M.p. 257–260° (dec.). $[\alpha]_D = -4.9$ ($c = 0.41$, MeOH).
226	Saponin 2 3β-*O* ⟵ Glc^2 ⟵ Glc ^{3}↑ Api(f)	*Pometia ridleyi* KING emend. RADLK. (Sapindaceae), stem bark [92]. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{21} = +4.9$ ($c = 0.32$, MeOH).
227	Saponin 3 3β-*O* ⟵ Glc^2 ⟵ Glc ^{3}↑ Ara^3 ⟵ Api(f)	*Pometia ridleyi*, stem bark [92]. $C_{52}H_{84}O_{21}$: 1044.55. $[\alpha]_D^{21} = +16.0$ ($c = 0.25$, MeOH).
228	Saponin 5 3β-*O* ⟵ Glc^2 ⟵ Glc ^{3}↑ Gal^3 ⟵ Api(f)	*Pometia ridleyi*, stem bark [92]. $C_{53}H_{86}O_{22}$: 1074.56. $[\alpha]_D^{21} = +10.5$ ($c = 0.98$, MeOH).
229	Saponin 6 3β-*O* ⟵ Ara^2 ⟵ Glc ^{3}↑ Ara	*Pometia ridleyi*, stem bark [92]. $C_{46}H_{76}O_{16}$: 884.51. $[\alpha]_D^{21} = -27.3$ ($c = 0.13$, MeOH).

Table 1 (cont.)

230	Saponin 7 3β-O ⟵ Ara^2 ⟵ Glc (Ara ^{3}↑ Gal)	*Pometia ridleyi*, stem bark [92]. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{21} = +6.7$ ($c = 0.15$, MeOH).
231	Saponin 8 3β-O ⟵ Ara^2 ⟵ Glc (Ara ^{3}↑ Gal^3 ⟵ Api(f))	*Pometia ridleyi*, stem bark [92]. $C_{52}H_{84}O_{21}$: 1044.55. $[\alpha]_D^{21} = +12.8$ ($c = 0.22$, MeOH).
232	Polyscioside A 3β-O ⟵ GlcA^4 ⟵ Glc (GlcA ^{2}↑ Glc)	*Polyscias fruticosa* (L.) Harms (Araliaceae), leaves and roots [93]. White powder. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{18} = +1.4$ ($c = 1.47$, MeOH).
233	Polyscioside B 3β-O ⟵ GlcA^4 ⟵ Glc (GlcA ^{2}↑ Ara)	*Polyscias fruticosa*, leaves and roots [93]. White powder. $C_{47}H_{74}O_{18}$: 926.49. $[\alpha]_D^{27} = +9.5$ ($c = 0.63$, MeOH).
234	Polyscioside C 3β-O ⟵ GlcA^2 ⟵ Gal (GlcA ^{3}↑ Glc)	*Polyscias fruticosa*, leaves and roots [93]. White powder. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{27} = +18.6$ ($c = 1.40$, MeOH).
235	Polyscioside D 3β-O ⟵ GlcA^2 ⟵ Glc; (GlcA ^{4}↑ Glc) 28-O ⟵ Glc	*Polyscias fruticosa*, leaves and roots [93]. White powder. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]_D^{25} = -3.9$ ($c = 1.56$, MeOH).
236	Polyscioside E 3β-O ⟵ GlcA^2 ⟵ Ara; (GlcA ^{4}↑ Glc) 28-O ⟵ Glc	*Polyscias fruticosa*, leaves and roots [93]. White powder. $C_{53}H_{84}O_{23}$: 1088.54. $[\alpha]_D^{21} = +3.1$ ($c = 0.32$, MeOH).
237	Polyscioside F 3β-O ⟵ GlcA^2 ⟵ Gal; (GlcA ^{3}↑ Glc) 28-O ⟵ Glc	*Polyscias fruticosa*, leaves and roots [93]. White powder. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]_D^{27} = -18.8$ ($c = 0.69$, MeOH).
238	Polyscioside G 3β-O ← GlcA^4 ← Glc; 28-O ← Glc^3 ← Rha	*Polyscias fruticosa*, leaves and roots [93]. White powder. $C_{54}H_{86}O_{23}$: 1102.56. $[\alpha]_D^{26} = -12.1$ ($c = 0.33$, MeOH).
239	Polyscioside H 3β-O ⟵ GlcA^2 ⟵ Glc; (GlcA ^{4}↑ Glc) 28-O ⟵ Glc^3 ⟵ Rha	*Polyscias fruticosa*, leaves and roots [93]. White powder. $C_{60}H_{96}O_{28}$: 1264.61. $[\alpha]_D^{18} = +24.0$ ($c = 1.00$, MeOH).

Table 1 (cont.)

240	Saponin 2 3β-O ⟵ GlcA^3 ⟵ Gal ^{2}↑ Glc	*Bersama engleriana* GURKE (Melianthaceae), stem bark [94]. White powder. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{22} = +20.0$ ($c = 0.05$, MeOH).
241	Saponin 3 3β-O ← GlcA^3 ← Glc; 28-O ← Glc^6 ← Xyl	*Bersama engleriana*, stem bark [94]. White powder. $C_{53}H_{84}O_{23}$: 1088.54. $[\alpha]_D^{22} = +20.0$ ($c = 0.15$, MeOH).
242	Saponin 4 3β-O ← GlcA^3 ← Gal; 28-O ← Glc^4 ← Glc	*Bersama engleriana*, stem bark [94]. White powder. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]_D^{22} = +6.6$ ($c = 0.15$, MeOH).
243	Saponin 5 3β-O ← GlcA^3 ← Gal^3 ← Glc; 28-O ← Glc^6 ← Xyl	*Bersama engleriana*, stem bark [94]. White powder. $C_{59}H_{94}O_{28}$: 1250.59. $[\alpha]_D^{22} = +60.0$ ($c = 0.15$, MeOH).
244	Anhuienoside C 3β-O ← Xyl^2 ← Rha; 28-O ← Glc^6 ← Glc	*Anemone anhuiensis* Y. K. YANG (Ranunculaceae), rhizomes [95][96]. Amorphous powder. $C_{53}H_{86}O_{21}$: 1058.57. M.p. 238–241°. $[\alpha]_D^{20} = -8.6$ ($c = 0.42$, MeOH).
245	Anhuienoside D 3β-O ← Xyl; 28-O ← Glc^6 ← Glc^4 ← Rha	*Anemone anhuiensis*, rhizomes [95][96]. Amorphous powder. $C_{53}H_{86}O_{21}$: 1058.57. M.p. 251–253°. $[\alpha]_D^{20} = -63.6$ ($c = 0.33$, MeOH).
246	Anhuienoside E 3β-O ← Glc^2 ← Rha; 28-O ← Glc^6 ← Glc^4 ← Rha	*Anemone anhuiensis*, rhizomes [96]. Amorphous powder. $C_{60}H_{98}O_{26}$: 1234.63. M.p. 224–226°.
247	Anhuienoside F 3β-O ← Xyl^2 ← Rha^3 ← Glc; 28-O ← Glc^6 ← Glc^4 ← Rha	*Anemone anhuiensis*, rhizomes [96]. Amorphous powder. $C_{65}H_{106}O_{30}$: 1366.68. M.p. 235–236°.
248	Sandrosaponin IX 3β-O ← GlcA^2 ← Gal^2 ← Glc; 28-O ← Glc	*Bupleurum rigidum* L. (Apiaceae), roots [97]. Amorphous powder. $C_{54}H_{88}O_{24}$: 1120.57. $[\alpha]_D = +5.3$ ($c = 0.15$, MeOH).
249	Sandrosaponin X 3β-O ← GlcA^2 ← Gal^2 ← Glc	*Bupleurum rigidum*, roots [97]. Amorphous powder. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D = +17.7$ ($c = 0.10$, MeOH).

Table 1 (cont.)

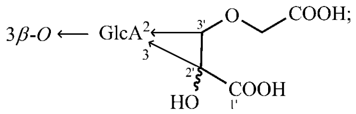
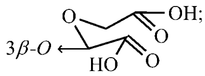
250	Begoniifolide D 3β-*O* ⟵ Ara^2 ⟵ Glc ^{4}↑ Glc 28-*O* ⟵ Glc^6 ⟵ Glc^4 ⟵ Rha	*Anemone begoniifolia* LEVT. et VANT (Ranunculaceae), whole plant [98]. White amorphous powder. $C_{65}H_{106}O_{31}$: 1382.67. $[\alpha]_D^{20} = -8.8$ ($c = 0.17$, MeOH).
251	Bidentatoside I  28-*O* ⟵ Glc	*Achyranthes bidentata* BLUME (Amaranthaceae), roots [99]. Amorphous powder. $C_{47}H_{70}O_{20}$: 954.45. $[\alpha]_D^{25} = +44.0$ ($c = 0.05$, MeOH).
252	Bidentatoside II  28-*O* ⟵ Glc	*Achyranthes bidentata* BLUME (Amaranthaceae), roots [100]. White amorphous powder. $C_{40}H_{62}O_{13}$: 750.42. $[\alpha]_D^{25} = +6.0$ ($c = 0.1$, MeOH).
253	Compound 1 3β ← GlcA (Me ester)^3 ← Glc; 28-*O* ← Glc	*Achyranthes bidentata* BLUME (Amaranthaceae), roots [101]. Colorless amorphous solid. $C_{49}H_{78}O_{19}$: 970.51. $[\alpha]_D^{25} = +5.6$ ($c = 0.31$, MeOH).
254	Compound 2 (= Achyranthoside C dimethyl ester) 3β-*O* ⟵ GlcA^3 ⟵ CH(OCH$_2$COOMe) | CH(OH)COOMe	*Achyranthes bidentata*, roots [101]. Colorless amorphous solid. $C_{49}H_{76}O_{20}$: 984.49. $[\alpha]_D^{25} = +12.6$ ($c = 0.28$, MeOH).
255	Compound 3 (= Achyranthoside C butyldimethyl ester) 3β-*O* ⟵ (GlcA Bu ester)^3 ⟵ CH(OCH$_2$COOMe) | CH(OH)COOMe	*Achyranthes bidentata*, roots [101]. Colorless amorphous solid. $C_{53}H_{84}O_{20}$: 1040.56. $[\alpha]_D^{25} = +14.8$ ($c = 0.33$, MeOH).
256	Compound 4 (= Achyranthoside E dimethyl ester) 3β-*O* ⟵ GlcA^3 ⟵ CH(OCH$_2$COOMe) | COOMe	*Achyranthes bidentata*, roots [101]. Colorless amorphous solid. $C_{48}H_{74}O_{19}$: 954.48. $[\alpha]_D^{25} = +1.1$ ($c = 0.21$, MeOH).
257	Compound 5 (= Achyranthoside E butylmethyl ester) 3β-*O* ⟵ (GlcA Bu ester)^3 ⟵ CH(OCH$_2$COOMe) | COOH	*Achyranthes bidentata*, roots [101]. Colorless amorphous solid. $C_{51}H_{80}O_{19}$: 996.53. $[\alpha]_D^{25} = +1.8$ ($c = 0.18$, MeOH).
258	Raddeanoside R_{10} 3β-*O* ← Ara^2 ← Glc^2 ← Rha; 28-*O* ← Glc^6 ← Glc^4 ← Rha^3 ← Glc	*Anemone raddeana* REGEL (Ranunculaceae), roots [102]. Amorphous powder. $C_{71}H_{116}O_{35}$: 1528.73. $[\alpha]_D^{18} = -270.0$ ($c = 0.4$, C_5H_5N).
259	Raddeanoside R_{11} 3β-*O* ← Ara^2 ← Glc^2 ← Rha; 28-*O* ← Glc^6 ← Glc^4 ← Rha^3 ← Glc^6 ← Glc	*Anemone raddeana*, roots [102]. Amorphous powder. $C_{77}H_{126}O_{40}$: 1690.78. $[\alpha]_D^{18} = -830.0$ ($c = 1.4$, C_5H_5N).

Table 1 (cont.)

260	Tomentoside 3β-*O* ← Xyl^2 ← Rha^3 ← Rib^4 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Anemone tomentosa* (MAXIM) PEI (Ranunculaceae), roots [103]. Amorphous powder. $C_{70}H_{114}O_{34}$: 1498.72. $[\alpha]_D^{25} = -41.5$ ($c = 0.26$, MeOH).
261	Saponin 3 3β-*O* ← Glc^6 ← Glc; 28-*O* ← Glc	*Gymnema sylvestre*, leaves [17]. Amorphous powder. $C_{48}H_{78}O_{18}$: 942.52. M.p. 206–209°. $[\alpha]_D^{20} = -6.5$ ($c = 0.11$, MeOH).
262	Saponin 4 3β-*O* ← Glc^6 ← Glc^6 ← Xyl	*Gymnema sylvestre*, leaves [17]. Amorphous powder. $C_{47}H_{76}O_{17}$: 912.51. M.p. 202–204°. $[\alpha]_D^{20} = -3.2$ ($c = 0.11$, MeOH).
263	Saponin 5 3β-*O* ← Glc^6 ← Glc^6 ← Xyl; 28-*O* ← Glc	*Gymnema sylvestre*, leaves [17]. Amorphous powder. $C_{53}H_{86}O_{22}$: 1074.56. M.p. 212–215°. $[\alpha]_D^{20} = -9.6$ ($c = 0.12$, MeOH).
264	Saponin 6 3β-*O* ← Glc^6 ← Glc; 28-*O* ← Glc^6 ← Glc	*Gymnema sylvestre*, leaves [17]. Amorphous powder. $C_{54}H_{88}O_{23}$: 1104.57. M.p. 209–211°. $[\alpha]_D^{20} = -12.1$ ($c = 0.12$, MeOH).
265	Compound 1 3β-*O* ← Ara^2 ← Rha^3 ← Rib^4 ← Glc^4 ← Glc^6 ← Rha	*Clematis chinensis* OSBECK (Ranunculaceae), roots [104]. Amorphous solid. $C_{64}H_{104}O_{29}$: 1336.67. $[\alpha]_D^{25} = -82.0$ ($c = 0.25$, MeOH).
266	Compound 2 3β-*O* ← Ara^2 ← Rha^3 ← Rib^4 ← Glc^4 ← Glc^6 ← Rha; 28-*O* ← Glc	*Clematis chinensis*, roots [104]. Amorphous solid. $C_{70}H_{114}O_{34}$: 1498.72. $[\alpha]_D^{25} = -70.0$ ($c = 0.25$, MeOH).
267	Compound 3 3β-*O* ← Ara^2 ← Rha^3 ← Rib^4 ← Glc; 28-*O* ← Glc	*Clematis chinensis*, roots [104]. Amorphous solid. $C_{58}H_{94}O_{25}$: 1190.61. $[\alpha]_D^{25} = -38.0$ ($c = 0.10$, MeOH).
268	Compound 5 3β-*O* ← Ara^2 ← Rha^3 ← Rib^4 ← Glc^4 ← Glc^6 ← Rha; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Clematis chinensis*, roots [104]. Amorphous solid. $C_{82}H_{134}O_{43}$: 1806.83. $[\alpha]_D^{25} = -94.0$ ($c = 0.25$, MeOH).
269	Clematomandshurica saponin A 3β-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Rib^4 ⟵ Glc^4 ⟵ Glc^6 ⟵ Rha; (Glc ^{3}↑ isoferuloyl) 28-*O* ⟵ Glc^6 ⟵ Glc^4 ⟵ Rha	*Clematis mandshurica* RUPR. (Ranunculaceae), roots and rhizomes [105]. Amorphous powder. $C_{92}H_{142}O_{46}$: 1982.88. $[\alpha]_D^{20} = -96.0$ ($c = 1.0$, MeOH).
270	Clematomandshurica saponin B 3β-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Rib^4 ⟵ Glc^4 ⟵ Glc^6 ⟵ Rha; (Glc ^{2}↑ isoferuloyl) 28-*O* ⟵ Glc^6 ⟵ Glc^4 ⟵ Rha	*Clematis mandshurica*, roots and rhizomes [105]. Amorphous powder. $C_{92}H_{142}O_{46}$: 1982.88. $[\alpha]_D^{20} = -92.0$ ($c = 1.0$, MeOH).

Table 1 (cont.)

271	Clematomandshurica saponin C $3\beta\text{-}O \leftarrow \text{Ara}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Rib}^{4} \leftarrow \text{Glc}^{4} \leftarrow \text{Glc}$; $28\text{-}O \leftarrow \text{Glc}^{6} \leftarrow \text{Glc}^{4} \leftarrow \text{Rha}$	*Clematis mandshurica*, roots and rhizomes [105]. Amorphous powder. $C_{76}H_{124}O_{39}$: 1660.77. $[\alpha]_D^{20} = -29.0$ ($c = 1.0$, MeOH).
272	Clematomandshurica saponin D $3\beta\text{-}O \leftarrow \text{Ara}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{All}^{4} \leftarrow \text{Glc}^{4} \leftarrow \text{Glc}^{6} \leftarrow \text{Rha}$; $28\text{-}O \leftarrow \text{Glc}^{6} \leftarrow \text{Glc}^{4} \leftarrow \text{Rha}$	*Clematis mandshurica*, roots and rhizomes [105]. Amorphous powder. $C_{83}H_{136}O_{44}$: 1836.84. $[\alpha]_D^{20} = -68.6$ ($c = 1.2$, MeOH).
273	Clematernoside A $3\beta\text{-}O \leftarrow \text{Ara}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Rib}^{4} \leftarrow \text{Glc}^{4} \leftarrow \text{Glc}^{2} \leftarrow$ isoferuloyl; $28\text{-}O \leftarrow \text{Glc}^{6} \leftarrow \text{Glc}^{4} \leftarrow \text{Rha}$	*Clematis terniflora* DC; var. *robusta* TAMURA (Ranunculaceae), roots [106]. Amorphous powder. $C_{86}H_{132}O_{42}$: 1836.82. $[\alpha]_D^{28} = -54.5$ ($c = 0.53$, MeOH).
274	Clematernoside B $3\beta\text{-}O \leftarrow \text{Ara}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Rib}^{4} \leftarrow \text{Glc}^{4} \leftarrow \text{Glc}^{3} \leftarrow$ isoferuloyl; $28\text{-}O \leftarrow \text{Glc}^{6} \leftarrow \text{Glc}^{4} \leftarrow \text{Rha}$	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{86}H_{132}O_{42}$: 1836.82. $[\alpha]_D^{28} = -32.8$ ($c = 0.61$, MeOH).
275	Clematernoside E isoferuloyl $\downarrow^{2}$ $3\beta\text{-}O \leftarrow \text{Ara}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Rib}^{4} \leftarrow \text{Glc}^{4} \leftarrow \text{Glc}$; $\uparrow^{3}$ $\text{Rha} \rightarrow {}^{6}\text{Glc}$ $28\text{-}O \leftarrow \text{Glc}^{6} \leftarrow \text{Glc}^{4} \leftarrow \text{Rha}$	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{98}H_{152}O_{51}$: 2144.93. $[\alpha]_D^{28} = -65.0$ ($c = 0.10$, MeOH).
276	Clematernoside F $3\beta\text{-}O \leftarrow \text{Ara}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Rib}^{4} \leftarrow \text{Glc}^{4} \leftarrow \text{Glc}^{2} \leftarrow$ cinnamoyl (3′,4′-di-OMe); $28\text{-}O \leftarrow \text{Glc}^{6} \leftarrow \text{Glc}^{4} \leftarrow \text{Rha}$	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{87}H_{134}O_{42}$: 1850.83. $[\alpha]_D^{30} = -63.5$ ($c = 0.57$, MeOH).
277	Clematernoside G isoferuloyl $\downarrow^{2}$ $3\beta\text{-}O \leftarrow \text{Ara}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Rib}^{4} \leftarrow \text{Glc}^{4} \leftarrow \text{Glc}$; $\uparrow^{3}$ $\text{Rha} \rightarrow {}^{6}\text{Glc}$ $\uparrow^{4}$ $28\text{-}O \leftarrow \text{Glc}^{6} \leftarrow \text{Glc}^{4} \leftarrow \text{Rha}$ Glc	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{104}H_{162}O_{56}$: 2306.98. $[\alpha]_D^{30} = -48.5$ ($c = 0.84$, MeOH).
278	Clematernoside H (*E*)-cinnamoyl (4'-OMe) $\downarrow^{2}$ $3\beta\text{-}O \leftarrow \text{Ara}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Rib}^{4} \leftarrow \text{Glc}^{4} \leftarrow \text{Glc}$; $\uparrow^{3}$ $\text{Rha} \rightarrow {}^{6}\text{Glc}$ $\uparrow^{4}$ $28\text{-}O \leftarrow \text{Glc}^{6} \leftarrow \text{Glc}^{4} \leftarrow \text{Rha}$ Glc	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{104}H_{162}O_{55}$: 2290.99. $[\alpha]_D^{28} = -42.5$ ($c = 0.45$, MeOH).

Table 1 (cont.)

279	Clematernoside I isoferuloyl ↓2 3β-*O*←Ara^2←Rha^3←Rib^4←Glc^4←Glc; ↑3 Glc→^{2}Rha→^{6}Glc ↑4 28-*O*←Glc^6←Glc^4←Rha Glc	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{110}H_{172}O_{61}$: 2469.04. $[\alpha]_D^{28} = -32.3$ ($c = 0.60$, MeOH).
280	Clematernoside J isoferuloyl ↓2 3β-*O*←Ara^2←Rha^3←Rib^4←Glc^4←Glc; ↑3 Rha→^{6}Glc ↑4 28-*O*←Glc^6←Glc^4←Rha Glc→^{2}Glc	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{110}H_{172}O_{61}$: 2469.04. $[\alpha]_D^{28} = -37.6$ ($c = 0.55$, MeOH).
281	Clematernoside K isoferuloyl ↓2 3β-*O*←Ara^2←Rha^3←Rib^4←Glc^4←Glc; ↑3 Glc→^{2}Rha→^{6}Glc 28-*O*←Glc^6←Glc^4←Rha	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{104}H_{162}O_{56}$: 2306.98. $[\alpha]_D^{28} = -45.4$ ($c = 0.48$, MeOH).
282	Saponin 1 3β-*O*←Glc^2←Glc^3←Glc^2←Xyl; ↑4 Glc 28-*O*←Rha^2←Glc^6←Glc	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{77}H_{126}O_{41}$: 1706.78. $[\alpha]_D^{25} = -17.0$ ($c = 0.1$, MeOH).
283	Saponin 2 3β-*O*←Glc^2←Glc^3←Glc^2←Xyl; ↑4 Glc 28-*O*←Rha	*Campsiandra guayanensis B. stergios*, aerial parts (Caesalpiniaceae) [107]. White solid. $C_{65}H_{106}O_{31}$: 1382.67. $[\alpha]_D^{25} = -20.0$ ($c = 0.1$, MeOH).
284	Saponin 6 3β-*O*←Xyl^2←Xyl; 28-*O*←Rha^3←isovaleroyl	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{57}H_{82}O_{16}$: 1022.56. $[\alpha]_D^{25} = -29.0$ ($c = 0.1$, MeOH).
285	Saponin 7 3β-*O*←Glc^2←Xyl; ↑4 Glc 28-*O*←Rha^3←isovaleroyl	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{58}H_{94}O_{22}$: 1142.62. $[\alpha]_D^{25} = +33.0$ ($c = 0.1$, MeOH).
286	Saponin 8 3β-*O*←Glc^2←Xyl; 28-*O*←Rha^3←isovaleroyl	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{52}H_{84}O_{17}$: 980.57. $[\alpha]_D^{25} = +52.0$ ($c = 0.1$, MeOH).

Table 1 (cont.)

287	Saponin 9 $3\beta\text{-}O \leftarrow \text{Glc}^2 \leftarrow \text{Xyl}$; $28\text{-}O \leftarrow \text{Rha}$	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{47}H_{76}O_{16}$: 896.51. $[\alpha]_D^{25} = -35.0$ ($c = 0.1$, MeOH).
288	Scabiosaponin A $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}^3 \leftarrow \text{Xyl}^4 \leftarrow \text{Glc}$; $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}$	*Scabiosa tschiliensis* GRUN. (Dipsacaceae), whole plant [108]. Amorphous solid. $C_{64}H_{104}O_{30}$: 1352.66. M.p. 216–218°. $[\alpha]_D^{20} = -6.6$ ($c = 0.10$, MeOH).
289	Scabiosaponin B $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}^3 \leftarrow \text{Xyl}^4 \leftarrow \text{Glc}^4 \leftarrow \text{Xyl}$; $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}$	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{69}H_{112}O_{34}$: 1484.70. M.p. 230–231°. $[\alpha]_D^{25} = -28.9$ ($c = 0.30$, MeOH).
290	Scabiosaponin C $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}^3 \leftarrow \text{Xyl}^4 \leftarrow \text{Glc}$; $^4\uparrow$ (on Ara) Glc $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}$	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{70}H_{114}O_{35}$: 1514.71. M.p. 219–220°. $[\alpha]_D^{25} = -19.3$ ($c = 0.20$, MeOH).
291	Scabiosaponin D $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}$; $^4\uparrow$ (on Ara) Glc $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}$	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{59}H_{96}O_{26}$: 1220.62. M.p. 228–229°. $[\alpha]_D^{25} = -11.8$ ($c = 0.17$, MeOH).
292	Scabiosaponin E $3\beta\text{-}O \leftarrow \text{Xyl}^2 \leftarrow \text{Rha}^3 \leftarrow \text{Xyl}$; $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}$	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{58}H_{94}O_{25}$: 1190.61. M.p. 208–210°. $[\alpha]_D^{20} = -22.9$ ($c = 0.56$, MeOH).
293	Scabiosaponin F $3\beta\text{-}O \leftarrow \text{Xyl}^2 \leftarrow \text{Rha}^3 \leftarrow \text{Glc}$; $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}$	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{59}H_{96}O_{26}$: 1220.62. M.p. 218–219°. $[\alpha]_D^{20} = -11.1$ ($c = 0.10$, MeOH).
294	Scabiosaponin G $3\beta\text{-}O \leftarrow \text{Xyl}^2 \leftarrow \text{Rha}^3 \leftarrow \text{Glc}^4 \leftarrow \text{Glc}$; $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}$	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{65}H_{106}O_{31}$: 1382.67. M.p. 228–230°. $[\alpha]_D^{21} = -20.3$ ($c = 1.28$, MeOH).
295	Saponin 2 $3\beta\text{-}O \leftarrow \text{GlcA}^4 \leftarrow \text{Xyl}$; $^3\uparrow$ (on GlcA) Ac $28\text{-}O \leftarrow \text{Glc}$	*Symplocos glomerata* KING (Symplocaceae), stem bark [109]. White powder. $C_{49}H_{76}O_{19}$: 968.50. $[\alpha]_D^{21} = +9.0$ ($c = 0.5$, MeOH).

Table 1 (cont.)

296	Saponin 3 3β-*O* ← GlcA^{4} ← Xyl; ^{2}↑ Ac 28-*O* ← Glc	*Symplocos glomerata*, stem bark [109]. White powder. $C_{49}H_{76}O_{19}$: 968.50. $[\alpha]_D^{21} = 0$ ($c = 0.46$, MeOH).
297	Saponin 4 Ac ↓^{3} 3β-*O* ← GlcA^{4} ← Xyl; ^{2}↑ Ac 28-*O* ← Glc	*Symplocos glomerata*, stem [109]. White powder. $C_{51}H_{78}O_{20}$: 1010.51. $[\alpha]_D^{21} = +1.5$ ($c = 0.2$, MeOH).
298	Saponin 5 3β-*O* ← GlcA^{4} ← Ara; 28-*O* ← Glc	*Symplocos glomerata*, stem [109]. White powder. $C_{47}H_{74}O_{18}$: 926.49. $[\alpha]_D^{21} = +4.7$ ($c = 0.38$, MeOH).
299	Saponin 6 3β-*O* ← GlcA^{4} ← Ara; ^{2}↑ Ac 28-*O* ← Glc	*Symplocos glomerata*, stem [109]. White powder. $C_{49}H_{76}O_{19}$: 968.50. $[\alpha]_D^{21} = +8.0$ ($c = 0.55$, MeOH).
300	Saponin 8 Xyl ↓^{2} 3β-*O* ← GlcA $\overset{4}{\leftarrow}$ Xyl; ^{3}↑ Ac 28-*O* ← Glc	*Symplocos glomerata*, stem [109]. White powder. $C_{54}H_{84}O_{23}$: 1100.54. $[\alpha]_D^{21} = +1.4$ ($c = 0.42$, C_5H_5N).
301	Saponin 9 Glc ↓^{2} 3β-*O* ← GlcA $\overset{4}{\leftarrow}$ Xyl; ^{3}↑ Ac 28-*O* ← Glc	*Symplocos glomerata*, stem [109]. White powder. $C_{55}H_{86}O_{24}$: 1130.55. $[\alpha]_D^{21} = +7.7$ ($c = 0.21$, C_5H_5N).
302	Saponin 10 Glc ↓^{2} 3β-*O* ← GlcA $\overset{4}{\leftarrow}$ Ara; ^{3}↑ Ac 28-*O* ← Glc	*Symplocos glomerata*, stem [109]. White powder. $C_{55}H_{86}O_{24}$: 1130.55. $[\alpha]_D^{21} = -10.8$ ($c = 0.61$, MeOH).
303	Aralia saponin V 3β-*O* ← Glc^{2} ← Glc; ^{3}↑ Glc 28-*O* ← Glc	*Aralia elata* (MIG.) SEEM. (Araliaceae), root bark [110]. Colorless amorphous powder. $C_{54}H_{88}O_{23}$: 1104.57. $[\alpha]_D = -11.3$ ($c = 0.2$, C_5H_5N).

Table 1 (cont.)

304	Helixoside B 3β-*O* ← Glc^2 ← Glc; 28-*O* ← Glc^6 ← Glc	*Hedera helix* L., fruits [111]. Colorless solid. $C_{54}H_{88}O_{23}$: 1104.57. $[\alpha]_D^{20} = -7.2$ ($c = 0.5$, MeOH).
305	Pastuchoside B 3β-*O* ← Ara^2 ← Rha; ↑^{4} Glc^4 ← Rha 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Hedera pastuchowii* (Araliaceae), leaves [112]. White powder. $C_{71}H_{116}O_{34}$: 1512.73. M.p. 212°. $[\alpha]_D^{20} = -40.0$ ($c = 0.1$, MeOH).
306	Pastuchoside D 3β-*O* ← Ara^2 ← Rha; ↑^{4} Glc 28-*O* ← Glc^6 ← Glc	*Hedera pastuchowii*, leaves [112]. White powder. $C_{59}H_{96}O_{26}$: 1220.62. M.p. 213°. $[\alpha]_D^{20} = -30.0$ ($c = 0.1$, MeOH).
307	Pastuchoside E 3β-*O* ← Ara^2 ← Rha; ↑^{4} Glc 28-*O* ← Glc	*Hedera pastuchowii*, leaves [112]. White powder. $C_{53}H_{86}O_{21}$: 1058.57. M.p. 205°. $[\alpha]_D^{20} = +25.0$ ($c = 0.1$, MeOH).
308	Colchiside B 3β-*O* ← GlcA^3 ← Rha; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Hedera colchica* K. Koch, berries [113]. White powder. $C_{60}H_{96}O_{27}$: 1248.61. M.p. 180°. $[\alpha]_D^{25} = +15.0$ (MeOH).
309	Saponin 1 3β-*O* ← Ara^2 ← Glc; ↑^{3} Glc^3 ← Glc 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Meryta lanceolata* Hort (Araliaceae), leaves and stems [114]. Amorphous powder. $C_{71}H_{116}O_{36}$: 1544.72. $[\alpha]_D^{23} = -4.3$ ($c = 1.43$, MeOH).
310	Saponin 2 3β-*O* ← Ara^2 ← Glc; ↑^{3} Glc^3 ← Glc 28-*O* ← Glc^6 ← Glc^4 ← Rha ↑^{6} Ac	*Meryta lanceolata*, leaves and stems [114]. Amorphous powder. $C_{73}H_{118}O_{37}$: 1586.74. $[\alpha]_D^{23} = -0.9$ ($c = 0.75$, MeOH).
311	Saponin 3 3β-*O* ← Ara^3 ← Glc^3 ← Glc^2 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Meryta lanceolata*, leaves and stems [114]. Amorphous powder. $C_{71}H_{116}O_{36}$: 1544.72. $[\alpha]_D^{23} = +3.3$ ($c = 1.32$, MeOH).
312	Saponin 2 3β-*O* ← GlcA^2 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Meryta lanceolata*, leaves and stems [115]. Amorphous powder. $C_{60}H_{96}O_{28}$: 1264.61. $[\alpha]_D^{23} = -10.5$ ($c = 2.33$, MeOH).

Table 1 (cont.)

313	Saponin 3 3β-*O* ⟵ GlcA^2 ⟵ Glc; 28-*O* ⟵ Glc^6 ⟵ Glc^4 ⟵ Rha ^{6}↑ Ac	*Meryta lanceolata*, leaves and stems [115]. Amorphous powder. $C_{62}H_{98}O_{29}$: 1306.62. $[\alpha]_D^{23} = -16.7$ ($c = 0.88$, MeOH).
314	Saponin 4 3β-*O* ← Ara^3 ← Glc^3 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Meryta lanceolata*, leaves and stems [115]. Amorphous powder. $C_{65}H_{106}O_{31}$: 1382.67. $[\alpha]_D^{23} = +3.3$ ($c = 1.1$, MeOH).
315	Godoside A 3β-*O* ← GlcA^4 ← Glc^6 ← caffeoyl; 28-*O* ← Glc	*Ilex godajam* (COLEBR.) WALL. (Aquifoliaceae), aerial parts [116]. $C_{57}H_{82}O_{22}$: 1118.53. $[\alpha]_D^{27} = +98.3$ ($c = 0.019$, MeOH).
316	Godoside B 3β-*O* ⟵ GlcA^4 ⟵ Glc^6 ⟵ caffeoyl; ^{2}↑ Gal 28-*O* ⟵ Glc	*Ilex godajam*, aerial parts [116]. $C_{63}H_{92}O_{27}$: 1280.58. $[\alpha]_D^{27} = +17.9$ ($c = 0.014$, MeOH).
317	Hylonoside **V** 3β-*O* ⟵ GlcA^2 ⟵ Glc^4 ⟵ Glc; 28-*O* ⟵ Glc	*Ilex hylonoma* (Aquifoliaceae), leaves [117]. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]_D^{21} = +9.0$ ($c = 0.8$, MeOH).
318	Saponin 2 3β-*O* ⟵ Ara^3 ⟵ Glc; ^{2}↑ Ac 28-*O* ⟵ Glc	*Ilex amara* (VELLOZO) LOES. (Aquifoliaceae), leaves [118]. Amorphous solid. $C_{49}H_{78}O_{18}$: 954.52.
319	Ilekudinoside A 3β-*O* ⟵ Ara^2 ⟵ Rha; ^{3}↑ Glc 28-*O* ⟵ Glc	*Ilex kudincha* C. J. TSENG (Aquifoliaceae), leaves [119]. Amorphous powder. $C_{53}H_{86}O_{21}$: 1058.57. $[\alpha]_D^{23} = -13.8$ ($c = 0.78$, MeOH).
320	Compound 13 3β-*O* ⟵ Ara^2 ⟵ Rha ^{3}↑ GlcA	*Akebia trifoliata* (THUNB) KOIDZ, stem [120]. Amorphous solid. $C_{47}H_{74}O_{17}$: 910.49. $[\alpha]_D^{27} = -4.0$ ($c = 0.10$, MeOH).
321	Saponin 1 3β-*O* ⟵ Glc^2 ⟵ Glc ^{6}↑ Ara	*Albizia gummifera* C. A. SMITH (Mimosaceae), stem bark [121]. White flakes. $C_{47}H_{76}O_{17}$: 914.51. M.p. 198–201°. $[\alpha]_D^{20} = -32.0$ ($c = 0.12$, MeOH).

Table 1 (cont.)

322	Saponin 2 3β-*O* ← Glc^2 ← Glc; (Glc^6 ← Ara) 28-*O* ← Glc^6 ← Glc	*Albizia gummifera*, bark [121]. White flakes. $C_{59}H_{96}O_{27}$: 1236.61. M.p. 204–206.7°. $[\alpha]_D^{20} = -24.0$ ($c = 0.08$, MeOH).
323	Pursaethoside A 3β-*O* ← Glc*N*Ac^3 ← Xyl; (Glc*N*Ac^6 ← Ara) 28-*O* ← Glc^2 ← Api(f)	*Entada pursaetha* DC (Mimosaceae), seeds [122]. White powder. $C_{59}H_{95}NO_{25}$: 1217.62. $[\alpha]_D^{22} = -15.0$ ($c = 0.06$, MeOH).
324	Compound 1 3β-*O* ← Glc^3 ← Glc^6 ← Glc^2 ← Xyl (Glc^2 ← Rha)	*Calotropis procera* L. (Asclepidaceae), stem [123]. White powder. $C_{59}H_{96}O_{26}$: 1220.62. M.p. 205°. $[\alpha]_D^{20} = -50.0$ (MeOH).
325	Compound 1 3β-*O* ← Glc^2 ← Rha; 28-*O* ← Xyl	*Calotropis procera*, stem [124]. Amorphous solid. $C_{46}H_{76}O_{16}$: 884.51. M.p. 102°.
326	Lingustrin B 3β-*O* ← palmitoyl; 28-*O* ← Ara^2 ← palmitoyl (Ara^4 ← palmitoyl)	*Lingustrum ovalifolium* HASSK (Oleaceae), flowers [125]. Colorless oil. $C_{83}H_{146}O_{10}$: 1303.09. $[\alpha]_D = +32.1$ ($c = 0.3$, $CHCl_3$).
327	Lingustrin C 3β-*O* ← palmitoyl; 28-*O* ← Ara	*Lingustrum ovalifolium*, flowers [125]. Colorless oil. $C_{51}H_{86}O_8$: 826.63. $[\alpha]_D = +37.5$ ($c = 2.4$, $CHCl_3$).
328	Eupteleasaponin XI 3β-*O* ← Xyl^3 ← Glc^2 ← Rha (Glc^4 ← Rha)	*Euptelea polyandra*, leaves [126]. Colorless crystals ($CHCl_3$/MeOH). $C_{53}H_{86}O_{20}$: 1042.57. M.p. 241–245°. $[\alpha]_D^{26} = +11.6$ ($c = 0.1$, MeOH).
329	Compound 8 3β-*O* ← Ara^2 ← Rha^3 ← Glc^4 ← Glc	*Pulsatilla chinensis* (BGE.) REGEL (Ranunculaceae), roots [127]. Amorphous solid. $C_{53}H_{86}O_{21}$: 1058.60. $[\alpha]_D^{27} = -6.0$ ($c = 0.1$, $CHCl_3$/MeOH, 1:1).
330	Compound 9 3β-*O* ← Ara^2 ← Rha^3 ← Glc^4 ← Glc (Ara^4 ← Glc)	*Pulsatilla chinensis*, roots [127]. Amorphous solid. $C_{59}H_{96}O_{26}$: 1220.62. $[\alpha]_D^{27} = -5.0$ ($c = 0.1$, $CHCl_3$/MeOH, 1:1).

Table 1 (cont.)

331	Saponin 4 3β-*O* ⟵ Ara^{2} ⟵ Rha^{3} ⟵ Glc^{4} ⟵ Glc ^{4}↑ Glc	*Pentaclethra macroloba* (WILLD.) KUNZE (Mimosoideae), stem bark [128]. Colorless amorphous solid. $C_{59}H_{96}O_{26}$: 1220.62. M.p. 245–247°. $[\alpha]_D = -0.004$ (MeOH).
332	Compound 2 3β-*O* ⟵ Ara^{2} ⟵ Rha^{3} ⟵ Glc^{4} ⟵ Glc^{2} ⟵ Glc ^{4}↑ Glc^{3} ⟵ Glc	*Pentaclethra macroloba*, stem bark [129]. White amorphous powder. $C_{71}H_{116}O_{36}$: 1544.72.
333	Saponin 1 3β-*O* ← Ara; 28-*O* ← Glc	*Lafoensia glyptocarpa* KOEHNE (Lytraceae), leaves [130]. Amorphous solid. $C_{41}H_{66}O_{12}$: 750.46. M.p. 220°. $[\alpha]_D^{25} = +10.3$ ($c = 0.003$, MeOH).
334	Saponin 2 3β-*O* ← Glc^{3} ← Glc; 28-*O* ← Glc^{6} ← Glc^{4} ← Rha	*Ranunculus fluitans* L., aquatic part [131]. White powder. $C_{60}H_{98}O_{27}$: 1250.67. M.p. 210–215° (dec.). $[\alpha]_D^{20} = -5.2$ ($c = 0.42$, MeOH).
335	Saponin 3 3β-*O* ← Ara^{2} ← Glc; 28-*O* ← Glc^{6} ← Glc	*Fagonia cretica* LINN. (Zygophyllaceae), aerial parts [132]. Amorphous powder. $C_{53}H_{86}O_{22}$: 1074.56. $[\alpha]_D^{23} = +7.0$ ($c = 1.4$, MeOH).
336	Saponin **7** 3β-*O* ← GlcA (Me ester); 28-*O* ← Glc	*Viguiera decurrens* A. GRAY (Asteraceae), roots [133]. Colorless powder. $C_{43}H_{68}O_{14}$: 808.46. M.p. 216–218°. $[\alpha]_D = +5.7$ ($c = 0.28$, $CHCl_3$).
337	Eclalbatin 3β-*O* ← Glc; 28-*O* ← Ara	*Eclipta alba* (L) HASSK (Asteraceae), whole plant [134]. Colorless granules. $C_{41}H_{66}O_{12}$: 750.46. M.p. 256–257° (dec.). $[\alpha]_D^{20} = +1.5$ ($c = 1.25$, MeOH).
338	Saponin 6 3β-*O* ← Glc; 28-*O* ← GlcA^{2} ← Glc	*Chenopodium ficifolium* (Chenopodiaceae), roots [135]. Amorphous powder. $C_{48}H_{76}O_{19}$: 956.50.
339	Saponin 3 3β-*O* ← GlcA; 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Xyl	*Aster auriculatus* FRANCH., roots [136]. Amorphous powder. $C_{57}H_{90}O_{25}$: 1174.58. $[\alpha]_D^{21} = -23.2$ ($c = 0.056$, MeOH).

Table 1 (cont.)

340	Compound 4 3β-*O* ← Gal^2 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Pulsatilla patens* var. *Multifida*, roots [137]. Amorphous powder. $C_{60}H_{98}O_{27}$: 1250.63. M.p. 221–223°. $[\alpha]_D^{20} = -8.4$ ($c = 0.20$, MeOH).
341	Nipponoside B 3β-*O* ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Acanthopanax nipponicus* MAKINO, leaves [138]. White powder. $C_{54}H_{88}O_{22}$: 1088.58. $[\alpha]_D^{25} = -2.7$ ($c = 0.5$, MeOH).
342	Acanthopanaxoside B 3β-*O* ← Ara^2 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha (Glc^4 ^{6}↑ Ac)	*Acanthopanax senticosus* (RUPR. MAXIM) HARMS., leaves [139]. Amorphous powder. $C_{61}H_{98}O_{27}$: 1262.63. $[\alpha]_D^{22} = -4.4$ ($c = 0.8$, MeOH).
343	Compound 1 3β-*O* ← Ara^2 ← Rha^3 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha^3 ← Glc	*Trevesia palmata* (ROXB. EX LINDL.) VIS (Araliaceae), aerial parts [140]. White powder. $C_{71}H_{116}O_{35}$: 1528.73. $[\alpha]_D^{25} = +28.0$ ($c = 0.9$, MeOH).
344	Compound 2 3β-*O* ← Ara^2 ← Rha^3 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Trevesia palmata*, aerial parts [140]. White powder. $C_{65}H_{106}O_{30}$: 1366.68. $[\alpha]_D^{25} = +38.0$ ($c = 1.0$, MeOH).
345	Compound 3 3β-*O* ← Ara^2 ← Qui; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Trevesia palmata*, aerial parts [140]. White powder. $C_{59}H_{96}O_{25}$: 1204.62. $[\alpha]_D^{25} = +30.0$ ($c = 1.0$, MeOH).
346	Indicasaponin B 3β-*O* ← Ara^3 ← Ara; 28-*O* ← Glc (Ara^3 ^{2}↑ Glc)	*Fagonia indica* BURMF., whole plant [141]. Amorphous powder. $C_{52}H_{84}O_{21}$: 1044.55. $[\alpha]_D^{25} = +24.0$ ($c = 0.16$, MeOH).
347	Saponin 14 3β-*O* ← GlcA^2 ← Gal; 28-*O* ← Glc^4 ← Rha	*Medicago hybrida* L. (Leguminosae), roots [142]. Amorphous solid. $C_{54}H_{86}O_{23}$: 1102.56. M.p. 231–234°. $[\alpha]_D^{25} = +12.1$ ($c = 1.0$, MeOH).
348	Gleditsioside G 3β-*O* ← Glc^6 ← Ara^2 ← Xyl; 28-*O* ← Glc ^{2}← Rha^4 ← Xyl^3 ← Xyl (Glc ^{6}↑ Rha ^{2}← menthiafoloyl (6'*S*)) (Rha ^{3}↑ menthiafoloyl (9'-OH))	*Gleditsia sinensis* LAM. (Leguminosae), fruits [143]. Amorphous solid. $C_{94}H_{148}O_{42}$: 1948.94. M.p. 202–203°. $[\alpha]_D^{21} = -10.0$ ($c = 0.10$, MeOH).

Table 1 (cont.)

349	Gleditsioside H 3β-*O* ⟵ Glc[6] ⟵ Ara[2] ⟵ Xyl 28-*O* ⟵ Glc[2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Xyl 6 ↑ Rha	*Gleditsia sinensis* LAM. (Leguminosae), fruits [144]. White amorphous solid. $C_{74}H_{120}O_{37}$: 1600.75. M.p. 250–251° (dec.). $[\alpha]_D^{21} = -12.0$ ($c = 0.10$, MeOH).
350	Gleditsioside I 3β-*O* ← Glc[6] ← Ara[2] ← Xyl; 28-*O* ← Glc[2] ← Rha[4] ← Xyl[3] ← Xyl	*Gleditsia sinensis*, fruits [144]. White amorphous solid. $C_{68}H_{110}O_{33}$: 1454.69. M.p. 255–256° (dec.). $[\alpha]_D^{21} = -17.0$ ($c = 0.10$, MeOH).
351	Gleditsioside N 3β-*O* ⟵ Glc[6] ⟵ Ara[2] ⟵ Xyl; menthiafoloyl (9'-OH) ↓ 3 28-*O* ⟵ Glc [2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Xyl 6 ↑ menthiafoloyl (6'*S*)	*Gleditsia sinensis* LAM. (Leguminosae), fruits [145]. White amorphous solid. $C_{88}H_{138}O_{38}$: 1802.89. M.p. 191–192° (dec.). $[\alpha]_D^{21} = -20.0$ ($c = 0.1$, MeOH).
352	Gleditsioside O 3β-*O* ⟵ Glc[6] ⟵ Ara[2] ⟵ Xyl; menthiafoloyl (6'*S*) ↓ 3 28-*O* ⟵ Glc [2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Xyl 6 ↑ menthiafoloyl (6'*S*)	*Gleditsia sinensis*, fruits [145]. White amorphous solid. $C_{88}H_{138}O_{37}$: 1786.89. M.p. 207–208° (dec.). $[\alpha]_D^{21} = -20.0$ ($c = 0.1$, MeOH).
353	Gleditsioside P 3β-*O* ⟵ Glc[6] ⟵ Ara[2] ⟵ Xyl; menthiafoloyl (6'*S*) ↓ 3 28-*O* ⟵ Glc [2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Xyl 6 ↑ menthiafoloyl (6'*S*) [6''] ⟵ Xyl[2] ⟵ menthiafoloyl	*Gleditsia sinensis*, fruits [145]. White amorphous solid. $C_{103}H_{160}O_{43}$: 2085.03. M.p. 175–176° (dec.). $[\alpha]_D^{21} = -12.0$ (c=0.1, MeOH).
354	Compound 9 3β-*O* ← Ara[2] ← Rha[3] ← Xyl[4] ← Ac	*Sapindus emarginatus*, pericarps [146]. White powder. $C_{48}H_{76}O_{16}$: 908.51. $[\alpha]_D^{22} = -20.2$ ($c = 3.8$, MeOH).
Aglycone: (3β)-3-Hydroxy-27-norolean-12-en-28-oic acid		
355	Zygophyloside M 3β-*O* ← Qui; 28-*O* ← Glc	*Zygophyllum gaetulum* EMB. & MAIRE (Zygophyllaceae), aerial parts [147]. $C_{41}H_{66}O_{12}$: 750.46. $[\alpha]_D^{25} = +29.7$ ($c = 1.0$, MeOH).

Table 1 (cont.)

Aglycone: Vaccaric acid (=(3β,4α)-3,4-Dihydroxy-23-norolean-12-en-28-oic acid)		
356	Saponin 2 28-*O* ← Fuc^2 ← Rha^4 ← Xyl ^{3}↑ Glc	*Gypsophila oldhamiana* MIQ. (Caryophyllaceae), roots [148]. White powder. $C_{52}H_{84}O_{21}$: 1044.55. $[\alpha]_D^{25} = +5.9$ ($c = 0.10$, MeOH).
357	Vaccaroside H 3*β*-*O* ← GlcA^2 ← Gal; Ac ↓ ^{4} 28-*O* ← Fuc^2 ← Rha^4 ← Xyl ^{3}↑ Ara(f)	*Vaccaria segetalis*, seeds [149]. Amorphous solid. $C_{65}H_{102}O_{32}$: 1394.64. M.p. 154° (dec.). $[\alpha]_D^{24} = -13.4$ ($c = 1.28$, MeOH).
Aglycone: (2β,3β)-2,3-Dihydroxyolean-12-en-28-oic acid		
358	Saponin 5 3*β*-*O* ← Glc^2 ← Ara^2 ← Rha	*Medicago arborea* L. (Leguminosae), leaves [150]. Amorphous solid. $C_{47}H_{76}O_{17}$: 912.51. M.p. 227–229°. $[\alpha]_D^{25} = +3.4$ ($c = 0.10$, MeOH).
359	Saponin 6 3*β*-*O* ← GlcA; 28-*O* ← Ara^2 ← Rha	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{47}H_{72}O_{20}$: 956.46. M.p. 240–242°. $[\alpha]_D^{25} = -10.0$ ($c = 0.07$, MeOH).
360	Saponin 18 3*β*-*O* ← GlcA; 28-*O* ← Ara^2 ← Rha^4 ← Xyl ^{3}↑ Api(f)	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{57}H_{88}O_{28}$: 1220.55. M.p. 271–275°. $[\alpha]_D^{25} = -22.3$ ($c = 0.07$, MeOH).
361	Caryocaroside IV-5 3*β*-*O* ← GlcA	*Caryocar glabrum* (AUBL.) PERS., fruits [151]. White powder. $C_{36}H_{56}O_{10}$: 648.39. $[\alpha]_D^{20} = +26.2$ ($c = 0.58$, MeOH).
362	Caryocaroside IV-6 3*β*-*O* ← GlcA (Me ester)	*Caryocar glabrum*, fruits [151]. White powder. $C_{37}H_{58}O_{10}$: 662.40. $[\alpha]_D^{20} = +12.0$ ($c = 0.17$, MeOH).
363	Caryocaroside IV-7 3*β*-*O* ← GlcA^3 ← Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{42}H_{66}O_{15}$: 810.44. $[\alpha]_D^{20} = +8.4$ ($c = 0.17$, MeOH).
364	Caryocaroside IV-8 3*β*-*O* ← GlcA (Me ester)^3 ← Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{43}H_{68}O_{15}$: 824.46. $[\alpha]_D^{20} = +30.0$ ($c = 1.0$, MeOH).

Table 1 (cont.)

365	Caryocaroside IV-9 3β-*O* ← GlcA[3] ← Gal; 28-*O* ← Glc	*Caryocar glabrum*, fruits [151]. White powder. $C_{48}H_{76}O_{20}$: 972.49. $[\alpha]_D^{20} = +12.0$ ($c = 0.5$, MeOH).
366	Caryocaroside IV-10 3β-*O* ← GlcA (Me ester)[3] ← Gal; 28-*O* ← Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{49}H_{78}O_{20}$: 986.51. $[\alpha]_D^{22} = +12.0$ ($c = 0.5$, MeOH).
367	Caryocaroside IV-11 3β-*O* ← GlcA[3] ← Gal[3] ← Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{48}H_{76}O_{20}$: 972.49. $[\alpha]_D^{20} = +12.0$ ($c = 0.29$, MeOH).
368	Caryocaroside IV-17 3β-*O* ← GlcA[3] ← Gal[3] ← Xyl; 28-*O* ← Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{53}H_{84}O_{24}$: 1104.54. $[\alpha]_D^{22} = +17.0$ ($c = 0.5$, MeOH).
369	Caryocaroside IV-18 3β-*O* ← GlcA (Me ester)[3] ← Gal[3] ← Xyl; 28-*O* ← Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]_D^{22} = +17.0$ ($c = 0.5$, MeOH).
370	Caryocaroside IV-19 3β-*O* ← GlcA[3] ← Gal[4] ← Gal[3] ← Xyl	*Caryocar villosum*, fruits [152]. White powder. $C_{53}H_{84}O_{24}$: 1104.54. $[\alpha]_D^{22} = +5.2$ ($c = 0.29$, MeOH).
371	Caryocaroside IV-20 3β-*O* ← GlcA[3] ← Gal[4] ← Gal[3] ← Gal[3] ← Xyl	*Caryocar villosum*, fruits [152]. White powder. $C_{59}H_{94}O_{29}$: 1266.59. $[\alpha]_D^{22} = +13.0$ ($c = 1.0$, MeOH).
372	Caryocaroside IV-21 3β-*O* ← GlcA[3] ← Gal[4] ← Gal[3] ← Gal[3] ← Xyl; 28-*O* ← Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{65}H_{104}O_{34}$: 1428.64. $[\alpha]_D^{22} = +10.8$ ($c = 0.25$, MeOH).
373	Compound 3 3β-*O* ← GlcA[3] ← Rha; 28-*O* ← Glc	*Amaranthus cruentus* L. (Amaranthaceae), seeds [153]. Amorphous solid. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{25} = 0$ (MeOH).
Aglycone: (2α,3β)-2,3-Dihydroxyolean-12-en-28-oic acid		
374	Saponin 3 3β-*O* ← Xyl[2] ← Xyl; 4 ↑ Glc 28-*O* ← Rha[2] ← Glc[6] ← Glc	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{64}H_{104}O_{31}$:1368.16. $[\alpha]_D^{25} = -12.0$ ($c = 0.1$, MeOH).
375	Saponin 4 3β-*O* ← Xyl[2] ← Xyl; 28-*O* ← Rha 4 ↑ Glc	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{52}H_{84}O_{21}$: 1044.55. $[\alpha]_D^{25} = +56.0$ ($c = 0.1$, MeOH).

Table 1 (cont.)

376	Saponin 5 3*β*-*O* ← Xyl² ← Xyl; 28-*O* ← Rha³ ← isovaleroyl	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{51}H_{82}O_{17}$: 966.56. $[\alpha]_D^{25} = -17.0$ ($c = 0.1$, MeOH).
377	Saponin 10 3*β*-*O* ← Glc² ← Xyl; 28-*O* ← Rha³ ← isovaleroyl	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{52}H_{84}O_{18}$: 996.57. $[\alpha]_D^{25} = -44.0$ ($c = 0.1$, MeOH).

Aglycone: (3β,16α)-3,16-Dihydroxyolean-12-en-28-oic acid

378	Ixeris saponin A 3*β*-*O* ← Ara³ ← Glc³ ← Glc	*Ixeris sonchifolia* (BGE) HANCE (Compositae), whole plant [154]. White amorphous powder. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]_D^{25} = +16.0$ ($c = 0.23$, C_5H_5N).
379	Ixeris saponin B 3*β*-*O* ⟵ Ara² ⟵ Glc; ³↑ Glc 28-*O* ⟵ Glc	*Ixeris sonchifolia*, whole plant [154]. White amorphous powder. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]_D^{25} = +22.4$ ($c = 0.21$, C_5H_5N).
380	Saponin 1 3*β*-*O* ⟵ Ara² ⟵ Glc ³↑ Glc	*Dizygotheca kerchoveana* HORT-VEITCH (Araliaceae), leaves and stem [155]. Amorphous powder. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]_D^{23} = +19.5$ ($c = 0.94$, MeOH).
381	Saponin 2 3*β*-*O* ⟵ Ara² ⟵ Glc; ³↑ Glc 28-*O* ⟵ Glc⁶ ⟵ Glc⁴ ⟵ Rha	*Dizygotheca kerchoveana*, leaves and stems [155]. Amorphous powder. $C_{65}H_{106}O_{32}$: 1398.67. $[\alpha]_D^{23} = -13.0$ ($c = 0.94$, MeOH).
382	Saponin 3 3*β*-*O* ⟵ Ara² ⟵ Glc; ³↑ Glc³ ⟵ (*E*)-cinnamoyl (4'-OH) 28-*O* ⟵ Glc⁶ ⟵ Glc⁴ ⟵ Rha	*Dizygotheca kerchoveana*, leaves and stem [155]. Amorphous powder. $C_{74}H_{112}O_{34}$: 1544.70. $[\alpha]_D^{23} = +4.9$ ($c = 0.96$, MeOH).
383	Saponin 4 3*β*-*O* ⟵ Ara² ⟵ Glc; ³↑ Glc³ ⟵ (*Z*)-cinnamoyl (4'-OH) 28-*O* ⟵ Glc⁶ ⟵ Glc⁴ ⟵ Rha	*Dizygotheca kerchoveana*, leaves and stem [155]. Amorphous powder. $C_{74}H_{112}O_{34}$: 1544.70. $[\alpha]_D^{23} = -14.9$ ($c = 0.84$, MeOH).

Table 1 (cont.)

384	Saponin 2 3β-*O* ← GlcA^4 ← Rha	*Schefflera arboricola*, leaves and stems [84]. Amorphous powder. $C_{42}H_{66}O_{14}$: 794.45. $[\alpha]^{23}_{D} = -27.8$ ($c = 1.10$, MeOH).
385	Pitheduloside K 3β-*O* ⟵ Glc^2 ⟵ Glc ^{6}↑ Ara^2⟵ Ara	*Pithecellobium dulce* BENTH. (Leguminosae), seeds [156]. Colorless needles. $C_{52}H_{84}O_{22}$: 1060.54. M.p. 200–202°. $[\alpha]^{25}_{D} = -4.1$ ($c = 3.5$, MeOH).
386	Saponin 6 3β-*O* ← Ara^2 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Caulophyllum thalictroides* (Berberidaceae), roots and rhizomes [214], *Pithecellobium dulce* seeds [157]. Amorphous solid. $C_{59}H_{96}O_{27}$: 1236.61. $[\alpha]^{25}_{D} = -15.0$ ($c = 0.41$, MeOH).
387	Saponin 3 (= Acacioside A) 3β-*O* ← Glc*N*Ac^6 ← Ara^2 ← Xyl	*Acacia tenuifolia* (L.) WILLD. (Mimosaceae), stem [158]. White solid. $C_{48}H_{77}NO_{17}$: 939.52. M.p. 280° (dec.). $[\alpha]^{25}_{D} = -0.4$ ($c = 0.26$, MeOH).
388	Codonoposide 3β-*O* ← GlcA^3 ← Xyl; 28-*O* ← Ara^2 ← Rha^3 ← Xyl	*Codonopsis lanceolata* (SIEB et. ZUCC.) BENTHAM et HOOKER (Campanulaceae), roots [159]. Amorphous solid. $C_{30}H_{90}O_{26}$: 866.57. M.p. 220°. $[\alpha]^{20}_{D} = -29.6$ (EtOH).
389	Compound 5 3β-*O* ← Ara^2 ← Rha^3 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Trevesia palmata*, aerial parts [140]. White powder. $C_{65}H_{106}O_{31}$: 1382.67. $[\alpha]^{25}_{D} = +22.0$ ($c = 1.0$, MeOH).
390	Auriculatusaponin D 3β-*O* ⟵ GlcA; 28-*O* ⟵ Ara^2 ⟵ Rha^4 ⟵ Ara ^{3}↑ Xyl^3⟵ Xyl	*Aster auriculatus* FRANCH (Compositae), roots [136]. White needles. $C_{62}H_{98}O_{30}$: 1322.61. M.p. 232–235°. $[\alpha]^{21}_{D} = -56.1$ ($c = 0.027$, MeOH).
391	Auriculatusaponin E 3β-*O* ⟵ GlcA (Me ester); 28-*O* ⟵ Xyl^2 ⟵ Rha^3 ⟵ Api(f) ^{4}↑ Ara^3⟵ Xyl	*Aster auriculatus*, roots [136]. Amorphous powder. $C_{63}H_{100}O_{30}$: 1336.63. M.p. 280–284°. $[\alpha]^{31}_{D} = -23.7$ ($c = 0.046$, MeOH).

Table 1 (cont.)

392	Asterlingulatoside A 3β-*O*←Glc; 28-*O*←Ara	*Aster lingulatus* (Compositae), whole plant [160]. Amorphous powder. $C_{41}H_{66}O_{13}$: 766.45. M.p. 199–201°. $[\alpha]_D$ +7.6 (c = 1.0, MeOH).
393	Asterlingulatoside B 3β-*O*←Glc; 28-*O*←Ara²←Rha	*Aster lingulatus*, whole plant [160]. Amorphous powder. $C_{47}H_{76}O_{17}$: 912.51. M.p. 218–220°. $[\alpha]_D$ = −32.1 (c = 0.8, MeOH).
394	Asterlingulatoside C 3β-*O*←Glc; 28-*O*←Ara²←Rha⁴←Xyl	*Aster lingulatus*, whole plant [161]. White powder. $C_{52}H_{84}O_{21}$: 1044.55. M.p. 192–194°. $[\alpha]_D$ = −45.5 (c = 1.1, C_5H_5N).
395	Asterlingulatoside D 3β-*O*←Glc; 28-*O*←Ara²←Rha⁴←Xyl³←Xyl	*Aster lingulatus*, whole plant [161]. White powder. $C_{57}H_{92}O_{25}$: 1176.59. M.p. 196–198°. $[\alpha]_D$ = −63.2 (c = 1.0, C_5H_5N).
396	Astersedifolioside A 3β-*O*←Glc²←Rha; 28-*O*←Ara²←Rha	*Aster sedifolius* (Asteraceae), aerial parts [162]. $C_{53}H_{86}O_{21}$: 1058.57. $[\alpha]_D^{25}$ = −19.1 (c = 0.1, MeOH).
397	Astersedifolioside B 3β-*O*←Glc²←Rha; 28-*O*←Ara²←Rha⁴←Xyl	*Aster sedifolius*, aerial parts [162]. $C_{58}H_{94}O_{25}$: 1190.61. $[\alpha]_D^{25}$ = −21.2 (c = 0.1, MeOH).
398	Astersedifolioside C 3β-*O*←Glc²←Glc²←Rha; 28-*O*←Ara²←Rha⁴←Xyl	*Aster sedifolius*, aerial parts [162]. $C_{64}H_{104}O_{30}$: 1352.66. $[\alpha]_D^{25}$ = −19.3 (c = 0.1, MeOH).
399	Saponin 1 3β-*O*←Ara; 28-*O*←Glc⁶←Glc⁴←Rha	*Oreopanax guatemalensis* DECNE. & PLANCH (Araliaceae), leaves and stems [163]. Amorphous powder. $C_{53}H_{86}O_{22}$: 1074.56. $[\alpha]_D^{23}$ = −22.9 (c = 0.49, MeOH).
400	Saponin 4 3β-*O*←Ara³←Glc³←Glc²←Glc; 28-*O*←Glc⁶←Glc⁴←Rha	*Meryta lanceolata*, leaves and stems [114]. Amorphous powder. $C_{71}H_{116}O_{37}$: 1560.72. $[\alpha]_D^{23}$ = −12.8 (c = 1.90, MeOH).
401	Aralia-saponin I 3β-*O*←Ara³←Glc; 28-*O*←Glc	*Aralia elata* (MIQ.) SEEM. (Araliaceae), root bark [164]. Colorless powder. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]_D$ = −28.9 (c = 0.15, C_5H_5N).
402	Aralia-saponin III 3β-*O*←Ara³←Glc³←Glc; 28-*O*←Glc	*Aralia elata*, root bark [164]. Colorless powder. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]_D$ = −13.3 (c = 0.2, C_5H_5N).

Table 1 (cont.)

403	Aralia-saponin IV 3*β*-*O* ← Glc^3 ← Glc^3 ← Glc; 28-*O* ← Glc	*Aralia elata*, root bark [164]. Colorless powder. $C_{54}H_{88}O_{24}$: 1120.57. $[\alpha]_D = -18.8$ ($c = 0.2$, C_5H_5N).
404	Aralia saponin VI 3*β*-*O* ⟵ Glc^2 ⟵ Glc; ^{3}↑ Glc 28-*O* ⟵ Glc	*Aralia elata* (MIQ) SEEM, root bark [110]. Colorless amorphous powder. $C_{54}H_{88}O_{24}$: 1120.57. $[\alpha]_D = -18.8$ ($c = 0.2$, C_5H_5N).
405	Albiziahexoside 3*β*-*O* ← Glc*N*Ac^6 ← Ara^2 ← Xyl; 28-*O* ← Xyl^2 ← Rha^4 ← Rha	*Albizzia lebbeck* (Leguminosae), leaves [165]. White powder. $C_{65}H_{105}NO_{29}$: 1363.68. M.p. 275° (dec.). $[\alpha]_D^{26} = -40.3$ ($c = 1.0$, MeOH).
406	Gledistside A 3*β*-*O* ⟵ Glc^6 ⟵ Ara^2 ⟵ Xyl; 28-*O* ⟵ Glc^2 ⟵ Rha^2 ⟵ Gal ^{6}↑ ^{4}↑ Xyl^3 ⟵ Xyl menthiafoloyl	*Gledistsia dolavayi* FRANCH. (Leguminosae), fruits [166]. White powder. $C_{84}H_{134}O_{41}$: 1798.84. M.p. 184–186°. $[\alpha]_D^{26} = -23.0$ ($c = 0.36$, MeOH).
407	Gledistside B 3*β*-*O* ⟵ Glc^6 ⟵ Ara^2 ⟵ Xyl; 28-*O* ⟵ Glc^2 ⟵ Rha^2 ⟵ Gal ^{6}↑ ^{4}↑ Xyl^3 ⟵ Xyl menthiafoloyl (9'-OH)	*Gledistsia dolavayi* FRANCH., fruits [166]. White powder. $C_{84}H_{134}O_{42}$: 1814.83. M.p. 195–197°. $[\alpha]_D^{26} = -40.7$ ($c = 0.26$, MeOH).
408	Gleditsioside E 3*β*-*O* ⟵ Glc^6 ⟵ Ara^2 ⟵ Xyl; 28-*O* ⟵ Glc^2 ⟵ Rha^4 ⟵ Xyl^3 ⟵ Xyl ^{6}↑ Rha^2 ⟵ menthiafoloyl (9'-OH) ^{3}↑ menthiafoloyl (6''*S*)	*Gleditsia sinensis* LAM. (Leguminosae), fruits [143]. Amorphous solid. $C_{94}H_{148}O_{43}$: 1964.94. M.p. 200–201°. $[\alpha]_D^{21} = -23.0$ ($c = 0.10$, MeOH).
409	Gleditsioside F 3*β*-*O* ⟵ Glc^6 ⟵ Ara^2 ⟵ Xyl; 28-*O* ⟵ Glc^2 ⟵ Rha^4 ⟵ Xyl^3 ⟵ Xyl ^{6}↑ Rha^2 ⟵ menthiafoloyl (6'*S*) ^{3}↑ menthiafoloyl (6'*S*)	*Gleditsia sinensis*, fruits [143]. Amorphous solid. $C_{94}H_{148}O_{42}$: 1948.94. M.p. 195–196°. $[\alpha]_D^{21} = -20.0$ ($c = 0.10$, MeOH).

Table 1 (cont.)

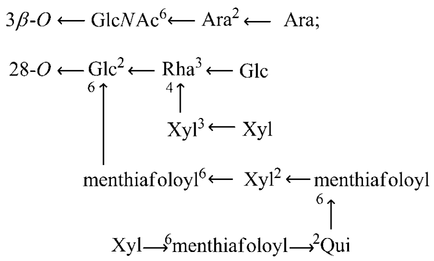
410	Gleditsioside J $3\beta\text{-}O \leftarrow Glc^{6} \leftarrow Ara^{2} \leftarrow Xyl$; $28\text{-}O \leftarrow Glc^{2} \leftarrow Rha^{4} \leftarrow Xyl^{3} \leftarrow Xyl$ (Rha) $^{2}\uparrow$ Gal	*Gleditsia sinensis*, fruits [144]. White amorphous solid. $C_{74}H_{120}O_{39}$: 1632.74. M.p. 256–257° (dec.). $[\alpha]_D^{21} = -15.0$ ($c = 0.10$, MeOH).
411	Gleditsioside K $3\beta\text{-}O \leftarrow Glc^{6} \leftarrow Ara^{2} \leftarrow Xyl$; $28\text{-}O \leftarrow Glc^{2} \leftarrow Rha^{4} \leftarrow Xyl^{3} \leftarrow Xyl$ (Rha) $^{2}\uparrow$ Xyl	*Gleditsia sinensis*, fruits [144]. White amorphous solid. $C_{73}H_{118}O_{38}$: 1602.73. M.p. 238–239° (dec.). $[\alpha]_D^{21} = -12.0$ ($c = 0.10$, MeOH).
412	Gleditsioside Q $3\beta\text{-}O \leftarrow Glc^{6} \leftarrow Ara^{2} \leftarrow Xyl$; $28\text{-}O \leftarrow Glc^{2} \leftarrow Rha^{4} \leftarrow Xyl^{3} \leftarrow Xyl$ (Glc) $^{6}\uparrow$ menthiafoloyl (9'-OH)	*Gleditsia sinensis*, fruits [145]. White amorphous solid. $C_{78}H_{124}O_{37}$: 1652.78. M.p. 210–211° (dec.). $[\alpha]_D^{21} = -18.0$ ($c = 0.1$, MeOH).
413	Gleditsia saponin C′ $3\beta\text{-}O \leftarrow Glc^{6} \leftarrow Ara^{2} \leftarrow Xyl$; $28\text{-}O \leftarrow Glc^{2} \leftarrow Rha^{4} \leftarrow Xyl^{3} \leftarrow Xyl$ (Glc) $^{6}\uparrow$ Rha	*Gleditsia sinensis*, fruits [144]. White amorphous solid. $C_{74}H_{120}O_{38}$: 1616.75. M.p. 234–235° (dec.). $[\alpha]_D^{21} = -18.0$ ($c = 0.1$, MeOH).
414	Gleditsia saponin E′ $3\beta\text{-}O \leftarrow Glc^{6} \leftarrow Ara$; $28\text{-}O \leftarrow Glc^{2} \leftarrow Rha^{4} \leftarrow Xyl^{3} \leftarrow Xyl$ (Glc) $^{6}\uparrow$ Rha	*Gleditsia sinensis*, fruits [144]. White amorphous solid. $C_{69}H_{112}O_{34}$: 1484.70. M.p. 232–233° (dec.). $[\alpha]_D^{21} = -33.0$ ($c = 0.10$, MeOH).
415	Saponin CP05 	*Calliandra pulcherrima* BENTH (Leguminosae), leaves [167][168]. $C_{122}H_{191}NO_{58}$: 2598.20.

Table 1 (cont.)

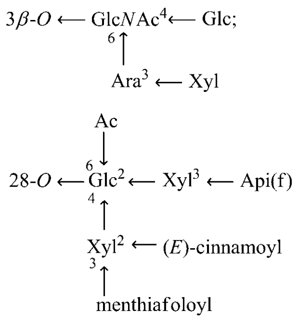
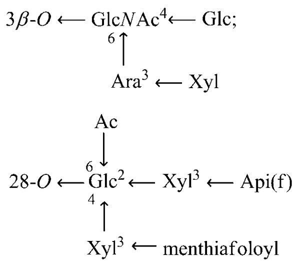
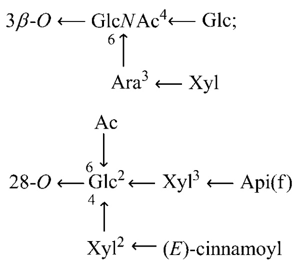
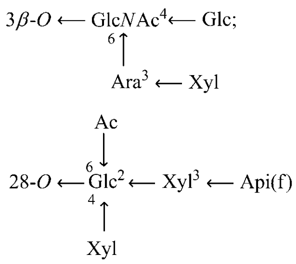
416	Compound 1 	*Entada africana* GUILL. and PERR. (Leguminosae), roots [169]. White solid. $C_{96}H_{143}NO_{43}$: 1997.90. $[\alpha]_D^{25} = -51.0$ ($c = 0.1$, MeOH).
417	Compound 2 	*Entada africana*, roots [169]. White solid. $C_{87}H_{137}NO_{42}$: 1867.86. $[\alpha]_D^{25} = -46.0$ ($c = 0.1$, MeOH).
418	Compound 4 	*Entada africana*, roots [169]. White solid. $C_{86}H_{129}NO_{41}$: 1831.80. $[\alpha]_D^{25} = -29.0$ ($c = 0.1$, MeOH).
419	Compound 5 	*Entada africana*, roots [169]. White solid. $C_{77}H_{123}NO_{40}$: 1701.76. $[\alpha]_D^{25} = -28.0$ ($c = 0.1$, MeOH).

Table 1 (cont.)

420	Compound 6 3β-*O* ⟵ Glc*N*Ac^4 ⟵ Glc; [6 ⟵ Ara^3 ⟵ Xyl] 28-*O* ⟵ Glc^2 ⟵ Xyl^3 ⟵ Api(f); [Glc 4 ⟵ Xyl]	*Entada africana*, roots [169]. White solid. $C_{75}H_{121}NO_{39}$: 1659.75. $[\alpha]^{25}_{D} = -25.0$ ($c = 0.1$, MeOH).
421	Compound 8 3β-*O* ⟵ Glc*N*Ac^4 ⟵ Glc; [6 ⟵ Ara^3 ⟵ Ara] 28-*O* ⟵ Glc^2 ⟵ Xyl^3 ⟵ Api(f); [Glc 6 ⟵ Ac; Glc 4 ⟵ Xyl^2 ⟵ (*E*)-cinnamoyl]	*Entada africana*, roots [169]. White solid. $C_{86}H_{129}NO_{41}$: 1831.80. $[\alpha]^{25}_{D} = -11.0$ ($c = 0.1$, MeOH).
422	Compound 9 3β-*O* ⟵ Glc*N*Ac^4 ⟵ Glc; [6 ⟵ Ara^3 ⟵ Ara] 28-*O* ⟵ Glc^2 ⟵ Xyl^3 ⟵ Api(f); [Glc 6 ⟵ Ac; Glc 4 ⟵ Xyl]	*Entada africana*, roots [169]. White solid. $C_{77}H_{123}NO_{40}$: 1701.76. $[\alpha]^{25}_{D} = -9.0$ ($c = 0.1$, MeOH).
423	Pursaethoside B 3β-*O* ⟵ Glc*N*Ac^3 ⟵ Xyl; [6 ⟵ Ara] 28-*O* ⟵ Glc^2 ⟵ Api(f)	*Entada pursaetha*, seeds [122]. White powder. $C_{59}H_{95}NO_{26}$: 1233.61. $[\alpha]^{22}_{D} = -27.0$ ($c = 0.06$, MeOH).
424	Foetidissimoside B 3β-*O* ⟵ GlcA; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Xyl^3 ⟵ Glc; [Rha 4 ⟵ Xyl]	*Cucurbita foetidissima* H. B. K. (Cucurbitaceae), roots [170]. White powder. $C_{63}H_{100}O_{31}$: 1352.62. $[\alpha]^{25}_{D} = -31.8$ ($c = 0.11$, MeOH).

Table 1 (cont.)

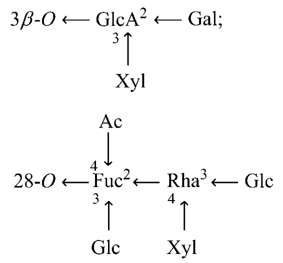
425	Saponin 23 	*Quillaja saponaria* (Caryophyllaceae), bark [171]. $C_{78}H_{124}O_{42}$: 1732.76.
Aglycone: (3β,22α)-3,22-Dihydroxyolean-12-en-28-oic acid		
426	Kochianoside I 3*β*-*O* ← GlcA	*Kochia scoparia* SCHRAD (Chenopodiaceae), fruit [172]. Colorless crystals. $C_{36}H_{56}O_{10}$: 648.39. M.p. 172–175°. $[\alpha]_D^{24} = +84.4$ ($c = 0.1$, MeOH).
Aglycone: 24-Hydroxyechinocystic acid		
427	Saponin 1 3*β*-*O* ← GlcA[4] ← Xyl	*Prunella vulgaris* L. (Labiatae), spikes [173]. White amorphous powder. $C_{41}H_{64}O_{15}$: 796.42. M.p. 218–220°. $[\alpha]_D^{25} = -20.1$ ($c = 0.2$, MeOH).
Aglycone: (3β,16α)-3,16,24-Trihydroxyolean-12-en-28-oic acid		
428	Saponin 2 3*β*-*O* ← GlcA (Me ester)	*Prunella vulgaris* L., spikes [173]. White amorphous powder. $C_{37}H_{58}O_{11}$: 678.40. M.p. 239–240°. $[\alpha]_D^{25} = -17.8$ ($c = 0.2$, MeOH).
429	Saponin 1 3*β*-*O* ← Glc[4] ← Rha	*Lepidagathis hyalina* NEES (Acanthaceae), leaves [174]. Colorless powder. $C_{42}H_{68}O_{13}$: 780.47. M.p. 315–317°. $[\alpha]_D^{27} = +40.2$ ($c = 3.10$, MeOH).
Aglycone: Siaresinolic acid (=(3β,19α)-3,19-Dihydroxyolean-12-en-28-oic acid)		
430	Monepaloside K 3*β*-*O* ← Xyl[3] ← Ara	*Morinda nepalensis* var. *alba* HAND. MAZZ (Dipsacaceae), whole plant [175]. White powder. $C_{40}H_{64}O_{12}$: 736.44. M.p. 177–179°. $[\alpha]_D^{26} = +0.88$ ($c = 0.29$, MeOH).
431	Randia saponin V 3*β*-*O* ← Ara[2] ← Rha; 28-*O* ← Glc	*Randia formosa* SCHUM. (Rubiaceae), leaves [176]. White powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{20} = -29.6$ ($c = 0.24$, MeOH).

Table 1 (cont.)

432	Oblonganoside K 3β-*O* ← Xyl; 28-*O* ← Glc	*Ilex oblonga* (Aquifoliaceae), leaves [177]. Amorphous powder. $C_{41}H_{66}O_{13}$: 766.45. $[\alpha]_D^{21} = +25.3$ ($c = 0.27$, MeOH).
433	Latifoloside B 3β-*O* ← Ara[2] ← Rha; 28-*O* ← Glc	*Ilex latifolia* Thunb (Aquifoliaceae), leaves [178]. Colorless powder. $C_{47}H_{76}O_{17}$: 912.51. M.p. 225–228°.
434	Latifoloside C 3β-*O* ← Ara[2] ← Rha; (Ara ←3– Glc) 28-*O* ← Glc	*Ilex latifolia*, leaves [178]. Colorless powder. $C_{53}H_{86}O_{22}$: 1074.56. M.p. 231–234°.
435	Latifoloside H 3β-*O* ← Ara[2] ← Rha; (Ara ←3– Glc) 28-*O* ← Glc[2] ← Rha	*Ilex latifolia*, leaves [179]. Amorphous solid. $C_{59}H_{96}O_{26}$: 1220.62. M.p. 227–231°.
436	Hylonoside III 3β-*O* ← GlcA[4] ← Glc; 28-*O* ← Glc	*Ilex hylonoma* (Aquifoliaceae), leaves [117]. White amorphous powder. $C_{48}H_{76}O_{20}$: 972.49. $[\alpha]_D^{21} = +21.0$ ($c = 0.7$, MeOH).
437	Hylonoside IV 3β-*O* ← GlcA[2] ← Glc[4] ← Glc; 28-*O* ← Glc	*Ilex hylonoma*, leaves [117]. Amorphous powder. $C_{54}H_{86}O_{25}$: 1134.55. $[\alpha]_D^{21} = +17.0$ ($c = 0.8$, MeOH).
438	Scabiosaponin J 3β-*O* ← Ara[2] ← Rha[3] ← Glc; 28-*O* ← Glc[6] ← Glc	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{59}H_{96}O_{27}$: 1236.61. M.p. 212–214°. $[\alpha]_D^{20} = -6.5$ ($c = 0.10$, MeOH).
439	Scabiosaponin K 3β-*O* ← Ara[2] ← Rha[3] ← Xyl[4] ← Glc; 28-*O* ← Glc[6] ← Glc	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{64}H_{104}O_{31}$: 1368.66. M.p. 220–222°. $[\alpha]_D^{20} = -36.0$ ($c = 0.10$, MeOH).
440	Compound 1 3β-*O* ← Ara; 28-*O* ← Glc	*Sanguisorba officinalis* L. (Rosaceae), roots [180]. Amorphous solid. $C_{41}H_{66}O_{13}$: 766.45. $[\alpha]_D^{25} = +14.0$ ($c = 0.10$, MeOH).
Aglycone: Methyl (3β,16α)-3,16-dihydroxyolean-12-en-28-oate		
441	Auriculatusaponin C 3β-*O* ← Glc; 28-*O* ← CH_2COOH	*Aster auriculata*, roots [15]. Amorphous powder. $C_{38}H_{60}O_{11}$: 692.41. M.p. 245–247°. $[\alpha]_D^{21} = -13.0$ ($c = 0.054$, MeOH).

Table 1 (cont.)

Aglycone: (3β,21α)-3,21-Dihydroxyolean-12-en-28-oic acid		
442	Compound 4 3*β*-*O* ← Ara[2] ← Rha[3] ← Rib[4] ← Glc; 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Clematis chinensis*, roots [104]. Amorphous solid. $C_{70}H_{114}O_{35}$: 1514.71. $[\alpha]_D^{25} = -108.0$ ($c = 0.25$, MeOH).
Aglycone: Machaerinic acid (= (3β,21β)-3,21-Dihydroxyolean-12-en-28-oic acid)		
443	Pachyelaside B 3*β*-*O* ← Glc[2] ← Glc[3] ← Glc[2] ← Glc	*Pachyelasma tessmannii* (Leguminosae) [181]. Amorphous solid. $C_{54}H_{88}O_{23}$: 1104.57. $[\alpha]_D^{20} = -36.2$ ($c = 0.167$, EtOH).
444	Saponin 1 3*β*-*O* ← GlcA[3] ← Rha; 28-*O* ← Glc	*Achyranthes aspera* LINN (Amaranthaceae), aerial parts [182]. Partly solidified gum. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{23} = -13.0$ ($c = 0.42$, MeOH).
445	Saponin 2 3*β*-*O* ← GlcA[2] ← Gal; 28-*O* ← Glc	*Achyranthes aspera* LINN, aerial parts [182]. Gum. $C_{48}H_{76}O_{20}$: 972.49. $[\alpha]_D^{21} = -24.0$ ($c = 0.41$, MeOH).
Aglycone: 21-[(E)-Cinnamoyl]machaerinic acid (= (3β,21β)-3-Hydroxy-21-{[(2E)-3-phenylprop-2-enoyl]oxy}olean-12-en-28-oic acid)		
446	Pachyelaside A 3*β*-*O* ← Glc[2] ← Glc[3] ← Glc[2] ← Glc	*Pachyelasma tessmannii* (Leguminosae) [181]. Amorphous solid. $C_{63}H_{94}O_{25}$: 1250.61. $[\alpha]_D^{20} = +37.1$ ($c = 0.167$, EtOH).
447	Pachyelaside C 3*β*-*O* ⟵ Glc[2] ⟵ Xyl[3] ⟵ Glc[2] ⟵ Glc (Glc [4] ↑ Xyl)	*Pachyelasma tessmannii* [181]. Amorphous solid. $C_{67}H_{100}O_{28}$: 1352.64. $[\alpha]_D^{20} = +22.5$ ($c = 0.167$, EtOH).
448	Pachyelaside D 3*β*-*O* ⟵ Glc[2] ⟵ Glc[3] ⟵ Glc[2] ⟵ Glc (Glc [4] ↑ Xyl)	*Pachyelasma tessmannii* [181]. Amorphous solid. $C_{68}H_{102}O_{29}$: 1382.65. $[\alpha]_D^{20} = +16.8$ ($c = 0.167$, EtOH).
Aglycone: Hederagenin (= (3β)-3,23-Dihydroxyolean-12-en-28-oic acid)		
449	Fargoside E 3*β*-*O* ← Ara[3] ← GlcA (Me ester)	*Holboellia fargesii*, roots [183]. Amorphous solid. $C_{42}H_{66}O_{14}$: 794.44. $[\alpha]_D^{28} = +18.3$ ($c = 0.8$, MeOH).
450	Anhuienoside A 23-*O* ← Glc[2] ← Glc	*Anemone anhuiensis* Y. K. YANG. (Ranunculaceae), rhizomes [184]. White powder. $C_{42}H_{68}O_{14}$: 796.46. M.p. 225–228°. $[\alpha]_D^{20} = +22.7$ ($c = 0.16$, MeOH).

Table 1 (cont.)

451	Anhuienoside B 23-*O* ← Glc^2 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Anemone anhuiensis*, rhizomes [184]. White powder. $C_{60}H_{98}O_{28}$: 1266.62. M.p. 222–224°. $[\alpha]_D^{20} = -25.6$ ($c = 0.12$, MeOH).
452	Transsylvanoside G 3β-*O* ← Xyl^2 ← Rha^3 ← Glc^4 ← Glc; 28-*O* ← Xyl^4 ← Glc	*Cephalaria transsylvanica* L. (Dipsacaceae), flowers [185]. Amorphous powder. $C_{64}H_{104}O_{31}$: 1368.66. $[\alpha]_D^{25} = -86.1$ ($c = 2.35$, MeOH).
453	Transsylvanoside H 3β-*O* ← Xyl^2 ← Rha^3 ← Xyl	*Cephalaria transsylvanica*, flowers [185]. Amorphous powder. $C_{46}H_{74}O_{16}$: 882.50. $[\alpha]_D^{15} = +69.6$ ($c = 1.26$, MeOH).
454	Transsylvanoside I 3β-*O* ← Xyl^4 ← Rha^3 ← Glc^4 ← Glc; 28-*O* ← Glc^4 ← Glc	*Cephalaria transsylvanica* L., flowers [186]. Amorphous powder. $C_{65}H_{106}O_{32}$: 1398.67. $[\alpha]_D^{27} = -102.1$ ($c = 3.30$, MeOH).
455	Transsylavanoside J 3β-*O* ← Xyl^2 ← Rha^3 ← Glc; 28-*O* ← Glc^4 ← Glc	*Cephalaria transsylvanica*, flowers [186]. Amorphous powder. $C_{59}H_{96}O_{27}$: 1236.61. $[\alpha]_D^{18} = +20.3$ ($c = 1.88$, MeOH).
456	Transsylavanoside K 3β-*O* ← Xyl^4 ← Rha	*Cephalaria transsylvanica*, flowers [186]. Amorphous powder. $C_{41}H_{66}O_{12}$: 750.46. $[\alpha]_D^{18} = -21.0$ ($c = 0.75$, MeOH).
457	Caryocaroside II-1 3β-*O* ← Glc^3 ← Gal	*Caryocar glabrum* (AUBL.) PERS. (Caryocaraceae), fruits [151]. White powder. $C_{42}H_{68}O_{14}$: 796.46. $[\alpha]_D^{20} = +31.9$ ($c = 0.83$, MeOH).
458	Caryocaroside II-2 3β-*O* ← Glc^3 ← Gal; 28-*O* ← Glc	*Caryocar glabrum*, fruits [151]. White powder. $C_{48}H_{78}O_{19}$: 958.51. $[\alpha]_D^{20} = +20.7$ ($c = 0.75$, MeOH).
459	Caryocaroside II-3 3β-*O* ← Glc^3 ← Gal^3 ← Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{48}H_{78}O_{19}$: 958.51. $[\alpha]_D^{20} = +15.6$ ($c = 0.42$, MeOH).
460	Caryocaroside II-7 3β-*O* ← $GlcA^3$ ← Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{42}H_{66}O_{15}$: 810.44. $[\alpha]_D^{20} = +11.4$ ($c = 0.44$, MeOH).
461	Caryocaroside II-9 3β-*O* ← $GlcA^3$ ← Gal; 28-*O* ← Glc	*Caryocar glabrum*, fruits [151]. White powder. $C_{48}H_{76}O_{20}$: 972.49. $[\alpha]_D^{20} = +11.9$ ($c = 1.0$, MeOH).

Table 1 (cont.)

462	Caryocaroside II-10 3β-*O*←GlcA (Me ester)^3←Gal; 28-*O*←Glc	*Caryocar glabrum*, fruits [151]. White powder. $C_{49}H_{78}O_{20}$: 986.51. $[\alpha]_D^{20} = +10.8$ ($c = 0.17$, MeOH).
463	Caryocaroside II-11 3β-*O*←GlcA^3←Gal^3←Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{48}H_{76}O_{20}$: 972.49. $[\alpha]_D^{20} = +11.5$ ($c = 0.42$, MeOH).
464	Caryocaroside II-12 3β-*O*←Glc^3←Gal^3←Xyl; 28-*O*←Glc	*Caryocar villosum* (Caryocaraceae), fruits [152]. White powder. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]_D^{22} = +12.7$ ($c = 0.83$, MeOH).
465	Caryocaroside II-13 3β-*O*←Glc^3←Gal^3←Gal; 28-*O*←Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{54}H_{88}O_{24}$: 1120.57. $[\alpha]_D^{22} = +16.3$ ($c = 0.83$, MeOH).
466	Caryocaroside II-16 3β-*O*←Glc^3←Gal^4←Gal^3←Gal^3←Xyl; 28-*O*←Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{65}H_{106}O_{33}$: 1414.66. $[\alpha]_D^{22} = +18.0$ ($c = 0.75$, MeOH).
467	Caryocaroside II-22 3β-*O*←GlcA^3←Gal^3←Rha	*Caryocar villosum* (AUBLA.) PERS. (Caryocaraceae), stem bark [187]. White powder. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{20} = +8.5$ ($c = 1.0$, MeOH).
468	Caryocaroside II-23 3β-*O*←GlcA^3←Gal^3←Rha; 28-*O*←Glc	*Caryocar villosum*, stem bark [187]. White powder. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]_D^{20} = +15.7$ ($c = 0.66$, MeOH).
469	Caryocaroside II-24 3β-*O*←GlcA^3←Gal^3←Rha; 28-*O*←Glc^2←galloyl	*Caryocar villosum*, stem bark [187]. White powder. $C_{61}H_{90}O_{28}$: 1270.56. $[\alpha]_D^{20} = +18.0$ ($c = 0.25$, MeOH).
470	Durupcoside C 3β-*O*←Ara^3←Glc^3←Glc	*Aralia elata* SEEM. (Araliaceae), leaves [188]. White powder. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]_D^{27} = +35.7$ ($c = 0.28$, MeOH).
471	Congmuyenoside A 3β-*O*⟵Glc^2⟵Glc ^{3}↑ Glc	*Aralia elata* SEEM, leaves [189]. White powder. $C_{48}H_{78}O_{19}$: 958.51. M.p. 262–264°; $[\alpha]_D = +25.5$ (C_5H_5N).
472	Congmuyenoside B 3β-*O*⟵Glc^2⟵Glc ^{3}↑ Glc^3⟵Glc	*Aralia elata* SEEM, leaves [189]. White powder. $C_{54}H_{88}O_{24}$: 1120.57. M.p. 283–284°. $[\alpha]_D = +30.0$ (C_5H_5N).

Table 1 (cont.)

473	Aralia saponin VII 3β-*O* ⟵ Glc^2 ⟵ Glc; ^{3}↑ Glc 28-*O* ⟵ Glc	*Aralia elata*, root bark [110]. Colorless amorphous powder. $C_{54}H_{88}O_{24}$: 1120.57. $[\alpha]_D = +23.1$ ($c = 0.3$, C_5H_5N).
474	Aralia saponin IX 3β-*O* ⟵ Ara^2 ⟵ Glc; ^{3}↑ Glc 28-*O* ⟵ Glc	*Aralia elata*, root bark [110]. Colorless amorphous powder. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]_D = +13.3$ ($c = 0.6$, C_5H_5N).
475	Saponin 1 3β-*O* ← GlcA^2 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Meryta lanceolata* Hort (Araliaceae), leaves and stems [115]. Amorphous powder. $C_{60}H_{96}O_{29}$: 1280.60. $[\alpha]^{23}_D = -18.2$ ($c = 0.91$, MeOH).
476	Saponin 5 3β-*O* ← GlcA^2 ← Glc	*Meryta lanceolata*, leaves and stems [115]. $C_{42}H_{66}O_{15}$: 810.44. isolated as a mixture with udosaponin E.
477	Atriplico saponin A 3β-*O* ← Xyl^2 ← Glc	*Zygophyllum atriplicoides* (Zygophyllaceae), whole plant [190]. Crystals (MeOH–$CHCl_3$, 18 : 82). $C_{41}H_{66}O_{13}$: 766.45. M.p. 215–217°. $[\alpha]^{25}_D = +40.0$ ($c = 0.02$, MeOH).
478	Saponin 1 3β-*O* ← Ara^2 ← Glc; 28-*O* ← Glc	*Fagonia cretica* (Zygophyllaceae), aerial parts [132]. Amorphous powder. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]^{23}_D = +30.0$ ($c = 2.47$, MeOH).
479	Tanguticoside A 3β-*O* ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Clematis tangutica* (Maxim.) Korsh. (Ranunculaceae), aerial parts [191][192]. Amorphous powder. $C_{54}H_{88}O_{23}$: 1104.57. M.p. 214–216°. $[\alpha]^{26}_D = -10.6$ ($c = 0.31$, MeOH).
480	Tanguticoside B 3β-*O* ← Glc^2 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Clematis tangutica*, aerial parts [191][192]. Amorphous powder. $C_{60}H_{98}O_{28}$: 1266.62. M.p. 214–216°. $[\alpha]^{18.7}_D = -7.4$ ($c = 0.51$, MeOH).
481	Saponin 1 3β-*O* ← Ara; 28-*O* ← Rha	*Clematis tangutica*, aerial parts [193][194]. Colorless. powder. $C_{41}H_{66}O_{12}$: 750.46. $[\alpha]^{25}_D = +46.7$ ($c = 0.1$, MeOH).

Table 1 (cont.)

482	Saponin 2 3β-*O* ← Ara^{4} ← Glc; 28-*O* ← Rha	*Clematis tangutica*, aerial parts [193][194]. Colorless plate crystals. $C_{47}H_{76}O_{17}$: 912.51. M.p. 237–242°. $[\alpha]_{D}^{25} = +33.3$ ($c = 0.1$, MeOH).
483	Clematernoside C 3β-*O* ← Ara^{2} ← Rha^{3} ← Rib^{4} ← Glc^{4} ← Glc^{2} ← isoferuloyl; 28-*O* ← Glc^{6} ← Glc^{4} ← Rha	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{86}H_{132}O_{43}$: 1852.81. $[\alpha]_{D}^{28} = -43.1$ ($c = 0.61$, MeOH).
484	Clematernoside D isoferuloyl ↓ 2 3β-*O* ← Ara^{2} ← Rha^{3} ← Rib^{4} ← Glc^{4} ← Glc; ↑ 3 Rha → ^{6}Glc 28-*O* ← Glc^{6} ← Glc^{4} ← Rha	*Clematis terniflora* var. *robusta*, roots [106]. Amorphous powder. $C_{98}H_{152}O_{52}$: 2160.92. $[\alpha]_{D}^{28} = -50.2$ ($c = 0.67$, MeOH).
485	Clematibetoside A 3β-*O* ← Ara^{2} ← Rha^{3} ← Rib^{4} ← Glc^{4} ← Glc^{2} ← caffeoyl; 28-*O* ← Glc^{6} ← Glc^{4} ← Rha	*Clematis tibetana* KUNTZE (Ranunculaceae), aerial parts [195]. Yellowish powder. $C_{85}H_{130}O_{43}$: 1838.80. $[\alpha]_{D}^{28} = -59.2$ ($c = 0.33$, MeOH).
486	Clematibetoside C 3β-*O* ← Rib; 28-*O* ← Glc^{6} ← Glc^{4} ← Rha	*Clematis tibetana*, aerial parts [195]. White powder. $C_{53}H_{86}O_{22}$: 1074.56. $[\alpha]_{D}^{28} = -25.7$ ($c = 0.67$, MeOH).
487	Compound 1 3β-*O* ← Gal^{2} ← Glc; 28-*O* ← Glc	*Pulsatilla patens* var. *multifida* (PRITZ.) S. H. LI et Y. H. HUANG (Ranunculaceae), roots [137]. Amorphous powder. $C_{48}H_{78}O_{19}$: 958.51. M.p. 239–241°. $[\alpha]_{D}^{20} = +20.8$ ($c = 0.19$, MeOH).
488	Compound 2 3β-*O* ← Gal^{2} ← Glc ↑ 6 Glc	*Pulsatilla patens* var. *multifida*, roots [137]. Amorphous powder. $C_{48}H_{78}O_{19}$: 958.51. M.p. 208–212°. $[\alpha]_{D}^{20} = +21.2$ ($c = 0.15$, MeOH).
489	Compound 5 3β-*O* ← Gal^{2} ← Glc; ↑ 6 Glc 28-*O* ← Glc^{6} ← Glc^{4} ← Rha	*Pulsatilla patens* var. *multifida*, roots [137]. Amorphous powder. $C_{66}H_{108}O_{33}$: 1428.68. M.p. 234–237°. $[\alpha]_{D}^{20} = -10.2$ ($c = 0.22$, MeOH).
490	Saponin 3 3β-*O* ← Ara^{2} ← Rha^{3} ← Glc ↑ 4 Glc	*Pentaclethra macroloba* (WILLD.) KUNTZE (Mimosoideae), stem bark [128]. Colorless amorphous solid. $C_{53}H_{86}O_{22}$: 1074.56. M.p. 261–268°. $[\alpha] = -3.0$ ($c = 0.5$, MeOH).

Table 1 (cont.)

491	Compound 1 $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}^3 \leftarrow \text{Glc}^4 \leftarrow \text{Glc}^2 \leftarrow \text{Glc}$ $^4\uparrow$ (on Ara) $\text{Glc}^3 \leftarrow \text{Glc}$	*Pentaclethra macroloba*, bark [129]. White powder. $C_{71}H_{116}O_{37}$: 1560.72.
492	Saponin 5 $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}$; $28\text{-}O \leftarrow \text{Glc}^2 \leftarrow \text{Xyl}$ $^6\uparrow$ (on Glc) $\text{Glc}^4 \leftarrow \text{Rha}$	*Oreopanax guatemalensis* (Araliaceae), leaves and stems [163]. Amorphous powder. $C_{64}H_{104}O_{30}$: 1352.66. $[\alpha]_D^{23} = -29.5$ ($c = 0.29$, MeOH).
493	Saponin 6 $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}$; $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}^4 \leftarrow \text{Rha}$ $^2\uparrow$ (on Glc) Glc	*Oreopanax guatemalensis*, leaves and stems [163]. Amorphous powder. $C_{65}H_{106}O_{31}$: 1382.67. $[\alpha]_D^{23} = -28.2$ ($c = 1.09$, MeOH).
494	Saponin 7 $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}$; $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}^4 \leftarrow \text{Rha}$ $^2\uparrow$ (on Glc) Ara(f)	*Oreopanax guatemalensis*, leaves and stems [163]. Amorphous powder. $C_{64}H_{104}O_{30}$: 1352.66. $[\alpha]_D^{23} = -37.6$ ($c = 0.61$, MeOH).
495	Hupehensis saponin F $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}^3 \leftarrow \text{Rib}$; $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}^4 \leftarrow \text{Rha}^3 \leftarrow \text{Glc}^6 \leftarrow \text{Glc}^4 \leftarrow \text{Rha}$	*Anemone hupehensis* LEMOINE (Ranunculaceae), leaves and roots [196]. Amorphous solid. $C_{82}H_{134}O_{44}$: 1822.82. $[\alpha]_D^{13} = +18.7$ ($c = 2.53$, MeOH).
496	Hupehensis saponin G $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}^3 \leftarrow \text{Rib}$; $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}^4 \leftarrow \text{Rha}^3 \leftarrow \text{Glc}^6 \leftarrow \text{Glc}^4 \leftarrow \text{Rha}^6 \leftarrow \text{Glc}$	*Anemone hupehensis*, leaves and roots [196]. Amorphous solid. $C_{88}H_{144}O_{49}$: 1984.88. $[\alpha]_D^{13} = +8.0$ ($c = 3.1$, C_5H_5N).
497	Eranthisaponin A $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}^3 \leftarrow \text{All}$; $^4\uparrow$ (on Ara) Glc $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}^4 \leftarrow \text{Rha}$	*Eranthis cilicica* SCHOTT. et KOTSCHY (Ranunculaceae), tubers [197]. Amorphous solid. $C_{71}H_{116}O_{36}$: 1544.72. $[\alpha]_D^{26} = -52.0$ ($c = 0.1$, MeOH).
498	Eranthisaponin B $3\beta\text{-}O \leftarrow \text{Ara}^2 \leftarrow \text{Rha}$; $^4\uparrow$ (on Ara) Glc $28\text{-}O \leftarrow \text{Glc}^6 \leftarrow \text{Glc}^4 \leftarrow \text{Rha}$ $^4\uparrow$ (on Rha) $\text{Rha} \rightarrow {}^4\text{Glc} \rightarrow {}^6\text{Glc}$	*Eranthis cilicica*, tubes [197]. Amorphous solid. $C_{83}H_{136}O_{45}$: 1852.84. $[\alpha]_D^{26} = -36.0$ ($c = 0.10$, MeOH).

Table 1 (cont.)

499	Saponin 1 3β-*O* ← Ara^3 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Ranunculus fluitans* L. (Ranunculaceae), aquatic part [131]. White powder. $C_{59}H_{96}O_{27}$: 1236.61. M.p. 190–195° (dec.). $[\alpha]_D^{20} = +2.5$ ($c = 0.81$, MeOH).
500	Compound 4 3β-*O* ← Ara^2 ← Rha^3 ← Xyl^2 ← Ac	*Sapindus emarginatus* (Sapindaceae), pericarps [146]. White powder. $C_{48}H_{76}O_{17}$: 924.51. $[\alpha]_D^{22} = +5.9$ ($c = 3.7$, MeOH).
501	Scheffarboside C 3β-*O* ← Ara^2 ← Rha^3 ← Ara^4 ← Ara	*Schefflera arboricola* (Araliaceae), stem [85]. White amorphous powder. $C_{51}H_{82}O_{20}$: 1014.54. $[\alpha]_D^{20} = +1.5$ ($c = 0.32$, C_5H_5N).
502	Pastuchoside A 3β-*O* ← Ara^2 ← Rha; (4 ↑) Glc^4 ← Rha 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Hedera pastuchowii* (Araliaceae), leaves [112]. White powder. $C_{71}H_{116}O_{35}$: 1528.73. M.p. 198°. $[\alpha]_D^{20} = -16.0$ ($c = 0.1$, MeOH).
503	Pastuchoside C 3β-*O* ← Ara^2 ← Rha; (4 ↑) Glc 28-*O* ← Glc^6 ← Glc	*Hedera pastuchowii*, leaves [112]. White powder. $C_{59}H_{96}O_{27}$: 1236.61. M.p. 201°. $[\alpha]_D^{20} = -18.0$ ($c = 0.1$, MeOH).
504	Helixoside A 3β-*O* ← Glc^2 ← Glc; 28-*O* ← Glc^6 ← Glc	*Hedera helix* L., fruits [111]. Colorless solid. $C_{54}H_{88}O_{24}$: 1120.57. $[\alpha]_D^{20} = +3.2$ ($c = 0.6$, MeOH).
505	Saponin 2 3β-*O* ← Ara^2 ← Rha^3 ← Glc^4 ← Glc; 28-*O* ← Glc^6 ← Glc	*Lonicera japonica* THUNB (Caprifoliaceae), flowers [198]. Amorphous powder. $C_{65}H_{106}O_{32}$: 1398.67.
506	Loniceroside C 3β-*O* ← Glc; 28-*O* ← Glc^6 ← Xyl (2 ↑) Rha	*Lonicera japonica* (THUNB.) (Caprifoliaceae), aerial parts [199]. Amorphous powder. $C_{53}H_{86}O_{22}$: 1074.56. M.p. 227–230°. $[\alpha]_D^{27} = -26.7$ ($c = 0.12$, C_5H_5N).
507	Saponin 1 3β-*O* ← Ara^4 ← Glc^4 ← Glc	*Bongardia chrysogonum* (L.) BOISS (Berberidaceae), tubers [200]. White powder. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]_D^{25} = -2.5$ ($c = 0.16$, MeOH).
508	Saponin 2 3β-*O* ← Ara^4 ← Glc^4 ← Glc; 28-*O* ← Glc^6 ← Glc	*Bongardia chrysogonum*, tubers [200]. White powder. $C_{59}H_{96}O_{28}$: 1252.61. $[\alpha]_D^{25} = -3.8$ ($c = 0.31$, MeOH).

Table 1 (cont.)

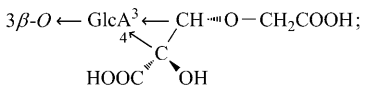
509	Saponin 2 3β-*O* ← Ara² ← Rha; 28-*O* ← Glc² ← Rha	*Elattostachys apetala* (Labill.) Radlk. (Sapindaceae), stem bark [201]. $C_{53}H_{86}O_{21}$: 1058.57. $[\alpha]^{20}_{D} = -14.3$ ($c = 0.53$, MeOH).
510	Saponin 3 3β-*O* ← Ara² ← Rha³ ← Xyl; 28-*O* ← Glc² ← Rha	*Elattostachys apetala*, stem bark [201]. $C_{58}H_{94}O_{25}$: 1190.61. $[\alpha]^{20}_{D} = -14.1$ ($c = 0.28$, MeOH).
511	Saponin 4 3β-*O* ← Ara² ← Rha³ ← Xyl; 28-*O* ← Glc² ← Rha (Glc⁶ ← Glc)	*Elattostachys apetala*, stem bark [201]. $C_{64}H_{104}O_{30}$: 1352.66; $[\alpha]^{20}_{D} = -12.6$ ($c = 0.32$, MeOH).
512	Saponin 7 3β ← Glc² ← Glc² ← Rha; 28-*O* ← Glc	*Medicago hybrida* L. (Leguminosae), roots [142]. Amorphous solid. $C_{54}H_{88}O_{23}$: 1104.57. M.p. 224–225°. $[\alpha]^{25}_{D} = -4.12$ ($c = 1.0$, MeOH).
513	Leucanthoside A 3β-*O* ← Ara² ← Rha³ ← Xyl; 28-*O* ← Glc⁶ ← All	*Cephalaria leucantha* L. (Dipsacaceae), aerial parts [202]. Colorless gum. $C_{58}H_{94}O_{26}$: 1206.60. $[\alpha]^{20}_{D} = -17.4$ ($c = 1.03$, MeOH).
514	Patrinia saponin H_3 3β-*O* ← Ara² ← Rha³ ← Glc; 28-*O* ← Glc⁶ ← Glc⁴ ← Rha	*Patrinia scabiosaefolia* Fisch. (Valerianaceae), aerial parts [203]. Amorphous powder. $C_{65}H_{106}O_{31}$: 1382.67. M.p. 228–230°. $[\alpha]^{20}_{D} = -13.4$ ($c = 0.6$, C_5H_5N).
515	Decaisoside F 3β-*O* ← Ara² ← Rha³ ← Xyl; 28-*O* ← Glc⁶ ← Glc⁴ ← Xyl	*Decaisnea fargesii* Franch, seeds [204]. White powder. $C_{63}H_{102}O_{29}$: 1322.65. M.p. 227–230° (dec.). $[\alpha]^{20}_{D} = -18.9$ ($c = 0.09$, MeOH).
516	Basellasaponin A  28-*O* ← Glc	*Basella rubra* L. (Basellaceae), aerial parts [205]. Colorless crystals (MeOH–H_2O). $C_{47}H_{70}O_{21}$: 970.44. M.p. 228–230°. $[\alpha]^{24}_{D} = +30.1$ ($c = 0.1$, MeOH).
517	Compound 4 3β-*O* ← Ara² ← Qui; 28-*O* ← Glc⁶ ← Glc⁴ ← Rha	*Trevesia palmata*, aerial parts [140]. White powder. $C_{59}H_{96}O_{26}$: 1220.62. $[\alpha]^{25}_{D} = +25.0$ ($c = 1.0$, MeOH).

Table 1 (cont.)

518	Colchiside A 3β-*O* ← Xyl	*Hedera colchica* K. KOCH (Araliaceae), berries [113]. White powder. $C_{35}H_{56}O_{8}$: 604.40. $[\alpha]_D^{25} = +12.6$ (MeOH).
Aglycone: 16α-Hydroxyhederagenin (=(3β,16α)-3,16,23-Trihydroxyolean-12-en-28-oic acid)		
519	Aralia-saponin II 3β-*O* ← Ara^3 ← Glc; 28-*O* ← Glc	*Aralia elata*, root bark [164]. Colorless powder. $C_{47}H_{76}O_{19}$: 944.50. $[\alpha]_D = -39.4$ ($c = 0.22$, C_5H_5N).
Aglycone: (3β)-3,24-Dihydroxyolean-12-en-28-oic acid		
520	Rivaloside E 3β-*O* ← GlcA; 28-*O* ← Glc	*Galium rivale* (SIBTH and SM.) GRISEB. (Rubiaceae), aerial parts [206]. Amorphous solid. $C_{42}H_{66}O_{15}$: 810.44. $[\alpha]_D = -7.6$ ($c = 0.2$, MeOH).
Aglycone: (3β)-3,27-Dihydroxyolean-12-en-28-oic acid		
521	Saponin 2 3β-*O* ← Ara^2 ← Glc; 28-*O* ← Glc^6 ← Glc	*Fagonia cretica*, aerial parts [132]. Amorphous powder. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]_D^{23} = +4.2$ ($c = 1.46$, MeOH).
Aglycone: (3β)-3,29-Dihydroxyolean-12-en-28-oic acid		
522	Oblonganoside L 3β-*O* ← Xyl; 28-*O* ← Glc	*Ilex oblonga* (Aquifoliaceae), leaves [177]. Amorphous powder. $C_{41}H_{66}O_{13}$: 766.45. $[\alpha]_D^{21} = +37.2$ ($c = 0.14$, MeOH).
523	Zygophyloside K 3β-*O* ← GlcA; 28-*O* ← Glc	*Zygophyllum decumbens*, whole plant [207]. Amorphous solid. $C_{42}H_{66}O_{15}$: 810.44. M.p. 192–196°.
524	Compound 1 3β-*O* ← GlcA^3 ← Glc; 28-*O* ← Glc	*Platyphora opima* STAL (Chrysomelid beetle) [208]. $C_{48}H_{76}O_{20}$: 972.49. $[\alpha]_D^{25}$ +29.8 ($c = 0.57$, MeOH).
Aglycone: 23-O-Acetylhederagenin (=(3β)-23-(Acetyloxy)-3-hydroxyolean-12-en-28-oic acid)		
525	Compound 7 3β-*O* ← Ara^2 ← Rha^3 ← Xyl^4 ← Ac	*Sapindus emarginatus*, pericarps [146]. White powder. $C_{50}H_{78}O_{18}$: 966.52. $[\alpha]_D^{22} = -10.4$ ($c = 0.7$, MeOH).
Aglycone: 29-Hydroxyhederagenin (=(3β)-3,23,29-Trihydroxyolean-12-en-28-oic acid)		
526	Saponin 5 3β-*O* ⟵ Ara^2 ⟵ Rha; 28-*O* ⟵ Glc^2 ⟵ Glc (Glc^6 ↑ Glc)	*Elattostachys apetala*, stem bark [201]. $C_{59}H_{96}O_{28}$: 1252.61. $[\alpha]_D^{20} = -15.0$ ($c = 0.32$, MeOH).

Table 1 (cont.)

527	Saponin 6 3β-*O* ⟵ Ara[2] ⟵ Rha[3] ⟵ Ara; 28-*O* ⟵ Glc[2] ⟵ Glc (Glc ⟶ 6 of Glc)	*Elattostachys apetala*, stem bark [201]. $C_{64}H_{104}O_{32}$: 1384.65.
528	Saponin 7 3β-*O* ⟵ Ara[2] ⟵ Rha[3] ⟵ Xyl; 28-*O* ⟵ Glc[2] ⟵ Glc (Glc ⟶ 6 of Glc)	*Elattostachys apetala*, stem bark [201]. $C_{64}H_{104}O_{32}$: 1384.65.
529	Nipponoside D 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Acanthopanax nipponicus*, leaves [138]. White powder. $C_{48}H_{78}O_{19}$: 958.51. $[\alpha]_D^{25} = -4.5$ ($c = 0.61$, MeOH).
Aglycone: 23-Hydroxy-3-oxoolean-12-en-28-oic acid		
530	Nipponoside A 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Acanthopanax nipponicus* MAKINO (Araliaceae), leaves [138]. White powder. $C_{48}H_{76}O_{18}$: 940.50. $[\alpha]_D^{25} = -1.4$ ($c = 0.5$, MeOH).
Aglycone: Arjunic acid (=(2α,3β,19α)-2,3,19-Trihydroxyolean-12-en-28-oic acid)		
531	Arjunetoside 3β-*O* ← Glc; 28-*O* ← Glc	*Terminalia arjuna* (Combetaceae), root bark [209]. Colorless granules. $C_{42}H_{68}O_{15}$: 812.46. M.p. 268–270°. $[\alpha]_D^{20} = +68.0$ ($c = 0.25$, MeOH).
Aglycone: Arjunolic acid (=(2α,3β)-2,3,23-Trihydroxyolean-12-en-28-oic acid)		
532	Biondianoside G 3β-*O* ← Glc; 28-*O* ← Glc[2] ← Glc	*Biondia chinensis* SCHLTR. (Asclepiadaceae), roots [210]. White powder. $C_{48}H_{78}O_{20}$: 974.51. $[\alpha]_D^{25} = +0.5$ ($c = 0.40$, MeOH).
533	Stelmatotriterpenoside E 3β-*O* ← Glc; 28-*O* ← Glc[6] ← Glc	*Stelmatocrypton khasianum* (BENTH) BAIL (Asclepiadaceae), stem [211]. White powder. $C_{48}H_{78}O_{20}$: 974.51. M.p. 226–229° (dec.). $[\alpha]_D^{25} = -43.5$ ($c = 0.18$, MeOH).
Aglycone: (3β,19α)-3,19,23-Trihydroxyolean-12-en-28-oic acid		
534	Oblonganoside M 3β-*O* ← Xyl; 28-*O* ← Glc	*Ilex oblonga* (Aquifoliaceae), leaves [177]. Amorphous powder. $C_{41}H_{66}O_{14}$: 782.45. $[\alpha]_D^{21} = -2.9$ ($c = 0.43$, MeOH).

Table 1 (cont.)

535	Randia saponin VI 3β-*O* ← Ara; 28-*O* ← Glc	*Randia formosa* SCHUM (Rubiaceae), leaves [176]. White powder. $C_{41}H_{66}O_{14}$: 782.45. $[\alpha]^{20}_{D} = +7.1$ ($c = 0.14$, MeOH).
536	Randia saponin VII 3β-*O* ← Glc; 28-*O* ← Glc	*Randia formosa*, leaves [176]. White powder. $C_{42}H_{68}O_{15}$: 812.46. $[\alpha]^{20}_{D} = +16.6$ ($c = 0.35$, MeOH).
Aglycone: Caulophyllogenin (=(3β,16α)-3,16,23-Trihydroxyolean-12-en-28-oic acid)		
537	Compound 6 3β-*O* ← Ara[2] ← Rha[3] ← Glc; 28-*O* ← Glc[6] ← Qui[4] ← Rha (Qui 2 ↑ Glc)	*Trevesia palmata*, aerial parts [140]. White powder. $C_{71}H_{116}O_{36}$: 1544.72. $[\alpha]^{25}_{D} = +11.0$ ($c = 1.0$, MeOH).
538	Ligatoside A 3β-*O* ← GlcA; 28-*O* ← Glc[2] ← 3′,4′-di(OMe)benzoyl	*Platyphora ligata* (Chrysomelid beetle) (Coleoptera) [212]. Yellowish oil. $C_{51}H_{74}O_{19}$: 990.48.
539	Ligatoside B 3β-*O* ← GlcA; (GlcA 2 ↑ Glc) 28-*O* ← Glc[2] ← 3′,4′-di(OMe)benzoyl	*Platyphora ligata* [212]. Yellowish oil. $C_{57}H_{84}O_{24}$: 1152.54.
540	Saponin 5 (Leonticin D) 3β-*O* ← Ara; 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Caulophyllum thalictroides* (L.) MICHX., roots and rhizomes (Berberidaceae) [213], *Leontice kiangnanensis* [214]. Amorphous solid. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]^{25}_{D} = -28.0$ ($c = 0.64$, MeOH).
541	Aralia saponin VIII 3β-*O* ← Glc[2] ← Glc; (Glc 3 ↑ Glc[3] ← Glc) 28-*O* ← Glc	*Aralia elata*, root bark [110]. Colorless amorphous powder. $C_{60}H_{98}O_{30}$: 1298.61. $[\alpha]_{D} = +23.1$ ($c = 0.3$, C_5H_5N).
542	Ixeris saponin C 3β-*O* ← Ara[3] ← Glc[3] ← Glc; 28-*O* ← Glc	*Ixeris sonchifolia*, whole plant [154]. White amorphous powder. $C_{53}H_{86}O_{24}$: 1106.55. $[\alpha]^{25}_{D} = +28.6$ ($c = 0.25$, C_5H_5N).
Aglycone: Bayogenin (=2β,3β,23-Trihydroxyolean-12-en-28-oic acid)		
543	Caryocaroside III-1 3β-*O* ← Glc[3] ← Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{42}H_{68}O_{15}$: 812.46. $[\alpha]^{20}_{D} = +24.9$ ($c = 1.0$, MeOH).

Table 1 (cont.)

544	Caryocaroside III-2 3β-*O* ← Glc^3 ← Gal; 28-*O* ← Glc	*Caryocar glabrum*, fruits [151]. White powder. $C_{48}H_{78}O_{20}$: 974.51. $[\alpha]_D^{20} = +28.8$ ($c = 1.0$, MeOH).
545	Caryocaroside III-3 3β-*O* ← Glc^3 ← Gal^3 ← Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{48}H_{78}O_{20}$: 974.51. $[\alpha]_D^{20} = +15.0$ ($c = 0.42$, MeOH).
546	Caryocaroside III-4 3β-*O* ← Glc^3 ← Gal^3 ← Xyl	*Caryocar glabrum*, fruits [151]. White powder. $C_{47}H_{76}O_{19}$: 944.50. $[\alpha]_D^{20} = +17.5$ ($c = 0.42$, MeOH).
547	Caryocaroside III-5 3β-*O* ← GlcA	*Caryocar glabrum*, fruits [151]. White powder. $C_{36}H_{56}O_{11}$: 664.38. $[\alpha]_D^{20} = +16.8$ ($c = 0.25$, MeOH).
548	Caryocaroside III-7 3β-*O* ← $GlcA^3$ ← Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{42}H_{66}O_{16}$: 826.44. $[\alpha]_D^{20} = +26.2$ ($c = 0.67$, MeOH).
549	Caryocaroside III-9 3β-*O* ← $GlcA^3$ ← Gal; 28-*O* ← Glc	*Caryocar glabrum*, fruits [151]. White powder. $C_{48}H_{76}O_{21}$: 988.49. $[\alpha]_D^{20} = +15.6$ ($c = 1.0$, MeOH).
550	Caryocaroside III-12 3β-*O* ← Glc^3 ← Gal^3 ← Xyl; 28-*O* ← Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{53}H_{86}O_{24}$: 1106.55. $[\alpha]_D^{22} = +23.7$ ($c = 0.59$, MeOH).
551	Caryocaroside III-13 3β-*O* ← Glc^3 ← Gal^3 ← Gal; 28-*O* ← Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{54}H_{88}O_{25}$: 1136.56. $[\alpha]_D^{22} = +23.0$ ($c = 0.5$, MeOH).
552	Caryocaroside III-14 3β-*O* ← Glc^3 ← Gal^3 ← Gal^3 ← Xyl; 28-*O* ← Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{59}H_{96}O_{29}$: 1268.60. $[\alpha]_D^{22} = +19.9$ ($c = 0.83$, MeOH).
553	Caryocaroside III-15 3β-*O* ← Glc^3 ← Gal^4 ← Gal^3 ← Gal^3 ← Xyl	*Caryocar villosum*, fruits [152]. White powder. $C_{59}H_{96}O_{29}$: 1268.60. $[\alpha]_D^{22} = +30.0$ ($c = 0.25$, MeOH).
554	Caryocaroside III-16 3β-*O* ← Glc^3 ← Gal^4 ← Gal^3 ← Gal^3 ← Xyl; 28-*O* ← Glc	*Caryocar villosum*, fruits [152]. White powder. $C_{65}H_{106}O_{34}$: 1430.66. $[\alpha]_D^{22} = +17.3$ ($c = 0.37$, MeOH).
555	Caryocaroside III-22 3β-*O* ← $GlcA^3$ ← Gal^3 ← Rha	*Caryocar villosum*, stem bark [187]. White powder. $C_{48}H_{76}O_{20}$: 972.49. $[\alpha]_D^{20} = +9.6$ ($c = 0.42$, MeOH).
556	Caryocaroside III-23 3β-*O* ← $GlcA^3$ ← Gal^3 ← Rha; 28-*O* ← Glc	*Caryocar villosum*, stem bark [187]. White powder. $C_{54}H_{86}O_{25}$: 1134.55. $[\alpha]_D^{20} = +16.0$ ($c = 0.5$, MeOH).

Table 1 (cont.)

557	Conyzasaponin A 3*β*-*O* ← Glc^{3} ← Xyl; 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Api(f)	*Conyza blinii* Levl. (Asteraceae), aerial parts [215]. White powder. $C_{62}H_{100}O_{30}$: 1324.63. M.p. 219–220°. $[\alpha]_D^{25} = -13.0$ ($c = 0.94$, MeOH).
558	Conyzasaponin B 3*β*-*O* ← Glc^{3} ← Xyl; 28-*O* ← Ara^{2} ← Rha^{3} ← Ara ^{4}↑ Xyl^{3} ← Api(f)	*Conyza blinii*, aerial parts [215]. White needles (MeOH). $C_{67}H_{108}O_{34}$: 1456.67. M.p. 233–234°. $[\alpha]_D^{25} = +6.0$ ($c = 0.63$, MeOH).
559	Conyzasaponin C 3*β*-*O* ← Glc^{3} ← Xyl; 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Rha ^{3}↑ Api(f)	*Conyza blinii*, aerial parts [215]. White needles (MeOH). $C_{68}H_{110}O_{34}$: 1470.69. M.p. 225–226°. $[\alpha]_D^{25} = -20.0$ ($c = 0.59$, MeOH).
560	Conyzasaponin G 3*β*-*O* ← Glc^{3} ← Xyl	*Conyza blinii*, aerial parts [215]. White powder. $C_{41}H_{66}O_{14}$: 782.45. M.p. 214–216°.
561	Conyzasaponin I 3*β*-*O* ← Glc^{3} ← Xyl; 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Rha	*Conyza blinii* Levl., aerial parts [216]. White solid. $C_{63}H_{102}O_{30}$: 1338.65. M.p. 240–242°. $[\alpha]_D^{23} = -26.7$ ($c = 1.14$, MeOH).
562	Conyzasaponin M 3*β*-*O* ← Glc^{3} ← Xyl; 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Api(f) ^{3}↑ Api(f)	*Conyza blinii*, aerial parts [216]. White needles (MeOH). $C_{67}H_{108}O_{34}$: 1456.67. M.p. 236–238°. $[\alpha]_D^{20} = -42.5$ ($c = 0.36$, MeOH).
563	Conyzasaponin N 3*β*-*O* ← Glc; 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Api(f) ^{3}↑ Api(f)	*Conyza blinii*, aerial parts [216]. White needles (MeOH). $C_{62}H_{100}O_{30}$: 1324.63. M.p. 231–233°. $[\alpha]_D^{20} = -42.3$ ($c = 0.36$, MeOH).
564	Conyzasaponin O 3*β*-*O* ← Glc^{3} ← Glc; 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Api(f) ^{3}↑ Api(f)	*Conyza blinii*, aerial parts [216]. White needles (MeOH). $C_{68}H_{110}O_{35}$: 1486.68. M.p. 245–247°. $[\alpha]_D^{20} = -38.6$ ($c = 0.17$, MeOH).

Table 1 (cont.)

565	Conyzasaponin P $3\beta\text{-}O \leftarrow \mathrm{Glc}^3 \leftarrow \mathrm{Xyl}$; $28\text{-}O \leftarrow \mathrm{Ara}^2 \leftarrow \mathrm{Rha}^4 \leftarrow \mathrm{Xyl}$ $^3\uparrow$ (at Rha) Api(f)	*Conyza blinii*, aerial parts [216]. White solid (MeOH). $C_{62}H_{100}O_{30}$: 1324.63. M.p. 243–245°. $[\alpha]^{20}_{D} = -30.4$ ($c = 0.51$, MeOH).
566	Conyzasaponin Q $3\beta\text{-}O \leftarrow \mathrm{Glc}^3 \leftarrow \mathrm{Xyl}$; $28\text{-}O \leftarrow \mathrm{Ara}^2 \leftarrow \mathrm{Rha}^4 \leftarrow \mathrm{Xyl}^3 \leftarrow \mathrm{Xyl}$ $^3\uparrow$ (at Rha) Api(f)	*Conyza blinii*, aerial parts [216]. White needles (MeOH). $C_{67}H_{108}O_{34}$: 1456.67. M.p. 242–244°. $[\alpha]^{20}_{D} = -34.2$ ($c = 1.26$, MeOH).
566	Conyzasaponin Q $3\beta\text{-}O \leftarrow \mathrm{Glc}^3 \leftarrow \mathrm{Xyl}$; $28\text{-}O \leftarrow \mathrm{Ara}^2 \leftarrow \mathrm{Rha}^4 \leftarrow \mathrm{Xyl}^3 \leftarrow \mathrm{Xyl}$ $^3\uparrow$ (at Rha) Api(f)	*Conyza blinii*, aerial parts [216]. White needles (MeOH). $C_{67}H_{108}O_{34}$: 1456.67. M.p. 242–244°. $[\alpha]^{20}_{D} = -34.2$ ($c = 1.26$, MeOH).
567	Bernardioside B_2 (Bellis saponin BS_6) $28\text{-}O \leftarrow \mathrm{Glc}^2 \leftarrow \mathrm{Rha}$ $^6\uparrow$ (at Glc) Glc	*Bellis bernardii*, whole plant [217]. White powder. $C_{48}H_{78}O_{19}$: 958.51. M.p. 170° (uncleared).
568	Bellidiastroside B_3 $3\beta\text{-}O \leftarrow \mathrm{Glc}$; $28\text{-}O \leftarrow \mathrm{Fuc}^2 \leftarrow \mathrm{Rha}$ $^3\uparrow$ (at Fuc) Ara(f)	*Aster bellidiastrum* (L.) SCOP. (Asteraceae), whole plant [218]. Crystals (MeOH). $C_{53}H_{86}O_{22}$: 1274.56. M.p. 223–225°. $[\alpha]^{22}_{D} = -22.8$ ($c = 0.42$, MeOH).
569	Bellidiastroside UD_2 $3\beta\text{-}O \leftarrow \mathrm{Xyl}$; $28\text{-}O \leftarrow \mathrm{Glc}^6 \leftarrow \mathrm{Glc}$	*Aster bellidiastrum*, whole plant [218]. Crystals (MeOH). $C_{47}H_{76}O_{19}$: 944.48. M.p. 208–212°.
570	Besysaponin U_{D2} $3\beta\text{-}O \leftarrow \mathrm{Glc}$; $28\text{-}O \leftarrow \mathrm{Glc}^2 \leftarrow \mathrm{Rha}$ $^3\uparrow$ (at Glc) Glc	*Bellis sylvestris* CYR. (Asteraceae), aerial parts [219]. White powder. $C_{54}H_{88}O_{24}$: 1120.57. M.p. 226–227°.
571	Polygalasaponin F $3\beta\text{-}O \leftarrow \mathrm{Glc}$; $28\text{-}O \leftarrow \mathrm{Glc}^2 \leftarrow \mathrm{Rha}^4 \leftarrow \mathrm{Xyl}$	*Polygala japonica*, aerial parts [220]. White amorphous solid. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]^{20}_{D} = +0.5$ ($c = 0.23$, MeOH).
572	Polygalasaponin G $28\text{-}O \leftarrow \mathrm{Glc}^2 \leftarrow \mathrm{Rha}^4 \leftarrow \mathrm{Xyl}$ $^3\uparrow$ (at Rha) Api(f)	*Polygala japonica*, aerial parts [220]. White amorphous solid. $C_{52}H_{84}O_{22}$: 1060.55. $[\alpha]^{20}_{D} = -7.6$ ($c = 0.075$, MeOH).

Table 1 (cont.)

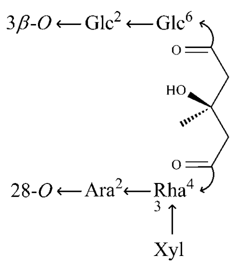
573	Polygalasaponin J 3*β*-*O* ← Glc; 28-*O* ← Glc^2 ← Rha^4 ← Xyl^4 ← Gal	*Polygala japonica*, aerial parts [220]. White amorphous solid. $C_{59}H_{96}O_{28}$: 1252.61. $[\alpha]_D^{20} = +3.2$ (MeOH).
574	Compound 4 3*β*-*O* ← GlcA^3 ← Rha; 28-*O* ← Glc	*Amaranthus cruentus*, seeds [153]. Amorphous solid. $C_{48}H_{76}O_{20}$: 972.49. $[\alpha]_D^{25} = 0$ (MeOH).
575	Compound 3 3*β*-*O* ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Pulsatilla patens* var. *multifida*, roots [137]. Amorphous powder. $C_{54}H_{88}O_{24}$: 1120.57. M.p. 228–232°. $[\alpha]_D^{20} = -0.82$ ($c = 0.12$, MeOH).
576	Saponin 9 3*β*-*O* ← GlcA; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{52}H_{82}O_{23}$: 1074.52. M.p. 230–233°. $[\alpha]_D^{25} = +7.0$ ($c = 0.04$, MeOH).
577	Tubeimoside V 	*Bolbostemma paniculatum* (Maxim.) Franquet (Cucurbitaceae), tuber [221]. Amorphous solid. $C_{64}H_{100}O_{30}$: 1348.63. M.p. 230° (dec.). $[\alpha]_D^{20} = +14.0$ ($c = 0.105$, MeOH).
Aglycone: (2β,3β,6β)-2,3,6,23-Tetrahydroxyolean-12-en-28-oic acid		
578	Madlongiside C 28-*O* ← Ara	*Madhuca longifolia*, seeds [222]. Colorless needles. $C_{35}H_{56}O_{10}$: 636.39. M.p. 196–198°. $[\alpha]_D^{25} = +32.0$ ($c = 1.2$, MeOH).
579	Madlongiside D 28-*O* ← Ara^2 ← Rha	*Madhuca longifolia*, seeds [222]. Colorless needles. $C_{41}H_{66}O_{14}$: 782.45. M.p. 230–232°. $[\alpha]_D^{25} = -12.9$ ($c = 1.8$, MeOH).
Aglycone: Entagenic acid (= (3β,15α,16α)-3,15,16-Trihydroxyolean-12-en-28-oic acid)		
580	Pursaethoside C 3*β*-*O* ← Glc*N*Ac^3 ← Xyl; ^{6}↑ Ara 28-*O* ← Glc^2 ← Api(f)	*Entada pursaetha*, seeds [122]. White powder. $C_{59}H_{95}NO_{27}$: 1249.61. $[\alpha]_D^{22} = -21.0$ ($c = 0.06$, MeOH).

Table 1 (cont.)

581	Pursaethoside D $3\beta\text{-}O \longleftarrow \text{Glc}N\text{Ac}^3 \longleftarrow \text{Xyl};$ $^6\uparrow$ Ara $28\text{-}O \longleftarrow \text{Glc}^2 \longleftarrow \text{Api(f)}$ $^4\uparrow$ Api(f)	*Entada pursaetha*, seeds [122]. White powder. $C_{64}H_{103}NO_{31}$: 1381.65. $[\alpha]_D^{22} = -33.3$ ($c = 0.07$, MeOH).
582	Pursaethoside E $3\beta\text{-}O \longleftarrow \text{Glc}N\text{Ac}^3 \longleftarrow \text{Xyl};$ $^6\uparrow$ Ara Glc $\downarrow$ $28\text{-}O \longleftarrow {}^4\text{Glc}^2 \longleftarrow \text{Api(f)}$ $^3\uparrow$ Api(f)	*Entada pursaetha*, seeds [122]. White powder. $C_{70}H_{113}O_{36}N$: 1543.70. $[\alpha]_D^{22} = -18.1$ ($c = 0.07$, MeOH).
Aglycone: Acacic acid (= (3β,16α,21β)-3,16,21-Trihydroxyolean-12-en-28-oic acid)		
583	Compound 3 $3\beta\text{-}O \longleftarrow \text{Glc}N\text{Ac}^4 \longleftarrow \text{Glc};$ $^6\uparrow$ $\text{Ara}^3 \longleftarrow \text{Xyl}$ Ac $\downarrow$ $28\text{-}O \longleftarrow {}^6\text{Glc}^2 \longleftarrow \text{Xyl}^3 \longleftarrow \text{Api(f)}$ $^4\uparrow$ $\text{Xyl}^3 \longleftarrow$ menthiafoloyl	*Entada africana* GUILL. and PERR. (Leguminosae), roots [169]. White solid. $C_{87}H_{137}NO_{43}$: 1883.86. $[\alpha]_D^{25} = -39.0$ ($c = 0.1$, MeOH).
584	Compound 7 $3\beta\text{-}O \longleftarrow \text{Glc}N\text{Ac}^4 \longleftarrow \text{Glc};$ $^6\uparrow$ $\text{Ara}^3 \longleftarrow \text{Xyl}$ Ac $\downarrow$ $28\text{-}O \longleftarrow {}^6\text{Glc}^2 \longleftarrow \text{Xyl}^3 \longleftarrow \text{Api(f)}$ $^4\uparrow$ Xyl	*Entada africana*, roots [169]. White solid. $C_{77}H_{123}NO_{41}$: 1717.76. $[\alpha]_D^{25} = -23.0$ ($c = 0.1$, MeOH).
Aglycone: (3β,16α,21β)-21-{[(2-Aminophenyl)carbonyl]oxy}-3,16-dihydroxyolean-12-en-28-oic acid		
585	Grandibracteoside A $3\beta\text{-}O \leftarrow \text{Glc}N\text{Ac}^6 \leftarrow \text{Fuc}^2 \leftarrow \text{Xyl};$ $28\text{-}O \leftarrow \text{Glc}^2 \leftarrow \text{Rha}^4 \leftarrow \text{Xyl}$	*Albizia grandibracteata* TAUB (Fabaceae), leaves [223]. Amorphous solid. $C_{73}H_{112}N_2O_{32}$: 1528.72. $[\alpha]_D^{23} = -20.7$ ($c = 0.1$, MeOH).

Table 1 (cont.)

586	Grandibracteoside B 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 28-*O* ⟵ Glc^2 ⟵ Rha^4 ⟵ Xyl ^{6}↑ Glc	*Albizia grandibracteata*, leaves [223]. Amorphous solid. $C_{79}H_{112}N_2O_{37}$: 1680.69. $[\alpha]^{23}_{D} = +27.2$ ($c = 0.1$, MeOH).
587	Grandibracteoside C 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia grandibracteata*, leaves [223]. Amorphous solid. $C_{79}H_{122}N_2O_{37}$: 1690.77. $[\alpha]^{23}_{D} = -19.8$ ($c = 0.1$, MeOH).
Aglycone: (3β,16α,21β)-3,16-Dihydroxy-21-{[(2-hydroxyphenyl)carbonyl]oxy}olean-12-en-28-oic acid		
588	Adianthifolioside A 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia adianthifolia* (Sch.) W. F. Wright (Mimosaceae), roots [224]. White powder. $C_{79}H_{121}NO_{38}$: 1691.76. $[\alpha]^{20}_{D} = -20.0$ ($c = 0.1$, MeOH).
589	Adianthifolioside B 3β-*O* ⟵ Glc^6 ⟵ Fuc^2 ⟵ Xyl; ^{2}↑ Glc 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia adianthifolia*, roots [224]. White solid. $C_{83}H_{128}O_{43}$: 1812.78. $[\alpha]^{20}_{D} = -20.0$ ($c = 0.1$, MeOH).
*Aglycone: 21-*O*-[(*E*)-Cinnamoyl]acacic acid (=(3β,16α,21β)-3,16-Dihydroxy-21-{[(2*E*)-3-phenylprop-2-enoyl]oxy}olean-12-en-28-oic acid)*		
590	Acacioside B 3β-*O* ← Glc*N*Ac^6 ← Ara^2 ← Xyl	*Acacia tenuifolia*, stem [158]. White solid. $C_{57}H_{83}NO_{19}$: 1085.56. M.p. 282° (dec.). $[\alpha]^{25}_{D} = +19.0$ ($c = 3.4$, MeOH).
591	Acacioside C 3β-*O* ← Glc*N*Ac^6 ← Ara^2 ← Ara	*Acacia tenuifolia*, stem [158]. White solid. $C_{57}H_{83}NO_{19}$: 1085.56. M.p. 278° (dec.). $[\alpha]^{25}_{D} = +14.8$ ($c = 3.4$, MeOH).

Table 1 (cont.)

*Aglycone: 21-*O*-(9-Hydroxymenthiafoloyl)acacic acid (=(3β,16α,21β)-3,16-Dihydroxy-21-{[(2*E*)-6-hydroxy-2-(hydroxymethyl)-6-methylocta-2,7-dienoyl]oxy}olean-12-en-28-oic acid)*		
592	Kinmoonoside C 3β-*O* ⟵ Glc^2⟵ Glc; ^{6}↑ Ara 28-*O* ⟵ Glc^2⟵ Rha^3⟵ Glc ^{4}↑ Ara(f)	*Acacia concinna*, fruits [225]. Colorless solid. $C_{80}H_{128}O_{40}$: 1728.80. $[\alpha]_D^{25} = +8.4$ ($c = 0.35$, MeOH).
*Aglycone: 21-*O*-Menthiafoloylacacic acid (=(3β,16α,21β)-3,16-dihydroxy-21-{[(2*E*)-6-hydroxy-2,6-dimethylocta-2,7-dienoyl]oxy}olean-12-en-28-oic acid)*		
593	Pithecelloside 3β-*O* ← Glc^6 ← Ara^2 ← Ara	*Pithecellobium dulce* (ROXB) BENTH., seeds [226]. White powder. $C_{56}H_{88}O_{20}$: 1080.59. $[\alpha]_D^{20} = +2.9$ ($c = 0.28$, MeOH).
594	Pitheduloside J 3β-*O* ⟵ Glc^2⟵ Glc; ^{6}↑ Ara^2⟵ Ara 28-*O* ⟵ Glc^2⟵ Rha^3⟵ Glc ^{4}↑ Ara(f)	*Pithecellobium dulce*, seeds [156]. Colorless needles. $C_{85}H_{136}O_{43}$: 1844.85. M.p. 199–201°. $[\alpha]_D^{25} = -28.0$ ($c = 2.2$, MeOH).
*Aglycone: 21-*O*-Acylacacic acid (=(3β,16α,21β)-21-(Acetyloxy)-3,16-dihydroxyolean-12-en-28-oic acid)*		
595	Adianthifolioside C 3β-*O* ⟵ Glc^6⟵ Fuc^2⟵ Ara(f); ^{2}↑ Glc 21β-*O* ⟵ menthiafoloyl(9'-OH) ^{6}↑ Qui ⟶ ^{6}menthiafoloyl ⟶ ^{4}Qui 28-*O* ⟵ Glc^2⟵ Rha^3⟵ Glc ^{4}↑ Ara(f)	*Albizia adianthifolia* (SCHUMACH) W. F. WRIGHT (Mimosaceae), roots [227]. White power. $C_{108}H_{172}O_{54}$: 2333.07. $[\alpha]_D^{25} = -30.0$ ($c = 0.1$, MeOH).
596	Adianthifolioside D 3β-*O* ⟵ Glc*N*Ac^6⟵ Fuc^2⟵ Xyl; 21β-*O* ⟵ menthiafoloyl(9'-OH) ^{6}↑ Qui ⟶ ^{6}menthiafoloyl ⟶ ^{4}Qui 28-*O* ⟵ Glc^2⟵ Rha^3⟵ Glc ^{4}↑ Ara(f)	*Albizia adianthifolia*, roots [227]. White power. $C_{104}H_{163}NO_{49}$: 2210.03. $[\alpha]_D^{25} = -40.0$ ($c = 0.1$, MeOH).

Table 1 (cont.)

597	Adianthifolioside E $3\beta\text{-}O \leftarrow \text{Glc}N\text{Ac}^{6} \leftarrow \text{Fuc}^{2} \leftarrow \text{Xyl}$; $21\beta\text{-}O \leftarrow \text{menthiafoloyl}^{6} \leftarrow \text{Qui}$ $^{4}\uparrow$ $\text{Qui} \longrightarrow {}^{6}\text{menthiafoloyl}$ $28\text{-}O \leftarrow \text{Glc}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Glc}$ $^{4}\uparrow$ Ara(f)	*Albizia adianthifolia*, roots [227]. White power. $C_{104}H_{163}NO_{48}$: 2194.03. $[\alpha]_D^{25} = -43.0$ ($c = 0.1$, MeOH).
598	Adianthifolioside F $3\beta\text{-}O \leftarrow \text{Glc}^{6} \leftarrow \text{Fuc}^{2} \leftarrow \text{Ara}$; $^{2}\uparrow$ Glc $21\beta\text{-}O \leftarrow \text{menthiafoloyl}^{6} \leftarrow \text{Qui}$; $28\text{-}O \leftarrow \text{Glc}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Glc}$ $^{4}\uparrow$ Ara(f)	*Albizia adianthifolia*, roots [227]. White power. $C_{92}H_{148}O_{47}$: 2004.92. $[\alpha]_D^{25} = -10.0$ ($c = 0.1$, MeOH).
599	Kinmoonoside A $3\beta\text{-}O \leftarrow \text{Glc}^{2} \leftarrow \text{Glc}$; $^{6}\uparrow$ Ara $21\beta\text{-}O \leftarrow$ menthiafoloyl(6'*R*,9'-OH) $^{6}\uparrow$ menthiafoloyl(9''-OH) $\longrightarrow {}^{4}\text{Qui}$ $28\text{-}O \leftarrow \text{Glc}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Glc}$ $^{4}\uparrow$ Ara(f)	*Acacia concinna* WALL (Leguminosae), fruits [225]. Amorphous solid. $C_{96}H_{152}O_{47}$: 2056.95. $[\alpha]_D^{25} = -14.4$ ($c = 0.44$, MeOH).
600	Kinmoonoside B $3\beta\text{-}O \leftarrow \text{Glc}^{2} \leftarrow \text{Glc}$; $^{6}\uparrow$ Ara $21\beta\text{-}O \leftarrow$ menthiafoloyl(6'*S*,9'-OH) $^{6}\uparrow$ menthiafoloyl(9''-OH) $\longrightarrow {}^{4}\text{Qui}$ $28\text{-}O \leftarrow \text{Glc}^{2} \leftarrow \text{Rha}^{3} \leftarrow \text{Glc}$ $^{4}\uparrow$ Ara(f)	*Acacia concinna*, fruits [225]. Amorphous solid. $C_{96}H_{152}O_{47}$: 2056.95. $[\alpha]_D^{25} = -38.5$ ($c = 0.66$, MeOH).

Table 1 (cont.)

601	Pitheduloside H 3β-*O* ⟵ Glc^2⟵ Glc; 6↑ Ara^2⟵ Ara 21β-*O*⟵menthiafoloyl^6⟵ Xyl 4↑ menthiafoloyl(6''*S*) 28-*O* ⟵ Glc^2 ⟵ Rha^3⟵ Glc 4↑ Ara(f)	*Pithecellobium dulce* Benth. (Leguminosae), seeds [156]. Colorless needles. $C_{100}H_{158}O_{49}$: 2142.99. M.p. 196–198°. $[\alpha]_D^{25} = -23.6$ (*c* = 3.1, MeOH).
602	Pitheduloside I 3β-*O* ⟵ Glc^2⟵ Glc; 6↑ Ara^2⟵ Ara 21β-*O* ⟵ menthiafoloyl(6'*S*) 6↑ menthiafoloyl(9''-OH)⟶^{4}Xyl 28-*O* ⟵ Glc^2 ⟵ Rha^3⟵ Glc 4↑ Ara(f)	*Pithecellobium dulce*, seeds [156]. Colorless needles. $C_{100}H_{158}O_{50}$: 2158.98. M.p. 222–224°. $[\alpha]_D^{25} = -16.2$ (*c* = 2.0, MeOH).
603	Gummiferaoside A 3β-*O* ⟵ Glc^2⟵ Glc; 6↑ Fuc^2⟵ Xyl 21β-*O* ⟵ menthiafoloyl^6⟵Qui 4↑ Qui ⟶ ^{6}menthiafoloyl 28-*O* ⟵ Glc^2 ⟵ Rha 4↑ Xyl	*Albizia gummifera* (J. F. Gmel.) C. A. Sm. var. *gummifera* (Fabaceae), roots [228]. Amorphous solid. $C_{102}H_{162}O_{48}$: 2155.02. M.p. 154° (dec.). $[\alpha]_D^{25} = -15.0$ (*c* = 0.32, MeOH).
604	Gummiferaoside B 3β-*O* ⟵ Glc^2⟵ Glc; 6↑ Fuc^2⟵ Ara 21β-*O* ⟵ menthiafoloyl^6⟵Qui 4↑ Qui ⟶ ^{6}menthiafoloyl 28-*O* ⟵ Glc^2 ⟵ Rha 4↑ Xyl	*Albizia gummifera*, roots [228]. White solid. $C_{102}H_{162}O_{48}$: 2155.02. $[\alpha]_D^{26} = -11.0$ (*c* = 0.18, MeOH).

Table 1 (cont.)

605	Gummiferaoside C 3*β*-*O* ⟵ Glc[2] ⟵ Glc; [6]↑ Fuc[2] ⟵ Ara 21*β*-*O* ⟵ menthiafoloyl[6] ⟵ Qui [4]↑ Qui ⟶ [6]menthiafoloyl [4]↑ menthiafoloyl[6] ⟵ Qui; 28-*O* ⟵ Glc[2] ⟵ Rha[4] ⟵ Xyl	*Albizia gummifera* (J. F. GMEL.) C. A. SM. var. *gummifera* (Fabaceae), roots [228]. White solid. $C_{113}H_{178}O_5$: 2347.67. $[\alpha]_D^{26} = -24.0$ ($c = 0.28$, MeOH).
606	Proceraoside A 3*β*-*O* ⟵ Glc[6] ⟵ Fuc[2] ⟵ Xyl; 21*β*-*O* ⟵ 2',6'-dihydromenthiafoloyl [6]↑ menthiafoloyl ⟶ [4]Qui 28-*O* ⟵ Glc[2] ⟵ Rha[3] ⟵ Glc [4]↑ Ara(f)	*Albizia procera* BENTH. (Leguminosae), seeds [229]. Colorless needles. $C_{96}H_{154}O_{44}$: 2011.05. M.p. 202–204°. $[\alpha]_D^{25} = -23.0$ ($c = 1.5$, MeOH).
607	Proceraoside B 3*β*-*O* ⟵ Glc[6] ⟵ Ara[2] ⟵ Xyl; 21*β*-*O* ⟵ 2',3'-dihydromenthiafoloyl [6]↑ menthiafoloyl(6''*S*) ⟶ [4]Qui 28-*O* ⟵ Glc[2] ⟵ Rha[3] ⟵ Glc [4]↑ Ara(f)	*Albizia procera*, seeds [229]. Colorless needles. $C_{95}H_{152}O_{44}$: 1996.97. M.p. 194–196°. $[\alpha]_D^{25} = -20.4$ ($c = 1.8$, MeOH).
608	Proceraoside C 3*β*-*O* ⟵ Glc[6] ⟵ Ara[2] ⟵ Xyl; 21*β*-*O* ⟵ 2',3'-dihydromenthiafoloyl [6]↑ menthiafoloyl(6''*R*) ⟶ [4]Qui 28-*O* ⟵ Glc[2] ⟵ Rha[3] ⟵ Glc [4]↑ Ara(f)	*Albizia procera*, seeds [229]. Colorless needles. $C_{95}H_{152}O_{44}$: 1996.97. M.p. 185–187°. $[\alpha]_D^{25} = -26.6$ ($c = 1.4$, MeOH).
609	Julibroside J_1 (Revised structure) 3*β*-*O* ⟵ Glc[6] ⟵ Ara[2] ⟵ Xyl; 21*β*-*O* ⟵ menthiafoloyl(9'-OH)[6] ⟵ Qui [4]↑ Qui ⟶ [6]menthiafoloyl(6''*R*) 28-*O* ⟵ Glc[2] ⟵ Rha[3] ⟵ Glc [4]↑ Ara(f)	*Albizia julibrissin* DURAZZ (Leguminosae), stem bark [230]. White powder. $C_{101}H_{160}O_{49}$: 2157.00. $[\alpha]_D^{17} = -30.1$ ($c = 0.073$, 70% MeOH).

Table 1 (cont.)

610	Julibroside J_5 3β-*O* ⟵ Glc^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O* ⟵ menthiafoloyl(9'-OH)^6 ⟵ Qui ^{4}↑ Qui ⟶^{6}menthiafoloyl(6''*R*) 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin* Durazz, stem bark [231]. White powder. $C_{102}H_{162}O_{49}$: 2171.02. $[\alpha]_D^{14} = -35.0$ ($c = 0.05$, 70% MeOH).
611	Julibroside J_8 3β-*O* ⟵ Glc^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O* ⟵ menthiafoloyl(9'-OH)^6 ⟵ Qui ^{4}↑ Qui ⟶^{6}menthiafoloyl(6''*S*) 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin*, stem bark [231]. White powder. $C_{102}H_{162}O_{49}$: 2171.02. $[\alpha]_D^{14} = -28.6$ ($c = 0.035$, 70% MeOH).
612	Julibroside J_9 3β-*O* ⟵ Glc^6 ⟵ Ara^2 ⟵ Xyl; 21β-*O* ⟵ menthiafoloyl(9'-OH)^6 ⟵ Qui ^{4}↑ Qui ⟶^{6}menthiafoloyl(6''*S*) 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin*, stem bark [230]. White powder. $C_{101}H_{160}O_{49}$: 2157.00. $[\alpha]_D^{17} = -31.6$ ($c = 0.11$, 70% MeOH).
613	Julibroside J_{12} 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O* ⟵ menthiafoloyl(9'-OH)^6 ⟵ Qui ^{4}↑ Qui ⟶^{6}menthiafoloyl(6''*R*) 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin*, stem bark [231]. White powder. $C_{104}H_{165}NO_{49}$: 2212.04. $[\alpha]_D^{14} = +7.7$ ($c = 0.078$, 70% MeOH).
614	Julibroside J_{13} 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O* ⟵ menthiafoloyl(9'-OH)^6 ⟵ Qui ^{4}↑ Qui ⟶^{6}menthiafoloyl(6''*S*) 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin*, stem bark [231]. White powder. $C_{104}H_{165}NO_{49}$: 2212.04. $[\alpha]_D^{14} = +23.8$ ($c = 0.11$, 70% MeOH).

Table 1 (cont.)

615	Julibroside J_{21} 3β-*O* ⟵ Glc^2 ⟵ Xyl; ^{6}↑ Ara 21β-*O*⟵menthiafoloyl(9'-OH)^6⟵Qui ^{4}↑ Xyl ⟶^{6}menthiafoloyl(6''*R*) 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin* DURAZZ, stem bark [232]. White powder. $C_{100}H_{158}O_{49}$: 2142.99. $[\alpha]_D^{25} = -28.0$ ($c = 0.25$, MeOH).
616	Julibroside J_{27} 3β-*O* ⟵ Glc^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O*⟵menthiafoloyl(6'*S*,9'-OH) ^{6}↑ menthiafoloyl(6''*S*,9''-OH)⟶^{4}Qui 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin*, stem bark [233]. White powder. $C_{96}H_{152}O_{46}$: 2040.95.
617	Julibroside J_{28} 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O*⟵menthiafoloyl^6⟵Qui ^{4}↑ Qui ⟶^{6}menthiafoloyl(6''*R*) 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin* DURAZZ, stem bark [234]. White powder. $C_{104}H_{165}NO_{48}$: 2196.04.
618	Julibroside J_{29} 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O*⟵menthiafoloyl(9'-OH)^6⟵Qui 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin* DURAZZ, stem bark [235]. White powder. $C_{88}H_{141}NO_{43}$: 1899.89.
619	Julibroside J_{30} 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O*⟵menthiafoloyl(9'-OH)^6⟵Xyl 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin*, stem bark [235]. White powder. $C_{87}H_{139}NO_{43}$: 1885.87.

Table 1 (cont.)

620	Julibroside J_{31} 3β-*O* ⟵ Glc^6 ⟵ Fuc^2 ⟵ Xyl; ^{2}↑ Glc 21β-*O* ⟵ menthiafoloyl(9'-OH)^6 ⟵ Qui 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin*, stem bark [235]. White powder. $C_{92}H_{148}O_{48}$: 2020.91.
621	Avicin D 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O* ⟵ menthiafoloyl(6'*S*,9'-OH) ^{6}↑ menthiafoloyl(9''-OH) ⟶ ^{4}Qui 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Acacia victoriae* BENTH (Leguminosae), seed pods [236]. Amorphous solid. $C_{98}H_{155}NO_{46}$: 2081.98. $[\alpha]_D^{25} = -30.0$ ($c = 0.4$, MeOH).
622	Avicin G 3β-*O* ⟵ Glc*N*Ac^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O* ⟵ menthiafoloyl(6'*S*,9'-OH) ^{6}↑ menthiafoloyl ⟶ ^{4}Qui 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Acacia victoriae*, seed pods [236]. Amorphous solid. $C_{98}H_{155}NO_{45}$: 2065.99. $[\alpha]_D^{25} = -26.9$ ($c = 0.4$, MeOH).

Aglycone: 21-Acyl-16-deoxyacacic acid (=(3β,21β)-21-(Acetyloxy)-3-hydroxyolean-12-en-28-oic acid)

623	Julibroside J_{26} 3β-*O* ⟵ Glc^6 ⟵ Ara^2 ⟵ Xyl; 21β-*O* ⟵ menthiafoloyl(6'*S*,9'-OH); ^{6}↑ Qui 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia julibrissin* DURAZZ (Leguminosae), stem bark [237]. White powder. $C_{85}H_{136}O_{42}$: 1828.85.
624	Proceraoside D 3β-*O* ⟵ Glc^6 ⟵ Fuc^2 ⟵ Xyl; 21β-*O* ⟵ 2'3'-dihydromenthiafoloyl(6'*S*); ^{6}↑ menthiafoloyl(6''*S*) ⟶ ^{4}Qui 28-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Glc ^{4}↑ Ara(f)	*Albizia procera*, seeds [229]. Colorless needles. $C_{96}H_{154}O_{43}$: 1994.99. M.p. 194–196°. $[\alpha]_D^{25} = -12.9$ ($c = 1.8$, MeOH).

Table 1 (cont.)

Aglycone: (2α,3α,19α)-2-(Acetyloxy)-3,19-dihydroxyolean-12-en-28-oic acid		
625	Rivaloside C 28-*O* ← Glc^6 ← Glc	*Galium rivale* (SIBTH. and SM.) GRISEB. (Rubiaceae), aerial parts [206]. Amorphous solid. $C_{44}H_{70}O_{16}$: 854.47. $[\alpha]_D = -3.6$ ($c = 0.2$, MeOH).
Aglycone: (2α,3α,19α)-2,3,19-Trihydroxyolean-12-en-28-oic acid		
626	Rivaloside D 28-*O* ← Glc^6 ← Glc	*Galium rivale*, aerial parts [206]. Amorphous solid. $C_{42}H_{68}O_{15}$: 812.46. $[\alpha]_D = -25.9$ ($c = 0.1$, MeOH).
Aglycone: (2α,3α,19α)-2,3,19,23-Tetrahydroxyolean-12-en-28-oic acid		
627	Saponin 1 28-*O* ← Gal	*Pteleopsis hylodendron* MILBDR. (Combretaceae), stem bark [238]. White solid. $C_{36}H_{58}O_{11}$: 666.40. $[\alpha]_D^{25} = +30.0$ ($c = 0.02$, MeOH).
Aglycone: Terminolic acid (=(2α,3β,6β)-2,3,6,23-Tetrahydroxyolean-12-en-28-oic acid)		
628	Beciumecine 1 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Rha (Rha ←³ Api(f))	*Becium grandiflorum* var. *obovatum* (Lamiaceae), root bark [239]. White amorphous powder. $C_{63}H_{102}O_{31}$: 1354.64. $[\alpha]_D^{19} = -31.8$ ($c = 1.7$, MeOH).
Aglycone: Protobassic acid (=(2β,3β,6β)-2,3,6,23-Tetrahydroxyolean-12-en-28-oic acid)		
629	Saponin 4 3*β*-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Rha (Rha ←³ Rha)	*Argania spinosa* (Sapotaceae), shell [240]. Amorphous solid. $C_{70}H_{114}O_{36}$: 1530.71. $[\alpha]_D^{25} = -11.3$ ($c = 0.05$, MeOH).
630	Compound 1 3*β*-*O* ← Glc^2 ← Ara; (Glc ←⁶ Glc) 28-*O* ← Glc	*Amaranthus caudatus* (Amaranthaceae), leaves [241]. $C_{53}H_{86}O_{25}$: 1122.55.
631	Compound 2 3*β*-*O* ← Glc^6 ← Glc; 28-*O* ← Glc	*Amaranthus caudatus*, leaves [241]. $C_{48}H_{78}O_{21}$: 990.50.
632	Saponin 2 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Rha (Xyl ←⁴ Xyl)	*Mimusops laurifolia*, leaves [242]. White powder. $C_{63}H_{102}O_{31}$: 1354.64. $[\alpha]_D^{21} = -35.2$ ($c = 0.25$, MeOH).

Table 1 (cont.)

633	Saponin 3 3β-*O* ⟵ Glc; 28-*O* ⟵ Xyl[2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Rha (Xyl[3] ←[4] Xyl)	*Mimusops laurifolia*, leaves [242]. White powder. $C_{63}H_{102}O_{31}$: 1354.64. $[\alpha]_D^{21} = -40.8$ ($c = 0.46$, MeOH).
634	Saponin 4 3β-*O* ⟵ Glc; 28-*O* ⟵ Xyl[2] ⟵ Rha[3] ⟵ Rha (Rha ←[4] Xyl[3] ⟵ Rha)	*Mimusops laurifolia*, leaves [242]. White powder. $C_{64}H_{104}O_{31}$: 1368.66. $[\alpha]_D^{21} = -44.6$ ($c = 0.44$, MeOH).
635	Saponin 11 3β-*O* ⟵ Glc[4] ⟵ Api(f); 28-*O* ⟵ Ara[2] ⟵ Rha[3] ⟵ Rha (Rha ←[4] Xyl[3] ⟵ Rha)	*Mimusops laurifolia*, leaves [242]. White powder. $C_{69}H_{112}O_{35}$: 1500.70. $[\alpha]_D^{21} = -59.8$ ($c = 0.14$, MeOH).
636	Saponin 12 3β-*O* ⟵ Glc[4] ⟵ Api(f); 28-*O* ⟵ Ara[2] ⟵ Rha (Rha ←[4] Xyl[3] ⟵ Rha)	*Mimusops laurifolia*, leaves [242]. White powder. $C_{63}H_{102}O_{31}$: 1354.79. $[\alpha]_D^{21} = -44.8$ ($c = 0.48$, MeOH).
637	Saponin 15 3β-*O* ⟵ Glc; 28-*O* ⟵ Xyl[2] ⟵ Rha (Rha ←[4] Xyl[3] ⟵ Rha)	*Mimusops laurifolia*, leaves [242]. White powder. $C_{58}H_{94}O_{27}$: 1222.60. $[\alpha]_D^{21} = -28.5$ ($c = 0.41$, MeOH).
Aglycone: 16α-Hydroxyprotobassic acid (=(2β,3β,6β,16α)-2,3,6,16,23-Pentahydroxyolean-12-en-28-oic acid)		
638	Elengin 3β-*O* ⟵ Glc[6] ⟵ Glc; 28-*O* ⟵ Ara[2] ⟵ Rha (Rha ←[4] Xyl[3] ⟵ Rha)	*Mimusops elengi* LINN (Sapotaceae) [243]. Amorphous powder. $C_{64}H_{104}O_{33}$: 1400.65. $[\alpha]_D^{25} = -40.0$ ($c = 0.60$, MeOH).
639	Saponin 3 3β-*O* ⟵ Glc[3] ⟵ Glc; 28-*O* ⟵ Ara[2] ⟵ Rha[3] ⟵ Rha (Rha ←[4] Xyl[3] ⟵ Rha)	*Argania spinosa* (L.) (Sapotaceae), shell [240]. Amorphous solid. $C_{70}H_{114}O_{37}$: 1546.70. $[\alpha]_D^{25} = -19.9$ ($c = 0.01$, MeOH).
640	Saponin 7 3β-*O* ← GlcA[3] ← Api(f) 28-*O* ← Ara[2] ← Rha[4] ← Xyl[3] ← Rha	*Mimusops laurifolia* (FORSSK.) FRIIS (Sapotaceae), seeds [244]. White powder. $C_{63}H_{100}O_{33}$: 1384.61. $[\alpha]_D^{21} = -50.8$ ($c = 0.25$, MeOH).

Table 1 (cont.)

641	Saponin 8 3β-*O* ← Glc^{3} ← Glc; 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Rha	*Mimusops laurifolia*, seeds [244]. White powder. $C_{64}H_{104}O_{33}$: 1400.65. $[\alpha]_{D}^{21} = -41.7$ ($c = 0.27$, MeOH).
642	Saponin 9 3β-*O* ← Glc^{6} ← Glc^{6} ← Glc; 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Rha	*Mimusops laurifolia*, seeds [244]. White powder. $C_{70}H_{114}O_{38}$: 1562.70. $[\alpha]_{D}^{21} = -45.0$ ($c = 0.4$, MeOH).
643	Saponin 1 3β-*O* ← Glc; 28-*O* ← Xyl^{2} ← Rha^{3} ← Rha ^{4}↑ Xyl^{3} ← Rha	*Mimusops laurifolia* (FORSSK.) FRIIS, leaves [242]. White powder. $C_{64}H_{104}O_{32}$: 1384.65. $[\alpha]_{D}^{21} = -42.3$ ($c = 0.44$, MeOH).
644	Saponin 5 3β-*O* ← Glc^{3} ← Api(f); 28-*O* ← Ara^{2} ← Rha^{3} ← Rha ^{4}↑ Xyl^{3} ← Rha	*Mimusops laurifolia*, leaves [242]. White powder. $C_{69}H_{112}O_{36}$: 1516.69. $[\alpha]_{D}^{21} = -61.7$ ($c = 0.34$, MeOH).
645	Saponin 6 3β-*O* ← Glc^{3} ← Api(f); 28-*O* ← Xyl^{2} ← Rha^{3} ← Rha ^{4}↑ Xyl^{3} ← Rha	*Mimusops laurifolia*, leaves [242]. White powder. $C_{69}H_{112}O_{36}$: 1516.69. $[\alpha]_{D}^{21} = -58.7$ ($c = 0.52$, MeOH).
646	Saponin 7 3β-*O* ← Glc^{3} ← Api(f); 28-*O* ← Xyl^{2} ← Rha ^{4}↑ Xyl → ^{4}Xyl^{3} ← Rha	*Mimusops laurifolia*, leaves [242]. White powder. $C_{68}H_{110}O_{36}$: 1502.68. $[\alpha]_{D}^{21} = -50.4$ ($c = 0.5$, MeOH).
647	Saponin 8 3β-*O* ← Glc^{4} ← Api(f); 28-*O* ← Ara^{2} ← Rha^{3} ← Rha ^{4}↑ Xyl^{3} ← Rha	*Mimusops laurifolia*, leaves [242]. White powder. $C_{69}H_{112}O_{36}$: 1516.69. $[\alpha]_{D}^{21} = -67.8$ ($c = 0.39$, MeOH).
648	Saponin 9 3β-*O* ← Glc^{4} ← Api(f); 28-*O* ← Ara^{2} ← Rha^{4} ← Xyl^{3} ← Rha	*Mimusops laurifolia*, leaves [242]. White powder. $C_{63}H_{102}O_{32}$: 1370.78. $[\alpha]_{D}^{21} = -52.7$ ($c = 0.26$, MeOH).
649	Saponin 10 3β-*O* ← Glc^{4} ← Api(f); 28-*O* ← Xyl^{2} ← Rha^{3} ← Rha ^{4}↑ Xyl^{3} ← Rha	*Mimusops laurifolia*, leaves [242]. White powder. $C_{69}H_{112}O_{36}$: 1516.69. $[\alpha]_{D}^{21} = -62.0$ ($c = 0.51$, MeOH).

Table 1 (cont.)

650	Saponin 13 $3\beta\text{-}O \longleftarrow \mathrm{Glc}^{4} \longleftarrow \mathrm{Api(f)};$ $\quad\quad\quad{}^{3}\uparrow$ $\quad\quad\quad\mathrm{Rha}$ $28\text{-}O \longleftarrow \mathrm{Ara}^{2} \longleftarrow \mathrm{Rha}^{3} \longleftarrow \mathrm{Rha}$ $\quad\quad\quad\quad\quad\quad{}^{4}\uparrow$ $\quad\quad\quad\quad\quad\quad\mathrm{Xyl}^{3} \longleftarrow \mathrm{Rha}$	*Mimusops laurifolia*, leaves [242]. White powder. $C_{75}H_{122}O_{40}$: 1662.75. $[\alpha]_D^{21} = -58.9$ ($c = 0.43$, MeOH).
651	Saponin 14 $3\beta\text{-}O \longleftarrow \mathrm{Glc}^{4} \longleftarrow \mathrm{Api(f)};$ $\quad\quad\quad{}^{3}\uparrow$ $\quad\quad\quad\mathrm{Rha}$ $28\text{-}O \longleftarrow \mathrm{Xyl}^{2} \longleftarrow \mathrm{Rha}^{3} \longleftarrow \mathrm{Rha}$ $\quad\quad\quad\quad\quad\quad{}^{4}\uparrow$ $\quad\quad\quad\quad\quad\quad\mathrm{Xyl}^{3} \longleftarrow \mathrm{Rha}$	*Mimusops laurifolia*, leaves [242]. White powder. $C_{75}H_{122}O_{40}$: 1662.75. $[\alpha]_D^{21} = -70.2$ ($c = 0.5$, MeOH).
652	Glycoside 3 $3\beta\text{-}O \leftarrow \mathrm{Glc}$; $28\text{-}O \leftarrow \mathrm{Rha}$	*Mussaenda macrophylla*, root bark [245]. White powder. $C_{42}H_{68}O_{16}$: 828.44. M.p. 238–242° (dec.). $[\alpha]_D = -5.2$ ($c = 0.1$, C_5H_5N).
Aglycone: 16α-Hydroxy-23-deoxyprotobassic acid (=(2β,3β,6β,16α)-2,3,6,16-Tetrahydroxyolean-12-en-28-oic acid)		
653	Glycoside 1 $3\beta\text{-}O \leftarrow \mathrm{Glc}$; $28\text{-}O \leftarrow \mathrm{Rha}$	*Mussaenda macrophylla* Wall (Rubiaceae), root bark [245]. White powder. $C_{42}H_{68}O_{15}$: 812.44. M.p. 233–235° (dec.). $[\alpha]_D = -8.0$ ($c = 0.1$, C_5H_5N).
654	Glycoside 2 $28\text{-}O \leftarrow \mathrm{Glc}$	*Mussaenda macrophylla*, root bark [245]. White powder. $C_{36}H_{58}O_{11}$: 666.40. M.p. 225–228° (dec.). $[\alpha]_D = -8.9$ ($c = 0.1$, C_5H_5N).
Aglycone: (2α,3β,6β,19α)-2,3,6,19,23-Pentahydroxyolean-12-en-28-oic acid		
655	Combreglucoside $28\text{-}O \leftarrow \mathrm{Glc}$	*Combretum nigricans* Lepr. Ex Guill et Perrot (Combretaceae), stem bark [246]. Amorphous solid. $C_{36}H_{58}O_{12}$: 682.39. M.p. 260°.
Aglycone: 24-Hydroxyterminolic acid (=(2α,3β,6β)-2,3,6,23,24-Pentahydroxyolean-12-en-28-oic acid)		
656	Beciumecine 2 $3\beta\text{-}O \leftarrow \mathrm{Glc}$; $28\text{-}O \leftarrow \mathrm{Ara}^{2} \leftarrow \mathrm{Rha}^{4} \leftarrow \mathrm{Xyl}^{3} \leftarrow \mathrm{Rha}$	*Becium grandiflorum* var. *obovatum* [239]. White amorphous powder. $C_{58}H_{94}O_{28}$: 1238.59. $[\alpha]_D^{20} = -28.3$ ($c = 1.2$, MeOH).

Table 1 (cont.)

Aglycone: Polygalacic acid (= 16α-Hydroxybayogenin; (2β,3β,16α)-2,3,16,23-Tetrahydroxyolean-12-en-28-oic acid)

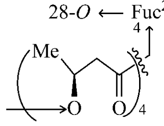
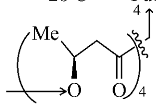
657	Bellisoside A 3*β*-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Rha (Fuc: 4 ↑ Ac; Rha: 2 ↑ Ac)	*Bellis perennis* L. (Compositae), roots [247]. Amorphous powder. $C_{63}H_{100}O_{29}$: 1320.63. $[\alpha]_D^{24} = -19.6$ ($c = 0.45$, MeOH).
658	Bellisoside B 3*β*-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Rha (Fuc: 4 ↑ Ac; Rha: 3 ↑ Ac)	*Bellis perennis* L., roots [247]. Amorphous powder. $C_{63}H_{100}O_{29}$: 1320.63. $[\alpha]_D^{24} = -22.1$ ($c = 0.51$, MeOH).
659	Bellisoside C 3*β*-*O* ← Rha; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Rha (Fuc: 4 ↑ (3*S*)-3-hydroxybutanoyl)	*Bellis perennis* L., roots [247]. Amorphous powder. $C_{63}H_{102}O_{28}$: 1306.66. $[\alpha]_D^{24} = -27.8$ ($c = 0.47$, MeOH).
660	Bellisoside D 3*β*-*O* ← Rha; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Rha (Fuc: 4 ↑ (3*S*)-3-acetoxybutanoyl)	*Bellis perennis* L., roots [247]. Amorphous powder. $C_{65}H_{104}O_{29}$: 1348.67. $[\alpha]_D^{24} = -39.0$ ($c = 0.44$, MeOH).
661	Bellisoside E 3*β*-*O* ← Rha; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Rha (Fuc: 4 ↑) 	*Bellis perennis* L., roots [247]. Amorphous powder. $C_{75}H_{120}O_{34}$: 1564.77. $[\alpha]_D^{24} = -32.0$ ($c = 0.85$, MeOH).
662	Bellisoside F 3*β*-*O* ← Rha; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Rha (Fuc: 4 ↑; Rha: 2 ↑ Ac) 	*Bellis perennis* L., roots [247]. Amorphous powder. $C_{77}H_{122}O_{35}$: 1606.78. $[\alpha]_D^{24} = -27.9$ ($c = 0.55$, MeOH).
663	Besysaponin U_{B1} 3*β*-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Rha (Fuc: 3 ↑ (*E*)-but-2-enoyl)	*Bellis sylvestris*, aerial parts [219]. White powder. $C_{63}H_{102}O_{28}$: 1306.66. M.p. 209°.
664	Platycoside D 3*β*-*O* ← Glc^6 ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Api(f)	*Platycodon grandiflorum* A. DC. (Campanulaceae), roots [248]. Amorphous powder. $C_{69}H_{112}O_{37}$: 1532.69. $[\alpha]_D^{24} = -17.9$ ($c = 0.16$, MeOH).

Table 1 (cont.)

665	Platycoside G$_3$ 3β-*O* ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Api(f)	*Platycodon grandiflorum* (JACK.) A. DC., roots (Campanulaceae) [249]. White amorphous powder. $C_{63}H_{102}O_{32}$: 1370.64. $[\alpha]_D^{20} = -108.0$ ($c = 0.3$, MeOH).
666	Platycoside H 3β-*O* ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Platycodon grandiflorum* A. DC. (Campanulaceae), roots [250] [251]. White amorphous powder. $C_{58}H_{94}O_{28}$: 1238.59.
667	Platycoside I 3β-*O* ← Glc^6 ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Platycodon grandiflorum*, roots [250][251]. White amorphous powder. $C_{64}H_{104}O_{33}$: 1400.64.
668	Platycoside J 3β-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Platycodon grandiflorum*, roots [250][251]. White amorphous powder. $C_{52}H_{84}O_{23}$: 1076.54.
669	Conyzasaponin D 3β-*O* ← Glc^3 ← Xyl; 28-*O* ← Ara^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl^3 ← Api(f)^2 ← Gal	*Conyza blinii* LEVL. (Asteraceae), aerial parts [252]. White amorphous solid. $C_{73}H_{118}O_{40}$: 1634.72. M.p. 220 – 221°. $[\alpha]_D^{20} = -47.0$ ($c = 0.35$, MeOH).
670	Conyzasaponin E 3β-*O* ← Glc^3 ← Xyl; 28-*O* ← Ara^2 ← Rha^3 ← Ara ^{4}↑ Xyl^3 ← Api(f)^2 ← Gal	*Conyza blinii* LEVL., aerial parts [252]. White amorphous solid. $C_{73}H_{118}O_{40}$: 1634.72. M.p. 238–239°. $[\alpha]_D^{20} = -33.0$ ($c = 0.34$, MeOH).
671	Conyzasaponin F 3β-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl^3 ← Api(f)^2 ← Gal	*Conyza blinii* LEVL., aerial parts [252]. White amorphous solid. $C_{68}H_{110}O_{36}$: 1502.68. M.p. 215–216°. $[\alpha]_D^{20} = -44.0$ ($c = 0.52$, MeOH).
672	Conyzasaponin H 3β-*O* ← Glc^3 ← Xyl; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Api(f)^2 ← Gal	*Conyza blinii* LEVL., aerial parts [252]. White amorphous solid. $C_{68}H_{110}O_{36}$: 1502.68. M.p. 230–232°. $[\alpha]_D^{20} = -36.0$ ($c = 0.37$, MeOH).
673	Conyzasaponin J 3β-*O* ← Glc^3 ← Xyl; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Rha	*Conyza blinii*, aerial parts [216]. White solid. $C_{63}H_{102}O_{31}$: 1354.64. M.p. 236–238°. $[\alpha]_D^{20} = -41.4$ ($c = 0.86$, MeOH).

Table 1 (cont.)

674	Conyzasaponin K 3*β*-*O* ← Glc^3 ← Xyl; 28-*O* ← Ara^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl^3 ← Rha	*Conyza blinii*, aerial parts [216]. White solid. $C_{68}H_{110}O_{35}$: 1486.68. M.p. 237–239°. $[\alpha]^{20}_{D} = -56.5$ ($c = 0.76$, MeOH).
675	Conyzasaponin L 3*β*-*O* ← Glc^3 ← Xyl; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Rha^2 ← Gal	*Conyza blinii*, aerial parts [216]. White solid. $C_{69}H_{112}O_{36}$: 1516.69. M.p. 236–238°. $[\alpha]^{20}_{D} = -33.6$ ($c = 1.08$, MeOH).
676	Durantanin I 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Api(f)^3 ← Rha	*Duranta repens* LINN (Verbena-ceae), leaves [253]. White powder. $C_{58}H_{94}O_{27}$: 1222.60. M.p. 216–220°. $[\alpha]^{22}_{D} = -57.4$ ($c = 1.21$, MeOH).
677	Durantanin II 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Rha ^{3}↑ Api(f)	*Duranta repens*, leaves [253]. White powder. $C_{63}H_{102}O_{31}$: 1354.64. M.p. 225–227°. $[\alpha]^{22}_{D} = -62.8$ ($c = 1.22$, MeOH).
678	Durantanin III 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Rha	*Duranta repens*, leaves [253]. White powder. $C_{58}H_{94}O_{27}$: 1222.60. M.p. 223–225°. $[\alpha]^{22}_{D} = -45.6$ ($c = 1.37$, MeOH).

Aglycone: 16α,24-Dihydroxybayogenin (=24-Hydroxypolygalacic acid; Platycodigenin; (2β,3β,16α)-2,3,16,23,24-Pentahydroxyolean-12-en-28-oic acid)

679	Platycoside A 3*β*-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Platycodon grandiflorum* A. DC. (Campanulaceae), roots [254]. Amorphous powder. $C_{58}H_{94}O_{29}$: 1254.59. $[\alpha]^{24}_{D} = -20.0$ ($c = 0.1$, MeOH).
680	Platycoside B 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl ^{2}↑ Ac	*Platycodon grandiflorum* A. DC., roots [254]. Amorphous powder. $C_{54}H_{86}O_{25}$: 1134.55. $[\alpha]^{23}_{D} = -23.0$ ($c = 0.1$, MeOH).
681	Platycoside C 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl ^{3}↑ Ac	*Platycodon grandiflorum* A. DC., roots [254]. Amorphous powder. $C_{54}H_{86}O_{25}$: 1134.55. $[\alpha]^{26}_{D} = -22.9$ ($c = 0.07$, MeOH).

Table 1 (cont.)

682	Platycoside E 3*β*-*O* ← Glc^6 ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Api(f)	*Platycodon grandiflorum*, roots [248]. Amorphous powder. $C_{69}H_{112}O_{38}$: 1548.68. $[\alpha]_D^{26} = -26.9$ ($c = 0.20$, MeOH).
683	Platycoside F 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha	*Platycodon grandiflorum*, roots [255]. Amorphous powder. $C_{47}H_{76}O_{20}$: 960.49. $[\alpha]_D^{24} = -32.6$ ($c = 1.0$, MeOH).
684	Platycoside G_1 3*β*-*O* ← Glc^6 ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Platycodon grandiflorum* (JACQ.) A. DC., roots [249]. White amorphous powder. $C_{64}H_{104}O_{34}$: 1416.64. $[\alpha]_D^{20} = -11.2$ ($c = 0.3$, MeOH).
685	Platycoside G_2 3*β*-*O* ← Glc^6 ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha	*Platycodon grandiflorum* (JACQ.) A. DC., roots [249]. White amorphous powder. $C_{59}H_{96}O_{30}$: 1284.60. $[\alpha]_D^{20} = -50.6$ ($c = 0.2$, MeOH).
686	Platycoside K 3*β*-*O* ← Glc^3 ← Glc	*Platycodon grandiflorum*, roots [250][251]. White powder. $C_{42}H_{68}O_{17}$: 844.44.
687	Platycoside L 3*β*-*O* ← Glc^6 ← Glc	*Platycodon grandiflorum*, roots [250][251]. White powder. $C_{42}H_{68}O_{17}$: 844.45.
688	Deapioplatycoside E 3*β*-*O* ← Glc^6 ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Platycodon grandiflorum* A. DC., roots [256]. Amorphous powder. $C_{64}H_{104}O_{34}$: 1416.64. $[\alpha]_D^{20} = -22.0$ ($c = 0.1$, EtOH).
Aglycone: (3β,20α)-3,20,24-Trihydroxy-29-norolean-12-en-28-oic acid		
689	Eupteleasaponin VIII 24-*O* ← Glc	*Euptelea polyandra* SIEB et ZUCE, leaves [126]. Colorless crystals ($CHCl_3$–MeOH). $C_{35}H_{56}O_{10}$: 636.39. M.p. 199–201°. $[\alpha]_D^{26} = +73.9$ ($c = 0.1$, MeOH).
690	Eupteleasaponin IX 24-*O* ⟵ Glc^4 ⟵ Rha ^{6}↑ Ac	*Euptelea polyandra*, leaves [126]. Colorless crystals ($CHCl_3$–MeOH). $C_{43}H_{68}O_{15}$: 824.46. M.p. 221–225°. $[\alpha]_D^{26} = +34.9$ ($c = 0.1$, MeOH).

Table 1 (cont.)

Aglycone: (2α,3β)-2,23-Dihydroxy-3-sulfoxyolean-12-en-28-oic acid		
691	Compound 11 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Akebia trifoliata* (THUNB) KOIDZ (Lardizabalaceae), stem [120]. Amorphous solid. $C_{48}H_{78}O_{22}SNa$: 1061.47. $[\alpha]_D^{27} = -8.0$ ($c = 0.10$, MeOH).
692	Compound 12 28-*O* ← Glc^6 ← Glc	*Akebia trifoliata* KOIDZ, stem [120]. Amorphous solid. $C_{42}H_{68}O_{18}SNa$: 915.41. $[\alpha]_D^{27} = +14.0$ ($c = 0.10$, MeOH).
*Aglycone: 21-*O*-Acyl-2β,23-dihydroxyacacic acid (=(2β,3β,16α,21β)-21-(Acetyloxy)-2,3,16,23-tetrahydroxyolean-12-en-28-oic acid)*		
693	Saponin GC-1 3β-*O* ⟵ Rha; 21β-*O*⟵menthiafoloyl(6′*S*)^6⟵Ara (Ara ←^{4} menthiafoloyl(6″*S*)); 28-*O* ⟵ Glc^2 ⟵ Rha^4 ⟵ Xyl^3 ⟵ Xyl (Glc ←^{6} Rha)	*Gymnocladus chinensis* BAILLON (Leguminosae), fruits [257]. White crystals. $C_{88}H_{138}O_{40}$: 1834.88.
Aglycone: (2β,3β,6β)-2,3,6,28-Tetrahydroxyolean-12-en-23-oic acid		
694	Gamboukokoenside A 23-*O* ← Ara	*Gambeya boukokoensis* AUBR. et PELLEGR. (Sapotacese), stem bark [258]. White crystals. $C_{35}H_{56}O_{11}$: 652.38. M.p. > 300°.
Aglycone: (6β)-6,28-Dihydroxy-3-oxoolean-12-en-23-oic acid		
695	Gamboukokoenside B 23-*O* ← Ara	*Gambeya boukokoensis*, stem bark [258]. White crystals. $C_{35}H_{54}O_{10}$: 634.37. M.p. > 300°.
Aglycone: Gypsogenin (=(3β)-3-Hydroxy-23-oxoolean-12-en-28-oic acid)		
696	Saponin 2 3β-*O* ← Ara^2 ← Xyl	*Akebiae quinata* (THUNB) DECNE (Lardizabalaceae), fruits [259]. White amorphous powder. $C_{40}H_{62}O_{12}$: 734.42. M.p. 207°. $[\alpha]_D^{20} = +40.7$ ($c = 1.8$, MeOH).
697	Saponin 3 3β-*O* ← Ara^2 ← Rha	*Akebiae quinata*, fruits [259]. White amorphous powder. $C_{41}H_{64}O_{12}$: 748.44. M.p. 207°. $[\alpha]_D^{20} = +19.4$ ($c = 1.20$, MeOH).

Table 1 (cont.)

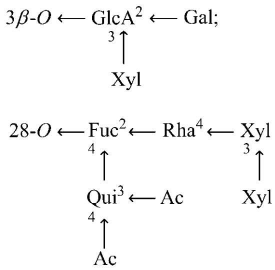
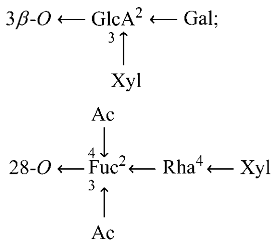
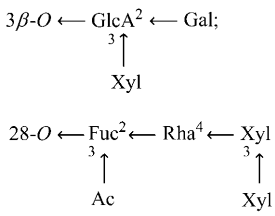
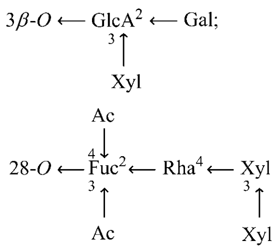
698	Saponin 9 3*β*-*O* ← Ara[2] ← Xyl; 28-*O* ← Glc[6] ← Glc	*Akebiae quinata*, fruits [259]. White amorphous powder. $C_{52}H_{82}O_{22}$: 1058.53. M.p. 195°. $[\alpha]_D^{20} = +13.3$ ($c = 1.5$, MeOH).
699	Saponin of gypsogenin 3*β*-*O* ← GlcA[2] ← Gal[3] ← Xyl	*Silene cucubalus* (Caryophyllaceae), roots [260]. $C_{47}H_{72}O_{19}$: 940.47.
700	Silenorubicoside A 	*Silene rubicunda* FRANCH. (Caryophyllaceae), roots [261]. White solid. $C_{79}H_{122}O_{41}$: 1726.80. M.p. 205–207°. $[\alpha]_D^{22} = -6.3$ ($c = 0.83$, MeOH).
701	Silenorubicoside C 	*Silene rubicunda*, roots [261]. White solid. $C_{68}H_{104}O_{33}$: 1448.65. M.p. 205–207°. $[\alpha]_D^{22} = +7.1$ ($c = 0.96$, MeOH).
702	Silenoside A 3*β*-*O* ← GlcA[2] ← Gal; 28-*O* ← Fuc[2] ← Rha[4] ← Xyl[3] ← Xyl	*Silene vulgaris* (MOENCH) GARCKE syn. *S. inflata* SM. (Caryophyllaceae), roots [262]. Light yellow powder. $C_{64}H_{100}O_{31}$: 1364.62.
703	Glanduloside B 	*Acanthophyllum glandulosum* (Caryophyllaceae), roots [263]. White powder. $C_{72}H_{114}O_{35}$: 1538.71. $[\alpha]_D^{20} = +5.0$ ($c = 0.10$, MeOH).
704	Glanduloside C 	*Acanthophyllum glandulosum*, roots [263]. White powder. $C_{73}H_{112}O_{37}$: 1580.69. $[\alpha]_D^{20} = +13.0$ ($c = 0.10$, MeOH).

Table 1 (cont.)

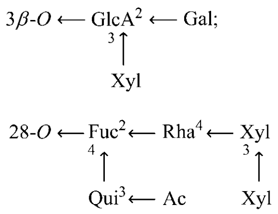
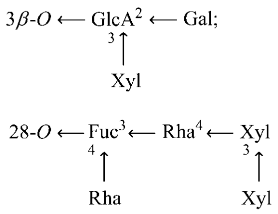
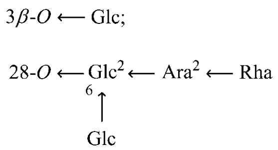
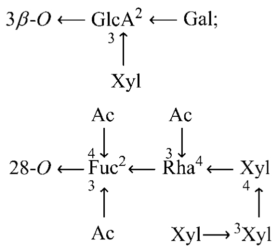
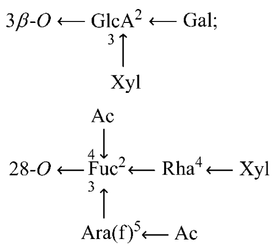
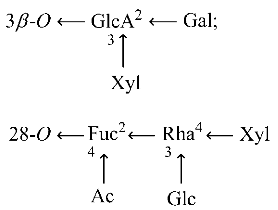
705	Glanduloside D 	*Acanthophyllum glandulosum*, roots [263]. White powder. $C_{77}H_{120}O_{40}$: 1684.74. $[\alpha]_D^{20} = +13.0$ ($c = 0.10$, MeOH).
706	Saponin 1 	*Acanthophyllum squarrosum* Boiss., roots [264]. White powder. $C_{75}H_{118}O_{39}$: 1642.72. $[\alpha]_D^{20} = -12.0$ ($c = 0.1$, MeOH).
707	Saponin 2 	*Acanthophyllum squarrosum*, roots [264]. White powder. $C_{59}H_{94}O_{27}$: 1234.60. $[\alpha]_D^{20} = +3.0$ ($c = 0.1$, MeOH).
708	Compound 1 	*Acanthophyllum squarrosum* Boiss., roots [265]. White powder. $C_{75}H_{100}O_{47}$: 1752.54. $[\alpha]_D^{20} = +4.0$ ($c = 0.10$, MeOH).
709	Compound 2 	*Acanthophyllum squarrosum*, roots [265]. White powder. $C_{72}H_{108}O_{38}$: 1580.65. $[\alpha]_D^{20} = -20.0$ ($c = 0.10$, MeOH).
710	Saponin 1 	*Agrostemma githago* var. *githago* L., seeds [266]. $C_{72}H_{112}O_{37}$: 1568.69.

Table 1 (cont.)

711	Saponin 2 $3\beta\text{-}O \longleftarrow \mathrm{GlcA}^{2} \longleftarrow \mathrm{Gal}$; $\quad ^{3}\uparrow$ Xyl (on GlcA) $28\text{-}O \longleftarrow \mathrm{Fuc}^{2} \longleftarrow \mathrm{Rha}^{4} \longleftarrow \mathrm{Xyl}$ $^{4}\uparrow$ Ac (on Fuc); $^{3}\uparrow$ Glc (on Rha); $^{3}\uparrow$ Xyl (on Xyl)	*Agrostemma githago* var. *githago* L., seeds [266]. $C_{77}H_{120}O_{41}$: 1700.73.
712	Snatzkein F Ac $^{4}\downarrow$ (on Fuc) $28\text{-}O \longleftarrow \mathrm{Fuc}^{2} \longleftarrow \mathrm{Rha}^{4} \longleftarrow \mathrm{Xyl}$ $^{3}\uparrow$ Ara(f) (on Fuc)	*Arenaria filicaulis* (BOISS) (Caryophyllaceae), rhizomes [267]. Amorphous solid. $C_{54}H_{84}O_{21}$: 1068.55. M.p. 275–277°. $[\alpha]_D = +2.7$ ($c = 0.65$, MeOH).
713	Junceoside A $3\beta\text{-}O \longleftarrow \mathrm{GlcA}^{2} \longleftarrow \mathrm{Ara}$; $^{3}\uparrow$ Gal (on GlcA) $28\text{-}O \longleftarrow \mathrm{Fuc}^{2} \longleftarrow \mathrm{Rha}^{4} \longleftarrow \mathrm{Xyl}$ $^{3}\uparrow$ Glc (on Rha)	*Arenaria juncea* M. BIEB. (Caryophyllaceae), roots [268]. Amorphous powder. $C_{70}H_{110}O_{36}$: 1526.68. $[\alpha]_D^{20} = -6.0$ ($c = 0.1$, MeOH).
714	Junceoside B $3\beta\text{-}O \longleftarrow \mathrm{GlcA}^{2} \longleftarrow \mathrm{Ara}$; $^{3}\uparrow$ Gal (on GlcA) $28\text{-}O \longleftarrow \mathrm{Fuc}^{2} \longleftarrow \mathrm{Rha}^{4} \longleftarrow \mathrm{Xyl}^{3} \longleftarrow \mathrm{Xyl}$	*Arenaria juncea*, roots [268]. White powder. $C_{69}H_{108}O_{35}$: 1496.67. $[\alpha]_D^{20} = +5.0$ ($c = 0.1$, MeOH).
715	Junceoside C $3\beta\text{-}O \longleftarrow \mathrm{GlcA}^{2} \longleftarrow \mathrm{Gal}$; $^{3}\uparrow$ Xyl (on GlcA) $28\text{-}O \longleftarrow \mathrm{Fuc}^{2} \longleftarrow \mathrm{Rha}^{4} \longleftarrow \mathrm{Xyl}$	*Arenaria juncea*, roots [268]. White powder. $C_{64}H_{100}O_{31}$: 1364.62. $[\alpha]_D^{20} = +13.0$ ($c = 0.1$, MeOH).
716	Saponin 1 $3\beta\text{-}O \longleftarrow \mathrm{GlcA}^{3} \longleftarrow \mathrm{Gal}$; $28\text{-}O \longleftarrow \mathrm{Ara}^{2} \longleftarrow \mathrm{Rha}^{4} \longleftarrow \mathrm{Xyl}$ $^{3}\uparrow$ Fuc (on Ara); $^{3}\uparrow$ Glc (on Rha)	*Spergularia ramosa*, aerial parts (Caryophyllaceae), [269]. $C_{70}H_{110}O_{36}$: 1526.68. $[\alpha]_D^{25} = +16.5$ ($c = 1.0$, MeOH).
717	Saponin 3 $3\beta\text{-}O \longleftarrow \mathrm{GlcA}^{3} \longleftarrow \mathrm{Glc}$; $28\text{-}O \longleftarrow \mathrm{Ara}^{2} \longleftarrow \mathrm{Rha}^{4} \longleftarrow \mathrm{Xyl}$ $^{3}\uparrow$ Fuc (on Ara); $^{3}\uparrow$ Gal (on Rha)	*Spergularia ramosa*, aerial parts [269]. $C_{70}H_{110}O_{36}$: 1526.68. $[\alpha]_D^{25} = +12.4$ ($c = 1.0$, MeOH).

Table 1 (cont.)

718	Saponin 5 3β-*O* ⟵ Glc^{3}⟵ Gal; 28-*O* ⟵ Ara^{2}⟵ Rha^{4}⟵ Xyl ^{3}↑ ^{3}↑ Fuc Glc	*Spergularia ramosa*, aerial parts [269]. $C_{70}H_{112}O_{35}$: 1512.70. $[\alpha]_D^{25} = +8.5$ ($c = 1.0$, MeOH).
719	Repensoside F 3β-*O* ⟵ GlcA^{2} ⟵ Gal; ^{3}↑ Xyl Ac ^{3}↓ 28-*O* ⟵ Fuc^{2}⟵ Rha^{4}⟵ Xyl ^{4}↑ ^{3}↑ Ac Ara	*Gypsophilla repens* L. (Caryophyllaceae), roots [270]. Colorless amorphous powder. $C_{73}H_{112}O_{37}$: 1580.69.
720	Saponin 1 (= Arginin ester of saponin G4) 3β-*O* ⟵ GlcA^{2} ⟵ Gal; ^{3}↑ Xyl 28-*O* ⟵ Fuc^{2}⟵ Rha^{4}⟵ Xyl ^{3}↑ Glc^{3}⟵ Arginin	*Gypsophila trichotoma* WEND. (Caryophyllaceae), roots [271]. White amorphous powder. Isolated as a mixture with saponin 2. $C_{76}H_{122}N_4O_{37}$: 1682.78.
721	Saponin 2 3β-*O* ⟵ GlcA^{2} ⟵ Gal; ^{3}↑ Ara 28-*O* ⟵ Fuc^{2}⟵ Rha^{4}⟵ Xyl ^{3}↑ Glc^{3}⟵ Arginin	*Gypsophila trichotoma* WEND., roots [271]. White amorphous powder. Isolated as a mixture with saponin 1. $C_{76}H_{122}N_4O_{37}$: 1682.78.
722	Segetoside B 3β-*O*⟵ GlcA (Me ester)^{2}⟵ Gal; Ac ^{4}↓ 28-*O* ⟵ Fuc^{2}⟵ Rha^{4}⟵ Xyl ^{3}↑ Ara(f)^{5} ⟵ Ac	*Vaccaria segetalis* (NECK) GARCKE (Caryophyllaceae), seeds [272]. Amorphous solid. $C_{69}H_{106}O_{33}$: 1462.66. $[\alpha]_D^{24} = -8.7$ ($c = 0.52$, MeOH).
723	Segetoside F 3β-*O*⟵ GlcA (Me ester)^{2}⟵ Gal; Ac ^{4}↓ 28-*O* ⟵ Fuc^{2}⟵ Rha^{4}⟵ Xyl ^{3}↑ Ara(f)	*Vaccaria segetalis* (NECK) GARCKE, seeds [273]. Amorphous solid. $C_{67}H_{104}O_{32}$: 1420.65.

Table 1 (cont.)

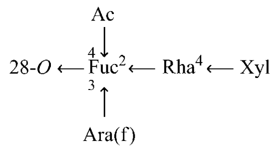
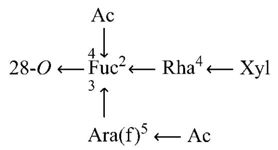
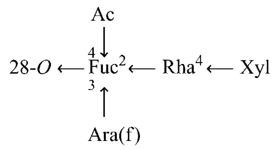
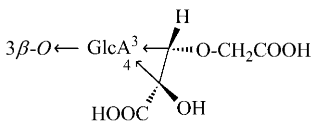
724	Segetoside G 3β-*O*⟵ GlcA (Bu ester)[2] ⟵ Gal; 	*Vaccaria segetalis*, seeds [274]. Amorphous solid. $C_{70}H_{110}O_{32}$: 1462.70. $[\alpha]_D^{24} = -6.4$ ($c = 0.36$, MeOH).
725	Segetoside H 3β-*O*⟵ GlcA[2] ⟵ Gal; 	*Vaccaria segetalis*, seeds [274]. Amorphous solid. $C_{68}H_{104}O_{33}$: 1448.65. $[\alpha]_D^{24} = -36.7$ ($c = 0.14$, MeOH).
726	Vaccaroside G 3β-*O*⟵ GlcA[2] ⟵ Gal; 	*Vaccaria segetalis*, seeds [149]. Amorphous solid. $C_{66}H_{102}O_{32}$: 1406.63. M.p. 159° (dec.). $[\alpha]_D^{24} = -9.5$ ($c = 1.77$, MeOH).
727	Basellasaponin B  28-*O* ⟵ Glc	*Basella rubra*, aerial parts [205]. Colorless crystals (MeOH–H_2O). $C_{47}H_{68}O_{21}$: 968.43. M.p. 226–228°. $[\alpha]_D^{26} = +57.4$ ($c = 0.1$, MeOH).
728	Clematibetoside B 3β-*O* ← Ara[2] ← Rha; 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Clematis tibetana*, aerial parts [195]. White powder. $C_{59}H_{94}O_{26}$: 1218.60. $[\alpha]_D^{28} = -13.0$ ($c = 0.51$, MeOH).
729	Nipponoside C 3β-*O* ← Glc; 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Acanthopanax nipponicus*, leaves [138]. White powder. $C_{54}H_{86}O_{23}$: 1102.56. $[\alpha]_D^{25} = -7.0$ ($c = 0.5$, MeOH).
Aglycone: 2β-Hydroxygypsogenin (=(2β,3β)-2,3-Dihydroxy-23-oxoolean-12-en-28-oic acid)		
730	Oleragenoside 3β-*O* ← GlcA; 28-*O* ← Glc	*Spinacia oleracea* L. (Chenopodiaceae) [275]. White powder. $C_{42}H_{64}O_{16}$: 824.42.
731	Compound 5 3β-*O* ← GlcA[3] ← Rha; 28-*O* ← Glc	*Amaranthus cruentus*, seeds [153]. Amorphous solid. $C_{48}H_{74}O_{20}$: 970.48. $[\alpha]_D^{25} = 0$ (MeOH).

Table 1 (cont.)

732	Saponin 10 3β-*O* ← GlcA; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{52}H_{80}O_{23}$: 1072.51. M.p. 226–228°. $[\alpha]^{25}_{D} = +17.9$ ($c = 0.03$, MeOH).
Aglycone: Quillaic acid (=(3β,16α)-3,16-Dihydroxy-23-oxoolean-12-en-28-oic acid)		
733	Saponin 1 3β-*O* ← GlcA^2 ← Gal	*Quillaja saponaria* Molina (Rosaceae), bark [276]. Amorphous solid. $C_{42}H_{64}O_{16}$: 824.42.
734	Saponin 2 3β-*O* ⟵ GlcA^2 ⟵ Gal ^{3}↑ Rha	*Quillaja saponaria*, bark [276]. Amorphous solid. $C_{48}H_{74}O_{20}$: 970.48.
735	Saponin 3 3β-*O* ⟵ GlcA^2 ⟵ Gal ^{3}↑ Xyl	*Quillaja saponaria*, bark [276]. Amorphous solid. $C_{47}H_{72}O_{20}$: 956.46.
736	Saponin 4 3β-*O* ⟵ GlcA^2 ⟵ Gal; Ac ↓^{4} 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl ^{3}↑ Rha	*Quillaja saponaria* Molina, bark [277]. Amorphous solid. $C_{67}H_{106}O_{33}$: 1438.66.
737	Saponin 5 3β-*O* ⟵ GlcA^2 ⟵ Gal; ^{3}↑ Rha Ac ↓^{4} 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl ^{3}↑ Rha	*Quillaja saponaria*, bark [277]. Amorphous solid. $C_{73}H_{116}O_{37}$: 1584.72.
738	Saponin 6 3β-*O* ⟵ GlcA^2 ⟵ Gal; ^{3}↑ Xyl Ac ↓^{4} 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl ^{3}↑ Rha	*Quillaja saponaria*, bark [277]. Amorphous solid. $C_{72}H_{114}O_{37}$: 1570.70.

Table 1 (cont.)

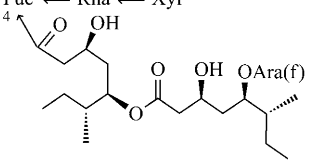
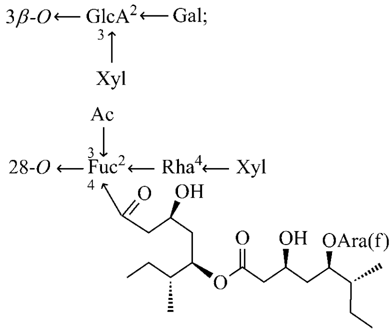
739	Saponin 7 3*β*-*O* ⟵ GlcA[2] ⟵ Gal; (3 ↑ Rha) 28-*O* ⟵ Fuc[2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Api(f) (Fuc: 4 ← Ac; 3 ↑ Rha)	*Quillaja saponaria*, bark [277]. $C_{78}H_{124}O_{41}$: 1716.76. Amorphous solid.
740	Saponin 8 3*β*-*O* ⟵ GlcA[2] ⟵ Gal; (3 ↑ Xyl) 28-*O* ⟵ Fuc[2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Api(f) (Fuc: 4 ← Ac; 3 ↑ Rha)	*Quillaja saponaria*, bark [277]. $C_{77}H_{122}O_{41}$: 1702.75. Amorphous solid.
741	Saponin 9 3*β*-*O* ⟵ GlcA[2] ⟵ Gal; (3 ↑ Rha) 28-*O* ⟵ Fuc[2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Xyl (Fuc: 4 ← Ac; 3 ↑ Rha)	*Quillaja saponaria*, bark [277]. Amorphous solid. $C_{78}H_{124}O_{41}$: 1716.76.
742	Saponin 10 3*β*-*O* ⟵ GlcA[2] ⟵ Gal; (3 ↑ Xyl) 28-*O* ⟵ Fuc[2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Xyl (Fuc: 4 ← Ac; 3 ↑ Rha)	*Quillaja saponaria*, bark [277]. Amorphous solid. $C_{77}H_{122}O_{41}$: 1702.75.
743	Saponin S7 3*β*-*O* ⟵ GlcA[2] ⟵ Gal; (3 ↑ Rha) 28-*O* ⟵ Fuc[2] ⟵ Rha[4] ⟵ Xyl (Fuc: 3 ← Ac; 4 ↖ acyl chain) 	*Quillaja saponaria* MOLINA, bark [278]. Amorphous solid. $C_{90}H_{144}O_{43}$: 1912.91.

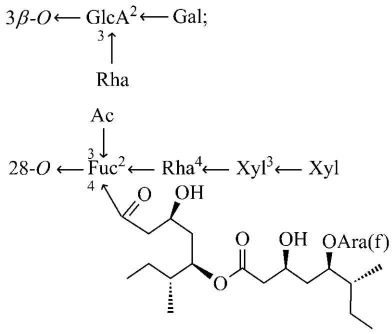
Table 1 (cont.)

744 Saponin S8



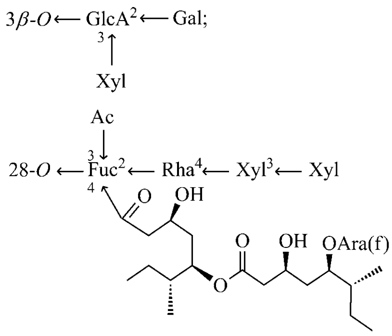
Quillaja saponaria, bark [278].
Amorphous solid.
$C_{89}H_{142}O_{43}$: 1898.89.

745 Saponin S9



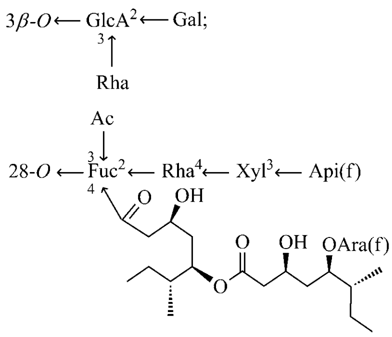
Quillaja saponaria, bark [278].
Amorphous solid.
$C_{95}H_{152}O_{47}$: 2044.95.

746 Saponin S10



Quillaja saponaria, bark [278].
Amorphous solid.
$C_{94}H_{150}O_{47}$: 2030.93.

747 Saponin S11



Quillaja saponaria, bark [278].
Amorphous solid.
$C_{95}H_{152}O_{47}$: 2044.95.

Table 1 (cont.)

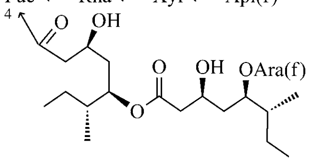
748	Saponin S12 3β-*O* ← GlcA^2 ← Gal; (Xyl →^{3} GlcA) 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Api(f) (Ac →^{3} Fuc; acyl →^{4} Fuc) 	*Quillaja saponaria*, bark [278]. Amorphous solid. $C_{94}H_{150}O_{47}$: 2030.93.
749	Saponin 1 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Ara^4 ← Ara	*Gypsophila oldhamiana* Miq. (Caryophyllaceae), roots [148]. White powder. $C_{57}H_{90}O_{25}$: 1174.58. $[\alpha]_D^{25} = +8.1$ ($c = 0.10$, MeOH).
750	Pachystegioside A 3β-*O* ← GlcA^2 ← Gal; (Xyl →^{3} GlcA) 28-*O* ← Fuc^2 ← Rha^4 ← Xyl (Qui →^{4} Fuc; Xyl →^{3} Xyl) Qui^3 ← Ac (Ac →^{4} Qui)	*Acanthophyllum pachystegium* K. H. (Caryophyllaceae), roots [279]. White power. $C_{79}H_{122}O_{42}$: 1742.74. $[\alpha]_D^{25} = -27.2$ ($c = 0.05$, MeOH).
751	Pachystegioside B 3β-*O* ← GlcA^2 ← Gal; (Xyl →^{3} GlcA) 28-*O* ← Fuc^2 ← Rha^4 ← Xyl (Qui →^{4} Fuc; Xyl →^{3} Xyl) Qui^4 ← Ac	*Acanthophyllum pachystegium*, roots [279]. White power. $C_{77}H_{120}O_{41}$: 1700.73. $[\alpha]_D = -32.2$ ($c = 0.05$, MeOH).
752	Pachystegioside C 3β-*O* ← GlcA^2 ← Gal; (Xyl →^{3} GlcA) 28-*O* ← Fuc^2 ← Rha^4 ← Xyl (Qui →^{4} Fuc) Qui^4 ← Ac	*Acanthophyllum pachystegium*, roots [279]. White power. $C_{72}H_{112}O_{37}$: 1568.69. $[\alpha]_D^{25} = -10.4$ ($c = 0.05$, MeOH).

Table 1 (cont.)

753	Vaccariside B 3β-*O* ⟵ GlcA² ⟵ Gal; Ac ↓ 4 28-*O* ⟵ Fuc³ ⟵ Ara(f) ↑ 2 Rha³ ⟵ Xyl	*Vaccaria segetalis* (Caryophyllaceae), seeds [280]. $C_{66}H_{102}O_{33}$: 1422.63.
754	Vaccariside C 3β-*O* ⟵ GlcA² ⟵ Gal; ↑ 3 Ac Ac ↓ 4 28-*O* ⟵ Fuc³ ⟵ Ara(f) ↑ 2 Rha³ ⟵ Xyl	*Vaccaria segetalis*, seeds [280]. $C_{68}H_{104}O_{34}$: 1464.64.
755	Vaccariside D 3β-*O* ⟵ GlcA² ⟵ Gal; Ac ↓ 4 28-*O* ⟵ Fuc³ ⟵ Ara(f) ↑ 2 Rha³ ⟵ Ara	*Vaccaria segetalis*, seeds [280]. $C_{66}H_{102}O_{33}$: 1422.63.
756	Vaccariside E 3β-*O* ⟵ GlcA² ⟵ Gal; ↑ 3 Xyl Ac ↓ 4 28-*O* ⟵ Fuc³ ⟵ Ara(f) ↑ 2 Rha³ ⟵ Xyl	*Vaccaria segetalis*, seeds [280]. $C_{71}H_{110}O_{37}$: 1554.67.
757	Vaccaroside E 3β-*O* ⟵ GlcA² ⟵ Gal; Ac ↓ 4 28-*O* ⟵ Fuc³ ⟵ Ara(f) ↑ 2 Rha⁴ ⟵ Xyl	*Vaccaria segetalis* (NECK) GARCKE, seeds [149]. Amorphous solid. $C_{66}H_{102}O_{33}$: 1422.63. M.p. 230° (dec.). $[\alpha]_D^{21} = -22.4$ ($c = 1.0$, MeOH).

Table 1 (cont.)

758	Segetoside I 3β-*O* ⟵ GlcA^2 ⟵ Gal; Ac ^{4}↓ 28-*O* ⟵ Fuc^3 ⟵ Ara(f)^5 ⟵ Ac ^{2}↑ Rha^4 ⟵ Xyl	*Vaccaria segetalis*, seeds [274]. Amorphous solid. $C_{68}H_{104}O_{34}$: 1464.64. $[\alpha]_D^{24} = -13.9$ ($c = 1.27$, MeOH).
759	Saponin 2 3β-*O* ⟵ GlcA^3 ⟵ Gal; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Glc ^{3}↑ (Ara) ^{4}↑ (Rha) Fuc Xyl	*Spergularia ramosa*, aerial parts [269]. $C_{70}H_{110}O_{37}$: 1542.67. $[\alpha]_D^{25} = +23.2$ ($c = 1.0$, MeOH).
760	Saponin 4 3β-*O* ⟵ GlcA^3 ⟵ Glc; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Gal ^{3}↑ (Ara) ^{4}↑ (Rha) Fuc Xyl	*Spergularia ramosa*, aerial parts [269]. $C_{70}H_{110}O_{37}$: 1542.67. $[\alpha]_D^{25} = +20.8$ ($c = 1.0$, MeOH).
761	Saponin 6 3β-*O* ⟵ Glc^3 ⟵ Gal; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Glc ^{3}↑ (Ara) ^{4}↑ (Rha) Fuc Xyl	*Spergularia ramosa*, aerial parts [269]. $C_{70}H_{112}O_{36}$: 1528.69. $[\alpha]_D^{25} = +17.0$ ($c = 1.0$, MeOH).
762	Silenoside B 3β-*O* ⟵ GlcA^2 ⟵ Gal; 28-*O* ⟵ Fuc^2 ⟵ Rha^2 ⟵ Glc ^{4}↑ (Rha) Xyl	*Silene vulgaris*, roots [262]. Light yellow powder. $C_{65}H_{102}O_{33}$: 1410.63. M.p. 240°.
763	Silenoside C 3β-*O* ⟵ GlcA^2 ⟵ Gal; ^{3}↑ (GlcA) Ara 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl ^{2}↑ (Rha) Glc	*Silene vulgaris*, roots [262]. Light yellow powder. $C_{70}H_{110}O_{37}$: 1542.67. M.p. 238°.
764	Compound 1 3β-*O* ⟵ GlcA^2 ⟵ Gal; Ac ^{4}↓ 28-*O* ⟵ Fuc^3 ⟵ Glc ^{2}↑ Rha^4 ⟵ Xyl^2 ⟵ Ara^2 ⟵ Ara	*Silene fortunei* Wis (Caryophyllaceae), roots [281]. White powder. $C_{77}H_{120}O_{42}$: 1716.73. $[\alpha]_D^{20} = -6.0$ ($c = 0.132$, H_2O).

Table 1 (cont.)

765	Compound 1 3β-*O* ⟵ GlcA^2 ⟵ Gal; Ac ↓^{4} 28-*O* ⟵ Fuc^3 ⟵ Glc^6 ⟵ Ac ↑^{2} Rha^4 ⟵ Xyl^2 ⟵ Ara^2 ⟵ Ara	*Silene fortunei*, roots [282]. Amorphous powder. $C_{78}H_{118}O_{44}$: 1758.75.
766	Compound 2 (= Jenisseensoside E) 3β-*O* ⟵ GlcA^2 ⟵ Gal; (*E*)-cinnamoyl (4'-OMe) ↓^{4} 28-*O* ⟵ Fuc^3 ⟵ Ac ↑^{2} Rha	*Silene fortunei*, roots [282]. Isolated as a mixture with (*Z*)-isomer. Amorphous powder. $C_{66}H_{94}O_{27}$: 1318.60.
767	Compound 3 (= Jenisseensoside F) 3β-*O* ⟵ GlcA^2 ⟵ Gal; (*Z*)-cinnamoyl (4'-OMe) ↓^{4} 28-*O* ⟵ Fuc^3 ⟵ Ac ↑^{2} Rha	*Silene fortunei*, roots [282]. Isolated as a mixture with (*E*)-isomer. Amorphous powder. $C_{66}H_{94}O_{27}$: 1318.60.
768	Silenorubicoside B 3β-*O* ⟵ GlcA^2 ⟵ Gal; ↑^{3} Xyl Ac (↓^{4} Fuc), Ac (↓^{6} Glc) 28-*O* ⟵ Fuc^3 ⟵ Glc^4 ⟵ Ac ↑^{2} Rha^4 ⟵ Xyl	*Silene rubicunda*, roots [261]. White solid. $C_{76}H_{116}O_{40}$: 1668.70. M.p. 207–209°. $[\alpha]_D^{22} = -7.2$ ($c = 0.97$, MeOH).
769	Sinocrassuloside VI 3β-*O* ⟵ GlcA^2 ⟵ Gal; ↑^{3} Xyl (*E*)-cinnamoyl (4'-OMe) ↓^{4} 28-*O* ⟵ Fuc^3 ⟵ Ac ↑^{2} Rha	*Sinocrassula asclepiadea*, roots [283]. White amorphous powder. $C_{71}H_{102}O_{31}$: 1450.64. $[\alpha]_D^{26} = +18.4$ ($c = 0.076$, MeOH).

Table 1 (cont.)

770	Sinocrassuloside VII 3β-*O* ⟵ GlcA^2 ⟵ Gal; ^{3}↑ Xyl (*Z*)-cinnamoyl (4'-OMe) $_4$↓ 28-*O* ⟵ Fuc^3 ⟵ Ac ^{2}↑ Rha	*Sinocrassula asclepiadea*, roots [283]. White amorphous powder. $C_{71}H_{102}O_{31}$: 1450.64. $[\alpha]_D^{26} = +8.3$ ($c = 0.004$, MeOH).
771	Sinocrassuloside VIII 3β-*O* ⟵ GlcA (Me ester)^2 ⟵ Gal; ^{3}↑ Xyl (*E*)-cinnamoyl (4'-OMe) $_4$↓ 28-*O* ⟵ Fuc^3 ⟵ Ac ^{2}↑ Rha	*Sinocrassula asclepiadea*, roots [283]. White amorphous powder. $C_{72}H_{104}O_{31}$: 1464.66. $[\alpha]_D^{26} = +12.1$ ($c = 0.022$, MeOH).
772	Sinocrassuloside IX 3β-*O* ⟵ GlcA (Me ester)^2 ⟵ Gal; ^{3}↑ Xyl (*Z*)-cinnamoyl (4'-OMe) $_4$↓ 28-*O* ⟵ Fuc^3 ⟵ Ac ^{2}↑ Rha	*Sinocrassula asclepiadea*, roots [283]. White amorphous powder. $C_{72}H_{104}O_{31}$: 1464.66. $[\alpha]_D^{26} = +37.5$ ($c = 0.016$, MeOH).
773	Sinocrassuloside X 3β-*O* ⟵ GlcA^2 ⟵ Gal; ^{3}↑ Xyl (*E*)-cinnamoyl (4'-OMe) $_4$↓ 28-*O* ⟵ Fuc^2 ⟵ Rha	*Sinocrassula asclepiadea*, roots [283]. White amorphous powder. $C_{69}H_{100}O_{30}$: 1408.63. $[\alpha]_D^{26} = +38.5$ ($c = 0.026$, MeOH).
774	Sinocrassuloside XI 3β-*O* ⟵ GlcA^2 ⟵ Gal; ^{3}↑ Xyl Glc $_3$↓ 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl ^{4}↑ Ac	*Sinocrassula asclepiadea*, roots [283]. White amorphous powder. $C_{72}H_{112}O_{38}$: 1584.68. $[\alpha]_D^{26} = +3.5$ ($c = 0.019$, MeOH).

Table 1 (cont.)

775	Saponarioside A 3β-*O* ⟵ $GlcA^{2}$ ⟵ Gal; 3↑ Xyl 28-*O* ⟵ Fuc^{2} ⟵ Rha^{4} ⟵ Xyl^{3} ⟵ Xyl 4↑ Ac ⟶ $^{4}Qui^{3}$ ⟵ Xyl	*Saponaria officinalis* L. (Caryophyllaceae), whole plant [284]. Amorphous solid. $C_{82}H_{128}O_{45}$: 1832.83. M.p. 243–245° (dec.). $[\alpha]_D^{20} = -25.5$ ($c = 0.90$, C_5H_5N).
776	Saponarioside B 3β-*O* ⟵ $GlcA^{2}$ ⟵ Gal; 3↑ Xyl 28-*O* ⟵ Fuc^{2} ⟵ Rha^{4} ⟵ Xyl^{3} ⟵ Xyl 4↑ Ac ⟶ ^{4}Qui	*Saponaria officinalis*, whole plant [284]. Amorphous solid. $C_{77}H_{120}O_{41}$: 1700.73. M.p. 236–238° (dec.). $[\alpha]_D^{20} = -15.0$ ($c = 1.1$, C_5H_5N).
777	Compound 3 3β-*O* ⟵ Glc; 28-*O* ⟵ Glc^{2} ⟵ Ara^{2} ⟵ Rha 6↑ Glc	*Acanthophyllum squarrosum*, roots [265]. White powder. $C_{59}H_{94}O_{28}$: 1250.59. $[\alpha]_D^{20} = -2.0$ ($c = 0.10$, MeOH).

Aglycone: 22β-Hydroxyquillaic acid (= (3β,16α,22β)-3,16,22-Trihydroxy-23-oxoolean-12-en-28-oic acid)

778	Saponin 20a 3β-*O* ⟵ $GlcA^{2}$ ⟵ Gal; 3↑ Rha (2*S*)-2-methylbutanoyl ↓4 28-*O* ⟵ Fuc^{2} ⟵ Rha^{3} ⟵ Glc 4↑ Xyl	*Quillaja saponaria*, bark [171]. Isolated as mixture with saponin 20b. $C_{76}H_{120}O_{39}$: 1656.74.
779	Saponin 20b 3β-*O* ⟵ $GlcA^{2}$ ⟵ Gal; 3↑ Xyl (2*S*)-2-methylbutanoyl ↓4 28-*O* ⟵ Fuc^{2} ⟵ Rha^{3} ⟵ Glc 4↑ Xyl	*Quillaja saponaria*, bark [171]. Isolated as a mixture with saponin 20a. $C_{75}H_{118}O_{39}$: 1642.72.

Table 1 (cont.)

780	Saponin 21a 3β-*O* ← GlcA^2 ← Gal; ^{3}↑ Rha (2*S*)-2-methylbutanoyl ↓^{4} 28-*O* ← Fuc^2 ← Rha^3 ← Glc ^{4}↑ Xyl^3 ← Api(f)	*Quillaja saponaria*, bark [171]. Isolated as a mixture with saponin 21b. $C_{81}H_{128}O_{43}$: 1788.78.
781	Saponin 21b 3β-*O* ← GlcA^2 ← Gal; ^{3}↑ Xyl (2*S*)-2-methylbutanoyl ↓^{4} 28-*O* ← Fuc^2 ← Rha^3 ← Glc ^{4}↑ Xyl^3 ← Api(f)	*Quillaja saponaria*, bark [171]. Isolated as a mixture with saponin 21a. $C_{80}H_{126}O_{43}$: 1774.77.
782	Saponin 22a 3β-*O* ← GlcA^2 ← Gal; ^{3}↑ Rha (3*S*,4*S*)-3-hydroxy-4-methylhexanoyl ↓^{4} 28-*O* ← Fuc^2 ← Rha^3 ← Glc ^{3}↑ ^{4}↑ Rha Xyl^3 ← Api(f)	*Quillaja saponaria*, bark [171]. Isolated as a mixture with saponin 22b. $C_{89}H_{142}O_{48}$: 1978.87.
783	Saponin 22b 3β-*O* ← GlcA^2 ← Gal; ^{3}↑ Xyl (3*S*,4*S*)-3-hydroxy-4-methylhexanoyl ↓^{4} 28-*O* ← Fuc^2 ← Rha^3 ← Glc ^{3}↑ ^{4}↑ Rha Xyl^3 ← Api(f)	*Quillaja saponaria*, bark [171]. Isolated as a mixture with saponin 22a. $C_{88}H_{140}O_{48}$: 1964.85.

Aglycone: (11α,21α)-21-Hydroxy-11-methoxy-3-oxoolean-12-en-28-oic acid

784	Papyrioside LD 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Tetrapanax papyriferum* K. Koch (Araliaceae), leaves [285]. Amorphous powder. $C_{49}H_{78}O_{19}$: 970.51. $[\alpha]_D^{27} = -24.5$ ($c = 0.7$, MeOH).

Table 1 (cont.)

Aglycone: (11α)-11-Hydroxy-3,21-dioxoolean-12-en-28-oic acid		
785	Papyrioside LA 3β-$O \longleftarrow \mathrm{Glc}^{6} \longleftarrow \mathrm{Glc}^{4} \longleftarrow \mathrm{Rha}$ $^{6}\uparrow$ Ac	*Tetrapanax papyriferum* K. Koch, leaves [285]. Amorphous powder. $C_{50}H_{76}O_{20}$: 996.53. $[\alpha]_D^{27} = -21.5$ ($c = 4.7$, MeOH).
Aglycone: (11α)-11-Methoxy-3,21-dioxoolean-12-en-28-oic acid		
786	Papyrioside LB 3β-$O \longleftarrow \mathrm{Glc}^{6} \longleftarrow \mathrm{Glc}^{4} \longleftarrow \mathrm{Rha}$ $^{6}\uparrow$ Ac	*Tetrapanax papyriferum* K. Koch, leaves [285]. Amorphous powder. $C_{51}H_{78}O_{20}$: 1010.51. $[\alpha]_D^{27} = -23.9$ ($c = 2.3$, MeOH).
Aglycone: (3α,11α)-3-Hydroxy-11-methoxy-21-oxoolean-12-en-28-oic acid		
787	Papyrioside LC 3β-$O \longleftarrow \mathrm{Glc}^{6} \longleftarrow \mathrm{Glc}^{4} \longleftarrow \mathrm{Rha}$ $^{6}\uparrow$ Ac	*Tetrapanax papyriferum* K. Koch, leaves [285]. Amorphous powder. $C_{51}H_{80}O_{20}$: 1012.52. $[\alpha]_D^{27} = -34.1$ ($c = 1.6$, MeOH).
Aglycone: (3α)-3-Hydroxy-21-oxoolean-12-en-28-oic acid		
788	Papyrioside LE 28-$O \leftarrow \mathrm{Glc}^{6} \leftarrow \mathrm{Glc}^{4} \leftarrow \mathrm{Rha}$	*Tetrapanax papyriferum* K. Koch, leaves [286]. Amorphous powder. $C_{48}H_{76}O_{18}$: 940.50. $[\alpha]_D^{25} = -25.7$ ($c = 1.0$, MeOH).
789	Papyrioside LF 3β-$O \longleftarrow \mathrm{Glc}^{6} \longleftarrow \mathrm{Glc}^{4} \longleftarrow \mathrm{Rha}$ $^{6}\uparrow$ Ac	*Tetrapanax papyriferum*, leaves [286]. Amorphous powder. $C_{50}H_{78}O_{19}$: 982.51. $[\alpha]_D^{27} = -14.4$ ($c = 1.9$, MeOH).
Aglycone: (2α,3α)-2-(Acetyloxy)-3-hydroxy-19-oxoolean-12-en-28-oic acid		
790	Rivaloside A 28-$O \leftarrow \mathrm{Glc}^{6} \leftarrow \mathrm{Glc}$	*Galium rivale* (Sibth. and Sm.) Griseb. (Rubiaceae), aerial parts [287]. Amorphous solid. $C_{44}H_{68}O_{16}$: 852.45. $[\alpha]_D = +3.7$ ($c = 0.2$, MeOH).
Aglycone: (2α,3α)-2,3-Dihydroxy-19-oxoolean-12-en-28-oic acid		
791	Rivaloside B 28-$O \leftarrow \mathrm{Glc}^{6} \leftarrow \mathrm{Glc}$	*Galium rivale*, aerial parts [287]. Amorphous solid. $C_{42}H_{66}O_{15}$: 810.44. $[\alpha]_D = -15.4$ ($c = 0.2$, MeOH).
Aglycone: (2α,3β,19α)-2,3,19,23-Tetrahydroxy-11-oxoolean-12-en-28-oic acid		
792	Saponin 3 28-$O \leftarrow \mathrm{Glc}$	*Pteleopsis suberosa* (Combretaceae), stem bark [288]. White solid. $C_{36}H_{56}O_{12}$: 680.38. M.p. 130°(dec.). $[\alpha]_D^{25} = -8.0$ ($c = 0.1$, MeOH).

Table 1 (cont.)

Aglycone: (2α,3β,19α)-2,3,19,23,24-Pentahydroxy-11-oxoolean-12-en-28-oic acid		
793	Saponin 1 28-*O* ← Glc	*Pteleopsis suberosa* ENGL. et DIELS, stem bark [288]. White solid. $C_{36}H_{56}O_{13}$: 696.37. M.p. 185°. $[\alpha]_D^{25} = -20.0$ ($c = 0.1$, MeOH).
Aglycone: (2α,3β,6β,19α)-2,3,6,19,24-Pentahydroxy-11-oxoolean-12-en-28-oic acid		
794	Saponin 4 28-*O* ← Glc	*Pteleopsin suberosa*, stem bark [288]. White solid. $C_{36}H_{56}O_{13}$: 696.37. M.p. 195–200°. $[\alpha]_D^{25} = -32.0$ ($c = 0.1$, MeOH).
Aglycone: (2α,3β,19β)-2,3,19,23,24-Pentahydroxy-11-oxoolean-12-en-28-oic acid		
795	Saponin 2 28-*O* ← Glc	*Pteleopsis suberosa*, stem bark [288]. White solid. $C_{36}H_{56}O_{13}$: 696.37. M.p. 180°. $[\alpha]_D^{25} = -27.6$ ($c = 0.1$, MeOH).
Aglycone: (3β)-3-Hydroxy-27-oxoolean-12-en-28-oic acid		
796	Saponin 4 3β-*O* ← Ara^2 ← Glc; 28-*O* ← Glc^6 ← Glc	*Fagonia cretica*, aerial parts [132]. Amorphous powder. $C_{53}H_{84}O_{23}$: 1088.54. $[\alpha]_D^{23} = +42.3$ ($c = 0.70$, MeOH).
Aglycone: (2α,19α)-2,19-Dihydroxy-3-oxoolean-12-en-28-oic acid		
797	Compound 1 28-*O* ← Glc	*Terminalia arjuna* (Combretaceae), roots [289]. Colorless crystals. $C_{36}H_{56}O_{10}$: 648.39. M.p. 147–148°.
Aglycone: Bellisonic acid (=(2β,3β)-2,3,23-Trihydroxy-16-oxoolean-12-en-28-oic acid)		
798	Bernardioside B$_1$ 3β-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl	*Bellis bernardii* BOISS (Asteraceae), whole plant [217]. White powder. $C_{53}H_{84}O_{23}$: 1088.54. M.p. 170°.
799	Bernardioside B$_4$ 3β-*O* ← Rha; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Rha	*Bellis bernardii*, whole plant [217]. White powder. $C_{59}H_{94}O_{26}$: 1218.60. M.p. 193°.
800	Bernardioside C$_2$ 3β-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Rha	*Bellis bernardii*, whole plant [217]. White powder. $C_{59}H_{94}O_{27}$: 1234.60. M.p. 203–204°.

Table 1 (cont.)

Aglycone: 2-Oxouncargenin A (=(3β,6β)-3,6,23-Trihydroxy-2-oxoolean-12-en-28-oic acid)		
801	Madlongiside A 28-*O*←Ara	*Madhuca longifolia* (L.) MACBRIDE (Sapotaceae), seeds [222]. Amorphous solid. $C_{35}H_{54}O_{10}$: 634.37. M.p. 202–204°. $[\alpha]_D^{25} = +34.5$ ($c = 0.8$, MeOH).
802	Madlongiside B 3β-*O*←Glc; 28-*O*←Ara	*Madhuca longifolia*, seeds [222]. Colorless needles. $C_{41}H_{64}O_{15}$: 796.42. M.p. 212–214°. $[\alpha]_D^{25} = +15.7$ ($c = 1.5$, MeOH).
*Aglycone: 21-*O*-Angeloyl-22-*O*-(2-methylbutanoyl)barrigenol R₁-23-oic acid (=(3β,15α,16α,21β,22α)-3,15,16,28-Tetrahydroxy-22-[(2-methylbutanoyl)oxy]-21-{[(2Z)-2-methylbut-2-enoyl]oxy}olean-12-en-23-oic acid)*		
803	TR-saponin B 3β-*O*←GlcA³←Ara	*Camellia sinensis* var. *assamica*, roots [290]. Isolated as Me ester. $C_{52}H_{80}O_{20}$: 1024.52.
*Aglycone: 16α-*O*-Acetyl-21-*O*-angeloyl-22-*O*-(2-methylbutanoyl)barrigenol R_1-23-oic acid=((3β,15α,16α,21β,22α)-16-(Acetyloxy)-3,15,28-trihydroxy-22-[(2-methylbutanoyl)oxy]-21-{[(2Z)-2-methylbut-2-enoyl]oxy}olean-12-en-23-oic acid)*		
804	TR-saponin C 3β-*O*←GlcA³←Ara	*Camellia sinensis* var. *assamica*, roots [290]. Isolated as Me ester. $C_{54}H_{82}O_{21}$: 1066.53.
Aglycone: (3β)-3,24-Dihydroxyolean-12-en-30-oic acid		
805	Albiziasaponin B 3β-*O*←GlcA²←GlcA²←Rha	*Albizia myriophylla* BENTH. (Leguminosae), stems [291]. Colorless crystals ($CHCl_3$/MeOH). $C_{48}H_{74}O_{20}$: 970.48. M.p. 220–223°. $[\alpha]_D^{24} = +4.6$ ($c = 0.1$, MeOH).
Aglycone: (3β)-3,28-Dihydroxyolean-12-en-30-oic acid		
806	Davuricoside N 3β-*O*⟵Ara²⟵Glc; ⁴↑ Glc 30-*O*⟵$CH_2CH(OH)CH_2O$⟵GlcA (Na-salt)	*Lysimachia davurica* LEDEB. (Primulaceae), whole plant [292]. White powder. $C_{56}H_{89}O_{26}Na$: 1200.56. M.p. 237–240°. $[\alpha]_D^{20} = +14.5$ ($c = 0.10$, MeOH).
Aglycone: (3β,16α)-3,16,28-Trihydroxyolean-12-en-30-oic acid		
807	Mirabilin 3β-*O*⟵Ara²⟵Glc ⁴↑ Glc²⟵Xyl ⁶↑ Glc	*Cyclamen mirabile* HILDEBR. (Primulaceae), tubers [293]. Amorphous powder. $C_{58}H_{94}O_{28}$: 1238.59. $[\alpha]_D^{20} = +5.2$ ($c = 0.42$, MeOH).

Table 1 (cont.)

Aglycone: (3β,16α)-3,16,28-Trihydroxyolean-12-en-30-oic acid		
808	Ardisicrenoside G 3β-*O* ← Ara^{2} ← Glc $^{4}\uparrow$ Glc^{2} ← Rha	*Ardisia crenata* Sims (Myrsinaceae), roots [294]. Amorphous powder. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]_{D}^{22} = +27.0$ ($c = 0.26$, MeOH).
809	Ardisicrenoside H 3β-*O* ← Ara^{2} ← Glc $^{4}\uparrow$ Glc^{2} ← Xyl	*Ardisia crenata* Sims, roots [294]. Amorphous powder. $C_{53}H_{84}O_{23}$: 1088.54. $[\alpha]_{D}^{22} = +64.0$ ($c = 0.16$, MeOH).
Aglycone: Gypsogenic acid (=(3β)-3-Hydroxyolean-12-ene-23,28-dioic acid)		
810	Caryocaroside V-1 3β-*O* ← Glc^{3} ← Gal	*Caryocar glabrum*, fruits [151]. White powder. $C_{42}H_{66}O_{15}$: 810.44. $[\alpha]_{D}^{20} = +16.7$ ($c = 0.17$, MeOH).
811	Segetoside C 28-*O* ← Glc^{3} ← Glc $^{6}\uparrow$ Glc^{2} ← Glc^{6} ← Ac	*Vaccaria segetalis* (Neck) Garcke (Caryophyllaceae), seeds [295]. White amorphous powder. $C_{56}H_{88}O_{26}$: 1176.56. $[\alpha]_{D}^{22} = +8.9$ ($c = 0.43$, MeOH).
812	Vaccaroid A 28-*O* ← Glc^{2} ← Glc $^{6}\uparrow$ Glc^{3} ← Glc	*Vaccaria segetalis* [296]. $C_{54}H_{86}O_{25}$: 1134.55.
813	Pachystegioside D 28-*O* ← Gal^{3} ← Glc^{6} ← Glc^{2} ← Glc	*Acanthophyllum pachystegium*, roots [279]. White power. $C_{54}H_{86}O_{25}$: 1134.55. $[\alpha]_{D}^{25} = -18.6$ ($c = 0.05$, MeOH).
814	Glanduloside A 23-*O* ← Gal; 28-*O* ← Gal^{3} ← Glc $^{6}\uparrow$ Gal	*Acanthophyllum glandulosum* Bge. (Caryophyllaceae), roots [263]. White powder. $C_{54}H_{86}O_{25}$: 1134.55. $[\alpha]_{D}^{20} = -6.0$ ($c = 0.10$, MeOH).
815	Repensoside A 3β-*O* ← Xyl; 28-*O* ← Gal^{6} ← Glc	*Gypsophilla repens* L. (Caryophyllaceae), roots [270]. Colorless amorphous powder. $C_{47}H_{74}O_{19}$: 942.48.
816	Repensoside B 3β-*O* ← Xyl; 28-*O* ← Gal^{6} ← Glc $^{2}\uparrow$ Xyl	*Gypsophilla repens* L., roots [270]. Colorless amorphous powder. $C_{52}H_{82}O_{23}$: 1074.52.

Table 1 (cont.)

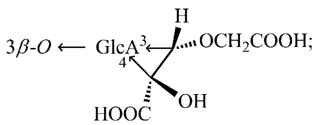
817	Repensoside C 3*β*-*O* ←Xyl; 28-*O* ←Glc^6←Glc ^{3}↑ Glc	*Gypsophilla repens* L., roots [270]. Colorless amorphous powder. $C_{53}H_{84}O_{24}$: 1104.54.
818	Repensoside D 3*β*-*O* ← Gal^4 ← Glc ^{2}↑ Gal^2 ← Glc	*Gypsophilla repens* L., roots [270]. Colorless amorphous powder. $C_{54}H_{86}O_{25}$: 1134.58.
819	Repensoside E 3*β*-*O* ← GlcA^3← Xyl ^{2}↑ Glc 28-*O* ← Fuc^2 ← Rha^4← Xyl^3 ← Ara ^{4}↑ (Fuc) ^{4}↑ (Ara) Qui Ara	*Gypsophilla repens* L., roots [270]. Colorless amorphous powder. $C_{80}H_{158}O_{42}$: 1790.02.
820	Basellasaponin C  28-*O* ← Glc	*Basella rubra*, aerial parts [205]. Crystals (MeOH/H_2O). $C_{47}H_{68}O_{22}$: 984.42. M.p. 230–232°. $[\alpha]_D^{25} = +42.1$ ($c = 0.1$, MeOH).
821	Saponarioside C 3*β*-*O* ←Xyl; 28-*O* ←Glc^6←Glc^6← Gal ^{3}↑ Glc	*Saponaria officinalis* L. (Caryophyllaceae), whole plant [297]. Amorphous solid. $C_{59}H_{94}O_{29}$: 1266.59. M.p. 234° (dec.). $[\alpha]_D^{22} = +8.9$ ($c = 0.63$, MeOH).
822	Saponarioside D 3*β*-*O* ←Xyl; 28-*O* ←Glc^6←Glc^2← Glc ^{3}↑ Glc	*Saponaria officinalis*, whole plant [297]. Amorphous solid. $C_{59}H_{94}O_{29}$: 1266.59. M.p. 237° (dec.). $[\alpha]_D^{22} = -3.4$ ($c = 0.53$, MeOH).
823	Saponarioside E 3*β*-*O* ←Glc; 28-*O* ←Glc^6←Glc^2← Glc ^{3}↑ Glc	*Saponaria officinalis*, whole plant [297]. Amorphous solid. $C_{60}H_{96}O_{30}$: 1296.60. M.p. 210° (dec.). $[\alpha]_D^{22} = -6.9$ ($c = 0.23$, MeOH).
824	Saponarioside H 3*β*-*O* ← Xyl; 28-*O* ← Glc	*Saponaria officinalis*, whole plant [297]. Amorphous solid. $C_{41}H_{64}O_{14}$: 780.43. M.p. 244° (dec.). $[\alpha]_D^{22} = +15.2$ ($c = 0.29$, MeOH).

Table 1 (cont.)

825	Saponarioside L 3β-*O* ⟵Xyl; 28-*O* ⟵Glc^3⟵ Glc ^{6}↑ Glc	*Saponaria officinalis*, whole plant [298]. Amorphous solid. $C_{53}H_{84}O_{24}$: 1104.54. $[\alpha]^{22}_{D} = +3.6$ ($c = 0.5$, MeOH).
826	Saponarioside M 3β-*O* ⟵Xyl; 28-*O* ⟵Glc ^{6}↑ Glc^2⟵ Glc	*Saponaria officinalis*, whole plant [298]. Amorphous solid. $C_{53}H_{84}O_{24}$: 1104.54. $[\alpha]^{22}_{D} = +2.8$ ($c = 0.5$, MeOH).
827	Silenorubicoside D 23-*O* ⟵Glc^2⟵ GlcA; 28-*O* ⟵Glc^3⟵ Glc ^{6}↑ Glc^6⟵ Gal	*Silene rubicunda*, roots [261]. White solid. $C_{66}H_{104}O_{36}$: 1472.63. M.p. 171–173°. $[\alpha]^{22}_{D} = +28.0$ ($c = 0.93$, MeOH).
Aglycone: 16α-Hydroxygypsogenic acid (= (3β,16α)-3,16-Dihydroxyolean-12-ene-23,28-dioic acid)		
828	Saponarioside F 3β-*O* ⟵Xyl; 28-*O* ⟵Glc^3⟵ Glc ^{6}↑ Glc^2⟵ Glc	*Saponaria officinalis* L. (Caryophyllaceae), whole plant [297]. Amorphous solid. $C_{59}H_{94}O_{30}$: 1282.58. M.p. 232° (dec.). $[\alpha]^{22}_{D} = -19.6$ ($c = 0.56$, MeOH).
829	Saponarioside G 3β-*O* ⟵Xyl; 28-*O* ⟵Glc^3⟵ Glc ^{6}↑ Glc	*Saponaria officinalis*, whole plant [297]. Amorphous solid. $C_{53}H_{84}O_{25}$: 1120.53. M.p. 233° (dec.). $[\alpha]^{22}_{D} = -12.6$ ($c = 0.57$, MeOH).
830	Saponarioside I 3β-*O* ⟵Xyl; 28-*O* ⟵Glc^3⟵ Glc ^{6}↑ Glc^6⟵ Gal	*Saponaria officinalis* L., whole plant [298]. Amorphous solid. $C_{59}H_{94}O_{30}$: 1282.58. $[\alpha]^{22}_{D} = +10.0$ ($c = 0.4$, MeOH).
831	Segetoside K 28-*O* ⟵Glc^3⟵ Glc ^{6}↑ Glc^2⟵ Glc	*Vaccaria segetalis* (NECK) GARCKE, seeds [299]. Amorphous solid. $C_{54}H_{86}O_{26}$: 1150.54. $[\alpha]^{24}_{D} = -20.5$ ($c = 0.28$, MeOH).
832	Sinocrassuloside I 28-*O* ⟵Glc^3⟵ Glc ^{6}↑ Glc	*Sinocrassula asclepiadea* FRANCH. (Caryophyllaceae), roots [283]. White amorphous powder. $C_{48}H_{76}O_{21}$: 988.49. $[\alpha]^{26}_{D} = +17.6$ ($c = 0.051$, MeOH).
833	Sinocrassuloside II 28-*O* ⟵Glc^3⟵ Glc ^{6}↑ Glc^6⟵ [(3*R*)-3-hydroxy-3-methyl glutaryl]	*Sinocrassula asclepiadea*, roots [283]. White amorphous powder. $C_{54}H_{84}O_{25}$: 1132.53. $[\alpha]^{26}_{D} = +13.9$ ($c = 0.074$, MeOH).

Table 1 (cont.)

834	Sinocrassuloside III 28-*O* ← Glc^3 ← Glc ^{6}↑ Glc^6 ← [3-hydroxy-4-carbomethoxy-3-methylbutanoyl]	*Sinocrassula asclepiadea*, roots [283]. White amorphous powder. $C_{55}H_{86}O_{25}$: 1146.55. $[\alpha]_D^{26} = +30.4$ ($c = 0.023$, MeOH).
835	Saponin 5 3*β*-O ← GlcA; 28-*O* ← Glc	*Medicago truncatula* (Leguminosae), aerial parts [300]. Amorphous powder. $C_{42}H_{64}O_{17}$: 840.41. $[\alpha]_D^{20} = -25.3$ ($c = 0.1$, MeOH).
836	Saponin 11 3*β*-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha	*Medicago truncatula* (Leguminosae), aerial parts [300]. Amorphous powder. $C_{53}H_{84}O_{24}$: 1104.54. $[\alpha]_D^{20} = -0.2$ ($c = 0.1$, MeOH).
837	Saponin 12 3*β*-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Ara ^{4}↑ Xyl	*Medicago truncatula*, aerial parts [300]. Amorphous powder. $C_{63}H_{100}O_{32}$: 1368.62. $[\alpha]_D^{20} = -15.4$ ($c = 0.1$, MeOH).
838	Saponin 14 3*β*-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl	*Medicago truncatula*, aerial parts [300]. Amorphous powder. $C_{63}H_{100}O_{32}$: 1368.62. $[\alpha]_D^{20} = -20.1$ ($c = 0.1$, MeOH).
839	Saponin 1 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Api(f)	*Muraltia anonidifolia* E. MEY (Polygalaceae), roots [301]. White powder. $C_{57}H_{90}O_{27}$: 1206.57. $[\alpha]_D^{25} = -18.4$ ($c = 0.25$, MeOH).
840	Saponin 2 3*β*-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl	*Muraltia anonidifolia*, roots [301]. White powder. $C_{57}H_{90}O_{27}$: 1206.57. $[\alpha]_D^{25} = -26.5$ ($c = 0.25$, MeOH).
841	Saponin 3 3*β*-*O* ← Glc^2 ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl	*Muraltia anonidifolia*, roots [301]. White powder. $C_{63}H_{100}O_{32}$: 1368.62. $[\alpha]_D^{25} = -20.4$($c = 0.25$, MeOH).
842	Saponin 4 3*β*-*O* ← Glc^2 ← Glc; 28-*O* ← Ara^2 ← Rha	*Muraltia anonidifolia*, roots [301]. White powder. $C_{53}H_{84}O_{24}$: 1104.54. $[\alpha]_D^{25} = +19.6$ ($c = 0.25$, MeOH).
843	Saponin 5 3*β*-*O* ← Glc^2 ← Glc	*Muraltia anonidifolia*, roots [301]. White powder. $C_{42}H_{66}O_{16}$: 826.44. $[\alpha]_D^{25} = +37.2$($c = 0.26$, MeOH).

Table 1 (cont.)

844	Polygalasaponin E 28-*O* ← Glc^2 ← Rha^4 ← Xyl	*Polygala japonica* HOUTT. (Polygalaceae), aerial parts [220]. White amorphous solid. $C_{47}H_{74}O_{19}$: 942.48. $[\alpha]_D^{20} = -0.3$ ($c = 0.12$, MeOH).
845	Polygalasaponin H 28-*O* ← Glc^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl	*Polygala japonica*, aerial parts [220]. White amorphous solid. $C_{52}H_{82}O_{23}$: 1074.52. $[\alpha]_D^{20} = -2.4$ (MeOH).
846	Saponin 1 3*β*-*O* ← Glc; 28-*O* ← Glc^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl	*Polygala japonica* HOUTT., whole plant [302]. White powder. $C_{58}H_{92}O_{28}$: 1236.58. M.p. 246–248°. $[\alpha]_D^{23} = -22.5$ ($c = 0.15$, MeOH).
847	Ageratoside B_1 3*β*-*O* ← Glc; 28-*O* ← Glc^6 ← Glc	*Aster ageratoides* var. *ovatus*, ground part [303]. White powder. $C_{48}H_{76}O_{21}$: 988.49. $[\alpha]_D^{22} = +18.3$ ($c = 0.5$, MeOH).
848	Ageratoside B_2 3*β*-*O* ← Glc^4 ← Xyl; 28-*O* ← Ara^2 ← Rha^3 ← Xyl	*Aster ageratoides* var. *ovatus*, ground part [303]. White powder. $C_{57}H_{90}O_{27}$: 1206.57. $[\alpha]_D^{22} = -12.8$ ($c = 0.5$, MeOH).
849	Albesoside A 3*β*-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Aster albescens*, roots [304]. Powder. $C_{58}H_{92}O_{28}$: 1236.58. M.p. 256–258°. $[\alpha]_D = +80.5$ ($c = 0.5$, MeOH).

Aglycone: (2β,3β,16α)-2,3,16-Trihydroxyolean-12-ene-23,28-dioic acid

850	Saponin 1 3*β*-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha	*Medicago truncatula* (Leguminosae), aerial parts [300]. Amorphous powder. $C_{53}H_{84}O_{25}$: 1120.53. $[\alpha]_D^{20} = -18.0$ ($c = 0.1$, MeOH).
851	Saponin 2 3*β*-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Api(f)	*Medicago truncatula*, aerial parts [300]. Amorphous powder. $C_{58}H_{92}O_{29}$: 1252.57. $[\alpha]_D^{20} = -12.1$ ($c = 0.1$, MeOH).
852	Saponin 3 3*β*-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Ara ^{4}↑ Xyl	*Medicago truncatula*, aerial parts [300]. Amorphous powder. $C_{63}H_{100}O_{33}$: 1384.61. $[\alpha]_D^{20} = -14.6$ ($c = 0.1$, MeOH).

Table 1 (cont.)

853	Saponin 4 3β-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Ara	*Medicago truncatula*, aerial parts [300]. Amorphous powder. $C_{58}H_{92}O_{29}$: 1252.57. $[\alpha]_D^{20} = -14.2$ ($c = 0.1$, MeOH).
854	Saponin 6 3β-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl	*Medicago truncatula*, aerial parts [300]. Amorphous powder. $C_{63}H_{100}O_{33}$: 1384.61. $[\alpha]_D^{20} = -22.5$ ($c = 0.1$, MeOH).
855	Saponin 7 3β-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Medicago truncatula*, aerial parts [300]. Amorphous powder. $C_{58}H_{92}O_{29}$: 1252.57. $[\alpha]_D^{20} = -29.5$ ($c = 0.1$, MeOH).
856	Saponin 8 3β-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Medicago truncatula*, aerial parts [300]. Amorphous powder. $C_{52}H_{82}O_{24}$: 1090.52. $[\alpha]_D^{20} = -20.1$ ($c = 0.1$, MeOH).
857	Saponin 9 3β-*O* ← Glc^3 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Ac	*Medicago truncatula*, aerial parts [300]. Amorphous powder. $C_{55}H_{86}O_{26}$: 1162.54. $[\alpha]_D^{20} = -17.8$ ($c = 0.1$, MeOH).
858	Saponin 3 3β-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Ara	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{52}H_{82}O_{24}$: 1090.52. M.p. 268–270°. $[\alpha]_D^{25} = -24.6$ ($c = 0.18$, MeOH).
859	Saponin 4 3β-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^3 ← Ara ^{4}↑ Xyl	*Medicago arborea* L., leaves [150]. $C_{57}H_{90}O_{28}$: 1222.56. Amorphous solid. M.p. 281–283°. $[\alpha]_D^{25} = -8.2$ ($c = 0.02$, MeOH).
860	Saponin 12 3β-*O* ← GlcA; 28-*O* ← Ara^2 ← Rha^3 ← Api(f) ^{4}↑ Xyl	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{57}H_{88}O_{29}$: 1236.54. M.p. 291–295°. $[\alpha]_D^{25} = -13.5$ ($c = 0.04$, MeOH).
861	Saponin 13 3β-*O* ← GlcA; 28-*O* ← Ara^2 ← Rha^3 ← Ara ^{4}↑ Xyl	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{57}H_{88}O_{29}$: 1236.54. M.p. 290–295°. $[\alpha]_D^{25} = -18.8$ ($c = 0.05$, MeOH).

Table 1 (cont.)

862	Saponin 14 3β-*O* ← GlcA; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{52}H_{80}O_{25}$: 1104.50. M.p. 273–275°. $[\alpha]_D^{25} = -8.5$ ($c = 0.03$, MeOH).
863	Saponin 16 3β-*O* ⟵ Glc^2 ⟵ Glc^2 ⟵ Ara; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Api(f) 4↑ Xyl	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{68}H_{108}O_{37}$: 1516.66. M.p. 293–296°. $[\alpha]_D^{25} = -14.3$ ($c = 0.06$, MeOH).
864	Saponin 17 3β-*O* ⟵ Glc^2 ⟵ Glc; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Ara 4↑ Xyl	*Medicago arborea* L., leaves [150]. Amorphous solid. $C_{63}H_{100}O_{33}$: 1384.61. M.p. 287–290°. $[\alpha]_D^{25} = -18.7$ ($c = 0.04$, MeOH).
865	Ageratoside A$_1$ 3β-*O* ⟵ Glc^4 ⟵ Xyl; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Api(f) 4↑ Ac	*Aster ageratoides* var. *ovatus* NAKAI (Compositae), ground part [303]. White powder. $C_{59}H_{92}O_{29}$: 1264.57. $[\alpha]_D^{22} = -42.8$ ($c = 1.0$, MeOH).
866	Ageratoside A$_2$ 3β-*O* ⟵ Glc^4 ⟵ Glc; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Api(f) 4↑ Ac	*Aster ageratoides* var. *ovatus*, ground part [303]. White powder. $C_{60}H_{94}O_{30}$: 1294.58. $[\alpha]_D^{22} = -38.9$ ($c = 1.0$, MeOH).
867	Ageratoside A$_3$ 3β-*O* ⟵ Glc^4 ⟵ Xyl; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Ara 4↑ Ac	*Aster ageratoides* var. *ovatus*, ground part [303]. White powder. $C_{59}H_{92}O_{29}$: 1264.57. $[\alpha]_D^{22} = -25.7$ ($c = 1.0$, MeOH).
868	Ageratoside A$_4$ 3β-*O* ⟵ Glc; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Ara 4↑ Ac	*Aster ageratoides* var. *ovatus*, ground part [303]. White powder. $C_{54}H_{84}O_{25}$: 1132.53. $[\alpha]_D^{22} = -16.7$ ($c = 1.0$, MeOH).
869	Ageratoside A$_5$ 3β-*O* ⟵ Glc; 28-*O* ⟵ Ara^2 ⟵ Rha^3 ⟵ Api(f) 4↑ Ac	*Aster ageratoides* var. *ovatus*, ground part [303]. White powder. $C_{54}H_{84}O_{25}$: 1132.53. $[\alpha]_D^{22} = -30.9$ ($c = 0.5$, MeOH).

Table 1 (cont.)

870	Herniaria saponin C 3*β*-*O* ⟵ GlcA^2⟵ Rha; Rha ↓ 3 28-*O*⟵ Fuc^2⟵ Rha ↑ 4 Ac	*Herniaria fontanesii* GAY (Caryophyllaceae), aerial parts [305]. Amorphous powder. $C_{62}H_{96}O_{30}$: 1320.60. $[\alpha]_D^{18} = -26.0$ ($c = 0.6$, MeOH).
871	Herniaria saponin D 3*β*-*O* ⟵ GlcA^2⟵ Rha; Rha ↓ 3 28-*O*⟵ Fuc^2⟵ Rha	*Herniaria fontanesii*, aerial parts [305]. Amorphous powder. $C_{60}H_{94}O_{29}$: 1278.59. $[\alpha]_D^{18} = -26.0$ ($c = 0.35$, MeOH).
Aglycone: (3β)-3,29-Dihydroxyolean-12-ene-23,28-dioic acid		
872	Saponin 2 28-*O* ← Glc^6 ← Gal	*Gypsophila capillaris* (FORSSK) (Caryophyllaceae), whole plant [306]. Amorphous solid. $C_{42}H_{66}O_{16}$: 826.44. M.p. 211–213°. $[\alpha]_D^{20} = +54.0$ ($c = 0.166$, MeOH).
Aglycone: (3β)-3-Hydroxy-2-oxoolean-12-ene-23,28-dioic acid		
873	Saponin 2 3*β*-*O* ⟵ Glc; 28-*O* ⟵ Glc^2⟵ Rha^3⟵ Api(f) ↑ 4 Xyl	*Polygala japonica*, whole plant [302]. White powder. $C_{58}H_{90}O_{28}$: 1234.56. M.p. 241–243°. $[\alpha]_D^{23} = -21.6$ ($c = 0.22$, MeOH).
Aglycone: Presenegenin (= (2β,3β)-2,3,27-Trihydroxyolean-12-ene-23,28-dioic acid)		
874	Bredemeyeroside B 3*β*-*O* ⟵ Glc; Rha Api(f) ↓ 3 ↓ 3 28-*O*⟵ Fuc^2⟵ Rha^4⟵ Xyl	*Bredemeyera floribunda* WILLD. (Polygalaceae), roots [307]. White powder. $C_{64}H_{102}O_{32}$: 1382.64. M.p. 254–256°. $[\alpha]_D = -8.0$ ($c = 1.0$, MeOH).
875	Bredemeyeroside D 3*β*-*O* ⟵ Glc; Rha ↓ 3 28-*O*⟵ Fuc^2⟵ Rha^4⟵ Xyl	*Bredemeyera floribunda* WILLD., roots [308]. White amorphous powder. $C_{59}H_{94}O_{28}$: 1250.59. M.p. 242–244°. $[\alpha]_D = -10.0$ ($c = 0.008$, MeOH).
876	Saponin 1 3*β*-*O* ⟵ Glc; (*E*)-cinnamoyl (4'-OMe) ↓ 4 28-*O*⟵ Fuc^2⟵ Rha^4⟵ Xyl^4⟵ Ara	*Polygala ruwenzoriensis* CHOD. (Polygalaceae), roots [309]. White amorphous powder. Isolated as a mixture with saponin 2. $C_{68}H_{100}O_{30}$: 1396.63.

Table 1 (cont.)

877	Saponin 2 3*β*-*O* ← Glc; (*Z*)-cinnamoyl (4'-OMe) ↓4 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^4 ← Ara	*Polygala ruwenzoriensis* CHOD., roots [309]. White amorphous powder. Isolated as a mixture with saponin 1. $C_{68}H_{100}O_{30}$: 1396.63.
878	Saponin 3 3*β*-*O* ← Glc; (*E*)-cinnamoyl (3',4'-di-OMe) ↓4 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^4 ← Ara	*Polygala ruwenzoriensis* CHOD., roots [309]. Isolated as a mixture with saponin 4. White amorphous powder. $C_{69}H_{102}O_{31}$: 1426.68.
879	Saponin 4 3*β*-*O* ← Glc; (*Z*)-cinnamoyl (3',4'-di-OMe) ↓4 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^4 ← Ara	*Polygala ruwenzoriensis* CHOD., roots [309]. Isolated as a mixture with saponin 3. White amorphous powder. $C_{69}H_{102}O_{31}$: 1426.68.
880	Saponin 5 3*β*-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^4 ← Gal	*Polygala ruwenzoriensis* CHOD., roots [309]. White amorphous powder. $C_{59}H_{94}O_{29}$: 1266.59. $[\alpha]^{25}_{D} = -14.0$ ($c = 0.1$, MeOH).
881	Saponin 6 3*β*-*O* ← Glc; Ac ↓4 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^4 ← Gal ↑3 (Fuc) ↑3 (Xyl) Api(f) Ara	*Carpolobia alba* G. DON (Polygalaceae) [309]. White amorphous powder. $C_{71}H_{112}O_{38}$: 1572.68. $[\alpha]^{25}_{D} = -20.0$ ($c = 0.1$, MeOH).
882	Saponin 7 3*β*-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^4 ← Gal ↑3 (Xyl) Glc	*Polygala arenaria* WILLD. (Polygalaceae) [309]. White amorphous powder. $C_{65}H_{104}O_{34}$: 1428.64. $[\alpha]^{25}_{D} = -10.0$ ($c = 0.1$, MeOH).
883	Arillatanoside A 3*β*-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Xyl	*Polygala arillata* BUCH-HAM (Polygalaceae), stem bark [310][311]. Amorphous powder. $C_{58}H_{92}O_{28}$: 1236.58. $[\alpha]^{19}_{D} = -4.7$ ($c = 0.43$, MeOH).
884	Arillatanoside B 3*β*-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^4 ← Gal ↑4 (Fuc) ↑3 (Xyl) Ac Xyl	*Polygala arillata*, stem bark [310] [311]. White amorphous solid. $C_{66}H_{104}O_{34}$: 1440.64. $[\alpha]^{19}_{D} = +5.4$ ($c = 0.32$, MeOH).

Table 1 (cont.)

885	Arillatanoside C 3β-*O* ⟵ Glc; 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl^4 ⟵ Gal (Xyl: ^{3}↑ Xyl)	*Polygala arillata*, stem bark [310] [311]. White amorphous solid. $C_{64}H_{102}O_{33}$: 1398.63. $[\alpha]_D^{19} = +8.0$ ($c = 0.41$, MeOH).
886	Polygalasaponin XXVIII 3β-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha ^{4} ← Xyl	*Polygala japonica* Houtt. (Polygalaceae), root [312]. Amorphous powder. $C_{53}H_{84}O_{24}$: 1104.54. $[\alpha]_D^{30} = -1.0$ ($c = 0.52$, MeOH).
887	Polygalasaponin XXIX 3β-*O* ← Glc; 28-*O* ← Fuc^2 ← Rha ^{4} ← Xyl^4 ← Api(f)^5 ← Gal	*Polygala japonica*, roots [312]. Amorphous powder. $C_{64}H_{102}O_{33}$: 1398.63. $[\alpha]_D^{25} = -11.2$ ($c = 2.82$, MeOH).
888	Polygalasaponin XXX 3β-*O* ⟵ Glc; (*E*)-cinnamoyl (4'-OMe) ↓^{4} 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl^4 ⟵ Gal ^{3}↑ Glc	*Polygala japonica*, roots [312]. Amorphous powder. $C_{75}H_{112}O_{36}$: 1588.69. $[\alpha]_D^{30} = -1.1$ ($c = 0.46$, MeOH).
889	Polygalasaponin XXXI 3β-*O* ⟵ Glc; (*E*)-cinnamoyl (3',4',5'-tri-OMe) ↓^{4} 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl^3 ⟵ Ara (Rha: ^{3}↑ Api(f))	*Polygala japonica*, root [312]. Amorphous powder. $C_{75}H_{112}O_{36}$: 1588.69. $[\alpha]_D^{30} = -12.0$ ($c = 0.25$, MeOH).
890	Polygalasaponin XXXII 3β-*O* ⟵ Glc; (*E*)-cinnamoyl (4'-OMe) ↓^{4} 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl^3 ⟵ Ara (Fuc: ^{3}↑ Rha; Rha: ^{3}↑ Api(f))	*Polygala japonica*, root [312]. Amorphous powder. $C_{79}H_{118}O_{38}$: 1674.73. $[\alpha]_D^{26} = -6.6$ ($c = 0.48$, MeOH).
891	Polygalasaponin XXXIII 3β-*O* ⟵ Glc; 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl ^{4}↑ Ac	*Polygala fallax* Hemsl. (Polygalaceae), roots [313]. Amorphous powder. $C_{55}H_{86}O_{25}$: 1146.55. $[\alpha]_D^{25} = -4.9$ ($c = 0.44$, MeOH).
892	Polygalasaponin XXXIV 3β-*O* ⟵ Glc; 28-*O* ⟵ Fuc^2 ⟵ Rha^4 ⟵ Xyl^4 ⟵ Gal ^{4}↑ Ac	*Polygala fallax*, roots [313]. Amorphous powder. $C_{61}H_{96}O_{30}$: 1308.60. $[\alpha]_D^{25} = +1.6$ ($c = 0.64$, MeOH).

Table 1 (cont.)

893	Polygalasaponin XXXV 3β-O ⟵ Glc; Ac 4↓ 28-O⟵ Fuc^2⟵ Rha^4⟵ Xyl^4⟵ Gal 3↑ Ac	*Polygala fallax*, roots [313]. Amorphous powder. $C_{63}H_{98}O_{31}$: 1350.61. $[\alpha]_D^{25} = -2.1$ ($c = 0.74$, MeOH).
894	Polygalasaponin XXXVI 3β-O ⟵ Glc; Ac 4↓ 28-O⟵ Fuc^2⟵ Rha^4⟵ Xyl^4⟵ Gal 3↑ (Fuc) 3↑ (Rha) Ac Api(f)^5⟵Ac	*Polygala fallax*, roots [313]. Amorphous powder. $C_{70}H_{108}O_{36}$: 1524.66. $[\alpha]_D^{25} = -12.1$ ($c = 0.40$, MeOH).
895	Polygalasaponin XXXVII 3β-O ⟵ Glc^2⟵ Glc; Ac 3↓ 28-O⟵ Fuc^2⟵ Rha^4⟵ Xyl	*Polygala fallax*, roots [313]. Amorphous powder. $C_{61}H_{96}O_{30}$: 1308.60. $[\alpha]_D^{25} = +19.2$ ($c = 0.46$, MeOH).
896	Polygalasaponin XXXVIII 3β-O ⟵ Glc^2⟵ Glc; Ac 4↓ 28-O⟵ Fuc^2⟵ Rha^4⟵ Xyl^4⟵ Gal	*Polygala fallax*, roots [313]. Amorphous powder. $C_{67}H_{106}O_{35}$: 1470.65. $[\alpha]_D^{25} = +3.7$ ($c = 0.50$, MeOH).
897	Polygalasaponin XXXIX 3β-O ⟵ Glc^2⟵ Glc; Ac 4↓ 28-O⟵ Fuc^2⟵ Rha^4⟵ Xyl 3↑ Rha	*Polygala fallax*, roots [313]. Amorphous powder. $C_{67}H_{106}O_{34}$: 1454.66. $[\alpha]_D^{25} = -0.8$ ($c = 0.55$, MeOH1).
898	Polygalasaponin XL 3β-O ⟵ Glc^2⟵ Glc; Ac 4↓ 28-O⟵ Fuc^2⟵ Rha^4⟵ Xyl^4⟵ Gal 3↑ (Fuc) 3↑ (Rha) Ac Api(f)	*Polygala fallax*, roots [313]. Amorphous powder. $C_{74}H_{116}O_{40}$: 1644.70. $[\alpha]_D^{25} = -6.9$ ($c = 0.45$, MeOH).
899	Polygalasaponin XLI 3β-O ⟵ Glc^2⟵ Glc; Ac 4↓ 28-O⟵ Fuc^2⟵ Rha^4⟵ Xyl^4⟵ Gal 3↑ (Fuc) 3↑ (Rha) Ac Api(f)^5⟵ Ac	*Polygala fallax*, roots [313]. Amorphous powder. $C_{76}H_{118}O_{41}$: 1686.71. $[\alpha]_D^{25} = -6.5$ ($c = 0.54$, MeOH).

Table 1 (cont.)

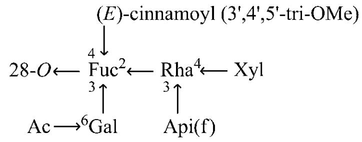
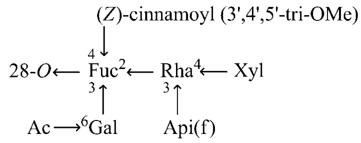
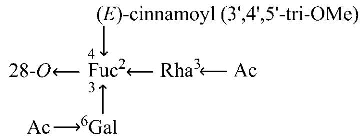
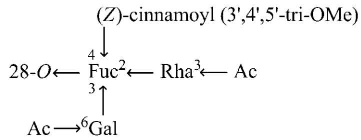
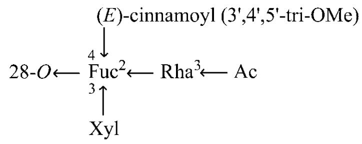
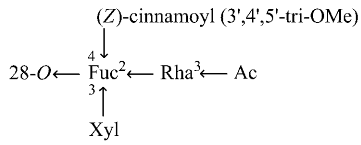
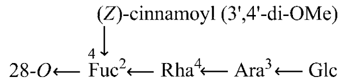
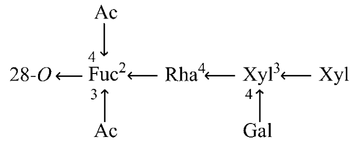
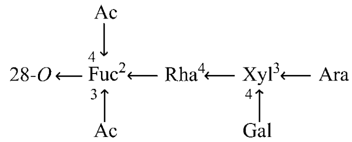
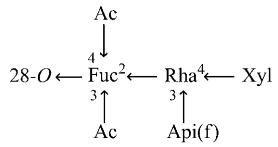
900	Glycoside 1 3β-*O* ⟵ Glc; 	*Muraltia heisteria* (L.) DC., roots, *M. satureioides* DC (Polygalaceae), roots [314]. Isolated as a mixture with its (*Z*)-isomer. White powder. $C_{78}H_{116}O_{38}$: 1660.71.
901	Glycoside 2 3β-*O* ⟵ Glc; 	*Muraltia heisteria*, roots; *M. satureioides*, roots [314]. Isolated as a mixture with its (*E*)-isomer. White powder. $C_{78}H_{116}O_{38}$: 1660.71.
902	Glycoside 3 3β-*O* ⟵ Glc; 	*Muraltia heisteria*, roots [314]. Isolated as a mixture with its (*Z*)-isomer. White powder. $C_{70}H_{102}O_{31}$: 1438.64.
903	Glycoside 4 3β-*O* ⟵ Glc; 	*Muraltia heisteria*, roots [314]. Isolated as a mixture with its (*E*)-isomer. White powder. $C_{70}H_{102}O_{31}$: 1438.64.
904	Glycoside 5 3β-*O* ⟵ Glc; 	*Muraltia heisteria*, roots [314]. Isolated as a mixture with its (*Z*)-isomer. White powder. $C_{67}H_{98}O_{29}$: 1366.62.
905	Glycoside 6 3β-*O* ⟵ Glc; 	*Muraltia heisteria*, roots [314]. Isolated as a mixture with its (*E*)-isomer. White powder. $C_{67}H_{98}O_{29}$: 1366.62.

Table 1 (cont.)

906	Saponin 1 3*β*-*O* ⟵ Glc; (*E*)-cinnamoyl (4'-OMe) ↓4 28-*O*⟵ Fuc²⟵ Rha⁴⟵ Xyl³⟵ Glc 4↑ Gal	*Polygala arenaria* Willd. (Polygalaceae), roots [315]. Isolated as a mixture with its (*Z*)-isomer. White powder. $C_{75}H_{112}O_{36}$: 1588.69.
907	Saponin 2 3*β*-*O* ⟵ Glc; (*Z*)-cinnamoyl (4'-OMe) ↓4 28-*O*⟵ Fuc²⟵ Rha⁴⟵ Xyl³⟵ Glc 4↑ Gal	*Polygala arenaria*, roots [315]. Isolated as a mixture with its (*E*)-isomer. White powder. $C_{75}H_{112}O_{36}$: 1588.69.
908	Saponin 3 3*β*-*O* ⟵ Glc; (*E*)-cinnamoyl (3',4'-di-OMe) ↓4 28-*O*⟵ Fuc²⟵ Rha⁴⟵ Xyl³⟵ Glc 4↑ Gal	*Polygala arenaria*, roots [315]. Isolated as a mixture with its (*Z*)-isomer. White powder. $C_{76}H_{114}O_{37}$: 1618.70.
909	Saponin 4 3*β*-*O* ⟵ Glc; (*Z*)-cinnamoyl (3',4'-di-OMe) ↓4 28-*O*⟵ Fuc²⟵ Rha⁴⟵ Xyl³⟵ Glc 4↑ Gal	*Polygala arenaria*, roots [315]. Isolated as a mixture with its (*E*)-isomer. White powder. $C_{76}H_{114}O_{37}$: 1618.70.
910	Saponin 5 3*β*-*O* ⟵ Glc; (*E*)-cinnamoyl (4'-OMe) ↓4 28-*O*⟵ Fuc²⟵ Rha⁴⟵ Ara³⟵ Glc	*Polygala arenaria*, roots [315]. Isolated as a mixture with its (*Z*)-isomer. White powder. $C_{69}H_{102}O_{31}$: 1426.68.
911	Saponin 6 3*β*-*O* ⟵ Glc; (*Z*)-cinnamoyl (4'-OMe) ↓4 28-*O*⟵ Fuc²⟵ Rha⁴⟵ Ara³⟵ Glc	*Polygala arenaria*, roots [315]. Isolated as a mixture with its (*E*)-isomer. White powder. $C_{69}H_{102}O_{31}$: 1426.68.
912	Saponin 7 3*β*-*O* ⟵ Glc; (*E*)-cinnamoyl (3',4'-di-OMe) ↓4 28-*O*⟵ Fuc²⟵ Rha⁴⟵ Ara³⟵ Glc	*Polygala arenaria*, roots [315]. Isolated as a mixture with its (*Z*)-isomer. White powder. $C_{70}H_{104}O_{32}$: 1456.65.

Table 1 (cont.)

913	Saponin 8 3β-*O* ← Glc; 3β-*O* ← Glc;  	*Polygala arenaria*, roots [315]. Isolated as a mixture with its (*E*)-isomer. White powder. $C_{70}H_{104}O_{32}$: 1456.65.
914	Compound 1 3β-*O* ← Glc;  	*Carpolobia alba* G. DON, roots; *C. lutea* D. GON (Polygalaceae), roots [316]. White powder. $C_{68}H_{106}O_{35}$: 1482.70. $[\alpha]^{25}_{D} = +8.8$ ($c = 0.057$, MeOH).
915	Compound 2 3β-*O* ← Glc;  	*Carpolobia alba*, roots; *C. lutea*, roots [316]. White powder. $C_{68}H_{106}O_{35}$: 1482.70. $[\alpha]^{25}_{D} = -8.3$ ($c = 0.06$, MeOH).
916	Compound 3 3β-*O* ← Glc;  	*Carpolobia lutea*, roots [316]. White powder. $C_{62}H_{96}O_{30}$: 1320.60. $[\alpha]^{25}_{D} = -5.6$ ($c = 0.063$, MeOH).

Aglycone: Serratagenic acid (=(3β)-3-Hydroxyolean-12-ene-28,29-dioic acid)

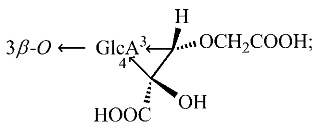
917	Acanthopanaxoside C 3β-*O* ← Ara^{2} ← Rha	*Acanthopanax senticosus*, leaves [139]. Amorphous powder. $C_{41}H_{64}O_{13}$: 764.43. $[\alpha]^{25}_{D} = -3.2$ ($c = 0.8$, MeOH).
918	Eupteleasaponin X 3β-*O* ← Glc^{4} ← Rha	*Euptelea polyandra*, leaves [126]. Colorless crystals ($CHCl_3$/MeOH). $C_{42}H_{66}O_{14}$: 794.45. M.p. 237–239°. $[\alpha]^{26}_{D} = +12.1$ ($c = 0.1$, MeOH).
919	Basellasaponin D  28-*O* ← Glc	*Basella rubra*, aerial parts [205]. Fine crystals (MeOH/H_2O). $C_{47}H_{68}O_{22}$: 984.42. M.p. 215–217°. $[\alpha]^{27}_{D} = +24.0$ ($c = 0.1$, MeOH).

Table 1 (cont.)

Aglycone: 28-Methylserratagenate (=(3β)-3-Hydroxy-28-methoxy-28-oxoolean-12-en-29-oic acid)		
920	Saponin 2 3β-*O* ← Glc^2 ← Xyl	*Taverniera aegyptiaca* BOISS (Fabaceae), roots and stem bark [317]. White powder. $C_{42}H_{66}O_{14}$: 794.45.
921	Saponin 3 3β-*O* ← Glc^2 ← Rha	*Taverniera aegyptiaca*, roots and stem bark [317]. White powder. $C_{43}H_{68}O_{14}$: 808.46.
Aglycone: Spergulagenic acid (=(3β)-3-Hydroxyolean-12-ene-28,30-dioic acid)		
922	Saponin 6 3β-*O* ← Glc^2 ← Glc^2 ← Rha	*Phytolacca icosandra*, berries [318]. White powder. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{23} = +22.0$ ($c = 0.1$, MeOH).
Aglycone: Serjanic acid (=(3β)-3-Hydroxy-30-methoxy-30-oxoolean-12-en-28-oic acid)		
923	Saponin 3 3β-*O* ← Glc^2 ← Glc	*Phytolacca icosandra* L. (Phytolaccaceae), berries [318]. White powder. $C_{43}H_{68}O_{15}$: 824.46. $[\alpha]_D^{23} = +49.0$ ($c = 0.1$, MeOH).
924	Saponin 4 3β-*O* ← Glc^3 ← Glc^3 ← Glc	*Phytolacca icosandra*, berries [318]. White powder. $C_{49}H_{78}O_{20}$: 986.51. $[\alpha]_D^{23} = +47.0$ ($c = 0.1$, MeOH).
925	Saponin 5 3β-*O* ← Glc^2 ← Glc^2 ← Rha	*Phytolacca icosandra*, berries [318]. White powder. $C_{49}H_{78}O_{19}$: 970.51. $[\alpha]_D^{23} = +21.0$ ($c = 0.1$, MeOH).
926	Compound 7 3β-*O* ← Glc^2 ← Glc^2 ← Xyl; 28-*O* ← Glc	*Diploclisia glaucescens* (Menispermaceae), fruits [319]. Colorless powder. $C_{54}H_{86}O_{24}$: 1118.55. $[\alpha]_D^{25} = +23.3$ ($c = 1.13$, MeOH).
927	Saponin 3 3β-*O* ← Ara^3 ← Glc; 28-*O* ← Glc	*Chenopodium quinoa* (Chenopodiaceae), seeds [320]. White powder. $C_{48}H_{76}O_{19}$: 956.50.
Aglycone: (3β,16α)-3,16-Dihydroxyolean-12-ene-28,30-dioic acid		
928	Saponin 3 3β-*O* ⟵ $GlcA^2$ ⟵ Xyl ^{3}↑ Ara	*Schefflera divaricata* MERILL. (Araliaceae), aerial parts [321]. $C_{46}H_{72}O_{19}$: 928.47. $[\alpha]_D^{25} = +9.0$ ($c = 1.0$, MeOH).

Table 1 (cont.)

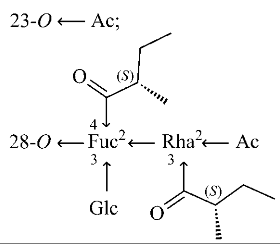
Aglycone: (3β,16α)-3-Hydroxy-16-[(3-hydroxy-3-methylbutanoyl)oxy]olean-12-ene-28,30-dioic acid		
929	Saponin 4 3β-*O* ⟵ GlcA^2 ⟵ Xyl ^{3}↑ Ara	*Schefflera divaricata*, aerial parts [321]. $C_{51}H_{80}O_{21}$: 1028.52. $[\alpha]_D^{25} = +3.4$ ($c = 1.0$, MeOH).
Aglycone: Phytolaccagenic acid (=(3β)-3,23-Dihydroxy-30-methoxy-30-oxoolean-12-en-28-oic acid)		
930	Saponin 1 3β-*O* ← GlcA^3 ← Ara; 28-*O* ← Glc	*Chenopodium quinoa* WILLD. (Chenopodiaceae), seeds [322]. White powder. $C_{48}H_{74}O_{21}$: 986.47. $[\alpha]_D = +10.8$ ($c = 0.003$, MeOH).
931	Saponin 3 3β-*O* ← Glc^2 ← Xyl^3 ← Glc; 28-*O* ← Glc	*Chenopodium quinoa* (Chenopodiaceae), seeds [322]. White powder. $C_{54}H_{86}O_{25}$: 1134.55. $[\alpha]_D = +3.0$ ($c = 0.004$, MeOH).
932	Saponin 5 3β-*O* ← Ara^3 ← Glc	*Chenopodium quinoa* (Chenopodiaceae), seeds [323]. Amorphous powder. $C_{42}H_{66}O_{15}$: 810.44.
933	Saponin 2 3β-*O* ← Glc^3 ← Glc; 28-*O* ← Glc	*Diploclisia glaucescens* (Bl.) DIELS (Menispermaceae), fruits [324]. $C_{49}H_{78}O_{21}$: 1002.50. M.p. 214–218°. $[\alpha]_D^{25} = +48.3$ ($c = 0.65$, MeOH).
934	Saponin 3 3β-*O* ← Glc^2 ← Glc^2 ← Rha; 28-*O* ← Glc	*Diploclisia glaucescens*, fruits [324]. $C_{55}H_{88}O_{25}$: 1148.56. M.p. 227–230°. $[\alpha]_D^{25} = +5.3$ ($c = 0.7$, MeOH).
935	Saponin 19 3β-*O* ⟵ GlcA^2 ⟵ Gal; (2*S*)-2-methylbutanoyl ↓$_4$ 28-*O* ⟵ Fuc^2 ⟵ Rha ^{3}↑ Glc	*Quillaja saponaria* MOLINA, bark [171]. $C_{66}H_{104}O_{31}$: 1392.70.
936	Saponin S13 3β-*O* ⟵ GlcA^2 ⟵ Gal; 	*Quillaja saponaria*, bark [278]. Amorphous powder. $C_{75}H_{116}O_{34}$: 1560.73.

Table 1 (cont.)

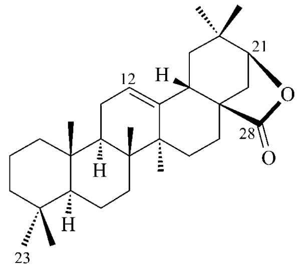
937	Gycoside 1 3β-*O* ← Xyl^4 ← Glc	*Phytolacca americana* L. (Phytolacaceae), stem [325]. Amorphous powder. $C_{42}H_{66}O_{15}$: 810.44. $[\alpha]_D^{21.8} = +46.1$ ($c = 0.74$, MeOH).
Aglycone: Cincholic acid (=(3β)-3-Hydroxyolean-12-ene-27,28-dioic acid)		
938	Saponin 1 3β-*O* ← Glc	*Cephalanthus occidentalis* L. (Rubiaceae), roots and stem bark [326]. Colorless powder. $C_{36}H_{56}O_{10}$: 648.41. $[\alpha]_D^{25} = +36.5$ ($c = 0.1$, MeOH).
939	Saponin 2 28-*O* ← Glc	*Cephalanthus occidentalis*, roots and stem bark [326]. Colorless powder. $C_{36}H_{56}O_{10}$: 648.41. $[\alpha]_D^{25} = +17.6$ ($c = 0.1$, MeOH).
940	Saponin 3 3β-*O* ← Fuc^4 ← Glc	*Cephalanthus occidentalis*, roots and stem bark [326]; *Uncaria tomentosa* [327]. Colorless powder. $C_{42}H_{66}O_{14}$: 794.45. $[\alpha]_D^{25} = +21.3$ ($c = 0.1$, MeOH).
941	Saponin 4 3β-*O* ← Fuc^4 ← Glc; 28-*O* ← Glc	*Cephalanthus occidentalis*, roots and stem bark [326]; *Uncaria tomentosa* [327]. Colorless powder. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{25} = +30.9$ ($c = 0.1$, MeOH).
942	Saponin 5 3β-*O* ← Glc; 28-*O* ← Glc^2 ← Ara	*Cephalanthus occidentalis*, roots and stem bark [326]. Colorless powder. $C_{47}H_{74}O_{19}$: 942.48. $[\alpha]_D^{25} = +23.2$ ($c = 0.1$, MeOH).
943	Glycoside 2 3β-*O* ← Fuc; 28-*O* ← Glc	*Uncaria tomentosa* (Rubiaceae) [327]. Colorless amorphous powder. $C_{42}H_{66}O_{14}$: 794.45. $[\alpha]_D^{25} = +36.0$ ($c = 1.21$, MeOH).
Aglycone: (3β,6β)-3,6-Dihydroxyolean-12-ene-23,29-dioic acid		
944	Gomphrenoside 3β-*O* ← Ara; 29-*O* ← Glc	*Gomphrena globosa* L. (Amaranthaceae), aerial parts [328]. White powder. $C_{41}H_{64}O_{15}$: 796.42. M.p. 185°.

Table 1 (cont.)

Aglycone: (2β,3β,16α,21β)-2,3,16-Trihydroxy-28-oxo-21,28-epoxyolean-12-en-23-oic acid

945	Ageratoside C_1 3β-*O* ← Glc[4] ← Xyl	*Aster ageratoides* var. *ovatus*, ground part [303]. White powder. $C_{41}H_{62}O_{16}$: 810.40. $[\alpha]_D^{22} = -2.3$ ($c = 1.0$, MeOH).

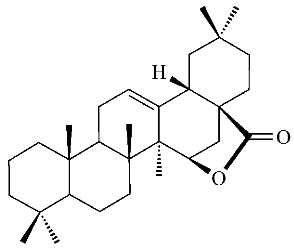
3.2. Δ[12]-Oleanan-28,21β-olide Type



Aglycone: Machaerinic acid γ-lactone (=(3β,21β)-3-Hydroxy-21,28-epoxyolean-12-en-28-one)

946	Saponin 4 3β-*O* ⟵ Glc[2] ⟵ Glc 6↑ Ara	*Albizia gummifera*, stem bark [121]. White flakes (MeOH). $C_{47}H_{74}O_{17}$: 910.49. M.p. 289–292°. $[\alpha]_D^{20} = -15.0$ ($c = 0.1$, MeOH).
947	Saponin 5 3β-*O* ← Glc[2] ← GlcA	*Albizia gummifera*, stem bark [121]. White powder. $C_{42}H_{64}O_{14}$: 792.43. M.p. 295–297° (dec.). $[\alpha]_D^{20} = -21.0$ ($c = 0.09$, MeOH).

3.3. Δ[12]-Oleanan-28,15β-olide Type

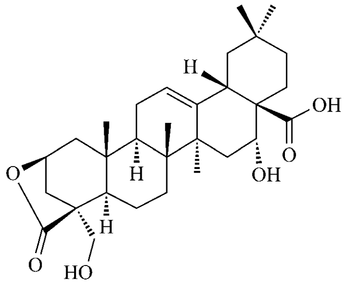


Aglycone: Dumortierigenin (=(3β,15β,22α)-3,22-Dihydroxy-15,28-epoxyolean-12-en-28-one)

948	Dumortierinoside A 3β-*O* ← GlcA[2] ← Glc[2] ← Rha	*Isolatocereus dumortieri* BACKBG. (Cactaceae) [329]. White powder. $C_{48}H_{74}O_{19}$: 954.48. M.p. > 300°. $[\alpha]_D^{20} = -45.4$ ($c = 0.011$, MeOH).

Table 1 (cont.)

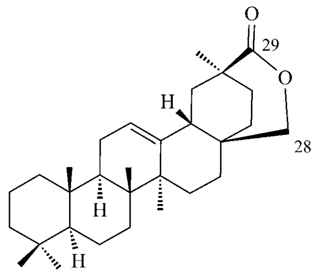
3.4. Δ^{12}-Oleanan-24,2*β*-olide Type



Aglycone: Platycogenic acid A lactone (=(2β,3β,16α)-3,16,23-Trihydroxy-24-oxo-2,24-epoxyolean-12-en-28-oic acid)

949	Platycoside M-1 3*β*-*O*←Glc	*Platycodon grandiflorum A. DC.* (Campanulaceae), roots [330]. White powder. $C_{36}H_{54}O_{12}$: 678.36.
950	Platycoside M-2 3*β*-*O*←Glc; 28-*O*←Ara^2←Rha	*Platycodon grandiflorum*, roots [330]. White powder. $C_{47}H_{72}O_{20}$: 956.46.
951	Platycoside M-3 3*β*-*O*←Glc; 28-*O*←Ara^2←Rha^4←Xyl	*Platycodon grandiflorum*, roots [330]. White powder. $C_{52}H_{80}O_{24}$: 1088.50.

3.5. Δ^{12}-Oleanan-29,28*β*-olide Type

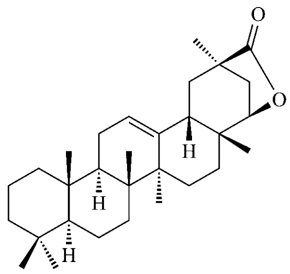


Aglycone: (3β,16α)-3,16-Dihydroxy-28,29-epoxyolean-12-en-29-one

952	Coumoside A 3*β*-*O*⟵Ara^4⟵Glc^6⟵Glc (Ara: ^{2}↑ Glc; Glc^6: ^{2}↑ Ara)	*Cyclamen coum*, whole plant [331]. Colorless crystals. $C_{58}H_{92}O_{27}$: 1220.60. M.p. 282° (dec.). $[\alpha]_D = +17.0$ ($c = 0.0004$, 95% EtOH).
953	Coumoside B 3*β*-*O*⟵Ara^2⟵Glc (Ara: ^{4}↑ Glc^2⟵Xyl)	*Cyclamen coum*, whole plant [332]. Colorless crystals. $C_{58}H_{92}O_{27}$: 1220.58. M.p. 271° (dec.). $[\alpha]_D^{25} = -4.0$ ($c = 0.002$, 95% EtOH).

Table 1 (cont.)

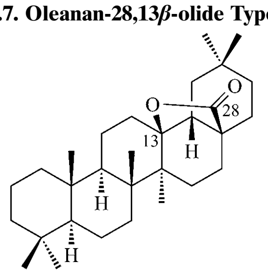
3.6. Δ^{12}-Oleanan-29,22β-olide Type



Aglycone: 24-Hydroxy-11-deoxoglabrolide (= (3β,22β)-3,24-Dihydroxy-22,29-epoxyolean-12-en-29-one)

954	Albiziasaponin A 3β-*O* ← GlcA^2 ← GlcA^2 ← Rha	*Albizia myriophylla* Benth. (Leguminosae), stems [291]. Colorless crystals ($CHCl_3$/MeOH). $C_{48}H_{72}O_{20}$: 968.46. M.p. 226–229°. $[\alpha]_D^{24} = -28.2$ ($c = 0.1$, MeOH).
955	Albiziasaponin C 3β-*O* ⟵ GlcA^2 ⟵ Glc^2 ⟵ Rha (Glc ³↑ Glc)	*Albizia myriophylla*, stems [291]. Colorless crystals ($CHCl_3$/MeOH). $C_{54}H_{84}O_{24}$: 1116.54. M.p. 269–272°. $[\alpha]_D^{24} = -12.6$ ($c = 0.1$, MeOH).
956	Albiziasaponin D 3β-*O* ⟵ GlcA^2 ⟵ Glc^2 ⟵ Rha (Glc ³↑ Xyl)	*Albizia myriophylla*, stems [291]. Colorless crystals ($CHCl_3$/MeOH). $C_{53}H_{82}O_{23}$: 1086.52. M.p. 238–240°. $[\alpha]_D^{24} = -13.3$ ($c = 0.1$, MeOH).
957	Albiziasaponin E 3β-*O* ⟵ GlcA^2 ⟵ GlcA^2 ⟵ Rha (GlcA ³↑ Xyl)	*Albizia myriophylla*, stems [291]. Colorless crystals ($CHCl_3$/MeOH). $C_{53}H_{80}O_{24}$: 1100.50. M.p. 240–242°. $[\alpha]_D^{24} = -11.4$ ($c = 0.1$, MeOH).

3.7. Oleanan-28,13β-olide Type



Aglycone: (3β,12α)-3,12-Dihydroxy-13,28-epoxyoleanan-28-one

958	Kochianoside III 3β-*O* ← GlcA^3 ← Xyl	*Kochia scoparia*, fruits [172]. Colorless crystals. $C_{41}H_{64}O_{14}$: 780.43. M.p. 224–225°. $[\alpha]_D^{26} = +47.9$ ($c = 0.6$, MeOH).

Table 1 (cont.)

Aglycone: (3β,16α,22α)-3,22-Dihydroxy-28-oxo-13,28-epoxyoleanan-16-yl acetate

959	Capilliposide G 3β-*O* ⟵ Ara[2] ⟵ Glc; 4↑ Glc[2] ⟵ Xyl 22α-*O* ⟵ Glc	*Lysimachia capillipes* HEMST. (Primulaceae), whole plant [333]. White powder. M.p. 229–231°. $C_{60}H_{96}O_{29}$: 1280.60. $[\alpha]_D^{20} = -5.0$ ($c = 0.50$, MeOH).
960	Capilliposide H 3β-*O* ⟵ Ara[2] ⟵ Glc; 4↑ Glc[2] ⟵ Xyl 22α-*O* ⟵ Glc	*Lysimachia capillipes*, whole plant [333]. White powder. $C_{61}H_{98}O_{29}$: 1294.62. M.p. 230–232°. $[\alpha]_D^{20} = -5.2$ ($c = 0.50$, MeOH).

Aglycone: Eupteleogenin (=(4aS,6aS,6bR,8aR,10S,12aS,12bR,12cS,13aS,13bS,13cR)-10-Hydroxy-6a,6b,9,9,12a-pentamethyl-2-methylideneoctadecahydro-2H,5H-13b,4a-(epoxymethano)piceno[13,14-b]oxiren-15-one)

961	Eupteleasaponin VI 3β-*O* ⟵ Glc[2] ⟵ Rha 3↑ Glc	*Euptelea polyandra* SIEB et ZUCC. (Eupteleaceae), leaves [126]. Colorless crystals ($CHCl_3$/MeOH). $C_{47}H_{72}O_{18}$: 924.47. M.p. 184–187°. $[\alpha]_D^{25} = +46.8$ ($c = 0.1$, MeOH).
962	Eupteleasaponin VI acetate Ac 6↓ 3β-*O* ⟵ Glc[2] ⟵ Rha 3↑ Glc	*Euptelea polyandra*, leaves [126]. Colorless crystals ($CHCl_3$/MeOH). $C_{49}H_{74}O_{19}$: 966.48. M.p. 180–184°. $[\alpha]_D^{26} = +31.9$ ($c = 0.1$, MeOH).
963	Eupteleasaponin VII Rha 4↓ 3β-*O* ⟵ Glc[2] ⟵ Rha 3↑ Gal	*Euptelea polyandra*, leaves [126]. Colorless crystals ($CHCl_3$/MeOH). $C_{53}H_{82}O_{22}$: 1070.53. M.p. 168–172°. $[\alpha]_D^{26} = +14.6$ ($c = 0.1$, MeOH).

Aglycone: (3β,16α)-3,16-Dihydroxy-13,28-epoxyoleanan-28-one

964	Ardisianoside H 3β-*O* ⟵ Ara[2] ⟵ Glc 4↑ Glc[2] ⟵ Xyl 3↑ Glc[3] ⟵ Glc 4↑ Glc	*Ardisia japonica*, whole plant [19]. Amorphous powder. $C_{70}H_{114}O_{37}$: 1546.70. $[\alpha]_D^{22} = -19.4$ ($c = 1.0$, MeOH).

Aglycone: (3β,16α)-3,16,30-Trihydroxy-13,28-epoxyoleanan-28-one

965	Ardisianoside I 3β-*O* ⟵ Ara[2] ⟵ Glc 4↑ Glc[2] ⟵ Rha	*Ardisia japonica*, whole plant [19]. Amorphous powder. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]_D^{22} = -29.4$ ($c = 1.0$, MeOH).

Table 1 (cont.)

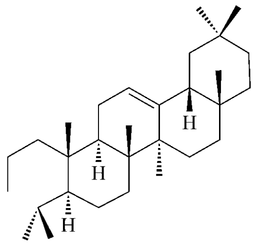
Aglycone: (3β,16α)-3,16-Dihydroxy-28-oxo-13,28-epoxyoleanan-30-al

966 Ardisianoside J

3β-*O* ⟵ Ara[2] ⟵ Glc
(4 ↑ Glc[2] ⟵ Rha)

Ardisia japonica, whole plant [19].
Amorphous powder.
$C_{53}H_{84}O_{23}$: 1088.54.
$[\alpha]_D^{22} = -28.2$ ($c = 0.3$, MeOH).

3.8. Δ^{12}-3,4-Secooleanane Type



*Aglycone: (16α)-3,16-Dihydroxy-3,4-secooleanan-4(24),12-dien-23,28-dioic acid (=(1*R*,2*R*,4a*R*,4b*S*,6*R*,6a*R*,10a*S*,12a*R*)-2-(1-Carboxyethenyl)-1,3,4,4a,4b,5,6,7,8,9,10,10a,12,12a-tetradecahydro-6-hydroxy-1-(3-hydroxypropyl)-1,4a,4b,9,9-pentamethylchrysene-6a(2*H*)-carboxylic acid)*

967 Sinocrassuloside IV

28-*O* ⟵ Glc[6] ⟵ Glc[6] ⟵ [(3*R*)-3-hydroxy-3-methyl glutaryl]

Sinocrassula asclepiadea (Caryophyllaceae), roots [283].
White amorphous powder.
$C_{48}H_{74}O_{20}$: 970.48.
$[\alpha]_D^{26} = +22.6$ ($c = 0.031$, MeOH).

968 Sinocrassuloside V

28-*O* ⟵ Glc[6] ⟵ Glc[6] ⟵ [(3*R*)-3-hydroxy-3-methyl glutaryl]
(3 ↑ Glc)

Sinocrassula asclepiadea, roots [283].
White amorphous powder.
$C_{54}H_{84}O_{25}$: 1132.53.
$[\alpha]_D^{26} = +39.7$ ($c = 0.026$, MeOH).

*Aglycone: 3,4-seco-16α-Hydroxygypsogenic Acid (=(1*S*,2*S*,4a*R*,4b*S*,6*R*,6a*R*,10a*S*,12a*R*)-2-(1-Carboxyethyl)-1,3,4,4a,4b,5,6,7,8,9,10,10a,12,12a-tetradecahydro-6-hydroxy-1-(3-hydroxypropyl)-1,4a,4b,9,9-pentamethylchrysene-6a(2*H*)-carboxylic acid)*

969 Saponarioside K

28-*O* ⟵ Glc[6] ⟵ Glc
(3 ↑ Glc)

Saponaria officinalis, whole plant [298].
Amorphous solid.
$C_{48}H_{76}O_{21}$: 988.49.
$[\alpha]_D^{22} = +6.0$ ($c = 0.6$, MeOH).

3.9. $\Delta^{12,29}$-30-Noroleanane Type

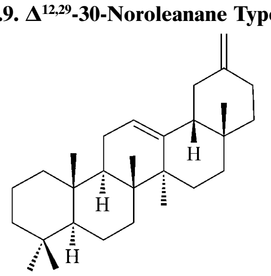


Table 1 (cont.)

Aglycone: Akebonoic acid (=(4aS,6aS,6bR,8aR,10S,12aR,12bR,14bS)-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-Octadecahydro-10-hydroxy-6a,6b,9,9,12a-pentamethyl-2-methylidenepicene-4a(2H)-carboxylic acid)		
970	Eupteleasaponin XII 3β-*O* ← Glc^3 ← Ara; 4↑ Rha 28-*O* ← Glc	*Euptelea polyandra*, leaves [126]. Colorless crystals ($CHCl_3$/MeOH). $C_{52}H_{82}O_{21}$: 1042.57. M.p. 175–177°. $[\alpha]_D^{25} = +33.9$ (*c* = 0.1, MeOH).
971	Nudicaucin A 3β-*O* ← Ara^3 ← Gal; 28-*O* ← Glc	*Hedyotis nudicaulis*, whole plant [91]. White plates. $C_{46}H_{72}O_{17}$: 896.48. M.p. 291.5–293° (dec.). $[\alpha]_D = +71.3$ (*c* = 0.44, MeOH).
972	Guaianin R 3β-*O* ← Ara^2 ← Rha^3 ← Glc^3 ← Rha; 28-*O* ← Glc	*Guaiacum officinale* L. (Zygophyllaceae), bark [334]. White powder. $C_{58}H_{92}O_{25}$: 1188.59. M.p. 360–370° (dec.). $[\alpha]_D^{25} = +2.0$ (*c* = 0.38, MeOH).
973	Acanthopanaxoside A 3β-*O* ← Ara^2 ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha 6↑ Ac	*Acanthopanax senticosus* (Rupr. Maxim) Harms. (Araliaceae), leaves [139]. Amorphous powder. $C_{60}H_{94}O_{27}$: 1246.60. $[\alpha]_D^{22} = +11.8$ (*c* = 1.0, MeOH).
974	Mutongsaponin E 3β-*O* ← Ara^2 ← Xyl; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Akebia trifoliata* var. *australis* stem [335]. Amorphous solid. $C_{57}H_{90}O_{25}$: 1174.58.
Aglycone: 3β,23-Dihydroxy-30-noroleana-12,20(29)-dien-28-oic acid (=(4aS,6aS,6bR,8aR,9R,10S,12aR,12bR,14bS)-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-Octadecahydro-10-hydroxy-9-(hydroxymethyl)-6a,6b,9,12a-tetramethyl-2-methylidenepicene-4a(2H)-carboxylic acid)		
975	Fargoside C 3β-*O* ← Ara^2 ← Ara 3↑ GlcA	*Holboellia fargesii*, roots [183]. Amorphous solid. $C_{45}H_{68}O_{18}$: 896.44. $[\alpha]_D^{25} = +54.0$ (*c* = 0.6, MeOH).
976	Fargoside D 3β-*O* ← Ara^3 ← GlcA (Me ester)	*Holboellia fargesii*, roots [183]. Amorphous solid. $C_{41}H_{62}O_{14}$: 778.41. $[\alpha]_D^{23} = +65.6$ (*c* = 0.5, MeOH).
977	Boussingoside E 3β-*O* ← GlcA; 28-*O* ← Glc	*Boussingaultia baselloides* H. B. K. (Basellaceae), tubers [336]. Amorphous solid. $C_{41}H_{62}O_{15}$: 794.41. $[\alpha]_D^{20} = +16.0$ (*c* = 0.5, MeOH).

Table 1 (cont.)

978	Mutongsaponin D 3β-*O* ← Ara[3] ← Glc; 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Akebia trifoliata* var. *australis*, stem [335]. Amorphous solid. $C_{58}H_{92}O_{27}$: 1220.58. $[\alpha]_D^{27} = +13.5$ ($c = 0.11$, MeOH).
Aglycone: 30-Norarjunolic acid (=(4aS,6aS,6bR,8aR,9R,10R,11R,12aR,12bR,14bS)-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-Octadecahydro-10,11-dihydroxy-9-(hydroxymethyl)-6a,6b,9,12a-tetramethyl-2-methylidenepicene-4a(2H)-carboxylic acid)		
979	Mutongsaponin A 28-*O* ← Glc	*Akebia trifoliata* var. *australis* (Diels) Rehd. (Lardizabalaceae), stem [335]. Amorphous solid. $C_{35}H_{54}O_{10}$: 634.37. $[\alpha]_D^{27} = +44.1$ ($c = 0.27$, MeOH).
980	Mutongsaponin B 28-*O* ← Glc[6] ← Glc[4] ← Rha[3] ← Xyl	*Akebia trifoliata* var. *australis*, stem [335]. Amorphous solid. $C_{52}H_{82}O_{23}$: 1074.52. $[\alpha]_D^{27} = +5.4$ ($c = 0.45$, MeOH).
981	Zygophyloside J 3β-*O* ← GlcA; 28-*O* ← Glc	*Zygophyllum decumbens*, whole plant [207]. Amorphous solid. $C_{41}H_{62}O_{16}$: 810.40. M.p. 184–188° (dec.).
Aglycone: 3β-Hydroxy-23-oxo-30-noroleana-12,20(29)-dien-28-oic acid (=(4aS,6aS,6bR,10S,12aR,12bR,14bR)-9-Formyl-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-octadecahydro-10-hydroxy-6a,6b,9,12a-tetramethyl-2-methylidenepicene-4a(2H)-carboxylic acid)		
982	Acanjaposide B 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Acanthopanax japonica*, leaves [337]. White solid. $C_{47}H_{72}O_{18}$: 924.47. $[\alpha]_D^{25} = +18.9$ ($c = 0.82$, MeOH).
Aglycone: 3β-Hydroxy-30-noroleana-12,20(29)-diene-23,28-dioic acid (=(3S,6aR,6bS,8aS,12aR,14aR,14bR)-2,3,4,4a,5,6,6a,6b,7,8,9,10,11,12,12a,14,14a,14b-Octadecahydro-3-hydroxy-4,6a,6b,14b-tetramethyl-11-methylidenepicene-4,8a(1H)-dicarboxylic acid)		
983	Acanjaposide A 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Acanthopanax japonica* Franch et Savart (Araliaceae), leaves [337]. White powder. $C_{47}H_{72}O_{19}$: 940.47. $[\alpha]_D^{25} = +24.8$ ($c = 0.60$, MeOH).
Aglycone: 2β,3β-Dihydroxy-30-noroleana-12,20(29)-diene-23,28-dioic acid (=(2S,3R,6aR,6bS,8aS,12aR,14aR,14bR)-2,3,4,4a,5,6,6a,6b,7,8,9,10,11,12,12a,14,14a,14b-Octadecahydro-2,3-dihydroxy-4,6a,6b,14b-tetramethyl-11-methylidenepicene-4,8a(1H)-dicarboxylic acid)		
984	Compound 3 3β-*O* ← Glc; 28-*O* ← Glc	*Amaranthus caudatus* (Amaranthaceae), leaves [241]. $C_{41}H_{62}O_{16}$: 810.40.

Table 1 (cont.)

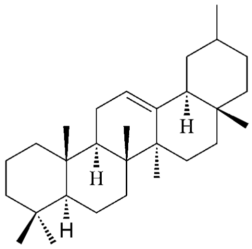
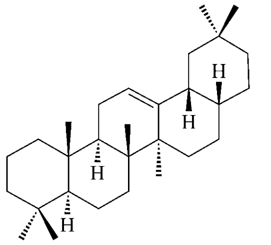
985	Compound 6 3*β*-*O* ← GlcA; 28-*O* ← Glc	*Amaranthus cruentus*, seeds [153]. Amorphous solid. $C_{41}H_{60}O_{17}$: 824.38. $[\alpha]_D^{25} = +43.8$ (MeOH).
	3.10. Δ^{12}-29-Noroleanane Type	
		
*Aglycone: 3β,20α-Dihydroxy-29-norolean-12-en-28-oic acid (= (2*R*,4a*R*,6a*S*,6b*R*,10*S*,12a*R*,12b*R*,14b*R*)-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-Octadecahydro-2,10-dihydroxy-2,6a,6b,9,9,12a-hexamethylpicene-4a(2*H*)-carboxylic acid)*		
986	Fargoside A 3*β*-*O* ← Glc[2] ← Xyl	*Holboellia fargesii* Reaub (Lardizabalaceae), roots [183]. Amorphous solid. $C_{40}H_{64}O_{13}$: 752.43. $[\alpha]_D^{25} = +24.4$ ($c = 1.0$, MeOH).
*Aglycone: 3β,20α,23-Trihydroxy-29-norolean-12-en-28-oic acid (= Nippogenin E; (2*R*,4a*R*,6a*S*,6b*R*,8a*R*,9*R*,10*S*,12a*R*,12b*R*,14b*S*)-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-Octadecahydro-2,10-dihydroxy-9-(hydroxymethyl)-2,6a,6b,9,12a-pentamethylpicene-4a(2*H*)-carboxylic acid)*		
987	Nipponoside E 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Acanthopanax nipponicus*, leaves [138]. White powder. $C_{47}H_{76}O_{19}$: 944.53. $[\alpha]_D^{25} = -2.9$ ($c = 0.1$, MeOH).
*Aglycone: 3β,20α,24-Trihydroxy-29-norolean-12-en-28-oic acid (= (2*R*,4a*R*,6a*S*,6b*R*,8a*R*,9*S*,10*S*,12a*R*,12b*R*,14b*S*-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-Octadecahydro-2,10-dihydroxy-9-(hydroxymethyl)-2,6a,6b,9,12a-pentamethylpicene-4a(2*H*)-carboxylic acid)*		
988	Fargoside B 24*β*-*O* ⟵ Glc[2] ⟵ Fuc [3]↑ Ara	*Holboellia fargesii*, roots [183]. Amorphous solid. $C_{46}H_{74}O_{18}$: 914.49. $[\alpha]_D^{22} = +39.6$ ($c = 1.0$, MeOH).
*Aglycone: 3β,20-Dihydroxy-23-oxo-29-norolean-12-ene-28-oic acid (= (2*R*,4a*R*,6a*S*,6b*R*,8a*R*,9*S*,10*S*,12a*R*,12b*R*,14b*S*)-9-Formyl-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-octadecahydro-2,10-dihydroxy-2,6a,6b,9,12a-pentamethylpicene-4a(2*H*)-carboxylic acid)*		
989	Acanjaposide C 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Acanthopanax japonica*, leaves [337]. White powder. $C_{47}H_{74}O_{19}$: 942.48. $[\alpha]_D^{25} = +6.5$ ($c = 0.85$, MeOH).

Table 1 (cont.)

3.11. Δ^{12}-28-Noroleanane Type



Aglycone: 3β-Hydroxy-28-norolean-12-en-16-one (=(4aS,6aS,6bR,8aR,10S,12aR,12bR,14bR)-2,3,4,4a,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-Octadecahydro-10-hydroxy-2,2,6a,6b,9,9,12a-heptamethylpicen-5(1H)-one)

990	Auriculatusaponin A 3β-*O*←GlcA	*Aster auriculatus* (Compositae), roots [15]. Amorphous powder. $C_{35}H_{54}O_8$: 602.38. M.p. 219–221°. $[\alpha]_D^{21} = -14.5$ ($c = 0.107$, MeOH).

Aglycone: 3β,24-Dihydroxy-28-norolean-12-en-16-one (=(4aS,6aS,6bR,8aR,9S,10S,12aR,12bR,14bR)-2,3,4,4a,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-Octadecahydro-10-hydroxy-9-(hydroxymethyl)-2,2,6a,6b,9,12a-hexamethylpicen-5(1H)-one)

991	Saponin 3 3β-*O*←GlcA^4←Xyl	*Prunella vulgaris* L. (Labiatae), spikes [173]. White amorphous powder. $C_{40}H_{62}O_{13}$: 750.42. M.p. 209–210°. $[\alpha]_D^{25} = -34.1$ ($c = 0.2$, MeOH).

Aglycone: 3β-Hydroxy-16-oxo-28-norolean-12-en-17αH-23-al (=(3S,4S,4aR,6aR,6bS,8aR,12aR,14aR,14bR)-1,2,3,4,4a,5,6,6a,6b,7,8,8a,9,10,11,12,12a,14,14a,14b-Icosahydro-3-hydroxy-4,6a,6b,11,11,14b-hexamethyl-8-oxopicene-4-carbaldehyde)

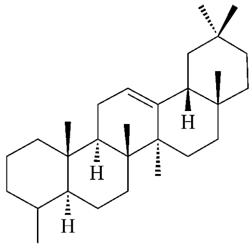
992	Neogypsoside A 3β-*O*← GlcA^2← Gal (Xyl →3 GlcA)	*Gypsophila oldhamiana* (Miq.) (Caryophyllaceae), roots [338]. White amorphous powder. $C_{46}H_{70}O_{18}$: 910.46. $[\alpha]_D^{25} = -39.8$ ($c = 0.13$, MeOH).

Aglycone: 3β-Hydroxy-16-oxo-28-norolean-12-en-17βH-23-al (=(3S,4S,4aR,6aR,6bS,8aS,12aR,14aR,14bR)-1,2,3,4,4a,5,6,6a,6b,7,8,8a,9,10,11,12,12a,14,14a,14b-Icosahydro-3-hydroxy-4,6a,6b,11,11,14b-hexamethyl-8-oxopicene-4-carbaldehyde)

993	Neogypsoside B 3β-*O*← GlcA^2← Gal (Xyl →3 GlcA)	*Gypsophila oldhamiana* (Miq.) (Caryophyllaceae), roots [338]. White amorphous powder. $C_{46}H_{70}O_{18}$: 910.46. $[\alpha]_D^{25} = +28.7$ ($c = 0.13$, MeOH).

Table 1 (cont.)

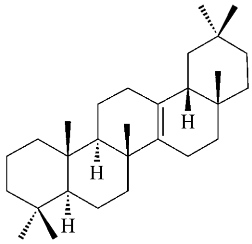
3.12. Δ^{12}-23-Noroleanane Type



*Aglycone: 3β,4α,16α-Trihydroxy-23-norolean-12-en-28-oic acid (=(4a*R*,5*R*,6a*S*,6b*R*,8a*R*,9*S*,10*S*,12a*R*,12b*R*,14b*S*)-1,3,4,5,6,6a,6b,7,8,8a,9,10,11,12,12a,12b,13,14b-Octadecahydro-5,9,10-trihydroxy-2,2,6a,6b,9,12a-hexamethylpicene-4a(2*H*)-carboxylic acid)*

994	Vaccaroside F 3*β*-*O*⟵ GlcA²⟵ Gal; Ac (→4) ; Ara(f) (→3) 28-*O*⟵ Fuc²⟵ Rha⁴⟵ Xyl	*Vaccaria segetalis*, seeds [149]. Amorphous solid. $C_{65}H_{102}O_{33}$: 1410.63. M.p. 200° (dec.). $[\alpha]_D^{20} = -28.0$ ($c = 0.15$, MeOH).

3.13. Δ^{13}-27-Noroleanane Type



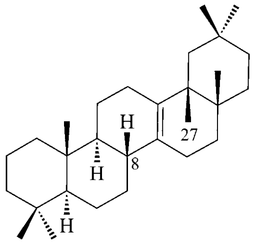
*Aglycone: Pyrocincholic acid (=3β-Hydroxy-27-norolean-13-en-28-oic acid; (4a*S*,6b*R*,8a*R*,10*S*,12a*R*,12b*R*,14b*S*)-1,3,4,5,6,6b,7,8,8a,9,10,11,12,12a,12b,13,14,14b-Octadecahydro-10-hydroxy-2,2,6b,9,9,12a-hexamethylpicene-4a(2*H*)-carboxylic acid)*

995	Compound 1 3*β*-*O*←Qui; 28-*O*←Glc⁶←Glc	*Isertia pittieri* (STANDL.) STANDL. (Rubiaceae), stem bark [339]. White powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{20} = -20.0$ ($c = 0.011$, MeOH).
996	Compound 2 3*β*-*O*←Glc⁶←Qui; 28-*O*←Glc²←Glc	*Isertia pittieri*, stem bark [339]. White powder. $C_{53}H_{86}O_{22}$: 1074.56. $[\alpha]_D^{20} = +2.2$ ($c = 0.009$, MeOH).
997	Saponin 2 3*β*-*O*←Qui⁴←Rha; 28-*O*←Glc⁶←Glc	*Neonauclea sessilifolia*, roots [340]. Amorphous powder. $C_{53}H_{86}O_{21}$: 1058.57. $[\alpha]_D^{25} = -43.0$ ($c = 0.5$, MeOH).

Table 1 (cont.)

998	Inermiside I 3β-*O* ← Glc⁶ ← Glc; 28-*O* ← Qui	*Mitragyna inermis* (WILLD.) O. KUNTZE (Rubiaceae), bark [341]. Colorless needles (MeOH/H_2O 3:2). $C_{47}H_{76}O_{17}$: 912.50. M.p. 226–228°. $[\alpha]_D^{25} = -32.5$ ($c = 1.0$, MeOH).
999	Inermiside II 3β-*O* ← Qui	*Mitragyna inermis*, bark [341]. Colorless needles. (MeOH). $C_{35}H_{56}O_7$: 588.39. M.p. 211–213°. $[\alpha]_D^{25} = -0.13$ ($c = 0.001$, MeOH).

3.14. Rearranged Δ^{13}-Oleanane Type



*Aglycone: 3β-Hydroxyisopolygalic-13-en-28-acid (= (4a*S*,6b*R*,8a*R*,10*S*,12a*R*,12b*S*,14b*S*)-1,3,4,5,6,6b,7,8,8a,9,10,11,12,12a,12b,13,14,14b-Octadecahydro-10-hydroxy-2,2,9,9,12a,14b-hexamethylpicene-4a(2*H*)-carboxylic acid)*

1000	Compound 1 28-*O* ← Glc⁶ ← Glc⁴ ← Rha	*Schefflera bodinieri* (LEVI.) REHD. (Araliaceae), roots [342]. Amorphous powder. $C_{47}H_{76}O_{17}$: 912.51.
1001	Compound 3 28-*O* ← Glc⁶ ← Glc	*Schefflera bodinieri* (LEVI.) REHD., roots [342]. Amorphous powder. $C_{41}H_{66}O_{13}$: 766.45.

*Aglycone: 3-Oxoisopolygalic-13-en-28-acid (= (4a*S*,6b*R*,8a*R*,12a*R*,12b*S*,14b*S*)-1,3,4,5,6,6b,7,8,8a,9,10,11,12,12a,12b,13,14,14b-Octadecahydro-2,2,9,9,12a,14b-hexamethyl-10-oxopicene-4a(2*H*)-carboxylic acid)*

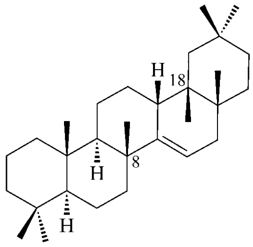
1002	Compound 2 28-*O* ← Glc⁶ ← Glc⁴ ← Rha	*Schefflera bodinieri* (LEVI.) REHD., roots [342]. Amorphous powder. $C_{47}H_{74}O_{17}$: 910.49.

*Aglycone: 3β-Hydroxy-18-methyl-27-norolean-13-en-28-acid (= (4a*S*,6b*R*,8a*R*,10*S*,12a*R*,12b*R*,14b*S*)-1,3,4,5,6,6b,7,8,8a,9,10,11,12,12a,12b,13,14,14b-Octadecahydro-10-hydroxy-2,2,6b,9,9,12a,14b-heptamethylpicene-4a(2*H*)-carboxylic acid)*

1003	Compound 4 28-*O* ← Glc⁶ ← Glc⁴ ← Rha	*Schefflera bodinieri*, roots [342]. Amorphous powder. $C_{48}H_{78}O_{17}$: 926.52.

Table 1 (cont.)

3.15. Rearranged Δ^{14}-Oleanane Type



Aglycone: 3β-Hydroxy-18β-methyl-27-norolean-14-en-28-oic acid (=(4aS,6bR,8aR,10S,12aR,12bR,14aR,14bS)-1,3,4,5,6b,7,8,8a,9,10,11,12,12a,12b,13,14,14a,14b-Octadecahydro-10-hydroxy-2,2,6b,9,9,12a,14b-heptamethylpicene-4a(2H)-carboxylic acid)

1004	Bodinitin B 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Schefflera bodinieri*, roots [343]. White powder. $C_{48}H_{78}O_{17}$: 926.52. $[\alpha]_D^{25} = +8.7$ ($c = 0.3$, MeOH).

Aglycone: 3β-Hydroxy-18β-methyl-26,27-dinorolean-14-en-28-oic acid (=(4aS,6bR,8aR,10S,12aR,12bS,14aS,14bS)-1,3,4,5,6b,7,8,8a,9,10,11,12,12a,12b,13,14,14a,14b-Octadecahydro-10-hydroxy-2,2,9,9,12a,14b-hexamethylpicene-4a(2H)-carboxylic acid)

1005	Bodinitin A 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Schefflera bodinieri* (LEVI.) REHD., root [343]. White powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{25} = +8.0$ ($c = 1.0$, MeOH).

Aglycone: (4aS,6bR,8aR,12aR,12bS,14aS,14bS)-1,3,4,5,6b,7,8,8a,9,10,11,12,12a,12b,13,14,14a,14b-Octadecahydro-2,2,9,9,12a,14b-hexamethyl-10-oxopicene-4a(2H)-carboxylic acid

1006	Bodinitin C 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Schefflera bodinieri*, roots [343]. White powder. $C_{47}H_{74}O_{17}$: 910.49. $[\alpha]_D^{25} = +10.5$ ($c = 0.3$, MeOH).

Aglycone: (4aS,6bR,8aR,12aR,12bR,14aR,14bS)-1,3,4,5,6b,7,8,8a,9,10,11,12,12a,12b,13,14,14a,14b-Octadecahydro-2,2,6b,9,9,12a,14b-heptamethyl-10-oxopicene-4a(2H)-carboxylic acid

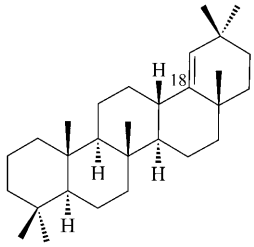
1007	Bodinitin D 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Schefflera bodinieri*, roots [343]. White powder. $C_{48}H_{76}O_{17}$: 924.51. $[\alpha]_D^{25} = +11.4$ ($c = 0.3$, MeOH).

Aglycone: (2R,4aS,6bR,8aR,12aR,12bR,14aR,14bS)-1,3,4,5,6b,7,8,8a,9,10,11,12,12a,12b,13,14,14a,14b-Octadecahydro-2,6b,9,9,12a,14b-hexamethyl-10-oxopicene-2,4a(2H)-dicarboxylic acid

1008	Compound 2 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Schefflera bodinieri* (LEVI.) (Araliaceae), leaves [344]. Amorphous powder. $C_{48}H_{74}O_{19}$: 954.48. $[\alpha]_D^{25} = +37.8$ ($c = 0.5$, MeOH).

Table 1 (cont.)

3.16. Δ^{18}-Oleanane Type



Aglycone: Morolic acid (=(3β)-3-Hydroxyolean-18-en-28-oic acid)		
1009	Kochianoside II 3*β*-*O* ⟵ GlcA^2 ⟵ Glc ^{3}↑ Xyl	*Kochia scoparia*, fruits [172]. Colorless crystals. $C_{47}H_{74}O_{18}$: 926.49. M.p. 203–204°. $[\alpha]_D^{23} = -9.6$ ($c = 0.1$, MeOH).
1010	Saponin 11 3*β*-*O* ⟵ GlcA^4 ⟵ Xyl; ^{2}↑ Ac 28-*O* ⟵ Glc	*Symplocos glomerata*, stem bark [109]. White powder. $C_{49}H_{76}O_{19}$: 968.50. $[\alpha]_D^{21} = -8.1$ ($c = 0.28$, MeOH).
Aglycone: (3β)-3,23-Dihydroxyolean-18-en-28-oic acid		
1011	Saponin 4 3*β*-*O* ⟵ Ara^2 ⟵ Rha; 28-*O* ⟵ Glc^6 ⟵ Glc^4 ⟵ Rha ^{6}↑ Ac	*Oreopanax guatemalensis*, leaves and stems [163]. Amorphous powder. $C_{61}H_{98}O_{27}$: 1262.63. $[\alpha]_D^{23} = -15.9$ ($c = 0.33$, MeOH).
Aglycone: (3β)-3-Hydroxyolean-18-ene-27,28-dioic acid		
1012	Phelasin A 3*β*-*O* ← Glc^2 ← Glc	*Anthocephalus cadamba* (Roxb) Miq. (Rubiaceae), bark [345]. Amorphous powder. $C_{42}H_{66}O_{15}$: 810.44. M.p. 248–251° (dec.). $[\alpha]_D^{22} = -7.1$ ($c = 0.3$, MeOH).

3.17. $\Delta^{9,12}$-Oleanane Type

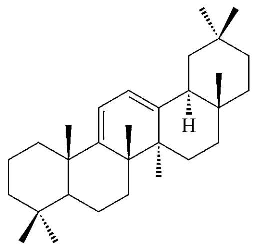
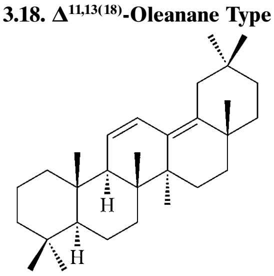


Table 1 (cont.)

Aglycone: (3β,16β)-Oleana-9(11),12-diene-3,16,23,28-tetrol		
1013	Saponin 1 3β-*O* ⟵ Fuc²⟵ Glc ³↑ Glc	*Clinopodium urticifolium* (Labiatae), whole plant [346]. Amorphous powder. $C_{48}H_{78}O_{18}$: 942.52.
1014	Saponin 3 3β-*O* ⟵ Fuc²⟵ Glc ³↑ Glc⁶⟵ Glc	*Clinopodium urticifolium*, whole plant [346]. $C_{54}H_{88}O_{23}$: 1104.57.
1015	Saponin 4 3β-*O* ⟵ Fuc²⟵ Glc ³↑ Glc⁶⟵ Glc⁴⟵ Glc	*Clinopodium urticifolium*, whole plant [346]. $C_{60}H_{98}O_{28}$: 1266.62.
Aglycone: (3β,16β,21β)-Oleana-9(11),12-diene-3,16,21,23,28-pentol		
1016	Saponin 2 3β-*O* ⟵ Fuc²⟵ Glc ³↑ Glc	*Clinopodium urticifolium*, whole plant [346]. White powder. $C_{48}H_{78}O_{19}$: 958.51.
Aglycone: (3α)-3-Hydroxy-21-oxooleana-9(11),12-dien-28-oic acid		
1017	Papyrioside LG 28-*O* ← Glc⁶ ← Glc⁴ ← Rha	*Tetrapanax papyriferum*, leaves [286]. Amorphous powder. $C_{48}H_{74}O_{18}$: 938.49. $[\alpha]_D^{25} = +12.5$ ($c = 1.0$, MeOH).
Aglycone: 3,21-Dioxooleana-9(11),12-dien-28-oic acid		
1018	Papyrioside LH 28-*O* ← Glc⁶ ← Glc⁴ ← Rha	*Tetrapanax papyriferum*, leaves [286]. Amorphous powder. $C_{48}H_{72}O_{18}$: 936.47. $[\alpha]_D^{25} = +30.2$ ($c = 0.5$, MeOH).

3.18. $\Delta^{11,13(18)}$-Oleanane Type



Aglycone: (3β,22β)-Oleana-11,13(18)-diene-3,22-diol		
1019	Saponin 1 3β-*O* ← Glc	*Taverniera aegyptiaca* Boiss (Leguminosae), root bark [347]. Amorphous powder. $C_{36}H_{58}O_7$: 602.42. M.p. 175–179°.

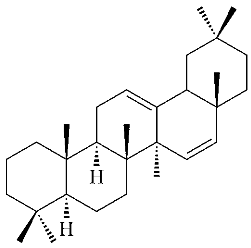
Table 1 (cont.)

Aglycone: (1β,3β,22β)-Oleana-11,13(18)-diene-1,3,22-triol		
1020	Saponin 2 3β-*O* ← Glc	*Taverniera aegyptiaca*, root bark [347]. Needles (MeOH). $C_{36}H_{58}O_8$: 618.41. M.p. 207–209°.
1021	Saponin 3 3β-*O* ← Glc[2] ← Xyl	*Taverniera aegyptiaca*, root bark [347]. Amorphous powder. $C_{41}H_{66}O_{12}$: 750.46. M.p. 196–198°.
1022	Saponin 4 3β-*O* ← Glc[2] ← Rha	*Taverniera aegyptiaca*, roots and stem bark [317]. Amorphous powder. $C_{42}H_{68}O_{12}$: 764.47.
1023	Saponin 5 3β-*O* ← GlcA[2] ← Glc	*Taverniera aegyptiaca*, roots and stem bark [317]. Isolated as Me ester. Amorphous powder. $C_{42}H_{66}O_{14}$: 794.45.
1024	Saponin 6 3β-*O* ← GlcA[2] ← Xyl	*Taverniera aegyptiaca*, roots and stem bark [317]. Isolated as Me ester. Amorphous powder. $C_{41}H_{64}O_{13}$: 764.43.
1025	Saponin 7 3β-*O* ← GlcA[2] ← Rha	*Taverniera aegyptiaca*, roots and stem bark [317]. Isolated as Me ester. Amorphous powder. $C_{42}H_{66}O_{13}$: 778.45.
Aglycone: 16-Deoxysaikogenin A (= (3β)-Oleana-11,13(18)-diene-3,23,28-triol)		
1026	Saikosaponin K 3β-*O* ⟵ Glc[2] ⟵ Glc [6]↑ Glc[2] ⟵ Glc	*Bupleurum subovatum*, roots [348]. White powder. $C_{54}H_{88}O_{23}$: 1104.57. M.p. 221–223°.
1027	Scrokoelziside B 3β-*O* ⟵ Glc[4] ⟵ Fuc[2] ⟵ Glc [3]↑ Rha	*Scrophularia koelzii* (Scrophulariaceae), aerial parts [349]. Amorphous powder. $C_{54}H_{88}O_{21}$: 1072.58. $[\alpha]_D^{27} = +14.0$ ($c = 0.09$, C_5H_5N).
Aglycone: Saikogenin A (= (3β,16β)-Oleana-11,13(18)-diene-3,16,23,28-tetrol)		
1028	Saikosaponin Q 3β-*O* ⟵ Glc[2] ⟵ Glc [6]↑ Glc[2] ⟵ Glc	*Bupleurum subovatum* (LINK) (Umbelliferae), roots [348]. White powder. $C_{54}H_{88}O_{24}$: 1120.57. M.p. 223–225°.

Table 1 (cont.)

Aglycone: (3β)-3-Hydroxyoleana-11,13(18)-dien-28-oic acid		
1029	Saponin 2 3β-*O* ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Oreopanax guatemalensis*, leaves and stems [163]. Amorphous powder. $C_{54}H_{86}O_{22}$: 1086.56. $[\alpha]_D^{23} = -103.1$ ($c = 0.36$, MeOH).
1030	Saponin 3 3β-*O* ← Glc^2 ← Rha; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Oreopanax guatemalensis*, leaves and stems [163]. Amorphous powder. $C_{60}H_{96}O_{26}$: 1232.62. $[\alpha]_D^{23} = -94.2$ ($c = 0.26$, MeOH).
Aglycone: (3β,16α)-3,16,23,29-Tetrahydroxyoleana-11,13(18)-dien-28-oic acid		
1031	Sandrosaponin VIII 3β-*O* ⟵ Fuc^2 ⟵ Glc (Fuc 3 ↑ Glc^4 ⟵ SO_3^-)	*Bupleurum rigidum*, roots [97]. Amorphous powder. $C_{48}H_{76}O_{23}S$: 1052.45. $[\alpha]_D = +6.6$ ($c = 0.2$, MeOH).
Aglycone: (3β)-3-Hydroxyoleana-11,13(18)-diene-23,28-dioic acid		
1032	Saponarioside J 3β-*O* ⟵ Xyl; 28-*O* ⟵ Glc^3 ⟵ Glc (Glc^3 6 ↑ Glc)	*Saponaria officinalis*, whole plant [298]. Amorphous solid. $C_{53}H_{82}O_{24}$: 1102.52. $[\alpha]_D^{22} = -33.7$ ($c = 0.35$, MeOH).
Aglycone: 1-O-[(3β,16α)-3,16,23,28-Tetrahydroxy-30-oxooleana-11,13(18)-dien-30-yl]-D-xylitol		
1033	Saikosaponin V-1 3β-*O* ← Fuc^3 ← Glc	*Bupleurum chinense* DC (Umbelliferae), roots [350]. White powder. $C_{47}H_{76}O_{19}$: 944.50.
1034	Saikosaponin V-2 3β-*O* ← Fuc^3 ← Glc^2 ← Glc	*Bupleurum chinense* DC, roots [351]. White powder. $C_{53}H_{86}O_{24}$: 1106.55. M.p. 238–243°.

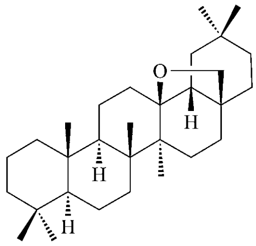
3.19. $\Delta^{12,15}$-Oleanane Type



Aglycone: (2β,3β,6β)-2,3,6,23-Tetrahydroxyoleana-12,15-dien-28-oic acid		
1035	Se-Saponin A 3β-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Rha	*Clerodendrum serratum* var. *amplexifolium* MOLDENKE (Verbenaceae), aerial parts [352]. Amorphous powder. $C_{58}H_{92}O_{27}$: 1220.58.

Table 1 (cont.)

3.20. 13,28-Epoxyoleanane Type



Aglycone: Protoprimulagenin A (=*(3β,16α)-13,28-Epoxyoleanane-3,16-diol*)

1036	Ardisianoside A 3β-*O* ⟵ Ara[2] ⟵ Glc 4↑ Glc[2] ⟵ Xyl 3↑ Glc[3] ⟵ Glc 4↑ Glc	*Ardisia japonica* (THUNB) Bl. (Myrsinaceae), whole plant [19]. Amorphous powder. $C_{70}H_{116}O_{36}$: 1532.72. $[\alpha]_D^{22} = -15.5$ ($c = 1.0$, MeOH).
1037	Ardisianoside B 3β-*O* ⟵ Ara[2] ⟵ Glc 4↑ Glc[2] ⟵ Xyl 3↑ Glc[3] ⟵ Glc	*Ardisia japonica*, whole plant [19]. Amorphous powder. $C_{64}H_{106}O_{31}$: 1370.67. $[\alpha]_D^{22} = -15.7$ ($c = 1.0$, MeOH).
1038	Ardisianoside C 3β-*O* ← Ara[4] ← Glc[2] ← Rha	*Ardisia japonica*, whole plant [19]. Amorphous powder. $C_{47}H_{78}O_{16}$: 898.53. $[\alpha]_D^{22} = -21.3$ ($c = 1.0$, MeOH).
1039	Ardisianoside D 3β-*O* ← Ara[4] ← Glc[2] ← Xyl	*Ardisia japonica*, whole plant [19]. Amorphous powder. $C_{46}H_{76}O_{16}$: 884.51. $[\alpha]_D^{22} = -46.5$ ($c = 0.9$, MeOH).
1040	Ardisianoside E 3β-*O* ⟵ Ara[4] ⟵ Glc 2↑ Glc	*Ardisia japonica*, whole plant [19]. Amorphous powder. $C_{47}H_{78}O_{17}$: 914.56. $[\alpha]_D^{22} = -7.8$ ($c = 1.0$, MeOH).
1041	Protoprimuloside B 3β-*O* ⟵ Glc[2] ⟵ Glc 3↑ Gal[2] ⟵ Rha	*Primula elatior* sub sp. *Meyeri* (Primulaceae), roots [353]. Amorphous powder. $C_{54}H_{90}O_{22}$: 1090.59. M.p. 242–243° (dec.). $[\alpha]_D = -5.5$ ($c = 0.0049$, MeOH).

Table 1 (cont.)

Aglycone: (3β,16α)-13,28-Epoxyoleanane-3,16,29-triol		
1042	Ardisimamilloside E 3β-*O* ⟵ Ara^2 ⟵ Glc $^4\uparrow$ Glc^2⟵ Rha	*Ardisia mamillata* HANCE, roots [36]. White powder. $C_{53}H_{88}O_{22}$: 1076.58. $[\alpha]_D^{25} = -25.1$ ($c = 0.24$, MeOH).
Aglycone: (3β,16α)-13,28-Epoxyoleanane-3,16,30-triol		
1043	Ardisianoside F 3β-*O* ⟵ Ara^2 ⟵ Glc $^4\uparrow$ Glc^2⟵ Xyl $^3\uparrow$ Glc	*Ardisia japonica*, whole plant [19]. Amorphous powder. $C_{58}H_{96}O_{27}$: 1224.61. $[\alpha]_D^{22} = -13.2$ ($c = 0.3$, MeOH).
*Aglycone: 13β,28-Epoxy-30-noroleanane-3β,16α,20β-triol (=(2*S*,4a*S*,5*R*,6a*S*,6b*R*,8a*R*,10*S*,12a*R*,12b*R*,14a*S*,14b*R*)-1,3,4,4a,6,6a,6b,7,8,8a,11,12,12a,12b,13,14,14a,14b-Octadecahydro-2,6a,6b,9,9,12a-hexamethyl-2*H*,5*H*-14a,4a-(epoxymethano)picene-2,5,10-triol)*		
1044	Ardisianoside G 3β-*O* ⟵ Ara^2 ⟵ Glc $^4\uparrow$ Glc^2⟵ Rha	*Ardisia japonica*, whole plant [19]. Amorphous powder. $C_{52}H_{86}O_{22}$: 1062.56. $[\alpha]_D^{22} = -19.7$ ($c = 0.9$, MeOH).
Aglycone: Saikogenin F (=(3β,16β)-13,28-Epoxyolean-11-ene-3,16,23-triol)		
1045	Saponin 4 3β-*O* ← Gal^2 ← Glc	*Atriplex semibaccata*, whole plant [21]. Amorphous powder. $C_{42}H_{68}O_{14}$: 796.46.
1046	Sandrosaponin 1 3β-*O* ⟵ Fuc^3⟵ Glc $^2\uparrow$ Glc^4⟵ SO_3Na	*Bupleurum rigidum*, aerial parts [354]. Amorphous powder. $C_{48}H_{77}O_{21}SNa$: 1044.47. M.p. 282–285° (dec.). $[\alpha]_D = +47.8$ ($c = 0.22$, MeOH).
Aglycone: (3β,16β)-13,28-Epoxyolean-11-ene-3,16,23-triol		
1047	Saponin 3 3β-*O* ← Gal^2 ← Glc	*Atriplex semibaccata*, whole plant [21]. Amorphous powder. $C_{42}H_{68}O_{15}$: 812.46.
1048	Sandrosaponin VII 3β-*O* ⟵ Fuc^3⟵ Glc $^2\uparrow$ Glc	*Bupleurum rigidum*, roots [97]. Amorphous powder. $C_{48}H_{78}O_{19}$: 958.51. $[\alpha]_D = +23.0$ ($c = 0.2$, MeOH).
Aglycone: Anagalligenin A (=(3β,16α,22α,28α)-13,28-Epoxyoleanane-3,16,22,28-tetrol)		
1049	Capilliposide A 3β-*O* ⟵ Ara^2 ⟵ Glc $^4\uparrow$ Glc^2⟵ Xyl	*Lysimachia capillipes* HEMST (Primulaceae), whole plant [355]. White powder. $C_{52}H_{86}O_{23}$: 1078.56. $[\alpha]_D^{20} = -26.7$ ($c = 0.50$, MeOH).

Table 1 (cont.)

1050	Capilliposide C 3β-*O* ⟵ Ara[2] ⟵ Glc; (4↑ Glc[2] ⟵ Xyl at Ara-4) 22-*O* ⟵ Glc	*Lysimachia capillipes*, whole plant [355]. White powder. $C_{58}H_{96}O_{28}$: 1240.61. $[\alpha]_D^{20} = -5.0$ ($c = 0.50$, MeOH).
*Aglycone: 22-*O*-Caproylanagalligenin A (=(3β,16α,22α,28α)-3,16,28-Trihydroxy-13,28-epoxyoleanan-22-yl hexanoate)*		
1051	Capilliposide B 3β-*O* ⟵ Ara[2] ⟵ Glc (4↑ Glc[2] ⟵ Xyl at Ara-4)	*Lysimachia capillipes*, whole plant [355]. White powder. $C_{58}H_{96}O_{24}$: 1176.63. $[\alpha]_D^{20} = -23.4$ ($c = 0.55$, MeOH).
*Aglycone: 22-*O*-Isovaleroylanagalligenin A (=(3β,16α,22α,28α)-3,16,28-Trihydroxy-13,28-epoxyoleanan-22-yl 3-methylbutanoate)*		
1052	Capilliposide D 3β-*O* ⟵ Ara[2] ⟵ Glc (4↑ Glc[2] ⟵ Xyl at Ara-4)	*Lysimachia capillipes* HEMSL. (Primulaceae), whole plant [356]. White powder. $C_{57}H_{94}O_{24}$: 1162.61. M.p. 239–241°. $[\alpha]_D^{20} = -10.0$ ($c = 0.90$, MeOH).
*Aglycone: 22-*O*-[(Z)-Hex-2-enoyl]anagalligenin A (=(3β,16α,22α,28α)-3,16,28-Trihydroxy-13,28-epoxyoleanan-22-yl (2Z)-hex-2-enoate)*		
1053	Maejaposide A 3β-*O* ⟵ GlcA[3] ⟵ Gal[2] ⟵ Rha[2] ⟵ Xyl (2↑ Gal at GlcA-2)	*Maesa japonica* (THUNB) MORIZI & ZOLL. (Myrsinaceae), roots [357]. Amorphous solid. $C_{65}H_{104}O_{30}$: 1364.66. $[\alpha]_D^{24} = -24.0$ ($c = 0.5$, MeOH).
*(A): Aglycone: 22-*O*-[2-Methylbutanoyl]anagalligenin A (=(3β,16α,22α,28α)-3,16,28-Trihydroxy-13,28-epoxyoleanan-22-yl 2-methylbutanoate)* *(B): Aglycone: 22-*O*-Angeloylanagalligenin A (=(3β,16α,22α,28α)-3,16,28-Trihydroxy-13,28-epoxyoleanan-22-yl (2Z)-but-2-enoate)*		
1054	Maejaposide B 3β-*O* ⟵ GlcA[3] ⟵ Gal[2] ⟵ Rha[2] ⟵ Xyl (2↑ Gal at GlcA-2)	*Maesa japonica*, roots [357]. Mixture of two compounds: $C_{64}H_{104}O_{30}$ (A): 1352.66. $C_{64}H_{102}O_{30}$ (B): 1350.65.
*Aglycone: 21β-*O*-(Angeloyloxy)-22-*O*-angeloylanagalligenin A (=(3β,16α,21β,22α,28α)-22-[(2Z)-But-2-enoyloxy]-3,16,28-trihydroxy-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate)*		
1055	Maejaposide C 3β-*O* ⟵ GlcA[3] ⟵ Gal[2] ⟵ Rha[2] ⟵ Xyl (2↑ Gal at GlcA-2)	*Maesa japonica*, roots [357]. Amorphous solid. $C_{69}H_{108}O_{32}$: 1448.68. $[\alpha]_D^{24} = -23.2$ ($c = 0.5$, MeOH).

Table 1 (cont.)

No.	Compound	Source and data
	*Aglycone: 21β-*O*-(Angeloyloxy)-22-*O*-(2-methylbutanoyl)anagalligenin A (=(3β,16α,21β,22α,28α)-3,16,28-Trihydroxy-22-[(2-methylbutanoyl)oxy]-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate)*	
1056	Maejaposide D 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha^2 ⟵ Xyl ^{2}↑ Gal (on GlcA)	*Maesa japonica*, roots [357]. Amorphous solid. $C_{69}H_{110}O_{32}$: 1450.70. $[\alpha]_D^{24} = -20.4$ ($c = 0.5$, MeOH).
	*Aglycone: 21β-*O*-(Angeloyloxy)-22-*O*-[(Z)-2-hexenoyl]anagalligenin A (=(3β,16α,21β,22α,28α)-3,16,28-Trihydroxy-21-{[(2Z)-2-methylbut-2-enoyl]oxy}-13,28-epoxyoleanan-22-yl (2Z)-hex-2-enoate)*	
1057	Maejaposide E 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha^2 ⟵ Xyl ^{2}↑ Gal (on GlcA)	*Maesa japonica*, roots [357]. Amorphous solid. $C_{70}H_{110}O_{32}$: 1462.70. $[\alpha]_D^{24} = -23.6$ ($c = 0.5$, MeOH).
	Aglycone: (3β,16α,21β,22α,28α)-3,16,22,28-Tetrahydroxy-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate	
1058	Maesasaponin I 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha ^{2}↑ Gal (on GlcA)	*Maesa lanceolata* FORSSKAL. var. *golungensis* (Myrsinaceae), leaves [358]. $C_{59}H_{94}O_{27}$: 1234.60. $[\alpha]_D^{31} = -27.7$ ($c = 0.84$, C_5H_5N).
	Aglycone: (3β,16α,21β,22α,28α)-16-(Acetyloxy)-3,22,28-trihydroxy-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate	
1059	Maesasaponin II 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha ^{2}↑ Gal (on GlcA)	*Maesa lanceolata*, leaves [358]. $C_{61}H_{96}O_{28}$: 1276.61. $[\alpha]_D^{33} = -29.7$ ($c = 0.69$, C_5H_5N).
	Aglycone: (3β,16α,21β,22α,28α)-22-(Acetyloxy)-3,16,28-trihydroxy-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate	
1060	Maesasaponin III 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha ^{2}↑ Gal (on GlcA)	*Maesa lanceolata*, leaves [358]. $C_{61}H_{96}O_{28}$: 1276.61. $[\alpha]_D^{34} = -45.5$ ($c = 1.0$, C_5H_5N).
	Aglycone: (3β,16α,21β,22α,28α)-16,22-Bis(acetyloxy)-3,28-dihydroxy-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate	
1061	Maesasaponin IV$_2$ 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha ^{2}↑ Gal (on GlcA)	*Maesa lanceolata*, leaves [358]. $C_{63}H_{98}O_{29}$: 1318.62. $[\alpha]_D^{35} = -19.5$ ($c = 1.0$, C_5H_5N).
	Aglycone: (3β,16α,21β,22α,28α)-3,16,28-Trihydroxy-22-(propanoyloxy)-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate	
1062	Maesasaponin IV$_3$ 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha ^{2}↑ Gal (on GlcA)	*Maesa lanceolata*, leaves [358]. $C_{62}H_{98}O_{28}$: 1290.62. $[\alpha]_D^{28} = -41.5$ ($c = 1.0$, C_5H_5N).

Table 1 (cont.)

Aglycone: (3β,16α,21β,22α,28α)-16-(Acetyloxy)-3,28-dihydroxy-22-(propanoyloxy)-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate

1063	Maesasaponin V_2 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa lanceolata*, leaves [358]. $C_{64}H_{100}O_{29}$: 1332.63. $[\alpha]_D^{30} = -47.0$ ($c = 1.0$, C_5H_5N).

Aglycone: (3β,16α,21β,22α,28α)-22-(Butanoyloxy)-3,16,28-trihydroxy-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate

1064	Maesasaponin V_3 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa lanceolata*, leaves [358]. $C_{63}H_{100}O_{28}$: 1304.64. $[\alpha]_D^{32} = -30.0$ ($c = 0.05$, C_5H_5N).

Aglycone: (3β,16α,21β,22α,28α)-3,16,28-Trihydroxy-13,28-epoxyoleanane-21,22-diyl (2Z,2′Z)-bis(2-methylbut-2-enoate)

1065	Maesasaponin VI_2 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa lanceolata*, leaves [358]. $C_{64}H_{100}O_{28}$: 1316.64. $[\alpha]_D^{33} = -33.0$ ($c = 1.0$, C_5H_5N).

Aglycone: (3β,16α,21β,22α,28α)-16-(Acetyloxy)-22-(butanoyloxy)-3,28-dihydroxy-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate

1066	Maesasaponin VI_3 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa lanceolata*, leaves [358]. $C_{65}H_{102}O_{29}$: 1346.65. $[\alpha]_D^{34} = -44.5$ ($c = 1.0$, C_5H_5N).

Aglycone: (3β,16α,21β,22α,28α)-16-(Acetyloxy)-3,28-dihydroxy-13,28-epoxyoleanane-21,22-diyl (2Z,2′Z)-bis(2-methylbut-2-enoate)

1067	Maesasaponin VII_1 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa lanceolata*, leaves [358]. $C_{66}H_{102}O_{29}$: 1358.65. $[\alpha]_D^{35} = -41.5$ ($c = 0.59$, C_5H_5N).

Aglycone: (3β,16α,21β,22α,28α)-3,16,28-Trihydroxy-22-{[(2Z)-3-phenylprop-2-enoyl]oxy}-13,28-epoxyoleanan-21-yl benzoate

1068	Maesabalide I 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa balansae* MEZ. (Myrsinaceae), leaves [359][360]. White amorphous powder. $C_{76}H_{108}O_{32}$: 1532.68. $[\alpha]_D^{18} = -30.5$ ($c = 0.53$, C_5H_5N).

Aglycone: (3β,16α,21β,22α,28α)-3,16,28-Trihydroxy-22-{[(2Z)-3-phenylprop-2-enoyl]oxy}-13,28-epoxyoleanan-21-yl (2Z)-2-methylbut-2-enoate

1069	Maesabalide II 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa balansae*, leaves [359][360]. White amorphous powder. $C_{74}H_{110}O_{32}$: 1510.70. $[\alpha]_D^{18} = -44.4$ ($c = 0.59$, C_5H_5N).

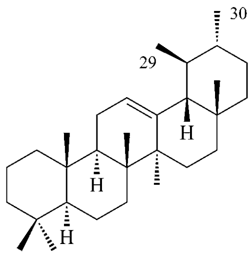
Table 1 (cont.)

*Aglycone: (3β,16α,21β,22α,28α)-3,16,28-Trihydroxy-22-{[(2*E*)-3-phenylprop-2-enoyl]oxy}-13,28-epoxyoleanan-21-yl benzoate*		
1070	Maesabalide III 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa balansae*, leaves [359][360]. White amorphous powder. $C_{76}H_{108}O_{32}$: 1532.68. $[\alpha]_D^{18} = -50.4$ ($c = 0.58$, C_5H_5N).
*Aglycone: (3β,16α,21β,22α,28α)-3,16,28-Trihydroxy-22-{[(2*E*)-3-phenylprop-2-enoyl]oxy}-13,28-epoxyoleanan-21-yl (2*Z*)-2-methylbut-2-enoate*		
1071	Maesabalide IV 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa balansae*, leaves [359][360]. White amorphous powder. $C_{74}H_{110}O_{32}$: 1510.70. $[\alpha]_D^{18} = -61.5$ ($c = 0.59$, C_5H_5N).
*Aglycone: (3β,16α,21β,22α,28α)-16-(Acetyloxy)-3,28-dihydroxy-22-{[(2*E*)-3-phenylprop-2-enoyl]oxy}-13,28-epoxyoleanan-21-yl benzoate*		
1072	Maesabalide V 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa balansae*, leaves [359][360]. White amorphous powder. $C_{78}H_{110}O_{33}$: 1574.69. $[\alpha]_D^{18} = -61.5$ ($c = 0.59$, C_5H_5N).
*Aglycone: (3β,16α,21β,22α,28α)-16-(Acetyloxy)-3,28-dihydroxy-22-{[(2*E*)-3-phenylprop-2-enoyl]oxy}-13,28-epoxyoleanan-21-yl (2*Z*)-2-methylbut-2-enoate*		
1073	Maesabalide VI 3β-*O* ⟵ GlcA^3 ⟵ Gal^2 ⟵ Rha^2 ⟵ Rha (GlcA ^{2}↑ Gal)	*Maesa balansae*, leaves [359][360]. White amorphous powder. $C_{76}H_{112}O_{33}$: 1552.71. $[\alpha]_D^{18} = -54.8$ ($c = 0.68$, C_5H_5N).
Aglycone: (3β)-3-Hydroxy-13,28-epoxyoleanan-16-one		
1074	Saponin 1 3β-*O* ⟵ Ara^2 ⟵ Glc (Ara ^{4}↑ Glc)	*Lysimachia davurica* (Primulaceae), whole plant [361]. White powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{20} = -18.8$ ($c = 0.10$, MeOH).
Aglycone: (3β)-3,30-Dihydroxy-13,28-epoxyoleanan-16-one		
1075	Ardisimamilloside G 3β-*O* ⟵ Ara^2 ⟵ Glc (Ara ^{4}↑ Glc^2 ⟵ Rha)	*Ardisia mamillata* Hance (Myrsinaceae), roots [362]. White powder. $C_{53}H_{86}O_{22}$: 1074.56. $[\alpha]_D^{25} = -22.6$ ($c = 0.83$, MeOH).
Aglycone: Cyclamiretin A (=(3β,16α)-3,16-Dihydroxy-13,28-epoxyoleanan-30-al)		
1076	Saponin 2 3β-*O* ← Xyl^2 ← GlcA	*Lysimachia davurica*, whole plant [361]. White powder. $C_{41}H_{64}O_{14}$: 780.43. $[\alpha]_D^{20} = -5.0$ ($c = 0.10$, MeOH).

Table 1 (cont.)

1077	Saponin 3 3*β*-*O* ← Ara^2 ← Glc	*Lysimachia davurica*, whole plant [361]. White powder. $C_{41}H_{66}O_{13}$: 766.45. $[\alpha]_D^{20} = -7.3$ ($c = 0.25$, MeOH).
1078	Saponin 4 3*β*-*O* ⟵ Ara^2 ⟵ Glc^4 ⟵ Rha 4↑ Glc^4 ⟵ Xyl	*Ardisia japonica* (Thunb) Bl. (Myrsinaceae), aerial parts [363]. $C_{58}H_{94}O_{26}$: 1206.60. $[\alpha]_D^{25} = -16.5$ ($c = 1.0$, MeOH).
Aglycone: (3β,16α,28α)-3,16,28-Trihydroxy-13,28-epoxyoleanan-30-al		
1079	Ardisimamilloside A 3*β*-*O* ⟵ Ara^2 ⟵ Glc 4↑ Glc^2 ⟵ Rha	*Ardisia mamillata* Hance (Myrsinaceae), roots [364]. White powder. $C_{53}H_{86}O_{23}$: 1090.56. M.p. 235–236° (dec.). $[\alpha]_D^{25} = -20.9$ ($c = 0.23$, MeOH).
Aglycone: (3β)-3-Hydroxy-16-oxo-13,28-epoxyoleanan-30-al		
1080	Ardisimamilloside B 3*β*-*O* ⟵ Ara^2 ⟵ Glc 4↑ Glc^2 ⟵ Rha	*Ardisia mamillata*, roots [364]. White powder. $C_{53}H_{84}O_{22}$: 1072.55. M.p. 261–262° (dec.). $[\alpha]_D^{25} = -23.5$ ($c = 0.24$, MeOH).
1081	Ardisimamilloside H 3*β*-*O* ⟵ Ara^4 ⟵ Glc^2 ⟵ Rha	*Ardisia mamillata*, roots [362]. White powder. $C_{47}H_{74}O_{17}$: 910.49. $[\alpha]_D^{25} = -12.7$ ($c = 0.23$, MeOH).
Aglycone: (3β,16α)-3,16-Dihydroxy-13,28-epoxyoleanan-30-oic acid		
1082	Ardisimamilloside F 3*β*-*O* ⟵ Ara^2 ⟵ Glc 4↑ Glc^2 ⟵ Rha	*Ardisia mamillata*, roots [36]. White powder. $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]_D^{25} = -18.6$ ($c = 0.63$, MeOH).

3.21. Δ^{12}-Ursane Type



Aglycone: (3β)-Urs-12-ene-3,27-diol		
1083	Atriplicosaponin B 3*β*-*O* ⟵ Qui^4 ⟵ Glc 2↑ SO_3H	*Zygophyllum atriplicoides*, whole plant [190]. Crystals. $C_{42}H_{70}O_{14}S$: 830.45. M.p. 215–217°. $[\alpha]_D^{25} = +10.3$ ($c = 0.02$, MeOH).

Table 1 (cont.)

Aglycone: (3β,21α)-Urs-12-ene-3,21,28-triol		
1084	Latifoloside I 3*β*-*O* ← Glc² ← Rha; 21*α*-*O* ← Glc	*Ilex latifolia* THUNB (Aquifoliaceae), bark [365]. Colorless powder. $C_{48}H_{80}O_{17}$: 928.54. $[\alpha]^{25}_{D} = +36.7$ ($c = 0.21$, MeOH).
Aglycone: (3β,11α,15α,16α)-15,16-Epoxyurs-12-ene-3,11,28-triol		
1085	Rotundifolioside D 3*β*-*O* ← Fuc² ← Glc² ← Xyl	*Bupleurum rotundifolium*, fruits [366]. White powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]^{24}_{D} = -40.4$ ($c = 1.11$, C_5H_5N).
Aglycone: (3β,11α,16α)-Urs-12-ene-3,11,16,28-tetrol		
1086	Rotundifolioside B 3*β*-*O* ← Fuc² ← Glc² ← Xyl	*Bupleurum rotundifolium* L. (Umbelliferae), fruits [366]. White powder. $C_{47}H_{78}O_{17}$: 914.52. $[\alpha]^{24}_{D} = -60.5$ ($c = 0.62$, C_5H_5N).
1087	Rotundifolioside C 3*β*-*O* ← Fuc² ← Glc² ← Rha	*Bupleurum rotundifolium*, fruits [366]. White powder. $C_{48}H_{80}O_{17}$: 928.54. $[\alpha]^{24}_{D} = -93.0$ ($c = 0.29$, C_5H_5N).
Aglycone: Ursolic acid (=(3β)-3-Hydroxyurs-12-en-28-oic acid)		
1088	Saponin 3 3*β*-*O* ← Ara² ← Glc	*Ilex amara* (Aquifoliaceae), leaves [118]. Amorphous solid. $C_{41}H_{66}O_{12}$: 750.46.
1089	Saponin 4 3*β*-*O* ← Gal² ← Glc	*Ilex amara*, leaves [118]. Amorphous solid. $C_{42}H_{68}O_{13}$: 780.47.
1090	Indicasaponin A 3*β*-*O* ⟵ Ara³ ⟵ Ara; (Ara ²↑ Glc) 28-*O* ⟵ Glc	*Fangonia indica* BURM. f. (Zygophyllaceae), whole plant [141]. Amorphous powder. $C_{52}H_{84}O_{21}$: 1044.55. $[\alpha]^{25}_{D} = +23.0$ ($c = 0.17$, MeOH).
1091	Indicasaponin C 3*β*-*O* ← Ara³ ← Glc⁴ ← SO_3H; 28-*O* ← Glc	*Fagonia indica* BURM., whole plant [367]. Amorphous powder. $C_{47}H_{76}O_{20}S$: 992.88. $[\alpha]^{25}_{D} = +18.0$ ($c = 0.15$, MeOH).
1092	Indicasaponin D 3*β*-*O* ⟵ Ara² ⟵ Xyl; (Ara ³↑ Glc⁴ ⟵ SO_3H) 28-*O* ⟵ Glc	*Fagonia indica*, whole plant [367]. Amorphous powder. $C_{52}H_{84}O_{24}S$: 1124.51. $[\alpha]^{25}_{D} = +27.0$ ($c = 0.18$, MeOH).

Table 1 (cont.)

1093	Cussosaponin D 3β-*O* ← Ara[2] ← Gal; 28-*O* ← Glc	*Cussonia racemosa* BAKER (Araliaceae), leaves [368]. Amorphous powder. $C_{47}H_{78}O_{17}$: 914.52. $[\alpha]_D^{30} = -50.0$ ($c = 1.2$, C_5H_5N).
1094	Cussosaponin E 3β-*O* ← Ara[2] ← Gal; 28-*O* ← Glc[6] ← Glc[4] ← Rha	*Cussonia racemosa*, leaves [368]. White powder. $C_{59}H_{96}O_{26}$: 1220.66. $[\alpha]_D^{30} = -14.8$ ($c = 1.6$, C_5H_5N).
Aglycone: Pomolic acid (=(3β)-3,19-Dihydroxyurs-12-en-28-oic acid)		
1095	Compound 1 3β-*O* ← Glc[2] ← Rha	*Cordia piauhiensis* FRESEN (Boraginaceae) [369]. White amorphous solid. $C_{42}H_{68}O_{13}$: 780.47. M.p. 218–220°. $[\alpha]_D^{20} = -0.4$ ($c = 0.05$, MeOH).
1096	Oblonganoside H 3β-*O* ← Xyl; 28-*O* ← Glc	*Ilex oblonga* (Aquifoliaceae), leaves [177]. Amorphous powder. $C_{41}H_{66}O_{13}$: 766.45. $[\alpha]_D^{21} = +71.0$ ($c = 0.10$, MeOH).
1097	Godoside D 3β-*O* ← Ara; 28-*O* ← Glc[2] ← Glc	*Ilex godajam*, aerial parts [116]. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]_D^{27} = +66.7$ ($c = 0.026$, MeOH).
1098	Latifoloside G 3β-*O* ⟵ Ara[2] ⟵ Rha; (Ara 3 ↑ Glc) 28-*O* ⟵ Glc[2] ⟵ Rha	*Ilex latifolia*, leaves [179]. Amorphous solid. $C_{59}H_{96}O_{26}$: 1220.62. M.p. 215–218°.
1099	Latifoloside L 3β-*O* ⟵ Ara[2] ⟵ Rha (Ara 3 ↑ Glc[2] ⟵ Glc)	*Ilex latifolia*, bark [370]. $C_{53}H_{86}O_{22}$: 1076.56. Colorless powder. $[\alpha]_D^{25} = +7.5$ ($c = 0.35$, MeOH).
1100	Ilekudinoside B 3β-*O* ← GlcA; 28-*O* ← Glc	*Ilex kudincha*, leaves [120]; *Randia formosa*, leaves [176]. Amorphous powder. $C_{42}H_{66}O_{15}$: 810.44. $[\alpha]_D^{23} = -15.3$ ($c = 0.49$, MeOH).
1101	Ilekudinoside E (= Randiasaponin III) 3β-*O* ← Ara[3] ← Glc; 28-*O* ← Glc	*Ilex kudincha*, leaves [120]; *Randia formosa*, leaves [176]. Amorphous powder. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]_D^{23} = -0.7$ ($c = 0.51$, MeOH).
1102	Randiasaponin IV (= Latifoloside A) 3β-*O* ← Ara[2] ← Rha; 28-*O* ← Glc	*Randia formosa*, leaves [176]; *Ilex latifolia*, leaves [178]. White powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{20} = -65.0$ ($c = 0.24$, MeOH).

Table 1 (cont.)

1103	Scabrioside A 3β-*O* ← Xyl; 28-*O* ← Glc^6 ← All	*Scabiosa rotata* BIEB. (Dipsacaceae), roots [371]. Colorless solid. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]_D^{20} = -22.9$ ($c = 0.38$, MeOH).
1104	Scabrioside B 3β-*O* ← Xyl^2 ← Rha; 28-*O* ← Glc^6 ← All	*Scabiosa rotata*, roots [371]. Colorless solid. $C_{53}H_{86}O_{22}$: 1074.56. $[\alpha]_D^{20} = -35.2$ ($c = 0.5$, MeOH).
1105	Scabrioside C 3β-*O* ← Ara^2 ← Rha; 28-*O* ← Glc^6 ← All	*Scabiosa rotata*, roots [371]. Colorless solid. $C_{53}H_{86}O_{22}$: 1074.56. $[\alpha]_D^{20} = -33.9$ ($c = 0.54$, MeOH).
1106	Scabrioside D 3β-*O* ← Xyl^2 ← Rha^3 ← Glc; 28-*O* ← Glc^6 ← All	*Scabiosa rotata*, roots [371]. Colorless solid. $C_{59}H_{96}O_{27}$: 1236.61. $[\alpha]_D^{20} = -23.0$ ($c = 0.5$, MeOH).
1107	Scabiosaponin H 3β-*O* ← Ara^2 ← Rha^3 ← Glc^4 ← Glc; 28-*O* ← Glc^6 ← Glc	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{65}H_{106}O_{32}$: 1398.67. M.p. 230–232°. $[\alpha]_D^{20} = -11.3$ ($c = 0.10$, MeOH).
1108	Scabiosaponin I 3β-*O* ← Ara^2 ← Rha^3 ← Glc 28-*O* ← Glc^6 ← Glc	*Scabiosa tschiliensis*, whole plant [108]. Amorphous solid. $C_{59}H_{96}O_{27}$: 1236.61. M.p. 213–215°. $[\alpha]_D^{20} = -15.0$ ($c = 0.10$, MeOH).
1109	Compound 5 3β-*O* ← Ara; 28-*O* ← Glc^6 ← Galloyl	*Sanguisorba officinalis*, roots [180]. Pale-yellow solid. $C_{48}H_{70}O_{17}$: 918.46. $[\alpha]_D^{25} = +10.0$ ($c = 0.10$, MeOH).
1110	Sarcandroside B 3β-*O* ⟵ Xyl^2 ⟵ Rha; ^{3}↑ Glc 28-*O* ⟵ Glc	*Sarcandra glabra*, whole plant [372]. Amorphous solid. $C_{53}H_{86}O_{22}$: 1074.56. M.p. 267–269°.

Aglycone: Ilexgenin B (=(3β,20β)-3,19-Dihydroxyurs-12-en-28-oic acid)

1111	Latifoloside D 3β-*O* ← Ara^2 ← Rha; 28-*O* ← Glc	*Ilex latifolia* (Aquifoliaceae), leaves [178]. $C_{47}H_{76}O_{17}$: 912.51. Colorless powder. M.p. 212–215°.
1112	Latifoloside E 3β-*O* ⟵ Ara^2 ⟵ Rha; ^{3}↑ Glc 28-*O* ⟵ Glc	*Ilex latifolia*, leaves [178]. $C_{53}H_{86}O_{22}$: 1074.56. Colorless powder. M.p. 228–230°.

Table 1 (cont.)

1113	Latifoloside F 3β-*O* ⟵ Ara^2 ⟵ Rha; ^{3}↑ Glc 28-*O* ⟵ Glc^2 ⟵ Rha	*Ilex latifolia*, leaves [179]. Amorphous solid. $C_{59}H_{96}O_{26}$: 1220.62. M.p. 235–238°.
Aglycone: (2α,3β)-2,3-Dihydroxyurs-12-en-28-oic acid		
1114	Biondianoside F 3β-*O* ⟵ Glc; 28-*O* ⟵ Glc^2 ⟵ Glc ^{6}↑ Glc	*Biondia chinensis* Schltr. (Asclepiadaceae), roots [210]. White amorphous powder. $C_{54}H_{88}O_{24}$: 1120.57. $[\alpha]^{25}_{D} = -19.0$ ($c = 0.1$, MeOH).
Aglycone: (3β,21α)-3,21-Dihydroxyurs-12-en-28-oic acid		
1115	Latifoloside J 3β-*O* ← Glc^2 ← Rha 21α-*O* ← Glc	*Ilex latifolia*, bark [365]. Colorless powder. $C_{48}H_{78}O_{18}$: 942.52. $[\alpha]^{25}_{D} = +7.4$ ($c = 0.67$, MeOH).
Aglycone: (3β)-3,23-Dihydroxyurs-12-en-28-oic acid		
1116	Compound 1 3β-*O* ← Ara	*Cussonia bancoensis* Aurev. & Pellegr. (Araliaceae), stem bark [373]. White powder. $C_{35}H_{56}O_8$: 604.40. $[\alpha]^{31}_{D} = +65.2$ ($c = 0.046$, MeOH).
1117	Compound 2 3β-*O* ← Glc	*Cussonia bancoensis* stem bark [373]. White powder. $C_{36}H_{58}O_9$: 634.41. $[\alpha]^{31}_{D} = +43.4$ ($c = 0.046$, MeOH).
Aglycone: (2α,3β)-2,3,23-Trihydroxyurs-12-en-28-oic acid		
1118	Ilekudinoside C 3β-*O* ← Ara; 28-*O* ← Glc	*Ilex kudincha*, leaves [119]. Amorphous powder. $C_{41}H_{66}O_{14}$: 782.45. $[\alpha]^{23}_{D} = +8.6$ ($c = 0.66$, MeOH).
1119	Stelmatotriterpenoside F 3β-*O* ← Glc; 28-*O* ← Glc^6 ← Glc	*Stelmatocrypton khasianum*, stem [211]. White powder. $C_{48}H_{82}O_{22}$: 1010.53. M.p. 217–220° (dec.). $[\alpha]^{25}_{D} = -14.9$ ($c = 0.27$, MeOH).
1120	Mutongsaponin C 28-*O* ← Glc^6 ← Glc^4 ← Rha^3 ← Xyl	*Akebia trifoliata* var. *australis*, stem [335]. White crystals (MeOH). $C_{53}H_{86}O_{23}$: 1090.56. $[\alpha]^{27}_{D} = -10.8$ ($c = 0.11$, MeOH).

Table 1 (cont.)

Aglycone: (3β)-3,20,23-Trihydroxyurs-12-en-28-oic acid		
1121	Compound 4 3β-*O*←Ara³←Xyl; 28-*O*←Glc⁶←Rha³←Rha	*Tupidanthus calyptratus*, aerial parts [374]. White powder. $C_{58}H_{94}O_{26}$: 1206.60. $[\alpha]_D^{25} = +35.0$ ($c = 1.0$, MeOH).
1122	Compound 5 3β-*O*←Ara³←Xyl; 28-*O*←Glc⁶←Rha	*Tupidenthus calyptratus*, aerial parts [374]. White powder. $C_{52}H_{84}O_{22}$: 1060.54. $[\alpha]_D^{25} = +27.0$ ($c = 1.0$, MeOH).
Aglycone: (3β,20β)-3,19,24-Trihydroxyurs-12-en-28-oic acid		
1123	Brevicuspisaponin I 3β-*O*←Ara	*Ilex brevicuspis* REISSEK (Aquifoliaceae), leaves [375]. White powder. $C_{35}H_{56}O_9$: 620.39. M.p. 237–238°. $[\alpha]_{589}^{18} = +36.0$ ($c = 1.35$, MeOH).
Aglycone: (3β,20β)-3,19,23,24-Tetrahydroxyurs-12-en-28-oic acid		
1124	Brevicuspisaponin II 3β-*O*←Ara	*Ilex brevicuspis*, leaves [375]. White powder. $C_{35}H_{56}O_{10}$: 636.39. M.p. 203–204°. $[\alpha]_{589}^{16} = +29.0$ ($c = 0.64$, MeOH).
Aglycone: (2α,3β)-2,3,19-Trihydroxyurs-12-en-28-oic acid		
1125	Stelmatotriterpenoside G 3β-*O*←Glc; 28-*O*←Glc²←Glc	*Stelmatocrypton khasianum*, stem [211]. White powder. $C_{48}H_{78}O_{20}$: 974.51. M.p. 185–187°. $[\alpha]_D^{25} = -138.0$ ($c = 0.06$, MeOH).
Aglycone: (2α,3α)-2,3,24-Trihydroxyurs-12-en-28-oic acid		
1126	Compound 4 28-*O*←Glc	*Prunus serrulata* var. *spontanea* (Rosaceae), leaves [376]. Amorphous powder. $C_{36}H_{58}O_{10}$: 650.40. $[\alpha]_D^{20} = -25.0$ ($c = 0.08$, MeOH).
Aglycone: Rotundic acid (=(3β)-3,19,23-Trihydroxyurs-12-en-28-oic acid)		
1127	Ilekudinoside D 3β-*O*←Ara; 28-*O*←Glc	*Ilex kudincha*, leaves [119]. Amorphous powder. $C_{41}H_{66}O_{14}$: 782.45. $[\alpha]_D^{23} = +11.5$ ($c = 2.16$, MeOH).
1128	Randiasaponin II 3β-*O*←Ara³←Glc	*Randia formosa*, leaves [176]. White powder. $C_{41}H_{66}O_{14}$: 780.43. $[\alpha]_D^{20} = +10.9$ ($c = 0.12$, MeOH).

Table 1 (cont.)

1129	Oblonganoside I 3*β*-*O* ← Xyl; 28-*O* ← Glc	*Ilex oblonga* (Aquifoliaceae), leaves [177]. Amorphous powder. $C_{41}H_{66}O_{14}$: 782.45. $[\alpha]_D^{21} = -3.8$ ($c = 0.30$, MeOH).
*Aglycone: (3β,19α)-3,23-*O*-(Hydroxyethylidene)-3,19,23-trihydroxyurs-12-en-28-oic acid (=(2*R*,4a*R*,4b*R*,6a*R*,6b*S*,8a*S*,11*R*,12*R*,12a*S*,14a*R*,14b*R*,16a*S*)-4a,5,6,6a,6b,7,8,9,10,11,12,12a,14,14a,14b,15,16,16a-Octadecahydro-12-hydroxy-2-(hydroxymethyl)-4a,6a,6b,11,12,14b-hexamethyl-4*H*-piceno[3,4-*d*][1,3]dioxine-8a(4b*H*)-carboxylic acid)*		
1130	Oblonganoside J 28-*O* ← Glc	*Ilex oblonga* (Aquifoliaceae), leaves [177]. Amorphous powder. $C_{38}H_{60}O_{11}$: 692.41. $[\alpha]_D^{21} = -72.3$ ($c = 0.37$, MeOH).
Aglycone: (2α,3α)-2,3,19,24-Tetrahydroxyurs-12-en-28-oic acid		
1131	Compound 2 28-*O* ← Glc	*Rubus xanthocarpus* (Rosaceae), aerial parts [377]. Amorphous powder. $C_{36}H_{58}O_{11}$: 666.40. M.p. 226–228°. $[\alpha]_D^{20} = -27.0$ ($c = 0.32$, MeOH).
Aglycone: (2α,3α)-2,3,19-Trihydroxy-24-oxours-12-en-28-oic acid		
1132	Compound 3 28-*O* ← Glc	*Rubus xanthocarpus*, aerial parts [377]. White powder. $C_{36}H_{56}O_{11}$: 664.38. M.p. 144–146°. $[\alpha]_D^{20} = -64.0$ ($c = 0.12$, MeOH).
Aglycone: (1β,2α,3β)-1,2,3,19-Tetrahydroxyurs-12-en-28-oic acid		
1133	Saponin 1 28-*O* ← Gal^2 ← Glc	*Acorus calamus* LINN. (Araceae), rhizome [40]. Amorphous solid. $C_{42}H_{68}O_{16}$: 828.45. M.p. 94°.
1134	Compound 1 3*β*-*O* ← Xyl	*Centipeda minima* (Compositae), whole plant [378]. Amorphous solid. $C_{36}H_{58}O_{10}$: 650.40. M.p. 140°.
Aglycone: (1β,2β,3β)-1,2,3,19-Tetrahydroxyurs-12-en-28-oic acid		
1135	Compound 2 28-*O* ← Xyl	*Centipeda minima*, whole plant [378]. Amorphous solid. $C_{36}H_{58}O_{10}$: 650.40. M.p. 142°.

Table 1 (cont.)

Aglycone: (2α,3β)-2,3,20,23-Tetrahydroxyurs-12-en-28-oic acid		
1136	Compound 1 3β-*O* ← Ara^3 ← Xyl; 28-*O* ← Glc^6 ← Glc	*Tupidanthus calyptratus* (Araliaceae), aerial parts [374]. White powder. $C_{52}H_{84}O_{24}$: 1092.54. $[\alpha]_D^{25} = +9.0$ ($c = 1.0$, MeOH).
1137	Compound 2 3β-*O* ← Ara^3 ← Xyl; 28-*O* ← Glc	*Tupidanthus calyptratus*, aerial parts [374]. White powder. $C_{46}H_{74}O_{19}$: 930.48. $[\alpha]_D^{25} = +15.0$ ($c = 1.0$, MeOH).
1138	Compound 3 3β-*O* ← Ara; 28-*O* ← Glc	*Tupidanthus calyptratus*, aerial parts [374]. White powder. $C_{41}H_{66}O_{15}$: 798.44. $[\alpha]_D^{25} = +18.0$ ($c = 1.0$, MeOH).
Aglycone: (3β)-3,19-Dihydroxyurs-12-ene-23,28-dioic acid		
1139	Godoside C 23-*O* ← Glc; 28-*O* ← Glc	*Ilex godajam*, aerial parts [116]. $C_{42}H_{66}O_{16}$: 826.44. $[\alpha]_D^{27} = +27.0$ ($c = 0.015$, MeOH).
Aglycone: (3β,20β)-3,19,24-Trihydroxyurs-12-ene-23,28-dioic acid		
1140	Compound 5 28-*O* ← Glc	*Ilex psammophila*, leaves [379]. $C_{36}H_{56}O_{12}$: 680.38. Isolated as acetate. $[\alpha]_D^{20} = +20.7$ ($c = 1.03$, $CHCl_3$).
Aglycone: (2α,3β)-2-(Acetyloxy)-3,19-dihydroxyurs-12-ene-23,28-dioic acid		
1141	2-*O*-Acetylsuavissomoside F1 28-*O* ← Glc	*Rubuscochin chinensis* TRATT. (Rosaceae), leaves [380]. Amorphous solid. $C_{38}H_{58}O_{13}$: 722.39. $[\alpha]_D^{28} = -11.9$ ($c = 0.25$, MeOH).
Aglycone: (3β,20β)-3,19-Dihydroxyurs-12-ene-24,28-dioic acid		
1142	Compound 4 28-*O* ← Glc	*Ilex psammophila* REISSEK (Aquifoliaceae), leaves [379]. $C_{36}H_{56}O_{11}$: 664.38. $[\alpha]_D^{20} = +31.1$ ($c = 1.11$, MeOH).
Aglycone: (3β)-3,19-Dihydroxyurs-12-ene-24,28-dioic acid		
1143	Compound 2 28-*O* ← Glc^6 ← Me	*Rubus pileatus* FOCKE. (Rosaceae), aerial parts [381]. Isolated as Me ester. $C_{37}H_{58}O_{11}$: 678.40.
1144	Mussaendoside V 24-*O* ← Glc; 28-*O* ← Glc	*Mussaenda pubescens* AIT. F. (Rubiaceae), aerial parts [382]. White powder. $C_{42}H_{66}O_{16}$: 826.44. $[\alpha]_D^{25} = -22.8$ ($c = 0.26$, MeOH).

Table 1 (cont.)

Aglycone: (2α,3β)-2,3,19-Trihydroxyurs-12-ene-24,28-dioic acid		
1145	Stelmatotriterpenoside H 24-*O* ← Glc; 28-*O* ← Glc	*Stelmatocrypton khasianum*, stem [211]. White powder. $C_{48}H_{78}O_{20}$: 974.51. M.p. 219–221°. $[\alpha]_D^{25} = +200.0$ ($c = 0.02$, MeOH).
1146	Compound 4 28-*O* ← Glc[6] ← Me	*Rubus pileatus* aerial parts [381]. Isolated as Me ester. $C_{37}H_{58}O_{12}$: 694.39.
1147	Compound 5 28-*O* ← Glc[3] ← Me	*Rubus pileatus*, aerial parts [381]. Isolated as Me ester. $C_{37}H_{58}O_{12}$: 694.39.
Aglycone: Quinovic acid (=(3β)-3-Hydroxyurs-12-ene-27,28-dioic acid)		
1148	Phelasin B 3β-*O* ← Glc[2] ← Glc	*Anthocephalus cadamba* (ROXB) MIQ. (Rubiaceae), bark [345]. Colorless needles. $C_{42}H_{66}O_{15}$: 810.44. M.p. 238–241°. $[\alpha]_D^{23} = +38.1$ ($c = 1.1$, MeOH).
1149	Saponin 1 3β-*O* ← Qui; 28-*O* ← Glc	*Neonauclea sessilifolia* MERR. (Rubiaceae), stem [383]. White amorphous powder. $C_{42}H_{66}O_{14}$: 794.45. $[\alpha]_D^{25} = +50.0$ ($c = 0.002$, MeOH).
1150	Saponin 2 3β-*O* ← Rha[4] ← Glc	*Neonauclea sessilifolia*, stem [383]. White powder. $C_{42}H_{66}O_{14}$: 794.45. $[\alpha]_D^{25} = -20.0$ ($c = 0.1$, MeOH).
1151	Saponin 1 3β-*O* ← Qui[2] ← Glc	*Neonauclea sessilifolia* (ROXB.) MERR., roots [340]. Colorless solid. $C_{42}H_{66}O_{14}$: 794.45. M.p. 220–222°. $[\alpha]_D^{22} = +43.0$ ($c = 0.6$, MeOH).
1152	Saponin 6 3β-*O* ← Glc; 28-*O* ← Glc[2] ← Ara	*Cephalanthus occidentalis*, roots and stem bark [326]. Colorless powder. $C_{47}H_{74}O_{19}$: 942.47. $[\alpha]_D^{25} = +33.1$ ($c = 0.1$, MeOH).
1153	Zygophyloside G 3β-*O* ← Glc[2] ← SO_3H; 28-*O* ← Glc	*Zygophyllum coccineum* L. (Zygophyllaceae), roots; *Z. dumosum* BOISS, roots [384]. Amorphous powder. $C_{42}H_{66}O_{18}S$: 890.40. M.p. 240–244°. $[\alpha]_D^{25} = +20.0$ ($c = 0.16$, MeOH).

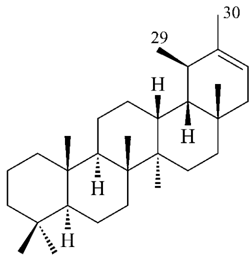
Table 1 (cont.)

1154	Zygophyloside H 3*β*-*O* ← Qui[2] ← Ara; 28-*O* ← Glc	*Zygophyllum coccineum*, roots; *Z. dumosum* roots [384]. Amorphous powder. $C_{47}H_{74}O_{18}$: 926.49. M.p. 215–219°. $[\alpha]_D^{25} = +36.0$ ($c = 0.17$, MeOH).
1155	Compound 4 3*β*-*O* ← Rha	*Uncaria tomentosa* (WILLD.) DC (Rubiaceae), root bark [385]. Amorphous solid. $C_{36}H_{56}O_9$: 632.39. $[\alpha]_D^{25} = +10.0$ ($c = 1.0$, MeOH).
1156	Compound 6 3*β*-*O* ← Qui[3] ← Glc	*Uncaria tomentosa*, root bark [385]. Amorphous solid. $C_{42}H_{66}O_{14}$: 794.45. $[\alpha]_D^{25} = +36.0$ ($c = 1.0$, MeOH).
1157	Compound 7 3*β*-*O* ← Qui[3] ← Gal	*Uncaria tomentosa*, root bark [385]. Amorphous solid. $C_{42}H_{66}O_{14}$: 794.45. $[\alpha]_D^{25} = +18.0$ ($c = 1.0$, MeOH).
1158	Compound 8 3*β*-*O* ← Rha[3] ← Glc; 27-*O* ← Glc	*Uncaria tomentosa*, root bark [385]. Amorphous solid. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{25} = +25.0$ ($c = 1.0$, MeOH).
1159	Compound 9 27-*O* ← Glc	*Uncaria tomentosa*, root bark [385]. Amorphous solid. $C_{36}H_{56}O_{10}$: 648.39. $[\alpha]_D^{25} = +55.0$ ($c = 1.0$, MeOH).
1160	Compound 1 3*β*-*O* ← Fuc[4] ← Glc	*Adina rubella* HANCE (Rubiaceae), roots [386]. Powder. $C_{42}H_{66}O_{14}$: 794.45. M.p. 230–232°. $[\alpha]_D^{27} = +18.4$ ($c = 0.0032$, MeOH).
1161	Compound 2 3*β*-*O* ← Fuc[4] ← Glc; 28-*O* ← Glc	*Adina rubella*, roots [386]. Powder. $C_{48}H_{76}O_{19}$: 956.50. M.p. 225–230°. $[\alpha]_D^{20} = +32.6$ ($c = 0.0069$, MeOH).
1162	Compound 3 3*β*-*O* ← Rha[4] ← Glc; 28-*O* ← Glc	*Adina rubella*, roots [386]. Powder. $C_{48}H_{76}O_{19}$: 956.50. M.p. 232–235°. $[\alpha]_D^{24} = +6.3$ ($c = 0.0039$, MeOH).

Table 1 (cont.)

1163	Compound 4 3β-*O* ← Glc^2 ← Glc; 28-*O* ← Glc	*Adina rubella*, roots [386]. Powder. $C_{48}H_{76}O_{20}$: 972.49. M.p. 206–209°. $[\alpha]_D^{24} = +21.9$ ($c = 0.0064$, MeOH).

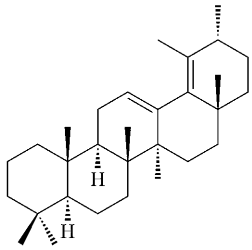
3.22. Δ^{20}-Ursane Type



Aglycone: (3β)-3-Hydroxyurs-20-en-28-oic acid

1164	Zygophyloside I 3β-*O* ← Glc^2 ← Ara^2 ← Rha; 28-*O* ← Glc^2 ← SO_3H	*Zygophyllum gaetulum*, aerial parts [147]. $C_{53}H_{86}O_{24}S$: 1138.52. $[\alpha]_D^{25} = +15.5$ ($c = 1.0$, MeOH).
1165	Zygophyloside L 3β-*O* ← Glc^2 ← Ara^2 ← Rha; 28-*O* ← Glc	*Zygophyllum gaetulum*, aerial parts [147]. $C_{53}H_{86}O_{21}$: 1058.57. $[\alpha]_D^{25} = +18.1$ ($c = 1.0$, MeOH).

3.23. $\Delta^{12,18}$-Ursane Type



Aglycone: (3β)-3-Hydroxyursa-12,18-dien-28-oic acid

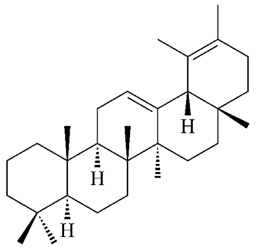
1166	Latifoloside K 3β-*O* ⟵ Ara^2 ⟵ Rha; (3↑ Glc) 28-*O* ⟵ Glc	*Ilex latifolia* Thunb (Aquifoliaceae), bark [370]. Colorless powder. $C_{53}H_{84}O_{21}$: 1056.55. $[\alpha]_D^{25} = +0.74$ ($c = 0.78$, MeOH).
1167	Compound 4 3β-*O* ← Ara	*Sanguisorba officinalis*, roots [180]. Amorphous solid. $C_{35}H_{54}O_7$: 586.39. $[\alpha]_D^{25} = +112.0$ ($c = 0.10$, MeOH).

Table 1 (cont.)

Aglycone: (3β)-3-Hydroxyursa-12,18-diene-24,28-dioic acid

1168	Ilexhainanoside A 28-*O*←Glc	*Ilex hainanensis* MERR. (Aquifoliaceae), leaves [387]. Colorless gum. $C_{36}H_{54}O_{10}$: 646.37. $[\alpha]_D^{26} = +140.1$ ($c = 3.5$, MeOH).

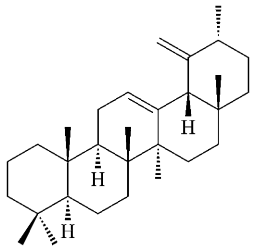
3.24. $\Delta^{12,19(20)}$-Ursane Type



Aglycone: (3β)-3,30-Dihydroxyursa-12,19-diene-24,28-dioic acid

1169	Ilexhainanoside B 28-*O*←Glc	*Ilex hainanensis*, leaves [387]. $C_{36}H_{54}O_{11}$: 662.37. Colorless gum. $[\alpha]_D^{26} = +23.4$ ($c = 1.3$, MeOH).

3.25. $\Delta^{12,19(29)}$-Ursane Type



Aglycone: (3β)-3-Hydroxyursa-12,19(29)-dien-28-oic acid

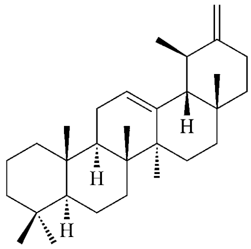
1170	Compound 2 3β-*O*←Ara; 28-*O*←Glc	*Sanguisorba officinalis*, roots [180]. Amorphous solid. $C_{41}H_{64}O_{12}$: 748.44. $[\alpha]_D^{25} = +12.0$ ($c = 0.10$, MeOH).

Aglycone: (3β)-3,23-Dihydroxyursa-12,19(29)-dien-28-oic acid

1171	Compound 3 3β-*O*←Ara; 28-*O*←Glc	*Sanguisorba officinalis*, roots [180]. Amorphous solid. $C_{41}H_{64}O_{13}$: 764.43. $[\alpha]_D^{25} = +24.0$ ($c = 0.10$, MeOH).

Table 1 (cont.)

3.26. $\Delta^{12,20(30)}$-Ursane Type



Aglycone: (3β)-3,19-Dihydroxyursa-12,20(30)-dien-28-oic acid

1172	Ilekudinoside F 3β-*O* ⟵ Ara[2] ⟵ Rha; [3]↑ Glc[2] ⟵ Glc 28-*O* ⟵ Glc[2] ⟵ Rha	*Ilex kudincha*, leaves [119]. Amorphous powder. $C_{65}H_{104}O_{31}$: 1380.66. $[\alpha]_D^{23} = +6.4$ ($c = 0.65$, MeOH).

Aglycone: (2α,3β)-2,3-Dihydroxyursa-12,20(30)-dien-28-oic acid

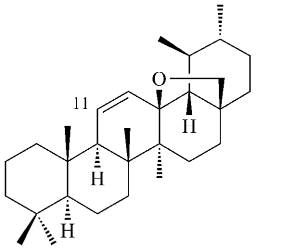
1173	Compound 1 3β-*O* ⟵ Glc[2] ⟵ Ara[2] ⟵ Glc [3]↑ Xyl	*Alternanthera repens* (LINN.) LINK (Amaranthaceae), aerial parts [388]. $C_{52}H_{82}O_{22}$: 1058.53. $[\alpha]_D^{25} = +19.0$ ($c = 1.0$, MeOH).
1174	Compound 2 3β-*O* ⟵ Glc[2] ⟵ Ara[2] ⟵ Qui [3]↑ Xyl	*Alternanthera repens*, aerial parts [388]. $C_{52}H_{82}O_{21}$: 1042.53. $[\alpha]_D^{25} = +16.0$ ($c = 1.0$, MeOH).
1175	Compound 3 3β-*O* ⟵ Glc[2] ⟵ Ara [3]↑ Xyl	*Alternanthera repens*, aerial parts [388]. $C_{46}H_{72}O_{17}$: 896.48. $[\alpha]_D^{25} = +28.0$ ($c = 1.0$, MeOH).
1176	Compound 4 3β-*O* ← Glc[3] ← Xyl	*Alternanthera repens*, aerial parts [388]. $C_{41}H_{64}O_{13}$: 764.43. $[\alpha]_D^{25} = +32.0$ ($c = 1.0$, MeOH).

Aglycone: (3β)-3,19,23-Trihydroxyursa-12,20(30)-dien-28-oic acid

1177	Randiasaponin I 3β-*O* ← Ara; 28-*O* ← Glc	*Randia formosa*, leaves [176]. White powder. $C_{41}H_{64}O_{14}$: 780.43. $[\alpha]_D^{20} = +45.9$ ($c = 0.17$, MeOH).

Table 1 (cont.)

3.27. 13β,28-Epoxy-Δ^{11}-ursane Type



Aglycone: (3β,16α)-13,28-Epoxyurs-11-ene-3,16-diol

1178	Rotundifolioside A 3β-*O*$\leftarrow$Glc$^2\leftarrow$Glc$^2\leftarrow$Xyl	*Bupleurum rotundifolium*, fruits [366]. White powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{24} = -9.4$ ($c = 0.64$, C_5H_5N).
1179	Rotundifolioside I 3β-*O*$\leftarrow$Fuc$^2\leftarrow$Glc$^2\leftarrow$Xyl	*Bupleurum rotundifolium*, fruits [366]. White powder. $C_{47}H_{76}O_{16}$: 896.51. $[\alpha]_D^{24} = -10.1$ ($c = 0.99$, C_5H_5N).
1180	Rotundifolioside J 3β-*O*$\leftarrow$Fuc$^2\leftarrow$Glc$^2\leftarrow$Rha	*Bupleurum rotundifolium*, fruits [366]. White powder. $C_{48}H_{78}O_{16}$: 910.53. $[\alpha]_D^{24} = +31.3$ ($c = 1.0$, C_5H_5N).

Aglycone: (3β,16α,21β)-13,28-Epoxyurs-11-ene-3,16,21-triol

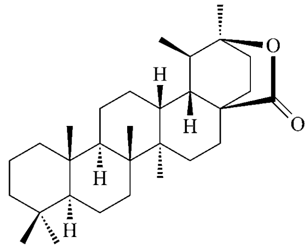
1181	Rotundifolioside E 3β-*O*$\leftarrow$Fuc$^2\leftarrow$Glc$^2\leftarrow$Xyl	*Bupleurum rotundifolium*, fruits [366]. White powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{24} = -16.8$ ($c = 0.59$, C_5H_5N).
1182	Rotundifolioside F 3β-*O*$\leftarrow$Fuc$^2\leftarrow$Glc$^2\leftarrow$Rha	*Bupleurum rotundifolium*, fruits [366]. White powder. $C_{48}H_{78}O_{17}$: 926.52. $[\alpha]_D^{24} = -12.9$ ($c = 0.47$, C_5H_5N).

Aglycone: (3β,16α)-13,28-Epoxyurs-11-ene-3,16,23-triol

1183	Rotundifolioside G 3β-*O*$\leftarrow$Glc$^2\leftarrow$Glc$^2\leftarrow$Xyl	*Bupleurum rotundifolium*, fruits [366]. White powder. $C_{47}H_{76}O_{18}$: 928.50. $[\alpha]_D^{24} = +3.8$ ($c = 0.90$, C_5H_5N)
1184	Rotundifolioside H 3β-*O*$\leftarrow$Fuc$^2\leftarrow$Glc$^2\leftarrow$Xyl	*Bupleurum rotundifolium*, fruits [366]. White powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{24} = -62.0$ ($c = 0.18$, C_5H_5N).

Table 1 (cont.)

3.28. Ursan-28,20β-olide Type



Aglycone: (3β)-3-Hydroxy-20,28-epoxyursan-28-one

1185	Zygophyloside N 3β-*O* ← Glc[2] ← Ara[2] ← Rha		*Zygophyllum gaetulum* Emb et Maire (Zygophyllaceae), aerial parts [389]. $C_{47}H_{76}O_{16}$: 896.51. $[\alpha]_D^{25} = -148.5$ ($c = 0.5$, MeOH).

Aglycone: (3β,19α)-3,19-Dihydroxy-20,28-epoxyurs-12-en-28-one

1186	Ilekudinoside G 3β-*O* ⟵ Ara[2] ⟵ Rha [3]↑ Glc[2] ⟵ Glc		*Ilex kudincha*, leaves [119]. Amorphous powder. $C_{53}H_{84}O_{22}$: 1072.55. $[\alpha]_D^{23} = -60.6$ ($c = 0.45$, C_5H_5N).

Aglycone: (3β,19α)-3,19-Dihydroxy-20,28-epoxyursa-11,13(18)-dien-28-one

1187	Ilekudinoside K 3β-*O* ← Glc [2] ← Rha		*Ilex kudingcha*, leaves [390]. Amorphous powder. $C_{42}H_{64}O_{13}$: 776.43. $[\alpha]_D^{20} = -16.9$ ($c = 0.10$, MeOH).
1188	Ilekudinoside N 3β-*O* ← Glc[2] ← Glc		*Ilex kudingcha*, leaves [390]. Amorphous powder. $C_{42}H_{64}O_{14}$: 792.43. $[\alpha]_D^{20} = -18.6$ ($c = 0.10$, MeOH).
1189	Ilekudinoside O 3β-*O* ← Ara[2] ← Glc		*Ilex kudingcha*, leaves [390]. Amorphous powder. $C_{41}H_{62}O_{13}$: 762.42. $[\alpha]_D^{20} = -17.1$ ($c = 0.1$, MeOH).
1190	Ilekudinoside P 3β-*O* ← Ara[3] ← Glc		*Ilex kudingcha*, leaves [390]. Amorphous powder. $C_{41}H_{62}O_{13}$: 762.42. $[\alpha]_D^{20} = -17.6$ ($c = 0.1$, MeOH).

Aglycone: (3β,12β,19α)-3,12,19-Trihydroxy-20,28-epoxyurs-13(18)-en-28-one

1191	Ilekudinoside I 3β-*O* ← Ara[2] ← Glc		*Ilex kudingcha*, leaves [119]. Amorphous powder. $C_{41}H_{64}O_{14}$: 780.43. $[\alpha]_D^{23} = -49.3$ ($c = 0.35$, MeOH).
1192	Ilekudinoside J 3β-*O* ← Glc[2] ← Glc		*Ilex kudingcha*, leaves [119]. Amorphous powder. $C_{42}H_{66}O_{15}$: 810.44. $[\alpha]_D^{23} = -21.9$ ($c = 2.11$, MeOH).

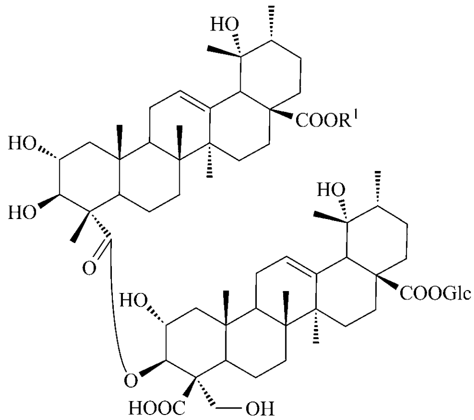
Table 1 (cont.)

1193	Ilekudinoside L 3*β*-*O* ← Ara^3 ← Glc	*Ilex kudingcha*, leaves [390]. Amorphous powder. $C_{41}H_{64}O_{14}$: 780.43. $[\alpha]_D^{20} = -23.0$ ($c = 0.10$, MeOH).
1194	Ilekudinoside Q 3*β*-*O* ← Glc^2 ← Rha	*Ilex kudingcha*, leaves [390]. Amorphous powder. $C_{42}H_{66}O_{14}$: 794.45. $[\alpha]_D^{20} = -20.5$ ($c = 0.1$, MeOH).
1195	Ilekudinoside R 3*β*-*O* ← Ara^2 ← Rha	*Ilex kudingcha*, leaves [390]. Amorphous powder. $C_{41}H_{64}O_{13}$: 764.43. $[\alpha]_D^{20} = -17.0$ ($c = 0.1$, MeOH).

Aglycone: (3β,11β,19α)-3,11,19-Trihydroxy-20,28-epoxyurs-13(18)-en-28-one

1196	Ilekudinoside H 3*β*-*O* ⟵ Ara^2 ⟵ Rha ^{3}↑ Glc^2 ⟵ Glc	*Ilex kudingcha*, leaves [119]. Amorphous powder. $C_{53}H_{84}O_{23}$: 1088.54. $[\alpha]_D^{23} = -99.3$ ($c = 2.34$, C_5H_5N).
1197	Ilekudinoside M 3*β*-*O* ← Ara^2 ← Rha	*Ilex kudingcha*, leaves [390]. Amorphous powder. $C_{41}H_{64}O_{13}$: 764.43. $[\alpha]_D^{20} = -20.3$ ($c = 0.10$, MeOH).
1198	Ilekudinoside S 3*β*-*O* ← Glc^2 ← Rha	*Ilex kudingcha*, leaves [390]. Amorphous powder. $C_{42}H_{64}O_{14}$: 792.43. $[\alpha]_D^{20} = -24.6$ ($c = 0.1$, MeOH).

3.29. Δ^{12}-Ursane-Dimer Type

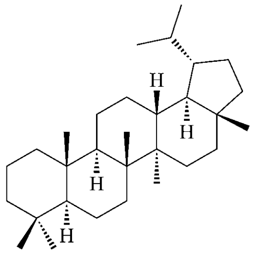


1199	Rubupungenoside A R^1 = Glc^6 ← Me	*Rubus pungens* Camb var. *oldhamii*, aerial parts [391]. Isolated as Me-ester. Amorphous powder. $C_{73}H_{112}O_{24}$: 1372.75. M.p. 231–233°. $[\alpha]_D^{21} = +12.3$ ($c = 0.35$, MeOH).

Table 1 (cont.)

1200	Rubupungenoside B $R^1 = Glc^3 \leftarrow Me$	*Rubus pungens*, aerial parts [391]. Isolated as Me-ester. Amorphous powder. $C_{73}H_{112}O_{24}$: 1372.75. M.p. 216–218°. $[\alpha]_D^{21} = +15.8$ ($c = 0.25$, MeOH).

3.30. Lupane Type



Aglycone: (3β,21β)-Lupane-3,20,21,28-tetrol		
1201	Snatzkein A 3β-*O* ← Glc	*Arenaria filicaulis* Boiss rhizome (syn. *Gypsophila filicaulis* Boiss) (Caryophyllaceae) [392]. Amorphous solid. $C_{36}H_{62}O_9$: 638.44. M.p. 178–180°. $[\alpha]_D = -16.0$ ($c = 0.2$, MeOH).
1202	Snatzkein B 3β-*O* ← $Glc^2 \leftarrow CH_2CH_2OH$	*Arenaria filicaulis*, rhizome [392]. Amorphous solid. $C_{38}H_{66}O_{10}$: 682.46. M.p. 240–242°. $[\alpha]_D = -31.3$ ($c = 0.16$, MeOH).
1203	Snatzkein G 3β-*O* ← $Glc^2 \leftarrow Glc$	*Arenaria filicaulis* Boiss, rhizome (Caryophyllaceae) [32]. $C_{46}H_{70}O_{14}$: 798.48. M.p. 171.5°.
Aglycone: (3β,16β)-Lupane-3,16,20,28-tetrol		
1204	Snatzkein E 3β-*O* ← $Glc^2 \leftarrow SO_3H$	*Arenaria filicaulis*, rhizomes [393]. Amorphous solid. $C_{36}H_{62}SO_{12}$: 718.40. M.p. 235°. $[\alpha]_D^{20} = +43.4$ ($c = 0.224$, MeOH).
Aglycone: Betulinic acid (= (3β)-3-Hydroxylup-20(29)-en-28-oic acid)		
1205	Kochianoside IV 3β-*O* ← $GlcA^3 \leftarrow Xyl$	*Kochia scoparia*, fruits [172]. Colorless crystals. $C_{41}H_{64}O_{13}$: 764.43. M.p. 212–214°. $[\alpha]_D^{21} = +15.5$ ($c = 0.8$, MeOH).

Table 1 (cont.)

1206	Saponin 1 3β-*O* ← GlcA^2 ← Glc; 28-*O* ← Glc	*Bersama engleriana* GURKE (Melianthaceae), stem bark [94]. White powder. $C_{48}H_{76}O_{19}$: 956.50. $[\alpha]_D^{22} = +26.6$ ($c = 0.15$, MeOH).
1207	Saponin 12 3β-*O* ← Xyl^2 ← Xyl; 28-*O* ← Rha^3 ← isovaleroyl	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{51}H_{82}O_{16}$: 950.56. $[\alpha]_D^{25} = 11.0$ ($c = 0.1$, MeOH).
1208	Saponin 13 3β-*O* ← Glc^2 ← Xyl; 28-*O* ← Rha^3 ← isovaleroyl	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{52}H_{84}O_{17}$: 980.57. $[\alpha]_D^{25} = -23.0$ ($c = 0.1$, MeOH).
1209	Saponin 5 3β-*O* ← GlcA^2 ← Xyl	*Schefflera divaricata*, aerial parts [321]. $C_{41}H_{64}O_{13}$: 764.43. $[\alpha]_D^{25} = +112.0$ ($c = 1.0$, MeOH).
1210	Cussosaponin A 3β-*O* ← Glc; 28-*O* ← Glc^6 ← Ara	*Cussonia racemosa*, leaves [368]. Amorphous powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_D^{30} = -14.7$ ($c = 0.3$, C_5H_5N).
1211	Cussosaponin B 3β-*O* ← Ara^2 ← Gal; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Cussonia racemosa*, leaves [368]. Amorphous powder. $C_{59}H_{96}O_{26}$: 1220.62. $[\alpha]_D^{30} = -34.0$ ($c = 0.8$, C_5H_5N).
1212	Cussosaponin C 3β-*O* ← Ara^2 ← Rha; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Cussonia racemosa*, leaves [368]. Amorphous powder. $C_{59}H_{96}O_{25}$: 1204.62. $[\alpha]_D^{30} = -6.5$ ($c = 0.4$, C_5H_5N).
1213	Compound 3 3β-*O* ← Ara^2 ← Rha ^{4}↑ Glc	*Pulsatilla koreana*, roots [394]. White solid. $C_{47}H_{76}O_{16}$: 896.51. M.p. 247–250°. $[\alpha]_D^{25} = -5.9$ ($c = 0.05$, MeOH).
1214	Compound 4 3β-*O* ← Ara^4 ← Rha^3 ← Glc	*Pulsatilla koreana*, roots [394]. White solid. $C_{47}H_{76}O_{16}$: 896.51. M.p. 245–250°. $[\alpha]_D^{25} = -6.0$ ($c = 0.05$, MeOH).
1215	Compound 2 3β-*O* ← Ara^2 ← Rha; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Pulsatilla chinensis*, roots [395]. Amorphous solid. $C_{59}H_{96}O_{25}$: 1204.62. $[\alpha]_D^{26} = -34.0$ ($c = 0.1$, MeOH).

Aglycone: (2α,3β)-2,3-Dihydroxylup-20(29)-en-28-oic acid

1216	Saponin 11 3β-*O* ← Xyl^2 ← Xyl; 28-*O* ← Rha^3 ← isovaleroyl	*Campsiandra guayanensis*, aerial parts [107]. White solid. $C_{51}H_{82}O_{17}$: 966.56. $[\alpha]_D^{25} = -30.0$ ($c = 0.1$, MeOH).

Table 1 (cont.)

Aglycone: (3β)-3,20-Dihydroxylupan-28-oic acid		
1217	Snatzkein C 3β-*O*←Glc^2←Gal; 28-*O*←Glc	*Arenaria filicaulis* Boiss (Caryophyllaceae), rhizomes [396]. Amorphous solid. $C_{48}H_{80}O_{19}$: 960.53. M.p. 234–235°. $[\alpha]_D^{20} = -52.1$ ($c = 0.46$, MeOH).
1218	Snatzkein D 3β-*O*←Glc^2←Glc; 28-*O*←Glc	*Arenaria filicaulis*, rhizomes [396]. Amorphous solid. $C_{48}H_{80}O_{19}$: 960.53. M.p. 223–225°. $[\alpha]_D^{20} = -27.7$ ($c = 0.36$, MeOH).
Aglycone: (3β)-3,23-Dihydroxylup-20(29)-en-28-oic acid		
1219	Bourneioside A 3β-*O*←Glc; 28-*O*←Glc	*Lonicera bournei* Hemsl. (Caprifoliaceae), flower buds [397]. White crystals (MeOH). $C_{42}H_{68}O_{14}$: 796.45. M.p. 205–207°. $[\alpha]_D^{21} = +55.0$ ($c = 0.1$, MeOH).
1220	Bourneioside B 3β-*O*←Glc; 28-*O*←Glc^6←Glc	*Lonicera bournei*, flower buds [397]. White crystals (MeOH). $C_{48}H_{78}O_{19}$: 958.51. M.p. 214–216°. $[\alpha]_D^{21} = +40.0$ ($c = 0.1$, MeOH).
1221	Saponin 6 3β-*O*←GlcA^2←Xyl ^{3}↑ Glc	*Schefflera divaricata*, aerial parts [321]. $C_{47}H_{74}O_{19}$: 942.48. $[\alpha]_D^{25} = +95.0$ ($c = 1.0$, MeOH).
1222	Saponin 7 3β-*O*←GlcA^2←Xyl	*Schefflera divaricata*, aerial parts [321]. $C_{41}H_{64}O_{14}$: 780.43. $[\alpha]_D^{25} = +105.0$ ($c = 1.0$, MeOH).
1223	Saponin 8 3β-*O*←GlcA	*Schefflera divaricata*, aerial parts [321]. $C_{36}H_{56}O_{10}$: 648.39. $[\alpha]_D^{25} = +60.0$ ($c = 1.0$, MeOH).
1224	Saponin 9 3β-*O*←GlcA^3←Glc	*Schefflera divaricata*, aerial parts [321]. $C_{42}H_{66}O_{15}$: 810.44. $[\alpha]_D^{25} = +101.0$ ($c = 1.0$, MeOH).
1225	Compound 1 3β-*O*←Ara^2←Rha ^{4}↑ Glc	*Pulsatilla koreana*, roots [394]. White solid. $C_{47}H_{76}O_{17}$: 912.51. M.p. 250–252°. $[\alpha]_D^{25} = -11.3$ ($c = 0.1$, MeOH).

Table 1 (cont.)

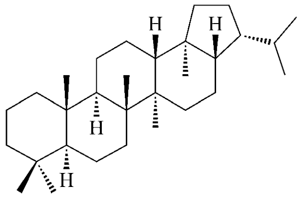
1226	Compound 2 3β-*O* ← Ara^4 ← Rha^3 ← Glc	*Pulsatilla koreana*, roots [394]. White solid. $C_{47}H_{76}O_{17}$: 912.51. M.p. 252–254°. $[\alpha]_D^{25} = -11.0$ ($c = 0.1$, MeOH).
1227	Compound 5 3β-*O* ← Ara^4 ← Glc	*Pulsatilla koreana*, roots [394]. White solid. $C_{41}H_{66}O_{13}$: 766.45. M.p. 267–269°. $[\alpha]_D^{25} = -27.7$ ($c = 0.09$, MeOH).
1228	Compound 3 3β-*O* ← Ara^2 ← Rha; ^{4}↑ Glc 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Pulsatilla chinensis*, roots [395]. Amorphous solid. $C_{65}H_{106}O_{31}$: 1382.67. $[\alpha]_D^{26} = -38.4$ ($c = 0.1$, MeOH).
1229	Compound 4 3β-*O* ← Ara^2 ← Rha; ^{4}↑ Glc^4 ← Glc 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Pulsatilla chinensis*, roots [395]. Amorphous solid. $C_{71}H_{116}O_{36}$: 1544.72. $[\alpha]_D^{26} = -38.0$ ($c = 0.1$, MeOH).
Aglycone: (3α,11α)-3,11-Dihydroxylup-20(29)-en-28-oic acid		
1230	Acankoreoside C 3β-*O* ← Glc; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Acanthopanax koreanum* (Araliaceae), leaves [398]. Colorless needles (aq-MeOH). $C_{54}H_{88}O_{23}$: 1104.57. M.p. 247–249°. $[\alpha]_D^{26} = -44.6$ ($c = 0.36$, EtOH).
Aglycone: (3α,11α)-3,11,23-Trihydroxylup-20(29)-en-28-oic acid		
1231	Acankoreoside B 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Acanthopanax koreanum*, leaves [399]. White powder. $C_{48}H_{78}O_{19}$: 958.51. M.p. 220–223°. $[\alpha]_D^{27} = -37.5$ ($c = 0.37$, EtOH).
Aglycone: (3β)-3,20,23-Trihydroxylupan-28-oic acid		
1232	Compound 1 3β-*O* ← Ara^2 ← Rha; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Pulsatilla chinensis* (BUNGE) REGEL (Ranunculaceae), roots [395]. Amorphous solid. $C_{59}H_{98}O_{27}$: 1238.63. $[\alpha]_D^{26} = -48.0$ ($c = 0.1$, MeOH).
Aglycone: (3β)-3-Hydroxy-23-oxolup-20(29)-en-28-oic acid		
1233	Saponin 10 3β-*O* ← GlcA^2 ← Xyl	*Schefflera divaricata*, aerial parts [321]. $C_{41}H_{62}O_{14}$: 778.43. $[\alpha]_D^{25} = +120.0$ ($c = 1.0$, MeOH).

Table 1 (cont.)

1234	Saponin 11 3*β*-*O* ← $GlcA^3$ ← Glc	*Schefflera divaricata*, aerial parts [321]. $C_{42}H_{64}O_{15}$: 808.42. $[\alpha]_D^{25} = +98.0$ ($c = 1.0$, MeOH).
1235	Saponin 12 3*β*-*O* ← GlcA	*Schefflera divaricata*, aerial parts [321]. $C_{36}H_{54}O_{10}$: 646.37. $[\alpha]_D^{25} = +62.0$ ($c = 1.0$, MeOH).
Aglycone: (3α,11α)-3,11-Dihydroxy-23-oxolup-20(29)-en-28-oic acid		
1236	Acankoreoside D 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Acanthopanax koreanum*, leaves [398]. White powder. $C_{48}H_{76}O_{19}$: 956.50. M.p. 222–225°. $[\alpha]_D^{26} = -40.8$ ($c = 0.37$, EtOH).
Aglycone: (3α)-3-Hydroxylup-20(29)-ene-23,28-dioic acid		
1237	Acankoreoside A 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Acanthopanax koreanum* (Araliace), leaves [399]. White powder. $C_{48}H_{76}O_{19}$: 956.50. M.p. 225–228°. $[\alpha]_D^{27} = -41.2$ ($c = 0.39$, EtOH).
Aglycone: (3α)-3-(Acetyloxy)-30-hydroxylup-20(29)-ene-23,28-dioic acid		
1238	Acantrifoside C 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Acanthopanax trifoliatus* (L.) Merr. (Araliace), leaves [400]. White powder. $C_{50}H_{78}O_{21}$: 1014.50. M.p. 217–218°. $[\alpha]_D^{25} = -19.5$ ($c = 0.51$, MeOH).
*Aglycone: (3α,20*S*)-3-Hydroxy-29-oxolupane-23,28-dioic acid*		
1239	Acankoreoside E 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Acanthopanax koreanum* Nakai (Araliace), leaves [401]. White powder. $C_{48}H_{76}O_{20}$: 972.49. M.p. 223–227°. $[\alpha]_D^{26} = -20.4$ ($c = 0.49$, MeOH).
Aglycone: (3β)-3-Hydroxylup-20(29)-ene-27,28-dioic acid		
1240	Compound 5 28-*O* ⟵ Glc^2 ⟵ Xyl^2 ⟵ Glc (Xyl attached at position 3 of Xyl: ³↑ Xyl)	*Anomospermum grandifolium* Eichler (Menispermaceae), stem [402]. White powder. $C_{52}H_{82}O_{23}$: 1074.52. $[\alpha]_D^{22} = +54.0$ ($c = 0.05$, MeOH).
Aglycone: 3,4-Secolupa-4(23),20(29)-diene-3,28-dioic acid (=(3α,4β,5β,8α,9β,10α,13α,14β,15β)-4-(2-Carboxyethyl)-4,9-dimethyl-3,15-di(prop-1-en-2-yl)androstan-18-oic acid)		
1241	Sessiloside 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Acanthopanax sessiliflorus* (Araliaceae), leaves [403]. White powder. $C_{48}H_{76}O_{18}$: 940.50.

Table 1 (cont.)

3.31. Hopane Type



Aglycone: (3β,5β,16β)-Hopane-3,16,22-triol

1242	Glinuside D 3β-*O*←Ara; 22-*O*←Glc[4]←Rha	*Glinus lotoides* var. *dictamnoides* BURM (Molluginaceae), aerial parts [404]. White powder. $C_{47}H_{78}O_{16}$: 898.53. $[\alpha]_D = +9.7$ ($c = 0.26$, MeOH).
1243	Glinuside E 3β-*O*←Ara; 22-*O*←Glc[4]←Glc	*Glinus lotoides* var. *dictamnoides*, aerial parts [404]. White powder. $C_{47}H_{78}O_{17}$: 914.52. $[\alpha]_D = +4.3$ ($c = 0.05$, MeOH).

Aglycone: (16β)-12,16,22-Trihydroxyhopan-3-one

1244	Glinoside B 16β-*O*←Ara	*Glinus oppositifolius* (Molluginaceae), aerial parts [405]. $C_{35}H_{58}O_8$: 606.41. $[\alpha]_D^{20} = +37.0$ ($c = 0.1$, MeOH).

Aglycone: (16β)-12,16,21,22-Tetrahydroxyhopan-3-one

1245	Glinoside A 16β-*O*←Ara	*Glinus oppositifolius* L., aerial parts [405]. $C_{35}H_{58}O_9$: 622.41. $[\alpha]_D^{20} = +46.0$ ($c = 0.1$, MeOH).

3.32. Modified Hopane Type

Aglycone: Spergulagenin A

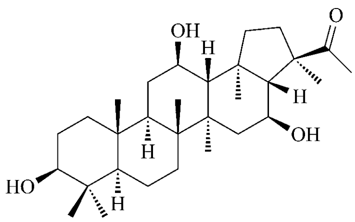
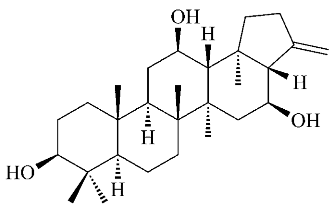
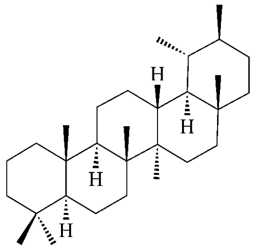
1246	Spergulin A  3β-*O*⟵Xyl[3]⟵SO_3H	*Mollugo spergula* LINN (Molluginaceae), aerial parts [406]. Colorless needles. $C_{35}H_{58}O_{11}S$: 686.37. M.p. 220–221° (dec.). $[\alpha]_D^{25} = +19.1$ ($c = 0.66$, DMSO).

Table 1 (cont.)

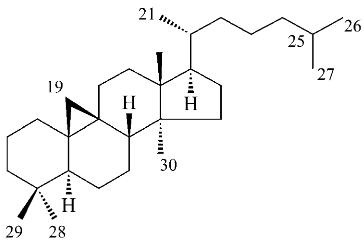
Aglycone: Spergulatriol		
1247	Spergulin B  3β-*O* ⟵ Xyl[2] ⟵ Rha	*Mollugo spergula*, aerial parts [406]. Colorless powder. $C_{39}H_{64}O_{11}$: 708.44. M.p. 271–273° (dec.). $[\alpha]_D^{20} = -20.0$ ($c = 0.85$, C_5H_5N).

3.33. Taraxastane Type



Aglycone: (2α,3β)-2,3-Dihydroxytaraxast-20-en-28-oic acid (=(2α,3β,18α,19α)-2,3-Dihydroxyurs-20-en-28-oic acid)		
1248	Arborenin 3β-*O* ← Glc[2] ← Glc	*Careya arborea*, leaves [407]. Colorless needles (MeOH). $C_{42}H_{68}O_{14}$: 796.46. M.p. 310–312° (dec.). $[\alpha]_D^{21} = -22.3$ ($c = 0.58$, MeOH).

3.34. Cycloartane Type



*Aglycone: (3β,6α,9β,16β,24*E*)-9,19-Cyclolanost-24-ene-3,6,16,26-tetrol*		
1249	Kahiricoside II 3β-*O* ← Glc	*Astragalus kahiricus* (Leguminosae), aerial parts [408]. Colorless needles. $C_{36}H_{60}O_9$: 636.42. M.p. 118°. $[\alpha]_D^{25} = +12.3$ ($c = 0.06$, MeOH).

Table 1 (cont.)

1250	Kahiricoside III 3β-*O* ← Glc[2] ← Ac	*Astragalus kahiricus*, aerial parts [408]. Colorless needles. $C_{38}H_{62}O_{10}$: 678.43. M.p. 140°. $[\alpha]_D^{25} = +49.0$ ($c = 0.065$, MeOH).
1251	Kahiricoside IV 3β-*O* ← Glc[6] ← Ac	*Astragalus kahiricus*, aerial parts [408]. Colorless needles. $C_{38}H_{62}O_{10}$: 678.43. M.p. 165°. $[\alpha]_D^{25} = +175.0$ ($c = 0.02$, MeOH).
1252	Kahiricoside V 3β-*O* ← Glc[2] ← Ac; 26-*O* ← Glc	*Astragalus kahiricus*, aerial parts [408]. Colorless needles. $C_{42}H_{70}O_{14}$: 798.48. M.p. 157–158°. $[\alpha]_D^{25} = +86.7$ ($c = 0.015$, MeOH).
*Aglycone: (3β,6α,9β,16β,24*S*)-9,19-Cyclolanostane-3,6,16,24,25-pentol*		
1253	Oleifolioside A 3β-*O* ← Xyl[2] ← Ara; 6α-*O* ← Xyl	*Astragalus oleifolius* (Leguminosae), stem [409]. White powder. $C_{45}H_{76}O_{17}$: 888.51. $[\alpha]_D^{27} = +18.9$ ($c = 0.1$, MeOH).
1254	Oleifolioside B 3β-*O* ← Xyl[2] ← Ara; 6α-*O* ← Glc	*Astragalus oleifolius*, stem [409]. White powder. $C_{46}H_{78}O_{18}$: 918.52. $[\alpha]_D^{27} = +21.9$ ($c = 0.1$, MeOH).
Aglycone: (3β,9β,12β,16β)-3-Hydroxy-24-oxo-16,23-epoxy-9,19-cyclolanost-22-en-12-yl acetate		
1255	Asiaticoside A 3β-*O* ← Xyl	*Actaea asiatica* HARA (Ranunculaceae), roots/rhizomes [410]. White powder. $C_{37}H_{56}O_9$: 644.39. M.p. 142–145°. $[\alpha]_D^{20} = -67.0$ ($c = 1.52$, MeOH).
Aglycone: (3β,9β,12β,16β)-3-Hydroxy-24-oxo-16,23-epoxy-9,19-cyclolanosta-7,22-dien-12-yl acetate		
1256	Asiaticoside B 3β-*O* ← Xyl	*Actaea asiatica*, roots/rhizomes [410]. White powder. $C_{37}H_{54}O_9$: 642.38. M.p. 143–147°. $[\alpha]_D^{20} = -105.0$ ($c = 0.52$, MeOH).

Table 1 (cont.)

*Aglycone: (3β,9β,22R,24*S*,25*S*)-3,24,26-Trihydroxy-22,25-epoxy-9,19-cyclolanost-7-en-16-one*		
1257	Aquilegioside G 3*β*-*O* ← Glc^2 ← Glc	*Aquilegia vulgaris* L. (Ranunculaceae), aerial parts [411]. White powder. $C_{42}H_{68}O_{15}$: 812.46. $[\alpha]_D^{25} = -30.8$ ($c = 0.30$, MeOH).
1258	Aquilegioside H 3*β*-*O* ← Glc^2 ← Glc; 26*β*-*O* ← Glc	*Aquilegia vulgaris*, aerial parts [411]. White powder. $C_{48}H_{78}O_{20}$: 974.51. $[\alpha]_D^{25} = -32.4$ ($c = 0.50$, MeOH).
*Aglycone: (3β,9β,22*E*,24*E*)-3-Hydroxy-9,19-cyclolanosta-22,24-dien-26-oic acid*		
1259	Mussaendoside W 3*β*-*O* ⟵ Glc^2 ⟵ Glc^2 ⟵ Rha (Glc →3 of first Glc; Glc →6 of second Glc)	*Mussaenda macrophylla*, root bark [245]. White powder. $C_{60}H_{96}O_{27}$: 1248.61. M.p. 175–178°. $[\alpha]_D = -4.3$ ($c = 0.5$, MeOH).
*Aglycone: Cyclopassifloic acid A (=(1α,3β,9β,22*R*,24*S*)-1,3,22,24-Tetrahydroxy-24-(hydroxymethyl)-9,19-cyclolanostan-28-oic acid)*		
1260	Cyclopassifloside I 28-*O* ← Glc	*Passiflora edulis*, leaves and stems [412]. Amorphous solid. $C_{37}H_{62}O_{12}$: 698.42. $[\alpha]_D^{25} = +54.5$ ($c = 0.2$, MeOH).
*Aglycone: Cyclopassifloic acid B (=(1α,3β,9β,24*S*)-1,3,24-Trihydroxy-24-(hydroxymethyl)-9,19-cyclolanostan-28-oic acid)*		
1261	Cyclopassifloside II 28-*O* ← Glc	*Passiflora edulis*, leaves and stems [412]. Amorphous solid. $C_{37}H_{62}O_{11}$: 682.43. $[\alpha]_D^{25} = +46.8$ ($c = 6.8$, MeOH).
1262	Cyclopassifloside III 28-*O* ← Glc; 31-*O* ← Glc	*Passiflora edulis*, leaves and stems [412]. Amorphous solid. $C_{43}H_{72}O_{16}$: 844.48. $[\alpha]_D^{25} = +25.7$ ($c = 3.5$, MeOH).
*Aglycone: Cyclopassifloic acid C (=(1α,3β,9β,24*S*)-1,3,20,24-Tetrahydroxy-24-(hydroxymethyl)-9,19-cyclolanostan-28-oic acid)*		
1263	Cyclopassifloside IV 28-*O* ← Glc	*Passiflora edulis*, leaves and stems [412]. Amorphous solid. $C_{37}H_{62}O_{12}$: 698.42. $[\alpha]_D^{25} = +33.1$ ($c = 6.3$, MeOH).
1264	Cyclopassifloside V 28-*O* ← Glc; 31-*O* ← Glc	*Passiflora edulis*, leaves and stems [412]. Amorphous solid. $C_{43}H_{72}O_{17}$: 860.48. $[\alpha]_D^{25} = +16.5$ ($c = 6.8$, MeOH).

Table 1 (cont.)

*Aglycone: Cyclopassifloic acid D (=(1α,3β,9β,22*R*)-1,3,22-Trihydroxy-24-oxo-9,19-cyclolanostan-28-oic acid)*		
1265	Cyclopassifloside VI 28-*O* ← Glc	*Passiflora edulis*, leaves and stems [412]. Amorphous solid. $C_{36}H_{58}O_{11}$: 666.40. $[\alpha]_D^{25} = +36.2$ ($c = 2.6$, MeOH).
*Aglycone: Cyclopassifloic acid E (=(1α,3β,9β,16β,24*S*)-1,3,16,20,24-Pentahydroxy-24-(hydroxymethyl)-9,19-cyclolanostan-28-oic acid)*		
1266	Cyclopassifloside VII 28-*O* ← Glc	*Passiflora edulis* Sims (Passifloraceae), leaves and stems [413]. Colorless needles. $C_{37}H_{62}O_{13}$: 714.42. M.p. 163–165°. $[\alpha]_D^{25} = +35.6$ ($c = 1.5$, MeOH).
*Aglycone: Cyclopassifloic acid F (=(1α,3β,9β,16β,24*S*)-1,3,16,24-Tetrahydroxy-24-(hydroxymethyl)-9,19-cyclolanostan-28-oic acid)*		
1267	Cyclopassifloside VIII 28-*O* ← Glc	*Passiflora edulis*, leaves and stems [413]. Amorphous solid. $C_{37}H_{62}O_{12}$: 698.42. $[\alpha]_D^{25} = +38.6$ ($c = 1.3$, MeOH).
1268	Cyclopassifloside IX 28-*O* ← Glc; 31-*O* ← Glc	*Passiflora edulis*, leaf and stems [413]. Amorphous solid. $C_{43}H_{72}O_{17}$: 860.48. $[\alpha]_D^{25} = +19.0$ ($c = 1.3$, MeOH).
*Aglycone: Cyclopassifloic acid G (=(1α,3β,9β,16α,24*S*)-1,3,16,24-Tetrahydroxy-24-(hydroxymethyl)-9,19-cyclolanostan-28-oic acid)*		
1269	Cyclopassifloside X 28-*O* ← Glc	*Passiflora edulis*, leaves and stems [413]. Colorless needles. $C_{37}H_{62}O_{12}$: 698.42. M.p. 167–169°. $[\alpha]_D^{25} = +36.8$ ($c = 2.1$, MeOH).
1270	Cyclopassifloside XI 28-*O* ← Glc; 31-*O* ← Glc	*Passiflora edulis*, leaves and stems [413]. Colorless needles. $C_{43}H_{72}O_{17}$: 860.48. M.p. 171–173°. $[\alpha]_D^{25} = +13.6$ ($c = 2.7$, MeOH).
3.35. Modified Cycloartane Type		
Aglycone: (3β,9β,16α,22S)-3,16-Dihydroxy-22,26-epoxy-9,19-cyclolanost-24-en-26-one		
1271	Aquilegioside I 3*β*-*O* ← Ara^2 ← Glc^6 ← Glc	*Aquilegia vulgaris*, aerial parts [411]. White powder. $C_{47}H_{74}O_{18}$: 926.49. $[\alpha]_D^{25} = -1.9$ ($c = 0.30$, MeOH).

Table 1 (cont.)

Aglycone: (3β,9β,16α,22S)-3,16,28-Trihydroxy-22,26-epoxy-9,19-cyclolanost-24-en-26-one

1272	Aquilegioside J 3β-*O* ← Ara^2 ← Glc^4 ← Glc	*Aquilegia vulgaris*, aerial parts [411]. White powder. $C_{47}H_{74}O_{19}$: 942.48. $[\alpha]_D^{25} = +15.2$ ($c = 0.30$, MeOH).

*Aglycone: 6-*O*-Acetylcycloastragenol (=3β,6α,9β,16β,20R,24S)-3,16,25-Trihydroxy-20,24-epoxy-9,19-cyclolanostan-6-yl acetate*

1273	Huangquiyenin D 3β-*O* ← Glc	*Astragalus membranaceus* (Leguminosae), leaves [414]. White powder. $C_{38}H_{62}O_{11}$: 694.43.

Aglycone: 12β-Acetoxycimigenol (=12β-Acetoxy-16,23:16,24-diepoxycycloartane-3β,15α,25-triol; (2S,4aR,5aR,7R,7aR,7bR,8R,11S,12aS,13R,13aS,13bR,15aR)-2,13-Dihydroxy-11-(2-hydroxypropan-2-yl)-1,1,7a,8,13a-pentamethyloctadecahydro-10,12a-epoxycyclopropa[1′,8a′]naphtho[2′,1′:4,5]indeno[2,1-b]oxepin-7-yl acetate)

1274	Cimiracemoside 3β-*O* ← Xyl	*Cimicifuga racemosa* (Ranunculaceae), rhizomes [415]. White powder. $C_{37}H_{58}O_{11}$: 678.40. M.p. 179–184°. $[\alpha]_D = -40.0$ ($c = 0.55$, $CHCl_3$).

*Aglycone: 25-*O*-Ethylcimigenol (=(2S,4aR,5aS,7aR,7bR,8R,11S,12aS,13R,13aS,13bR,15aR)-11-(2-Ethoxypropan-2-yl)-1,1,7a,8,13a-pentamethyloctadecahydro-10,12a-epoxycyclopropa[1′,8a′]naphtho[2′,1′:4,5]indeno[2,1-b]oxepine-2,13-diol)*

1275	Compound 3 3β-*O* ← Xyl	*Actaea asiatica*, roots/rhizomes [410]. White powder. $C_{37}H_{60}O_9$: 648.42. M.p. 327–329°. $[\alpha]_D^{20} = +16.6$ ($c = 0.30$, MeOH).

Aglycone: (1′R,2S,4′S,4aR,5′S,5aR,7R,7aR,7bR,8R,10R,11aS,12aS,12bS,14aR)-2,4′-Dihydroxy-1,1,5′,7a,8,12a-hexamethylhexadecahydro-2H-spiro[cyclopropa[1′,8a′]naphtho[2′,1′:4,5]indeno[2,1-b]pyran-10,2′-[3,6]dioxabicyclo[3.1.0]hexan]-7-yl acetate

1276	2′-*O*-Acetylactein 3β-*O* ← Xyl^2 ← Ac	*Cimicifuga foetida* (Ranunculaceae), roots [416]. White powder. $C_{39}H_{58}O_{11}$: 702.40. M.p. 143–146°. $[\alpha]_D = -56.6$ ($c = 0.5$, MeOH).

Aglycone: (1′R,2S,4aR,5′R,5aR,7R,7aR,7bR,8R,10S,11aS,12aS,12bS,14aR)-2-Hydroxy-1,1,5′,7a,8,12a-hexamethylhexadecahydro-2H-spiro[cyclopropa[1′,8a′]naphtho[2′,1′:4,5]indeno[2,1-b]pyran-10,2′-[3,6]-dioxabicyclo[3.1.0]hexan]-7-yl acetate

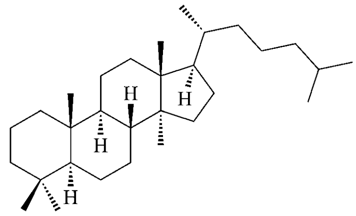
1277	2′-*O*-Acetyl-27-deoxyactein 3β-*O* ← Xyl^2 ← Ac	*Cimicifuga foetida*, roots [416]. White powder. $C_{39}H_{58}O_{10}$: 686.40. M.p. 147–149°. $[\alpha]_D = -34.1$ ($c = 0.74$, MeOH).

Table 1 (cont.)

*Aglycone: Heinsiagenin A (=(2*E*,4*E*,6*R*)-*N*-[(3*S*,4*R*,5*R*)-4,5-Dimethyl-2-oxotetrahydrofuran-3-yl]-6-[(1*R*,3a*S*,3b*S*,5a*R*,7*S*,9a*R*,10a*S*,12a*R*)-7-hydroxy-3a,6,6,12a-tetramethyltetradecahydro-1*H*-cyclopenta-[a]cyclopropa[e]phenanthren-1-yl]-2-methylhepta-2,4-dienamide)*

1278	Mussaendoside U 3β-*O* ⟵ Glc[2] ⟵ Glc[2] ⟵ Rha (Glc[2]: 4↑ Rha; Glc[2]: 6↑ Glc[2] ⟵ Glc)	*Mussaenda pubescens*, aerial parts [382]. White powder. $C_{72}H_{115}NO_{32}$: 1505.74. $[\alpha]_D^{25} = -14.0$ ($c = 0.27$, MeOH).

3.36. Lanostane Type



Aglycone: (3β)-3-Hydroxy-24-methylidenelanost-8-en-30-oic acid

1279	Eryloside F_1 3β-*O* ← Ara[2] ← Gal	*Erylus formosus* (Sponge) [417]. Amorphous solid. $C_{42}H_{68}O_{12}$: 764.47. $[\alpha]_D^{25} = -3.0$ ($c = 0.1$, MeOH).
1280	Eryloside M 3β-*O* ⟵ Ara[2] ⟵ Gal (Ara[2]: 3↑ Ara)	*Erylus formosus* [417]. Amorphous solid. $C_{47}H_{76}O_{16}$: 896.51. $[\alpha]_D^{25} = -10.2$ ($c = 0.25$, MeOH).
1281	Eryloside O 3β-*O* ⟵ Ara[2] ⟵ Glc*N*Ac (Ara[2]: 3↑ Ara[4] ⟵ Ara)	*Erylus formosus* [417]. Amorphous solid. $C_{54}H_{87}NO_{20}$: 1069.58. $[\alpha]_D^{25} = -7.0$ ($c = 0.25$, MeOH).
1282	Eryloside P 3β-*O* ⟵ Ara[2] ⟵ Gal (Ara[2]: 3↑ Ara[4] ⟵ Gal[4] ⟵ Glc[2] ⟵ Xyl)	*Erylus formosus* [417]. Amorphous solid. $C_{64}H_{104}O_{30}$: 1352.66. $[\alpha]_D^{25} = -10.2$ ($c = 0.25$, MeOH).

Aglycone: (3β)-3-Hydroxylanosta-8,24-dien-30-oic acid

1283	Eryloside N 3β-*O* ⟵ Ara[2] ⟵ Gal (Ara[2]: 3↑ Ara)	*Erylus formosus* [417]. Amorphous solid. $C_{46}H_{74}O_{16}$: 882.50. $[\alpha]_D^{25} = -14.0$ ($c = 0.25$, MeOH).
1284	Eryloside Q 3β-*O* ⟵ Ara[2] ⟵ Gal (Ara[2]: 3↑ Ara[4] ⟵ Gal[4] ⟵ Glc[2] ⟵ Xyl)	*Erylus formosus* [417]. Amorphous solid. $C_{63}H_{102}O_{30}$: 1338.65. $[\alpha]_D^{25} = -11.0$ ($c = 0.25$, MeOH).
1285	Nobiloside 3β-*O* ← GlcA[4] ← Gal A[3] ← Ara	*Erylus nobilis* (marine sponge) [418]. White powder. $C_{47}H_{72}O_{19}$: 940.47. $[\alpha]_D^{24} = -41.6$ ($c = 0.10$, MeOH).

Table 1 (cont.)

Aglycone: (3β)-3-Hydroxy-24-methylidenelanost-8-en-30-oic acid		
1286	Eryloside G 3β-*O* ⟵ Gal^2 ⟵ Glc*N*Ac ^{3}↑ Ara	*Erylus nobilis* [419]. White amorphous solid. $C_{50}H_{81}NO_{17}$: 967.55. M.p. 187–191° (dec.). $[\alpha]_D^{25} = -18.8$ ($c = 0.09$, MeOH).
1287	Eryloside H 3β-*O* ⟵ Ara^2 ⟵ Glc*N*Ac ^{3}↑ Ara	*Erylus nobilis* [419]. White amorphous solid. $C_{49}H_{79}NO_{16}$: 937.54. M.p. 208–210°. $[\alpha]_D^{25} = -12.4$ ($c = 0.07$, MeOH).
Aglycone: (3β)-3-Hydroxy-25-methyl-24-methylidenelanost-8-en-30-oic acid		
1288	Eryloside I 3β-*O* ⟵ Gal^2 ⟵ Glc*N*Ac ^{3}↑ Ara	*Erylus nobilis* [419]. White amorphous solid. $C_{51}H_{83}NO_{17}$: 981.57. M.p. 203–206°. $[\alpha]_D^{25} = -18.0$ ($c = 0.06$, MeOH).
1289	Eryloside J 3β-*O* ⟵ Ara^2 ⟵ Glc*N*Ac ^{3}↑ Ara	*Erylus nobilis* [419]. White amorphous solid. $C_{50}H_{81}NO_{16}$: 951.56. M.p. 193–196°. $[\alpha]_D^{25} = -16.9$ ($c = 0.06$, MeOH).
Aglycone: (3β,24R)-3,24-Dihydroxylanosta-8,25-dien-30-oic acid		
1290	Eryloside F_2 3β-*O* ← Ara^2 ← Gal	*Erylus formosus* [417]. Amorphous solid. $C_{41}H_{66}O_{13}$: 766.45. $[\alpha]_D^{25} = -32.0$ ($c = 0.10$, MeOH).
Aglycone: (3β,24S)-3,24-Dihydroxylanosta-8,25-dien-30-oic acid		
1291	Eryloside F_3 3β-*O* ← Ara^2 ← Gal	*Erylus formosus* [417]. Amorphous solid. $C_{41}H_{66}O_{13}$: 766.45. $[\alpha]_D^{25} = -25.0$ ($c = 0.10$, MeOH).
Aglycone: (3β)-3-Hydroxy-24-oxolanosta-8,25-dien-30-oic acid		
1292	Eryloside F_4 3β-*O* ← Ara^2 ← Gal	*Erylus formosus* [417]. Amorphous solid. $C_{41}H_{64}O_{13}$: 764.43. $[\alpha]_D^{25} = -12.0$ ($c = 0.10$, MeOH).
Aglycone: (3β,7α)-3,7-Dihydroxy-24-methylidenelanost-8-en-21-oic acid		
1293	Lactiposide E 7α-*O* ← Xyl	*Laetiporus versisporus* (LLOYD) IMAZ. (Polyporaceae), fruits [420]. Colorless needles. $C_{36}H_{58}O_8$: 618.41. M.p. 218–220°. $[\alpha]_D^{25} = +9.1$ ($c = 0.3$, MeOH).

Table 1 (cont.)

Aglycone: (3β,7α,15α)-3,7,15-Trihydroxy-24-methylidenelanost-8-en-21-oic acid		
1294	Lactiposide F 7α-*O* ← Glc	*Laetiporus versisporus*, fruits [420]. Colorless needles. $C_{37}H_{60}O_{10}$: 664.42. M.p. 220–222°. $[\alpha]_D^{25} = +16.7$ ($c = 0.4$, MeOH).
Aglycone: (3β,15α)-3,15-Dihydroxy-24-methylidenelanost-8-en-21-oic acid		
1295	Lactiposide G 21-*O* ← Glc	*Laetiporus versisporus*, fruits [420]. Colorless needles. $C_{37}H_{60}O_{9}$: 648.42. M.p. 238–240°. $[\alpha]_D^{25} = +28.8$ ($c = 0.3$, MeOH).
Aglycone: (3β,5α,15β)-3,9,15-Trihydroxy-4,4-dimethylcholesta-8(14),24-dien-23-one		
1296	Sarasinoside H_1 3β-*O* ⟵ Xyl^2 ⟵ Glc*N*Ac^6 ⟵ Glc^2 ⟵ Glc 4↑ Gal*N*Ac	*Melophlus isis* (sponge) (Ancorinidae) [421]. White amorphous solid. $C_{62}H_{100}N_2O_{28}$: 1320.65. M.p. 204–207°. $[\alpha]_D^{25} = -9.0$ ($c = 0.2$, MeOH).
Aglycone: (3β,5α,15α)-3,9,15-Trihydroxy-4,4-dimethylcholesta-8(14),24-dien-23-one		
1297	Sarasinoside I_1 3β-*O* ⟵ Xyl^2 ⟵ Glc*N*Ac^6 ⟵ Glc^2 ⟵ Glc 4↑ Gal*N*Ac	*Melophlus isis* [421]. White amorphous solid. $C_{62}H_{100}N_2O_{28}$: 1320.65. M.p. 219–222°. $[\alpha]_D^{25} = -5.3$ ($c = 0.2$, MeOH).
Aglycone: (3β,5α,15β)-3,9-Dihydroxy-15-methoxy-4,4-dimethylcholesta-8(14),24-dien-23-one		
1298	Sarasinoside H_2 3β-*O* ⟵ Xyl^2 ⟵ Glc*N*Ac^6 ⟵ Glc^2 ⟵ Glc 4↑ Gal*N*Ac	*Melophlus isis* [421]. White amorphous solid. $C_{63}H_{102}N_2O_{28}$: 1334.65. M.p. 201–203°. $[\alpha]_D^{25} = -8.9$ ($c = 0.1$, MeOH).
Aglycone: (3β,5α,15α)-3,9-Dihydroxy-15-methoxy-4,4-dimethylcholesta-8(14),24-dien-23-one		
1299	Sarasinoside I_2 3β-*O* ⟵ Xyl^2 ⟵ Glc*N*Ac^6 ⟵ Glc^2 ⟵ Glc 4↑ Gal*N*Ac	*Melophlus isis* [421]. White amorphous solid. $C_{63}H_{102}N_2O_{28}$: 1334.65. M.p. 216–219°. $[\alpha]_D^{25} = -6.3$ ($c = 0.12$, MeOH).
Aglycone: (3β,5α)-3,25-Dihydroxy-4,4-dimethylcholest-8-en-23-one		
1300	Sarasinoside J 3β-*O* ⟵ Xyl^2 ⟵ Glc*N*Ac^6 ⟵ Glc^2 ⟵ Glc 4↑ Gal*N*Ac	*Melophlus sarassinorum* (Marine sponge) [422]. Yellow solid. $C_{62}H_{102}N_2O_{27}$: 1306.67. $[\alpha]_D^{20} = -9.8$ ($c = 0.5$, MeOH).

Table 1 (cont.)

Aglycone: (3β,5α,15β)-3,9,25-Trihydroxy-15-methoxy-4,4-dimethylcholest-8(14)-en-23-one

1301	Sarasinoside K 3β-*O* ⟵ Xyl² ⟵ Glc*N*Ac⁶⟵ Glc² ⟵ Glc Xyl ←⁴ Gal*N*Ac	*Melophlus sarassinorum* [422]. Yellow solid. $C_{63}H_{104}N_2O_{29}$: 1352.67. $[\alpha]_D^{20} = -6.8$ ($c = 0.5$, MeOH).

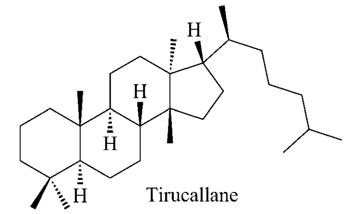
Aglycone: (3β,5α)-3,9-Dihydroxy-4,4-dimethylcholesta-8(14),24-diene-15,23-dione

1302	Sarasinoside L 3β-*O* ⟵ Xyl² ⟵ Glc*N*Ac⁶⟵ Glc² ⟵ Glc Xyl ←⁴ Gal*N*Ac	*Melophlus sarassinorum* [422]. Yellow solid. $C_{62}H_{98}N_2O_{28}$: 1318.63. $[\alpha]_D^{20} = -10.2$ ($c = 0.5$, MeOH).

Aglycone: (3β)-3-Hydroxy-8,9-epoxy-8,9-seco-30-norlanosta-8(14),9(11),24-trien-23-one

1303	Sarasinoside M 3β-*O* ⟵ Xyl² ⟵ Glc*N*Ac⁶⟵ Glc² ⟵ Glc Xyl ←⁴ Gal*N*Ac	*Melophlus sarassinorum* [422]. Yellow solid. $C_{62}H_{98}N_2O_{27}$: 1302.64. $[\alpha]_D^{20} = -7.6$ ($c = 0.5$, MeOH).

3.37. Rearranged Tirucallane Type



Tirucallane

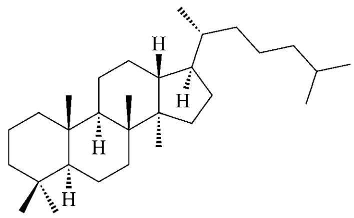
Aglycone: (3β,13α,14β,17α,20S,21S)-21-Ethoxy-21,23-epoxylanosta-7,24-dien-3-ol

1304	Sapimukoside C 3β-*O* ⟵ Glc² ⟵ Rha Glc ←³ Ara	*Sapindus mukorossi* GAETN. (Sapindaceae), roots [423]. White powder. $C_{49}H_{80}O_{16}$: 924.54. M.p. 172–174°. $[\alpha]_D^{25} = -6.7$ ($c = 0.45$, MeOH).
1305	Sapimukoside E 3β-*O* ⟵ Glc² ⟵ Rha³⟵ Ara Glc ←³ Ara	*Sapindus mukorossi*, roots [424]. White powder. $C_{54}H_{88}O_{20}$: 1056.59. $[\alpha]_D^{24} = -5.5$ ($c = 0.55$, MeOH).
1306	Sapimukoside F 3β-*O* ⟵ Glc² ⟵ Rha³⟵ Xyl Glc ←³ Ara	*Sapindus mukorossi*, roots [424]. White powder. $C_{54}H_{88}O_{20}$: 1056.59. $[\alpha]_D^{24} = -8.6$ ($c = 0.30$, MeOH).
1307	Sapimukoside H 3β-*O* ⟵ Glc² ⟵ Rha³⟵ Ara Glc ←³ Rha	*Sapindus mukorossi*, roots [424]. White powder. $C_{55}H_{90}O_{20}$: 1070.60. $[\alpha]_D^{24} = -36.7$ ($c = 0.30$, MeOH).

Table 1 (cont.)

1308	Sapimukoside J 3β-*O* ← Glc^6 ← Rha	*Sapindus mukorossi*, roots [424]. White powder. $C_{44}H_{72}O_{12}$: 792.50. $[\alpha]_D^{24} = -21.9$ ($c = 0.32$, MeOH).
*Aglycone: (3β,13α,14β,17α,20*S*,21*S*)-21-Methoxy-21,23-epoxylanosta-7,24-dien-3-ol*		
1309	Sapimukoside D 3β-*O* ⟵ Glc^2 ⟵ Rha ^{3}↑ Ara	*Sapindus mukorossi*, roots [423]. $C_{48}H_{78}O_{16}$: 910.53. White powder. M.p. 180–182°. $[\alpha]_D^{25} = -12.3$ ($c = 0.49$, MeOH).
1310	Sapimukoside G 3β-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Xyl ^{3}↑ Ara	*Sapindus mukorossi*, roots [424]. White powder. $C_{53}H_{86}O_{20}$: 1042.57. $[\alpha]_D^{24} = -13.5$ ($c = 0.37$, MeOH).
1311	Sapimukoside I 3β-*O* ⟵ Glc^2 ⟵ Rha^3 ⟵ Ara ^{3}↑ Rha	*Sapindus mukorossi*, roots [424]. Amorphous powder. $C_{54}H_{88}O_{20}$: 1056.57. $[\alpha]_D^{24} = -30.3$ ($c = 0.33$, MeOH).

3.38. Dammarane Type



*Aglycone: (3β,12β,20*E*)-Dammara-20(22),24-diene-3,12-diol*		
1312	Isoginsenoside-Rh_3 3β-*O* ← Glc	*Panax ginseng* C. A. Mey (Araliaceae), fruits [425]. White powder. $C_{36}H_{60}O_7$: 604.43. $[\alpha]_D^{20} = +25.6$ ($c = 1.0$, MeOH).
Aglycone: (3β)-Dammar-24-ene-3,20,21-triol		
1313	Compound 6 3β-*O* ⟵ Ara^2 ⟵ Rha; ^{3}↑ Glc 21-*O* ⟵ Glc	*Gynostemma cardiospermum*, aerial parts [426]. Amorphous powder. $C_{53}H_{90}O_{21}$: 1062.60. $[\alpha]_D^{20} = -4.0$ ($c = 0.12$, MeOH).
*Aglycone: (20*S*)-Protopanaxadiol (= (3β,12β)-Dammar-24-ene-3,12,20-triol)*		
1314	Quinquenoside I 3β-*O* ← Glc^2 ← Glc^6 ← (*E*)-but-2-enoyl; 20β-*O* ← Glc	*Panax quinquefolium* L. (Araliaceae), roots [427]. Colorless crystals. M.p. 172–174°. $C_{52}H_{86}O_{19}$: 1014.58. $[\alpha]_D^{28} = +34.6$ ($c = 0.25$, MeOH).

Table 1 (cont.)

1315	Quinquenoside II 3β-*O* ← Glc^{2} ← Glc^{6} ← (*E*)-oct-2-enoyl; 20β-*O* ← Glc^{6} ← Glc	*Panax quinquefolium*, roots [427]. Colorless crystals. $C_{62}H_{104}O_{24}$: 1232.69. M.p. 168–170°. $[\alpha]_D^{28} = +22.5$ ($c = 0.25$, MeOH).
1316	Quinquenoside III 3β-*O* ⟵ Glc^{2} ⟵ Glc; ^{6}↑ Ac 20β-*O* ⟵ Glc	*Panax quinquefolium*, roots [427]. Colorless crystals. $C_{50}H_{84}O_{19}$: 988.56. M.p. 167–169°. $[\alpha]_D^{28} = +24.3$ ($c = 0.25$, MeOH).
1317	Quinquenoside V 3β-*O* ← Glc^{2} ← Glc; 20β-*O* ← Glc^{6} ← Glc^{4} ← Glc	*Panax quinquefolium*, roots [427]. Colorless crystals. $C_{60}H_{102}O_{28}$: 1270.66. M.p. 192–194°. $[\alpha]_D^{28} = +24.4$ ($c = 0.25$, MeOH).
1318	Notoginsenoside L 3β-*O* ← Glc^{2} ← Xyl; 20β -*O* ← Glc^{6} ← Glc	*Panax notoginseng* (BURK.) F. H. CHEN (Araliaceae), roots [428]. Colorless crystals (MeOH/H_2O). $C_{53}H_{90}O_{22}$: 1078.59. M.p. 195–197°. $[\alpha]_D^{28} = +20.4$ ($c = 0.1$, MeOH).
1319	Notoginsenoside O 3β-*O* ← Glc; 20β-*O* ← Glc^{6} ← Xyl^{3} ← Xyl	*Panax notoginseng* (BURK) F. H. CHEN, flowers [429]. Colorless crystals ($CHCl_3$/MeOH). $C_{52}H_{88}O_{21}$: 1048.58. M.p. 196–198°. $[\alpha]_D^{28} = +0.3$ ($c = 1.30$, MeOH).
1320	Notoginsenoside P 3β-*O* ← Glc; 20β-*O* ← Glc^{6} ← Xyl^{4} ← Xyl	*Panax notoginseng*, flowers [429]. Colorless crystals ($CHCl_3$/MeOH). M.p. 194–196°. $C_{52}H_{88}O_{21}$: 1048.58. $[\alpha]_D^{28} = +2.1$ ($c = 1.0$, MeOH).
1321	Notoginsenoside Q 3β-*O* ← Glc^{2} ← Glc^{2} ← Xyl; 20β-*O* ← Glc^{6} ← Xyl^{4} ← Xyl	*Panax notoginseng*, flowers [429]. Colorless crystals ($CHCl_3$/MeOH). M.p. 194–196°. $C_{63}H_{106}O_{30}$: 1342.68. $[\alpha]_D^{28} = -0.6$ ($c = 0.70$, MeOH).
1322	Notoginsenoside S 3β-*O* ← Glc^{2} ← Glc^{2} ← Xyl; 20β-*O* ← Glc^{6} ← Ara(f)^{5} ← Xyl	*Panax notoginseng*, flowers [429]. Colorless crystals ($CHCl_3$/MeOH). $C_{63}H_{106}O_{30}$: 1342.68. M.p. 186–188°. $[\alpha]_D^{28} = -8.7$ ($c = 1.40$, MeOH).
1323	Notoginsenoside T 3β-*O* ← Glc^{2} ← Glc^{2} ← Xyl; 20β-*O* ← Glc^{6} ← Glc^{3} ← Xyl	*Panax notoginseng*, flowers [429]. Colorless crystals ($CHCl_3$/MeOH). $C_{64}H_{108}O_{31}$: 1372.69. M.p. 196–198°. $[\alpha]_D^{28} = +6.8$ ($c = 1.20$, MeOH).

Table 1 (cont.)

Aglycone: (3β,12β)-Dammar-24-ene-3,12,17,20-tetrol		
1324	Compound 5 3*β*-*O* ← Glc^6 ← Glc; 20*β*-*O* ← Glc	*Cyclanthera pedata*, fruits [430]. $C_{48}H_{82}O_{18}$: 946.55.
Aglycone: (3β,6α,12β)-12,23-Epoxydammar-24-ene-3,6,20-triol		
1325	Ginsenoside Rh_9 20-*O* ← Glc	*Panax ginseng*, leaves [431]. White powder. $C_{36}H_{60}O_9$: 636.42.
*Aglycone: (3β,12β,23*E*)-Dammara-23,25-diene-3,12,20-triol*		
1326	Quinquenoside L_1 3*β*-*O* ← Glc^2 ← Glc; 20-*O* ← Glc	*Panax quinquefolium* L. (Araliaceae), leaves and roots [432]. White amorphous solid. $C_{48}H_{80}O_{18}$: 944.53. M.p. 208–210°.
*Aglycone: (3β,6α,12β,20*E*)-Dammara-20(22),24-diene-3,6,12-triol*		
1327	Ginsenoside-R_{g6} 6*α*-*O* ← Glc^2 ← Rha	*Panax ginseng* C. A. Mey (Araliaceae), stem leaves [433]. White powder. $C_{42}H_{70}O_{12}$: 766.49.
Aglycone: (3β,7β,12β)-Dammara-5,24-diene-3,7,12,20-tetrol		
1328	Quinquenoside IV 3*β*-*O* ← Glc^2 ← Glc; 20*β*-*O* ← Glc^6 ← Glc	*Panax quinquefolium*, roots [427]. Colorless crystals. $C_{54}H_{90}O_{24}$: 1122.58. M.p. 190–192°. $[\alpha]_D^{28} = +39.1$ ($c = 0.25$, MeOH).
*Aglycone: (3β,6α,12β,24*S*)-20,24-Epoxydammarane-3,6,12,25-tetrol*		
1329	Yesanchinoside A 6*α*-*O* ⟵ Glc^2 ⟵ Glc ^{6}↑ Ac	*Panax japonicus* C. A. Meyer (Araliaceae), underground part [434]. White powder. $C_{44}H_{74}O_{16}$: 858.50. $[\alpha]_D^{20} = +7.1$ ($c = 0.1$, 40% CH_3CN).
1330	Yesanchinoside B 6*α*-*O* ⟵ Glc^2 ⟵ Glc ^{6}↑ *α*-Glc	*Panax japonicus*, underground part [434]. White powder. $C_{48}H_{82}O_{20}$: 978.54. $[\alpha]_D^{20} = +11.3$ ($c = 0.1$, 40% CH_3CN).
1331	Yesanchinoside C 6*α*-*O* ← Glc^2 ← Glc^2 ← Xyl	*Panax japonicus*, underground part [434]. White powder. $C_{47}H_{80}O_{19}$: 948.53. $[\alpha]_D^{20} = +5.9$ ($c = 0.1$, 40% CH_3CN).

Table 1 (cont.)

*Aglycone: (3β,7β,24*E*)-Dammar-24-ene-3,7,20,26-tetrol*		
1332	Compound 2 3β-*O* ← Glc^2 ← Ara	*Bolbostemma paniculatum* (MAXIM.) FRANQUET (Cucurbitaceae), bulbs [435]. White powder. $C_{41}H_{70}O_{13}$: 770.48. M.p. 164–166°. $[\alpha]_D^{20} = +3.9$ ($c = 0.52$, MeOH).
1333	Compound 2a 3β-*O* ← Glc^2 ← Ara^3 ← Ac	*Bolbostemma paniculatum*, bulbs [435]. White powder. $C_{43}H_{72}O_{14}$: 812.49. M.p. 152–154°. $[\alpha]_D^{20} = +15.9$ ($c = 0.41$, MeOH).
1334	Compound 2b 3β-*O* ← Glc^2 ← Ara^4 ← Ac	*Bolbostemma paniculatum*, bulbs [435]. White powder. $C_{43}H_{72}O_{14}$: 812.49. M.p. 148–150°. $[\alpha]_D^{20} = +15.3$ ($c = 0.49$, MeOH).
*Aglycone: (3β,12β,24*Z*)-Dammar-24-ene-3,12,20,26-tetrol*		
1335	Quinquenoside L_2 3β-*O* ← Glc^2 ← Glc; 20β-*O* ← Glc	*Panax quinquefolium*, leaves and roots [432]. White amorphous solid. $C_{48}H_{82}O_{19}$: 962.54. M.p. 165–168°.
*Aglycone: (1β,2α,3β,20*R*)-Dammar-24-ene-1,2,3,20-tetrol*		
1336	Chilianoside A 3β-*O* ← Glc	*Rhoiptelea chiliantha* DIELS et HAND. – MAZZ (Rhoipteleaceae), leaves [436]. White powder. $C_{36}H_{62}O_9$: 638.44. $[\alpha]_D^{25} = +5.5$ ($c = 0.3$, C_5H_5N).
Aglycone: (3β,6α,12β)-Dammar-24-ene-3,6,12,20-tetrol		
1337	Notoginsenoside M 6α-*O* ← Glc^6 ← Glc(α); 20β-*O* ← Glc	*Panax notoginseng*, roots [428]. Colorless crystals (MeOH/H_2O). $C_{48}H_{82}O_{19}$: 962.54. M.p. 187–189°. $[\alpha]_D^{24} = +24.7$ ($c = 0.3$, MeOH).
1338	Notoginsenoside N 6α-*O* ← Glc^4 ← Glc(α); 20β-*O* ← Glc	*Panax notoginseng*, roots [428]. Colorless crystals (MeOH/H_2O). $C_{48}H_{82}O_{19}$: 962.54. M.p. 186–188°. $[\alpha]_D^{22} = +50.0$ ($c = 0.3$, MeOH).
1339	Yesanchinoside D 6α-*O* ← Glc^6 ← Ac; 20β-*O* ← Glc	*Panax japonicus*, underground part [434]. White powder. $C_{44}H_{74}O_{15}$: 842.50. $[\alpha]_D^{20} = +13.6$ ($c = 0.1$, 40% CH_3CN).

Table 1 (cont.)

1340	Yesanchinoside E 6α-*O* ← Glc^2 ← Rha; 20β-*O* ← Glc^6 ← Glc	*Panax japonicus*, underground part [434]. White powder. $C_{54}H_{92}O_{23}$: 1108.60. $[\alpha]_D^{20} = +1.5$ ($c = 0.1$, 40% CH_3CN).
1341	Yesanchinoside F 6α-*O* ⟵ Glc^2 ⟵ Rha; (6 ↑ Ac) 20β-*O* ⟵ Glc^6 ⟵ Glc	*Panax japonicus*, underground part [434]. White powder. $C_{56}H_{94}O_{24}$: 1150.61. $[\alpha]_D^{20} = +3.3$ ($c = 0.1$, 40% CH_3CN).
*Aglycone: (3β,12β,24*R*)-Dammar-25-ene-3,12,20,24-tetrol*		
1342	Ginsenoside Rg_7 3β-*O* ← Glc; 20β-*O* ← Glc	*Panax ginseng*, leaves [431]. White powder. $C_{42}H_{72}O_{14}$: 800.49.
*Aglycone: (1β,2α,3β,20*R*)-24-Hydroperoxydammar-25-ene-1,2,3,20-tetrol*		
1343	Chilianoside B 3β-*O* ← Glc^2 ← Ac	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{38}H_{64}O_{12}$: 712.44. $[\alpha]_D^{20} = +29.4$ ($c = 0.2$, MeOH).
1344	Chilianoside C 3β-*O* ← Glc	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{36}H_{62}O_{11}$: 670.43. $[\alpha]_D^{15} = +13.7$ ($c = 0.2$, MeOH).
1345	Chilianoside D 3β-*O* ← Glc^6 ← Ac	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{38}H_{64}O_{12}$: 712.44. $[\alpha]_D^{15} = +15.5$ ($c = 0.2$, MeOH).
*Aglycone: (1β,2α,3β,20R,23*E*)-25-Hydroperoxydammar-23-ene-1,2,3,20-tetrol*		
1346	Chilianoside E 3β-*O* ← Glc^2 ← Ac	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{38}H_{64}O_{12}$: 712.44. $[\alpha]_D^{20} = +44.0$ ($c = 0.2$, MeOH).
1347	Chilianoside F 3β-*O* ← Glc	*Rhoiptelea chiliantha*, leaves [436]. $C_{36}H_{62}O_{11}$: 670.43. $[\alpha]_D^{15} = +11.1$ ($c = 0.2$, MeOH).
1348	Chilianoside G 3β-*O* ← Glc^6 ← Ac	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{38}H_{64}O_{12}$: 712.44. $[\alpha]_D^{15} = +13.6$ ($c = 0.2$, MeOH).
*Aglycone: (3β,6α,12β,20*E*)-24,25-Epoxydammar-20(22)-ene-3,6,12,23-tetrol*		
1349	Ginsinoside R_{g8} 6α-*O* ← Glc^2 ← Rha	*Panax quinquefolium* (Araliaceae), roots [437]. Amorphous solid. $C_{42}H_{70}O_{14}$: 798.48. $[\alpha]_D^{25} = +1.9$ ($c = 0.4$, MeOH).

Table 1 (cont.)

Aglycone: (3β,6α,12β,23E)-25-Hydroperoxydammar-23-ene-3,6,12,20-tetrol		
1350	Ginsenoside Rh_6 20β-*O* ← Glc	*Panax ginseng*, leaves [431]. White powder. $C_{36}H_{62}O_{11}$: 670.43. $[\alpha]_D^{21} = +21.8$ ($c = 0.1$, MeOH).
Aglycone: (3β,7β,12β)-Dammara-5,24-diene-3,7,12,20-tetrol		
1351	Ginsenoside Rh_7 20β-*O* ← Glc	*Panax ginseng*, leaves [431]. White powder. $[\alpha]_D^{21} = +30.1$ ($c = 0.1$, MeOH). $C_{36}H_{60}O_9$: 636.42.
Aglycone: (3β,6α,12β,20Z,24ξ)-Dammara-20(22),25-diene-3,6,12,24-tetrol		
1352	Ginsenoside Rh_5 6α-*O* ← Glc	*Panax ginseng* (Araliaceae), leaves [431]; *Panax vietnamensis* [438]. White powder. $C_{36}H_{60}O_9$: 636.42. $[\alpha]_D^{25} = +32.4$ ($c = 2.39$, MeOH).
Aglycone: (1β,2α,3β,20R,23E)-Dammar-23-ene-1,2,3,20,25-pentol		
1353	Chilianoside K 3β-*O* ← Glc	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{36}H_{62}O_{10}$: 654.43. $[\alpha]_D^{15} = +10.3$ ($c = 0.2$, MeOH).
1354	Chilianoside L 3β-*O* ← Glc^6 ← Ac	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{38}H_{64}O_{11}$: 696.47. $[\alpha]_D^{15} = +14.2$ ($c = 0.2$, MeOH).
Aglycone: (3β,6α,12β)-Dammar-24-ene-3,6,12,17,20-pentol		
1355	Compound 1 6α-*O* ← Xyl; 20β-*O* ← Glc^2 ← Glc (6 ↑ Rha)	*Cyclanthera pedata* SCRABS (Cucurbitaceae), fruits [430]. $C_{53}H_{90}O_{23}$: 1094.59.
1356	Compound 2 6α-*O* ← Xyl; 20β-*O* ← Glc^2 ← Glc	*Cyclanthera pedata*, fruits [430]. $C_{47}H_{80}O_{19}$: 948.53.
1357	Compound 3 6α-*O* ← Glc; 20β-*O* ← Glc^2 ← Glc (6 ↑ Rha)	*Cyclanthera pedata*, fruits [430]. $C_{54}H_{92}O_{24}$: 1124.60.
1358	Compound 4 3β-*O* ← Glc^6 ← Glc; 6α-*O* ← Xyl; 20β-*O* ← Glc^2 ← Glc (6 ↑ Rha)	*Cyclanthera pedata*, fruits [430]. $C_{65}H_{110}O_{33}$: 1418.69.

Table 1 (cont.)

*Aglycone: (3β,7β,24*E*)-Dammar-24-ene-3,7,18,20,26-pentol*		
1359	Compound 1 (Tubeimoside IV) 3β-*O* ← Glc^2 ← Ara	*Bolbostemma paniculatum* (MAXIM.) FRANQUET (Cucurbitaceae), bulbs [435]. Microneedles (MeOH). $C_{41}H_{70}O_{14}$: 786.48. M.p. 184–186°. $[\alpha]_D^{20} = +5.4$ ($c = 0.56$, MeOH).
1360	Compound Ia 3β-*O* ← Glc^2 ← Ara^3 ← Ac	*Bolbostemma paniculatum*, bulbs [435]. White powder. $C_{43}H_{72}O_{15}$: 828.49. M.p. 170–172°. $[\alpha]_D^{20} = +19.1$ ($c = 0.39$, MeOH).
1361	Compound Ib 3β-*O* ← Glc^2 ← Ara^4 ← Ac	*Bolbostemma paniculatum*, bulbs [435]. White powder (MeOH). $C_{43}H_{72}O_{15}$: 828.49. M.p. 168–170°. $[\alpha]_D^{20} = +18.8$ ($c = 0.64$, MeOH).
1362	Compound Ic 3β-*O* ← Glc^2 ← Ara ^{6}↑ Ac	*Bolbostemma paniculatum*, bulbs [435]. White powder. $C_{43}H_{72}O_{15}$: 828.49. M.p. 152–154°. $[\alpha]_D^{20} = +20.2$ ($c = 0.47$, MeOH).
*Aglycone: (1β,2α,3β,20*R*)-Dammar-25-ene-1,2,3,20,24-pentol*		
1363	Chilianoside H 3β-*O* ← Glc	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{36}H_{62}O_{10}$: 654.43. $[\alpha]_D^{15} = +13.0$ ($c = 1.0$, MeOH).
1364	Chilianoside I 3β-*O* ← Glc^2 ← Ac	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{38}H_{64}O_{11}$: 696.47. $[\alpha]_D^{15} = +22.0$ ($c = 0.2$, MeOH).
1365	Chilianoside J 3β-*O* ← Glc^6 ← Ac	*Rhoiptelea chiliantha*, leaves [436]. White powder. $C_{38}H_{64}O_{11}$: 696.47. $[\alpha]_D^{15} = +16.7$ ($c = 0.2$, MeOH).
Aglycone: (3β,6α)-3,6,20-Trihydroxydammar-24-en-12-one		
1366	Ginsenoside Rh_8 20β-*O* ← Glc	*Panax ginseng*, leaves [431]. White powder. $C_{36}H_{60}O_9$: 636.42.
Aglycone: (3β,12β)-3,12,20-Trihydroxydammar-25-en-24-one		
1367	Ginsenoside III 3β-*O* ← Glc^2 ← Glc; 20β-*O* ← Glc	*Panax ginseng* C. A. MEYER (Araliaceae), flower buds [439]. White powder. $C_{48}H_{80}O_{19}$: 960.53. M.p. 203–205°.

Table 1 (cont.)

*Aglycone: (3β,7β,24*E*)-3,7,20,26-Tetrahydroxydammar-24-en-18-al*		
1368	Compound 3a $3\beta\text{-}O \leftarrow \mathrm{Glc}^{2} \leftarrow \mathrm{Ara}^{3} \leftarrow \mathrm{Ac}$	*Bolbostemma paniculatum*, bulbs [435]. White powder. $C_{43}H_{70}O_{15}$: 826.47. M.p. 132–134°. $[\alpha]_{D}^{20} = +22.9$ ($c = 0.48$, MeOH).
1369	Compound 3b $3\beta\text{-}O \leftarrow \mathrm{Glc}^{2} \leftarrow \mathrm{Ara}^{4} \leftarrow \mathrm{Ac}$	*Bolbostemma paniculatum*, bulbs [435]. White powder. $C_{43}H_{70}O_{15}$: 826.47. M.p. 136–138°. $[\alpha]_{D}^{20} = +20.8$ ($c = 0.53$, MeOH).
*Aglycone: (3β,23*S*)-3,20,23,30-Tetrahydroxydammar-24-en-16-one*		
1370	Protojujuboside A $3\beta\text{-}O \longleftarrow \mathrm{Ara}^{2} \longleftarrow \mathrm{Rha}$; $^{3}\uparrow$ $\mathrm{Glc}^{2} \longleftarrow \mathrm{Xyl}$ $^{6}\uparrow$ Glc $23\alpha\text{-}O \longleftarrow \mathrm{Glc}$	*Zizyphus jujube* Mill. var. *spinosa* Hu (Rhamnaceae), seeds [440]. Colorless crystals. $C_{64}H_{106}O_{32}$: 1386.67. M.p. 200–202°. $[\alpha]_{D}^{29} = -37.6$ ($c = 0.25$, MeOH).
1371	Protojujuboside B $3\beta\text{-}O \longleftarrow \mathrm{Ara}^{2} \longleftarrow \mathrm{Rha}$; $^{3}\uparrow$ $\mathrm{Glc}^{2} \longleftarrow \mathrm{Xyl}$ $23\alpha\text{-}O \longleftarrow \mathrm{Glc}$	*Zizyphus jujube* Mill. var. *spinosa* Hu, seeds [440]. Colorless crystals. $C_{58}H_{96}O_{27}$: 1224.61. M.p. 200–204°. $[\alpha]_{D}^{29} = -25.8$ ($c = 0.25$, MeOH).
1372	Protojujuboside B_{1} $3\beta\text{-}O \longleftarrow \mathrm{Ara}^{2} \longleftarrow \mathrm{Fuc}$; $^{3}\uparrow$ $\mathrm{Glc}^{2} \longleftarrow \mathrm{Xyl}$ $23\alpha\text{-}O \longleftarrow \mathrm{Glc}$	*Zizyphus jujube* var. *spinosa* Hu, seeds [440]. Colorless crystals. $C_{58}H_{96}O_{27}$: 1224.61. M.p. 201–203°. $[\alpha]_{D}^{29} = -24.4$ ($c = 0.25$, MeOH).
Aglycone: (3β,6α,12β)-3,6,12,20-Tetrahydroxydammar-25-en-24-one		
1373	Vina-ginsenoside R_{25} $6\alpha\text{-}O \leftarrow \mathrm{Glc}$; $20\beta\text{-}O \leftarrow \mathrm{Glc}$	*Panax vietnamensis*, roots and rhizomes [438]. Amorphous solid. $C_{42}H_{70}O_{15}$: 814.47. $[\alpha]_{D}^{25} = +0.8$ ($c = 0.6$, MeOH).
Aglycone: (3β)-3,20-Dihydroxydammar-24-ene-21,29-dioic acid		
1374	Compound 1 $3\beta\text{-}O \leftarrow \mathrm{Ara}^{3} \leftarrow \mathrm{Glc}$; $21\text{-}O \leftarrow \mathrm{Glc}$	*Gynostemma cardiospermum* Cogn. ex Oliv. (Cucurbitaceae), aerial parts [426]. Amorphous powder. $C_{47}H_{76}O_{20}$: 960.49. $[\alpha]_{D}^{20} = -8.0$ ($c = 0.16$, MeOH).

Table 1 (cont.)

1375	Compound 2 $3\beta\text{-}O \longleftarrow \text{Ara}^{3} \longleftarrow \text{Glc}^{6} \longleftarrow \text{Rha};$ $\quad {}^{2}\uparrow$ $\quad \text{Rha}$ $21\text{-}O \longleftarrow \text{Glc}$	*Gynostemma cardiospermum*, aerial parts [426]. Amorphous powder. $C_{59}H_{96}O_{28}$: 1252.61. $[\alpha]_{D}^{20} = -10.0$ ($c = 0.20$, MeOH).
1376	Compound 5 $3\beta\text{-}O \longleftarrow \text{Ara}^{3} \longleftarrow \text{Glc};$ $\quad {}^{2}\uparrow$ $\quad \text{Rha}$ $21\text{-}O \longleftarrow \text{Glc}$	*Gynostemma cardiospermum*, aerial parts [426]. Amorphous powder. $C_{53}H_{86}O_{24}$: 1106.55. $[\alpha]_{D}^{20} = -2.0$ ($c = 0.18$, MeOH).
*Aglycone: (3β,23*E*)-3,20,25-Trihydroxydammar-23-ene-21,29-dioic acid*		
1377	Compound 3 $3\beta\text{-}O \longleftarrow \text{Ara}^{3} \longleftarrow \text{Glc}^{6} \longleftarrow \text{Rha};$ $\quad {}^{2}\uparrow$ $\quad \text{Rha}$ $21\text{-}O \longleftarrow \text{Glc}$	*Gynostemma cardiospermum*, aerial parts [426]. Amorphous powder. $C_{59}H_{96}O_{29}$: 1268.60. $[\alpha]_{D}^{20} = -4.0$ ($c = 0.06$, MeOH).
*Aglycone: (3β,24*S*)-3,20,24-Trihydroxydammar-25-ene-21,29-dioic acid*		
1378	Compound 4 $3\beta\text{-}O \longleftarrow \text{Ara}^{3} \longleftarrow \text{Glc}^{6} \longleftarrow \text{Rha};$ $\quad {}^{2}\uparrow$ $\quad \text{Rha}$ $21\text{-}O \longleftarrow \text{Glc}$	*Gynostemma cardiospermum*, aerial parts [426]. Amorphous powder. $C_{59}H_{96}O_{29}$: 1268.60. $[\alpha]_{D}^{20} = -3.0$ ($c = 0.17$, MeOH).
*Aglycone: (3β,23*S*)-3,20-Dihydroxy-21,23-epoxydammar-24-en-21-one*		
1379	Saponin 1 $\quad \text{Ac}$ $\quad {}^{6}\downarrow$ $3\beta\text{-}O \longleftarrow \text{Glc}^{2} \longleftarrow \text{Rha}$ $\quad {}^{3}\uparrow$ $\quad \text{Xyl}$	*Gynostemma pentaphyllum* (THUNB.) MAKINO (Cucurbitaceae), aerial parts [441]. White amorphous powder. $C_{49}H_{78}O_{18}$: 954.52. $[\alpha]_{D}^{20} = -13.5$ ($c = 1.52$, MeOH).
1380	Saponin 3 $3\beta\text{-}O \longleftarrow \text{Glc}^{2} \longleftarrow \text{Rha}$ $\quad {}^{3}\uparrow$ $\quad \text{Xyl}$	*Gynostemma pentaphyllum*, aerial parts [441]. White amorphous powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]_{D}^{20} = -15.3$ ($c = 1.04$, MeOH).
1381	Saponin 5 $3\beta\text{-}O \longleftarrow \text{Glc}^{2} \longleftarrow \text{Rha}$ $\quad {}^{3}\uparrow$ $\quad \text{Glc}$	*Gynostemma pentaphyllum*, aerial parts [441]. White amorphous powder. $C_{48}H_{78}O_{18}$: 942.52. $[\alpha]_{D}^{20} = -9.3$ ($c = 0.90$, MeOH).
*Aglycone: (3β,20*R*,23*R*)-3,20-Dihydroxy-21,23-epoxydammar-24-en-21-one*		
1382	Saponin 2 $\quad \text{Ac}$ $\quad {}^{6}\downarrow$ $3\beta\text{-}O \longleftarrow \text{Glc}^{2} \longleftarrow \text{Rha}$ $\quad {}^{3}\uparrow$ $\quad \text{Xyl}$	*Gynostemma pentaphyllum*, aerial parts [441]. White amorphous powder. $C_{49}H_{78}O_{18}$: 954.52. $[\alpha]_{D}^{20} = +9.9$ ($c = 1.34$, MeOH).

Table 1 (cont.)

1383	Saponin 4 3β-*O* ⟵ Glc^2 ⟵ Rha ^{3}↑ Xyl	*Gynostemma pentaphyllum*, aerial parts [441]. White amorphous powder. $C_{47}H_{76}O_{17}$: 912.51. $[\alpha]^{20}_{D} = +136.8$ ($c = 0.54$, MeOH).
1384	Saponin 6 Ac ^{6}↓ 3β-*O* ⟵ Glc^2 ⟵ Rha^4 ⟵ Ac ^{3}↑ Xyl	*Gynostemma pentaphyllum*, aerial parts [441]. White amorphous powder. $C_{51}H_{80}O_{19}$: 996.53. $[\alpha]^{20}_{D} = 0$ ($c = 0.25$, MeOH).

3.39. Modified Dammarane Type

Aglycone: Jujubogenin (=(3β,16β)-16,23:16,30-Diepoxydammar-24-ene-3,20-diol)

1385	Bacoside A_4 3β-*O* ← Ara	*Bacopa monniera* (Scrophulariaceae), aerial parts [442]. Colorless needles. $C_{35}H_{56}O_8$: 604.40.
1386	Bacoside A_5 20β-*O* ← Ara	*Bacopa monniera*, aerial parts [442]. Colorless needles. $C_{35}H_{56}O_8$: 604.40.
1387	Bacopaside III 3β-*O* ← Glc^2 ← Ara(f)	*Bacopa monniera* WETTST. aerial parts [443]. Needles (MeOH/H_2O). $C_{41}H_{66}O_{13}$: 766.45. M.p. 232–234° (dec.). $[\alpha]^{23}_{D} = -44.8$ ($c = 0.52$, MeOH).
1388	Bacopaside IV 3β-*O* ← Ara^3 ← Glc	*Bacopa monniera*, aerial parts [443]. Fine needles (MeOH). $C_{41}H_{66}O_{13}$: 766.45. M.p. 272–274° (dec.). $[\alpha]^{23}_{D} = -5.2$ ($c = 0.5$, MeOH)
1389	Compound 2 3β-*O* ⟵ Ara^2 ⟵ Ara(f) ^{3}↑ Glc^6 ⟵ Glc	*Anomospermum grandifolium*, stem [402]. White powder. $C_{52}H_{84}O_{22}$: 1060.55. $[\alpha]^{22}_{D} = -12.0$ ($c = 0.05$, MeOH).
1390	Compound 3 3β-*O* ⟵ Ara^2 ⟵ Ara(f) ^{3}↑ Glc^6 ⟵ 3-hydroxy-3-methyl glutaryl	*Anomospermum grandifolium*, stem [402]. White powder. $C_{52}H_{82}O_{21}$: 1042.53. $[\alpha]^{22}_{D} = -22.0$ ($c = 0.05$, MeOH).

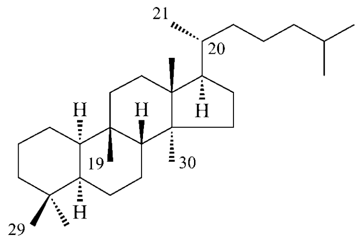
Aglycone: Pseudojujubogenin (=(1S,2R,4aR,6aS,6bR,8aR,10S,12aR,12bR,14aR,14bS)-1,6b,9,9,12a-Pentamethyl-2-(2-methylprop-1-en-1-yl)hexadecahydro-1H-4a,6a-methanophenanthro[2,1-d]pyrano[2,3-b]pyran-1,10(6H)-diol)

1391	Bacoside A_2 3β-*O* ⟵ Glc(f)^6 ⟵ Ara(f) ^{5}↑ Ara	*Bacopa monniera* (WETTST), (Scrophulariaceae). whole plant [444]. Amorphous solid. $C_{46}H_{74}O_{17}$: 898.49.

Table 1 (cont.)

1392	Bacopasaponin H 3β-*O*←Ara	*Bacopa monniera*, leaves [445]. Amorphous powder. $C_{35}H_{56}O_8$: 604.40. M.p. 251° (dec.). $[\alpha]_D^{27} = -31.2$ ($c = 0.68$, MeOH).
1393	Bacopaside V 3β-*O*←Ara(f)^3←Glc	*Bacopa monniera*, aerial parts [443]. Fine needles (MeOH). $C_{41}H_{66}O_{13}$: 766.45. M.p. 274–276° (dec.). $[\alpha]_D^{23} = -24.9$ ($c = 0.38$, MeOH)

3.40. Cucurbitane Type



*Aglycone: (3β,7β,23*E*)-7,25-Dimethoxycucurbita-5,23-dien-3-ol (=(1*S*,4*S*,7*S*,9β,23*E*)-7,25-Dimethoxy-9,10,14-trimethyl-4,9-cyclo-9,10-secocholesta-5,23-dien-1-ol)*

1394	Karaviloside I 3β-*O*←Glc	*Momordica charantia* L. (Cucurbitaceae), fruits [446]. White powder. $C_{38}H_{64}O_8$: 648.46. $[\alpha]_D^{29} = +41.1$ ($c = 0.1$, MeOH).
1395	Karaviloside II 3β-*O*←All	*Momordica charantia*, fruits [446]. White powder. $C_{38}H_{64}O_8$: 648.46. $[\alpha]_D^{27} = +39.3$ ($c = 0.1$, MeOH).

*Aglycone: (3β,7β,23*E*)-7-Methoxycucurbita-5,23-diene-3,25-diol (=(1*S*,4*S*,7*S*,9β,23*E*)-7-Methoxy-9,10,14-trimethyl-4,9-cyclo-9,10-secocholesta-5,23-diene-1,25-diol)*

1396	Karaviloside III 3β-*O*←All	*Momordica charantia*, fruits [446]. White powder. $C_{37}H_{62}O_8$: 634.44. $[\alpha]_D^{28} = +81.8$ ($c = 0.1$, MeOH).

*Aglycone: (3β,7β,22ξ,23ξ)-7β-Methoxycucurbita-5,24-diene-3,22,23-triol (=(1*S*,4*S*,7*S*,9β)-7-Methoxy-9,10,14-trimethyl-4,9-cyclo-9,10-secocholesta-5,24-diene-1,22,23-triol)*

1397	Karaviloside IV 23β-*O*←Glc	*Momordica charantia*, fruits [446]. White powder. $C_{37}H_{62}O_9$: 650.44. $[\alpha]_D^{28} = +29.8$ ($c = 0.1$, MeOH).
1398	Karaviloside V 3β-*O*←All; 23β-*O*←All	*Momordica charantia*, fruits [446]. White powder. $C_{43}H_{72}O_{14}$: 812.49. $[\alpha]_D^{28} = +18.3$ ($c = 0.1$, MeOH).

*Aglycone: (3β,16α)-3, 16,20,22,25-Pentahydroxycucurbit-5-en-11-one (=(1*S*,4*R*,9β,16α)-1,16,20,22,25-Pentahydroxy-9,10,14-trimethyl-4,9-cyclo-9,10-secocholest-5-en-11-one)*

1399	Compound 6 3β-*O*⟵ Glc^6 ⟵ Glc (Glc 4 ↑ Rha)	*Cyclanthera pedata*, fruits [430]. $C_{48}H_{80}O_{20}$: 976.52.

Table 1 (cont.)

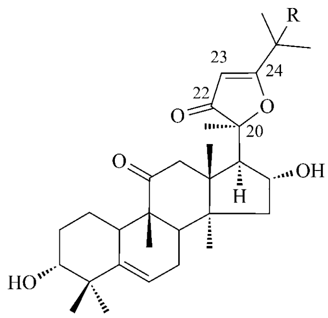
*Aglycone: (3β,24*R*)-3,20,24,25-Tetrahydroxycucurbit-5-en-11-one (=(1*S*,4*R*,9β,24*R*)-1,20,24,25-Tetrahydroxy-9,10,14-trimethyl-4,9-cyclo-9,10-secocholest-5-en-11-one)*

1400	20-Hydroxy-11-*O*xomogroside IA_1 24β-*O*←Glc	*Siraitia grosvenori* SWINGLE (Cucurbitaceae), fruits [447]. White powder. $C_{36}H_{62}O_{10}$: 654.43. $[\alpha]_D = +113.3$ ($c = 0.2$, MeOH).

*Aglycone: (3β,24*R*)-3,24,25-Trihydroxycucurbit-5-en-11-one (=(1*S*,4*R*,9β,24*R*)-1,24,25-Trihydroxy-9,10,14-trimethyl-4,9-cyclo-9,10-secocholest-5-en-11-one)*

1401	11-*O*xomogroside IIE 3β-*O*←Glc; 24β-*O*←Glc	*Siraitia grosvenori*, fruits [447]. White powder. $C_{42}H_{70}O_{14}$: 798.48. $[\alpha]_D = +64.8$ ($c = 0.3$, MeOH).

3.41. Modified Cucurbitane Type



*Aglycone: Picfeltarraeginin III (=3α,16α,20*S*)-3,16,25-Trihydroxy-20,24-epoxycucurbita-5,23-diene-11,22-dione; (1*R*,4*R*,9β,16α,20*S*)-1,16,25-Trihydroxy-9,10,14-trimethyl-20,24-epoxy-4,9-cyclo-9,10-secocholesta-5,23-diene-11,22-dione; R=OH)*

1402	Picfeltarraenin III 3α-*O*←Glc²←Rha	*Picria fel-tarrae* LOUR (Scrophulariaceae), whole plant [448]. Amorphous powder. $C_{42}H_{64}O_{15}$: 808.42. $[\alpha]_D^{20} = +25.7$ ($c = 0.09$, MeOH).

*Aglycone: (3α,16α,20*S*)-3,16-Dihydroxy-20,24-epoxycucurbita-5,23-diene-11,22-dione; (1*R*,4*R*,9β,16α,20*S*)-1,16-Dihydroxy-9,10,14-trimethyl-20,24-epoxy-4,9-cyclo-9,10-secocholesta-5,23-diene-11,22-dione; R=H*

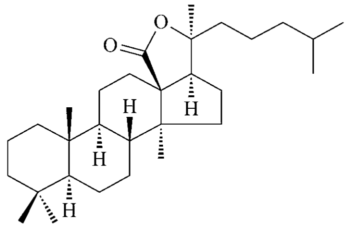
1403	Picfeltarraenin IV 3α-*O*←Xyl³←Glc²←Rha	*Picria fel-tarrae*, whole plant [448]. Colorless needles. $C_{47}H_{74}O_{18}$: 926.49. $[\alpha]_D^{20} = +24.0$ ($c = 0.083$, MeOH).

*Aglycone: (3α,16α,20*S*)-3,16,25-Trihydroxy-20,24-epoxycucurbit-5-ene-11,22-dione; (1*R*,4*R*,9β,16α,20*S*)-1,16,25-Trihydroxy-9,10,14-trimethyl-20,24-epoxy-4,9-cyclo-9,10-secocholest-5-ene-11,22-dione; 23,24-dihydro, R=OH*

1404	Picfeltarraenin V 3α-*O*←Xyl³←Glc²←Rha	*Picria fel-tarrae*, whole plant [448]. Amorphous powder. $C_{47}H_{76}O_{19}$: 944.50. $[\alpha]_D^{20} = +11.9$ ($c = 0.097$, MeOH).

Table 1 (cont.)

3.42. Holostane Type



*Aglycone: (3β,17α,22*E*)-Holosta-7,9(11),22,24-tetraene-3,17-diol (=(3β,22*E*)-18,20-Epoxylanosta-7,9(11),22,24-tetraene-3,17-diol)*

1405 Nobiliside A
3*β-O*←Xyl

Holothuria nobilis SELENKA (sea cucumber) (Holothuriidae) [449].
Colorless amorphous powder.
$C_{35}H_{50}O_8$: 598.35.
M.p. 211–212°.
$[\alpha]_D^{20} = -21.0$ ($c = 0.5$, MeOH).

Aglycone: (3β,17α)-22,25-Epoxyholost-9(11)-ene-3,17-diol (=(3β)-18,20:22,25-Diepoxylanost-9(11)-ene-3,17-diol)

1406 Nobiliside B
3*β-O*⟵ Xyl²⟵ Glc
4↑
SO_3Na

Holothuria nobilis [449].
Colorless amorphous powder.
$C_{41}H_{63}O_{17}SNa$: 882.38.
M.p. 192–196°.
$[\alpha]_D^{20} = -13.8$ ($c = 0.5$, MeOH).

Aglycone: (3β,12α,16β,17α)-16-Acetoxy-22,25-epoxyholost-9(11)-ene-3,12,17-triol (=(3β,12α,16β)-3,12,17-Trihydroxy-18,20:22,25-diepoxylanost-9(11)-en-16-yl acetate)

1407 Nobiliside C
3*β-O*←Xyl

Holothuria nobilis [449].
Colorless amorphous powder.
$C_{37}H_{56}O_{12}$: 692.38.
M.p. 218–221°.
$[\alpha]_D^{20} = -27.3$ ($c = 0.2$, MeOH).

*Aglycone: (3β,16β,23*S*)-16-Acetoxyholost-7-ene-3,23-diol (=(3β,16β,23*S*)-3,23-Dihydroxy-18,20-epoxylanost-7-en-16-yl acetate)*

1408 Frondoside D
3*β-O*⟵ Xyl²⟵ Qui²⟵ Xyl
4↑ 4↑
SO_3Na Xyl³⟵ Glc³⟵ Me

Cucumaria frondosa GUNNERUS (sea cucumber) [450].
Amorphous solid.
$C_{60}H_{95}O_{30}SNa$: 1350.56.
M.p. 217–220°.
$[\alpha]_D^{23} = -22.9$
($c = 0.0013$, C_5H_5N-H_2O, 1:4).

Aglycone: (3β,12α)-25-Acetoxy-3,12-dihydroxyholost-9(11)-en-22-one (=(3β,12α)-3,12-Dihydroxy-22-oxo-18,20-epoxylanost-9(11)-en-25-yl acetate)

1409 Fuscocineroside A
3*β-O*⟵ Xyl²⟵ Qui
4↑ 4↑
SO_3Na Glc³⟵ Glc³⟵ Me

Holothuria fuscocinerea JAEGER (Holothuridae) [451].
Colorless crystals.
$C_{56}H_{87}O_{28}SNa$: 1262.51.
M.p. 249–250°.
$[\alpha]_D^{20} = +6.3$ ($c = 0.76$, C_5H_5N).

Table 1 (cont.)

Aglycone: (3β,12α)-3,12-Dihydroxyholost-9(11)-en-22-one (= (3β,12α)-3,12-Dihydroxy-18,20-epoxylanost-9(11)-en-22-one)

1410	Fuscocineroside B 3β-*O* ⟵ Xyl^2 ⟵ Qui ^{4}↑ ^{4}↑ SO_3Na Glc^3 ⟵ Glc^3 ⟵ Me	*Holothuria fuscocinerea* [451]. Colorless crystals. $C_{54}H_{85}O_{26}SNa$: 1204.50. M.p. 248–250°. $[\alpha]^{20}_{D} = +7.4$ ($c = 0.82$, C_5H_5N).

Aglycone: (3β,12α)-22,25-Epoxyholost-9(11)-ene-3,12-diol (= (3β,12α)-18,20:22,25-Diepoxylanost-9(11)-ene-3,12-diol)

1411	Fuscocineroside C 3β-*O* ⟵ Xyl^2 ⟵ Qui ^{4}↑ ^{4}↑ SO_3Na Glc^3 ⟵ Glc^3 ⟵ Me	*Holothuria fuscocinerea* (sea cucumber) [451]. Colorless crystals. $C_{54}H_{85}O_{26}SNa$: 1204.50. M.p. 250–251°. $[\alpha]^{20}_{D} = -3.5$ ($c = 0.82$, C_5H_5N).

*Aglycone: (3β,16β,17α)-16-Acetoxyholosta-7,22,24-triene-3,17-diol (= (3β,16β,22*E*)-3,17-Dihydroxy-18,20-epoxylanosta-7,22,24-trien-16-yl acetate)*

1412	Intercedenside D 3β-*O* ⟵ Xyl^2 ⟵ Glc ^{4}↑ ^{4}↑ SO_3Na Xyl^3 ⟵ Glc^3 ⟵ Me	*Mensamaria intercedens* LAMPERT (sea cucumber) [452]. Colorless powder. $C_{55}H_{83}O_{27}SNa$: 1230.46. M.p. 214–216°. $[\alpha]^{20}_{D} = -36.3$ ($c = 0.54$, C_5H_5N)
1413	Intercedenside E 3β-*O* ⟵ Xyl^2 ⟵ Xyl ^{4}↑ ^{4}↑ SO_3Na Xyl^3 ⟵ Glc^3 ⟵ Me	*Mensamaria intercedens* [452]. Colorless powder. $C_{54}H_{81}O_{26}SNa$: 1200.47. $[\alpha]^{20}_{D} = -39.4$ ($c = 0.43$, C_5H_5N)
1414	Intercedenside H 3β-*O* ⟵ Xyl^2 ⟵ Qui ^{4}↑ ^{4}↑ SO_3Na Xyl^3 ⟵ Glc^3 ⟵ Me	*Mensamaria intercedens* [452]. Colorless powder. $C_{55}H_{83}O_{26}SNa$: 1214.49. M.p. 188–190°.

Aglycone: (3β,16β,17α)-16-Acetoxyholosta-7,24-diene-3,17-diol (= (3β,16β)-3,17-Dihydroxy-18,20-epoxylanosta-7,24-dien-16-yl acetate)

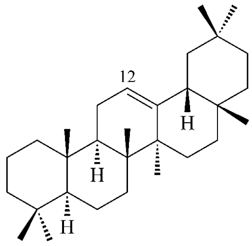
1415	Intercedenside F 3β-*O* ⟵ Xyl^2 ⟵ Glc ^{4}↑ ^{4}↑ SO_3Na Xyl^3 ⟵ Glc^3 ⟵ Me	*Mensamaria intercedens* [452]. Colorless powder. $C_{55}H_{85}O_{27}SNa$: 1232.50. M.p. 226–228°. $[\alpha]^{20}_{D} = -33.2$ ($c = 0.39$, C_5H_5N)
1416	Intercedenside I 3β-*O* ⟵ Xyl^2 ⟵ Qui ^{4}↑ ^{4}↑ SO_3Na Xyl^3 ⟵ Glc^3 ⟵ Me	*Mensamaria intercedens* [452]. Colorless powder. $C_{55}H_{85}O_{26}SNa$: 1216.50. M.p. 221–223°. $[\alpha]^{20}_{D} = -17.0$ ($c = 0.47$, C_5H_5N)

*Aglycone: (3β,16β)-16-Acetoxyholosta-7,22,24-trien-3-ol (= (3β,16β,22*E*)-3-Hydroxy-18,20-epoxylanosta-7,22,24-trien-16-yl acetate)*

1417	Intercedenside G 3β-*O* ⟵ Xyl^2 ⟵ Xyl ^{4}↑ ^{4}↑ SO_3Na Xyl^3 ⟵ Glc^3 ⟵ Me	*Mensamaria intercedens* [452]. Colorless powder. $C_{54}H_{81}O_{25}SNa$: 1184.48. M.p. 241.5–243.2°. $[\alpha]^{20}_{D} = -41.9$ ($c = 0.4$, C_5H_5N)

Table 2. *List of Known Triterpenoid Saponins and Prosapogenins* (with molecular formulae and plant sources) *Whose Biological Activities Are Reported during 1996–2007*

4.1. Δ^{12}-Oleanane Type



Aglycone: (3β,21β,22β)-Olean-12-ene-3,21,22,24-tetrol

1418 Saponin 2 — *Lupinus angustifolius* [37]. $C_{54}H_{88}O_{23}$: 1104.56.
3*β-O* ⟵ GlcA^2 ⟵ Gal^2 ⟵ Rha
3↑
Rha

Aglycone: Soyasapogenol B (=(3β,22β)-Olean-12-ene-3,22,24-triol)

1419 Saponin 6 — *Astragalus seberi*, aerial parts [22]. $C_{48}H_{78}O_{18}$: 942.52.
3*β-O* ← GlcA^2 ← Gal^2 ← Rha

*Aglycone: 22-*O*-Acetyl-21-*O*-angeloyltheasapogenol E (=(3β,16α,21β,22α)-22-(Acetyloxy)-3,16,28-trihydroxy-23-oxoolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*

1420 Theasaponin E$_1$ — *Camellia sinensis*, seeds [51]. $C_{59}H_{90}O_{27}$: 1230.57.
3*β-O* ⟵ GlcA^2 ⟵ Gal
3↑
Ara^2 ⟵ Xyl

*Aglycone: 28-*O*-Acetyl-21-*O*-angeloyltheasapogenol E (=(3β,16α,21β,22α)-28-(Acetyloxy)-3,16,22-trihydroxy-23-oxoolean-12-en-21-yl (2*Z*)-2-methylbut-2-enoate)*

1421 Theasaponin E$_2$ — *Camellia sinensis*, seeds [81]. $C_{59}H_{90}O_{27}$:1230.57.
3*β-O* ⟵ GlcA^2 ⟵ Gal
3↑
Ara^2 ⟵ Xyl

Aglycone: (3β,16β,22α)-3,22,28-Trihydroxyolean-12-en-16-yl acetate

1422 Na-Salt of alternoside II — *Gymnema sylvestre*, leaves [18]. $C_{50}H_{80}O_{20}Na$: 1023.52.
3*β-O* ← GlcA(Na-salt)^3 ← Glc;
28-*O* ← Rha

*Aglycon: 22-*O*-Acetyl-21-*O*-tigloylprotoaescigenin (=(3β,16α,21β,22α)-22-(Acetyloxy)-3,16,24,28-tetrahydroxyolean-12-en-21-yl (2*E*)-2-methylbut-2-enoate)*

1423 Escin 1a — *Aesculus chinensis*, seeds [73]. $C_{55}H_{86}O_{24}$:1130.55.
3*β-O* ⟵ GlcA^2 ⟵ Glc
4↑
Glc

*Aglycone: 22-*O*-Acetyl-21-*O*-angeloylprotoaescigenin*

1424 Escin 1b — *Aesculus chinensis*, seeds [73]. $C_{55}H_{86}O_{24}$: 1130.55.
3*β-O* ⟵ GlcA^2 ⟵ Glc
4↑
Glc

Table 2 (cont.)

*Aglycone: 28-*O*-Acetyl-21-*O*-tigloylprotoaescigenin*		
1425	Isoescin 1a 3β-*O* ← GlcA^2 ← Glc ^{4}↑ Glc	*Aesculus chinensis*, seeds [73]. $C_{55}H_{86}O_{24}$: 1130.55.
*Aglycone: 28-*O*-Acetyl-21-*O*-angeloylprotoaescigenin*		
1426	Isoescin 1b 3β-*O* ← GlcA^2 ← Glc ^{4}↑ Glc	*Aesculus chinensis*, seeds [73]. $C_{55}H_{86}O_{24}$:1130.55.
Aglycone: (3β)-Olean-12-ene-3,23,28-triol		
1427	Saponin 1 3β-*O* ← Fuc^2 ← Glc ^{3}↑ Glc^4 ← Glc	*Arbus precatorius*, (Fabaceae), aerial parts [453]. $C_{54}H_{90}O_{22}$: 1090.59.
Aglycone: Olean-12-ene-3β,16β,23,28-tetrol		
1428	Saponin 2 3β-*O* ← Fuc^2 ← Glc ^{3}↑ Glc^4 ← Glc	*Arbus precatorius* (Fabaceae), aerial parts [453]. $C_{54}H_{90}O_{23}$: 1106.58.
Aglycone: Barrigenol R$_1$ (=(3β,15α,16α,21β,22α)-Olean-12-ene-3,15,16,21,22,28-hexol)		
1429	Prosapogenin of Simplocososide A 3β-*O* ← GlcA (Me ester)^2 ← Glc ^{4}↑ Ara(f)	Acid hydrolysis product from simplocososide A [60]. $C_{48}H_{78}O_{21}$: 990.50.
*Aglycone: 21-*O*-Acetyl-22-*O*-angeloylbarringtogenol C (=(3β,16α,21β,22α)-21-(Acetyloxy)-3,16,28-trihydroxyolean-12-en-22-yl (2*Z*)-2-methylbut-2-enoate)*		
1430	Xanifolia X 3β-*O* ← GlcA (Bu ester)^2 ← Gal ^{3}↑ Ara(f)	*Xanthoceras sorbifolia* [56]. $C_{58}H_{92}O_{22}$: 1140.60.
Aglycone: (3β)-3,24-Dihydroxyolean-12-en-22-one		
1431	Dehydrosoyasaponin 1 3β-*O* ← GlcA^2 ← Gal^2 ← Rha	*Pisum sativum*, seeds [454]. $C_{48}H_{76}O_{18}$: 940.50.
Aglycone: Oleanolic acid (=(3β)-3-Hydroxyolean-12-en-28-oic acid)		
1432	Hookeroside A 3β-*O* ← Xyl^2 ← Rha^3 ← Xyl^4 ← Glc; 28-*O* ← Glc^6 ← Glc	*Scabiosa tschiliensis*, whole plant [108]. $C_{64}H_{104}O_{30}$: 1352.66.
1433	Hookeroside B 3β-*O* ← Xyl^2 ← Rha^3 ← Xyl^4 ← Glc^4 ← Xyl; 28-*O* ← Glc^6 ← Glc	*Scabiosa tschiliensis*, whole plant [108]. $C_{69}H_{112}O_{34}$: 1484.70.
1434	Prosapogenin of Scabiosaponin A 3β-*O* ← Ara^2 ← Rha^3 ← Xyl^4 ← Glc	Hydrolysis product of scabiosaponin A [108]. $C_{52}H_{84}O_{20}$: 1028.56.
1435	Ginsenoside R$_0$ (=Chikusetsusaponin V) 3β-*O* ← GlcA^2 ← Glc; 28-*O* ← Glc	*Panax ginseng*, roots [455]. $C_{48}H_{76}O_{19}$: 956.50.
1436	Saponin 1 3β-*O* ← Glc*N*Ac^6 ← Ara^2 ← Xyl	*Acacia tenuifolia* [158]. $C_{48}H_{77}NO_{16}$: 923.52.

Table 2 (cont.)

1437	Saponin 2 3*β*-*O* ← Glc*N*Ac^6 ← Ara^2 ← Ara	*Acacia tenuifolia* [158]. $C_{48}H_{77}NO_{16}$: 923.52.
1438	Compound 3 (Guaianin N) 3*β*-*O* ← Ara^3 ← Glc	*Akebia quinata* [456]. $C_{41}H_{66}O_{12}$: 750.46.
1439	Compound 7 (= Patrinia glycoside B-II) 3*β*-*O* ← Ara^2 ← Rha ^{3}↑ Glc	*Akebia quinata* [456]. $C_{47}H_{76}O_{16}$: 896.51.
1440	Saponin 1 3*β*-*O* ← Ara^2 ← Rha	*Pulsatilla chinensis*, roots [127]. $C_{41}H_{66}O_{11}$: 734.46.
1441	Saponin 4 3*β*-*O* ← Ara^2 ← Rha^3 ← Glc	*Pulsatilla chinensis*, roots [127]; *P. koreana*, roots [394]. $C_{47}H_{76}O_{16}$: 896.51.
1442	Saponin 6 3*β*-*O* ← Ara^2 ← Rha ^{4}↑ Glc	*Pulsatilla chinensis*, roots [127]; *P. koreana*, roots [394]. $C_{47}H_{76}O_{16}$: 896.51.
1443	Compound 6 3*β*-*O* ← Ara^2 ← Rha^3 ← Rib	*Clematis chenensis*, roots [104]. $C_{46}H_{74}O_{15}$: 866.50.
1444	Saponin 1 3*β*-*O* ← GlcA; 28-*O* ← Glc	*Chenopodium quinoa*, seeds [323]. $C_{42}H_{66}O_{14}$: 794.45.
1445	Prosapogenin of saponin 1 3*β*-*O* ← GlcA	Basic hydrolysis product of saponin 1 [323]. $C_{36}H_{56}O_9$: 632.39.
1446	Compound 2 3*β*-*O* ← Glc^2 ← Glc	*Viola ibukiana* Makino (Violaceae) [457]. $C_{42}H_{68}O_{13}$: 780.47.
1447	Saponin 3 28-*O* ← Glc	*Viguiera decurrens*, roots [133]. $C_{36}H_{58}O_8$: 618.41.
1448	Saponin Rd 10 3*β*-*O* ← Ara^2 ← Rha ^{4}↑ Glc	*Anemone raddeana*, rhizome [458]. $C_{47}H_{76}O_{16}$: 896.51.
1449	Momordin 1c 3*β*-*O* ← GlcA^3 ← Xyl	*Kochia scoparia*, fruits [459]. $C_{41}H_{64}O_{13}$: 764.43.
Aglycone: Echinocystic acid (= (3β,16α)-3,16-Dihydroxyolean-12-en-28-oic acid)		
1450	Tauroside H$_1$ 3*β*-*O* ← Ara^2 ← Rha; 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Acanthopanax senticosus*, leaves [139]. $C_{59}H_{96}O_{26}$: 1220.62.
1451	Prosapogenin of codonoposide 3*β*-*O* ← GlcA	Enzymatic hydrolysis product of codonoposide [159]. $C_{36}H_{56}O_{10}$: 576.39.
1452	BS of Saponin CP05 3*β*-*O* ← Glc*N*Ac^6 ← Ara^2 ← Ara; 28-*O* ← Glc^2 ← Rha^4 ← Xyl^3 ← Xyl ^{3}↑ (at Rha) Glc	Mild alkaline hydrolysis product of CP05 [168]. $C_{76}H_{123}NO_{39}$: 1673.77.
1453	HS of saponin CP05 3*β*-*O* ← Glc*N*Ac^6 ← Ara^2 ← Ara	Drastic alkaline hydrolysis product of CP05 [168]. $C_{48}H_{77}NO_{17}$: 939.52.

Table 2 (cont.)

Aglycone: Hederagenin (=(3β)-3,23-Dihydroxyolean-12-en-28-oic acid)		
1454	Collinsonidin (Compound 4) 3β-$O \leftarrow \mathrm{Ara}^{3} \leftarrow \mathrm{Glc}$	*Akebia quinata* [456]. $C_{41}H_{66}O_{13}$: 766.45.
1455	Kalopanax saponin A (=Compound 5) 3β-$O \leftarrow \mathrm{Ara}^{2} \leftarrow \mathrm{Rha}$	*Akebia quinata* [456], *Pulsatilla chinensis*, roots [127]. $C_{41}H_{66}O_{12}$: 750.46.
1456	Hederoside D_2 (=Caulosaponin B, Compound 6) 3β-$O \leftarrow \mathrm{Ara}^{2} \leftarrow \mathrm{Glc}$	*Akebia quinata* [456]. $C_{41}H_{66}O_{13}$: 766.45.
1457	Kalopanax saponin I 3β-$O \leftarrow \mathrm{Ara}^{2} \leftarrow \mathrm{Rha}^{2} \leftarrow \mathrm{Xyl}$	*Kalopanax pictus* [456]. $C_{46}H_{74}O_{16}$: 882.50.
1458	Saponin 5 3β-$O \leftarrow \mathrm{Ara}^{2} \leftarrow \mathrm{Rha}^{3} \leftarrow \mathrm{Glc}$	*Pulsatilla chinensis*, roots [127]. $C_{47}H_{76}O_{17}$: 912.51.
1459	Saponin 7 3β-$O \leftarrow \mathrm{Ara}^{2} \leftarrow \mathrm{Rha}$ $^{4}\uparrow$ Glc	*Pulsatilla chinensis*, roots [127]. $C_{47}H_{76}O_{17}$: 912.51.
1460	Saponin 3 3β-$O \leftarrow \mathrm{Ara}^{4} \leftarrow \mathrm{Glc}$	*Pulsatilla chinensis*, roots [127]. $C_{41}H_{66}O_{13}$: 766.45.
1461	Compound 14 3β-$O \leftarrow \mathrm{Ara}$; 28-$O \leftarrow \mathrm{Glc}$	*Sanguisorba officinalis*, roots [180]. $C_{41}H_{66}O_{13}$: 766.45.
1462	Loniceroside A 3β-$O \leftarrow \mathrm{Ara}$; 28-$O \leftarrow \mathrm{Glc}^{2} \leftarrow \mathrm{Rha}$ $^{6}\uparrow$ Xyl	*Lonicera japonica* [460]. $C_{52}H_{84}O_{21}$: 1044.55.
1463	Ilexoside XLVII 3β-$O \leftarrow \mathrm{GlcA}$; 28-$O \leftarrow \mathrm{Glc}$	*Ilex kudincha*, leaves [119]. $C_{42}H_{66}O_{15}$: 810.44.
Aglycone: (3β)-3,27-Dihydroxyolean-12-en-28-oic acid		
1464	Raddeanoside 12 (R_d 12) 3β-$O \leftarrow \mathrm{Ara}^{2} \leftarrow \mathrm{Rha}$	*Anemone raddeana*, rhizome [458]. $C_{41}H_{66}O_{12}$: 750.46.
1465	Raddeanoside 13 (R_d 13) 3β-$O \leftarrow \mathrm{Ara}^{2} \leftarrow \mathrm{Rha}$ $^{4}\uparrow$ Glc	*Anemone raddeana*, rhizome [458]. $C_{47}H_{76}O_{17}$: 912.51.
Aglycone: (3β,19α)-3,19-Dihydroxyolean-12-en-28-oic acid		
1466	Siaresinolic acid glucosyl ester 28-$O \leftarrow \mathrm{Glc}$	*Ilex oblonga*, leaves [177]. $C_{36}H_{58}O_{9}$: 634.41.
Aglycone: Gypsogenin (=(3β)-3-Hydroxy-23-oxoolean-12-en-28-oic acid)		
1467	Gypsoside 3β-$O \leftarrow \mathrm{GlcA}^{2} \leftarrow \mathrm{Ara}$; $^{4}\uparrow$ $\mathrm{Glc}^{4} \leftarrow \mathrm{Gal}$ 28-$O \leftarrow \mathrm{Fuc}^{2} \leftarrow \mathrm{Ara}^{3} \leftarrow \mathrm{Xyl}$ $^{4}\uparrow$ $\mathrm{Rha}^{3} \leftarrow \mathrm{Xyl}$	*Gypsophila paniculata* [461]. $C_{80}H_{126}O_{44}$: 1790.76.

Table 2 (cont.)

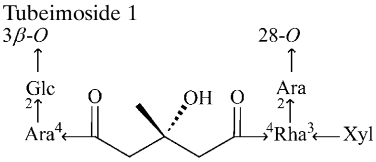
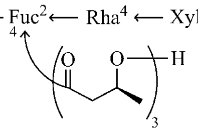
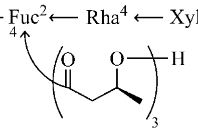
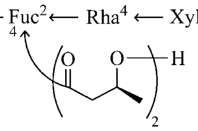
1468	Saporin 3 3*β*-*O* ⟵ GlcA[3] ⟵ Ara; (2↑) Glc[2] ⟵ Gal 28-*O* ⟵ Rha[2] ⟵ Fuc[4] ⟵ Xyl (4↑) Xyl[3] ⟵ Xyl	*Saponaria officinalis* [462]. $C_{80}H_{126}O_{44}$: 1790.76.
Aglycone: (3β)-3,24-Dihydroxyolean-12-en-28-oic acid		
1469	*α*-Hederin 3*β*-*O* ← Rha[2] ← Ara(f)	*Hedera helix* [463]. $C_{41}H_{66}O_{12}$: 750.46.
Aglycone: Bayogenin (= (2β,3β)-2,3,23-Trihydroxyolean-12-en-28-oic acid)		
1470	Saponin 3 3*β*-*O* ← Glc; 28-*O* ← Glc[2] ← Rha[4] ← Xyl	*Polygala japonica*, whole plant [302]. $C_{53}H_{86}O_{22}$: 1074.56.
1471	Saponin 4 (= Polygalasaponin V) 3*β*-*O* ⟵ Glc; 28-*O* ⟵ Glc[2] ⟵ Rha[4] ⟵ Xyl (3↑) Api(f)	*Polygala japonica*, whole plant [302]. $C_{58}H_{94}O_{26}$: 1206.60.
1472	Saponin 5 3*β*-*O* ← Glc	*Polygala japonica*, whole plant [302]. $C_{36}H_{56}O_{10}$: 648.39.
1473	Tubeimoside 1 	*Bolbostemma paniculatum*, tubers [464]. $C_{63}H_{96}O_{29}$: 1316.60.
1474	Bellis saponin BS-2 3*β*-*O* ← Glc; 28-*O* ← Fuc[2] ← Rha[4] ← Xyl[3] ← Rha	*Bellis perennis*, roots [247]. $C_{59}H_{96}O_{27}$: 1236.61.
1475	Virgaureasaponin B (VSB) 3*β*-*O* ⟵ Glc; 28-*O* ⟵ Fuc[2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Rha 	*Solidago virgaurea* L., whole plant [465]. $C_{71}H_{114}O_{33}$: 1494.72.
1476	Virgaureasaponin D (VSD) 3*β*-*O* ⟵ Glc[3] ⟵ Glc; 28-*O* ⟵ Fuc[2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Rha 	*Solidago virgaurea* L., whole plant [465]. $C_{77}H_{124}O_{38}$: 1656.78.
1477	Virgaureasaponin E (VSE) 3*β*-*O* ⟵ Glc[3] ⟵ Glc; 28-*O* ⟵ Fuc[2] ⟵ Rha[4] ⟵ Xyl[3] ⟵ Rha 	*Solidago virgaurea* L., whole plant [465]. $C_{73}H_{118}O_{36}$: 1570.74.

Table 2 (cont.)

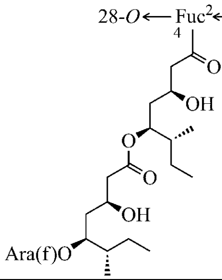
Aglycone: (2β,3β,16α)-2,3,16,23,24-Pentahydroxyolean-12-en-28-oic acid		
1478	Platycodin D_3 3β-*O* ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Api(f)	*Platycodon grandiflorum*, roots [249]. $C_{63}H_{102}O_{33}$: 1386.63.
1479	Platycodin D_2 3β-*O* ← Glc^6 ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Ara^3 ← Api(f)	*Platycodon grandiflorum*, roots [256]. $C_{63}H_{102}O_{33}$: 1386.63.
1480	Deapioplatycodin D 3β-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl	*Platycodon grandiflorum*, roots [256]. $C_{52}H_{84}O_{24}$: 1092.54.
1481	Platycodin D 3β-*O* ← Glc; 28-*O* ← Ara^2 ← Rha^4 ← Xyl^3 ← Api(f)	*Platycodon grandiflorum*, roots [256]. $C_{57}H_{92}O_{28}$: 1224.58.
Aglycone: Quillaic acid (=(3β,16α)-3,16-Dihydroxy-23-oxoolean-12-en-28-oic acid)		
1482	Jenisseensoside C 3β-*O* ← $GlcA^2$ ← Gal; 28-*O* ← Fuc^2 ← Rha (Fuc 4 ← *p*-(MeO)-(*E*)-cinnamoyl)	*Silene fortunei* roots [282]. $C_{64}H_{92}O_{26}$: 1276.59.
1483	Jenisseensoside D 3β-*O* ← $GlcA^2$ ← Gal; 28-*O* ← Fuc^2 ← Rha (Fuc 4 ← *p*-(MeO)-(*Z*)-cinnamoyl)	*Silene fortunei*, roots [282]. $C_{64}H_{92}O_{26}$: 1276.59.
1484	Deacylated saponin from Jenisseensosides C and D 3β-*O* ← $GlcA^2$ ← Gal; 28-*O* ← Fuc^2 ← Rha	Mild alkaline hydrolysis product from mixtures of jenisseensosides C and D [282]. $C_{54}H_{84}O_{24}$: 1116.54.
1485	Quillaja saponin-21 (QS-21) 3β-*O* ← $GlcA^2$ ← Gal; (GlcA 3 ← Xyl) 28-*O* ← Fuc^2 ← Rha^4 ← Xyl^3 ← Api(f) (Rha 2 ← Glc; Fuc 4 ← acyl chain) 	*Quillaja saponaria*, bark [462][466]. $C_{98}H_{160}O_{51}$: 2152.99.
Aglycone: Medicagenic acid (=(2β,3β)-2,3-Dihydroxyolean-12-ene-23,28-dioic acid)		
1486	Medicagenic 3-*O*-glucoside 3β-*O* ← Glc	*Medicago sativa*, roots [467][468]. $C_{36}H_{56}O_{11}$: 664.38.
Aglycone: Serjanic acid (=(3β)-3-Hydroxy-30-methoxy-30-oxoolean-12-en-28-oic acid)		
1487	Saponin 1 3β-*O* ← Glc	*Phytolacca icosandra*, berries [318]. $C_{37}H_{58}O_{10}$: 662.40.
1488	Saponin 2 3β-*O* ← Glc^3 ← Gal	*Phytolacca icosandra*, berries [318]. $C_{43}H_{68}O_{15}$: 824.46.

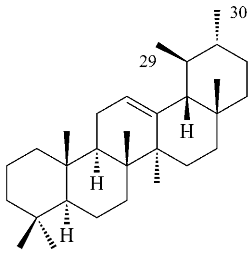
Table 2 (cont.)

Aglycone: Saikogenin G (=(3β,16α)-13,28-Epoxyolean-11-ene-3,16,23-triol)		
1489	Saikosaponin d 3β-*O* ← Fuc^3 ← Glc	*Bupleurum falcatum* (*falcata*) [469]. $C_{42}H_{68}O_{13}$: 780.47.
Aglycone: 16-Dehydroxysaikogenin G (=(3β)-13,28-Epoxyolean-11-ene-3,23-diol)		
1490	Mimengoside A 3β-*O* ← Fuc^3 ← Glc^4 ← Rha ^{2}↑ (at Fuc) Glc	*Buddleja madagascariensis*, leaves [470]. $C_{54}H_{88}O_{21}$: 1072.58.
Aglycone: (3β,16α,21β,22α)-3,21,28-Trihydroxy-16-(propanoyloxy)-13,28-epoxyoleanan-22-yl (2Z)-2-methylbut-2-enoate		
1491	Maesasaponin 1 3β-*O* ← GlcA^3 ← Gal^2 ← Rha ^{2}↑ (at GlcA) Gal	*Maesa lanceolata* [471]. Isolated as a mixture of six saponins. $C_{62}H_{98}O_{28}$: 1290.62.
Aglycone: (3β,16α,21β,22α)-16-(Butanoyloxy)-3,21,28-trihydroxy-13,28-epoxyoleanan-22-yl (2Z)-2-methylbut-2-enoate		
1492	Maesasaponin 2 3β-*O* ← GlcA^3 ← Gal^2 ← Rha ^{2}↑ (at GlcA) Gal	*Maesa lanceolata* [471]. Isolated as a mixture of six saponins. $C_{63}H_{100}O_{28}$: 1304.64.
Aglycone: (3β,16α,21β,22α)-3,21,28-Trihydroxy-22-{[(2Z)-2-methylbut-2-enoyl]oxy}-13,28-epoxyoleanan-16-yl pent-4-enoate		
1493	Maesasaponin 3 3β-*O* ← GlcA^3 ← Gal^2 ← Rha ^{2}↑ (at GlcA) Gal	*Maesa lanceolata* [471]. Isolated as a mixture of six saponins. $C_{64}H_{100}O_{28}$: 1316.64.
Aglycone: (3β,16α,21β,22α)-3,21,28-Trihydroxy-22-{[(2Z)-2-methylbut-2-enoyl]oxy}-13,28-epoxyoleanan-16-yl pentanoate		
1494	Maesasaponin 4 3β-*O* ← GlcA^3 ← Gal^2 ← Rha ^{2}↑ (at GlcA) Gal	*Maesa lanceolata* [471]. Isolated as a mixture of six saponins. $C_{64}H_{102}O_{28}$: 1318.66.
Aglycone: (3β,16α,21β,22α)-21-(Acetyloxy)-3,28-dihydroxy-16-(propanoyloxy)-13,28-epoxyoleanan-22-yl (2Z)-2-methylbut-2-enoate		
1495	Maesasaponin 5 3β-*O* ← GlcA^3 ← Gal^2 ← Rha ^{2}↑ (at GlcA) Gal	*Maesa lanceolata* [471]. Isolated as a mixture of six saponins. $C_{64}H_{100}O_{29}$: 1332.63.
Aglycone: (3β,16α,21β,22α)-21-(Acetyloxy)-3,28-dihydroxy-16-(butanoyloxy)-13,28-epoxyoleanan-22-yl (2Z)-2-methylbut-2-enoate		
1496	Maesasaponin 6 3β-*O* ← GlcA^3 ← Gal^2 ← Rha ^{2}↑ (at GlcA) Gal	*Maesa lanceolata* [471]. Isolated as a mixture of six saponins. $C_{65}H_{102}O_{29}$: 1346.65.

Table 2 (cont.)

Aglycone: Cyclamiretin A (= (3β,16α)-3,16-Dihydroxy-13,28-epoxyoleanan-30-al)		
1497	Cyclamin 3*β*-*O* ⟵ Ara^4 ⟵ Glc^2 ⟵ Xyl ^{2}↑ (Ara) Glc; ^{3}↑ (Glc) Glc	*Ardisia japonica*, whole plant [19]. $C_{58}H_{94}O_{27}$: 1222.60.

4.2. Δ^{12}-Ursane Type



Aglycone: Quinovic acid (= (3β)-3-Hydroxyurs-12-ene-27,28-dioic acid)		
1498	3-*O*-*β*-D-Glucopyranosyl quinovic acid-28-*β*-D-glucopyranosyl ester 3*β*-*O* ← Glc; 28-*O* ← Glc	*Zygophyllum gaetulum* [389]. $C_{42}H_{66}O_{15}$: 810.44.
Aglycone: Tomentic acid (= (2α,3β)-2,3,19-Trihydroxyurs-12-en-28-oic acid)		
1499	Tomentic acid glucosyl ester 3*β*-*O* ← Glc	*Sargentodoxa cuneata* [472]. $C_{36}H_{56}O_{10}$: 648.39.
Aglycone: Madecassic acid (= (2α,3β,6β)-2,3,6,23-Tetrahydroxyurs-12-en-28-oic acid)		
1500	Madecassoside 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Centella asiatica* [473]. $C_{48}H_{78}O_{20}$: 974.51.
Aglycone: (2α,3β)-2,3,23-Trihydroxyurs-12-en-28-oic acid		
1501	Asiaticoside 28-*O* ← Glc^6 ← Glc^4 ← Rha	*Centella asiatica* [473]. $C_{48}H_{78}O_{19}$: 958.51.
Aglycone: (3β)-3,23-Dihydroxyurs-12-en-28-oic acid		
1502	Cynarasaponin C 3*β*-*O* ← GlcA; 28-*O* ← Glc	*Ilex kudincha*, leaves [119]. $C_{42}H_{66}O_{15}$: 810.44.

4.3. 3,4-Secolupane Type

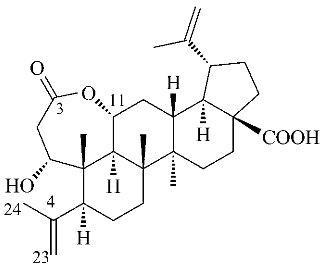
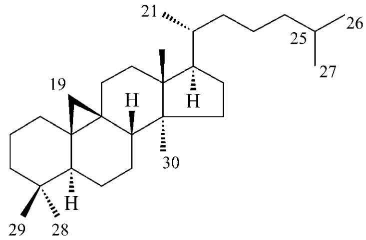


Table 2 (cont.)

*Aglycone: Chiisanogenin (=(1α,11α)-3,4-*seco*-1-Hydroxylupa-4(23),20(29)-diene-3,11-olido-28-oic acid)*

1503	Chiisanoside 28-*O*←Glc^6←Glc^4←Rha	*Acanthopanax sessiliflorus*, leaves [403]. $C_{48}H_{74}O_{19}$: 954.48.

4.4. Cycloartane Type



*Aglycone: (3β,6α,9β,16β,24*S*)-9,19-Cyclolanostane-3,6,16,24,25-pentol*

1504	Cyclocanthoside E 3*β*-*O*←Xyl; 6*α*-*O*←Glc	*Astragalus oleifolius*, stem and leaves [409]. $C_{41}H_{70}O_{14}$: 786.51.

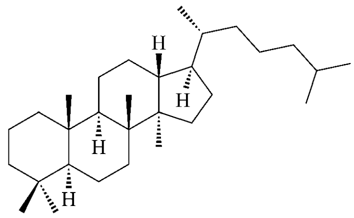
*Aglycone: (3β,6α,9β,16β,20*R*,24*S*)-20,24-Epoxy-9,19-cyclolanostane-3,6,16,25-tetrol*

1505	Astragaloside II 3*β*-*O*←Xyl^2←Ac; 6*α*-*O*←Glc	*Astragalus oleifolius*, stem and leaves [409]. $C_{43}H_{70}O_{15}$: 826.47.

*Aglycone: 12-*O*-Acetylacteol (=(1′*R*,2*S*,4′*S*,4a*R*,5′*S*,5a*R*,7*R*,7a*R*,7b*R*,8*R*,10*R*,11a*S*,12a*S*,12b*S*,14a*R*)-2,4′-Dihydroxy-1,1,5′,7a,8,12a-hexamethylhexadecahydro-2*H*-spiro[cyclopropa[1′,8a′]naphtho[2′,1′: 4,5]-indeno[2,1-*b*]pyran-10,2′-[3,6]dioxabicyclo[3.1.0]hexan]-7-yl acetate)*

1506	Actein 3*β*-*O*←Xyl	*Cimicifuga racemosa*, rhizome [474]. $C_{38}H_{58}O_{11}$: 690.40.

4.5. Dammarane Type



*Aglycone: (20*S*)-Protopanaxadiol (=(3β,12β)-Dammar-24-ene-3,12,20-triol)*

1507	Ginsenoside Rb$_1$ 3*β*-*O*←Glc^2←Glc; 20*β*-*O*←Glc^6←Glc	*Panax notoginseng*, roots [429]. $C_{54}H_{92}O_{23}$: 1108.60.
1508	Ginsenoside Rb$_3$ 3*β*-*O*←Glc^2←Glc; 20*β*-*O*←Glc^6←Xyl	*Panax notoginseng* [429]. $C_{53}H_{90}O_{22}$: 1078.59.
1509	Ginsenoside Rc 3*β*-*O*←Glc^2←Glc; 20*β*-*O*←Glc^6←Ara	*Panax notoginseng* [429]. $C_{53}H_{90}O_{22}$: 1078.59.

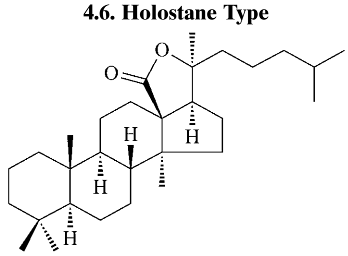
Table 2 (cont.)

1510	Ginsenoside Rd 3β-*O* ← Glc^2 ← Glc; 20β-*O* ← Glc	*Panax notoginseng* [429]. $C_{48}H_{82}O_{18}$: 946.55.
1511	Ginsenoside Rg_3 3β-*O* ← Glc^2 ← Glc	*Panax ginseng* (Korean red ginseng) [475]. $C_{42}H_{72}O_{14}$: 800.49.
1512	Noto-ginsenoside D 3β-*O* ← Glc^2 ← Glc; 20β-*O* ← Glc^6 ← Glc^6 ← Xyl	*Panax notoginseng*, roots [428]. $C_{59}H_{100}O_{27}$: 1240.65.
1513	Ginsenoside Rh_2 3β-*O* ← Glc	*Panax ginseng* [476]. $C_{36}H_{62}O_8$: 622.44.
1514	Compound K 20β-*O* ← Glc	*Panax ginseng*, roots [260]. Intestinal bacterial metabolite derived from oral administration. $C_{36}H_{62}O_8$: 622.44.
*Aglycone: (20*S*)-Protopanaxatriol (=(3β,6α,12β)-Dammar-24-ene-3,6,12,20-tetrol)*		
1515	Ginsenoside Rg_1 6α-*O* ← Glc; 20β-*O* ← Glc	*Panax ginseng* [475]. $C_{42}H_{72}O_{14}$: 800.49.
1516	Ginsenoside Re 6α-*O* ← Glc^2 ← Rha; 20β-*O* ← Glc	*Panax ginseng*, roots [475]. $C_{48}H_{82}O_{19}$: 962.54.
*Aglycone: (3β,6α,12β,20*Z*)-Dammara-20(22),24-diene-3,6,12-triol*		
1517	Ginsenoside Rh_4 6α-*O* ← Glc	*Panax vietnamensis* [438]. $C_{36}H_{60}O_8$: 620.43.
Aglycone: (3β,6α,12β)-20,24-Epoxydammarane-3,6,12,25-tetrol		
1518	Majonoside R_2 6α-*O* ← Glc^2 ← Xyl	*Panax victnamensis* [438]. $C_{41}H_{70}O_{14}$: 786.48.
1519	Pseudo-ginsenoside RT_4 6α-O ← Glc	*Panax victnamensis* [438]. $C_{36}H_{62}O_{10}$: 654.43.
1520	Vina-ginsenoside R_1 6α-*O* ⟵ Glc^2 ⟵ Rha ^{6}↑ Ac	*Panax victnamensis* [438]. $C_{44}H_{74}O_{15}$: 842.50.
1521	Vina-ginsenoside R_2 6α-*O* ⟵ Glc^2 ⟵ Xyl ^{6}↑ Ac	*Panax victnamensis* [438]. $C_{43}H_{72}O_{15}$: 828.49.
Aglycone: (3β,7β,12β)-Dammara-5,24-diene-3,7,12,20-tetrol		
1522	Noto-ginsenoside G 3β-*O* ← Glc^2 ← Glc; 20β-*O* ← Glc	*Panax notoginseng*, roots [428]. $C_{48}H_{80}O_{19}$: 960.53.
*Aglycone: (3β,6α,12β,23*E*)-Dammar-23-ene-3,6,12,20,25-pentol*		
1523	Noto-ginsenoside H 6α-*O* ← Glc^2 ← Xyl; 20β-*O* ← Glc	*Panax notoginseng*, roots [428]. $C_{47}H_{80}O_{19}$: 948.53.

Table 2 (cont.)

*Aglycone: (3β,12β,23*E*)-25-Hydroperoxydammar-23-ene-3,12,20-triol*		
1524	Noto-ginsenoside K 3β-*O* ← Glc^2 ← Glc; 20β-*O* ← Glc^6 ← Glc	*Panax notoginseng*, roots [428]. $C_{54}H_{92}O_{25}$: 1140.59.
Aglycone: (3β,12α)-Dammar-24-ene-3,12,20-triol		
1525	Noto-ginsenoside R_4 3β-*O* ← Glc^2 ← Glc; 20β-*O* ← Glc^6 ← Glc^6 ← Xyl	*Panax notoginseng*, roots [477]. $C_{59}H_{100}O_{27}$: 1240.65.
Aglycone: Jujubogenin (=(3β,16β)-16,23:16,30-Diepoxydammar-24-ene-3,20-diol)		
1526	Jujuboside A 3β-*O* ← Ara^2 ← Rha 3↑ Glc^6 ← Glc 2↑ Glc	*Zizyphus jujuba* var. *spinosa* [440]. $C_{54}H_{94}O_{26}$: 1158.60
1527	Jujuboside B_1 3β-*O* ← Ara^2 ← Fuc 3↑ Glc^2 ← Glc	*Zizyphus jujuba* var. *spinosa* [440]. $C_{51}H_{82}O_{21}$: 1030.53.
1528	Jujuboside C 3β-*O* ← Ara^2 ← Rha 3↑ Glc^6 ← Glc 2↑ Xyl	*Zizyphus jujuba* var. *spinosa* [440]. $C_{53}H_{92}O_{25}$: 1128.59.
1529	Bacoside A_3 3β-*O* ← Glc^2 ← Ara(f) 3↑ Glc	*Bacopa monniera* [478]. $C_{47}H_{76}O_{18}$: 928.50.

4.6. Holostane Type



Aglycone: (3β,12α)-18,20-Epoxylanost-9(11)-ene-3,12-diol		
1530	Pervicoside 3β-*O* ← Xyl^2 ← Qui^4 ← Glc^3 ← Glc^3 ← Me 4↑ SO_3Na	*Holothuria fuscocinerea* (sea cucumber) [451]. $C_{54}H_{87}O_{25}SNa$: 1190.55.
Aglycone: (3β,12α)-18,20:22,25-Diepoxylanost-9(11)-ene-3,12,17-triol		
1531	Holothurin 3β-*O* ← Xyl^2 ← Qui^4 ← Glc^3 ← Glc^3 ← Me 4↑ SO_3Na	*Holothuria fuscocinerea* [451]. $C_{54}H_{85}O_{27}SNa$: 1220.53.

Table 3. *List of Plant and Animal Sources (in alphabetical order) with Isolated Saponins as Mentioned in* Tables 1 *and* 2

Plants/Animals	Saponins
Acacia concinna	Kinmoonoside A (**599**), Kinmoonoside B (**600**), Kinmoonoside C (**592**)
Acacia tenuifolia	Saponin 3 (Acacioside A) (**387**), Saponin 1 (**1434**), Saponin 2 (**1437**), Acacioside B (**590**), Acacioside C (**591**)
Acacia victoriae	Avicin D (**621**), Avicin G (**622**)
Acanthopanax japonica	Acanjaposide A (**983**), Acanjaposide B (**982**), Acanjaposide C (**989**)
Acanthopanax koreanum	Acankoreoside A (**1237**), Acankoreoside B (**1231**), Acankoreoside C (**1230**), Acankoreoside D (**1236**), Acankoreoside E (**1239**)
Acanthopanax nipponicus	Nipponoside A (**530**), Nipponoside B (**341**), Nipponoside C (**729**), Nipponoside D (**529**), Nipponoside E (**987**)
Acanthopanax senticosus	Acanthopanaxoside A (**973**), Acanthopanaxoside B (**342**), Acanthopanaxoside C (**917**), Tauroside H_1 (**1450**)
Acanthopanax sessiliflorus	Sessiloside (**1241**), Chiisanoside (**1503**)
Acanthopanax trifoliatus	Acantrifoside C (**1238**)
Acanthophyllum glandulosum	Glanduloside A (**814**), Glanduloside B (**703**), Glanduloside C (**704**), Glanduloside D (**705**), Compound 2 (**1389**), Compound 3 (**1390**)
Acanthophyllum pachystegium	Pachystegioside A (**750**), Pachystegioside B (**751**), Pachystegioside C (**752**), Pachystegioside D (**813**)
Acanthophyllum squarrosum	Saponin 1 (**706**), Saponin 2 (**707**), Compound 1 (**708**), Compound 2 (**709**), Compound 3 (**777**)
Achyranthes aspara	Saponin 1 (**444**), Saponin 2 (**445**)
Achyranthes bidentata	Bidentatoside I (**251**), Bidentatoside II (**252**), Compound 1 (**253**), Compound 2 (Achyranthoside C dimethyl ester) (**254**), Compound 3 (Achyranthoside C butyl dimethyl ester) (**255**), Compound 4 (Achyranthoside E dimethyl ester) (**256**), Compound 5 (Achyranthoside E butyl methyl ester) (**257**)
Acorus calamus	Saponin 1 (**1133**), Saponin 2 (**47**)
Actaea asiatica	Asiaticoside A (**1255**), Asiaticoside B (**1256**), Compound 3 (**1275**)
Adina rubella	Compound 1 (**1160**), Compound 2 (**1161**), Compound 3 (**1162**), Compound 4 (**1163**)
Aesculus assamica	Assamicin I (**170**), Assamicin II (**153**), Assamicin III (**154**), Assamicin IV (**155**)
Aesculus chinensis	Aesculiside A (**171**), Aesculioside A (**159**), Aesculioside B (**158**), Aesculioside C (**160**), Aesculioside D (**162**), Aesculioside E (**161**), Aesculioside F (**163**), Aesculioside G (**164**), Aesculioside H (**168**), Isoescin IIa (**165**), Isoescin IIb (**167**), Isoescin IIIa (**68**), Isoescin IIIb (**69**), Escin IVa (**166**), Escin IVb (**169**), Escin VIb (**184**), Escin IVc (**178**), Escin IVd (**179**), Escin IVe (**180**), Escin IVf (**181**), Escin IVg (**182**), Escin IVh (**183**), Escin Ia (**1423**), Escin Ib (**1424**), Isoescin Ia (**1425**), Isoescin Ib (**1426**)
Aesculus hippocastanum	Escin IVa (**166**), Escin IVb (**169**), β-Escin = Escin Ib (**1424**)
Aesculus pavia	Aesculioside I_a (**91**), Aesculioside I_b (**147**), Aesculioside I_c (**53**), Aesculioside I_d (**150**), Aesculioside I_e (**151**), Aesculioside II_a (**92**), Aesculioside II_b (**156**), Aesculioside II_c (**54**), Aesculioside II_d (**157**), Aesculioside IV_a (**90**), Aesculioside IV_c (**146**)
Agrostemma githago	Saponin 1 (**710**), Saponin 2 (**711**)
Akebia trifoliata	Compound 11 (**691**), Compound 12 (**692**), Compound 13 (**320**), Mutongsaponin A (**979**), Mutongsaponin B (**980**), Mutongsaponin C (**1120**), Mutongsaponin D (**978**), Mutongsaponin E (**974**)

Table 3 (cont.)

Plants/Animals	Saponins
Akebia quinata	Saponin 2 (**696**), Saponin 3 (**697**), Saponin 9 (**698**), Compound 3 (**1438**), Compound 7 (**1439**), Collinsonidin (**1454**), Kalopanax saponin A (**1455**), Hederoside D_2 (**1456**)
Albizia adianthifolia	Adianthifolioside A (**588**), Adianthifolioside B (**589**), Adianthifolioside C (**595**), Adianthifolioside D (**596**), Adianthifolioside E (**597**), Adianthifolioside F (**598**)
Albizia grandibracteata	Grandibracteoside A (**585**), Grandibracteoside B (**586**), Grandibracteoside C (**587**)
Albizia gummifera	Gummiferaoside A (**603**), Gummiferaoside B (**604**), Gummiferaoside C (**605**), Saponin 1 (**321**), Saponin 2 (**322**), Saponin 4 (**946**), Saponin 5 (**947**)
Albizia julibrissin	Julibroside J_1 (**609**), Julibroside J_5 (**610**), Julibroside J_8 (**611**), Julibroside J_9 (**612**), Julibroside J_{12} (**613**), Julibroside J_{13} (**614**), Julibroside J_{21} (**615**), Julibroside J_{26} (**623**), Julibroside J_{27} (**616**), Julibroside J_{28} (**617**), Julibroside J_{29} (**618**), Julibroside J_{30} (**619**), Julibroside J_{31} (**620**)
Albizia myriophylla	Albiziasaponin B (**805**), Albiziasaponin A (**954**), Albiziasaponin C (**955**), Albiziasaponin D (**956**), Albiziasaponin E (**957**)
Albizia procera	Proceraoside A (**606**), Proceraoside B (**607**), Proceraoside C (**608**), Proceraoside D (**624**)
Albizzia lebbeck	Albiziahexoside (**405**)
Alternanthera repens	Compound 1 (**1173**), Compound 2 (**1174**), Compound 3 (**1175**), Compound 4 (**1176**)
Amaranthus caudatus	Compound 1 (**630**), Compound 2 (**631**), Compound 3 (**984**)
Amaranthus cruentus	Compound 3 (**373**), Compound 4 (**574**), Compound 5 (**731**), Compound 6 (**985**)
Anemone anhuiensis	Anhuienoside A (**450**), Anhuienoside B (**451**), Anhuienoside C (**244**), Anhuienoside D (**245**), Anhuienoside E (**246**), Anhuienoside F (**247**)
Anemone begoniifolia	Begoniifolide D (**250**)
Anemone hupehensis	Hupehensis saponin F (**495**), Hupehensis saponin G (**496**)
Anemone raddeana	Raddeanoside R_{10} (**258**), Raddeanoside R_{11} (**259**), Raddeanoside 12 (= R_d 12; **1464**), Raddeanoside 13 (= R_d 13; **1465**), Saponin R_d10 (**1448**)
Anemone tomentosa	Tomentoside (**260**)
Anomospermum grandifolium	Compound 2 (**1389**), Compound 3 (**1390**), Compound 5 (**1240**)
Anthocephalus cadamba	Phelasin A (**1012**), Phelasin B (**1148**)
Aquilegia vulgaris	Aquilegioside G (**1257**), Aquilegioside H (**1258**) Aquilegioside I (**1271**), Aquilegioside J (**1272**)
Aralia elata	Aralia-saponin I (**401**), Aralia-saponin II (**519**), Aralia-saponin III (**402**), Aralia-saponin IV (**403**), Aralia saponin V (**303**), Aralia saponin VI (**404**), Aralia saponin VII (**473**), Aralia saponin VIII (**541**), Aralia saponin IX (**474**), Congmuyenoside A (**471**), Congmuyenoside B (**472**), Durupcoside C (**470**)
Aralia subcapitata	Subcapitatoside A (**218**), Subcapitatoside B (**219**), Subcapitatoside C (**220**)
Arbus precatorius	Saponin 1 (**1427**), Saponin 2 (**1428**)
Ardisia crenata	Ardisicrenoside G (**808**), Ardisicrenoside H (**809**)
Ardisia japonica	Ardisianoside A (**1036**), Ardisianoside B (**1037**), Ardisianoside C (**1038**), Ardisianoside D (**1039**), Ardisianoside E (**1040**), Ardisianoside F (**1043**), Ardisianoside G (**1044**), Ardisianoside H (**964**), Ardisianoside I (**965**), Ardisianoside J (**966**), Ardisianoside K (**5**), Saponin 4 (**1078**), Cyclamin (**1497**)

Table 3 (cont.)

Plants/Animals	Saponins
Ardisia mamillata	Ardisimamilloside A (**1079**), Ardisimamilloside B (**1080**), Ardisimamilloside C (**42**), Ardisimamilloside D (**48**), Ardisimamilloside E (**1042**), Ardisimamilloside F (**1082**), Ardisimamilloside G (**1075**), Ardisimamilloside H (**1081**)
Arenaria filicaulis	Snatzkein A (**1201**), Snatzkein B (**1202**), Snatzkein C (**1217**), Snatzkein D (**1218**), Snatzkein E (**1204**), Snatzkein F (**712**), Santzkein G (**1203**)
Arenaria juncea	Junceoside A (**713**), Junceoside B (**714**), Junceoside C (**715**)
Argania spinosa	Saponin 3 (**639**), Saponin 4 (**629**)
Aster ageratoides	Ageratoside A_1 (**865**), Ageratoside A_2 (**866**), Ageratoside A_3 (**867**), Ageratoside A_4 (**868**), Ageratoside A_5 (**869**), Ageratoside B_1 (**847**), Ageratoside B_2 (**848**), Ageratoside C_1 (**945**)
Aster albescens	Albesoside A (**849**)
Aster auriculatus	Auriculatusaponin A (**990**), Auriculatusaponin B (**1**), Auriculatusaponin C (**441**), Auriculatusaponin D (**390**), Auriculatusaponin E (**391**), Saponin 3(**339**)
Aster bellidiastrum	Bellidiastroside B_3 (**568**), Bellidiastroside UD_2 (**569**)
Aster lingulatus	Asterlingulatoside A (**392**), Asterlingulatoside B (**393**), Asterlingulatoside C (**394**), Asterlingulatoside D (**395**)
Aster sedifolius	Astersedifolioside A (**396**), Astersedifolioside B (**397**), Astersedifolioside C (**398**)
Astragalus caprinus	Compound 1 (**23**)
Astragalus kahiricus	Kahiricoside II (**1249**), Kahiricoside III (**1250**), Kahiricoside IV (**1251**), Kahiricoside V (**1252**)
Astragalus membranaceus	Huangquiyenin D (**1273**)
Astragalus oleifolius	Oleifolioside A (**1253**), Oleifolioside B (**1254**), Cyclocanthoside E (**1504**), Astragaloside II (**1505**)
Astragalus suberi	Saponin 4 (**22**), Saponin 5 (**26**), Saponin 7 (**11**), Saponin 6 (**1419**)
Astragalus trigonus	Saponin 1 (**17**)
Atriplex semibaccata	Saponin 1 (**9**), Saponin 2 (**10**), Saponin 3 (**1047**), Saponin 4 (**1045**)
Bacopa monniera	Bacoside A_2 (**1391**), Bacoside A_3 (**1529**), Bacoside A_4 (**1385**), Bacoside A_5 (**1386**), Bacopaside III (**1387**), Bacopaside IV (**1388**), Bacopaside V (**1393**), Bacopasaponin H (**1392**)
Baptisia australis	Baptisiasaponin 1 (**2**)
Basella rubra	Basellasaponin A (**516**), Basellasaponin B (**727**), Basellasaponin C (**820**), Basellasaponin D (**919**)
Becium grandiflorum	Beciumecine 1 (**628**), Beciumecine 2 (**656**)
Bellis bernardii	Bernardioside B_1 (**798**), Bernardioside B_2 (**567**), Bernardioside B_4 (**799**), Bernardioside C_2 (**800**)
Bellis perennis	Bellisoside A (**657**), Bellisoside B (**658**), Bellisoside C (**659**), Bellisoside D (**660**), Bellisoside E (**661**), Bellisoside F (**662**), Bellis saponin BS-2 (**1474**)
Bellis sylvestris	Besysaponin U_{B1} (**663**), Besysaponin U_{D2} (**570**)
Berneuxia thibetica	Berneuxia saponin A (**55**), Berneuxia saponin B (**56**), Berneuxia saponin C (**204**)
Bersama engleriana	Saponin 1 (**1206**), Saponin 2 (**240**), Saponin 3 (**241**), Saponin 4 (**242**), Saponin 5 (**243**)
Biondia chinensis	Biondianoside F (**1114**), Biondianoside G (**532**)
Bolbostemma paniculatum	Compound 1 (Tubeimoside IV) (**1359**), Compound Ia (**1360**), Compound Ib (**1361**), Compound Ic (**1362**), Compound 2 (**1332**), Compound 2a (**1333**), Compound 2b (**1334**), Compound 3a (**1368**), Compound 3b (**1369**), Tubeimoside V (**577**), Tubeimoside I (**1473**)

Table 3 (cont.)

Plants/Animals	Saponins
Bongardia chrysogonum	Saponin 1 (**507**), Saponin 2 (**508**)
Boussingaultia baselloides	Boussingoside E (**977**)
Bredemeyera floribunda	Bredemeyeroside B (**874**), Bredemeyeroside D (**875**)
Buddleja madagascariensis	Mimengoside A (**1490**)
Bupleurum chinense	Saikosaponin V-1 (**1033**), Saikosaponin V-2 (**1034**)
Bupleurum falcatum	Saikosaponin d (**1489**)
Bupleurum rigidum	Sandrosaponin 1 (**1046**), Sandrosaponin VII (**1048**), Sandrosaponin VIII (**1031**), Sandrosaponin IX (**248**), Sandrosaponin X (**249**)
Bupleurum rotundifolium	Rotundifolioside A (**1178**), Rotundifolioside B (**1086**), Rotundifolioside C (**1087**), Rotundifolioside D (**1085**), Rotundifolioside E (**1181**), Rotundifolioside F (**1182**), Rotundifolioside G (**1183**), Rotundifolioside H (**1184**), Rotundifolioside I (**1179**), Rotundifolioside J (**1180**)
Bupleurum subovatum	Saikosaponin K (**1026**), Saikosaponin Q (**1028**)
Calliandra pulcherrima	Saponin CP05 (**415**)
Calotropis procera	Compound 1 (**324**), Compound 1 (**325**)
Camellia sinensis	Assamsaponin A (**203**), Assamsaponin B (**195**), Assamsaponin C (**196**), Assamsaponin D (**189**), Assamsaponin E (**88**), Foliatheasaponin 1 (**82**), Foliatheasaponin II (**83**), Foliatheasaponin III (**84**), Folia theasaponin IV (**85**), Foliatheasaponin V (**86**), Floratheasaponin A (**87**), Floratheasaponin B (**106**), Floratheasaponin C (**110**), Theasaponin A_1 (**186**), Theasaponin A_2 (**187**), Theasaponin A_3 (**188**), Theasaponin E_3 (**190**), Theasaponin E_4 (**191**), Theasaponin E_5 (**192**), Theasaponin E_6 (**193**), Theasaponin E_7 (**194**), Theasaponin F_1 (**197**), Theasaponin F_2 (**198**), Theasaponin F_3 (**199**), TR-saponin B (**803**), TR-saponin C (**804**), Theasaponin E_1 (**1420**), Theasaponin E_2 (**1421**)
Campsiandra guayanensis	Saponin 1 (**282**), Saponin 2 (**283**), Saponin 3 (**374**), Saponin 4 (**375**), Saponin 5 (**376**), Saponin 6 (**284**), Saponin 7 (**285**), Saponin 8 (**286**), Saponin 9 (**287**), Saponin 10 (**377**), Saponin 11 (**1216**), Saponin 12 (**1207**), Saponin 13 (**1208**)
Careya arborea	Arborenin (**1248**)
Carpolobia alba	Compound 1 (**914**), Compound 2 (**915**), Compound 3 (**916**), Saponin 6 (**881**)
Carpolobia lutea	Compound 1 (**914**), Compound 2 (**915**), Compound 3 (**916**)
Caryocar glabrum	Caryocaroside II-1 (**457**), Caryocaroside II-2 (**458**), Caryocaroside II-3 (**459**), Caryocaroside II-7 (**460**), Caryocaroside II-9 (**461**), Caryocaroside II-10 (**462**), Caryocaroside II-11(**463**), Caryocaroside III-1 (**543**), Caryocaroside III-2 (**544**), Caryocaroside III-3 (**545**), Caryocaroside III-4 (**546**), Caryocaroside III-5 (**547**), Caryocaroside III-7 (**548**), Caryocaroside III-9 (**549**), Caryocaroside IV-5 (**361**), Caryocaroside IV-6 (**362**), Caryocaroside IV-7 (**363**), Caryocaroside IV-8 (**364**), Caryocaroside IV-9 (**365**), Caryocaroside IV-11 (**367**), Caryocaroside V-1 (**810**)
Caryocar villosum	Caryocaroside II-12 (**464**), Caryocaroside II-13 (**465**), Caryocaroside II-16 (**466**), Caryocaroside II-22 (**467**), Caryocaroside II-23 (**468**), Caryocaroside II-24 (**469**), Caryocaroside III-12 (**550**), Caryocaroside III-13 (**551**), Caryocaroside III-14 (**552**), Caryocaroside III-15 (**553**), Caryocaroside III-16 (**554**), Caryocaroside III-22 (**555**), Caryocaroside III-23 (**556**), Caryocaroside IV-10 (**366**), Caryocaroside IV-17 (**368**), Caryocaroside IV-18 (**369**), Caryocaroside IV-19 (**370**), Caryocaroside IV-20 (**371**), Caryocaroside IV-21 (**372**)

Table 3 (cont.)

Plants/Animals	Saponins
Caulophyllum thalictroides	Saponin 5 (Leonticin D) (**540**), Saponin 6 (**386**)
Centella asiatica	Madecassoside (**1500**), Asiaticoside (**1501**)
Centipeda minima	Compound 1 (**1134**), Compound 2 (**1135**)
Cephalanthus occidentalis	Saponin 1 (**938**), Saponin 2 (**939**), Saponin 3 (**940**), Saponin 4 (**941**), Saponin 5 (**942**), Saponin 6 (**1152**)
Cephalaria leucantha	Leucanthoside A (**513**)
Cephalaria transsylvanica	Transsylvanoside G (**452**), Transsylvanoside H (**453**), Transsylvanoside I (**454**), Transsylavanoside J (**455**), Transsylavanoside K (**456**)
Chenopodium ficifolium	Saponin 6 (**338**)
Chenopodium quinoa	Saponin 1 (**930**), Saponin 3 (**927**), Saponin 3 (**931**), Saponin 5 (**932**), Saponin 1 (**1444**)
Cimicifuga foetida	2′-*O*-Acetylactein (**1276**), 2′-*O*-Acetyl-27-deoxyactein (**1277**)
Cimicifuga racemosa	Cimiracemoside (**1274**), Actein (**1506**)
Clematis chinensis	Compound 1 (**265**), Compound 2 (**266**), Compound 3(**267**), Compound 4 (**442**), Compound 5 (**268**), Compound 6 (**1443**)
Clematis mandshurica	Clematomandshurica saponin A (**269**), Clematomandshurica saponin B (**270**), Clematomandshurica saponin C (**271**), Clematomandshurica saponin D (**272**)
Clematis tangutica	Saponin 1 (**481**), Saponin 2 (**482**), Tanguticoside A (**479**), Tanguticoside B (**480**)
Clematis terniflora	Clematernoside A (**273**), Clematernoside B (**274**), Clematernoside C (**483**), Clematernoside D (**484**), Clematernoside E (**275**), Clematernoside F (**276**), Clematernoside G (**277**), Clematernoside H (**278**), Clematernoside I (**279**), Clematernoside J (**280**), Clematernoside K (**281**)
Clematis tibetana	Clematibetoside A (**485**), Clematibetoside B (**728**), Clematibetoside C (**486**)
Clerodendrum serratum	Se-Saponin A (**1035**)
Clinopodium urticifolium	Saponin 1 (**1013**), Saponin 2 (**1016**), Saponin 3 (**1014**), Saponin 4 (**1015**)
Codonopsis lanceolata	Codonoposide (**388**)
Combretum nigricans	Combreglucoside (**655**)
Conyza blinii	Conyzasaponin A (**557**), Conyzasaponin B (**558**), Conyzasaponin C (**559**), Conyzasaponin D (**669**), Conyzasaponin E (**670**), Conyzasaponin F (**671**), Conyzasaponin G (**560**), Conyzasaponin H (**672**), Conyzasaponin I (**561**), Conyzasaponin J (**673**), Conyzasaponin K (**674**), Conyzasaponin L (**675**), Conyzasaponin M (**562**), Conyzasaponin N (**563**), Conyzasaponin O (**564**), Conyzasaponin P (**565**), Conyzasaponin Q (**566**)
Cordia piauhiensis	Compound 1 (**1095**)
Craniotome furcata	Craniosaponin A (**145**)
Cucumaria frondosa	Frondoside D (**1408**)
Cucurbita foetidissima	Foetidissimoside B (**424**)
Cussonia bancoensis	Compound 1 (**1116**), Compound 2 (**1117**)
Cussonia racemosa	Cussosaponin A (**1210**), Cussosaponin B (**1211**), Cussosaponin C (**1212**), Cussosaponin D (**1093**), Cussosaponin E (**1094**)
Cyclamen coum	Coumoside A (**952**), Coumoside B (**953**)
Cyclamen mirabile	Mirabilin (**807**)
Cyclanthera pedata	Compound 1 (**1355**), Compound 2 (**1356**), Compound 3 (**1357**), Compound 4 (**1358**), Compound 5 (**1324**), Compound 6 (**1399**)
Decaisnea fargesii	Decaisoside F (**515**)

Table 3 (cont.)

Plants/Animals	Saponins
Dendrocalamus strictus	Compound 1 (**18**)
Diploclisia glaucescens	Saponin 2 (**933**), Saponin 3 (**934**), Compound 7 (**926**)
Dizygotheca kerchoveana	Saponin 1 (**380**), Saponin 2 (**381**), Saponin 3 (**382**), Saponin 4 (**383**)
Duranta repens	Durantanin I (**676**), Durantanin II (**677**), Durantanin III (**678**)
Eclipta alba	Eclalbatin (**337**)
Elattostachys apetala	Saponin 2 (**509**), Saponin 3 (**510**), Saponin 4 (**511**), Saponin 5 (**526**), Saponin 6 (**527**), Saponin 7 (**528**)
Entada africana	Compound 1 (**416**), Compound 2 (**417**), Compound 3 (**583**), Compound 4 (**418**), Compound 5 (**419**), Compound 6 (**420**), Compound 7 (**584**), Compound 8 (**421**), Compound 9 (**422**)
Entada pursaetha	Pursaethoside A (**323**), Pursaethoside B (**423**), Pursaethoside C (**580**), Pursaethoside D (**581**), Pursaethoside E (**582**)
Eranthis cilicica	Eranthisaponin A (**497**), Eranthisaponin B (**498**)
Erylus formosus	Eryloside F_1 (**1279**), Eryloside F_2 (**1290**), Eryloside F_3 (**1291**), Eryloside F_4 (**1292**), Eryloside M (**1280**), Eryloside N (**1283**), Eryloside O (**1281**), Eryloside P (**1282**), Eryloside Q (**1284**)
Erylus nobilis	Eryloside G (**1286**), Eryloside H (**1287**), Eryloside I (**1288**), Eryloside J (**1289**), Nobiloside (**1285**)
Eryngium campestre	Saponin 1 (**102**), Saponin 2 (**142**), Compound 1 (**141**), Compound 2 (**101**), Compound 3 (**103**), Compound 4 (**104**), Compound 5 (**105**)
Erythrina sigmoidea	Sigmoside C (**19**), Sigmoside D (**20**)
Euptelea polyandra	Eupteleasaponin VIII (**689**), Eupteleasaponin IX (**690**), Eupteleasaponin X (**918**), Eupteleasaponin XI (**328**), Eupteleasaponin VI (**961**), Eupteleasaponin VI acetate (**962**), Eupteleasaponin VII (**963**), Eupteleasaponin XII (**970**)
Fagonia cretica	Saponin 1 (**478**), Saponin 2 (**521**), Saponin 3 (**335**), Saponin 4 (**796**)
Fagonia indica	Indicasaponin A (**1090**), Indicasaponin B (**346**), Indicasaponin C (**1091**), Indicasaponin D (**1092**)
Foetidia africana	Compound 4 (**70**), Compound 5 (**74**), Compound 6 (**57**), Compound 7 (**75**), Compound 8 (**72**), Compound 9 (**77**), Compound 10 (**76**), Compound 11 (**71**), Compound 12 (**73**)
Galium rivale	Rivaloside A (**790**), Rivaloside B (**791**), Rivaloside C (**625**), Rivaloside D (**626**), Rivaloside E (**520**)
Gambeya boukokoensis	Gamboukokoenside A (**694**), Gamboukokoenside B (**695**),
Gleditsia dolavayi	Gledistside A (**406**), Gledistside B (**407**)
Gleditsia sinensis	Gleditsia saponin C′ (**413**), Gleditsia saponin E′ (**414**), Gleditsioside E (**408**), Gleditsioside F (**409**), Gleditsioside G (**348**), Gleditsioside H (**349**), Gleditsioside I (**350**), Gleditsioside J (**410**), Gleditsioside K (**411**), Gleditsioside N (**351**), Gleditsioside O (**352**), Gleditsioside P (**353**), Gleditsioside Q (**412**)
Glinus lotoides	Lotoidoside D (**216**), Lotoidoside E (**217**), Glinuside D (**1242**), Glinuside E (**1243**)
Glinus oppositifolius	Glinoside A (**1245**), Glinoside B (**1244**)
Gliricidia sepium	Gliricidoside A (**6**), Gliricidoside B (**7**)
Gomphrena globosa	Gomphrenoside (**944**)
Guaiacum officinale	Guaianin R (**972**)
Gymnema sylvestre	Compound 1 (**49**), Compound 2 (**4**), Compound 3 (**8**), Saponin 1 (**3**), Saponin 2 (**50**), Saponin 3 (**261**), Saponin 4 (**262**), Saponin 5 (**263**), Saponin 6 (**264**), Na-salt of alternoside II (**1422**)

Table 3 (cont.)

Plants/Animals	Saponins
Gymnocladus chinensis	Saponin GC-1 (**693**)
Gynostemma cardio-spermum	Compound 1 (**1374**), Compound 2 (**1375**), Compound 3 (**1377**), Compound 4 (**1378**), Compound 5 (**1376**), Compound 6 (**1313**)
Gynostemma pentaphyl-lum	Saponin 1 (**1379**), Saponin 2 (**1382**), Saponin 3 (**1380**), Saponin 4 (**1383**), Saponin 5 (**1381**), Saponin 6 (**1384**)
Gypsophila capillaris	Saponin 2 (**872**)
Gypsophila filicaulis	Snatzkein A (**1201**), Snatzkein B (**1202**)
Gypsophila oldhamiana	Saponin 1 (**749**), Saponin 2 (**356**), Neogypsoside A (**992**), Neogypsoside B (**993**)
Gypsophila paniculata	Gypsoside (**1467**)
Gypsophila trichotoma	Saponin 1 (**720**), Saponin 2 (**721**)
Gypsophilla repens	Repensoside A (**815**), Repensoside B (**816**), Repensoside C (**817**), Repensoside D (**818**), Repensoside E (**819**), Repensoside F (**719**)
Harpullia austrocale-donica	Saponin 1 (**58**), Saponin 1 (**152**), Saponin 2 (**59**), Saponin 2 (**185**), Saponin 3 (**60**), Saponin 4 (**173**), Saponin 5 (**174**), Saponin 6 (**175**), Saponin 7 (**176**), Saponin 8 (**177**)
Harpullia ramiflora	Harpuloside (**172**)
Hedera colchica	Colchiside A (**518**), Colchiside B (**308**)
Hedera helix	Helixoside A (**504**), Helixoside B (**304**), α-Hederin (**1469**)
Hedera pastuchowii	Pastuchoside A (**502**), Pastuchoside B (**305**), Pastuchoside C (**503**), Pastuchoside D (**306**), Pastuchoside E (**307**)
Hedyotis nudicaulis	Nudicaucin A (**971**), Nudicaucin B (**224**), Nudicaucin C (**225**)
Herniaria fontanesii	Herniaria saponin C (**870**), Herniaria saponin D (**871**)
Holboellia fargesii	Fargoside A (**986**), Fargoside B (**988**), Fargoside C (**975**), Fargoside D (**976**), Fargoside E (**449**)
Holothuria fuscocinerea	Fuscocineroside A (**1409**), Fuscocineroside B (**1410**), Fuscocineroside C (**1411**), Pervicoside (**1530**), Holothurin (**1531**)
Holothuria nobilis	Nobiliside A (**1405**), Nobiliside B (**1406**), Nobiliside C (**1407**)
Hydrocotyle sibthor-pioides	Hydrocotyloside I (**112**), Hydrocotyloside II (**113**), Hydrocotyloside III (**114**), Hydrocotyloside IV (**115**), Hydrocotyloside V (**116**), Hydrocotyloside VI (**117**), Hydrocotyloside VII (**89**)
Ilex amara	Saponin 2 (**318**), Saponin 3 (**1088**), Saponin 4 (**1089**)
Ilex brevicuspis	Brevicuspisaponin I (**1123**), Brevicuspisaponin II (**1124**)
Ilex godajam	Godoside A (**315**), Godoside B (**316**), Godoside C (**1139**), Godoside D (**1097**)
Ilex hainanensis	Ilexhainanoside A (**1168**), Ilexhainanoside B (**1169**)
Ilex hylonoma	Hylonoside III (**436**), Hylonoside IV (**437**), Hylonoside V (**317**)
Ilex kudingcha	Ilekudinoside A (**319**), Ilekudinoside B (**1100**), Ilekudinoside C (**1118**), Ilekudinoside D (**1127**), Ilekudinoside E (Randiasaponin III) (**1101**), Ilekudinoside F (**1172**), Ilekudinoside G (**1186**), Ilekudinoside H (**1196**), Ilekudinoside I (**1191**), Ilekudinoside J (**1192**), Ilekudinoside K (**1187**), Ilekudinoside L (**1193**), Ilekudinoside M (**1197**), Ilekudinoside N (**1188**), Ilekudinoside O (**1189**), Ilekudinoside P (**1190**), Ilekudinoside Q (**1194**), Ilekudinoside R (**1195**), Ilekudinoside S (**1198**), Randiasaponin IV (**1106**), Ilexoside XLVII (**1463**), Cynarasaponin C (**1502**)
Ilex latifolia	Latifoloside A (Randiasaponin IV) (**1102**), Latifoloside B (**433**), Latifoloside C (**434**), Latifoloside D (**1111**), Latifoloside E (**1112**), Latifoloside F (**1113**), Latifoloside G (**1098**), Latifoloside H (**435**), Latifoloside I (**1084**), Latifoloside J (**1115**), Latifoloside K (**1166**), Latifoloside L (**1099**)

Table 3 (cont.)

Plants/Animals	Saponins
Ilex oblonga	Oblonganoside H (**1096**), Oblonganoside I (**1129**), Oblonganoside J (**1130**), Oblonganoside K (**432**), Oblonganoside L (**522**), Oblonganoside M (**534**), Siaresinolic acid glucosyl ester (**1466**)
Ilex psammophila	Compound 4 (**1142**), Compound 5 (**1140**)
Isertia pittieri	Compound 1 (**995**), Compound 2 (**996**)
Isolatocereus dumortieri	Dumortierinoside A (**948**)
Ixeris sonchifolia	Ixeris saponin A (**378**), Ixeris saponin B (**379**), Ixeris saponin C (**542**)
Kalopanax pictus	Kalopanax saponin 1 (**1457**)
Kochia scoparia	Kochianoside I (**426**), Kochianoside II (**1009**), Kochianoside III (**958**), Kochianoside IV (**1205**), Momordin 1c (**1449**)
Koelreuteria paniculata	Saponin 4 (**29**)
Laetiporus versisporus	Lactiposide E (**1293**), Lactiposide F (**1294**), Lactiposide G (**1295**)
Lafoensia glyptocarpa	Saponin 1 (**333**)
Lathyrus japonicus	Lathyrus saponin 3 (**21**)
Leontice kiangnanensis	Saponin 5 (Leonticin D) (**540**)
Lepidagathis hyalina	Saponin 1 (**429**)
Lingustrum ovalifolium	Lingustrin B (**326**), Lingustrin C (**327**)
Lonicera bournei	Bourneioside A (**1219**), Bourneioside B (**1220**)
Lonicera japonica	Loniceroside C (**506**), Saponin 2 (**505**), Loniceroside A (**1462**)
Lupinus angustifolius	Saponin 3 (**43**), Saponin 4 (**44**), Saponin 2 (**1418**)
Lysimachia capillipes	Capilliposide A (**1049**), Capilliposide B (**1051**), Capilliposide C (**1050**), Capilliposide D (**1052**), Capilliposide G (**959**), Capilliposide H (**960**)
Lysimachia davurica	Davuricoside L (**40**), Davuricoside N (**806**), Davuricoside O (**41**), Saponin 1 (**1074**), Saponin 2 (**1076**), Saponin 3 (**1077**)
Lysimachia foenum-graecum	Foenumoside A (**61**), Foenumoside B (**63**), Foenumoside C (**64**), Foenumoside D (**65**), Foenumoside E (**62**)
Madhuca longifolia	Madlongiside A (**801**), Madlongiside B (**802**), Madlongiside C (**578**), Madlongiside D (**579**)
Maesa balansae	Maesabalide I (**1068**), Maesabalide II (**1069**), Maesabalide III (**1070**), Maesabalide IV (**1071**), Maesabalide V (**1072**), Maesabalide VI (**1073**)
Maesa japonica	Maejaposide A (**1053**), Maejaposide B (**1054**), Maejaposide C (**1055**), Maejaposide D (**1056**), Maejaposide E (**1057**)
Maesa lanceolata	Maesasaponin I (**1058**), Maesasaponin II (**1059**), Maesasaponin III (**1060**), Maesasaponin IV_2 (**1061**), Maesasaponin IV_3 (**1062**), Maesasaponin V_2 (**1063**), Maesasaponin V_3 (**1064**), Maesasaponin VI_2 (**1065**), Maesasaponin VI_3 (**1066**), Maesasaponin VII_1 (**1067**), Maesasaponin 1 (**1491**), Maesasaponin 2 (**1492**), Maesasaponin 3 (**1493**), Maesasaponin 4 (**1494**), Maesasaponin 5 (**1495**), Maesasaponin 6 (**1496**)
Maesa laxiflora	Maelaxin A (**32**), Maelaxin B (**33**), Maelaxin C (**34**), Maelaxin D (**35**), Maelaxin E (**36**), Maelaxin F (**37**)
Maesa tenera	Maetenoside A (**30**), Maetenoside B (**31**)
Medicago arborea	Saponin 3 (**858**), Saponin 4 (**859**), Saponin 5 (**358**), Saponin 6 (**359**), Saponin 9 (**576**), Saponin 10 (**732**), Saponin 12 (**860**), Saponin 13 (**861**), Saponin 14 (**862**), Saponin 16 (**863**), Saponin 17 (**864**), Saponin 18 (**360**)
Medicago hybrida	Saponin 7 (**512**), Saponin 14 (**347**)
Medicago sativa	Medicagenic 3-*O*-glucoside (**1486**)
Medicago truncatula	Saponin 1 (**850**), Saponin 2 (**851**), Saponin 3 (**852**), Saponin 4 (**853**), Saponin 5 (**835**), Saponin 6 (**854**), Saponin 7 (**855**), Saponin 8 (**856**), Saponin 9 (**857**), Saponin 11 (**836**), Saponin 12 (**837**), Saponin 14 (**838**)
Melophlus isis	Sarasinoside H_1 (**1296**), Sarasinoside H_2 (**1298**), Sarasinoside I_1 (**1297**), Sarasinoside I_2 (**1299**)

Table 3 (cont.)

Plants/Animals	Saponins
Melophlus sarassinorum	Sarasinoside J (**1300**), Sarasinoside K (**1301**), Sarasinoside L (**1302**), Sarasinoside M (**1303**)
Mensamaria intercedens	Intercedenside D (**1412**), Intercedenside E (**1413**), Intercedenside F (**1415**), Intercedenside G (**1417**), Intercedenside H (**1414**), Intercedenside I (**1416**)
Meryta lanceolata	Saponin 1 (**309**), Saponin 1 (**475**), Saponin 2 (**310**), Saponin 2 (**312**), Saponin 3 (**311**), Saponin 3 (**313**), Saponin 4 (**314**), Saponin 4 (**400**), Saponin 5 (**476**)
Mimusops elengi	Elengin (**638**)
Mimusops laurifolia	Saponin 1 (**643**), Saponin 2 (**632**), Saponin 3 (**633**), Saponin 4 (**634**), Saponin 5 (**644**), Saponin 6 (**645**), Saponin 7 (**640**), Saponin 7 (**646**), Saponin 8 (**641**), Saponin 8 (**647**), Saponin 9 (**642**), Saponin 9 (**648**), Saponin 10 (**649**), Saponin 11 (**635**), Saponin 12 (**636**), Saponin 13 (**650**), Saponin 14 (**651**), Saponin 15 (**637**)
Mitragyna inermis	Inermiside I (**998**), Inermiside II (**999**)
Mollugo spergula	Spergulin A (**1246**), Spergulin B (**1247**)
Momordica charantia	Karaviloside I (**1394**), Karaviloside II (**1395**), Karaviloside III (**1396**), Karaviloside IV (**1397**), Karaviloside V (**1398**)
Morinda nepalensis	Monepaloside K (**430**)
Muraltia anonidifolia	Saponin 1 (**839**), Saponin 2 (**840**), Saponin 3 (**841**), Saponin 4 (**842**), Saponin 5 (**843**)
Muraltia heisteria	Glycoside 1 (**900**), Glycoside 2 (**901**), Glycoside 3 (**902**), Glycoside 4 (**903**), Glycoside 5 (**904**), Glycoside 6 (**905**)
Muraltia satureioides	Glycoside 1 (**900**), Glycoside 2 (**901**)
Mussaenda macrophylla	Glycoside 1 (**653**), Glycoside 2 (**654**), Glycoside 3 (**652**), Mussaendoside W (**1259**)
Mussaenda pubescens	Mussaendoside U (**1278**), Mussaendoside V (**1144**)
Neonauclea sessilifolia	Saponin 1 (**1149**), Saponin 1 (**1151**), Saponin 2 (**997**), Saponin 2 (**1150**)
Oreopanax guatemalensis	Saponin 1 (**399**), Saponin 2 (**1029**), Saponin 3 (**1030**), Saponin 4 (**1011**), Saponin 5 (**492**), Saponin 6 (**493**), Saponin 7 (**494**)
Pachyelasma tessmannii	Pachyelaside A (**446**), Pachyelaside B (**443**), Pachyelaside C (**447**), Pachyelaside D (**448**)
Panax ginseng	Ginsenoside III (**1367**), Ginsenoside Rh_5 (**1352**), Ginsenoside Rh_6 (**1350**), Ginsenoside Rh_7 (**1351**), Ginsenoside Rh_8 (**1366**), Ginsenoside Rh_9 (**1325**), Ginsenoside-R_{g6} (**1327**), Ginsenoside Rg_7 (**1342**), Isoginsenoside Rh_3 (**1312**), Ginsenoside R_o (**1435**), Ginsenoside R_{g3} (**1512**), Ginsenoside R_{h2} (**1513**), Ginsenoside R_{g1} (**1515**), Ginsenoside R_e (**1516**)
Panax japonicus	Yesanchinoside A (**1329**), Yesanchinoside B (**1330**), Yesanchinoside C (**1331**), Yesanchinoside D (**1339**), Yesanchinoside E (**1340**), Yesanchinoside F (**1341**)
Panax notoginseng	Notoginsenoside L (**1318**), Notoginsenoside M (**1337**), Notoginsenoside N (**1338**), Notoginsenoside O (**1319**), Notoginsenoside P (**1320**), Notoginsenoside Q (**1321**), Notoginsenoside S (**1322**), Notoginsenoside T (**1323**), Ginsenoside R_{b1} (**1507**), Ginsenoside R_{b3} (**1508**), Ginsenoside R_c (**1509**), Ginsenoside R_d (**1510**), Notoginsenoside D (**1512**), Notoginsenoside G (**1522**), Notoginsenoside H (**1523**), Notoginsenoside K (**1524**), Notoginsenoside R_4 (**1525**)
Panax quinquefolium	Quinquenoside I (**1314**), Quinquenoside II (**1315**), Quinquenoside III (**1316**), Quinquenoside IV (**1328**), Quinquenoside V (**1317**), Quinquenoside L_1 (**1326**), Quinquenoside L_2 (**1335**), Ginsinoside R_{g8} (**1349**)

Table 3 (cont.)

Plants/Animals	Saponins
Panax vietnamensis	Ginsenoside Rh_5 (**1352**), Vina-ginsenoside R_{25} (**1373**), Ginsenoside Rh_4 (**1517**), Majonoside R_2 (**1518**), Pseudos-ginsenoside RT_4 (**1519**), Vina-ginsenoside R_1 (**1520**),Vina-ginsenoside R_2 (**1521**)
Passiflora edulis	Cyclopassifloside I (**1260**), Cyclopassifloside II (**1261**), Cyclopassifloside III (**1262**), Cyclopassifloside IV (**1263**), Cyclopassifloside V (**1264**), Cyclopassifloside VI (**1265**), Cyclopassifloside VII (**1266**), Cyclopassifloside VIII (**1267**), Cyclopassifloside IX (**1268**), Cyclopassifloside X (**1269**), Cyclopassifloside XI (**1270**)
Patrinia scabiosaefolia	Patrinia saponin H_3 (**514**)
Pentaclethra macroloba	Compound 1 (**491**), Compound 2 (**332**), Saponin 3 (**490**), Saponin 4 (**331**)
Petersianthus macrocarpus	Petersaponin III (**66**), Petersaponin IV (**67**)
Phytolacca americana	Gycoside 1 (**937**)
Phytolacca icosandra	Saponin 3 (**923**), Saponin 4 (**924**), Saponin 5 (**925**), Saponin 6 (**922**), Saponin 1 (**1487**), Saponin 2 (**1488**)
Picria fel-tarrae	Picfeltarraenin III (**1402**), Picfeltarraenin IV (**1403**), Picfeltarraenin V (**1404**)
Pisonia umbellifera	Saponin 4 (**221**), Saponin 5 (**222**), Saponin 6 (**223**)
Pisum sativum	Saponin 3 (**25**), Saponin 4 (**22**), Dehydrosoyasaponin 1 (**1431**)
Pithecellobium dulce	Pithecelloside (**593**), Pitheduloside H (**601**), Pitheduloside I (**602**), Pitheduloside J (**594**), Pitheduloside K (**385**), Saponin 6 (**386**)
Pittosporum tobira	Saponin $IIIA_2$ (**137**), Saponin $IIIA_3$ (**138**), Saponin III B_2 (**139**), Saponin III C_4 (**109**)
Pittosporum viridiflorum	Pittoviridoside (**111**)
Platycodon grandiflorum	Deapioplatycoside E (**688**), Platycoside A (**679**), Platycoside B (**680**), Platycoside C (**681**), Platycoside D (**664**), Platycoside E (**682**), Platycoside F (**683**), Platycoside G_1 (**684**), Platycoside G_2 (**685**), Platycoside G_3 (**665**), Platycoside H (**666**), Platycoside I (**667**), Platycoside J (**668**), Platycoside K (**686**), Platycoside L (**687**), Platycoside M-1 (**949**), Platycoside M-2 (**950**), Platycoside M-3 (**951**), Platycodin D_3 (**1478**), Platycodin D_2 (**1479**), Deapioplatycodin D (**1480**), Platycodin D (**1481**)
Platyphora ligata	Ligatoside A (**538**), Ligatoside B (**539**)
Platyphora opima	Compound 1 (**524**)
Polygala arenaria	Saponin 1 (**906**), Saponin 2 (**907**), Saponin 3 (**908**), Saponin 4 (**909**), Saponin 5 (**910**), Saponin 6 (**911**), Saponin 7 (**882**), Saponin 7 (**912**), Saponin 8 (**913**)
Polygala arillata	Arillatanoside A (**883**), Arillatanoside B (**884**), Arillatanoside C (**885**)
Polygala fallax	Polygalasaponin XL (**898**), Polygalasaponin XLI (**899**), Polygalasaponin XXXIII (**891**), Polygalasaponin XXXIV (**892**), Polygalasaponin XXXV (**893**), Polygalasaponin XXXVI (**894**), Polygalasaponin XXXVII (**895**), Polygalasaponin XXXVIII (**896**), Polygalasaponin XXXIX (**897**)
Polygala japonica	Polygalasaponin E (**844**), Polygalasaponin F (**571**), Polygalasaponin G (**572**), Polygalasaponin H (**845**), Polygalasaponin J (**573**), Polygalasaponin XXVIII (**886**), Polygalasaponin XXIX (**887**), Polygalasaponin XXX (**888**), Polygalasaponin XXXI (**889**), Polygalasaponin XXXII (**890**), Saponin 1 (**846**), Saponin 2 (**873**), Saponin 3 (**1470**), Saponin 4 (**1471**), Saponin 5 (**1472**)
Polygala ruwenzoriensis	Saponin 1 (**876**), Saponin 2 (**877**), Saponin 3 (**878**), Saponin 4 (**879**), Saponin 5 (**880**)

Table 3 (cont.)

Plants/Animals	Saponins
Polyscias fruticosa	Polyscioside A (**232**), Polyscioside B (**233**), Polyscioside C (**234**), Polyscioside D (**235**), Polyscioside E (**236**), Polyscioside F (**237**), Polyscioside G (**238**), Polyscioside H (**239**)
Pometia ridleyi	Saponin 2 (**226**), Saponin 3 (**227**), Saponin 5 (**228**), Saponin 6 (**229**), Saponin 7 (**230**), Saponin 8 (**231**)
Primula elatior	Protoprimuloside B (**1041**)
Prunella vulgaris	Saponin 1 (**427**), Saponin 2 (**428**), Saponin 3 (**991**)
Prunus serrulata	Compound 4 (**1126**)
Pteleopsis hylodendron	Saponin 1 (**627**)
Pteleopsis suberosa	Saponin 1 (**793**), Saponin 2 (**795**), Saponin 3 (**792**), Saponin 4 (**794**)
Pueraria peduncularis	Pedunsaponin B (**200**), Pedunsaponin C (**201**)
Pulsatilla chinensis	Compound 1 (**1232**), Compound 2 (**1215**), Compound 3 (**1228**), Compound 4 (**1229**), Compound 8 (**329**), Compound 9 (**330**), Saponin 1 (**1440**), Saponin 4 (**1441**), Saponin 6 (**1442**), Compound 5 (**1455**), Saponin 5 (**1458**), Saponin 7 (**1459**), Saponin 3 (**1460**)
Pulsatilla koreana	Compound 1 (**1225**), Compound 2 (**1226**), Compound 3 (**1213**), Compound 4 (**1214**), Compound 5 (**1227**), Saponin 4 (**1441**), Saponin 6 (**1442**)
Pulsatilla patens	Compound 1 (**487**), Compound 2 (**488**), Compound 3 (**575**), Compound 4 (**340**), Compound 5 (**489**)
Quillaja saponaria	Saponin 1 (**733**), Saponin 2 (**734**), Saponin 3 (**735**), Saponin 4 (**736**), Saponin 5 (**737**), Saponin 6 (**738**), Saponin 7 (**739**), Saponin 8 (**740**), Saponin 9 (**741**), Saponin 10 (**742**), Saponin 19 (**935**), Saponin 20a (**778**), Saponin 20b (**779**), Saponin 21a (**780**), Saponin 21b (**781**), Saponin 22a (**782**), Saponin 22b (**783**), Saponin 23 (**425**), Saponin S7 (**743**), Saponin S8 (**744**), Saponin S9 (**745**), Saponin S10 (**746**), Saponin S11 (**747**), Saponin S12 (**748**), Saponin S13 (**936**), Quillaja saponin 21 (**1485**)
Randia formosa	Ilekudinoside B (**1100**), Ilekudinoside E (Randiasaponin III) (**1101**), Randiasaponin I (**1177**), Randiasaponin II (**1128**), Randiasaponin III (**1105**), Randiasaponin IV (Latifoloside A) (**1102**), Randia saponin V (**431**), Randia saponin VI (**535**), Randia saponin VII (**536**)
Ranunculus fluitans	Saponin 1 (**499**), Saponin 2 (**334**)
Rhoiptelea chiliantha	Chilianoside A (**1336**), Chilianoside B (**1343**), Chilianoside C (**1344**), Chilianoside D (**1345**), Chilianoside E (**1346**), Chilianoside F (**1347**), Chilianoside G (**1348**), Chilianoside H (**1363**), Chilianoside I (**1364**), Chilianoside J (**1365**), Chilianoside K (**1353**), Chilianoside L (**1354**)
Rubus pileatus	Compound 2 (**1143**), Compound 4 (**1146**), Compound 5 (**1147**)
Rubus pungens	Rubupungenoside A (**1199**), Rubupungenoside B (**1200**)
Rubus xanthocarpus	Compound 2 (**1131**), Compound 3 (**1132**)
Rubuscochin chinensis	2-*O*-Acetylsuavissomoside F1 (**1141**)
Sanguisorba officinalis	Compound 1 (**440**), Compound 2 (**1170**), Compound 3 (**1171**), Compound 4 (**1167**), Compound 5 (**1109**), Compound 14 (**1461**)
Sanicula elata	Saniculasaponin I (**93**), Saniculasaponin II (**94**), Saniculasaponin III (**95**), Saniculasaponin IV (**96**), Saniculasaponin V (**97**), Saniculasaponin VI (**98**), Saniculasaponin VII (**99**), Saniculasaponin VIII (**100**), Saniculasaponin IX (**148**), Saniculasaponin X (**149**), Saniculasaponin XI (**202**)
Sanicula europaea	Saniculoside R-1 (**140**)
Sapindus emarginatus	Compound 4 (**500**), Compound 7 (**525**), Compound **9** (**354**)
Sapindus mukorossi	Sapimukoside C (**1304**), Sapimukoside D (**1309**), Sapimukoside E (**1305**), Sapimukoside F (**1306**), Sapimukoside G (**1310**), Sapimukoside H (**1307**), Sapimukoside I (**1311**), Sapimukoside J (**1308**)

Table 3 (cont.)

Plants/Animals	Saponins
Saponaria officinalis	Saponarioside A (**775**), Saponarioside B (**776**), Saponarioside C (**821**), Saponarioside D (**822**), Saponarioside E (**823**), Saponarioside F (**828**), Saponarioside G (**829**), Saponarioside H (**824**), Saponarioside I (**830**), Saponarioside J (**1032**), Saponarioside K (**969**), Saponarioside L (**825**), Saponarioside M (**826**), Saporin 3 (**1468**)
Sarcandra glabra	Sarcandroside B (**1110**)
Sargentodoxa cuneata	Tomentic acid glucosyl ester (**1499**)
Scabiosa rotata	Scabrioside A (**1103**), Scabrioside B (**1104**), Scabrioside C (**1105**), Scabrioside D (**1106**)
Scabiosa tschiliensis	Scabiosaponin A (**288**), Scabiosaponin B (**289**), Scabiosaponin C (**290**), Scabiosaponin D (**291**), Scabiosaponin E (**292**), Scabiosaponin F (**293**), Scabiosaponin G (**294**), Scabiosaponin H (**1107**), Scabiosaponin I (**1108**), Scabiosaponin J (**438**), Scabiosaponin K (**439**), Hookeroside A (**1432**), Hookeroside B (**1433**)
Schefflera arboricola	Saponin 1 (**205**), Saponin 2 (**384**), Saponin 3 (**206**), Saponin 4 (**207**), Saponin 5 (**208**), Saponin 6 (**209**), Saponin 7 (**210**), Saponin 8 (**211**), Saponin 9 (**212**), Scheffarboside A (**213**), Scheffarboside B (**214**), Scheffarboside C (**501**), Scheffarboside D (**215**)
Schefflera bodinieri	Compound 1 (**1000**), Compound 2 (**1002**), Compound 2 (**1008**), Compound 3 (**1001**), Compound 4 (**1003**), Bodinitin A (**1005**), Bodinitin B(**1004**), Bodinitin C (**1006**), Bodinitin D (**1007**)
Schefflera divaricata	Saponin 3 (**928**), Saponin 4 (**929**), Saponin 5 (**1209**), Saponin 6 (**1221**), Saponin 7 (**1222**), Saponin 8 (**1223**), Saponin 9 (**1224**), Saponin 10 (**1233**), Saponin 11 (**1234**), Saponin 12 (**1235**)
Scrophularia koelzii	Scrokoelziside B (**1027**)
Silene cucubalus	Saponin of gypsogenin (**699**)
Silene fortunei	Compound 1 (**764**), Compound 1 (**765**), Compound 2 (Jenisseensoside E) (**766**), Compound 3 (Jenisseensoside F) (**767**), Jenisseensoside C (**1482**), Jenisseensoside D (**1483**)
Silene inflata	Silenoside A (**702**)
Silene rubicunda	Silenorubicoside A (**700**), Silenorubicoside B (**768**), Silenorubicoside C (**701**), Silenorubicoside D (**827**)
Silene vulgaris	Silenoside A (**702**), Silenoside B (**762**), Silenoside C (**763**)
Simplocos chinensis	Symplocososide A (**118**), Symplocososide B (**120**), Symplocososide C (**119**), Symplocososide D (**121**), Symplocososide E (**123**), Symplocososide F (**143**), Symplocososide G (**127**), Symplocososide H (**129**), Symplocososide I (**128**), Symplocososide J (**130**), Symplocososide K (**131**), Simplocososide L (**132**), Simplocososide M (**133**), Simplocososide N (**124**), Simplocososide O (**144**), Simplocososide P (**134**), Simplocososide Q (**135**), Simplocososide R (**136**), Simplocososide S (**122**), Symplocososide X (**125**), Symplocososide Y (**126**)
Sinocrassula asclepiadea	Sinocrassuloside I (**832**), Sinocrassuloside II (**833**) Sinocrassuloside III (**834**), Sinocrassuloside IV (**967**), Sinocrassuloside V (**968**), Sinocrassuloside VI (**769**), Sinocrassuloside VII (**770**), Sinocrassuloside VIII (**771**), Sinocrassuloside IX (**772**), Sinocrassuloside X (**773**), Sinocrassuloside XI (**774**)
Siraitia grosvenori	20-Hydroxy-11-oxomogroside IA_1 (**1400**), 11-Oxomogroside IIE (**1401**)
Solidago virganrea	Virgaureasaponin B (**1475**), Virgaureasaponin D (**1476**), Virgaureasaponin E (**1477**)

Table 3 (cont.)

Plants/Animals	Saponins
Sophora koreensis	Acetyl subproside II (**52**), Echinosophoroside A_1(**51**), Echinosophoroside B (**46**)
Spartium junceum	Saponin 1 (**45**)
Spergularia ramosa	Saponin 1 (**716**), Saponin 2 (**759**), Saponin 3 (**717**), Saponin 4 (**760**), Saponin 5 (**718**), Saponin 6 (**761**)
Spinacia oleracea	Oleragenoside (**730**)
Stelmatocrypton khasianum	Stelmatotriterpenoside E (**533**), Stelmatotriterpenoside F (**1119**), Stelmatotriterpenoside G (**1125**), Stelmatotriterpenoside H (**1145**)
Styrax japonica	Jegosaponin A (**78**), Jegosaponin B (**79**), Jegosaponin C (**80**), Jegosaponin D (**81**)
Symplocos glomerata	Saponin 2 (**295**), Saponin 3 (**296**), Saponin 4 (**297**), Saponin 5 (**298**), Saponin 6 (**299**), Saponin 8 (**300**), Saponin 9 (**301**), Saponin 10 (**302**), Saponin 11 (**1010**)
Taverniera aegyptiaca	Saponin 1 (**1019**), Saponin 2 (**920**), Saponin 2 (**1020**), Saponin 3 (**921**), Saponin 3 (**1021**), Saponin 4 (**1022**), Saponin 5 (**1023**), Saponin 6 (**1024**), Saponin 7 (**1025**)
Terminalia arjuna	Arjunetoside (**531**), Compound 1 (**797**)
Ternstroemia japonica	Ternstroemiaside A (**27**), Ternstroemiaside B (**28**), Ternstroemiaside C (**38**), Ternstroemiaside D (**39**), Ternstroemiaside E (**13**), Ternstroemiaside F (**12**)
Tetrapanax papyriferum	Papyrioside LA (**785**), Papyrioside LB (**786**), Papyrioside LC (**787**), Papyrioside LD (**784**), Papyrioside LE (**788**), Papyrioside LF (**789**), Papyrioside LG (**1017**), Papyrioside LH (**1018**)
Trevesia palmata	Compound 1 (**343**), Compound 2 (**344**), Compound 3 (**345**), Compound 4 (**517**), Compound 5 (**389**), Compound 6 (**537**)
Trifolium resupinatum	Saponin 2 (**24**)
Tupidanthus calyptratus	Compound 1 (**1136**), Compound 2 (**1137**), Compound 3 (**1138**), Compound 4 (**1121**), Compound 5 (**1122**)
Uncaria tomentosa	Glycoside 2 (**943**), Saponin 3 (**940**), Saponin 4 (**941**), Compound 4 (**1155**), Compound 6 (**1156**), Compound 7 (**1157**), Compound 8 (**1158**), Compound 9 (**1159**)
Vaccaria segetalis	Segetoside B (**722**), Segetoside C (**811**), Segetoside F (**723**), Segetoside G (**724**), Segetoside H (**725**), Segetoside I (**758**), Segetoside K (**831**), Vaccaroid A (**812**), Vaccariside B (**753**), Vaccariside C (**754**), Vaccariside D (**755**), Vaccariside E (**756**), Vaccaroside E (**757**), Vaccaroside F (**994**), Vaccaroside G (**726**), Vaccaroside H (**357**)
Vigna angularis	Az II (**14**), Az III (**15**), Az IV (**16**)
Viguiera decurrens	Saponin 7 (**336**), Saponin 3 (**1447**)
Viola ibukiana	Compound 2 (**1446**)
Xanthoceras sorbifolia	Xanifolia Y (**107**), Saponin 1 (**108**), Xanifolia X (**1430**)
Zizyphus jujuba	Protojujuboside A (**1370**), Protojujuboside B (**1371**), Protojujuboside B_1 (**1372**), Jujuboside A (**1526**), Jujuboside B_1 (**1527**), Jujuboside C (**1528**)
Zygophyllum atriplicoides	Atriplico saponin A (**477**), Atriplicosaponin B (**1083**)
Zygophyllum coccineum	Zygophyloside G (**1153**), Zygophyloside H (**1154**)
Zygophyllum decumbens	Zygophyloside J (**981**), Zygophyloside K (**523**)
Zygophyllum dumosum	Zygophyloside G (**1153**), Zygophyloside H (**1154**)
Zygophyllum gaetulum	Zygophyloside I (**1164**), Zygophyloside L (**1165**), Zygophyloside M (**355**), Zygophyloside N (**1185**) 3-*O*-β-D-Glucopyranosyl quinovic acid 28-β-D-glucopyranosyl ether (**1498**)

6. Biological and Pharmacological Activities. – In early stages of civilization, saponins were generally used in the form of crude plant extracts as natural detergents, fish poisons, arrow poisons, and foaming agents. In the last 50 years, tremendous research regarding both chemical and biological aspects revealed versatile biological and pharmacological activities of pure saponins. For this reason, we have decided to summarize the major biological and pharmacological activities reported from mid-1996 to March, 2007, to create an interest among the scientists in global arena for research work in this field in order to make this natural resource more useful to our society.

6.1. *Anti-allergic Activity.* Foliatheasaponins II and III (**83** and **84**, resp.), isolated from the leaves of tea plant *Camellia sinensis*, inhibited significantly the release of β-hexosaminidase in RBL-2 H3 cells with inhibition of 55.7 and 22.8%, respectively, at the concentration of 6 μM. Foliatheasaponin II also showed inhibition of 46.3% at a lower concentration of 3 μM. The existing anti-allergic compounds, tranilast and ketotifenfumarate, showed inhibitions of 22.4 and 27.6%, respectively, at the concentration of 100 μM. It may be noted that β-hexosaminidase is stored in the secretory granules of mast cells and is released concomitantly with histamine, when the mast cells are immunologically activated on stimulation by an antigen or a degranulation inducer [49].

6.2. *Anti-atherosclerotic and Antiplatelet Effects.* Endothelial cell damage is considered to be a vital step in the genesis of thrombosis and atheriosclerosis, the common precursors of cardiovascular disorders. Platelet hyperfunction such as overproduction of thromboxane A_2 (TX A_2), a potent platelet aggregative and vasoconstrictive substance, has been frequently encountered in patients with cardiothrombotic diseases. Prostaglandin I_2 (PGI_2), a potent antiplatelet aggregative and vasodilatory substance produced in vascular walls, is also reported to be synthesized in minor amounts in patients suffering from atherosclerosis. *Hirai* reported that ginsenoside Rg_1 (**1515**) from Korean red ginseng inhibited platelet activation induced by TX A_2, through inhibition of TX A_2-induced Ca^{2+} mobilization, and ginsenoside Rg_3 (**1511**) induced TX A_2-induced platelet aggregation. Ginsenoside Re (**1516**), another component of red ginseng, was shown to stimulate *in vitro* PGI_2 formation in cultured vascular smooth muscle cells of rat through enhanced gene expression of cyclooxygenase. These results suggest that these components of red ginseng may have clinical potential for prevention and treatment of certain thrombotic and atherosclerotic disorders [475].

6.3. *Antibacterial Activity.* Saponin 3 (**652**) isolated from the root bark of *Mussaenda macrophylla* showed moderate inhibitory activity against the periodontopathic bacterium *Porphyromonas gingivitis* with a *MIC* value of 78 μg/ml [245].

6.4. *Anticomplementary Activity.* Ginsenoside R_0 (**1435**) of Korean red ginseng, *Panax ginseng*, showed significant anticomplementary activity with an IC_{50} value of 58 μM, whereas other ginsenosides isolated from the plant showed weak activities. Methyl esterification of ginsenoside R_0 increased remarkably the activity with an IC_{50} value of 10 μM [455].

6.5. *Antidiabetic Effect. Attele et al.* reported the antidiabetic effect of *Panax ginseng* berry extract in obese diabetic mice. The active component of this extract was ginsenoside Rc (**1509**) [479].

Oleanolic acid 3-*O*-glucuronide and momordin 1c (**1449**) of *Kochia scoparia* fruits inhibited the increase of serum glucose in orally glucose-loaded rats but did not lower serum glucose in normal or intraperitoneally glucose-loaded rats or alloxan-induced diabetic mice. These results indicate that these compounds neither have insulin-like activity nor insulin-releasing activity. They exhibit their hypoglycemic activity by suppressing the transfer of glucose from the stomach to the small intestine, and by inhibiting glucose transport at the brush border of the small intestine [459].

6.6. *Contraceptive Effect.* Segetoside B (**722**) isolated from the seeds of *Vaccaria segetalis* exhibited inhibitory activity against luteal cells resulting in 60% inhibition at a concentration of 20 μg/ml [272].

Segetoside F (**723**), isolated from the seeds of this plant, showed 100% inhibition of luteal cells at a concentration of 20 μg/ml with an IC_{50} value of 12.6 μg/ml [273]. It may be noted that the plant is used in Chinese folk medicine for promoting diuresis, activating blood circulation, and relieving carbuncles [480].

6.7. *Antifungal Activity.* Medicagenic acid 3-*O*-*β*-D-glucopyranoside (**1486**), isolated from *Medicago sativa* roots, showed significant inhibitory effect on the growth of three dermatophytic fungi, *Trichophyton interdigitale*, *T. tonsurans*, and *Microsporum gypseum*, with a *MIC* (minimum inhibitory concentration) value of < 0.0625 mg/ml (0.09 mM) against each fungus [467][468].

Mimengoside A (**1490**) isolated from the Egyptian plant *Buddleja madagascariensis* (Loganiaceae) showed antifungal activity against nine yeast strains, *Candida albicans*, *C. kefyr*, *C. glabrata*, *C. krusei*, *C. tropicalis*, *C. parapsilosis*, *C. zeylanoides*, *Cryptococcus neoformans*, and *Trichosporon asahii*, with a LC_{100} value of 50 μg/ml except *Candida glabrata* (LC_{100} 25 μg/ml). The positive control, amphotericin B had the LC_{100} value of 2 μg/ml [470].

The Tibetan herb *Clematis tangutica* is used to treat indigestion and skin diseases. The EtOH extract of the aerial parts of this plant showed antifungal activity against *Penicillium avellaneum* UC-4376. *Du et al.* isolated two hederagenin saponins, compound 1 and 2, **481** and **482**, respectively, from this plant and evaluated their antifungal activities against six pathogenic fungi, *Penicillium avellaneum*, *Candida albicans*, *C. glabrata*, *Cryptococcus neoformans*, *Saccharomyces cerevisiae*, and *Trichosporon beigelii*, and one plant pathogenic fungus, *Pyricularia oryzae*. Both the compounds 1 and 2 showed significant inhibition against *S. cerevisiae* with *MIC* values of 2.0 and 2.5 μg/disc, respectively. The antifungal drug amphotericin B used as positive control had a *MIC* value of 3.2 μg/disc against this strain [194].

Saponins 2–4 (**1418**, **43**, and **44**, resp.) of the seeds of *Lupinus angustifolius* showed moderate antifungal activity against *Candida albicans* with *MIC* values of 25, 25, and 30 μg/ml, respectively. Amphotericin B used as the positive control was found to inhibit the growth of *C. albicans* at 1 μg/ml [37].

30-Norlanostane saponin, sarasinoside J (**1300**), from the Indonesian sponge, *Melophlus sarassinorum* exhibited antimicrobial activity against the yeast *Saccharomyces cerevisiae* with an inhibition zone of 13 mm at a concentration of 10 μg in an agar diffusion assay [422].

Saponin **797** isolated from the roots of *Terminalia arjuna* displayed good antifungal activity against *Aspergillus niger*, *Candida albicans*, and *Bacillus oryzae* at concentrations of 25 and 50 μg/disc by filter paper disc method with inhibition zones in the range of 20–32 mm [289].

6.8. *Anti-inflammatory Activity. Lonicera japonica*, a twining shrub, has been known as an anti-inflammatory agent in Korea in ancient times and is used widely for treating upper respiratory tract infections, diabetes mellitus, and rheumatoid arthritis [481]. *Son* and co-workers have reported the isolation of three hederagenin glycosides, lonicerosides A, B, and C, from this plant. Lonicerosides A and C (**1462** and **506**, resp.) possessed *in vivo* anti-inflammatory activity against mouse ear edema provoked by croton oil [199][460]. Compound **506** inhibited ear edema (inhibition of 15–31% at 50–200 mg/kg), while the reference compound, prednisolone, showed inhibition of 57.9% at 10 mg/kg [199].

Polygala japonica is widely distributed in Asia and primarily in eastern China. It is used in traditional Chinese medicine for treatment of various inflammatory disorders, such as acute tonsillitis, pharyngitis, myelitis, and nephritis [482]. To find out its active principles, *Wang et al.* isolated six triterpenoid saponins and studied their anti-inflammatory effect on carrageenan-induced acute paw edema in mouse. They found that only three saponins, saponins 3, 4, and 5 (**1470**–**1472**, resp.) inhibited mouse paw edema induced by 1% solution of carrageenan in saline at a dose of 0.1 μM of the saponin per kg of animal [302]. Possibly, the OH group at C(23) and COOH group at C(17) play a crucial role to maintain the anti-inflammatory effect in these saponins.

Saikosaponin d (**1489**) isolated from the medicinal plant *Bupleurum falcatum* has potent anti-inflammatory and immunomodulatory properties. The anti-inflammatory properties of the saponins and other saikosaponins have been observed by their inhibition of mouse ear and paw edema induced by phorbol 12-myristate 13-acetate (PMA) *in vivo*, and reduction of cyclo-oxygenase (COX) and lipoxygenase (LOX) production *in vitro* [483][484]. *Marzio et al.* studied the functioning of T-cells, because T-cell activation plays a critical role in the regulation of both normal and pathogenic immune responses, and suggested that CD 69 expression might be involved in the pathogenesis of some autoimmune and inflammatory diseases such as rheumatoid arthritis, chronic hepatitis, and mild asthma [469]. *Leung et al.* studied the effect of saikosaponin d (**1489**) in T-cell activation, and their results demonstrated that this saponin at non-cytotoxic concentrations effectively suppressed the activation of CD69 and CD71 surface antigens in mouse T-cells stimulated with the lectin mitogen concanavalin A. Possibly this suppression of CD 69 and CD 71 expression may be involved in the mechanisms of immunosuppressive and anti-inflammatory properties of this saponin [485].

Two triterpenoid saponins 1 and 2, **1427** and **1428**, respectively, isolated from the aerial parts of the African plant *Abrus precatorius* (Fabaceae) exhibited moderate anti-inflammatory activities on the ear tissue of white rats induced by croton oil at a concentration of 300 μg (reduction was 85.0 and 85.5%, resp.). Their acetates showed greater inhibition at the same concentration (reduction was 94.9 and 95.2%, resp.) [453].

Four major saponins, escin 1a, escin 1b, isoescin 1a, and isoescin 1b (**1423**–**1426**, resp.), isolated from the seeds of *Aesculus chinensis*, showed potent anti-inflammatory activities on dimethyl benzene-induced inflammation of ear swellings in mice at a concentration of 30 mg/kg with an inhibitory rate in the range from 67.3 to 79.3% [73].

The roots and rhizomes of *Clematis mandshurica* are used in Chinese pharmacopoeia as anti-inflammatory, antitumor, and analgesic agents. *Shi et al.* isolated seven saponins from the roots and rhizomes of this plant and evaluated their inhibitory effects on cyclooxygenase 2 (COX-2) induced by lipopolysaccharide (LPS) in murine peritoneal macrophages. Only clematomandshurica saponins A and B (**269** and **270**, resp.) showed significant inhibitory activities on COX-2 with IC_{50} values of 2.66 and 2.58 μM, respectively, in comparison with the positive control celecoxib (IC_{50} 0.00051 μM) [105].

6.9. *Antileishmanial Activity. Maesa balansae*, a shrub of Vietnam, is used in traditional medicine for treatment of allergies, sprains, anthelminthic infections, skin ulcers, drunkenness, and headache [486]. The MetOH extract of the leaves of this plant showed potent *in vitro* activity against intracellular amastigotes *of Leishmania infantum* with an IC_{50} value of 0.4 μg/ml. The cytotoxic concentrations causing 50% cell death (CC_{50}) were *ca.* 1 μg/ml in murine macrophage host cells and > 32 μg/ml in human fibroblasts (MRC-5 cell line) [487]. Phytochemical investigation of this MeOH extract by *Germonprez* and co-workers led to the isolation of six triterpenoid saponins each having a hemiacetal moiety between C(13) and C(17). Saponins 3 and 4, **1070** and **1071**, respectively, showed the highest antileishmanial activity (IC_{50} 7.0 and 14.0 ng/ml, resp.), followed by saponin 2 (**1069**; IC_{50} 50 ng/ml), saponin 1 (**1068**; IC_{50} 70 ng/ml), saponin 6 (**1073**; IC_{50} 700 ng/ml), and saponin 5 (**1072**; IC_{50} 3400 ng/ml). For comparison, the drug pentostam (sodium stibogluconate) used as positive control had an IC_{50} value of 6 μg/ml (8.1 nM). Saponins 3 and 4 were *ca.* 300 times more active than pentostam. No cytotoxicity was detected in a human fibroblast (MRC-5) cell line (CC_{50} > 32 μg/ml). *In vivo* evaluation in the BALB/C mouse model demonstrated that > 90% reduction of liver amastigote burdens was observed one week after a single subcutaneous dose of individual compounds at 0.2–0.4 mg/kg was administered [488][489].

Maes et al. also studied the comparative activities of saponin 3 (**1070**; Maesabalide III, MB-III) and liposomal amphotericin B (Am Bisome) against *L. donovani* in hamsters after administration of a single subcutaneous dose on either day 1 (prophylactic treatment) or day 28 (curative treatment) after infection. Amastigote burdens in liver, spleen, and bone marrow were determined either 7 days (early effects) or 56 days (late effects) after treatment. Prophylactic administration of MB-III at 0.2 mg/kg reduced liver amastigote burdens by 99.8 and 83% within 7 and 56 days after treatment, respectively. In the latter group, all animals became ill and some died. Amphotericin B used as a reference drug at an intravenous dose of 5 mg/kg of body weight reduced liver amastigote burdens by 100% in both cases. Although both MB-III at a dose of 0.8 mg/kg and amphotericin at 5 mg/kg were 100% effective against liver stages, clearance from the spleen and bone marrow was not achieved. Curative administration of MB-III at 0.2 and 0.4 mg/kg was not protective, as no survivor was left at the termination of the experiment on day 84 [488].

The deacylated derivatives and the aglycones of these compounds possessed no activity at all. This fact suggests that both parts of the molecule, *i.e.*, the ester as well as sugar parts are necessary along with the aglycones for activity. The role of the oxygen bridge between C(13) and C(18) is not clear. However, indirect evidence indicates that it may be critical for the activity, because related saponins from other *Maesa* plant species were also active to some extent. The presence of a OH group at C(16) is also crucial for the activity, because a significant drop in activity was noted with saponins carrying an AcO group at C(16) (saponins 5 and 6). Hence, further pharmacological, toxicological, and pharmacokinetic studies are still needed before it can become a vital drug candidate for clinical trials in humans [359][489].

Mimengoside A (**1490**), isolated from *Buddleja madagascariensis*, exhibited weak antileismanial activity against *Leishmania infantum* with an LC_{100} value of 25 μg/ml compared to the reference drug, pentamidine (LC_{100} 5 μg/ml) [470].

Arborenin (**1248**), isolated from leaves of an Indian medicinal plant, *Careya arborea*, showed *in vitro* antileishmanial activity against *Leishmania donovani* (strain AG 83) in a dose-dependent manner. At a concentration of 15 μg/ml, it inhibited the growth by 55% on the 2nd day, 70% on 4th day, and 75% on day 7. The IC_{50} value was determined as 15 μg/ml, and that of amphotericin B used as positive control was 0.22 μg/ml. The compound was nontoxic to normal human peripheral blood mononuclear cells (PBMC) up to a concentration of 20 mg/l [407].

Cycloartane glycosides, oleifoliosides A and B (**1253** and **1254**, resp.), and cyclocanthoside E and astragaloside II (**1504** and **1505**, resp.), isolated from the stems of *Astragalus oleifolius*, showed notable growth inhibitory activity against *Leishmania donovani* with IC_{50} values ranging from 13.2 to 21.3 μg/ml [409].

6.10. *Antimalarial/Antiplasmodial Activity. Glinus oppositifolius* is used in traditional medicine against fever and jaundice [490]. *Traore et al.* isolated two saponins from this plant. One of the isolated saponins, glinoside A (**1245**) showed antiplasmodial activity against two strains of *Plasmodium falciparum*, strain 3D 7 (chloroquine sensitive) and W2 (chloroquine resistant) with IC_{50} values of 42.3 and 39.4 μg/ml, respectively. The drug chloroquine used as positive control had the IC_{50} values of 9.0 and 55.0 μg/ml, respectively [405].

6.11. *Anti-obesity Effect*. Accumulation of heat or energy inside the body results in obesity or other kinds of illness. Usually it occurs when dietary fat is directly absorbed from the intestine due to huge secretion of pancreatic lipase. Pancreatic lipase is a key enzyme for lipid breakdown to absorb fatty acids. Therefore, inhibition of dietary fat absorbtion is one of the effective ways of reducing obesity. In traditional Chinese medicine, the herb *Scabiosa tschiliensis* is used to remove heat from the body. Based on this fact, *Zheng et al.* conducted a pancreatic lipase inhibitory test on the isolated 13 triterpenoid saponins from this plant. The assay was conducted using triolein emulsified with phosphatidylcholine. The results indicated that scabiosaponins E, F, G, and I (**292**–**294**, and **1108**, resp.), and hookerosides A and B (**1432** and **1433**, resp.) exhibited strong inhibitory activity on pancreatic lipase. Moreover, prosapogenin (**1434**) of scabiosaponin A showed the strongest inhibitory activity at 0.12 mg/ml, similar to the lipase inhibitor orlistat at 0.005 mg/ml [108].

Lupane-type saponins, sessiloside (**1241**) and chiisanoside (**1503**), isolated from a hot water extract of *Acanthopanax sessiliflorus* leaves inhibited pancreatic lipase activity *in vitro* in a dose-dependent manner, and their IC_{50} values were 0.36 and 0.75 mg/ml, respectively. The saponin-rich fraction of the leaf-extract reduced the body weight significantly in mice that ate a high-fat diet supplemented with this saponin fraction without symptoms of diarrhoea. Consequently, it was suggested that lupane saponins of *A. sessiliflorus* leaf would be candidates for a mild and safe treatment to prevent and reduce obesity [403].

Oleanane saponins, tauroside H1 (**1450**) and acanthopanaxoside C (**917**), isolated from the leaves of *Acanthopanax senticosus*, inhibited the activity of pancreatic lipase *in vitro* by 38.3 and 44.9%, respectively, at a concentration of 1 mg/ml [139].

6.12. *Antiproliferative Effect on a Thyroid Cell Line.* Several *Aster* species have been used in traditional Chinese medicine for treatment of fever, cold, tonsillitis, and snake-bite and bee sting [491]. This fact encouraged *Corea et al.* to study the antiproliferative effect of three triterpenoid saponins, astersedifoliosides A–C (**396**–**398**, resp.) isolated from *Aster sedifolius* against a transformed thyroid cell line (Ki Mol) at a concentration ranging from 10 to 30 μM. Astersedifolioside B and C (**397** and **398**, resp.) were able to block the cell proliferation more efficiently than astersedifolioside A (**396**) at a high concentration (30 μM). Comparison of the sugar composition of astersedifolioside A and B (**396** and **397**, resp.) indicates that a further xylose unit at C(28) possibly increases the activity [162].

6.13. *Antipsoriatic Activity.* Psoriasis is a chronic skin disorder characterized by well-defined scaly earthematous plaques on the exterior surfaces on the extremities like elbows and knees. This disease is due to the growth of SVK-14 keratinocytes. An aqueous extract of *Centella asiatica* inhibited keratinocyte replication with an IC_{50} value of 209.9 mg/ml. This inhibitory effect of the plant extract was possibly due to the presence of two triterpenoid glycosides, madecassoside (**1500**) and asiaticoside (**1501**), which showed inhibition of keratinocyte replication *in vitro* with IC_{50} values of 8.6 and 8.4 μM, respectively, in comparison with the antipsoriatic drug dithranol (anthralin) with an IC_{50} value of 5.2 μM [473].

6.14. *Antispasmodic Activity.* The decoctions of both the aerial parts and roots of *Zygophyllum gaetulum* are used in Moroccan folk medicine as an antispasmodic remedy [492]. Extracts of the aerial parts, some purified fractions as well as pure triterpenoid saponins, zygophyloside M (**355**) and 3-*O*-*β*-D-glucopyranosyl quinovic acid-28-*β*-D-glucopyranosyl ester (**1498**), were found to reduce both electrically stimulated contractions and morphine-withdrawal contractions in isolated guinea-pig ileum [493]. *Aquino et al.* reported that a MeOH extract of the roots, its partially purified fraction, and isolated pure saponin, 3-*O*-*β*-D-glucopyranosyl quinovic acid-28-*β*-D-glucopyranosyl ester (**1498**), exhibited inhibition of contraction of electrically stimulated guinea pig ileum in a dose-dependent manner. The IC_{50} values were for the MeOH extract 150 μg/ml (C. L. = 120–152) and for the partially purified fractions C and D were 75 (C. L. = 69–82) and 67 (C. L. = 60–77) μg/ml (C. L. = LC_{50}), respectively. Compound **1498** showed the same order of potency at concentrations of 10–4 μg/ml [389]. These results justified the traditional use of aerial parts and roots of the plant as antispasmodic remedy.

6.15. *Antisweet Activity. Gymnema sylvestre*, distributed in India and the south-western region of China, is used to control diabetes mellitus [494]. In addition, the leaves of this plant are used in India for inhibiting the taste of sweetness [495]. *Ye et al.* isolated four saponins, **49**, **4**, **8**, and **1422**, from the leaves of this plant. Saponin 1 (**49**) and the Na salt of alternoside II (**1422**) exhibited the suppression of the sensation of sweetness induced by sucrose (0.2M) [18]. Such an activity was comparable to that reported for alternoside II [455]. This finding indicates that the antisweet activity of this type of triterpene saponins is related to the presence of acyl groups on *D*/*E* rings.

Jegosaponins A–D (**78**–**81**) from the Japanese tree *Styrax japonica* exhibited complete suppression of the sensation of sweetness induced by 0.2M sucrose at a concentration of 1 mM but did not suppress the sweetness of a 0.4M sucrose solution [48]. Theasaponin E1 (**1420**) showed mild antisweet activity [496].

6.16. *Antiviral Activity.* The roots of *Platycodon grandiflorum* have been used as antiphlogistic, antitussive, and expectorant in Chinese traditional medicine [497]. *Ma et al.* observed that the MeOH extract of the roots of *P. grandiflorum* exhibited inhibitory effect against respiratory syncytical virus (RSV) with an IC_{50} value of 44.1 μg/ml [498].

Bioassay-directed fractionation and purification of the MeOH extract of *P. grandiflorum* by *He et al.* led to the isolation of five saponins. One of them, namely, platycodin D3 (**1478**), exhibited weak anti-RSV activity with an IC_{50} value of 200 μg/mg compared with that of ribavirin, an approved drug for RSV treatment in humans (IC_{50} 2.6 μg/mg) [249].

Actein (**1506**), a cycloartane saponin isolated from the rhizome of *Cimicifuga racemosa* (black cohosh), showed potent anti-HIV (human immunodeficiency virus) activity [474].

Escins 1a and 1b (**1423** and **1424**, resp.) showed inhibitory activities against HIV-1 protease with IC_{50} values of 35 and 50 μM, respectively. The inhibition percentages of mixtures of major components, **1423**/**1424** 2:1 and isoescins 1a (**1425**)/isoescin 1b (**1426**) 2:1, were 89.9 and 50.8% at 100 μM, respectively. Acetylpepstatin used as positive control had an IC_{50} value of 0.30 μM. Escins and isoescins were isolated from the seeds of *Aesculus chinensis* [76].

Tomentic acid glucosyl ester (**1499**) isolated from *Sargentodoxa cuneata* (Sargentodoxaceae) showed significant inhibition of HSV-1 DNA synthesis at a concentration of 100 μM [472].

Maesasaponin mixture B (mixture of six saponins, **1491**–**1496**) from *Maesa lanceolata* showed inactivation of HSV (both types) by more than 99.9% at a concentration of 250 μg/ml for an incubation period of 30 min [471].

Three triterpenoid saponins, siaresinolic acid 28-*O*-*β*-D-glucopyranosyl ester (**1466**), and oblonganosides K and M (**432** and **534**, resp.), isolated from the leaves of *Ilex oblonga* showed significant inhibitory activities against TMV (Tobacco Mosaic Virus) replication with 84.5, 85.7, and 78.5% inhibitions, respectively, at a concentration of 0.2 mg/ml. The EC_{50} values of these compounds were determined to be 0.08, 0.076, and 0.085 mg/ml, respectively [177].

6.17. *Cytotoxic/Antitumor Activity.* Saponins kinmoonosides A–C (**599**, **600**, and, **592**, resp.) from the fruits of *Acacia concinna* showed significant cytotoxicities against human HT-1080 fibrosarcoma cells with ED_{50} values of 0.70, 0.91, and 2.83 μM, respectively. 5-Fluorouracil used as positive control had an ED_{50} value of 8.0 μM. Possibly the ester group at C(21) of the aglycone in these saponins might intensify the cytotoxicity [225].

Saponins **1436** and **1437** of *Acacia tenuifolia* were reported to exhibit cytotoxicity against a mammalian lung cancer cell line, M-109, with an IC_{50} value of 1.0 μg/ml [158].

One partially purified triterpenoid saponin mixture (Fraction 35 (FO35)) and two triterpenoid saponins, avicins D and G (**621** and **622**, resp.), from an Australian desert tree, *Acacia victoriae*, remarkably inhibited the growth of tumor cell lines SK-OV-3, OVCAR-3, *Jurkat*, U-937, MDA MB-468, MDA MB-453, MDA MB-435, SK-BR-3, MCF-7, and MDA-MB 231 with IC_{50} values > 25 μg/ml. FO 35, and avicins D and G induced cell cycle (G1) arrest of the human MDA-MB-453 breast cancer cell line and apoptosis of the *Jurkat* (T-cell leukaemia) and the MDA-MB-435 breast cancer cell line. The avicins also partially inhibited phosphatidylinositol 3-kinase activity in *Jurkat* T cells in a time-dependent manner and phosphorylation in the downstream protein Akt. Such observations indicate that triterpenoid saponins from *A. victoriae* might be potential anticancer agents [499]. Avicins D and G (**621** and **622**, resp.) exhibited potent cytotoxicity (apoptosis) towards *Jurkat* cells *in vitro* with IC_{50} values of 0.58 and 0.22 μg/ml, respectively [236].

Cycloartane glycosides, asiaticosides A and B (**1255** and **1256**, resp.), and 25-*O*-ethylcimigenol-3-*O*-*β*-D-xylopyranoside (**1275**), isolated from the roots/rhizomes of the Chinese medicinal plant *Actaea asiatica*, showed moderate cytotoxicities with IC_{50} values of 9.90, 9.74, and 11.79 μM against Hep G2 cancer cells, and 9.78, 8.32, and 11.99 μM against MCF-7 cancer cells, respectively [410].

Major saponin, *β*-escin or escin 1b (**1424**), of *Aesculus hippocastanum* (horse chestnut) seeds inhibited azoxymethane-induced colon carcinogenesis in rats *in vivo* by oral administration in diet at a dose of 250–500 ppm, and *in vitro* it exhibited cytotoxicity in HT-29 human colon cancer cell lines at a concentration of *ca.* 30 μM or above. At a lower concentration (5 μM), it inhibited HT-29 cell proliferation by regulating the cell cycle growth at the G-S phase due to induction of the cyclin-dependent kinase inhibitor p21. Both *in vivo* and *in vitro* assay results suggest that *β*-escin may be a useful candidate for colon-cancer chemoprevention and treatment. Hence, further study in this area is warranted [500].

Jung et al. established structure–cytotoxicity relationship of oleanan saponins having di- and trisaccharides isolated from *Akebia quinata*, as well as nitric oxide (NO) inhibition effect of these saponins. They used five tumor cell lines, A-549, SK-OV-3, SK-MEL-2, XF 498, and HCT 15, four saponin disaccharides, **1438**, **1454**–**1456**, and two saponin trisaccharides, **1457** and **1458**, for their study. Among these compounds, **1455** was the most potent cytotoxic saponin (IC_{50} 1.9–2.7 μg/ml). It showed a significant NO inhibition effect on lipopolysaccharide (LPS)-induced macrophage 264.7 cells (IC_{50} 2.14 μg/ml). On the basis of their results, they concluded that the hederagenin saponin with a *β*-oriented *α*-L-rhamnopyranosyl(1→2)-*α*-L-arabinopyranosyl unit at C(3) would be a significant cytotoxic and anti-inflammatory drug. Addition of one xylose unit to the rhamnose moiety decreased cytotoxicity, *e.g.*, **1457** (IC_{50} 5.2–6.8 μg/ml), and replacement of the rhamnose sugar by glucose also reduced cytotoxicity, *e.g.*, **1456** (IC_{50} 6.3–8.4 μg/ml) [456].

Three oleanane-saponins, grandibracteosides A–C (**585**–**587**, resp.), isolated from the MeOH extract of *Albizia grandibracteata*, exhibited cytotoxicity against two tumor cell lines, KB (nasopharyngeal carcinoma) and MCF 7 (breast adenocarcinoma), *in vitro* with IC_{50} values between 0.4 and 2.3 μM [223].

Saponins gummiferaosides A–C (**603**–**605**, resp.) of *Albizia gummifera* roots were assayed for their cytotoxicity against the A 2780 (human ovarian cancer), MDA-MB-435 (breast cancer), HT-29 (colon cancer), H522-T1 (non-small cell lung cancer), and U 937 (histiocytic lymphoma) cell lines. All of the compounds **603**–**605** showed significant cytotoxic effects against A 2780 with IC_{50} values of 0.37 (0.8 μg/ml), 0.70

(1.5 μg/ml), and 0.26 μM (0.6 μg/ml), respectively. Compound **605** also showed strong activity against HT-29, H522-Tl, and U-937 cell lines with IC_{50} values of 0.61, 0.64, and 0.29 μM, respectively [228].

The stem bark of *Albizia julibrissin* is recorded in the Chinese Pharmacopoeia as sedative and anti-inflammatory agent, and specified to treat injuries from falls and remove carbuncles [501].

Julibrosides J_8 and J_{13} (**613** and **614**, resp.), isolated from *Albizia julibrissin*, showed marked cytotoxic activities against the cancer cell line Bel-7402 at 100 μg/ml with inhibition of 86.66 and 93.33%, respectively, whereas julibrosides J_5 and J_{12} (**610** and **613**, resp.), also isolated from the same plant, exhibited mild activity against Bel-7402 cell line at the same concentration by the SRB assay method [231]. Other saponins, *i.e.*, julibrosides J_1 and J_9 (**609** and **612**, resp.), isolated from the same plant, showed significant cytotoxic activities against the KB cancer cell line *in vitro* by exhibiting inhibition of *ca.* 94% at 4 and 10 μM, respectively, by the SRB method [230].

Zou et al. isolated julibroside J_{21} (**615**) from the stem bark of this plant and studied its cytotoxic effect. The compound showed significant cytotoxic activity against the Bel-7402 cells (human liver cancer cell line) at 10 μg/ml by the SRB (sulforhodamine B) method with an inhibition of 80.8% [232].

Julibroside J_{27} (**616**) isolated from the stem bark of this plant showed inhibitory activity against the growth of KB and Bel cell lines with ED_{50} values of 0.6 and 5.0 μM, respectively [233].

From the BuOH fraction of a H_2O extract of the stem bark of this plant, *Liang et al.* isolated three triterpenoid saponins, julibrosides J_{29}, J_{30}, and J_{31} (**618**–**620**, resp.) and studied their antitumor activities. All these compounds, **618**–**620**, showed marked inhibitory activities against PC-3 M-IE 8, MDA-MB-435, and HeLa cancer cell lines *in vitro* at 10 μM concentration by the SRB and MTT methods. Their inhibition rates was 85.37, 84.98, and 80.85%, respectively, against PC-3 M-IE 8 cells; 84.47, 75.68, and 80.41%, respectively, against MDA-MB-435 cells, and 94.90, 91.65, and 83.48%, respectively, against HeLa cells [235]. From the BuOH fraction of the EtOH extract of *A. julibrissin* stem bark, *Liang et al.* also isolated julibroside J_{28} (**617**), which showed significant antitumor activity against PC-3 M-IE 8, Bel-7402, and HeLa cancer cell lines *in vitro* at 10.0 μM concentration with inhibitory rates of 80.47, 70.26, and 58.53%, respectively [234].

Cytotoxic activities of 21 saponins isolated from the whole plant of *Ardisia japonica* were studied against three human cancer cell lines, HL-60 (myeloid leukaemia), KATO-III (stomach adenocarcinoma), and A549 (lung adenocarcinoma) by MTT reduction assay. Saponins ardisianosides A, B, and C (**1036**–**1038**, resp.), and cyclamin (**1497**) showed marked activities against all these cell lines with IC_{50} values between 0.3 and 6.0 μM [19].

Asterlingulatosides A and B (**392** and **393**, resp.) from the whole plant of *Aster lingulatus* showed *in vitro* antitumor activity by inhibiting DNA synthesis in human leukaemia HL-60 cells by 20.1 and 18.2% at a concentration of 5 μM, 54.4 and 43.3% at 25 μM, and 87.2 and 81.9% at 100 μM, respectively [160].

Asterlingulatosides C and D (**394** and **395**, resp.) also isolated from this plant showed good inhibitory activity against DNA synthesis in human leukaemia HL-60 cells with IC_{50} values of 8.8 and 6.1 μM, respectively [161].

Saponins 5–7 (**26**, **1419**, and **11**, resp.) from the aerial parts of *Astragalus suberi* from Yemen exhibited a significant cytotoxic effect against Hep-2 cells (human carcinoma of larynx) with an IC_{50} value of 50 μg/ml, while saponins 5 and 7 (**26** and **11**, resp.) showed a weak cytotoxic effect against the cell line HeLa *in vitro* with an IC_{50} value of 98 and 74 μg/ml, respectively [22].

Li et al. isolated seven saponins, bellisosides A–F (**657**–**662**, resp.) and bellis saponin BS 2 (**1474**) from the roots of *Bellis perennis*, and evaluated their cytotoxic activities against HL-60 (human promyelocytic leukemia) cells by an MTT reduction assay procedure. Bellisosides E and F (**661** and **662**, resp.) with a long-chain acyl group showed strong cytotoxic activities with IC_{50} values of 1.4 and 0.5 μM, respectively, while the effects of the other six saponins were moderate (IC_{50} 3.9–26.0 μM) compared with that of cisplatine used as positive control (IC_{50} 1.8 μM). Possibly the cytotoxic activity of these saponins is related to the size of the acyl group at C(4) of fucose [247].

Tubeimoside 1 (TBMS 1; **1473**), a triterpenoid saponin isolated from the tubers of *Bolbostemma paniculatum* (Maxim) Franquet (Cucurbitaceae), was reported to show potent antitumor and antitumor promoting effect against human cervical carcinoma cell line HeLa [502][503]. To find out the role of mitochondria and mitochondrial cytochrome C (Cyt C) in tubeimoside 1-mediated apoptosis of HeLa cells, *Wang et al.* carried out the assay of mitochondrial transmembrane potential ($\Delta\Psi_m$) as the early stage of apoptosis characterized by the rupture of $\Delta\Psi_m$. Their results indicated that TBMS1 opened the permeability transition (PT) pore, thereby decreasing $\Delta\Psi_m$, releasing Cyt C from mitochondria, and further causing a series of events consistent with established mechanistic models of apoptosis. Therefore, it is reasonable to assume that the mitochondria are involved in TBMS1-induced apoptosis of HeLa cells, and the release of Cyt C to the cytosol may initiate a mitochondrial pathway of apoptosis [464].

In vitro antiproliferative activity of the ursane-type glycosides isolated from *Bupleurum rotundifolium* was evaluated against the MK-1 (human gastric adenocarcinoma), HeLa, and B16 F10 (murine melanoma) cell lines by MTT assay procedure. Among them, rotundifoliosides J and H (**1180** and **1184**, resp.) were cytotoxic against all these cell lines with GI_{50} (50% growth inhibition) values in the range of 11 to 37 μM. It is possible that the β-fucopyranosyl group at C(3) of the aglycone plays some role in the antiproliferative activity [366].

Saponins 2 and 3 (**460** and **467**, resp.) from the stem bark of *Caryocar villosum* exhibited moderate cytotoxic effects *in vitro* against human keratinocytes with LC_{50} values of 23 and 20.9 μM, respectively [187].

Monodesmosidic saponins, **265** and **1443**, from the roots of *Clematis chinensis* showed significant cytotoxic activities against the cultured tumor cell line HL-60 with IC_{50} values of 2.8 and 2.3 μM, respectively [104].

Saponin codonoposide (**388**) of *Codonopsis lanceolata* roots exhibited weak cytotoxicity against the tumor cell lines U 937, HL-60, and 3LL ($IC_{50} > 0.3$ μM against each cell line), but its prosapogenin, **1451**, obtained by enzymatic hydrolysis exhibited significant cytotoxicity against all these cell lines with IC_{50} values of 0.015, 0.030, and 0.040 μM, respectively. It indicates that the disaccharide unit at C(3) of the aglycone, echinocystic acid, is essential for cytotoxic and antitumor activity, and the sugar at C(28) decreases cytotoxicity [159].

Conyzasaponins D and F (**669** and **671**, resp.) isolated from the aerial parts of *Conyza blinii* exhibited moderate cytotoxicities against the cancer cell line HL-60 with IC_{50} values of 3.8 and 3.9 μM, respectively, compared with the positive control drugs, etoposide (IC_{50} 0.28 μM) and CP DD (IC_{50} 0.20 μM) [252]. The aerial parts of the plant is used in Chinese folk medicine for treatment of inflammatory diseases like chronic bronchitis [504].

Nine oleanane ester saponins, **416**–**422**, **583**, and **584**, isolated from the roots of *Entada africana* were tested for their antiproliferative activity against the cell lines J774-A1 (murine monocyte/macrophage), HEK-293, and WEH1-164. Compounds **416**, **417**, and **583** showed moderate-to-high cytotoxicity against all these cell lines with IC_{50} values 0.10–0.84 μM, and, among these compounds, compound **583** showed the highest cytotoxic activity. Possibly cinnamic acid and/or monoterpenoid residues play an important role for the cytotoxic activity of these compounds [169].

Erylosides G–J (**1286**–**1289**, resp.) isolated from the sponge *Erylus nobilis* exhibited moderate cytotoxicity against the cell line K 562 (human leukaemia) with LC_{50} values of 22.1, 24.8, 17.9, and 21.8 μg/ml, respectively [419].

Eryloside F_3 (**1291**) isolated from the Caribbean sponge *Erylus formosus* induced the early apoptosis of *Ehrlich* carcinoma cells at a concentration of 100 μg/ml [417].

Saponins 1–4, **101**–**104**, respectively, of *Eryngium campestre* showed weak cytotoxicity against HCT-116 and HT-29 (human colon cancer) cell lines with IC_{50} values between 40 and 100 μg/ml. The IC_{50} value of the positive control, paclitaxel, was 8.0 and 5.3 ng/ml, respectively [54].

A dried fruit extract of *Gleditsia sinensis* has been found to induce apoptotic activity on numerous solid tumor cell lines including breast cancer, hepatoma, and oesophageal, as well as primary cultured leukaemia cells obtained from bone marrow aspirate of patients. The apoptotic activity involves increase in intracellular reactive oxygen species (ROS) level, induction of mitochondrial membrane potential depolarization, and caspase 3 protease activation. The active constituents of this extract are triterpenoid saponins. Hence, further study on the apoptosis of cancer cells by using pure saponins will be helpful to find out future anticancer candidates for clinical trial [505–508].

Lotoidoside D (**216**) isolated from the roots of the Egyptian desert plant *Glinus lotoides* showed significant antitumor activity against HeLa tumor cell line at a very low concentration (inhibition was 34.44% at 10 nM) by MTT assay procedure [87].

Saponin GC-1 (**693**) isolated from the fruits of *Gymnocladus chinensis* BAILLON showed significant inibition of the growth of human cancer cell lines HL-60, Bel-7402, HeLa, and BGC-823 with IC_{50} values of 14.8, 18.4, 26.1, and 29.2 μM, respectively, *in vitro* by MTT and SRB assay procedures. The saponin **693** also induced apoptosis of HL-60 cells in a dose-dependent manner. To find out the mechanism of apoptosis, *Ma et al.* carried out reporter a gene assay to determine the activity of nuclear factor-κB (NF-κB). Their assay results indicated that NF-κB activity was decreased gradually by addition of increasing concentration of GC-1 (1–40 μM). This finding suggested that apoptosis induction of HL-60 cells by GC-1 might be due to inactivation of NF-κB [257].

Holostane-saponin fuscocineroside C (**1411**) isolated from the sea cucumber *Holothuria fuscocinerea* showed significant *in vitro* cytotoxicity against human tumor cells HL-60 and Bel-7402 with IC_{50} values of 0.88 and 0.58 μM, respectively, compared to the positive control, 10-hydroxycamptothecin, with IC_{50} values of 0.41 and 0.28 μM, respectively. Two known saponins, pervicoside C (**1530**) and holothurin A (**1531**), of the same sea cucumber also exhibited cytotoxicity against cell line Bel-7402 with IC_{50} values of 0.66 and 0.76 μM, respectively [451].

Ixeris sonchifolia of northeastern China is used as folk medicine in invigorating circulation of blood, normalizing menstruation, and eliminating blood stasis to relieve pain [509]. Cytotoxic assay-guided fractionation by *Feng et al.* resulted in the isolation of three saponins. Two of these saponins, ixeris saponins B (**379**) and C (**542**), showed significant cytotoxicity against cancer cell lines A375 (human melanoma), L929 (murine pneumoepithelial carcinoma), and HeLa (murine cervicoma) with IC_{50} values ranging from 8.83 to 15.83 μM by the MTT assay [154].

The Chinese medicinal plant *Lysimachia capillipes* is used for treatment of colds and rheumatoid arthritis [510]. *Tian et al.* isolated saponins capilliposides B (**1051**) and D (**1052**), which showed significant cytotoxic activity against human A-2780 cells with IC_{50} values of 0.1 and 0.2 μg/ml, respectively, by the methylene blue dye assay method; the anticancer drug hydroxycamptothecin was used as positive control [355][356].

Ginsenosides Rg_3 and Rh_2 (**1511** and **1513**, resp.) of red ginseng (*Panax ginseng*) have been found to inhibit the proliferation of prostate cancer cells, which may be due to modulation of MAP kinases [511]. Compound K (**1514**), an intestinal bacterial metabolite derived from oral administration of ginseng root, inhibited TPA-induced COX-2 expression, which may contribute to antitumor-promoting effect on mouse skin carcinogenesis [260].

Ginsenoside Rg_3 (**1511**) also promoted accumulation of rhodamine 123 (an effective substrate for multidrug resistance (MDR)-associated P-glycoprotein, Pgp, and agent that blocks Pgp) in drug-resistant human fibro carcinoma KBV 20C cells in a dose-dependent manner, but it had no effect on parental KB cells. Furthermore, Rg_3 increased the life span in mice ($p < 0.01$) implanted with DOX (doxorubicin)-resistant murine leukemia P388 cells *in vivo* at a dose of 10 mg/kg in combination with 4 mg/kg DOX and inhibited body weight significantly. Hence, a further clinical trial of Rg_3 in reversal of Pgp-associated MDR is highly feasible [512].

Oral administration of ginsenoside Rh_2 (**1513**) to nude mice bearing human ovarian cancer cells (HRA) resulted in remarkable retardation of tumor growth. In particular, tumor growth in mice treated with 15, 30, and 120 μM of ginsenoside Rh_2 was significantly inhibited, compared to that of in CDDP (*cis*-diamine dichloroplatinum (II))-treated mice as well as in untreated mice [476]. Further investigations by *Nakata et al.* showed that po treatment of tumor-bearing nude mice with ginsenoside Rh_2 resulted in induction of apoptosis in the tumor [513].

Triterpenoid B-group soyasaponins, *i.e.*, soyasaponins having soyasapogenol B as aglycone, have been found to induce macroautophagy in human colon cancer (HCT-15) cells at concentrations obtainable through consumption of legume foodstuffs. These saponins induce autophagy in cancer cells through modulating the activity of two signaling pathways that have previously been recognized in the control of induction of autophagy. These saponins diminish Akt activity through reduction of the activating Ser473 phosphorylation as well as enhance activity of ERK ½, which is necessary for induction of autophagy. These findings suggest that B-group soyasaponins may confer colon chemoprotective effects, and further characterization of these compounds as cancer preventive agents is warranted [514].

A crude triterpenoid saponin mixture isolated from the EtOH extract of the fruits of *Pittosporum tobira*, an endemic shrub of China and Japan, exhibited antiproliferative and apoptotic effects on human cell lines of colon adenocarcinoma, melanotic melanoma, breast carcinoma, pancreas adenocarcinoma, neuroblastoma, and medulloblastoma. The effects of cellular growth are concentration- and treatment time-dependent, and should be attributed to the blocking of G_0-G_1 cycle phase and to a significant apoptosis induction. In the acute toxicity test performed in mice and rats, the LD_{50} value was 25 and 1275 mg/kg in the ip and oral routes, respectively. By intravenous administration, the dose of 5 mg/kg was found to be maximal. The bioactivities of the isolated saponins have not yet been tested [58][515]. Pittoviridoside (**111**) from *Pittosporum viridiflorum* showed weak cytotoxicity against A 2780 (human ovarian cancer) cell line with an IC_{50} value of 10.1 μg/ml [59].

Platycodon grandiflorum is often cultivated on the farmyard in northeast Asia, as its roots are used as a common food and, in folk medicine, for remedy of bronchitis, asthma, pulmonary tuberculosis, hyperlipidemia, diabetes, and inflammatory diseases [516]. The aqueous extract of the roots also augmented the functioning of macrophages by inhibiting proliferation and enhancing phagocytosis, nitric oxide (NO) secretion, and the necessary gene expressions [517]. *Kim et al.* isolated eight triterpenoid saponins from the roots of this plant. Three of the isolated saponins, namely, platycodin D_2 (**1479**), deapioplatycodin D (**1480**), and platycodin D (**1481**) exhibited significant inhibition on the proliferation of five cultured human tumor cell lines, A549 (non-small cell lung), SK-OV-3 (ovary), SK-MEL-2 (melanona), XF 498 (central nerve system), and HCT-15 (colon), *in vitro* with ED_{50} values in the range of 4.0–18.0 μg/ml. Cisplatin used as positive control had ED_{50} values in the range of 0.8–2.2 μg/ml [256].

Saponin 3 (**991**) isolated from the spikes of *Prunella vulgaris* showed marginal cytotoxic activity against the growth of human hepatoma cells (SMMC-7721) with an IC_{50} value of 35 μM. The plant is used in Chinese medicine as antitumor and anti-inflammatory drug [173].

Saponins **1442** and **1441** from the roots of *Pulsatilla koreana* exhibited marked cytotoxic activity against A-549 (human lung carcinoma) cells with ED_{50} values of 2.6 and 4.2 μg/ml, respectively. Doxorubicin used as positive control showed an ED_{50} value of 0.02 μg/ml [394].

Nine triterpene saponins, **1440**–**1442**, **1455**, **1458**–**1460**, **329**, and **330**, isolated from the roots of *Pulsatilla chinensis*, exhibited moderate cytotoxic activities against the HL-60 (human leukaemia) cells with IC_{50} values ranging from 2.3 to 7.8 μg/ml, when compared with etoposide used as positive control (IC_{50} 0.3 μg/ml) [127].

Compound 3 (**1171**) and compound 14 (**1461**) from the roots of *Sanguisorba officinalis* showed moderate cyctotoxicities against HSC-2 cells with IC_{50} values of 15 and 18 μg/ml, respectively [180].

An inseparable saponin mixture of jenisseensosides E and F (**766** and **767**, resp.) from *Silene fortunei* displayed weak proliferation of *Jurkat* cells (human T-cell leukaemia) in the low concentration range of 10^{-3}–10^{-1} μM with stimulation index (*SI*) 1.36, and starting from concentration of 1 μM exhibited inhibition of *Jurkat* cells. Whereas mixture of jenisseensosides C and D (**1482** and **1483**, resp.) isolated from the same plant showed a significant inhibition of *Jurkat* cell proliferation starting from 5 μM concentration and a proliferative activity in the concentration range of 10^{-3}–10^{-1} μM with *SI* of 1.44. The deacylated saponin **1484** showed a lower proliferative activity and was found to be not cytotoxic to *Jurkat* cells at a concentration of 5 μM. These results suggested that the *p*-methoxycinnamoyl moiety, linked to the fucosyl residue, might be responsible for the toxicity of these saponins to T-lymphocytes [282].

The BuOH-soluble extract of the Chinese plant *Symplocos chinensis* exhibited significant cytotoxic activity. *Tang et al.* isolated six triterpenoid saponins, simplocososides A–F, from this extract and evaluated their cytotoxic activities against five cancer cell lines, KB, HCT-8, A549, MCF-7, and BGC-823. Simplocososides C and F (**119** and **143**, resp.) exhibited significant cytotoxic activities against the HCT-8 cells with IC_{50} values of 2.86 and 4.04 μg/ml, respectively, and saponin **143** also showed moderate activity against BGC-823 cells with an IC_{50} value of 7.29 μg/ml. The prosapogenin **1429** from simplocososide A (**118**) showed a good activity against KB cells (IC_{50} value of 0.3 μg/ml) [60].

Fu et al. evaluated the cytotoxicity of 19 saponins, symplocososides C–S, X, and Y isolated from *S. chinensis*, against five cancer cell lines (HCT-8, Bel-7402, BGC-823, A549, and A2780) using adriamycin as positive control. All these saponins showed cytotoxicity. Among them, symplocososides L (**132**), M (**133**), N (**124**), O (**144**), G (**127**), H (**129**), I (**128**), J (**130**), K (**131**), and X (**125**) showed marked activities against the HCT-8 and Bel-7402 cell lines with IC_{50} values in the range of 1.7–3.8 μM compared to control adriamycin (IC_{50} 0.8–1.0 μM). Possibly, the monoterpenoid substituents at either C(21) or C(22) influence their cytotoxicity. Symplocososides G, H, and J are also more active against other three cell lines with IC_{50} values in the range of 1.4–3.0 μM [62–64]. Simplocososide X (**125**) also showed a significant cytotoxic effect against cancer cells Hel-f (human embryo lung fibroblast) with an IC_{50} value of 1.95 μM determined by the MTT assay [63].

The *in vitro* antiproliferative activity of eight saponins isolated from *Trevesia palmata* against three cell lines, J 774 (murine monocytemacrophage), HEK-293 (human epithelial kidney), and WEHI-164 (murine fibrosarcoma) was evaluated. Among these saponins, saponins 5 and 6, **389** and **537**, respectively, were active against all these cell lines with IC_{50} values in the range of 0.1–0.3 μM. 6-Mercaptopurine used as positive control showed an IC_{50} value in the range of 0.003–0.017 μM [140].

Chan studied antitumor activity of the extract of *Xanthoceras sorbifolia* against twelve human tumor cell lines, namely, HTB-9 (bladder), HeLa-S3 (cervix), DU145 (prostate), H 460 (lung), MCF 7 (breast), K 562 (leukocytes), HCT116 (colon), HepG2 (liver), U2OS (bone), T98G (brain), SK-MEL-5 (skin), and OVCAR 3 (ovary). Among these cell lines, OVCAR 3 cells are most sensitive toward inhibition of cell growth with an IC_{50} value of 14.5 μg/ml. This fact encouraged *Chan* to find out the bioactive principles present in the plant extract, and he isolated two triterpenoid saponins, xanifolias X and Y (**1430** and **107**, resp.). Both compounds inhibited the growth of OVCAR 3 with IC_{50} values of 2 and 6 μg/ml, respectively. To study the structure–activity relationship, he removed the diangeloyl group or the carbohydrates of **107** and tested for activity. It was found that removal of both angeloyl groups at C(21) and C(22) completely abolished its activity ($IC_{50} > 120$ μg/ml). However, the removal of carbohydrates caused reduced activity (IC_{50} of 6 μg/ml). For comparison with a similar structure having only one angeloyl group either at C(21) or C(22), the activity of xanifolia X (**1430**) and β-escin (**1424**) against OVCAR 3 cells was studied, and less activity (IC_{50} values of 6.0 and 10.0 μg/ml, resp.) observed. On the basis of this result, it was suggested that diangeloyl groups at C(21) and C(22) are important for the cytotoxic activity of these saponins [56].

Saponin **108**, also isolated from the husks of *X. sorbifolia*, showed cytotoxic effect against six human tumor cell lines, HL-60, PC-3MIE-8, BGC-823, MDA-MB-435, Bel-7402, and HeLa with IC_{50} values in the range of 18.6–41.9 μg/ml, by the MTT and SRB assay methods [57].

The structure–activity relationship of some hederagenin diglycosides on KB-cell growth inhibition was studied by *Chwalek et al.* [518]. On the basis of their result, they concluded that the cytotoxicity of these saponins is related to both the sugar part and the structure of the genin (particularly the presence of a COOH or a COOR group at C(17)).

6.18. *Detoxication Activity.* Hepatic metallothioneins (MTs) are cysteine-rich low-molecular-weight (M_r 6000–7000) proteins that bind heavy metals with high affinity and thus play an important role in detoxication of heavy metals. *Kim et al.* studied the effects of α-hederin (**1469**) on the regulation of MT expression in murine hepatoma Hepa-1c1c7 cells. It was found that α-hederin in exposed RAW 264.7 cell culture increases MT expression for the release of the cytokines IL-6 and TNF-α. These cytokines are responsible for detoxication activity of MT against heavy metals [463].

6.19. *Gastroprotective Activity.* Theasaponin A_2 (**187**), and assamsaponins A and D (**203** and **189**, resp.) of *Camellia sinensis* var. *assamica* significantly inhibited EtOH-induced gastric mucosal lesions at a dose of 5.0 mg/kg po with inhibition of 54.7, 61.0, and 47.9%, respectively [80].

Theasaponins E_2 and E_5 (**1421** and **192**, resp.), and assamsaponin C (**196**) isolated from the seeds of this plant also showed inhibitory effects on EtOH-induced gastric mucosal lesions in rats at a dose of 5.0 mg/kg po with inhibitions of 77.6, 45.4, and 64.4%, respectively. Their activities were stronger than that of the prevailing drug, omeprazole (inhibition 43.1% at a dose of 10 mg/kg) [81].

Another saponin, theasaponin E_1 (**1420**) isolated from the seeds of *Camellia sinensis* (tea plant) also showed a significant inhibition (*ca.* 94%) of EtOH-induced gastric lesions in rats at a dose of 10 mg/kg [51].

6.20. *Hemolytic Activity.* Saponin 1 (**1444**) isolated from the seeds of *Chenopodium quinoa* showed weak hemolytic activity on sheep erythrocytes (HC_{50} 260 μg/ml); but its prosapogenin, **1445**, exhibited strong hemolytic activity with an HC_{50} (50% hemolyzing concentration) value of 6.2 μg/ml. These results can be interpreted by considering greater hydrophobic interaction of prosapogenin **1445** with membrane lipids due to a free COOH group at C(17) [323].

Saponins 2 and 3, **59** and **60**, respectively, of *Harpullia austro-caledonica* showed hemolytic activity and caused 100% hemolysis of a 10% suspension of sheep erythrocytes in phosphate buffer saline with HD_{100} values of 10 and 5 μg/ml, respectively. The hemolytic activity of **60** was twice that of **59**, suggesting that an arabinofuranosyl moiety attached to position 3 of the glucuronic acid moiety is more effective than a rhamnosyl moiety [44].

Oleanolic saponin mixture of eight compounds from *Pometia ridleyi* stem bark showed hemolytic activity and caused 50% hemolysis of a 10% suspension of sheep erythrocytes at a concentration of 23 mg/ml. Pure compounds were not available in sufficient amounts for their individual hemolytic activity study [92].

Adianthifoliosides A and B (**588** and **589**, resp.) from *Albizia adianthifolia* exhibited significant hemolytic activities on sheep erythrocytes with HD_{50} values of 17.5 and 48.0 μg/ml, respectively [224].

The maesasaponin mixture B (mixture of six saponins, **1491**–**1496**) from the leaves of *Maesa lanceolata* showed significant hemolytic activity on human erythrocytes (1% suspension) with an HC_{50} value of 1.6 μg/ml [471].

6.21. *Hepatoprotective Effect.* The MeOH extract and its BuOH-soluble fraction from the roots of the American ginseng, *Panax quinquefolium*, showed remarkable protective effects on liver injury induced by D-galactosamine and lipopolysaccharide. A mixture of D-galactosamine hydrochloride and lipopolysaccharide was injected intraperitoneally (ip) at a dose of 350 and 10 mg/kg in fasting male ddy mice to produce liver injury by increasing serum GPT (glutamate pyruvate transaminase) and GOT (glutamate oxaloacetate transaminase) levels. Administration of a separate single oral dose of each, the MeOH extract and its BuOH-soluble fraction, of 500 and 200 mg/kg, respectively, inhibited these levels significantly. Inhibitory activity of individual dammarane-type saponins isolated from the BuOH-soluble fraction has not yet been tested [427].

Ginsenosides Rb_3, Rc, Rd, and Re (**1508**–**1510** and **1516**, resp.) from Chinese *Panax notoginseng* were found to exhibit substantial hepatoprotective effects on liver injury in mice induced by D-galactosamine (D-Gal N)/lipopolysaccharide (LPS) at a dose of 100 mg/kg ip with inhibition between 89 and 97%. The experimental results also indicated that **1508** and **1509** showed much stronger activity than those of ginsenoside Rb_1 and Rg_1 (**1507** and **1515**, resp.) [429].

Five saponins, namely, majonoside R_2 (**1518**), pseudo-ginsenoside RT_4 (**1519**). vina-ginsenosides R_1, R_2 (**1520** and **1521**, resp.), and ginsenoside Rh_4 (**1517**) isolated from Vietnamese ginseng, *Panax vietnamensis*, showed significant hepatocytoprotective activities against D-galactosamine (D-Gal N)/tumor necrosis factor-alpha (TNF-α)-induced cell death in primary cultured mouse hepatocytes with IC_{50} values of 82.4, 74.8, 47.0, 63.2, and 97.0 μM, respectively. Silibinin, used as positive control, showed strong activity with an IC_{50} value of 14.0 μM [438].

6.22. *Immunomodulatory Activity.* Triterpenoid saponins are suitable immunostimulators, and hence their use as adjuvants in vaccination against several infectious diseases is well-established. Earlier, *White et al.* reported that the purified saponin QS-21 (**1485**) from *Quillaja saponaria* Molina acts as an adjuvant for a T-independent antigen [519]. The adjuvant activity of **1485** was evaluated by using it as a component in an experimental vaccine containing rHIV-1 envelope protein adsorbed to alum [520]. BALB/C Mice immunized with experimental vaccine containing saponin QS-21 (**1485**) produced significantly higher titers of antibodies than mice vaccinated with only alum-adsorbed HIV-1 160D. Similarly, saponin CP 05 (**415**) isolated from *Calliandra pulcherrima* showed remarkable adjuvant function in formulation of vaccine with the FML antigen of *Leishmania donovani* [167]. QS-21 (**1485**) and deacetylated saponins from *Quillaja saponaria*, the main adjuvant components with the FML glycoproteic antigen of *Leishmania donovani* in Leishmune vaccine, showed strong immunoprophylactic and immunotherapeutic potential against murine and canine visceral leishmaniasis [521–523].

To assess the contributions of the monoterpene, glycidic, and triterpene moieties to the adjuvant function of saponin CP05 (**415**), during vaccination against experimental visceral leishmaniasis, *Nico et al.* carried out experiments on a Balb/c mouse model immunized either with intact saponin CP05, the monoterpene-deprived BS of saponin CP05 (**1452**), the C(28)-carbohydrate-deprived HS of saponin CP05 (**1453**), or the sapogenin fraction (echinocystic acid) in formulation of vaccine with the FML (fucose mannose ligand) antigen of *Leishmania donovani* and challenged with 2×108 amastigotes of *L. chagasi*. The CP05-vaccine induced 90% survival and 92.1% parasite reduction, while a 100% survival and 94.1% protection were detected after the BS-vaccine treatment, indicating that the monoterpene acylated moiety (absent in the BS-vaccine) is not necessary for the induction of a protective Th-1 response, *i.e.*, the response for protective immunity against intracellular infectious agents. Only the DTH (delayed type hypersensitivity) response of BS-vaccine was mildly lower than that of CP05-vaccine. Maximal anti-FML antibody, CD 4^+, and CD 8^+ leishmania-specific lymphocytes, IFN-γ splenotype secretion, reduction in parasite load, and survival was also detected from the BS-vaccine. The HS–FML vaccine showed diminished responses in all tested variables, except IFN-γ secretion, indicating that the integrity of the carbohydrate moiety at C(28) is mandatory for these functions. No protection was induced by the sapogenin-FML-vaccine indicating that the saponin CP05 triterpene aglycone, which lacks the aldehyde group at C(4), is not an immunostimulating compound [168].

Saponin **764** from the roots of *Silene fortunei* exerted immunostimulating activity *in vitro* by showing enhancement of granulocyte phagocytosis (21–51%) in the concentration range of 10–100 μg/ml [281].

Heisler et al. found out that a combined administration of individually nontoxic concentrations of a chimeric toxin and triterpenoid saponin gypsoside (**1467**), isolated from *Gypsophila paniculata* L., at a concentration of 1.5 μg/ml enhanced synergistically the cytotoxic effect against the HER 14 tumor cell line up to 385,000-fold, while non-target cells are not affected at this effective concentration. This combined therapy with only a low required dose offers a new promising tool for tumor therapy. It may be noted that chimeric toxins are recombinant proteins or chemically coupled conjugates in which a cell-targeting moiety is combined with a cytotoxic agent [461].

Saponinum album (saporin; **1468**) from *Gypsophila paniculata* L. enhanced the cytotoxicity of a targeted chimeric toxin (composed of saporin, a cleavable adapter, and human epidermal growth factor (EGF)) more than 13,600-fold compared to control cells, decreasing the IC_{50} value from 2.4 nM to 0.18 pM, whereas quillaja saponin-21 (QS-21; **1485**) enhanced the cytotoxicity both on control cells lacking EGF receptor (EGFR) cells and on target cells. It indicated that, in the latter case, the enhancement is not target cell receptor-specific. Therefore, **1468** would be the best option to promote targeted saporin-3-based drug uptake [462].

Quillaic acid saponin (**749**), isolated from the roots of a Chinese medicinal plant, *Gypsophila oldhamiana*, showed immunomodulatory effect in a concentration-dependent manner. In the concentration range of 10–100 μg/ml, it showed a significant enhancement of granulocyte phagocytosis (40–75%), whereas, in the concentration range of 100 ng/ml–1 pg/ml, it exerted an immunosuppressive effect (65–22%) *in vitro* in the T-cell activation assay [148][524].

Dammarane-type triterpenoid saponins isolated from *Panax notoginseng* were found to exhibit an adjuvant activity on the cellular and humoral immune responses of mice against ovalbumin (OVA) [525][526].

Noto-ginsenosides D, G, H, and K (**1512** and **1522**–**1524**, resp.), isolated from the roots of *Panax notoginseng*, exhibited immunological adjuvant activity by increasing the serum IgG level in mice sensitized with ovalbumin (OVA). Their adjuvant activities were very similar to those of purified QS-21 from *Quillaja saponaria* [428].

To find out the relationship between adjuvant activity and structure of protopanaxadiol-type saponins such as ginsenosides Rb_1 and Rd (**1507** and **1510**, resp.), and noto-ginsenosides K and R_4 (**1524** and **1525**, resp.) of *Panax notoginseng*, *Sun et al.* evaluated their adjuvant potentials on the cellular and humoral immune responses of ICR mice against OVA. The effect of the substitution patterns of these saponins on their biological activities was investigated. Among these four saponins, the order of immunostimulation index against OVA-induced splenocyte proliferation was $Rd > Rb_1 > K > R_4$. The adjuvant potential of **1510** on antibody response was higher than that of the other three saponins. On the basis of their results, it was suggested that the length of the sugar side chain at C(20) and the linkage of the glucose moiety at C(3) of the protopanaxadiol unit could affect the adjuvant activities [477].

Matsuda et al. examined the immunological adjuvant activity of isolated protojujubosides and jujubosides from the seeds of the Chinese medicinal plant *Zizyphus jujuba* var. *spinosa* on serum OVA antibody levels in OVA-immunized mice. Their experimental results indicated that jujuboside C (**1528**) significantly increased antibody level, much more than QS-21 (**1485**), while protojujuboside A (**1370**), and jujubosides A and B_1 (**1526** and **1527**, resp.) showed values very similar to that of QS-21. On the basis of these results, it may be concluded that the 3-glycoside moiety in jujubogenin/ketodammarane saponins is important for the adjuvant activity [440].

Saponin 1 (**706**) isolated from the roots of *Acanthophyllum squarrosum* showed a moderate, concentration-dependent immunomodulatory effect in an *in vitro* lymphocyte proliferation assay. It was not cytotoxic to lymphocytes in culture up to the concentration of 10 μg/ml, but, at higher concentrations, a marked cytotoxicity was noted (58% at 100 μg/ml). It displayed an immunostimulant activity on the B-lymphocyte induced by LPS at low concentrations (1 μg/ml–100 pg/ml). The T-lymphocyte proliferation was suppressed by it to *ca.* 40% at 1 μg/ml [264].

Several other triterpenoid saponins reported to be strong adjuvants are saponaside A from *Saponaria* [527], lablaboside F from *Dolichos lablab* seeds [528], onjisaponins from *Polygala tenuifolia* [529], *Astragalus* saponin from *Astragalus membranaceus* [530], and soyasaponins from soyabean [531].

6.23. *Inhibition of Superoxide Generation in Human Neutrophil.* The roots of *Annemone raddeana* are used in Chinese folk medicine for curing rheumatism and neuralgia [532]. This fact tempted *Lu et al.* to study the effect of six isolated compounds from the rhizome of *A. raddeana* on superoxide generation in human neutrophils. Superoxide generation in human neutrophils is stimulated during phagocytosis and by treatment of the cells with various stimuli, such as chemoattractants and activators of protein kinase. Among these isolated compounds, two saponins, raddeanosides 12 and 13 (**1464** and **1465**, resp.) suppressed the superoxide generation induced by *N*-formyl-methionyl-leucyl-phenylalanine (fMLP) in a concentration-dependent manner, while saponin Rd 10 (**1448**) significantly enhanced the fMLP-induced superoxide generation in a specific narrow range of low concentration (0.5–0.7 μM) and efficiently suppressed this generation at other concentrations (above 0.9 μM) [458].

The aqueous MeOH extract of the whole plant of *Bacopa monniera* exhibited an inhibitory effect on superoxide released from polymorphonuclear cells in the nitroblue tetrazolium assay. Bacoside A_3 (**1529**) was found to be responsible for this effect [478].

Russo et al. observed that the MeOH extract of *Bacopa monniera* showed free radical-scavenging activity by quenching synthetic DPPH. They also confirmed that this plant extract exhibited protection against plasmid DNA strand scission, induced by hydroxyl radicals, generated from UV photolysis of H_2O_2 [533].

6.24. *Effect on Enzymatic Activity.* Saponin 3 (**25**), isolated from common garden pea (*Pisum sativum*), showed potent inhibition of the enzyme diguanylate cyclase, the key regulatory enzyme of cellulose synthesis in the bacterium *Acetobacter xylinum*, present in the etiolated pea shoots [29][534].

Nobiloside (**1285**) isolated from the marine sponge *Erylus nobilis* inhibited the activity of the enzyme neuraminidase from the bacterium *Clostridium perfringens* with an IC_{50} value of 0.46 μg/ml [418].

Ilexoside XLVIII (**1463**) and cynarasaponin C (b) from *Ilex kudincha* exhibited inhibitory activities on acyl CoA cholesteryl acyl transferase (ACAT) at a concentration of 1 mg/ml with inhibition of 64.3 and 63.9%, respectively [119].

Foenumoside E (**62**), isolated from *Lysimachia foenum-graecum*, inhibited the production of COX-1 (cyclooxygenase-1) by 14% and 12-LOX (12-lipoxygenase) by 50% at 100 μM. Both enzymes are implicated in the development and metabolism of cancer cell lines [45].

The matrix metalloproteinases (MMPs) are the Zn-dependent endoproteinases that are capable of degrading almost all the components of the extracellular matrix, such as skin, resulting in skin cancer. Usually, UV radiation induces the synthesis of MMP in fibroblast cells *in vitro*, and this MMP expression causes the damage of the connective tissues of skin. *Moon et al.* isolated two triterpenoid saponins from the whole plant of *Viola ibukiana* MAKINO (Violaceae). One of them, compound **1446**, significantly inhibited UV-induced MMP-1 protein expression by 63.2% at 0.1 μM, 38.2% at 1 μM, and 30.9% at 10 μM concentration in cultured fibroblasts in a dose-dependent manner [457].

6.25. *Inhibitory Activity on Osteoclast Formation.* Osteoporosis is a skeletal disease especially of elderly women characterized by low bone mass and structural deterioration of bone tissue leading to bone fragility and susceptibility to fracture. The major cause of this disease is dramatic estrogen withdrawal in women and formation of osteoclast-like multinucleated cells (OCLs) induced by 1α,25-dihydroxy vitamin D3. The roots of *Achyranthes bidentata* have been used in Chinese traditional medicine to relief pain and difficulty in movement of knees and trauma. On the basis of this fact, *Li et al.* isolated five saponins, **253**–**257**, from the root of this plant and studied their activity against osteoclast formation. All these saponins showed significant inhibition on 1α,25-dihydroxy vitamin D3-induced OCL formation (OCL formation was 0.8–5.5%) at a concentration of 20 μM *in vitro* [101].

6.26. *Insecticidal Activity.* Dehydrosoyasaponin 1 (**1431**) found as minor component in field peas (*Pisum sativum*), alfalfa, and other legumes exhibited antifeedant and insecticidal activity against rice weevil, *Sitophilus oryzae*, an insect pest of stored products at a dose of 1.7 mg/200 mg flour. This activity is enhanced in presence of lysolecithins (= lyso-phosphatylcholines (linoleoyl, palmitoyl, and oleoyl derivatives)) at a dose of 0.4 mg/200 mg flour (median survival time was 6.7 days). Possibly, lysolecithins showed synergistic insecticidal activity with the saponin [454].

Saponins 3 and 7, **1447** and **336**, respectively, from the roots of *Viguiera decurrens* showed weak insecticidal activity against the Mexican bean beetle larvae (*Epilachna varivestis*) with LC_{50} values of 1380 and 80 μg/ml, respectively [133].

6.27. *Insulin-Like Activity. Sakurai et al.* found that the EtOH extract of the roots of the Chinese plant *Aesculus assamica* showed insulin-like activity against both rat and 3T3-LI adipocytes. This finding prompted them to isolate two saponins, assamicins 1 and II (**170** and **153**, resp.) and to study their insulin-like activity. Both compounds almost completely inhibited the release of free fatty acids from epinephrine-treated rat adipocytes at concentrations of 100 and 25 μg/ml, respectively, just like insulin. They also enhanced the glucose uptake into 3T3-LI adipocytes as insulin does by 2.5- and 3.5-fold, respectively, at the concentration of 25 μg/ml, of the control having no sample [68].

6.28. *Membrane Activity. Melzig et al.* studied the interaction of acylated and non-acylated saponins on calf aortic endothelial membrane and observed that acylated saponins **1475**–**1477** from *Solidago virgaurea* L., and acetylated saponins **710** and **711** from *Agrostemma githago* at low concentrations (in the range 4–20 μg/ml) induce changes in the membrane structure, creating pores. Such pore-forming activity may be utilized for drug delivery into the cells [465].

6.29. *Molluscicidal Activity.* Four saponins, pachyelasides A–D (**446**, **443**, **447**, and **448**, resp.) isolated from the roots of an African medicinal plant *Pachyelasma tessmanii* showed potent molluscicidal activity against the South American snail *Biomphalaria glabrata* with LD_{50} values of 2, 2, 2, and 8 μg/ml, respectively [181].

The maesasaponin mixture B (consisting of six saponins, **1491**–**1496**) from *Maesa lanceolata* exerted molluscicidal activity against the aqueous snail *Biomphalaria glabrata* with LD_{95} and LD_{50} values of 4.1 and 2.3 μg/ml, respectively [471].

Glycosides of serjanic acid, **1487** and **1488**, from the fruits of the Indonesian plant *Phytolacca icosandra* exhibited molluscicidal activity against the snail *Biomphalaria glabrata* with the minimum concentration of 3.1 μg/ml required to kill the snails [318].

6.30. *Neuropharmacological Activity. Bacopa monniera* (locally known as Brahmi), a creeping annual plant of Indian origin, has been used as brain tonic and restorative in debilitation disorders by Ayurvedic medicinal practitioners. The plant extract (BM) and isolated triterpenoid saponins, known as bacosides, have been shown to enhance protein kinase activity in the hippocampus, which could also contribute to its nootropic action [535]. *Bhattacharya et al.* reported that a standardized bacoside-rich extract of BM, when administered for two weeks in rats, reversed cognitive deficits induced by intracerebroventricularly administered colchicines and by injection of ibotenic acid into the nucleus basalis magnocellularis. The central cholinergic system is considered to be the most important neurotransmitter involved in the regulation of cognitive functions. Cholinergic neuronal loss in hippocampal area is the major feature of *Alzheimer*'s disease (AD), and enhancement of central cholinergic activity by anticholinesterase is the main pharmacotherapy of AD-type senile dementia. BM reversed the depletion of acetylcholine, reduction in choline acetylase activity, and thus decreased in muscarinic cholinergic receptor binding in the frontal cortex and hippocampus, induced by neurotoxin, colchicines [536]. So BM and its major active principles, bacosides, exhibited neuroprotective and cognition-enhancing effects. Further research on other pharmacological effects is required to establish its minimum side-effects before application of this drug for clinical trials [537].

6.31. *Activity against Endothelial Dysfunction*. Homocysteine (Hcy) is formed in the body during metabolism of methionine, and its level can be inordinately increased due to genetic and nutritional factors. Hyperhomocysteinemia (HHey) is a risk factor for cardiovascular disease, such as coronary atherosclerotic disease, hypertension, and peripheral vascular disease. HHey plays a key role in vascular endothelial dysfunction, primarily due to the impaired nitric-oxide signaling, resulting in relaxant impairment of large vessels and arterioles. Dried roots of *Astragalus membranaceus* are used in Chinese folk medicine for cardiovascular diseases. To find out the major role of bioactive components of the root, *Zhang et al.* used crude saponin and polysaccharide mixtures of this root to study the effect on endothelial dysfunction. The results of their observation indicate that both saponin mixture (ASP) and polysaccharide mixture (APS) significantly reduce the reactive oxygen species (ROS) and thus inhibit the endothelial dysfunction. ASP exerted a more potent antioxidative effect than APS. Possibly, pure saponins may be more effective than their mixture in normalizing the function of endothelial tissue and to overcome some cardiovascular diseases [538].

6.32. *Snake-Venom-Antidote Activity*. The Brazilian plant *Bredemeyera floribunda* is used to treat snake bites in Brazilian folk medicine [251]. Bredemeyerosides B and D (**874** and **875**, resp.) isolated from this plant showed snake-venom-antidote activity against the lethality of jararaca venom (5 mg/kg) injected to mice by the oral administration of this drug at a dose of 100 mg/kg (90% survival after 24 h) [307][308].

6.33. *Sweet Activity*. In Thai and Vietnamese systems of traditional medicine, the stems of *Albizia myriophylla* are used as a substitute of licorice due to their sweet taste. *Yoshikawa et al.* isolated five saponins, albiziasaponins A–E (**954**–**957**, **805**, resp.) from the stems of Thai *A. myriophylla*. Sensory evaluation of these saponins indicated that one of the major saponins, albiziasaponin B (**805**), showed potent sweetness, which was 600 times sweeter than sucrose, whereas the sweetness of albiziasaponin A (**954**) was only five times higher than that of sucrose. This indicates that a free COOH group at C(30) seems to be essential for potent sweetness with this class of compounds [291].

7. Future Prospects. – It is clear from the above mentioned biological and pharmacological studies that triterpenoid saponins will be a major source of herbal drugs formulation. Therefore, extensive phytochemical and biological investigations of the unexplored flora and fauna are expected from the scientists of global arena. Moreover, much multidisciplinary collaboration embracing the utilization of natural sources, particularly plants, is essential to find out an impressive number of novel potential drugs for many disease states.

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