A Comprehensive Review of Plant-derivedTriterpenoids, Structures and Cytotoxicity: An update from 2015 to 2024

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Table 1. The cytotoxicity of ursane-type triterpenoids (**1-127**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Salvia urmiensis Bunge	3β,11α-dihydroxy-urs-12-ene (**1**)	A549 MCF-7	ND ND	58
Ixora coccinea Linn	Ixoroid acid (**2**)	3T3 PC3 HeLa	>30 >30 >30	59
Combretum racemosum	3-*O*-β-acetyl-ursolic acid (**3**)	HL 60 K562	**14.50±2.50** 50±3.00	60
	24-hydroxy-tormentic acid (**4**)	HL 60 K562	NA NA	
Salvia urmiensis Bunge	Urs-12-ene- 1β,3β,11β,22α-tetraol (**5**)	MCF-7	88.35±0.09	61
Vitex trifolia var. *simplicifolia*	3β-hydroxy-30-al-urs-12-en-28-oic acid (**6**)	HL-60 SGC-7901 PANC-1 Eca-109	**4.12** **10.46** **9.61** **7.65**	52
Ficus pandurata	Ficupanduratin A/1β-hydroxy-3β-acetoxy-11α-methoxy-urs-12-ene (**7**)	VERO	NA	62
	Ficupanduratin B /21α-hydroxy-3β-acetoxy-11α-methoxy-urs-12-ene] (**8**)	VERO	NA	
	11α,21α-dihydroxy-3β-acetoxy-urs-12-ene (**9**)	VERO	NA	
Acanthopanax trifoliatus	Acantrifoic acid C (**10**)	SF-268 MCF-7 HepG2 NCI-H460	NA NA NA NA	63
	Acantrifoic acid D (**11**)	SF-268 MCF-7 HepG2 NCI-H460	NA NA NA NA	
Rubus fructicosus	2,3-*O*-isopropylidene-1β,2β,3β,19α-tetrahydroxyurs-12-en-28-oic acid (**12**)	HL-60	197.9±11.5	64
	1,2-*O*-isopropylidene-1β,2α,3α,19α-tetrahydroxyurs-12-en-28-oic acid (**13**)	HL-60	193.5±19.0	
	2,3-*O*-isopropylidenyl-2α,3α,19α-trihydroxyurs-12-en-28-oic acid (**14**)	HL-60	72.8±3.3	
	1β-hydroxyeuscaphic acid (**15**)	HL-60	>200	
Sonneratia paracaseolaris	Paracaseolin E (**16**)	P388 HeLa A549 K562	>50 30.41 >50 >50	65
	Dulcioic acid (**17**)	P388 HeLa A549	39.77 >50 18	

		K562	>50	
Chaenomeles speciosa	Dihydrotomentosolic acid (**18**)	A549 SK-OV-3 SK-MEL-2 XF498	21.71 >30.0 >30.0 27.94	66
	Ilexgenin B (**19**)	A549 SK-OV-3 SK-MEL-2 XF498	>30.0 >30.0 >30.0 >30.0	
Tripterygium wilfordii	Regelindiol A (**20**)	HepG2 Hep3B Bcap37 U251 MCF-7 A549	**10.97±1.74** 88.20±1.05 45.20±2.12 >100 >100 26.32±1.60	67
Rhododendron arboreum	15-oxoursolic acid (**21**)	H157 A498 Hep G2 NCI-H226) MDR 2780AD	**9.2±0.23** 32.8±1.54 **4.9±0.02** **10.3±0.01** **2.3±0.04**	53
Ilex rotunda THUNB.	19α,24-dihydroxyurs-12-ene-3-keto-28-oic acid (**22**)	MCF7 HepG2 HeLa LN229	54.29±4.32 >100 42.67±7.23 54.63±5.52	68
	Rotundic acid (**23**)	MCF7 HepG2 HeLa LN229	>100 >100 >100 >100	
	Ilexgenin A (**24**)	MCF7 HepG2 HeLa LN229	77.90±8.76 >100 60.85±6.51 74.08±6.35	
Dracocephalum taliense	2α,3α-dihydroxy-11α,12α-epoxy-urs-28,13β-olide (**25**)	HepG2 NCI-H1975 MCF-7	6.58±0.14 7.17±0.26 >80	69
Agrimonia pilosa	1β,3α,19α-trihydroxy-2-oxours-12-en-28-oic acid (**26**)	HeLa HL-60 MCF-7	>50 >50 >50	50
	1β,2α,19α-trihydroxy-3-oxours-12-en-28-oic acid (**27**)	HeLa HL-60 MCF-7	**16.06** 45.53 34.21	
	Tormentic acid (**28**)	HeLa HL-60 MCF-7	33.25 >50 >50	
	Corosolic acid (**29**)	HeLa HL-60 MCF-7	**14.73** >50 42.72	
	2β-hydroxy pomolic acid (**30**)	HeLa HL-60 MCF-7	>50 >50 >50	
	19α-hydroxy ursolic acid (**31**)	HeLa HL-60	>50 >50	

		MCF-7	>50	
	3-*O*-acetylpomolic acid (**32**)	HeLa HL-60 MCF-7	>50 >50 >50	
Salvia barrelieri Etl.	Ursolic acid (**33**)	HL60 K562 HT1080	>100 >100 >100	70
Ilex asprella (Hook. et Arn.) Champ. ex Benth	2α,3β,19α-trihydroxyurs-12-ene-23,28-dioic acid (**34**)	HL-60 Bel 7402 BGC-823 KB	ND ND ND ND	71
Vitellaria paradoxa	2β,3β,19α-trihydroxyurs-12-en-28-oic acid (**35**)	MDA-MB-231	>100	72
	1α,2β,3β,19α-tretrahydroxyurs-12-en-28-oic acid (**36**)	MDA-MB-231	63.5	
	2β,3β,19α-trihydroxyurs-12-en-28-oic methyl ester (**37**)	MDA-MB-231	46.7	
	1α,2β,3β,19α-tretrahydroxyurs-12-en-28-oic acid methyl ester (**38**)	MDA-MB-231	>100	
Betula schmidtii	2α-*O*-Benzoyl-3β,19α-dihydroxy-urs-12-en-28-oic acid (**39**)	A549 SK-OV-3 SK-MEL-2 HCT15	**7.26** **11.75** **11.03** **3.44**	54
	2α-*O*-Benzoyl-19α-hydroxy-3-oxo-urs-12-en-28-oic acid (**40**)	A549 SK-OV-3 SK-MEL-2 HCT15	**5.12** **10.71** **10.24** **3.63**	
	Corosolic acid (**29**)	A549 SK-OV-3 SK-MEL-2 HCT15	23.51 >30.0 >30.0 **13.04**	
Actinidia chinensis PLANCH.	2α,3α,23,24-tetrahydroxyursa-12,20(30)-dien-28-oic acid (**41**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	**19.62±0.81** **18.86±1.56** 45.94±3.62 62.41±2.29 28.74±1.07	73
	2α,3α,24-trihydroxyursa-12,20(30)-dien-28-oic acid (**42**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	84.43±6.33 **16.63±0.61** 47.93±4.78 22.91±7.01 **15.27±0.86**	
	2α,3α,23-trihydroxyurs-12-en-28-oic acid (**43**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	**12.22±1.19** 52.94±9.08 36.29±1.71 45.13± 9.64 49.71±8.18	
	2α,3α,19α,24-tetrahydroxyurs-12-en-28-oic acid (**44**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	65.48±7.26 22.60±3.61 68.88±3.61 66.84±1.79 29.35±0.97	

	2α,3β,23,24-tetrahydroxyurs-12-en-28-oic acid **(45)**	HepG2 A549 MCF-7 SK-OV-3 HeLa	**11.76±0.88** 50.50±5.09 **12.00±0.21** **10.30±0.68** 61.52±7.28	
	2α,3β,23-trihydroxyursa-12,20(30)-dien-28-oic acid (**46**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	36.40±8.23 40.37±2.91 44.3±4.87 **16.33±1.94** 68.07±3.11	
	2α,3β,19α,23-tetrahydroxyurs-12-en-28-oic acid (**47**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	**19.08±0.91** 32.08±7.97 35.74±1.97 54.31±8.25 **15.05±0.52**	
	2α,3α,24-trihydroxyurs-12-en-28-oic acid (**48**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	65.47±1.26 39.30±5.49 **11.01±1.54** 40.85±2.66 41.55±5.11	
	2α,3β,23-trihydroxyurs-12-en-28-oic acid (**49**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	**14.22±0.79** 50.24±12.49 **16.99±1.95** 28.87±1.17 54.93±1.66	
	2α,3α,23,24-tetrahydroxyurs-12-en-28-oic acid (**50**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	> 100 31.29±0.98 51.38±4.21 37.94±0.72 93.59±1.59	
	3β-hydroxyurs-12-en-28-oic acid (**51**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	48.36±12.04 **12.69±8.17** **11.15±0.85** 31.74±8.88 > 100	
	2β,3α,23-trihydroxyurs-12-en-28-oic acid (**52**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	32.48±0.96 > 100 86.19±9.99 50.07±3.79 63.94±4.27	
	2β,3β,23-trihydroxyurs-12-en-28-oic acid (**53**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	63.29±4.68 94.45±2.53 > 100 37.21±8.06 > 100	
Camptotheca acuminata	3β-hydroxyurs-12-en-28-al (**54**)	HepG2 Hep3B	68.0±0.97 84.5±4.50	74
	3β-hydroxyurs-12-en-28-oic acid (**51**)	HepG2 Hep3B	88.5±5.50 42.7±1.85	
	3α-hydroxyurs-12-en-28-oic acid (**55**)	HepG2 Hep3B	42.1±3.28 32.1±3.12	
	3-keto-urs-11-en-13β(28)-olide (**56**)	HepG2 Hep3B	37.7±2.02 74.2±2.45	

Markhamia stipulata var. *canaense* V.S. Dang	Ursolic acid (**33**)	 HeLa HepG2 MCF-7	Inhibition (%) **86.36±3.69** 29.50±1.84 27.67±1.57	75
	6β,19α-dihydroxyursolic acid (**57**)	HeLa HepG2 MCF-7	26.19±1.25 5.57±1.02 43.38±2.11	
Chisocheton paniculatus	Vismiaefolic acid (**58**)	A549 HeLa GSU	>100 >100 >100	76
Morinda officinalis	Marinoid A (**59**)	U2OS MG63	**13.8** **13.0**	77
	Marinoid B (**60**)	U2OS MG63	NA NA	
	Marinoid C (**61**)	U2OS MG63	NA NA	
	Marinoid D (**62**)	U2OS MG63	NA NA	
	Marinoid E (**63**)	U2OS MG63	NA NA	
	Marinoid F (**64**)	U2OS MG63	NA NA	
	Rotundic acid (**23**)	U2OS MG63	NA NA	
	Pomolic acid (**65**)	U2OS MG63	27.2 **16.7**	
	Omolic acid 3β-acetate (**66**)	U2OS MG63	NA NA	
Glechoma longituba	Euscaphic acid G/2α, 3α, 23-trihydroxy-13α, 27-cyclours-11-en-28-oic acid (**67**)	NCI-H460	**4.11±0.49**	44
	2α,3α,23-trihydroxyurs-12-en-28-oic acid (**43**)	NCI-H460	ND	
	2α,3β,24-trihydroxyurs-12-en-28-oic acid (**68**)	NCI-H460	ND	
	2α,3α,23- trihydroxyursa-12,20(30)-dien-28-oic acid (**69**)	NCI-H460	ND	
	2α,3α-dihydroxyurs-12-en-28-oic acid (**70**)	NCI-H460	ND	
	2α,3α,24-trihydroxyurs-12-en-28-oic acid (**48**)	NCI-H460	ND	
	Corosolic acid (**29**)	NCI-H460	ND	
	2α,3β-dihydroxy-13α,27-cyclours-11-en-28-oic acid (**10**)	NCI-H460	ND	
	Ursolic acid (**33**)	NCI-H460	ND	
	3α-hydroxyurs-12-en-28-oic acid (**55**)	NCI-H460	ND	
Sanguisorba officinalis L.	3-oxo-15α,19α-dihydroxyurs-12-en-28-oic acid (**71**)	A549	42.93±0.05	51
	3-oxo-7β,19α-dihydroxyurs-12-en-28-oic acid (**72**)	A549	NA	

	2α,19α-dihydroxy-3-oxo-12-ursen-28-oic acid (**73**)	A549	NA	
	3-oxo-19α-hydroxyurs-12-en-28-oic acid (**74)**	A549	45.75±1.54	
	3,11-dioxo-19α-hydroxyurs-12-en-28-oic acid (**75**)	A549	43.41±0.37	
	Ursolic acid (**33**)	A549	44.81±0.46	
	19α-hydroxy ursolic acid (**31**)	A549	43.07±0.73	
	1α,2β,3β,19α-tretrahydroxyurs-12-en-28-oic acid (**36**)	A549	NA	
	1β-hydroxyeuscaphic acid (**15**)	A549	56.99±0.77	
	Euscaphic acid (**76**)	A549	NA	
	Fupenzic acid (**77**)	A549	45.41±0.86	
Dipsacus asper	3β-*O*-trans-feruloyl-2*α*-hydroxy-urs-12-en-28-oic acid (**78**)	A549 H157 HepG2 MCF-7	**12.80** **5.66** **9.50** **9.36**	55
Peganum harmala L	Urs-12-ene-28-carboxy-3α-tetradecanoate (**79**)	HeLa HepG2 SGC-7901	**15.1±1.0** 21.4±1.4 37.8±0.7	78
Penianthus zenkeri Diels	Uvaol (**80**)	KB-3-1	ND	79
	Ursolic acid (**33**)	KB-3-1	50.9	
Vaccinium emarginatum	3β-*O*-(E)-coumaroyl-19α-hydroxyurs-12-en-28-oic acid (**81**)	 PC-3 Du145	Inhibition (%) **89.3±0.5** NA	80
	3β-*O*-(Z)-coumaroyl-19α-hydroxyurs-12-en-28-oic acid (**82**)	PC-3 Du145	ND ND	
Salvia urmiensis Bunge	Salvurmin B (**83**)/3-oxo-30-hydroxy-urs-1,9,12-triene	SW1116 MCF-7	23.2±0.4 40.2±3.1	45
Melaleuca linariifolia	Urs-12,16-dien-3-one (**84**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	NA NA NA NA NA NA	48
	3β-acetoxy-11-ursen-13α,30-olide (**85**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	NA NA NA NA NA NA	
	3β-acetoxy-urs-12-ene-28-oic acid (**86**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	**15.15±2.05** NA NA NA NA NA	
Ophiorrhiza baviensis	3β,23,24-trihydroxyurs-12-en-28-oic acid (**87**)	MCF-7 HeLa	>50 >50	47

		KB A549	>50	
		SK-LU-1	>50	
	3β,19α,23,24–tetrahydroxyurs-12-en-28-oic acid (**88**)	MCF-7	>50	
		HeLa	>50	
		KB A549	>50	
		SK-LU-1	>50	
	Rutundic acid (**89**)	MCF-7	>50	
		HeLa	>50	
		KB A549	>50	
		SK-LU-1	>50	
Sanguisorba officinalis L	3-oxo-urs-11, 13(18)-dien-19, 28-olide (**90**)	A549	NA	81
		HeLa	NA	
		SK-Hep1	NA	
Styrax argentifolius H.L. Li	2α,3α,24-trihydroxyurs-12-en-28-oic acid (**48**)	KB	>100	82
		HepG2	>100	
		LU	>100	
Euphorbia fischeriana	Euphorfistrine F (**91**)	MCF-7	58.68±1.72	83
		HeLa	32.54±0.63	
		HCC1806	>100	
		PC3	>100	
		A549	99.58±1.52	
		H460	**6.7±0.21**	
		LO2	>100	
Juglans hopeiensis Hu	Jughopanes A (**92**)	MCF7	NA	84
		HT29	NA	
	Jughopanes B (**93**)	MCF7	NA	
		HT29	NA	
	2α-hydroxyursolic acid (**94**)	MCF7	**5.25**	
		HT29	**6.01**	
Schefflera barteri Harms	Jughopane B (**95**)	KB-3-1	NA	85
		HT29	NA	
	23-hydroxy-3-oxo-urs-12-en-28-oic acid (**96**)	KB-3-1	>90	
		HT29	> 90	
	23-hydroxyursolic acid (**97**)	KB-3-1	6.89±7.62	
		HT29	3.95±4.41	
Potentilla freyniana Bornm.	Ursolic acid (**33**)	Hep-G2	NA	86
		HCT-116	NA	
		BGC-823	NA	
		MCF-7	NA	
	Pomolic acid (**65**)	Hep-G2	NA	
		HCT-116	NA	
		BGC-823	NA	
		MCF-7	NA	
	Euscaphic acid (**76**)	Hep-G2	NA	
		HCT-116	NA	
		BGC-823	NA	
		MCF-7	NA	
	Tormentic acid (**28**)	Hep-G2	NA	
		HCT-116	NA	
		BGC-823	NA	
		MCF-7	NA	
	2-oxo-pomolic acid (**98**)	Hep-G2	NA	

		HCT-116 BGC-823 MCF-7	NA NA NA	
	3-hydroxy-13,28-epoxyurs-11-en-28-one (**99**)	Hep-G2 HCT-116 BGC-823 MCF-7	NA NA NA NA	
Dracocephalum moldavica L	Ursolic acid (**33**)	HeLa A549 HepG2	NA NA NA	87
	Colosolic acid (**100**)	HeLa A549 HepG2	NA NA NA	
	Euscaphic acid (**76**) 8	HeLa A549 HepG2	NA NA NA	
	Asiatic acid (**101**)	HeLa A549 HepG2	NA **6.62±0.34** **5.80±1.2**8	
	Esculentic acid (**102**)	HeLa A549 HepG2	NA NA NA	
	3β,24-dihydroxyurs-12-en-28-oic acid (**103**)	HeLa A549 HepG2	NA NA NA	
	(3β,6β)-3,6-dihydroxyurs-12-en-28-oic acid (**104**)	HeLa A549 HepG2	NA NA NA	
Potentilla atrosanguinea	Ursolic acid (**33**)	BC	**8.14**	88
	Euscaphic acid (**76**)	BC	50.27	
	3α,20α-dihydroxy-2-oxo-urs-12-en-28-oic acid (**105**)	BC	**12.45**	
Bauhinia variegata Linn	3*α*-hydroxy-urs-12, 15-diene (**106**)	DU-145 MCF-7 PC-3 HT-29	>20 >20 >20 >20	89
Swertia mileensis	Ursolic acid lactone (**107**)	HepG2 MDA-MB-231	NA NA	90
	Ursaldehyde (**108**)	HepG2 MDA-MB-231	NA NA	
	Robustanic acid (**109**)	HepG2 MDA-MB-231	NA NA	
Camellia ptilosperma	Ptilospermanol A (**110**)	HeLa H460 MB231 A549 HCT116 HT29 LLC CT26 Hepa 1-6	5.2±0.4 >10 2.2±0.3 >10 5.7±1.7 6.8±0.9 >10 7.5±0.1 4.7±0.5	56

	Ptilospermanol B (**111**)	HeLa	>10	
		H460	>10	
		MB231	4.9±0.7	
		A549	>10	
		HCT116	8.2±0.6	
		HT29	>10	
		LLC	>10	
		CT26	9.1±0.3	
		Hepa 1-6	>10	
	Ptilospermanol C (**112**)	HeLa	8.1±0.5	
		H460	>10	
		MB231	>10	
		A549	>10	
		HCT116	>10	
		HT29	8.5±0.3	
		LLC	>10	
		CT26	>10	
		Hepa 1-6	4.1±0.4	
	Ptilospermanol D (**113**)	HeLa	0.7±0.2	
		H460	>10	
		MB231	2.7±0.2	
		A549	>10	
		HCT116	1.4±0.5	
		HT29	5.1±1.1	
		LLC	>10	
		CT26	>10	
		Hepa 1-6	2.7±0.3	
	Ptilospermanol E (**114**)	HeLa	>10	
		H460	>10	
		MB231	>10	
		A549	>10	
		HCT116	>10	
		HT29	>10	
		LLC	>10	
		CT26	8.2±0.9	
		Hepa 1-6	>10	
	Ptilospermanol F (**115**)	HeLa	>10	
		H460	>10	
		MB231	9.3±0.5	
		A549	>10	
		HCT116	7.5±1.0	
		HT29	>10	
		LLC	>10	
		CT26	>10	
		Hepa 1-6	>10	
Primulina eburnea	Eburnealactone A (**116**)	A549	30.702±0.345	91
		MKN-45	**9.571±0.139**	
		PATU8988T	38.223±0.627	
		5637	**8.303±0.155**	
		L-02	NA	
		293T	NA	
	Eburnealactone B (**117**)	A549	NA	
		MKN-45	NA	

		PATU8988T 5637 L-02 293T	NA NA NA NA	
	Ursolic acid[(**33**)	A549 MKN-45 PATU8988T 5637 L-02 293T	24.964±0.036 NA NA NA NA NA	
Prunella vulgaris L.	2α,3α,22β,23α-tetrahydroxyurs-12-en-28-oic acid (**118**)	SW579	NA	92
	2α, 3α, 19α, 21α-tetrahydroxyurs-12-en-28-oic acid (**119**)	SW579	NA	
	2α, 3α-dihydroxyurs-23β(acetyl)-12,20(30)-dien-28-oic acid (**120**)	SW579	NA	
	2α, 3α, 20β, 24-tetrahydroxyurs-12-en-28-ursolic acid (**121**)	SW579	NA	
Syzygium jambos (L.) Alston	3β-acetoxy-2α,23-dihydroxyurs-12-en-28-oic acid (**122**)	H1975 HCC827	>40 >40	57
	23-acetoxy-2α,3β-dihydroxyurs-12-en-28-oic acid (**123**)	H1975 HCC827	>40 >40	
	23-*O-trans*-feruloyl-2α,3β-dihydroxyurs-12-en-28-oic acid (**124**)	H1975 HCC827	**4.16±0.23** **5.49±0.34**	
Gentiana scabra Bge.	3β-*O*-benzoyl-2α-hydroxyurs-12-en-28-oic acid (**125**)	Hep3B HCT116 HepG2 U87	51.26±6.61 >100 >100 >100	93
Syzygium handelii	3*β*-acetoxy-27-*trans*-caffeoyloxyurs-12-en-28-oic acid-methyl ester (**126**)	HepG2	81.3	49
	3*β*-acetoxy-27-*cis*-caffeoyloxyurs-12-en-28-oic acid-methyl ester (**127**)	HepG2	72.1	

Note: ND=not determined; NA= no active;

Table 2. The cytotoxicity of *nor*-ursane-type triterpenoids (**128-132**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Swertia mileensis	28-*nor*-urs-12-en-3β,17β-diol (**128**)	HepG2 MDA-MB-23	NA NA	90
Camptotheca acuminata	28-*nor*-urs-12-en-3β, 17β-diol (**128**)	HepG2 Hep3B	92.0±3.94 59.4±1.54	74
Dipsacus asper	2α,3β,24-trihydroxy-23-*nor*-urs-12-en-28-oic acid (**129**)	A549 H157 HepG2 MCF-7	NA NA NA NA	55
Potentilla freyniana Bornm.	2-hydroxymethyl-1-*nor*-ursa-2,12-dien-29-oic acid (**130**)/ Madengaisu B (**130**)	Hep-G2 HCT-116 BGC-823 MCF-7	NA NA 24.76±0.94 NA	86
	Rosamultic acid (**131**)	Hep-G2 HCT-116 BGC-823 MCF-7	NA NA NA NA	
	Hyptadienic acid (**132**)	Hep-G2 HCT-116 BGC-823 MCF-7	25.16±2.55 NA NA NA	

Table 3. The cytotoxicity of *seco*-ursane-type triterpenoids (**133-145**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Betula schmidtii	Schmidic acid (**133**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	54
	Cecropiacic acid 3-methyl ester (**134**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	
Betula pubescens	3,4-*seco*-urs-4(23),20(30)-dien-3-oic acid (**135**)	A375 AGS DLD-1 HeLa,	NA NA NA NA	94
	3,4-*seco*-urs-4(23),20(30)-dien-19-ol-3-oic acid (**136**)	A375 AGS DLD-1 HeLa	53±3.5 36±4.2 26±2.7 25±2.0	
Potentilla freyniana Bornm.	Cecropiacic acid (**137**)	Hep-G2 HCT-116 BGC-823	NA NA NA	86

		MCF-7	NA	
Gentiana scabra Bge.	3,4-*seco*-ursan-28-hydroxy-12-en-3-oic acid (**138**)	Hep3B HCT116 HepG2 U87	66.22±2.40 >100 >100 >100	93
Salvia urmiensis Bunge	Urmiensolide B /3-oxo-11α-hydroxy-17,22-*seco*-urs-12-en-22,17-lactone (**139**)	A549 MCF-7	**12.1±0.1** **2.8±0.08**	58
	Urmiensic acid /11α-hydroxy-3-oxo-17,22-*seco*-urs-12,17(28)-diene-22-oic acid (**140**)	A549 MCF-7	**10.9±0.18** **1.6±0.03**	
Salvia urmiensis Bunge	Salvurmin A /1β-hydroxy-3β-O-acyl-17,22-*seco*-urs-9,12,17(28)-triene-22-oic acid (**141**)	SW1116 MCF-7	41.6±2.6 54.2±5.3	45
Sanguisorba officinalis L.	18,19-*seco*,1β-hydroxyl-3,19-dioxo-urs-11,13(18)-dien-28-oic acid (**142**	A549	52.04±1.09	51
Isodon serra	Serratic Acid A (**143**)	B16-F10 A375 A549 MDA-MB-231	**10.42±0.03** >20 **8.80±0.10** >20	95
	Serratic Acid B (**144**)	B16-F10 A375 A549 MDA-MB-231	NA NA NA NA	
	Serratic Acid C (**145**)	B16-F10 A375 A549 MDA-MB-231	NA NA NA NA	

Table 4. The cytotoxicity of *seco*-ursane-type triterpenoid glycosides (**146-151**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Ilex rotunda THUNB.	Laevigin E (**146**)	MCF7 HepG2 HeLa LN229	17.83±2.09 79.13±9.12 22.58±2.09 30.98±2.77	68
Ilex asprella (Hook. et Arn.) Champ. ex Benth.	3-*O*-α-L-rhamnopyranosyl-(1→2)-β--xylopyrann osyl 19-*O*-β-D-glucopyranosyl-16-β-hydroxyl-18,19-*seco*-13(18)-urs-ene-21, 28-lactone (**147**)/Ilexasprellanoside J (**147**)	HL-60 Bel 7402 BGC-823 KB	NA NA NA NA	71
	3-*O*–β-D-xylopyrannosyl-19-*O*-α-L-rhamnopyranosyl-(1→2)-α-L-arabinopyranoside-16, 21-epoxy-18,19-*seco*-13(18)-urs-ene-28-oic acid (**148**)/Ilexasprellanoside K (**148**)	HL-60 Bel 7402 BGC-823 KB	NA NA NA NA	
Potentilla freyniana Bornm.	Potentillanoside E (**149**)	Hep-G2 HCT-116 BGC-823	NA NA NA	86

		MCF-7	NA	
Elsholtzia penduliflora W. W.	Penduloside A (**150**)/ 2α,3β-dihydroxy-19-oxo-18,19-*seco*-urs-11,13(18)-dien-28-*O*-β-ᴅ-glucopyranoside (**150**)	A549 MCF-7	NA NA	96
	Penduloside B (**151**)/2α,3α-dihydroxy-19-oxo-18,19-*seco*-urs-11,13(18)-dien-28-*O*-β-ᴅ-glucopyranoside (**151**)	A549 MCF-7	NA NA	

Table 5. The cytotoxicity of ursane-type triterpenoid glycosides (**152-167**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Combretum racemosum	Kaji-ichigoside F1 (**152**)	HL 60 K562	NA NA	60
Ilex rotunda THUNB.	Pedunculoside (**153**)	MCF-7 HepG2 HeLa LN229	29.50±3.51 >100 79.06±8.17 33.08±4.16	68
	3β-*O*-α-L-arabinopyranosyl-19α-hydroxyurs-12-en-28-oic acid (**154**)	MCF-7 HepG2 HeLa LN229	50.36±6.43 >100 >100 >100	
	Mateside (**155**)	MCF-7 HepG2 HeLa LN229	30.88±2.74 94.06±7.60 33.34±1.88 45.35±3.41	
Agrimonia pilosa	Rosamultin (**156**)	HeLa HL-60 MCF-7	>50 >50 >50	50
	Ziyu-glucoside II (**157**)	HeLa HL-60 MCF-7	**3.65** >50 >50	
Ilex asprella (Hook. et Arn.) Champ. ex Benth	3-*O*-[α-L-rha-(1→2)-β-D-xyl]-hydroxyurs-12-en-28-oic acid (**158**)	HL-60 Bel 7402 BGC-823 KB	NA NA NA NA	71
	3β-[(α-L-arabinopyranosyl)oxy]-19α-hydroxy-urs-12-en-28-oic acid-28-β-D-glucopyranosyl ester (**159**)	HL-60 Bel 7402 BGC-823 KB	ND ND ND ND	
Betula schmidtii	2-oxo-pomolic acid β-D-glucopyranosyl ester (**160**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	54
Globimetula dinklagei,	3-*O*-β-D-glucopyranosyl-α-amyrin (**161**)	MCF-7 HeLa Caco-2 A549	76.83±1.59 83.36±1.46 98.74±15.53 >100	97
Phragmanthera capitata	3-*O*-β-D-glucopyranosyl-28-hydroxy-α-amyrin (**162**)	MCF-7 HeLa	70.43±16.37 **6.88±2.41**	

		Caco-2 A549	>100 >100	
Schefflera barteri Harms	23-hydroxyursolic acid 3-*O*-α-L-arabinopyranoside (**163**)	KB-3-1 HT29	ND ND	85
	23-hydroxyursolic acid 3-*O*-β-D-glucopyranoside (**164**)	KB-3-1 HT29	ND ND	
Potentilla freyniana Bornm.	Rosamultin (**156**)	Hep-G2 HCT-116 BGC-823 MCF-7	NA NA NA NA	86
	Rubuside A (**165**)	Hep-G2 HCT-116 BGC-823 MCF-7	NA NA NA NA	
Elsholtzia penduliflora W. W.	Penduloside G (**166**) /2*α*,3*α*,19*α*-trihydroxylurs-12-en-28-oic acid 28-*O*-β-ᴅ-glucopyranosyl-(1→ 2)-β-ᴅ-glucopyranoside (**166**)	A549 MCF-7	**6.18±1.06** **6.82±1.09**	96
	Officinoterpenoside B (**167**)	A549 MCF-7	NA NA	

Table 6. The cytotoxicity for oleanane-type triterpenoids (**168-337**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Momordica cochinchinensi	Arjunolic acid (**168**)	HL-60 SMMC-7721 PANC-1 A-549 SW-480	NA NA NA NA NA	115
	Gypsogenic acid (**169**)	HL-60 SMMC-7721 PANC-1 A-549 SW-480	NA NA NA NA NA	
	Oleragenin (**170**)	HL-60 SMMC-7721 PANC-1 A-549 SW-480	NA NA NA NA NA	
	Gypsogenin (**171**)	HL-60 SMMC-7721 PANC-1 A-549 SW-480	NA NA NA NA NA	
	Oleanolic acid (**172**)	HL-60 SMMC-7721 PANC-1 A-549	>40 34.4 >40 32.8	

		SW-480	>40	
	Hederagenin (**173**)	HL-60 SMMC-7721 PANC-1 A-549 SW-480	NA NA NA NA NA	
Paeonia lactiflora	Paeonenoide A (**174**)	HL-60 Hep-G2 SK-OV-3	27.7±2.0 **15.1±1.3** 27.3±0.8	105
	11*α*,12*α*-epoxy-3β,23-dihydroxyolean-28,13β-olide (**175**)	HL-60 Hep-G2 SK-OV-3	24.4±3.1 **13.2±1.9** 22.0±1.4	
	11*α*,12*α*-epoxy-3β-hydroxyolean-28,13β-olide (**176**)	HL-60 Hep-G2 SK-OV-3	51.1±4.2 23.9±2.1 31.0±2.5	
	Oleanolic acid (**172)**	HL-60 Hep-G2 SK-OV-3	ND ND ND	
	Hederagenine (1**73)**	HL-60 Hep-G2 SK-OV-3	ND ND ND	
Combretum racemosum	Arjunolic acid (**168**)	HL 60 K562	NA NA	60
	Arjungenin (**177**)	HL 60 K562	NA NA	
	Terminolic acid (**178**)	HL 60 K562	NA NA	
	Combregenin (**179**)	HL 60 K562	NA NA	
	Bellericagenin B (**180**)	HL 60 K562	NA NA	
Bupleurum chinense	16β,22α,23α,28β-tetrahydroxy-11α-methoxyl-olean-12-en-3-one (**181**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 65.9 >80 >80 >80	116
	16α,23α,28β-trihydroxyoleana-11,13(18)-diene-3-one (**182**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 >80 >80 >80 >80	
	3β,23α,28β-trihydroxyoleana-11,13(18)-diene-16-one (**183**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 >80 >80 >80 >80	
	Saikogenin F (**184**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 75.7 >80 >80 >80	
	Saikogenin G (**185**)	A549	>80	

		HepG2	63.35	
		Hep3B	>80	
		BCAP-37	>80	
		MCF-7	>80	
	Saikogenin D (**186**)	A549	>80	
		HepG2	>80	
		Hep3B	>80	
		BCAP-37	>80	
		MCF-7	>80	
	Saikogenin A (**187**)	A549	>80	
		HepG2	>80	
		Hep3B	>80	
		BCAP-37	>80	
		MCF-7	>80	
Hydrocotyle nepalensis	Bemeuxin (**188**)	HL-60	**15.14**	104
		SMMC-7721	>40	
		A-549	22.89	
		MCF-7	25.29	
		SW480	>40	
	Barringtogenol C (**189**)	HL-60	22.66	
		SMMC-7721	**19.94**	
		A-549	**16.11**	
		MCF-7	**17.82**	
		SW480	21.97	
Salvia urmiensis Bunge	Olean-12-ene-1β,3β,11α,22α-tetraol (**190**)	MCF-7	110.23±0.12	61
Tripterygium regelii	Triregeloic acid (**191**)	MCF-7	Inhibitory rate (%) 24.1±2.21	117
Peganum harmala	3α-acetoxy-27-hydroxyolean-12-en-28-oic acid methyl ester (**192**)	A549	**8.03±0.81**	106
		H460	36.11±1.75	
		U-937	41.31±2.33	
		KG1	27.25±1.59	
		3T3	> 100	
Gypsophila oldhamiana	3β-hydroxyolean-13(18)-ene-23,28-dioic acid (**193**)	H460	7.14	118
	3β,12α-dihydroxy-23-carboxyolean-28,13β-olide (**194**)	H460	9.90	
Sonneratia paracaseolaris	Oleanolic acid (**172**)	P388	>50	65
		HeLa	>50	
		A549	23.90	
		K562	>50	
	3β-*O*-*trans*-*p*-coumaroyl maslinic acid (**195**)	P388	11.04	
		HeLa	13.10	
		A549	>50	
		K562	>50	
	3β-*O*-*cis*-*p*-coumaroyl maslinic acid (**196**)	P388	23.04	
		HeLa	24.90	
		A549	>50	
		K562	16.28	
Caragana sukiensis	β-amyrin (**197**)	HeLa	27.94	107
		A-549	23.55	
		MCF-7	35.31	

		DU-145 HEK-293	27.88 94.40	
	Soyasapogenol B (**198**)	HeLa A-549 MCF-7 DU-145 HEK-293	3.491 **2.104** **2.328** 10.93 >100	
	Melilotigenin C (**199**)	HeLa A-549 MCF-7 DU-145 HEK-293	18.62 21.24 28.65 26.00 95.60	
Chaenomeles speciosa	Maslinic acid **(200**)	A549 SK-OV-3 SK-MEL-2 XF498	>30.0 >30.0 >30.0 >30.0	66
Nuxia oppositifolia	3-oxoolean-12-en-29α-oic acid (katononic acid) (**201**)	HeLa A549 MDA	> 50 > 50 39.64	119
	2α,3β-dihydroxyolean-12-en-28-oic acid (Maslinic acid) (**200**)	HeLa A549 MDA	> 50 > 50 > 50	
	Oleanolic acid (**172**)	HeLa A549 MDA	> 50 > 50 > 50	
	3,11-dioxoolean-12-en-28-oic acid (**202**)	HeLa A549 MDA	ND ND ND	
Euphorbia fischeriana	Langdudajiin A (**203**)	Hep-3B A549	**12.52±1.16** **11.91±0.55**	108
Tripterygium wilfordii	28-hydroxy-3-oxo-olean-12-en-29-oic acid (**204**)	HepG2 Hep3B Bcap37 U251 MCF-7 A549	41.00±1.42 >100 70.40±1.37 >100 >100 29.81±1.68	67
	Regelin D (**205**)	HepG2 Hep3B Bcap37 U251 MCF-7 A549	**18.38±2.10** 75.35±1.16 52.33±1.92 >100 >100 37.62±1.56	
	Regelindiol B (**206**)	HepG2 Hep3B Bcap37 U251 MCF-7 A549	33.37±1.83 >100 37.73±1.41 >100 >100 67.23±1.21	
	3-acetoxy oleanolic acid (**207**)	HepG2 Hep3B Bcap37 U251 MCF-7	74.40±1.06 55.30±1.44 >100 >100 >100	

		A549	**16.09±1.84**	
Alafia barteri	3β-acetyloleana-5,12-dien-2,23-diol (**208**)	K562 WRL MCF-7 COLO	NA NA NA NA	120
Aralia armata (WALL.) SEEM.	3β-hydroxyoleana-11,13(18)-diene-28,30-dioic acid (**209**)	Sl-1	NA	121
	3-oxooleana-11,13(18)-diene-28,30-dioic acid (**210**)	Sl-1	NA	
	3β-hydroxyoleana-11,13(18)-dien-28-oic acid (**211**)	Sl-1	NA	
Agrimonia pilosa	Maslinic acid (**200**)	HeLa HL-60 MCF-7	>50 >50 >50	50
	18α-oleanolic acid (**212**)	HeLa HL-60 MCF-7	>50 >50 >50	
	Oleanolic acid (**172**)	HeLa HL-60 MCF-7	>50 >50 >50	
Echinochloa utilis Ohwi & Yabuno	Sawamilletin (**213**)	HeLa HL-60 MCF-7	>50 >50 >50	122
Tanacetum chiliophyllum var. *monocephalum*	Ulubelenolide (**214**)	PC3 MCF-7 U87MG HEK293	NA NA NA NA	123
Scopulariopsis sp.	3β,7β,15α,24-tetrahydroxyolean-12-ene-11,22-dione (**215**)	L5178Y	NA	124
	15α,22β,24-trihydroxyolean-11,13-diene-3-one (**216**)	L5178Y	NA	
Akebia trifoliata	2α,3β,23-trihydroxymultior-7-en-28-oic acid (**217**)	A549 HeLa HepG2	27.58±3.24 31.45±2.38 38. 52±5.63	125
	2α,3β-dihydroxyolean-13(18)-en-28-oic acid (**218**)	A549 HeLa HepG2	>100 >100 >100	
	2α,3β,29-trihydroxyolean-12-en-28-oic acid (**219**)	A549 HeLa HepG2	>100 >100 >100	
	Stachlic acid A (**220**)	A549 HeLa HepG2	>100 >100 >100	
	Mesembryanthemoidigenic acid (**221**)	A549 HeLa HepG2	>100 >100 >100	
	Gypsogenic acid (**169**)	A549 HeLa HepG2	26.54±7.52 43.63±8.41 35.67±7.50	

	Serratagenic acid (**222**)	A549 HeLa HepG2	>100 81.49±16.50 73.47±0.90	
	Akebonoic acid (**223**)	A549 HeLa HepG2	48.77±8.56 27.82±7.53 51.94±5.37	
Salvia barrelieri Etl.	3β-acetoxy-olean-18-ene-2α-ol (**224**)	HL60 K562 HT1080	>100 >100 28.75±0.4	70
	epi-germanidiol (**225**)	HL60 K562 HT1080	54.0±0.8 85.0±1.6 50.0±0.9	
	Olean-18-ene-1β,2α,3β-triol (**226**)	HL60 K562 HT1080	>100 >100 >100	
	Germanicol (**227**)	HL60 K562 HT1080	42.0±0.6 82.0±1.4 37.5±0.6	
	Micromeric acid (**228**)	HL60 K562 HT1080	52.0±0.9 82.0±1.0 41.5±0.7	
Ilex asprella (Hook. et Arn.) Champ. ex Benth	2α,3β,19α-trihydroxy-olean-12-ene-23,28-dioic acid (**229**)	HL-60 Bel 7402 BGC-823 KB	ND ND ND ND	71
Betula schmidtii	(3β)-3,23,28-trihydroxyolean-12-en-11-one (**230**).	A549 SK-OV-3 SK-MEL-2 HCT15	21.48 >30.0 >30.0 **18.23**	54
	11-oxo-erythrodiol (**231**)	A549 SK-OV-3 SK-MEL-2 HCT15	**15.40** >30.0 27.56 **16.15**	
	Maslinic acid (**200**)	A549 SK-OV-3 SK-MEL-2 HCT15	**4.51** 20.27 21.04 **3.31**	
	Morolic acid 3-*O*-caffeate (**232**)	A549 SK-OV-3 SK-MEL-2 HCT15	**1.83** **5.72** **4.08** **1.53**	
	Ambradiolic acid (**233**)	A549 SK-OV-3 SK-MEL-2 HCT15	**2.16** 24.65 **11.06** **1.94**	
Actinidia chinensis PLANCH.	2α,3β-dihydroxyolean-12-en-28-oic acid/(Maslinic acid) (**200**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	67.83±7.94 23.20±0.70 52.25±2.10 79.07±12.57 51.81±4.37	73
	2α,3α,24-trihydroxyolean-12-en-28-oic acid (**234**)	HepG2 A549 MCF-7	> 100 42.74±1.34 71.65±7.48	

		SK-OV-3 HeLa	25.83±0.78 63.23±4.05	
	3β-hydroxyolean-12-en-28-oic acid /Oleanolic acid (**172**)	HepG2 A549 MCF-7 SK-OV-3 HeLa	85.33±2.55 34.45±4.53 42.20±3.62 49.55±7.00 65.53±9.93	
Camptotheca acuminata,	3β-hydroxyolean-12-en-28-oic acid/Oleanolic acid (**172**)	HepG2 Hep3B	88.5±1.50 90.5±3.50	74
	3-oxo-olean-12-en-28-oic acid (**235**)	HepG2 Hep3B	39.1±3.09 92.0±3.00	
Phytolacca acinosa	Jaligonic acid B (**236**)	HL-60 HepG2.2.1.5 BEL-7402	> 200 > 200 > 200	126
	Jaligonic acid (**237**)	HL-60 HepG2.2.1.5 BEL-7402	> 200 > 200 > 200	
Turraea vogelii Hook. f. ex benth	Oleana-12,15,20-trien-3β-ol **(238)**	K562 WRL68 MCF-7	**7.31** NA NA	103
	Oleana-11,13-dien-3β,16α,28-triol **(239)**	K562 WRL68 MCF-7	95.30 NA NA	
Schima crenata	16α-*O*-acetyl-21β,22α-di-*O*-angeloyl-R_1-barrigenol (**240**)	HepG2 MDA-MB-231 MCF-7 HeLa	**13.1±0.58** 21.3±3.45 21.9±2.58 **16.9±1.91**	109
	22α-*O*-angeloyl-28-*O*-acetyl-3β,15α,16α-trihydroxyolean-12-en (**241**)	HepG2 MDA-MB-231 MCF-7 HeLa	**5.4±0.95** >50 >50 >50	
	22α-*O*-angeloyl-15-*O*-acetyl-3β,16α,28β-trihydroxyolean-12-en (**242**)	HepG2 MDA-MB-231 MCF-7 HeLa	**14.3±0.05** **12.9±1.56** **11.9±2.11** **19.3±0.95**	
	A_1-barrigenol (**243**)	HepG2 MDA-MB-231 MCF-7 HeLa	>50 >50 >50 >50	
	22α-*O*-angeloyl-A_1-barrigenol (**244**)	HepG2 MDA-MB-231 MCF-7 HeLa	22.1±1.01 33.6±5.24 45.0±3.76 **18.7±4.06**	
Leonurus japonicus	Leonuronin A / 23-*trans*-cafeoyloxy-2α,3β-dihydroxy-olean-12- en-28-oic acid (**245**)	A549 HeLa	12.56 18.13	110
	Leonuronin B / 2α-*trans*-*p*-coumaroyl-3β,23-dihydroxy-olean-12-en-28-oic acid (**246**)	A549 HeLa	6.97 12.32	
	Urjinolic acid (**247**)	A549 HeLa	ND ND	

	2α,3β,23-trihydroxyoleana-11,13(18)-dien-28-oic acid (**248**)	A549 HeLa	ND ND	
	β-amyrenol (**249**)	A549 HeLa	ND ND	
Morinda officinalis	Marinoid G (**250**)	U2OS MG63	NA NA	77
	Spathodic acid (**251**)	U2OS MG63	**18.4** 30.9	
	Sumaresinolic acid (**252**)	U2OS MG63	NA NA	
Sanguisorba officinalis L	Arjunic acid (**253**)	A549	NA	51
	2α,3α,9α,24-tetrahydroxyolean-12-en-28-oic acid (**254**)	A549	NA	
Juglans mandshurica Maxim	Klodorol B (**255**)	BGC-823 HepG-2 A549	52.96±4.22 32.15±3.19 22.95±2.19	127
Peganum harmala L	3α-acetoxy-27-hydroxy-olean-12-en-11-oxo-28-oic acid methyl ester (**256**)	HeLa HepG2 SGC-7901	> 100 74.7±1.8 > 100	78
	3α-hydroxy-olean-27-(4-hydroxy-3-methoxy-E-cinnamoyloxy)-12-en- 28-oic acid methyl ester (**257**)	HeLa HepG2 SGC-7901	39.6±1.0 34.5±0.6 34.8±0.9	
	3α-acetoxy-27-hydroxyolean-12-en-28-oic acid (**258**)	HeLa HepG2 SGC-7901	23.1±1.7 32.6±1.5 24.3±4.5	
	3α-acetoxyoleanolic acid (**259**)	HeLa HepG2 SGC-7901	12.3±0.5 17.6±3.6 16.6±2.2	
Micromeria persica	3β-palmitoxyolean-11:13(18)-dien (**260**)	MDA-MB231 DU-145	> 75 > 75	128
Vicia sativa L.)	(3β)-oleanan-3-ol (**261**)	HeLa HepG2 HL-60	NA NA NA	99
	Gummosogenin (**262**)	HeLa HepG2 HL-60	NA NA NA	
Eclipta prostrata	16α-hydroxy-olean-12-en-3-on-28,21β- olide (**263**)	MDA-MB-231 HeLa	NA NA	129
Juglans hopeiensis	Jughopenoid I (**264**)	HT-29 HepG2	NA NA	130
Dobera glabra (Forssk)	3β-hydroxyolean-13(18)-en-12-one (**265**)	HCT-116 PC-3 HepG-2 VERO-B	NA NA NA NA	131
	δ-amyrin (**266**)	HCT-116 PC-3 HepG-2 VERO-B	NA NA NA NA	
	11-oxo-β-amyrin (**267**)	HCT-116	NA	

		PC-3 HepG-2 VERO-B	NA NA NA	
Leptopus lolonum	24-*O*-(*cis*-*p*-coumaroyl)-3β-hydroxyl-olean-12-en-28-oic acid (**268**)	HepG2 MCF-7 A549 HeLa	47.51 37.32 41.53 45.51	132
	24-*O*-(*cis*-*p*-feruloyl)-3β-hydroxyl-olean-12-en-28-oic acid (**269**)	HepG2 MCF-7 A549 HeLa	60.14 74.27 65.95 58.12	
	3β-(*p*-hydroxy-*trans*-cinnamoyloxy)olean-12-en-28-oic acid (**270**)	HepG2 MCF-7 A549 HeLa	29.54 27.30 25.89 34.43	
	Oleanolic acid (**172**)	HepG2 MCF-7 A549 HeLa	>100 >100 >100 >100	
	3-*O*-caffeoyloleanolic acid (**271**)	HepG2 MCF-7 A549 HeLa	35.87 31.05 33.59 33.59	
	Methyl olean-12-en-2β,3β-diol-28-oate (**272**)	HepG2 MCF-7 A549 HeLa	>100 >100 >100 >100	
	24-*O*-(*trans*-*p*-feruloyl)-3β-hydroxyl-olean-12-en-28-oic acid (**273**)	HepG2 MCF-7 A549 HeL	26.47 30.39 25.54 20.28	
Sterculia foetida L.	Stercufoetin A (**274**)	MCF-7 HepG2 HeLa	> 100 > 100 > 100	133
	Vergatic acid (**275**)	MCF-7 HepG2 HeLa	ND ND ND	
	β-amyrin (**197**)	MCF-7 HepG2 HeLa	ND ND ND	
	Oleanolic acid (**172**)	MCF-7 HepG2 HeLa	ND ND ND	
	Maslinic acid (**200**)	MCF-7 HepG2 HeLa	ND ND ND	
Schima crenata	22α -*O*-angeloyl-15α,16α,28-trihydroxyolean-12-en-3-one (**276**)	A375 A549 LoVo	>50 38.82±6.94 >50	111
	16α-*O*-acetyl-22α-*O*-angeloyl-15α,28-dihydroxyolean-12-en-3-one (**277**)	A375 A549 LoVo	>50 >50 >50	

	28-*O*-acetyl-15α,16α,22α-trihydroxyolean-12-en- 3-one (**278**)	A375 A549 LoVo	>50 >50 35.71±4.47	
	16α-*O*-acetyl-21β-*O*-angeloyl-22α- (2-methylbutanoyloxy)-R_1-Barrigenol (**279**)	A375 A549 LoVo	**8.64±1.75** **5.94±0.92** **6.82±1.63**	
	Harpullone (**280**)	A375 A549 LoVo	NA NA NA	
	28-angeloyloxy-3β,15α,16α,22α-tetrahydroxyolean-12-ene (**281**)	A375 A549 LoVo	>25 **10.18±1.07** **8.77±1.21**	
	21,22-di-*O*-angeloyl R_1-barrigenol (**282**) / 21β, 22α-diangeloyloxy-3β, 15α, 16α, 28-tetrahydroxyolean-12-ene (**282**)	A375 A549 LoVo	>50 >50 >50	
Ophiorrhiza baviensis	3β,6β,23-trihydroxyolean-12-en-28-oic acid (**283**)	MCF-7 HeLa KB A549 SK-LU-1	>50 >50 >50 >50	47
Euphorbia fischeriana	Euphorfistrine G (**284**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	>100 >100 75.2±1.71 >100 48.49±0.67 **12.68±0.67** >100	83
	3β-hydroxyolean-12-en-11-one (**285**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	23.6±1.04 97.8±1.21 >100 >100 24.46±0.47 54.06±0.82 69.37±2.31	
	β-amyrin (**197**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	81.2±1.65 >100 >100 >100 >100 >100 >100	
	Myricolal (**286**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	98.53±1.73 >100 >100 >100 >100 >100 >100	
Lantana camara	Lantacamaric acid A/ 3β,25-epoxy-3α,24-dihydroxy-	HL-60	30.8±2.7	112

	olean-12-en-28-oic acid (**287**)			
	Lantacamaric acid B (**288**) / 3β,25-epoxy-3α,24-dihydroxy-22β-(3-methylcrotonoyloxy)olean-12-en-28-oic acid (**288**)	HL-60	**6.60±0.46**	
	Lantaninilic acid (**289**)	HL-60	68.4±15.4	
	Lantanilic acid (**290**)	HL-60	**4.00±0.67**	
	Camaric acid (**291**)	HL-60	**1.71±0.10**	
	Oleanonic acid (**292**)	HL-60	**9.79±2.13**	
	Lantadene A (**293**)	HL-60	25.4±3.1	
	24-hydroxy-22β-(3-methylcrotonoyloxy)-3-oxoolean-12-en-28-oic acid (**294**)	HL-60	**1.16±0.14**	
	Icterogenin (**295**)	HL-60	34.2±0.7	
Schefflera barteri Harms	*O*-octadecanoylisomultiflorenol (**296**)	KB-3-1 HT29	NA NA	85
	Oleanolic acid (**172**)	KB-3-1 HT29	NA NA	
	22-hydroxyoleanolic acid (**297**)	KB-3-1 HT29	NA NA	
Xanthium strumarium	Hederagenin (**173**)	HepG2 A549 HCT116 SW480	80.27 75.28 70.71 83.06	134
	Camaldulenic acid (**298**)	HepG2 A549 HCT116 SW480	89.01 68.32 55.66 73.64	
	Crategolic acid (**299**)	HepG2 A549 HCT116 SW480	>100 86.31 >100 80.54	
	Methyl crategolate (**300**)	HepG2 A549 HCT116 SW480	>100 >100 >100 >100	
Cissampelos pareira var. *hirsuta*	Cissatriterpenoid A (**301**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	135
	Cissatriterpenoid B (**302**)	HL-60 A549 SMMC-7721	NA NA NA	

		MCF-7 SW480	NA NA	
	Cissatriterpenoid C (**303**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA **17.55** 34.74 **19.77** 30.39	
Ardisia lindleyana D. Dietr.	Ardisiapunine B (**304**)	B16F10 A549 H460 MCF–7 HepG2 HeLa U87	**17.51±3.55** 29.86±4.26 33.09±0.58 21.73±2.71 **12.40±3.76** 24.96±6.88 25.50±3.45	113
	Ardisiapunine C (**305**)	B16F10 A549 H460 MCF–7 HepG2 HeLa U87	>100 >100 >100 >100 >100 >100 >100	
Potentilla freyniana Bornm.	2α,3β-dihydroxyolean-13(18)-en-28-oic acid (**218**)	Hep-G2 HCT-116 BGC-823 MCF-7	NA **13.25±1.65** 26.83±2.52 NA	86
	Camaldulenic acid (**298**)	Hep-G2 HCT-116 BGC-823 MCF-7	NA NA NA NA	
Dracocephalum moldavica L	2α,3β,24-trihydroxyolean-12-ene (**306**)	HeLa A549 HepG2	NA NA NA	87
	Oleanolic acid (**172**)	HeLa A549 HepG2	**6.54±1.04** NA NA	
	Sapogenin B (**307**)	HeLa A549 HepG2	**1.71±0.48** NA **9.94±3.18**	
Swertia mileensis	Erythrodiol (**308**)	HepG2 MDA-MB-231	NA NA	90
	3β-hydroxy-28-al-12-en-oleanoic acid (**309**)	HepG2 MDA-MB-231	NA NA	
	15α,16α-epoxy-olean-12-en-3-ol (**310**)	HepG2 MDA-MB-231	NA NA	
	3β-hydroxyolean-12-en-28-oic acid (**7**) /Oleanolic acid (**172**)	HepG2 MDA-MB-231	NA NA	
	Momordic acid (**311**)	HepG2 MDA-MB-231	NA NA	
	3-oxo-olean-12-en-28-oic acid (**235**)	HepG2 MDA-MB-231	NA NA	
	28-hydroxy-olean-12-en-3-one (**312**)	HepG2 MDA-MB-231	NA NA	

	2α-hydroxy-3-oxo-olean-12-en-28-oic acid (**313**)	HepG2 MDA-MB-231	NA NA	
	2-hydroxy-3-oxo-olean-1,12-dien-28-oic acid (**314**)	HepG2 MDA-MB-231	NA NA	
	Erythrodiol 3-palmitate (**315**)	HepG2 MDA-MB-231	NA NA	
	3β-hydroxy-11α,12α-epoxy-olean-28,13β-olide (**316**)	HepG2 MDA-MB-231	NA NA	
Glochidion puberum	Glochidpurnoid A (**317**)	HCT-116	NA	136
	Glochidpurnoid B (**318**)	HCT-116	**0.80±0.05**	
	Morolic acid acetate (**319**)	HCT-116	**2.99±0.34**	
Garcinia oligantha	2α,3β-diacetyl arjunolic acid (**320**)	HeLa HepG-2 MCF-7	**17.35±0.58** **16.76±0.95** **15.12±1.06**	114
	3β,23-diacetyl arjunolic acid (**321**)	HeLa HepG-2 MCF-7	**16.96±1.24** **13.77±1.15** 21.55±0.59	
	2α-acetyl arjunolic acid (**322**)	HeLa HepG-2 MCF-7	>50 >50 >50	
	Tomentoid B (**323**)	HeLa HepG-2 MCF-7	40.58±0.36 35.24±0.88 >50	
	2α,23-diacetoxy-3β-hydroxyolean-12-en-28-oic acid (**324**)	HeLa HepG-2 MCF-7	**17.51±0.73** **12.80±1.04** **13.27±0.42**	
Camellia ptilosperma	22α-*O*-angeloyl-A_1-barrigenol (**244**)	HeLa H460 MB231 A549 HCT116 HT29 LLC CT26 Hepa 1-6	ND ND ND ND ND ND ND ND ND	56
	Camellianol G (**325**)	HeLa H460 MB231 A549 HCT116 HT29 LLC CT26 Hepa 1-6	ND ND ND ND ND ND ND ND ND	
	Camelliagenin A 22-angelate (**326**)	HeLa H460 MB231 A549 HCT116 HT29 LLC CT26	ND ND ND ND ND ND ND ND	

		Hepa 1-6	ND	
	Methyl oleanolate(**327**)	HeLa H460 MB231 A549 HCT116 HT29 LLC CT26 Hepa 1-6	ND ND ND ND ND ND ND ND ND	
Primulina eburnea	Scutellaric acid (**328**)	A549 MKN-45 PATU8988T 5637 L-02 293T	NA NA NA NA NA NA	91
	3α,19α,24-trihydroxyolean-12-en-28-oic acid (**329**)	A549 MKN-45 PATU8988T 5637 L-02 293T	NA NA NA NA NA NA	
Maytenus guangxiensis	3β, 7β-dihydroxyolean-12-en-11-one (**330**)	Eca-109 PANC-1 EJ HeLa	51.93±2.705 28.20±1.521 44.38±2.801 58.85±1.374	137
	3β-O-acetyl-7β-hydroxyolean-12-en-11-one (**331**)	Eca-109 PANC-1 EJ HeLa	48.36±1.684 160.0±2.204 31.51±1.498 26.54±1.424	
Prunella vulgaris L.	2α, 3α-dihydroxyolean-23β(acetyl)-12-en-28-oic acid (**332**)	SW579	NA	92
Syzygium jambos (L.) Alston	3β-acetoxy-2α,23-dihydroxyolean-12-en-28-oic acid (**333**)	H1975 HCC827	>40 >40	57
	23-*O*-trans-feruloyl-2α,3β-dihydroxyolean-12-en-28-oic acid (**334**)	H1975 HCC827	**2.61±0.22** **4.37±0.94**	
	2α,3β,19α-trihydroxyolean-28-oic acid (**335**)	H1975 HCC827	>40 >40	
Gentiana scabra Bge.	3β-*O*-benzoyl-2α-hydroxyolean-12-en-28-oic acid (**336**)	Hep3B HCT116 HepG2 U87	>100 >100 >100 >100	93
	3β-*O*-(4′-hydroxybenzoyl)-2α-hydroxyolean-12-en-28-oic acid (**337**)	Hep3B HCT116 HepG2 U87	60.99±5.10 47.75±1.34 50.54±6.39 43.92±0.78	

Table 7. The cytotoxicity of *nor*-oleanane-type triterpenoids **(338-363)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Paeonia lactiflora	Paeonenoide D (**338**)	HL-60 Hep-G2 SK-OV-3	35.2±2.6 **18.3±1.2** **19.2±1.5**	105
	Paeonenoide E (**339**)	HL-60 Hep-G2 SK-OV-3	42.6±3.3 **17.2±1.1** 23.9±0.8	
	11*α*,12*α*-epoxy-3β,4β-dihydroxy-24-norolean-28-oic acid (**340**)	HL-60 Hep-G2 SK-OV-3	29.3±1.9 **14.2±0.9** 27.5±2.1	
	3β,4β,23,29-tetrahydroxy-24-norolean-12-en-28-oic acid (**341**)	HL-60 Hep-G2 SK-OV-3	32.7±2.7 **12.2±0.6** 29.0±1.8	
Phlomoides umbrosa (Turcz.) Kamelin & Makhm	Phlomisu A (**342**) 23,24-*O*-isopropylidene-19(18→17)-abeo-28-noroleanane-derived spirocyclic triterpenoids	HeLa HL-60 MCF-7	NA NA NA	138
	Phlomisu B (**343**)-abeo-28-noroleanane	HeLa HL-60 MCF-7	NA NA NA	
	Phlomisu C (**344**)-abeo-28-noroleanane	HeLa HL-60 MCF-7	NA NA NA	
	Phlomisu D (**345**)-abeo-28-noroleanane	HeLa HL-60 MCF-7	> 50 43.7±0.6 49.7±1.2	
	Phlomisu E (**346**)-28-noroleanane	HeLa HL-60 MCF-7	**19.3±1.0** **8.4±0.6** **15.4±1.9**	
	Phlomistetraol C (**347**)	HeLa HL-60 MCF-7	NA NA NA	
	(2α,3α,17R,18β)-19(18→17)-abeo-28-norolean-12-ene-2,3,18,23,24-pentol (**348**)	HeLa HL-60 MCF-7	> 50 41.7±0.3 > 100	
	Phlomishexaol A (**349**)	HeLa HL-60 MCF-7	NA NA NA	
	Phlomispentaol (**350**)	HeLa HL-60 MCF-7	> 50 **11.4±0.4** 24.6±1.9	
	Phlomisone (**351**)	HeLa HL-60 MCF-7	NA NA NA	
Akebia trifoliata	2α,3β,20α-trihydroxy-29-norolean-12-en-28-oic acid (**352**)	A549 HeLa HepG2	>100 >100 >100	125
Dipsacus asper	2α,3β-dihydroxy-23-norurs-4(24),11,13(18)-trien-28-oic acid	A549 H157	NA NA	55

	(**353**)	HepG2 MCF-7	NA NA	
Swertia mileensis	28-*nor*-oleanane (**354**) (28-nor)	HepG2 MDA-MB-231	NA NA	90
	3β,17β-dihydroxy-olean-12-ene (**355**) (28-nor)	HepG2 MDA-MB-231	NA NA	
Camellia ptilosperma	Camellenodiol (**356**)	HeLa H460 MB231 A549 HCT116 HT29 LLC CT26 Hepa 1-6	ND ND ND ND ND ND ND ND ND	56
Mastic	17β-hydroxy-11α-methoxyl-28-norolean-12-en-3-one (**357**)	SW480	NA	139
	28-norolean-12-en-3,11-dione (**358**)	SW480	NA	
	3β-hydroxy-28-norolean-12-en-11-one (**359**)	SW480	**2.30±0.38**	
	28-norolean-17-en-3,16,19-trione (**360**)	SW480	NA	
	28-norolean-17-en-3,16-dione (**361**)	SW480	NA	
	17β-hydroxy-28-norolean-9,12-dien-3-one (**362**)	SW480	NA	
	28-norolean-9,12-dien-3-one (**363**)	SW480	NA	

Table 8. The cytotoxicity of *seco*-oleanane-type triterpenoids (**364-373**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of Cancer cell lines	IC_{50} (μM)	References
Tripterygium regelii	Triregelolide A (**364**)	MCF-7	NA	117
	Triregelolide B (**365**)	MCF-7	NA	
Nuxia oppositifolia	3,4-seco-olean-12 ene-3,30 dioic acid (**366**)	HeLa A549 MDA	> 50 > 50 > 50	119
Dysoxylum lukii	Dysoxylukiine A (**367**)	SOSP-9607 MG-63 Saos-2 M663	27.0 25.1 24.7 27.1	140
	Dysoxylukiine B (**368**)	SOSP-9607 MG-63 Saos-2 M663	32.2 31.7 27.7 32.3	
Betula pubescens	3,4-*seco*-olean-4(24)-en-19-oxo-3-oic acid (**369**)	A375 AGS DLD-1	76±4.4 69±3.8 29±3.2	94

		HeLa,	33±4.0	
Juglans hopeiensis	Jughopenoid E (**370**)	HT-29 HepG2	NA NA	130
	Jughopenoid F (**371**)	HT-29 HepG2	NA NA	
Swertia mileensis	3,4-*seco*-3-*nor*-oleanane (**372**)	HepG2 MDA-MB-23	NA NA	90
	3,4-*seco*-olean-12-en-3,28-dioic acid (**373**)	HepG2 MDA-MB-23	NA NA	

Table 9. The cytotoxicity of *abeo*-oleanane-type triterpenoids (**374-377**) against cancer cell lines

Plant sources	Names and Numbers of compounds	Types of Cancer cell lines	IC_{50} (μM)	References
Swertia mileensis	Alstoscholarinoid A (**374**)	HepG2 MDA-MB-23	NA NA	90
	3-epitaraxerol (**375**)	HepG2 MDA-MB-23	NA NA	
	Isomyricadiol (**376**)	HepG2 MDA-MB-23	NA NA	
	Sweriyunnangenin A (**377**)	HepG2 MDA-MB-23	NA NA	

Table 10. The cytotoxicity of *nor*-oleanane-type triterpenoid glycosides (**378-380**) against cancer cell lines

Plant sources	Names and Numbers of compounds	Types of Cancer cell lines	IC_{50} μM	References
Stauntonia chinensis	3β,20α,24-trihydroxy-29-norolean-12-en-28-oic acid 24-*O*-β-L-fucopyranosyl-(1→2)-[β-D-xylopyranosyl-(1→3)]-β-D-glucopyranoside (**378**)	HCT-116 HepG2 BGC-823 NCI-H1650 A2780	23.46±0.47 26.27±0.46 25.45±0.41 21.67±0.59 **12.72±0.36**	141
	3β,20α,24-trihydroxy-29-norolean-12-en-28-oic acid 24-*O*-β-D-glucopyranosyl-(1→2)-[α-L-arabinopyranosyl-(1→3)]-β-D-glucopyranoside (**379**)	HCT-116 HepG2 BGC-823 NCI-H1650 A2780	24.64±0.75 32.04±0.53 28.94±0.62 **17.28±0.67** 31.76±0.92	
Elsholtzia penduliflora W. W.	Penduloside F (**380**)/2α,19α-dihydroxy-3-oxo-24-norolean-12-en-28-oic acid 28-*O*-β-D- glucopyranoside	A549 MCF-7	NA NA	96

Table 11. The cytotoxicity of oleanane-type triterpenoid glycosides (**381-592**) against cancer cell lines

Plant sources	Names and Numbers of compounds	Types of cancer cell lines	IC_{50} μM	References
Momordica cochinchinensis	3-*O*-β-D-glucofuranosidurono-6,3-lactone-gypsogenin (**381**)	HL-60	NA	115
		SMMC-7721	NA	
		PANC-1	NA	
		A-549	NA	
		SW-480	NA	
	3-*O*-α-L-rhamnopyranosyl-(1→3)-6'-*O*-methyl-β-D-glucuronopyranosyl-gypsogenin (**382**)	HL-60	NA	
		SMMC-7721	NA	
		PANC-1	NA	
		A-549	NA	
		SW-480	NA	
	3-*O*-6'-*O*-methyl-β-D-glucuronopyranosyl-gypsogenin (**383**)	HL-60	NA	
		SMMC-7721	NA	
		PANC-1	NA	
		A-549	NA	
		SW-480	NA	
	3-*O*-6′-*O*-methyl-β-D-glucuronopyranosyl-28-*O*-methyl- gypsogenin (**384**)	HL-60	**18.1**	
		SMMC-7721	>40	
		PANC-1	>40	
		A-549	>40	
		SW-480	>40	
	3-*O*-β-D-glucuronopyranosylgypsogenin (**385**)	HL-60	NA	
		SMMC-7721	NA	
		PANC-1	NA	
		A-549	NA	
		SW-480	NA	
	3-*O*-6'-*O*-methyl-β-D-glucuronopyranosyl-quilliac acid (**386**)	HL-60	NA	
		SMMC-7721	NA	
		PANC-1	NA	
		A-549	NA	
		SW-480	NA	
	3-*O*-β-D-galactopyranosyl-(1→2)-6'-*O*-methyl-β-D-glucuronopyranosyl-gypsogenin (**387**)	HL-60	NA	
		SMMC-7721	NA	
		PANC-1	NA	
		A-549	NA	
		SW-480	NA	
	3-*O*-β-D-galactopyranosyl-(1→2)-6'-*O*-methyl-β-D-glucuronopyranosyl-quilliac acid (**388**)	HL-60	NA	
		SMMC-7721	NA	
		PANC-1	NA	
		A-549	NA	
		SW-480	NA	
	3-*O*-β-D-galactopyranosyl-(1→2)-[α-L-rhamnopyranosyl (1→3)]-6'-*O*-methyl-β-D-glucuronopyranosyl-gypsogenin (**389**)	HL-60	NA	
		SMMC-7721	NA	
		PANC-1	NA	
		A-549	NA	
		SW-480	NA	
	3-*O*-β-D-galactopyranosyl-(1→2)-6'-*O*-methyl-β-D-glucurono-pyranosyl-28-*O*-β-D-galactopyranosyl-gypsogenin (**390**)	HL-60	NA	
		SMMC-7721	NA	
		PANC-1	NA	

		A-549 SW-480	NA NA	
	3-*O*-β-D-galactopyranosyl-(1→2)-[α-L-rhamnopyranosyl(1→3)]-6'-*O*-methyl-β-D-glucuronopyranosyl-quilliac acid (**391**)	HL-60 SMMC-7721 PANC-1 A-549 SW-480	NA NA NA NA NA	
Maesa argentea	3β-*O*-{([β-D-glucopyranosyl-(1→2)-α-L-rhamnopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)]-[β-D-galactopyranosyl-(1→2)]-β-D-glucuronopyranosyl)}-21β-angeloyloxy-22α-butanoyloxy-13β,28-oxidoolean-16α,28α-diol (**392**)	MRC-5	**1.47±0.37**	151
	3β-*O*-{([β-D-glucopyranosyl-(1→2)-α-L-rhamnopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)]-[β-D-galactopyranosyl-(1→2)]-β-D-glucuronopyranosyl)}-21β,22α-angeloyloxy-13β,28-oxidoolean-16α,28α-diol (**393**)	MRC-5	**3.35 ±2.38**	
	3β-*O*-{([β-D-glucopyranosyl-(1→2)-α-L-rhamnopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)]-[β-D-galactopyranosyl-(1→2)]-β-D-glucuronopyranosyl)}-21β-angeloyloxy-22α-(*E*)-cinnamoyloxy-13β,28-oxidoolean-16α,28α-diol (**394**)	MRC-5	**1.69 ±0.24**	
	3β-*O*-{([α-L-rhamnopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)]-[β-D-galactopyranosyl-(1→2)]-β-D-glucuronopyranosyl)}-21β-angeloyloxy-22α-(*E*)-cinnamoyloxy-13β,28-oxidoolean-16α,28α-diol (**395**)	MRC-5	**1.44±0.24**	
Combretum racemosum	28-*O*-β-D-glucopyranosyl-2α,3β,21β,23-tetrahydroxyolean-18-en-28-oate (**396**)	HL 60 K562	NA NA	60
	Arjunglucoside I (**397**)	HL 60 K562	NA NA	
	Chebuloside II (**398**)	HL 60 K562	NA NA	
	Combreglucoside (**399**)	HL 60 K562	NA NA	
	Bellericaside B (**400**)	HL 60 K562	NA NA	
Bupleurum chinense	Saikosaponin-b_2 (**401**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 35.1 >80 >80 >80	116
	2''-*O*-acetyl-saikosaponin-b_2 (**402**)	A549 HepG2 Hep3B BCAP-37	56.03 18.94 22.97 23.5	

		MCF-7	42.17	
	6"-*O*-acetyl-saikosaponin-b_2 (**403**)	A549 HepG2 Hep3B BCAP-37 MCF-7	69.32 21.84 >80 >80 46.53	
	Saikosaponin-b_3 (**404**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 27.53 >80 >80 64.27	
	Bupleuroside III (**405**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 >80 >80 >80 >80	
	Saikosaponin-t (**406**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 43.2 >80 >80 >80	
	Pleurosaponin F (**407**)	A549 HepG2 Hep3B BCAP-37 MCF-7	58.11 19.37 39.59 20.16 29.42	
	6"-*O*-acetylsaikosaponin-b_4 (**408**)	A549 HepG2 Hep3B BCAP-37 MCF-7	ND ND ND ND ND	
	Saikosaponin-f (**409**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 >80 37.81 >80 >80	
	11α-methoxy-saikosaponin f (**410**)	A549 HepG2 Hep3B BCAP-37 MCF-7	>80 >80 75.7 >80 >80	
Anemone amurensis	3-*O*-β-D-glucopyranosyl-(1→3)-α-L-rhamnopyranosyl[β-D-glucopyranosyl(1→4)]-(1→2)-α-L-arabinopyranosyl oleanolic acid 28-*O*-β-D-glucopyranosyl-(1→3)-α-L-rhamnopyranosyl-(1→4)-β-D-glucopyranosyl-(1→6)-β-D-glucopyranoside (**411**)	A549 Hep-G2	> 100 > 100	152
	hederagenin 28-*O*-β-D-glucopyranosyl-(1→3)-α-L-rhamnopyranosyl-(1→4)-β-D-glucopyranosyl-(1→6)-β-D-glucopyranosyl ester (**412**)	A549 Hep-G2	38.53 66.17	

Hydrocotyle nepalensis	Steganogenin 3-*O*-β-D-glucopyranoside (**413**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	104
	Steganogenin 3-*O*-α-L-rhamnopyranosyl-(1→2)-β-D-glucopyranoside (**414**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
	Steganogenin 3-*O*-β-D-glucopyranosyl-(1→2)-β-D-glucopyranoside (**415**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
	Chichipegenin 3-*O*-α-L-rhamnopyranosyl-(1→2)-β-D-glucopyranoside (**416**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
	Chichipegenin 3-*O*-β-D-glucopyranosyl-(1→2)-β-D-glucopyranoside (**417**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
	Barringtogenol C_3-*O*-β-D-glucopyranoside (**418**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
	Steganogenin 3-*O*-β-D-glucopyranosyl-(1→2)-glucopyranosyl-22-*O*-β-D-glucopyranoside (**419**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
Souliea vaginata	Hederasaponin B (**420**)	HT-29 A549 MDA-MB231	NA NA NA	153
Anchusa italica	(3β,21β)-21-[(β-d-glucopyranosyl-(1→2)-β-D-glucopyranosyl)oxy]-3-hydroxyolean-12-en-28-oic acid (**421**)	A-549 MDA-MB-231 KB KB-VIN MCF-7	NA NA NA NA NA	143
	Oleanazuroside 1 (**422**)	A-549 MDA-MB-231 KB KB-VIN MCF-7	NA NA NA NA NA	
	Oleanazuroside 2 (**423**)	A-549 MDA-MB-231 KB KB-VIN MCF-7	NA NA NA NA NA	

	24-hydroxytormentic acid ester glucoside (**424**)	A-549 MDA-MB-231 KB KB-VIN MCF-7	NA NA NA NA NA	
	24-*epi*-pinfaensin (**425**)	A-549 MDA-MB-231 KB KB-VIN MCF-7	NA NA NA NA NA	
	Oleanolic acid 3-*O*-α-l-arabinoside (**426**)	A-549 MDA-MB-231 KB KB-VIN MCF-7	**4.4** **8.0** **7.1** **13.2** **13.7**	
Impatiens parviflora	3-*O*-{[β-D-glucopyranosyl-(1→3)-]-[β-D-glucopyranosyl-(1→2)]}-β-D-glucuronopyranoside-16-*O*-acetyl-3β,22α,28-trihydroxy-olean-12-ene (**427**)	WM793 A375 HTB140 BJ Du145 PC3 PNT2	NA 41.19 NA NA NA NA NA	154
	3-*O*-{[β-D-glucopyranosyl-(1→3)-]-[β-D-glucopyranosyl-(1→2)]}-β-D-glucuronopyranoside-3β, 16α,22α,28-tetrahydroxy-olean-12-ene (**428**)	WM793 A375 HTB140 BJ Du145 PC3 PNT2	NA NA NA NA NA NA NA	
Aralia armata (WALL.) SEEM.	3β-*O*-(6'-*O*-methyl-β-D-glucuronopyranosyl)oleana-11,13(18)-dien-28-oic acid (**429**)	Sl-1	NA	121
	3β-(β-glucopyranosyloxy)-olean-12-en-28-oic acid (**430**)	Sl-1	NA	
Gymnocarpos decander	3-*O*-β-D-glucuronopyranosyl-2β,3β,16α,23-tetrahydroxyolean-12-en-28-*O*-β-D-apiofuranosyl-(1→3)-β-D-xylopyranosyl-(1→4)-α-L-rhamnopyranosyl-(1→2)-α-L-arabinopyranosyl ester (**431**)	HeLa Jurkat MCF7	57 42 59	155
	3-*O*-β-D-glucuronopyranosyl-2β,3β,16α-trihydroxyolean-12-en-28-*O*-α-L-rhamnopyranosyl-(1→3)-β-D-xylopyranosyl-(1→4)-α-L-rhamnopyranosyl-(1→2)-α-L-arabinopyranosyl ester (**432**)	HeLa Jurkat MCF7	71 60 67	
Xanthoceras sorbifolia Bunge	3-*O*-[α-L-arabinofuranosyl (1→3)]-[β-D-galactopyranosyl (1→2)]-β-D-(6-*O*-n-butyl)-glucuronopyranosyl-21-*O*-(3,4-*O*-diangeloyl)-β-D-fucopyranosyl-22-*O*-acetyl-barringtogenol C (**433**)	HCT-116 HepG2 U87-MG	60.29 78.92 39.69	142
	3-*O*-[α-L-arabinofuranosyl (1→3)]-[β-D-galactopyranosyl(1→2)]-β-D -(6-*O*-n-butyl)-glucuronopyranosyl-21-*O*-	HCT-116 HepG2 U87-MG	46.26 >100 >100	

	(3,4-*O*-diangeloyl)-β-D-fucopyranosyl-28-*O*-acetyl- barringtogenol C (**434**)			
	3-*O*-[α-L-arabinofuranosyl (1→3)]-[β-D-galactopyranosyl (1→2)]-β-D-(6-*O*-n-butyl)-glucuronopyranosyl-21,22-*O*-diangeloyl-R1-barrigenol C (**435**)	HCT-116 HepG2 U87-MG	**17.32** **9.75** >100	
	3-*O*-[α-L-arabinofuranosyl (1→3)]-[β-D-galactopyranosyl (1→2)]-β-D -(6-*O*-n-butyl)-glucuronopyranosyl-21,22-*O*-diangeloyl-barringtogenol C (**436**)	HCT-116 HepG2 U87-MG	51.23 38.50 >100	
	3-*O*-[α-L-arabinofuranosyl (1 → 3)]-[β-D-galactopyranosyl (1 → 2)]-β-D-(6-*O*-n-butyl)-glucuronopyranosyl-21-*O*-angeloyl-22-*O*-(2-methyl) butyryl-R1-barrigenol C (**437**)	HCT-116 HepG2 U87-MG	**12.67** **4.62** **15.21**	
	3-*O*-[α-L-arabinofuranosyl (1→3)]-[β-D-glucopyranosyl (1→2)]-β-D-(6-*O*-n-butyl)-glucuronopyranosyl-21,22-*O*-diangeloyl-24-hydroxy-R_1-barrigenol (**438**)	HCT-116 HepG2 U87-MG	44.46 31.22 >100	
Genista numidica	3-*O*-β-D-glucopyranosyl-3β,21β,28-trihydroxy-olean-12-en-27-oic acid (**439**)	Jurkat HeLa MCF-7	NA NA NA	156
	3-*O*-β-D-glucopyranosyl-3β,28,29-trihydroxy-olean-12-en-27-oic acid (**440**)	Jurkat HeLa MCF-7	NA NA NA	
	3-*O*-β-D-glucopyranosyl-3β,27,28-trihydroxy-olean-12-en-29-oic acid (**441**)	Jurkat HeLa MCF-7	NA NA NA	
	3-*O*-β-D-glucopyranosyl-olean-12-en-3β,27,28,29-tetraol (**442**)	Jurkat HeLa MCF-7	37±2.3 35±1.7 50±3.6	
Camellia oleifera Abel	Oleiferasaponin D_1 / 3-*O*-β-D-xylopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)-[β-D-galactopyranosyl-(1→2)]-β-D-glucuronopyranosyl-22α-angeloyloxyolean-12-ene-16α,28-diol(**443**)	HCT-116 HepG2 BGC-823 NCI-H1650 A2780	**8.33±0.75** **6.11±0.64** **9.53±0.34** **7.85±0.55** **6.48±0.5**	144
	Oleiferasaponin D_2 /3-*O*-β-D-xylopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)-[β-D-galactopyranosyl-(1→2)]-β-D-glucuronopyranosyl-22α-angeloyloxyolean-12-ene-23-al-16α,28-diol (**444**)	HCT-116 HepG2 BGC-823 NCI-H1650 A2780	**10.23±0.71** **8.52±0.64** **4.86±0.53** **3.31±1.17** **8.49±0.00**	
	Oleiferasaponin D_3/3-*O*-β-D-xylopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)-[β-D-galactopyranosyl-(1→2)]-β-D-glucuronopyranosyl-22α-tigloyloxyolean-12-ene-23-al-16α,28-diol (**445**)	HCT-116 HepG2 BGC-823 NCI-H1650 A2780	33.45±0.64 26.11±0.38 39.53±0.94 47.85±0.87 36.52±0.74	
	Oleiferasaponin D_4 /3-*O*-β-D-xylopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)-[β-D-galactopyranosyl-(1→2)]-β-D-glucuronopyranosyl-22α-(2-	HCT-116 HepG2 BGC-823 NCI-H1650 A2780	27.23±0.88 37.15±0.75 56.43±0.65 35.82±0.73 43.25±0.38	

	methylbutanoyloxy)olean-12-ene-23-al-16α,28-diol(**446**)			
	Oleiferasaponin D_5 /3-*O*-β-D-glucopyranosyl- (1→2)-β-D-galactopyranosyl-(1→3)-[β-D-galactopyranosyl-(1→2)]-β-D-glucuronopyranosyl22α-tigloyloxyolean-12-ene-23-al-16α,28-diol(**447**)	HCT-116 HepG2 BGC-823 NCI-H1650 A2780	29.32±0.42 34.18±0.66 44.53±0.83 45.93±0.59 33.35±0.44	
Dianthus elegans var. *elegans*	3-*O*-α-L-arabinofuranosyl-16α-hydroxyolean-12-ene-23α,28β-dioic acid /Dianoside M (1) (**448**)	HEK-293 A-549 HeLa	NA NA NA	157
	3-*O*-α-L-arabinofuranosyl-(1→3)-β-D-glucopyranosyl 16α-hydroxyolean-12-ene-23α-oic acid, 28-*O*-β-D-glucopyranosyl-(1 →6)-β-D-glycosyl ester / Dianoside N (2) (**449**)	HEK-293 A-549 HeLa	NA NA NA	
	Dianthosaponin C (**450**)	HEK-293 A-549 HeLa	NA NA NA	
	Medicago-saponin P_2 (**451**)	HEK-293 A-549 HeLa	NA NA NA	
	Dianchinenoside A (**452**)	HEK-293 A-549 HeLa	NA NA NA	
	Dianchinenoside B (**453**)	HEK-293 A-549 HeLa	NA NA NA	
Sheareria nana S. Moore	Astersedifolioside A (**454**)	HeLa PANC-1 A549	**15.1±0.3** **7.6±0.5** **8.5±0.3**	145
	Astersedifolioside B (**455**)	HeLa PANC-1 A549	**0.3±0.2** **18.6±0.2** **9.1±0.1**	
	Asterlingulatoside C (**456**)	HeLa PANC-1 A549	**15.7±0.3** **8.7±0.3** > 50	
Ilex asprella (Hook. et Arn.) Champ. ex Benth	3β, 19α-dihydroxyolean-12-ene-24,28-dioic acid-28-*O*-β-D-glucopyranoside (**457**)	HL-60 Bel 7402 BGC-823 KB	NA NA NA NA	71
Aesculus chinensis	Aesculusoside A /28-*O*-acetylprotoaescigenin 3-*O*-[β-D-glucopyranosyl(1→2)][β-D-glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid (**458**)	MCF-7	NA	158
	Aesculusoside B/22,28-*O*-diacetyl-protoaescigenin 3-*O*-[β-D-glucopyranosyl-(1→2)][β-D-glucopyranosyl-(1→4)]-β-D-glucuronopyranosyl acid (**459**)	MCF-7	NA	
	Aesculusoside C/21-*O*-acetylprotoaescigenin 3-*O*-[β-D-glucopyranosyl(1→2)][β-D-	MCF-7	NA	

	glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid (**460**)			
	Aesculusoside D/22-*O*-isobutyryl-28-*O*-acetylprotoaescigenin 3-*O*-[β-D-glucopyranosyl(1→2)][β-D-glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid (**461**)	MCF-7	NA	
	Aesculusoside E (**462**)/21-*O*-isobutyrylprotoaescigenin 3-*O*-[β-D-glucopyranosyl(1→2)][β-D-glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid (**462**)	MCF-7	NA	
	Aesculusoside F /21,28-*O*-diacetylbarringtogenol C 3-*O*-[β-D-glucopyranosyl (1→2)][β-D-glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid (**463**)	MCF-7	NA	
	21-*O*-isobutyryl-22-*O*-acetylprotoaescigenin 3-*O*-[β-D-glucopyranosyl(1→2)][β-D-glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid [Escin V] (**464**)	MCF-7	16.9	
	21-*O*-tigloyl-22-*O*-acetylprotoaescigenin 3-*O*-[β-D-glucopyranosyl (1→2)][β-D-glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid (Escin Ia) (**465**)	MCF-7	31.3	
	21-*O*-tigloyl-22-*O*-acetylbarringtogenol C 3-*O*-[β-D-glucopyranosyl(1→2)][β-D-glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid [Escin IIIa] (**466**)	MCF-7	**7.1**	
	21-*O*-tigloyl-28-*O*-acetylbarringtogenol C 3-*O*-[β-D-glucopyranosyl(1→2)][β-D-glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid [Isoescin IIIa] (**467**)	MCF-7	11.8	
	21-*O*-angeloyl-28-*O*-acetylbarringtogenol C 3-*O*-[β-D-glucopyranosyl (1→2)][β-D-glucopyranosyl(1→4)]-β-D-glucopyranosiduronic acid [Isoescin IIIb] (**468**)	MCF-7	29.5	
Cephalaria aristata Koch	Aristatoside A (**469**)	HEK-293 A549 HeLa	>50 >50 >50	146
	Aristatoside B (**470**)	HEK-293 A549 HeLa	>50 >50 >50	
	Aristatoside C (**471**)	HEK-293 A549 HeLa	**8.96±0.62** **3.52±0.11** 35.69±0.50	
Cephalaria gazipashensis Sumbul	Gazipashoside A (**472**)	HEK-293 A549 HeLa	>50 >50 >50	
	Gazipashoside B (**473**)	HEK-293 A549	>50 >50	

		HeLa	>50	
Cephalaria scoparia Contandr. & Quezel	Scoposide A (**474**)	HEK-293 A549 HeLa	>50 >50 >50	
	Scoposide B (**475**)	HEK-293 A549 HeLa	>50 >50 >50	
	Scoposide D (**476**)	HEK-293 A549 HeLa	>50 >50 >50	
	Scoposide F (**477**)	HEK-293 A549 HeLa	>50 >50 >50	
	Scoposide G (**478**)	HEK-293 A549 HeLa	>50 >50 >50	
	Lycicoside II (**479**)	HEK-293 A549 HeLa	>50 >50 >50	
Cephalaria cilicica Boiss. & Kotschy	Cilicicoside I (**480**)	HEK-293 A549 HeLa	>50 >50 >50	
*Cephalaria ay tachi*i Gokturk & Sumbul	Aytachoside A (**481**)	HEK-293 A549 HeLa	>50 >50 >50	
Cephalaria elazigensis var. purpurea Gok turk & Sumbul	Cephoside A (**482**)	HEK-293 A549 HeLa	33.76±2.00 >50 >50	
Cephalaria davisiana Gokturk & Sumbul	Davisianoside A (**483**)	HEK-293 A549 HeLa	>50 >50 >50	
	Davisianoside B (**484**)	HEK-293 A549 HeLa	20.43±3.21 **4.08±0.06** **11.74±0.82**	
Cephalaria el maliensis Hub.-Mor. & Matthews	Elmalienoside A (**485**)	HEK-293 A549 HeLa	>50 >50 >50	
	Elmalienoside B (**486**)	HEK-293 A549 HeLa	>50 >50 >50	
	Elmalienoside C (**487**)	HEK-293 A549 HeLa	>50 >50 >50	
Phytolacca acinosa	Esculentoside H (**488**)	HL-60 HepG2.2.1.5 BEL-7402	> 200 > 200 > 200	126
	Esculentoside B (**489**)	HL-60 HepG2.2.1.5 BEL-7402	25.80 73.9 188.41	
Ligularia przewalskii	3-*O*-[(6-*O*-*n*-butyl)-β-D-glucuronopyranosyl]-12-en-olean-3β,16β,28-triol (**490**)	HeLa HepG2 SGC7901	**8.40** 14.93 **9.71**	159

		MDA231 HL60 Lewis	**9.28** 10.58 13.04	
Patrinia heterophylla	3-*O*-[β-D-glucopyranosyl(1→2)-α-L-arabinopyranosyl]oleanolic acid-28-*O*-[β-D-glucopyranosyl(1→6)-β-D-glucopyranosyl]ester (**491**)	HL-60 K562 Jurkat	75.25±0.96 63.42±2.17 > 100	160
	3-*O*-[β-D-glucopyranosyl(1→2)-α-L-arabinopyranosyl]-hederagenin 28-*O*-[β-D-glucopyranosyl ester (**492**)	HL-60 K562 Jurkat	59.27±1.25 > 100 > 100	
Parkia bicolor A. Chev	Parkibicoloroside A / 3-*O*-{α-L-arabinopyranosyl-(1→4)-[β-D-glucopyranosyl-(1→3)]-β-D-xylopyranosyl-(1→2)}-[β-D-glucopyranosyl-(1→4)]-β-D-xylopyranosyl-21-*O*-cinnamoyl-machaerinic acid (**493**)	K562	48.49±0.16	161
	Parkibicoloroside B / 3-*O*-{β-D-glucopyranosyl-(1→2)-β-D-glucopyranosyl-(1→3)-[α-L-arabinopyranosyl-(1→4)]-β-D-xylopyranosyl-(1→2)}-[β-D-glucopyranosyl-(1→4)]-β-D-xylopyranosyl-21-*O*-cinnamoyl-machaerinic acid (**494**)	K562	65.67±0.18	
	Parkibicoloroside C / 3-*O*-{α-L-arabinopyranosyl-(1→4)-[β-D-glucopyranosyl-(1→3)]-β-D-xyloyranosyl-(1→2)}-[β-D-glucopyranosyl-(1→4)]-β-D-glucopyranosyl- 21-*O*-cinnamoyl-2α-hydroxy-machaerinic acid (**495**)	K562	81.66 ±0.17	
	Parkibicoloroside D /3-*O*-{β-D-glucopyranosyl-(1→2)-β-D-glucopyranosyl-(1→3)-[α-L-arabinopyranosyl-(1→4)]-β-D-xylopyranosyl-(1→2)}-[β-D-glucopyranosyl-(1→4)]-β-D-glucopyranosyl-21-*O*-cinnamoyl-machaerinic acid (**496**)	K562	56.43±0.18	
	Parkibicoloroside E /3-*O*-β-D-xylopyranosyl-28-*O*-α-L-rhamnopyranosyl-2α-hydroxy-machaerinic acid (**497**)	K562	> 100	
Enterolobium contortisiliquum	Contortisilioside H /3-*O*-{β-D-xylopyranosyl-(1→2)-β-D-galactopyranosyl-(1→6)-[β-D-glucopyranosyl-(1→2)]}-β-D-glucopyranosyl mesembryanthemoidigenic acid 28-*O*-{β-D-glucopyranosyl-(1→3)-[α-L-arabinofuranosyl-(1→4)]-α-L-rhamnopyranosyl-(1→2)}-β-D-glucopyranosyl ester (**498**)	HepG2 HL-60	43.6 49.8	162

	Contortisilioside I / 3-*O*-{β-D-xylopyranosyl-(1→2)-α-L-arabinopyranosyl-(1→6)-[β-D-glucopyranosyl-(1→2)]}-β-D-glucopyranosyl mesembryanthemoidigenic acid 28-*O*-{β-D-glucopyranosyl-(1→3)-[α-L-arabinofuranosyl-(1→4)]-α-L-rhamnopyranosyl-(1→2)}-β-D-glucopyranosyl ester (**499**)	HepG2 HL-60	41.4 44.6	
	Contortisilioside J / 3-*O*-{β-D-xylopyranosyl-(1→2)-α-L-arabinopyranosyl-(1→6)-[β-D-glucopyranosyl-(1→2)]}-β-D-glucopyranosyl serratagenic acid 28-*O*-{β-D-glucopyranosyl-(1→3)-[α-L-arabinofuranosyl-(1→4)]-α-L-rhamnopyranosyl-(1→2)}-β-D-glucopyranosyl ester (**500**)	HepG2 HL-60	46.8 53.5	
	Contortisilioside K / 3-*O*-{β-D-xylopyranosyl-(1→2)-β-D-galactopyranosyl-(1→6)-[β-D-glucopyranosyl-(1→2)]}-β-D-glucopyranosyl machaerinic acid 28-*O*-{[β-D-glucopyranosyl-(1→3)]-α-L-rhamnopyranosyl-(1→2)}-β-D-glucopyranosyl ester (**501**)	HepG2 HL-60	26.5 23.1	
	Contortisilioside E (**502**)	HepG2 HL-60	18.9 15.6	
	Contortisilioside F (**503**)	HepG2 HL-60	21.7 19.4	
	Contortisilioside L/ 21β-hydroxy-3β-[(*O*-β-D-xylopyranosyl-(1→2)-*O*-α-L-arabinopyranosyl-(1→6)-2-(acetylamino)-2-deoxy-β-D-glucopyranosyl)oxy]-olean-12-en-28-oic acid γ-lactone (**504**)	HepG2 HL-60	57.1 66.3	
	Contortisilioside M/ 21β-hydroxy-3β-[(*O*-β-D-xylopyranosyl-(1→2)-*O*-α-L-arabinopyranosyl-(1→6)-*O*-β-D-glucopyranosyl)oxy]-olean-12-en-28-oic acid γ-lactone (**505**)	HepG2 HL-60	> 80 > 80	
Albizia lebbeck	Lebbeckoside C/3-*O*-[β-D-xylopyranosyl-(l→2)- β-D-fucopyranosyl-(1→6)-[β-D-glucopyranosyl(1→2)]-β-D-glucopyranosyl]-21-*O*-{(2*E*,6*S*)-6-*O*-{4-*O*-[(2*E*,6*S*)-2,6-dimethyl-6-*O*-(β-D-quinovopyranosyl)octa-2,7-dienoyl]-4-*O*-[(2*E*,6*S*)-2,6-dimethyl-6-*O*-(β-D-quinovopyranosyl)octa-2,7-dienoyl]-β-D-quinovopyranosyl}-2,6-dimethylocta-2,7-dienoyl}acacic acid 28 *O*-[β-D-quinovopyranosyl-(l→3)-[α-L-arabinofuranosyl-(l→4)]-α-L-rhamnopyranosyl-(l→2)-β-D-	U-87 MG TG1	**1.69** **1.44**	163

	glucopyranosyl] ester (**506**)			
Ardisia gigantifolia stapf.	3β-*O*-α-Lrhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[β-D-glucopyranosyl-(1→2)]-α-L-arabinopyranosyl (**507**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**3.85±0.21** **0.88±0.09** **3.27±0.13** 13.19±0.51	147
	Cyclamiretin A 3β-O-α-L-rhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-α-L-arabinopyranosyl (**508**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**0.73±0.06** **6.93±0.23** 18.10±0.32 23.44±0.45	
	3β-*O*-α-L-rhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-α-L-arabinopyranosyl-13,28-epoxy-3β,16α,30-trihydroxyoleanane (**509**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**5.78±0.33** ND ND ND	
	3β-*O*-α-L-rhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[β-D-glucopyranosyl-(1→2)]-α-L-arabinopyranosyl-13β,28-epoxy-3β,16α, 22α-trihydroxyoleanane-30-al (**510**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**5.83±0.45** ND ND ND	
	3β-*O*-αL-rhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[β-D-glucopyranosyl-(1→2)]-α-L-arabinopyranosyl-13β,28-epoxy-3β,16α, 22α-trihydroxyoleanane (**511**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**1.14±0.42** ND ND ND	
	3β-*O*-α-L-rhamnopyranosyl-(1→3)-[β-D-glucopyranosyl-(1→4)-β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[βD-glucopyranosyl-(1→2)]-α-L-arabinopyranosyl-16α-hydroxy13β,28-epoxy-30-acetoxyoleane(**512**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**0.97±0.10** 10.17±0.12 **1.87±0.14** **0.95±0.11**	
	3β -*O*-α-L-rhamnopyranosyl-(1→3)-[β-D-glucopyranosyl-(1→4)-β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[β-D-glucopyranosyl-(1→2)]-α-L-arabinopyranosyl16α-hydroxy-13,28-epoxy-oleanane (**513**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**0.84±0.07** 15.86±0.35 **0.76±0.08** **3.91±0.19**	
	3β-*O*-α-L-rhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[β-Dglucopyranosyl-(1→2)]-α-L-arabinopyranosyl-16α-hydroxy13,28-epoxy-oleanane (**514**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**1.88±0.28** ND ND ND	
	3β-*O*-α-L-rhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[β-D-6-*O*-acetylglucopranosyl-(1→2)]-α-L-arabinopyranosyl-16α-hydroxy-13,28- epoxy-oleanane (**515**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**5.72±0.49** ND ND ND	
	Compound **516**	MCF-7 T47D MDA-MB-231 SK-BR-3	**3.69±0.31** ND ND ND	
	Compound **517**	MCF-7 T47D MDA-MB-231	**5.17±0.18** ND ND	

		SK-BR-3	ND	
	3β-*O*-α-L-rhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[β-D-glucopyranosyl-(1→2)]-αL-arabinopyranosyl-13,28-epoxy-3β,16α,30-trihydroxyoleanane (**518**)	MCF-7 T47D MDA-MB-231 SK-BR-3	>100 >100 >100 >100	
	3β-*O*-α-L-rhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[β-D-glucopyranosyl-(1→2)]-α-L-arabinopyranosyl-16-oxo-13β,28-epoxy-oleanane (**519**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**5.24±0.29** ND ND ND	
	Compound **520**	MCF-7 T47D MDA-MB-231 SK-BR-3	>100 >100 **3.06±0.24** >100	
	Cyclamiretin A 3β-*O*-α-L-rhamnopyranosyl-(1→3)-[β-D-xylopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→4)-[β-D-6-*O*-acetylglucopyranosyl-(1→2)]-α-L-arabinopyranosyl (**521**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**8.32±0.32** ND ND ND	
	3β-*O*-{α-L-rhamnopyranosyl-(1→3)-[β-D-xylopyranose (1→2)]-β-D-glucopyranosyl-(1→4)-α-L-arabinopyranosyl}-3β-hydroxy-13β,28-epoxy-oleanan-16-oxo-30-al (**522**)	MCF-7 T47D MDA-MB-231 SK-BR-3	**4.78±0.5**7 ND ND ND	
	Compound **523**	MCF-7 T47D MDA-MB-231 SK-BR-3	15.32±0.75 ND ND ND	
Dipsacus asper	2',3'-*O*-diacetyl-3-*O*-α-L-arabinopyranosyl-23-hydroxyolea-12-en-28-oic acid (**524**)	A549 H157 HepG2 MCF-7	**6.67** **9.70** **15.89** **15.08**	55
	2',4'-*O*-diacetyl-3-*O*-α-L-arabinopyranosyl-23-hydroxyolea-12-en-28-oic acid (**525)**	A549 H157 HepG2 MCF-7	**6.67** **9.57** **16.23** **15.23**	
	Leontoside A (**526**)	A549 H157 HepG2 MCF-7	35.24 36.45 46.40 52.06	
	4'-*O*-acetyl-3-*O*-α-L-arabinopyranosyl-3-hydroxyolea-12-en-28-oic acid (**527**)	A549 H157 HepG2 MCF-7	22.94 21.21 27.13 26.72	
	3'-*O*-acetyl-3-*O*-α-L-arabinopyranosyl-23-hydroxyolea-12-en-28-oic acid (**528**)	A549 H157 HepG2 MCF-7	34.18 30.02 34.35 37.32	
	2'-*O*-acetyl-3-*O*-α-L-arabinopyranosyl-23-hydroxyolea-12-en-28-oic acid (**529**)	A549 H157 HepG2 MCF-7	33.14 27.54 34.50 35.66	

Lecaniodiscus cupanioides Planch. ex Benth	Lecanioside A (**530**)	Caco-2	>25	164
Ternstroemia cherryi	Ternstroenol A/3-*O*-{α-L-rhamnopyranosyl-(1→2)-β-ᴅ-galactopyranosyl-(1→3)-β-ᴅ-glucopyranosyl-(1→2)-β-D-glucuronopyranosyl}-22(*S*)-(2*E*, 4*E*, 6*E*)-deca-2,4,6-trienoyl- barrigenol A_1 (**531**)	U87 U251	**3.63** **5.28**	148
	Ternstroenol B /3-*O*-{α-L-rhamnopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)-β-D-glucopyranosyl-(1→2)-β-D-glucuronopyranosyl}-21(*R*)-acetyl-22(*S*)-(2*E*, 4*E*, 6*E*)-deca-2,4,6-trienoyl-barrigenol A_1 (**532**)	U87 U251	**8.64** **10.28**	
	Ternstroenol C /3-*O*-{α-L-rhamnopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)-β-D-glucopyranosyl-(1→2)-β-D-glucuronopyranosyl}-22(*S*)-(2*E*, 4*E*, 6*E*)-deca-2,4,6-trienoyl- camelliagenin A (**533**)	U87 U251	**7.22** **7.20**	
	Ternstroenol D/3-*O*-{α-L-rhamnopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)-β-D-glucopyranosyl-(1→2)-β-D-glucuronopyranosyl}-21(*R*)-tiglate-22(*S*)-(2*E*, 4*E*, 6*E*)-deca-2,4,6-trienoyl-barrigenol R_1 (**534**)	U87 U251	**9.54** **10.35**	
	Ternstroenol E /3-*O*-{α-L-rhamnopyranosyl-(1→2)-β-D-galactopyranosyl-(1→3)-β-D-glucopyranosyl-(1→2)-β-D-glucuronopyranosyl}-21(*R*)-methyl butyrate-22(*S*)-(2*E*, 4*E*, 6*E*)-deca-2,4,6-trienoyl-barrigenol R_1 (**535**)	U87 U251	20.89 20.37	
	Sanchakasaponin G (**536**)	U87 U251	ND ND	
	Yuchasaponin A (**537**)	U87 U251	ND ND	
	3-*O*-[α-L-rhamnopyranosyl-(1→2)]-[β-D-galactopyranosyl-(1→3)]-[β-D-glucopyranosyl-(1→2)]-[β-D-glucuronopyranosyl]-22-*O*-[2*E*,4*E*]-octa-2,4-dienoyl-barrigenol-R_1 (**538**)	U87 U251	ND ND	
Erythrophleum fordii	Erythroside A/ 21β-cinnamoyloxy maslinic acid-3-*O*-{β-D-glucopyranosyl-(1→2)-*O*-β-D-glucopyranosyl-(1→3)-*O*-[α-D-xylopyranosyl-(1→4)-*O*-β-D-xylopyranosyl-(1→2)]-*O*-[β-D-xylopyranosyl-(1→4)-*O*-β-D-glucopyranosyl]} (**539**)	HCT116 U87-MG HepG2 BGC823 PC9	36.32 > 50.0 > 50.0 > 50.0 17.59	101
	Erythroside B / 21β-*O*-(6S,2*E*)-6-hydroxy-2,6-dimethyl-2,7-octadienoyl-maslinic acid-3-*O*-{β-D-glucopyranosyl-(1→2)-*O*-β-D-glucopyranosyl-(1→3)-*O*-[α-D-	HCT116 U87-MG HepG2 BGC823	25.46 > 50.0 28.61 46.24	

	xylopyranosyl-(1→4)-*O*-β-D-xylopyranosyl-(1→2)]-*O*-[β-D-xylopyranosyl-(1→4)-*O*-β-D-glucopyranosyl] (**540**)	PC9	16.67	
	Erythroside C / 21β-*O*-(6S,2*E*)-6-hydroxy-2,6-dimethyl-2,7-octadienoyl-maslinic acid-3-*O*-{β-D-xylopyranosyl-(1→2)-*O*-β-D-glucopyranosyl-(1→3)-*O*-[α-D-xylopyranosyl-(1→4)-*O*-β-D-xylopyranosyl-(1→2)]-*O*-[β-D-xylopyranosyl–(1→4)-*O*-β-D-glucopyranosyl}(**541**)	HCT116 U87-MG HepG2 BGC823 PC9	38.65 29.04 35.46 > 50.0 **13.14**	
	Erythroside D/21β-*O*-(6S,2*E*)-6-hydroxy-2,6-dimethyl-2,7-octadienoyl maslinic acid-3-*O*-β-D-xylopyranosyl-(1→4)-*O*-β-D-xylopyranosyl- (1→2)-*O*-[β-D-xylopyranosyl-(1→4)-*O*-β-D-glucopyranosyl] (**542**)	HCT116 U87-MG HepG2 BGC823 PC9	> 50.0 > 50.0 > 50.0 > 50.0 > 50.0	
	Erythroside E/ 21β-hydroxy-maslinic acid-3-*O*-{β-D-glucopyranosyl-(1→2)-*O*-β-D-glucopyranosyl-(1→3)-*O*-[α-D-xylopyranosyl-(1→4)-*O*-β-D-xylopyranosyl-(1→2)]-*O*-[β-D-xylopyranosyl-(1→4)-*O*-β-D-glucopyranosyl]} (**543**)	HCT116 U87-MG HepG2 BGC823 PC9	> 50.0 > 50.0 > 50.0 > 50.0 > 50.0	
	Erythroside F/ 21β-cinnamoyloxy maslinic acid-3-*O*-{β-D-xylopyranosyl-(1→2)-*O*-β-D-glucopyranosyl-(1→3)-*O*-[α-D-xylopyranosyl-(1→4)-*O*-β-D-xylopyranosyl-(1→2)]-*O*-[β-D-xylopyranosyl-(1→4)-*O*-β-D-glucopyranosyl]} (**544**)	HCT116 U87-MG HepG2 BGC823 PC9	> 50.0 > 50.0 > 50.0 > 50.0 > 50.0	
	Erythroside G / 21β-cinnamoyloxy maslinic acid-3-*O*-β-D-xylopyranosyl-(1→4)-*O*-β-D-xylopyranosyl-(1→2)-*O*-[β-D-xylopyranosyl-(1→4)-*O*-β-D-glucopyranosyl] (**545**)	HCT116 U87-MG HepG2 BGC823 PC9	> 50.0 > 50.0 > 50.0 > 50.0 > 50.0	
Anemone tomentosa (Maxim.) Pei	Tomentoside T1/ 3-*O*-β-D-galactopyranosyl-(1→3)-α-L-rhamnopyranosyl-(1→2)-β-D-xylopyranosyl oleanane acid (**546**)	MDA-MB-231 PC-3	**6.45** **4.17**	100
	Tomentoside T2/ 3β-[(β-D-xylopyranosyl) oxy]-23-dihydroxyoleana-11,13-dien-28-oic acid (**547**)	MDA-MB-231 PC-3	>50 49.2	
	Clemargenoside G (**548**)	MDA-MB-231 PC-3	20.58 9.93	
	Clemontanoside C (**549**)	MDA-MB-231 PC-3	**11.09** **6.25**	
	3-*O*-β-D-ribopyranosyl-(1→3)-α-L-rhamnopyranosyl-(1→2)-β-D-xylopyranosyl oleanane acid (**550**)	MDA-MB-231 PC-3	**4.21** **3.73**	
	CP4 (**551**)	MDA-MB-231 PC-3	**6.50** **6.46**	

	Giganteaside D (**552**)	MDA-MB-231 PC-3	**5.37** **3.53**	
	3-*O*-α-L-arabinopyranosyl oleanane acid 28-β-D-glucopyranosyl ester (**553**)	MDA-MB-231 PC-3	>50 45.14	
	3-*O*-β-D-xylopyranosyl oleanolic acid 28-*O*-β-D-glucopyranosyl ester (**554**)	MDA-MB-231 PC-3	21.58 10.55	
	Hederagenin 3-*O*-β-D-xylopyranoside (**555**)	MDA-MB-231 PC-3	26.95 23.41	
	Hederagenin 3-*O*-α-L-arabinopyranoside (**556**)	MDA-MB-231 PC-3	20.52 12.82	
	3-*O*-α-L-arabinopyranosyl oleanolic acid (**557**)	MDA-MB-231 PC-3	**7.58** **5.75**	
	3-*O*-β-D-xylopyranosyl oleanolic acid (**558**)	MDA-MB-231 PC-3	**6.03** **4.88**	
Elaeagnus angustifolia	Terpengustifol A (**559**)	A375	**12.1**	165
Eclipta prostrata	Compound **560**	MDA-MB-231 HeLa	14.1±2.2 7.5±1.3	129
	Compound **561**	MDA-MB-231 HeLa	NA NA	
	3β-hydroxy-28-norolean-12-en-16-one 3-*O*-β-D-glucopyranoside (**562**)	MDA-MB-231 HeLa	19.6±1.8 18.7±2.5	
	Eclalbasaponin A (**563**)	MDA-MB-231 HeLa	ND ND	
Momordica cochinchinensis	Mocochinoside A (**564**)	WiDr MCF-7	NA NA	149
	Mocochinoside B (**565**)	WiDr MCF-7	NA NA	
	Chikusetsusaponin IVa ethyl ester (**566**)	WiDr MCF-7	**8.42±0.66** 16.89±0.33	
	Momordin Ib (**567**)	WiDr MCF-7	18.16±1.27 19.74±0.02	
	Momordin IIb (**568**)	WiDr MCF-7	NA NA	
	Momordin II (**569**)	WiDr MCF-7	ND ND	
	Calenduloside G (**570**)	WiDr MCF-7	15.47±0.53 16.45±0.25	
	Calenduloside H (**571**)	WiDr MCF-7	NA NA	
	Elatoside A (**572**)	WiDr MCF-7	18.06±0.43 28.55±0.83	
	Elatoside C (**573**)	WiDr MCF-7	ND ND	
	Calendulaglycoside C 6'-*O*-7-butyl ester (**574**)	WiDr MCF-7	NA 19.44±0.14	
	Hederagenin 3-*O*-β-D-glucuronopyranoside (**575**)	WiDr MCF-7	NA NA	
Aralia armata	23-hydroxyoleanolic acid-[28-*O*-β-D-glucopyranosyl]-3-*O*-{β-D-glucopyranosyl-(1→2)-[β-D-glucopyranosyl-(1→3)]-β-D-	KB HepG2	25.1±1.2 23.7±0.9	102

	galactopyranoside} (**1**) / Aramatoside C (**576**)			
	oleanolic acid-[28-*O*-β-D-glucopyranosyl]-3-*O*-{β-D-glucopyranosyl-(1→2)-[β-D-glucopyranosyl-(1→3)]-β-D-galactopyranoside} (**2**) / Aramatoside D (**577**)	KB HepG2	29.5±1.3 23.9±0.7	
Schima crenata	Sasanquasaponin III (**578**)	A375 A549 LoVo	**4.64±0.21** **7.57±2.65** **3.63±1.86**	111
	Maetenoside B (**579**)	A375 A549 LoVo	**3.86±1.35** **4.05±0.99** **3.70±1.03**	
Clinopodium chinense	Clinoposaponin E /3β,16β,23,28-tetrahydroxylolean-11,13(18)-dien-3β-yl-[β-D-glucopyranosyl-(1→2)]-[β-D-glucopyranosyl-(1→6)]-β-D-glucopyranoside (**580**)	A549 HepG2	> 100 > 100	98
	Buddlejasaponin IVa (**581**)	A549 HepG2	> 100 > 100	
	Clinopodiside G (**582**)	A549 HepG2	> 100 > 100	
Thalictrum atriplex	Thalioatrioside A (**583**)	A549 MDA-MB-231 HepG2	NA NA NA	166
Potentilla freyniana Bornm.	2α,3β-dihydroxyolean-12-en-28-oic acid 28-*O*-β-D-glucopyranoside (**584**)	Hep-G2 HCT-116 BGC-823 MCF-7	**17.66±1.82** NA NA NA	86
	Arjunetin (**585**)	Hep-G2 HCT-116 BGC-823 MCF-7	NA NA NA NA	
Elsholtzia penduliflora W. W.	Penduloside C /2α,3α,29-trihydroxyolean-12-en-28-oic acid 28-*O*-β-D-glucopyranoside (**586**)	A549 MCF-7	**9.01±1.52** **10.98±1.76**	96
	Penduloside D/ 2α,3α,24,29-tetrahydroxyolean-12-en-28-oic acid 28-*O*-β-D-glucopyranoside (**587**)	A549 MCF-7	NA NA	
	Penduloside E /2α,3α,19α-trihydroxyolean-12-en-24,28-dioic acid 28-*O*-β-D-glucopyranoside (**588**)	A549 MCF-7	NA NA	
Schefflera barteri Harms	Vitalboside B (**589**)	KB-3-1 HT29	NA NA	85
Ardisia lindleyana	Ardisiapunine E (**590**)	HeLa	13.23	150
	3-*O*-*α*-L-arabinopyranosylcyclamiretin A (**591**)	HeLa	20.27	
	Ardisiacrispin B (**592**)	HeLa	**1.81**	

Table 12. The cytotoxicity of lupane-type triterpenoids **(593-655)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Combretum racemosum	Betulinic acid (**593**)	HL 60 K562	35.00±3.00 NA	60
Peganum harmala	3α,27-dihydroxylup-20(29)-en-28-oic acid methyl ester (**594**)	A549 H460 U-937 KG1 3T3	51.32±2.08 65.27±3.36 26.05±1.27 **16.35±1.15** > 100	106
	3α-acetoxy-27-hydroxylup-20(29)-en-28-oic acid methyl ester (**595**)	A549 H460 U-937 KG1 3T3	46.34±1.60 42.57±2.10 **18.60±0.95** 24.61±1.09 > 100	
Acanthopanax trifoliatus	Impressic acid (**596**)	SF-268 MCF-7 HepG2 NCI-H460	41.1 67.4 90.3 >100	63
	3α,11α-dihydroxy-lup-20(29)-en-23-al-28-oic acid (**597**)	SF-268 MCF-7 HepG2 NCI-H460	NA NA NA NA	
	3α-hydroxy-lup-20(29)-en-23,28-dioic acid (**598**)	SF-268 MCF-7 HepG2 NCI-H460	70.4 62.1 75.1 80.3	
	3α,11α-dihydroxy-lup-20(29)-en-23,28-dioic acid (**599**)	SF-268 MCF-7 HepG2 NCI-H460	NA NA NA NA	
	3α-hydroxylup-20(29)-en-30-ol-23,28-dioic acid (**600**)	SF-268 MCF-7 HepG2 NCI-H460	NA NA NA NA	
Sonneratia paracaseolaris	Paracaseolin A (**601**)	P388 HeLa A549 K562	>50 >50 >50 >50	65
	Paracaseolin B (**602**)	P388 HeLa A549 K562	27.25 >50 >50 >50	
	Paracaseolin C (**603**)	P388 HeLa A549 K562	22.39 33.20 14.43 >50	
	Paracaseolin D (**604**)	P388 HeLa A549 K562	10.56 19.13 1.89 >50	

	Lupeol (**605**)	P388 HeLa A549 K562	>50 >50 >50 >50	
	Betulin (**606**)	P388 HeLa A549 K562	44.40 42.46 >50 >50	
	Betulinic acid (**593**)	P388 HeLa A549 K562	41.97 >50 >50 >50	
	Alphitolic acid (**607**)	P388 HeLa A549 K562	34.38 >50 27.49 >50	
	3β-*O*-*cis*-*p*-coumaroyl alphitolic acid (**608**)	P388 HeLa A549 K562	22.36 27.15 15.43 >50	
	3β-*O*-*trans*-*p*-coumaroylbetulinic acid (**609**)	P388 HeLa A549 K562	39.03 >50 37.32 >50	
Juglans mandshurica Maxim	3β,19β,28-trihydroxylupane 3-*O*-trans-caffeate (**610**)	SGC-7901 A549	NA NA	168
	3β,19β,28-trihydroxylupane 3-*O*-cis-caffeate (**611**)	SGC-7901 A549	NA NA	
Jaffrea xerocarpa	Alphitolic acid (**607**)	KB cells	8.5±0.25	169
Chaenomeles speciosa	Betulinic acid (**593**)	A549 SK-OV-3 SK-MEL-2 XF498	**8.92** **14.55** **11.92** **11.17**	66
	23-hydroxybetulinic acid / 3α,24-dihydroxylup-20(29)-en-28-oic acid (**612**)	A549 SK-OV-3 SK-MEL-2 XF498	**13.46** **17.83** **15.27** **17.65**	
	Pycarenic acid/ 3-*O*-*trans*-caffeoylbetulinic acid(**613**)	A549 SK-OV-3 SK-MEL-2 XF498	>30.0 >30.0 >30.0 >30.0	
Alafia barteri	Lup-11,20(29)-dien-3β,28-diol (**614**)	K562 WRL MCF-7 COLO	NA NA NA NA	120
Celastrus orbiculatus Thunb.	3β-(*E*)-*p*-caffeoylnepeticin (**615**)	MCF-7 A2780s	35.03±1.31 > 40	170
Betula schmidtii	Betulin (**606**)	A549 SK-OV-3 SK-MEL-2 HCT15	**14.16** **11.94** **11.27** **12.49**	54

Chuquiraga erinaceas	Lupeol (**605**)	PC-3 LNCaP	>70 >70	171
	Heliantriol B2 / Betulin (**606**)	PC-3 LNCaP	46.58±1.10 42.81±1.06	
	Calenduladiol (**616**)	PC-3 LNCaP	>70 >70	
Camptotheca acuminata	Betulinic acid (**593**)	HepG2 Hep3B	91.2±1.31 81.5±3.50	74
Peganum harmala L	3α-acetoxy-14α-hydroxylup-20 (29)-en-11-oxo-28-oic acid methyl ester (**617**)	HeLa HepG2 SGC-7901	> 100 > 100 > 100	78
	3β-acetoxy-27-(4-hydroxy-3-methoxy-*E*-cinnamoyloxy) lup-en-28-oic acid methyl ester (**618**)	HeLa HepG2 SGC-7901	> 100 > 100 > 100	
	3β-acetoxy-27-hydroxy-lup-20 (29)-en-28-oic acid (**619**)	HeLa HepG2 SGC-7901	**11.5±3.4** **15.4±1.2** **14.6±0.8**	
	Methyl-lup-20 (29)-en-3-on-28-oate (**620**)	HeLa HepG2 SGC-7901	45.3±1.9 56.6±2.2 63.0±5.2	
	Betulonic acid/3-oxolup-20(29)-en-28-oic acid (**621**)	HeLa HepG2 SGC-7901	54.0±3.6 > 100 > 100	
	Lup-20 (29)-en-3-on-28-oic acid (**622**)	HeLa HepG2 SGC-7901	54.3±9.1 > 100 39.5±3.2	
	3-oxo-27-hydroxylup-20 (29)-en-28-acid methyl ester (**623**)	HeLa HepG2 SGC-7901	22.2±1.5 20.4±5.2 15.0±0.9	
	3-oxo-27-hydroxylup-20 (29)-en-28-oic acid (**624**)	HeLa HepG2 SGC-7901	> 100 > 100 > 100	
	3α-acetoxy-27-hydroxylup-20 (29)-en-28-oic acid methyl ester (**595**)	HeLa HepG2 SGC-7901	22.9±2.5 21.0±2.0 27.4±10.1	
	3β-acetoxy-27-hydroxylup-20 (29)-en-28-oic acid methyl ester (**625**)	HeLa HepG2 SGC-7901	**8.3±1.4** **11.0±0.7** **15.6±0.9**	
	3α,27-dihydroxylup-20 (29)-en-28-oic acid methyl ester (**594**)	HeLa HepG2 SGC-7901	24.7±0.6 30.6±3.5 **15.8±1.6**	
Globimetula dinklagei	Globimetulin A (**626**)	MCF-7 HeLa Caco-2 A549	>100 >100 >100 >100	97
	Globimetulin B (**627**)	MCF-7 HeLa Caco-2 A549	**6.88±0.26** **5.61±2.48** **5.76±0.19** **16.57±1.61**	
	Globimetulin C (**628**)	MCF-7 HeLa Caco-2 A549	45.80±3.48 33.08±1.97 94.61±1.89 >100	

Diospyros ehretioides	Lupeol (**605**)	HeLa HCT116, MCF-7 Vero cells	NA NA NA NA	172
	28-OAc-betulin (**629**)	HeLa HCT116, MCF-7 Vero cells	NA NA NA NA	
	Betulinic acid (**593**)	HeLa HCT116, MCF-7 Vero cells	NA NA NA NA	
	3-*O*-*trans*-caffeoylbetulinic acid (**613**)	HeLa HCT116, MCF-7 Vero cells	NA NA NA NA	
	Betulin(**606**)	HeLa HCT116, MCF-7 Vero cells	NA NA NA NA	
Adinandra hainanensis Hayata	Lupan-3β,20-dihydroxy-28-carbaldehyde (**630**)	KB MCF-7 HepG-2 LU	NA NA NA NA	167
Grewia flavescens Juss	3β-hydroxy-lup-20(29)-en-30-al (**631**)	HeLa	**16.5±0.5**	173
	Lupeol (**605**)	HeLa	23.5±1.7	
	Betulin(**606**)	HeLa	**11.1±0.5**	
Dobera glabra (Forssk)	Lup-20(29)-ene 3β-caffeate-30-al (**632**)	HCT-116 PC-3 HepG-2 VERO-B	> 100 > 100 > 100 > 100	131
	Lupeol (**605**)	HCT-116 PC-3 HepG-2 VERO-B	> 100 > 100 > 100 > 100	
	Δ 1 -lupenone (**633**)	HCT-116 PC-3 HepG-2 VERO-B	> 100 > 100 > 100 > 100	
	Lup-20(29)-en-3β,30-diol (**634**)	HCT-116 PC-3 HepG-2 VERO-B	> 100 > 100 > 100 > 100	
	Lupeol caffeate (**635**)	HCT-116 PC-3 HepG-2 VERO-B	> 100 > 100 > 100 > 100	
	30-hydroxylup-20(29)-ene 3β-caffeate (**636**)	HCT-116 PC-3 HepG-2	> 100 > 100 > 100	

		VERO-B	> 100	
	Betunaldehyde (**637**)	HCT-116 PC-3 HepG-2 VERO-B	> 100 > 100 > 100 > 100	
Leptopus lolonum	3β-*O*-(*trans*-p-coumaroyl)-lupane-28-al-20-ol (**638**)	HepG2 MCF-7 A549 HeLa	34.55 36.34 30.62 33.89	174
	3β-*O*-(*trans*-caffeoyl)-lupane-28-al-20-ol (**639**)	HepG2 MCF-7 A549 HeLa	40.67 55.73 45.66 47.20	
	3β-*O*-(*trans*-p-coumaroyl)-lupane-28-*O*-acetyl-20-ol (**640**)	HepG2 MCF-7 A549 HeLa	57.23 49.98 51.28 62.54	
	3β-*O*-(*cis*-caffeoyl)-20-ol-betulin (**641**)	HepG2 MCF-7 A549 HeLa	69.47 78.21 78.12 67.28	
	Ethyl 3β-O-(*trans*-caffeoyl)-lupane-28-oate (**642**)	HepG2 MCF-7 A549 HeLa	47.58 54.32 60.87 57.60	
	Monogynol A (**643**)	HepG2 MCF-7 A549 HeLa	>100 >100 >100 >100	
	3β-*O*-(trans-caffeoyl)-20-ol-betulin (**644**)	HepG2 MCF-7 A549 HeLa	62.48 72.24 74.71 62.86	
	3β-*O*-*trans*-coumaroylbetulinic acid (**609**)	HepG2 MCF-7 A549 HeLa	17.63 15.18 20.51 23.17	
	3β-*O*-(*cis*-coumaroyl)-betulinic acid (**645**)	HepG2 MCF-7 A549 HeLa	26.59 23.47 22.23 31.24	
	3β-*O*-coumaroylbetulin (**646**)	HepG2 MCF-7 A549 HeLa	53.84 57.02 50.34 48.37	
	3β-*O*-caffeoylbetulin (**647**)	HepG2 MCF-7 A549 HeLa	49.27 57.08 51.94 47.55	
	Betulinic acid (**593**)	HepG2 MCF-7 A549 HeLa	96.97 89.62 >100 >100	

	3β-*O*-(*trans*-p-coumaroyl)-lupane-20,28-diol (**648**)	HepG2 MCF-7 A549 HeLa	71.79 78.61 62.48 83.54	132
	3β-*O*-(*trans*-p-coumaroyl)-20-ol-betulinic acid (**649**)	HepG2 MCF-7 A549 HeLa	26.59 23.47 22.23 30.58	
Pulicaria jaubertii	Calenduladiol-3-*O*-palmitate (**650**)	HepG-2 MCF-7 PC-3	ND ND ND	175
Tetracarpidium conophorum	Betulinic acid (**593**)	HepG2	36.62	176
Melaleuca linariifolia	28-*O*-acetylbetulin (**651**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	NA NA NA NA NA NA	48
	3-oxolup-20(29)-en-28-oic acid (**621**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	**11.40±3.79** **16.23±1.57** NA 30.54±1.34 33.31±2.14 N/A	
	Betulinic aldehyde (**652**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	**18.50±3.21** **12.11±2.17** **3.85±0.98** **11.59±1.64** **15.36±2.35** **13.47±2.26**	
	Epilupeol (**653**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	NA NA NA NA NA NA	
	Betulinic acid (**593**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	**5.94±1.07** NA NA NA NA **15.05±1.98**	
	Diospyrolide (**654**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	NA NA NA NA NA NA	
	3β-hydroxy-lup-20(29)-en-30-al (**631**)	NCI-H441 NCI-H460 A549 SKOV3	NA NA NA NA	

		HeLa caki-1	NA NA	
	3-*O*-β-*trans*-p-coumaroylalphitolic acid (**655**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	**8.60±2.35** **16.43±1.73** **11.63±1.08** **10.34±0.72** **18.39±1.44** 25.63±0.67	
	3-*O*-*trans*-caffeoylbetulinic acid (**613**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	**11.50±1.34** 20.96±1.03 **12.34±2.28** **9.10±1.66** 23.62±0.89 **18.23±2.53**	
Holarrhena antidysenterica (L.)Wall	Holarol/ 3β-lup-20(31)-en-3,29,30-triol (**656**)	HeLa EAC Raji T24	NA NA NA 20.04	177
Schefflera barteri Harms	3-*O*-β-tridecanoyllupan-3-ol (**657**)	KB-3-1 HT29	NA NA	85
	3α,24-dihydroxylup-20(29)-en-28-oic acid (**612**)	KB-3-1 HT29	NA NA	
Xanthium strumarium	Methoxyl-3β-*O*-(trans-*p*-coumaroyl)-lupane-28-oate (**658**)	HepG2 A549 HCT116 SW480	**15.23** 20.38 **10.54** **17.56**	134
	3β-(3-furancarbonyloxy)-lupane-20-ol-betulinic acid (**659**)	HepG2 A549 HCT116 SW480	**12.05** **9.68** **4.27** **7.58**	
	3β-*O*-*trans*-coumaroylbetulinic acid (**609**)	HepG2 A549 HCT116 SW480	**12.47** 23.57 **15.20** 19.75	
	lupenyl acetate (**660**)	HepG2 A549 HCT116 SW480	78.24 87.65 > 100 > 100	
Ganoderma weberianum	3β-hydroxylup-20(29)-en-28-oic acid /betulinic acid (**593**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA 45.6±3.7	178
Potentilla freyniana Bornm.	Alphitolic acid (**607**)	Hep-G2 HCT-116 BGC-823 MCF-7	NA 21.62±0.33 NA NA	86
Zizyphus spina-christi	13β-hydroxy-lup-20(30)-ene-2,3-b-epoxy-28-carboxylate/Sidrin (**661**)	Myeloma THP-1 HeLa	**7.2** **5.1**	179
Bauhinia variegata Linn	Compound **662**	DU-145 MCF-7 PC-3 HT-29	>20 >20 >20 >20	89

Garcinia oligantha	23-acetyl hovenic acid (**663**)	HeLa HepG-2 MCF-7	26.06±1.72 24.18±1.01 >50	114
	2*α*,23-diacetyl hovenic acid (**664**)	HeLa HepG-2 MCF-7	19.62±1.92 >50 13.22±1.24	
	Betulinic acid (**593**)	HeLa HepG-2 MCF-7	>50 >50 >50	
	Betulin (**606**)	HeLa HepG-2 MCF-7	>50 >50 >50	
	3-hydroxy-23-acetoxy-lup-20(29)-en-28-oic acid (**665**)	HeLa HepG-2 MCF-7	**5.04±0.15** **9.76±0.96** **8.94±0.70**	
	23-hydroxybetulinic acid (**612**)	HeLa HepG-2 MCF-7	13.88±0.21 >50 13.46±1.26	
Ziziphus mauritiana	3-*O*-*trans*-p-coumaroylalphitolic acid (**655**)	L6	**15.8±6.4**	180
	Betulinic acid (**593**)	L6	ND	

Table 13. The cytotoxicity of *nor*-lupane-type triterpenoids **(666-672)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Ailanthus tryphysa	29-norlup-1-ene-3,20-dione (**666**)	HepG2 MOLT-3 A549 HuCCA-1 MDA-MB-321 HeLa T47-D MRC-5	NA NA NA NA NA NA NA NA	181
Cornus walteri	3-acetate-28-norlup-20(29)-en-3β-hydroxy-17β-hydroperoxide (**667**)	A549 SK-OV-3 SK-MEL-2 HCT-15	NA NA NA NA	182
	3-acetate-28-norlup-20(29)-en-3β,17β-diol (**668**)	A549 SK-OV-3 SK-MEL-2 HCT-15	NA NA NA NA	
Jaffrea xerocarpa	2α-formyl-A(1)norlup-20(29)-en-28-oic acid (**669**)	KB cells	7.9±0.12	169
	2β-formyl-A(1)norlup-20(29)-en-28-oic acid (**670**)	KB cells	7.0±0.17	
	Ceanothic acid (**671**)	KB cells	NA	
Alphitonia xerocarpus	Ceanothenic acid (**672**)	KB cells	2.6±0.16	183

Baill				
Camptotheca acuminata	3β,20-dihydroxy-30α-methyl,17(29)-β-epoxy-28-norlupane (**673**)	HepG2 Hep3B	94.0±4.00 84.5±4.50	74
	28-norlup-20(29)-en-3β-hydroxy-17β-hydroperoxide (**674**)	HepG2 Hep3B	29.6±1.02 47.5±1.84	
Streptocaulon griffithii Hook	30-nor-3β-acetoxy-lupan-20-one (**675**)	HL-60 P388 SMMC7721 Bcap37	81.89 > 100 > 100 > 100	184
Juglans hopeiensis	Jughopenoid A (**676**)	HT-29 HepG2	NA NA	130
	Jughopenoid C (**677**)	HT-29 HepG2	NA NA	
	Jughopenoid D /28-norlup-20 (29)-en-3β,17α-diol (**678**)	HT-29 HepG2	NA NA	
Dobera glabra (Forssk)	30-norlup-3β-ol-20-one (**679**)	HCT-116 PC-3 HepG-2 VERO-B	> 100 > 100 > 100 > 100	131
Leptopus lolonum	3β-*O*-(cis-caffeoyl)-norlupane-17β,20-diol (**680**)	HepG2 MCF-7 A549 HeLa	22.57 25.41 20.86 28.93	132
	3β-*O*-(trans-p-coumaroyl)-norlupane-17β-hydroperoxide-20-ol (**681**)	HepG2 MCF-7 A549 HeLa	31.20 27.56 36.47 33.02	
	3β-*O*-(trans-p-coumaroyl)-norlupane-17β,20-diol (**682**)	HepG2 MCF-7 A549 HeLa	**11.87** **13.61** **14.77** **17.29**	174
Melaleuca linariifolia	28-nor-lup-17(22)-ene (**683**)	NCI-H441 NCI-H460 A549 SKOV3 HeLa caki-1	NA NA NA NA NA NA	48
Ziziphus mauritiana	Ceanothic acid (**671**)	L6	>50	180
	3-dehydroxyceanothan-28β-19β-olide (**684**)	L6	>50	
	Colubrinic acid (**685**)	L6	>50	
	(1R,3S)-3-*O*-benzoylceanothic acid (**686**)	L6	**16.4±5.8**	
	(1S,3S)-3-*O*-benzoyl ceanothic acid (**687**)	L6	32.3±5.1	
	Ceanothenic acid (**672**)	L6	>50	

Table 14. The cytotoxicity of *seco*-lupane-type triterpenoids **(688-695)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Dysoxylum lukii	Dysoxylukiine C (**688**)	SOSP-9607 MG-63 Saos-2 M663	**8.3** **9.7** **8.4** **9.3**	140
Salvia buchananii	Salvibuchanic acid/ 2,3-*seco*-2,3-epoxy-2-hydroxylup-20(29)-en-28-oic acid (**689**)	Jurkat HeLa MCF7	38±0.9 40±2.1 70±3.1	185
Camptotheca acuminata	2,3-*seco*-lup-20(29)en-2,3,28-trioic acid (**690**)	HepG2 Hep3B	92.5±1.50 83.5±5.50	74
Juglans hopeiensis	Jughopenoid B (**691**)	HT-29 HepG2	49.17 NA	130
	Jughopenoid G (**692**)	HT-29 HepG2	NA NA	
	Jughopenoid H (**693**)	HT-29 HepG2	NA NA	
Eleutherococcus sessiliflorus	Sessiligenin (**694**)	HepG2 B16-F10 Lewis YAC-1	NA 17.9±0.6 NA NA	186
	Chiisanogenin (**695**)	HepG2 B16-F10 Lewis YAC-1	NA 23.8±0.8 NA NA	

Table 15. The cytotoxicity of *seco*-lupane-type triterpenoid glycosides **(696-698)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cance cell lines	IC_{50} (μM)	References
Eleutherococcus sessiliflorus	Chiisanoside (**696**)	HepG2 B16-F10 Lewis YAC-1	NA NA NA NA	186
	Divaroside (**697**)	HepG2 B16-F10 Lewis YAC-1	NA NA NA NA	
	Sessiliside-A1 (**698**)	HepG2 B16-F10 Lewis YAC-1	NA NA NA NA	

Table 16. The cytotoxicity of lupane triterpenoid glycosides (**699-701**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Jaffrea xerocarpa	28-*O*-β-D-glucopyranosyl-(1→3)-[β-D-glucopyranosyl-(1→2)]-β-D-glucopyranosyl- (1→2)-β-D-glucopyranosylceanothic acid (**699**)	KB cells	NA	169
Akebia trifoliata	2*α*,3β,23-trihydroxylup-20(29)-en-28-oic acid-*O*-β-D-glucopyranosyl ester/Akebiaoside C (**700**)	A549 HeLa HepG2	>100 >100 >100	125
Combretum racemosum	Guadranoside II (**701**)	HL 60 K562	NA NA	60

Table 17. The cytotoxicity of taraxastane-type triterpenoids (**702-713**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Cirsium setosum (Willd.) MB	3β,22α-dihydroxy-20-taraxasten-30-oic acid (**702**)	HCT-8 Bel7402 BGC-823 A549 A2780	>20 >20 >20 >20 **10.2**	187
	3β-hydroxy-22-oxo-20-taraxasten-30-oic acid (**703**)	HCT-8 Bel7402 BGC-823 A549 A2780	>20 >20 >20 >20 **3.9**	
	3-oxo-22α-hydroxy-20- taraxasten-30-oic acid (**704**)	HCT-8 Bel7402 BGC-823 A549 A2780	>20 >20 >20 >20 **17.8**	
	3β,19β-dihydroxy-20-taraxasten-30-oic acid (**705**)	HCT-8 Bel7402 BGC-823 A549 A2780	>20 >20 >20 >20 **12.4**	
Cirsium setosum (Willd.) MB**.**	22-oxo-20-taraxasten-3β, 30-diol (**706**)	HCT-8 Bel7402 BGC-823 A549 A2780	**18.5** >20 >20 >20 **4.7**	188
	22α-hydroxy-20-taraxasten-30β, 30-triol (**707**)	HCT-8 Bel7402 BGC-823 A549 A2780	**8.9** >20 >20 >20 **14.3**	

	20-taraxasten-3β, 30-diol (**708**)	HCT-8 Bel7402 BGC-823 A549 A2780	>20 >20 >20 >20 >20	
	20-taraxasten-3β-ol (**709**)	HCT-8 Bel7402 BGC-823 A549 A2780	>20 >20 >20 >20 >20	
Rhododendron dauricum	20-taraxastene-22α-methoxy-3β-ol (**710**)	A549, HeLa SK-Hep1	34.04±1.01 64.04±1.75 44.04±0.05	189
Pulicaria jaubertii	Pseudo-taraxaterol (**711**)	HepG-2 MCF-7 PC-3	ND ND ND	175
	Pseudo-taraxasterol acetate (**712**)	HepG-2 MCF-7 PC-3	ND ND ND	
	3β-acetoxytaraxaster-20-en-30-aldehyde (**713**)	HepG-2 MCF-7 PC-3	ND ND ND	

Table 18. The cytotoxicity of taraxerane-type triterpenoids (**714-719**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Salvia deserta	2β, 3β, 24β-trihydroxy-12, 13-cyclo-taraxer-l4-en-28-oic acid (**714**)	A549 MDA-MB-231 KB KB-VIN MCF7	>40 >40 >40 >40 >40	193
Manniophyton fulvum	Manniotaraxerol A (**715**)	HeLa	NA	194
	Manniotaraxerol B (**716**)	HeLa	NA	
Manilkara zapota L.	Taraxerol methyl ether (**717**)	BT474 Chago-K1 HepG2 KATO-III SW620 WI-38	184.95±1.61 >227.07 >227.07 >227.07 >227.07 >227.07	192
	Taraxerol (**718**)	BT474 Chago-K1 HepG2 KATO-III SW620 WI-3	>235.45 >235.45 >235.45 >235.45 >235.45 >235.45	
	Taraxerone (**719**)	BT474	19.24±0.40	

		Chago-K1	26.75±0.97	
		HepG2	20.41±1.43	
		KATO-III	26.49±0.57	
		SW620	>234.34	
		WI-3	>234.34	

Table 19. The cytotoxicity of friedelane-type triterpenoids (**720-747**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Cheiloclinium cognatum	Friedelin (**720**)	THP-1	39.07±2.93	197
		K562	38.52±2.30	
	β-friedelinol/ Friedelan-3β-ol (**721**)	THP-1	**15.75±2.60**	
		K562	**14.18±1.43**	
	28-hydroxyfriedelan-3-one (canophyllol, **722**)	THP-1	53.55±3.90	
		K562	43.71±2.01	
	29-hydroxyfriedelan-3-one (**723**)	THP-1	26.35±3.32	
		K562	50.55±3.62	
	Friedelane-3β,29-diol (**724**)	THP-1	33.60±2.26	
		K562	64.75±3.90	
Tripterygium wilfordii	Wilforic acid G (**725**)	HL-60	NA	195
		A-549	NA	
		SMMC-7721	NA	
		MCF-7	NA	
		SW-480	NA	
	Wilforic acid H (**726**)	HL-60	NA	
		A-549	NA	
		SMMC-7721	NA	
		MCF-7	NA	
		SW-480	NA	
	Wilforic acid I (**727**)	HL-60	NA	
		A-549	NA	
		SMMC-7721	NA	
		MCF-7	NA	
		SW-480	NA	
Anacolosa poilanei	3α-*p*-coumaroyl-D:A-friedo-oleanan-27-oic acid (**728**)	KB	**12.2±1.5**	198
		MCF7	**14.8±1.3**	
		HepG2	**11.3±1.2**	
		LU	**10.0±0.9**	
	3α-(3,4-dihydroxycinnamoyl)-D:A-friedo-oleanan-27-oic acid (**729**)	KB	26.8±1.0	
		MCF7	27.2±1.2	
		HepG2	>50	
		LU	>50	
	3α-(3,4-dihydroxycinnamoyl)-D:A-friedo-oleanan-27,15α-lactone (**730**)	KB	19.3±1.7	
		MCF7	20.6±1.9	
		HepG2	>50	
		LU	>50	
	Trichadenic acid A (**731**)	KB	ND	

		MCF7 HepG2 LU	ND ND ND	
	Trichadonic acid (**732**)	KB MCF7 HepG2 LU	ND ND ND ND	
Maytenus robusta Reissek	Friedelan-3-one (**733**)	THP-1 K562 TOV-21G MDA-MB-231	44.85±3.02 79.55±4.24 >100 >100	199
	Friedelane-3,16-dione (**734**)	THP-1 K562 TOV-21G MDA-MB-231	51.92±2.81 39.20±1.68 >100 >100	
	Friedelane-3-hydroxyimino (**735**)	THP-1 K562 TOV-21G MDA-MB-231	46.80±2.62 55.40±2.98 >100 >100	
	3-hydroxyiminofriedelan-16-one (**736**)	THP-1 K562 TOV-21G MDA-MB-231	45.67±2.63 54.63±2.88 35.67±1.30 34.60±1.70	
	Friedelane-3,4-lactone (**737**)	THP-1 K562 TOV-21G MDA-MB-231	47.95±1.81 40.82±3.23 47.95±1.81 40.82±3.23	
	3,4-lactonefriedelan-16-one (**738**)	THP-1 K562 TOV-21G MDA-MB-231	45.66±1.81 38.50±2.02 65.60±2.90 78.50±3.10	
Salacia elliptica	7α,15α-dihydroxyfriedelan-3-one (**739**)	A549	ND	200
	Friedelan-3-one (**733**)	A549	18.77±0.56	
	Friedelan-3β-ol (**721**)	A549	20.97±0.51	
	Friedelan-1,3-dione (**740**)	A549	ND	
	Friedelan-3,15-dione (**741**)	A549	ND	
	15α-hydroxyfriedelan-3-one (**742**)	A549	20.44±0.72	
	15α,26-dihydroxyfriedelan-3- one (**743**)	A549	20.01±0.81	
	26-hydroxyfriedelan-3,15-dione (**744**)	A549	21.63±1.71	
Manniophyton fulvum	3α,28-dihydroxyfriedelan-1-one (**745**)	HeLa	NA	194
	3α-hydroxy-1-oxofriedelane (**746**)	HeLa	NA	
Bridelia balansae Tutcher	Epifriedelanol /Friedelan-3β-ol (**721**)	HCT 116	NA	201
	Friedelin (**720**)	HCT 116	NA	
Salacia grandifolia	28-hydroxyfriedelane-3,15-dione (**747**)	THP-1 K-562	539±43 259±33	202

Table 20. The cytotoxicity of *nor*-friedelane-type triterpenoids (**748-755**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Anchietea pyrifolia	Anchietin A / 2β, 21β-dihydroxy-27-oxo-30-norfriedel-20(29)-en-27,15α-lactone (**748**)	HeLa HL60	>60 >60	203
	21β-hydroxycaloncobalactone (**749**)	HeLa HL60	>60 >60	
	Anchietin B/ 2β,21α-dihydroxy-27-oxo-30-norfriedel-20(29)-en-27,15α-lactone (**750**)	HeLa HL60	>60 >60	
	Anchietin C / 21α-hydroxy-27-oxo-30-norfriedel-20(29)-en-27,15α-lactone (**751**)	HeLa HL60	>60 >60	
	Anchietin D / 21α-dihydroxy-3-oxo-30-norfriedel-20(29)-en-27-oate (**752**)	HeLa HL60	>60 30.6±4.1	
	Anchietin E/ methyl 2β, 21β-dihydroxy-3-oxo-30-norfriedel-20(29)-en-27-oate (**753**)	HeLa HL60	>60 27.9±1.8	
	2β, 21β-dihydroxy-3-oxo-30-norfriedel-20(29)-en-27,19α-lactone (**754**)	HeLa HL60	>60 19.4±5.4	
	Welwitschiilactones B (**755**)	HeLa HL60	>60 >60	

Table 21. The cytotoxicity for ceanothane-type triterpenoids **(756-758)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Zizyphus jujuba	*ent*-epicatechinoceanothic acid A (**756**)	HSC-T6	43.5	205
	ent-epicatechinoceanothic acid B (**757**)	HSC-T6	NA	
	epicatechino-3-deoxyceanothetric acid A (**758**)	HSC-T6	NA	
Colubrina asiatica	3,7-*O*,*O*-dibenzoyl ceanothic acid methylester (**759**)	NCI-H187 KB MCF-7	11.49 25.51 NA	204
	3-*O*-acetyl-7-*O*-benzoyl ceanothic acid methyl ester (**760**)	NCI-H187 KB MCF-7	17.09 53.54 NA	
	Ceanothic acid (**761**)	NCI-H187 KB MCF-7	NA NA NA	
	24-hydroxyceanothic acid (**762**)	NCI-H187 KB MCF-7	NA NA NA	
	Zizyberenalic acid (**763**)	NCI-H187 KB MCF-7	NA NA NA	

Table 22. The cytotoxicity of hopane-types triterpenoids (**764-768**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Ainsliaea yunnanensis Franch	3β-carboxylicfilic-4(23)-ene (**764**)	A549	>10	206
		HeLa	>10	
		A431	>10	
		MCF-1	>10	
		THP-1	**5.12**	
	Adian-5-en-3α-ol (**765**)	A549	>10	
		HeLa	>10	
		A431	>10	
		MCF-1	>10	
		THP-1	**1.78**	
	Fernenol (**766**)	A549	>10	
		HeLa	>10	
		A431	>10	
		MCF-1	>10	
		THP-1	**1.74**	
	Fern-7-en-3β-ol (**767**)	A549	>10	
		HeLa	>10	
		A431	>10	
		MCF-1	>10	
		THP-1	**1.75**	
Albizia lebbeck L. Benth	29-hydroxyhopane (**768**)	Raw 264.7	ND	207

Table 23. The cytotoxicity of serratene-type triterpenoids (**769-792**) against cancer cell lines

Plant sources	Names and mumbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Lycopodium complanatum	Serrat A/ 2α, 3α, 20β, 21β, 24, 29 hexahydroxyserrat-14-en-16-one (**769**)	A549	NA	210
		calu-6	NA	
		NCI-H226	NA	
		NCI-H441	NA	
		NCI-H1975	NA	
		HepG2	NA	
		MCF-7	29.65	
		MCF-10A	NA	
	Serrat B / 3α, 6α, 20β, 21β, 24, 29-hexahydroxyserrat-14-en-16-one (**770**)	A549	NA	
		calu-6	NA	
		NCI-H226	NA	
		NCI-H441	NA	
		NCI-H1975	NA	
		HepG2	35.25	
		MCF-7	24.79	
		MCF-10A	NA	

	Serrat C/ 3α, 20β, 21β, 27α, 24, 29-hexahydroxyserrat-14-en-16- one (**771**)	A549	NA	
		calu-6	53.84	
		NCI-H226	NA	
		NCI-H441	43.18	
		NCI-H1975	58.56	
		HepG2	NA	
		MCF-7	**16.90**	
		MCF-10A	69.76	
	Serrat D / 3α, 20β, 21β, 27β, 24, 29-hexahydroxyserrat-14-en-16-one (**772**)	A549	NA	
		calu-6	NA	
		NCI-H226	NA	
		NCI-H441	NA	
		NCI-H1975	NA	
		HepG2	NA	
		MCF-7	**18.78**	
		MCF-10A	NA	
	Serrat E / 3α, 7β, 20β, 21β, 24-pentahydroxyserrat-14-en-16-one (**773**)	A549	NA	
		calu-6	NA	
		NCI-H226	58.91	
		NCI-H441	NA	
		NCI-H1975	NA	
		HepG2	59.19	
		MCF-7	29.82	
		MCF-10A	NA	
	Serrat F / 3α, 20β, 21β, 24-pentahydroxyserrat-13- en-15-one (**774**)	A549	NA	
		calu-6	NA	
		NCI-H226	NA	
		NCI-H441	NA	
		NCI-H1975	NA	
		HepG2	NA	
		MCF-7	21.36	
		MCF-10A	NA	
	16-oxolyclanitin (**775**)	A549	NA	
		calu-6	NA	
		NCI-H226	NA	
		NCI-H441	NA	
		NCI-H1975	NA	
		HepG2	73.04	
		MCF-7	23.66	
		MCF-10A	NA	
Lycopodium complanatum	Lycomplanatum A (**776**)	SKVO-3	NA	211
		DU-145	NA	
		NCI-1975	NA	
		BEL-7402	NA	
		MKN-45	NA	
		PC-3	>50	
		MCF-7	43.8	
	Lycomplanatum B (**777**)	SKVO-3	>50	
		DU-145	40.5	
		NCI-1975	36.8	
		BEL-7402	42.2	
		MKN-45	45.4	
		PC-3	44.8	

		MCF-7	37.1	
	Lycomplanatum C (**778**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	NA NA NA NA NA NA NA	
	Lycomplanatum D (**779**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	>50 >50 NA >50 36.6 NA 44.7	
	Lycomplanatum E (**780**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	NA NA NA NA NA NA NA	
	Lycomplanatum F (**781**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	NA NA NA NA NA NA 26.4	
	Lycomplanatum G (**782**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	NA NA NA NA NA NA 28.8	
	Lycomplanatum H (**783**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	NA NA NA NA NA NA **13.8**	
	3β,21β-dihydroxyserrat-14-en-16-one (**784**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	NA NA NA NA >50 46.8 31.6	
	3α,21β,29-trihydroxyserrat-14-en-16-one (**785**)	SKVO-3 DU-145 NCI-1975	NA NA NA	

		BEL-7402 MKN-45 PC-3 MCF-7	>50 44.3 >50 42.5	
	3β,21β,24-trihydroxyserrat-14-en-16-one (**786**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	NA NA NA >50 NA NA 35.6	
	3α,21β,24-trihydroxyserrat-14-en-16-one (**787**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	NA NA NA NA NA >50 NA	
	Lycernuic A (**788**)	SKVO-3 DU-145 NCI-1975 BEL-7402 MKN-45 PC-3 MCF-7	>50 42.6 >50 46.5 32.5 38.6 39.6	
Lycopodium clavatum L.	Lycomclavatol A (**789**)	HepG2 A549	40.7 87.0	213
	Lycomclavatol B (**790**)	HepG2 A549	NA NA	
Phlegmariurus carinatus	14α,21β-dihydroxyserrat-3β-yl acetate (**791**)	HepG2, A549 HuCCA-1	43.5±2.26 38.6±0.22 30.9±0.95	212
Phlegmariurus nummulariifolius (Blume)	3α,21β-dihydroxyserrat-14-en-23-oic acid (**792**)	HepG2, A549 HuCCA-1	NA NA **4.72**	

Table 24. The cytotoxicity of chiratene-type triterpenoids (**793** and **794**) against cancer cell lines

Plant source	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Gentiana scabra Bge.	11β-hydroxy-chirat-16-en-3-one (**793**)	Hep3B HCT116 HepG2 U87	>100 43.95±0.02 >100 >100	93
	Chirat-16-en-3-one (**794**)	Hep3B HCT116 HepG2 U87	>100 44.18±1.30 >100 >100	

Table 25. The cytotoxicity of arborinane-type triterpenoids (**795-797**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Dipsacus asper	25-acetoxy-28-dehydroxyrubiarbonone E (**795**)	A549 H157 HepG2 MCF-7	NA NA NA NA	55
Myrothecium inundatum	Myrotheol A (**796**)	RKO K562	51.0 28.9	214
	Myrotheol B (**797**)	RKO K562	62.3 63.9	

Table 26. The cytotoxicity of arborinane-type triterpenoids glycosides (**798** and **799**) against cancer cell lines

Plant source	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Myrothecium inundatum	Myrotheside C (**798**)	RKO K562	> 100 28.6	214
	Myrotheside D (**799**)	RKO K562	68.8 32.5	

Table 27. The cytotoxicity of dammarane-type triterpenoids **(800-869)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Ixora coccinea Linn	Ixorene isovalerate (**800**)	3T3 PC3 HeLa	>30 >30 >30	59
	Ixorene-3',8'-dimethyloctanoate (**801**)	3T3 PC3 HeLa	>30 >30 >30	
Ceriops tagal	Cereotagalol C (**802**)	HCT-116 CNE-2	29.7±0.25 >50	221
	Cereotagalol D (**803**)	HCT-116 CNE-2	>50 37.2±0.20	
Toona sinensis	Ocotillone (**804**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 >40 >40	231
	(20*S*,24*R*)-epoxydammarane-12,25-diol-3-one (**805**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 24.6 >40	

	(20*S*,24*R*)-epoxydammarane-3β,25-diol (**806**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 >40 >40	
	Richenone (**807**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 >40 >40	
	20-hydroxy-24-dammaren-3-one (**808**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 9.8 >40	
	Hollongdione (**809**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 >40 >40	
	(20*S*,24*S*)-dihydroxydammar-25-en-3-one (**810**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 >40 >40	
Aglaia elliptica	Dammar-24-en-3β-ol (**811**)	P-388	21.30±0.06	216
	3β-epicabraleahydroxy lactone (**812**)	P-388	104.71±0.05	
	(*E*)-25-hydroperoxydammar-23-en-3β,20-diol (**813**)	P-388	12.41±0.04	
	Dammar-24-en-3β,20-diol (**814**)	P-388	50.44±0.04	
	3β-acetyl-20S,24S-epoxy-25-hydroxydammarane (**815**)	P-388	8.20±0.06	
	3β-epiocotillol (**816**)	P-388	23.94±0.04	
Aglaia argentea	Dammar-24-en-3α-ol (**817**)	P-388	NA	232
	3β-epicabraleahydroxy lactone (**812**)	P-388	NA	
	(*E*)-25-hydroperoxydammar-23-en-3β,20-diol (**813**)	P-388	NA	
Jaffrea xerocarpa	17,20-didehydro-20-deoxyjujubogenin (**818**)	KB cells	NA	169
Gynostemma pentaphyllum (Thunb.)	Gypsapogenin A (**819**)	HepG2 A549	24.12 59.81	233
Celastrus orbiculatus Thunb	3β-(*E*)-3,4-dimethoxycinnamate-20(S)-dammarenediol II (**820**)	MCF-7 A2780s	> 40 > 40	170
	Dammarendiol II 3-*O*-caffeate (**821**)	MCF-7 A2780s	20.30±1.68 > 40	
Aglaia elliptica	3β-acetyl-20S,24S-epoxy-25-hydroxydammarane (**815**)	P-388	**4.09±0.09**	222
	20*S*,24S-epoxy-3α,25-dihydroxydammarane (**822**)	P-388	**11.03±0.10**	
Chisocheton	(24*E*)-3-oxo-dammara-20,24-dien-26-	A549	**17.7**	76

paniculatus	ol (**823**)	HeLa GSU	35.2 35.0	
Gynostemma pentaphyllum	(1*R*,3*S*,20*S*,23*R*)-20,23-dihydroxydammar-21-oic acid-21,23-lactone-1,3-oxa-5(10),24-diene (**824**)	MCF-7 HepG2 DU145	95.7±15.9 > 100 64.8±11.3	223
	(1*R*,3*S*,20*S*,23*S*)-20,23-dihydroxydammar-21-oicacid-21,23-lactone-1,3-oxa-5(10),24-diene (**825**)	MCF-7 HepG2 DU14	62.3±5.0 > 100 55.0±8.6	
	(1*R**,3*S**,20*R**,21*S**,23*R**,24*R**)-23-methoxy-20,21,25-tirhydroxy-1,3-oxa-21,24-cyclodammar-5(10)-ene (**826**)	MCF-7 HepG2 DU14	ND ND ND	
Cleome gynandra	Cleogynone A (**827**)	 MDA-MB-468 HCT-116 HCT-15 A549	inhibition (%) 52.55±5.42 NA 82.97±0.56 NA	224
	Cleogynone B (**828**)	MDA-MB-468 HCT-116 HCT-15 A549	51.28±1.99 55.79±1.23 81.74±0.34 16.14±1.72	
	Compound **829**	MDA-MB-468 HCT-116 HCT-15 A549	66.58±1.30 60.96±4.95 83.67±3.16 NA	
Walsura trichostemon	Compound (**830**)	 A549	inhibition (%) 35.1±9.1	225
	Compound (**831**)	A549	61.0±9.1	
	Compound (**832**)	A549	83.1±5.2	
	Compound (**833**)	A549	40.3±9.1	
Chisocheton pentandrus	Pentandrucine A (**834**)	MCF-7	101.01	226
	Pentandrucine B (**835**)	MCF-7	43.03	
	Pentandrucine C (**836**)	MCF-7	176.18	
	Pentandrucine D (**837**)	MCF-7	213.92	
	Pentandrucine E (**838**)	MCF-7	306.02	
	Pentandrucine F (**839**)	MCF-7	87.19	
	Pentandrucine G (**840**)	MCF-7	27.12	
	Pentandrucine H (**841**)	MCF-7	24.33	
	Pentandrucine I (**842**)	MCF-7	26.13	
	Pentandrucine J (**843**)	MCF-7	20.98	
	Cabrealeolactone (**844**)	MCF-7	61.18	
	Cabreadiol (**845**)	MCF-7	33.12	
Aglaia elliptica	3β-oleate-20*S*-hydroxydammar-24-en (**846**)	MCF-7 B16F10	NA NA	227
	3β-oleate-20*S*,24*S*-epoxy-25-hydroxydammarane (**847**)	MCF-7 B16F10	NA NA	
	20*S*-hydroxydammar-24-en-3-on	MCF-7	NA	

	(**848**)	B16F10	51.9	
	3β,20*S*-dihydroxydammar-24-en (**849**)	MCF-7 B16F10	NA NA	
	20*S*,24*S*-epoxy-3β,25-dihydroxydammarane (**850**)	MCF-7 B16F10	NA NA	
Juglans mandshurica Maxim	Dammar-3α,12(R),20(S)-triol-12,32(R);20,32-diepoxy-25-methy-25-en-tridecacyclic ether (**851**)	BGC-823 HepG-2 HT-29	37.64±1.96 18.88±0.68 47.51±3.02	228
	(23*E*)-12β,20(R),25(S),26-tetrahydroxydammar-23-en-3-one (**852**)	BGC-823 HepG-2 HT-29	20.55±1.35 56.33±4.21 44.27±1.58	
	(12 R,20S,24S)-20,24-;12,24-diepoxy-dammarane-3β-ol (**853**)	BGC-823 HepG-2 HT-29	87.14±3.11 60.50±1.22 43.19±0.99	
	12β,23(R)-epoxydammara-24-ene-3β,6α,20(S)-triol (**854**)	BGC-823 HepG-2 HT-29	82.66±1.89 91.58±2.71 79.17±1.17	
	Dammar-20(S),25(S)-epoxy-3β,12β,26-triol (**855**)	BGC-823 HepG-2 HT-29	78.42±2.63 76.95±3.31 82.44±4.18	
	Dammar-20(22),24-diene-3β,6α,12β-triol (**856**)	BGC-823 HepG-2 HT-29	>100 92.25±1.84 89.17±3.50	
	26-hydroxyl-24(*E*)-20(S)-protopanaxatriol (**857**)	BGC-823 HepG-2 HT-29	38.67±2.77 31.96±2.02 46.38±1.66	
	Horipenoid E (**858**)	BGC-823 HepG-2 HT-29	29.13±1.59 38.66±4.06 25.37±0.82	
Gynostemma pentaphyllum	(3S,19S,20S,23R)-3,19-oxa-19-methoxy-20,23- dihydroxydammar-21-oic acid-21,23-lactone-24-ene (**859**)	MCF-7 HepG2 DU145	NA NA NA	229
	(3S,19S,20S,23S)-3,19-oxa-19-methoxy-20,23-dihydroxydammar-21-oic acid-21,23-lactone-24-ene (**860**)	MCF-7 HepG2 DU145	**13.7±0.2** **14.8±1.5** 20.0±0.1	
	(3S,19S,23R)-3,19-oxa19-methoxy-20,23-dihydroxydammar -21-oicacid-21,23-lactone-20,24-diene (**861**)	MCF-7 HepG2 DU145	22.2±0.9 23.2±11.2 21.7±0.2	
Aglaia cucullata	20S,24S-epoxy-3α,25-dihydroxydammarane (**822**)	MCF-7 B16-F10 CV-1	142.25 97.33 173.82	234
	Dammaradienone (**862**)	MCF-7 B16-F10 CV-1	132.21 128.96 195.07	
	3α-acetyl-cabraleahydroxylactone (**863**)	MCF-7 B16-F10 CV-1	274.45 274.45 285.00	
	3α-acetyl-20*S*,24*S*-epoxy-3α,25-dihydroxydammarane (**864**)	MCF-7 B16-F10 CV-1	194.73 157.97 >300	

Aglaia cucullata	3α-acetyl-cabraleahydroxylactone (**863**)	B16-F10	153.38±0.19	230
	(20*S*)-20-hydroxydammar-24-en-3α-ol (**865**)	B16-F10	41.08±0.23	
	20*S*-hydroxydammar-24-en-3-on (**848**)	B16-F10	21.55±0.25	
	3β-epiocotillol (**816**)	B16-F10	195.07±0.32	
	Cabraleone (**866**)	B16-F10	545.01±0.22	
	Ocotillone (**804**)	B16-F10	303.68±0.24	
Aglaia elliptica (C.DC.) blume	Elliptaglin A (**867**)	MCF-7 B16F10	295.23 97.17	235
	Elliptaglin B (**868**)	MCF-7 B16F10	60.98 51.83	
	Elliptaglin C (**869**)	MCF-7 B16F10	234.99 190.27	

Table 28. The cytotoxicity of *nor*-dammarane-type triterpenoids **(870-877)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Toona sinensis	Cabralealactone (**870**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 >40 >40	231
	Cylindrictone D (**871**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 >40 >40	
Ailanthus altissima	Ailanaltiolide J (**872**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	218
	Cabralealactone (**870**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	
Cyclocarya paliurus	20 (*S*) 2*α*,3*α*,23-trihydroxyurs-l2-en-25,26,27-trinordammarane/ Cyclopalitin A (**873**)	B16F10	NA	237
	20 (*S*) 2*α*,3*β*,23-trihydroxyurs-l2-en-25,26,27-trinordammarane/ Cyclopalitin B (**874**)	B16F10	NA	
Aspergillus fumigatus	Asperfumin A (**875**)	A549 HGC-27 H1975	**8.4±1.1** **4.2±0.5** 20.9±2.2	236
	Asperfumin B (**876**)	A549 HGC-27	**12.2±1.4** **9.8±1.0**	

		H1975	26.5±2.8	
Aglaia cucullata	(20*S*,24*RS*)-23,24-epoxy-24-methoxy-25,26,27-tris-nordammar-3-one (**877**)	MCF-7 B16-F10 CV-1	133.13 105.32 >300	234

Table 29. The cytotoxicity of euphorfistrine E against cancer cell lines

Plant source	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Euphorbia fischeriana	Euphorfistrine E / (3*S*,5*R*,7*R*,8*R*,9*R*,10*S*,13*S*,17*R*,20*R*)-30(14→13)*abeo*-dammara-14,24-diene-3,7-diol (**878**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	**12.38±0.68** 31.62±0.67 24.9±0.84 **9.89±0.34** **14.79±0.61** 24.64±0.52 92.64±1.14	83

Table 30. The cytotoxicity of *seco*-dammarane triterpenoids **(879-887)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Aglaia stellatopilosa	Stellatonin A (**879**)	HT-29	NA	238
		MCF-7	NA	
		NCI-H460	NA	
	Stellatonin B (**880**)	HT-29	NA	
		MCF-7	NA	
		NCI-H460	NA	
	Stellatonin C (**881**)	HT-29	NA	
		MCF-7	NA	
		NCI-H460	NA	
	Stellatonin D (**882**)	HT-29	NA	
		MCF-7	NA	
		NCI-H460	NA	
	Stellatonin E (**883**)	HT-29	NA	
		MCF-7	NA	
		NCI-H460	NA	
Toona sinensis	Methyl shoreate (**884**)	A549	**7.1**	231
		HeLa	>40	
		HepG2	>40	
		SGC-7901	23.2	
		SW-480	>40	
	Shoreic acid (**885**)	A549	**6.0**	
		HeLa	>40	
		HepG2	>40	
		SGC-7901	>40	
		SW-480	>40	
Aglaia cucullata	Methyl 20(*S*)-hydroxy-3,4-secodam mar-4(28),24-diene-3-oic acid (**886**)	B16-F10	71.04±0.19	230
Aglaia cucullata	Eichlerianic acid (**887**)	MCF-7	>300	234
		B16-F10	>300	
		CV-1	287.76	

Table 31. The cytotoxicity of *seco*-dammarane triterpenoids glycosides (**888-906**) against cance cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Cyclocarya paliurus	Cyclocarioside F (**888**)	ASPC-1	NA	240
		SNU5	NA	
		HEPG-2	NA	
		HCT116	NA	
	Cyclocarioside J (**889**)	ASPC-1	NA	
		SNU5	NA	
		HEPG-2	NA	
		HCT116	NA	
	Cyclocarioside O (**890**)	ASPC-1	NA	
		SNU5	NA	
		HEPG-2	NA	
		HCT116	NA	
	Cyclocarioside P (**891**)	ASPC-1	93.94	

		SNU5	93.54	
		HEPG-2	62.21	
		HCT116	56.62	
	Cyclocarioside Q (**892**)	ASPC-1	NA	
		SNU5	NA	
		HEPG-2	NA	
		HCT116	NA	
	Cyclocarioside Z9 (**893**)	MCF-7	67.33	239
		PC-3	NA	
		Du145	NA	
		NCI-1975	NA	
		PC-9	NA	
		SKVO3	NA	
		HepG2	NA	
	Cyclocarioside Z10 (**894**)	MCF-7	NA	
		PC-3	NA	
		Du145	NA	
		NCI-1975	NA	
		PC-9	NA	
		SKVO3	NA	
		HepG2	NA	
	Cyclocarioside Z11 (**895**)	MCF-7	NA	
		PC-3	NA	
		Du145	NA	
		NCI-1975	NA	
		PC-9	NA	
		SKVO3	NA	
		HepG2	NA	
	Cyclocarioside R (**896**)	MCF-7	**13.25**	
		PC-3	23.44	
		Du145	**16.68**	
		NCI-1975	**11.31**	
		PC-9	**12.95**	
		SKVO3	**14.47**	
		HepG2	29.51	
	Cyclocarioside P (**891**)	MCF-7	20.72	
		PC-3	38.90	
		Du145	30.76	
		NCI-1975	22.38	
		PC-9	35.48	
		SKVO3	34.66	
		HepG2	53.70	
	Cyclocarioside Z3 (**897**)	MCF-7	23.54	
		PC-3	35.45	
		Du145	32.98	
		NCI-1975	25.78	
		PC-9	29.24	
		SKVO3	30.34	
		HepG2	55.78	
	Cyclocarioside I (**898**)	MCF-7	38.37	
		PC-3	NA	
		Du145	NA	
		NCI-1975	NA	

		PC-9 SKVO3 HepG2	NA NA NA	
	Cyclocarioside K (**899**)	MCF-7 PC-3 Du145 NCI-1975 PC-9 SKVO3 HepG2	35.34 NA NA NA NA NA NA	
	Cypaliuruside S (**900**)	HepG2	strong effect	241
	Cypaliuruside T (**901**)	HepG2	NA	
	Cypaliuruside U (**902**)	HepG2	NA	
	Cyclocarioside J (**889**)	HepG2	NA	
	Pterocaryoside B (**903**)	HepG2	NA	
	Pterocaryoside A (**904**)	HepG2	NA	
	20,23,24-trihydroxy-12α-*O*-β-D-quinovopyranoside-3,4-secodammara-4(28),25-dien-3-oic acid (**905**)	HepG2	NA	
	Cyclocarioside III (**906**)	HepG	NA	

Table 32. The cytotoxicity of dammarane-type triterpenoid glycosides **(907-957)** aganst cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Alphitonia xerocarpus Baill	3-*O*-β-D-glucopyranosyl-(1→6)-β-D-glucopyranosyl- 16β,22R:16α,18-diepoxydammar-24-ene-3β,20R-diol (**907**)	KB	NA	183
	3-*O*-β-D-xylopyranosyl-(1→6)-β-D-glucopyranosyl- (1→2)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyljujubogenin (**908**)	KB	NA	
	3-*O*-α-L-arabinopyranosyl-(1→6)-β-D-glucopyranosyl- (1→2)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyljujubogenin (**909**)	KB	NA	
	3-*O*-β-D-glucopyranosyl-(1→6)-β-D-glucopyranosyl-22α hydroxyjujubogenin (**910**)	KB	NA	
	3-*O*-[6-*O*-(trans,cis)-*p*-coumaroyl-β-D-glucopyranosyl-(1→6)]-β-D-glucopyranosyl-22α-hydroxyjujubogenin (**911**)	KB	NA	
	3-*O*-[6-*O*-(trans,cis)-sinapoyl-β-D-	KB	NA	

	glucopyranosyl-(1→6)]-β-D-glucopyranosyl-22α-hydroxyjujubogenin (**912**)			
	3β-*O*-α-L-rhamnopyranosyl-(1→2)-β-D-glucopyranosyloxy-20-oxo-16,17-seco-21(20→17)-abeodammar-24-ene-16,18:26,23-diolide (**913**)	KB	NA	
	(25S) 3-*O*-α-L-rhamnopyranosyl-(1→2)-β-D-glucopyranosyloxy-20-oxo-16,17-seco-21(20→17)-abeodammarane-16,18:26,23-diolide (**914**)			
	(25R) 3-*O*-α-L-rhamnopyranosyl-(1→2)-β-D-glucopyranosyloxy-20-oxo-16,17-seco-21(20→17)-abeodammarane-16,18:26,23-diolide (**915**)	KB	NA	
	3-*O*-α-L-rhamnopyranosyl-(1→2)-[4-*O*-(sodium sulfonato)-β-D-glucopyranosyl-(1→3)]-α-L-arabinopyranosyljujubogenin (**916**)	KB	NA	
	3-*O*-α-L-rhamnopyranosyl-(1→2)-[β-D-glucopyranosyl-(1→3)]-α-L-arabinopyranosyljujubogenin (**917**)			
	3-*O*-β-D-glucopyranosyl-(1→2)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyljujubogenin (**918**)	KB	NA	
Jaffrea xerocarpa	3-*O*-β-D-glucopyranosyl-(1→3)-α-L-arabinopyranosyl-17,20-didehydro-20-deoxyjujubogenin (**919**)	KB	NA	169
	3-*O*-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyl-17,20-didehydro-20-deoxyjujubogenin (**920**)	KB	NA	
	3-*O*-β-D-glucopyranosyl-(1→2)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyl-17,20-didehydro-20-deoxyjujubogenin (**921**)	KB	NA	
	3-*O*-β-D-xylopyranosyl-(1→6)-β-D-glucopyranosyl-(1→2)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyl-17,20-didehydro-20-deoxyjujubogenin (**922**)	KB	NA	
	3-*O*-α-L-arabinopyranosyl-(1→6)-β-D-glucopyranosyl-(1→2)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyl-17,20-didehydro-20-deoxyjujubogenin (**923**)	KB	NA	
	3-*O*-α-L-rhamnopyranosyl-(1→2)-[β-D-glucopyranosyl-(1→3)]-α-L-arabinopyranosyljujubogenin(**917**)	KB	NA	

	3-*O*-α-L-rhamnopyranosyl-(1→2)-[4-*O*-(sodium sulfonato)-β-D-glucopyranosyl-(1→3)]-α-L-arabinopyranosyljujubogenin (**916**)	KB	NA	
	3-*O*-β-D-glucopyranosyl-(1→2)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyljujubogenin (**918**)	KB	NA	
	3-*O*-β-D-xylopyranosyl-(1→6)-β-D-glucopyranosyl-(1→2)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyljujubogenin (**908**)	KB	NA	
	3-*O*-α-L-arabinopyranosyl-(1→6)-β-D-glucopyranosyl-(1→2)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranosyljujubogenin(**909**)	KB	NA	
Gouania longipetala	Gouaniaside I /7β-hydroxy-jujubogenin-3-*O*-α-L-rhamnopyranosyl-(1→2)-α-L-arabinopyranoside (**924**)	HL60 K562	NA NA	242
	Gouaniaside II /7-methyl,7,8-didehydro,30-nor-jujubogenin-3-*O*-α-L-rhamnopyranosyl-(1→2)-α-L-arabinopyranoside (**925**)	HL60 K562	NA NA	
	Gouaniaside III/7-methyl,7,8-didehydro,30-nor-jujubogenin-3-*O*-β-D-glucopyranosyl-(1→3)- [α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranoside (**926**)	HL60 K562	NA NA	
	Gouaniaside IV/7- methyl,7,8-didehydro,30-nor-jujubogenin-3-*O*-(6-*O*-acetyl-β-D-glucopyranosyl-(1→3))-[α-L-rhamnopyranosyl-(1→2)]-α-L-arabinopyranoside (**927**)	HL60 K562	NA NA	
	Gouaniaside V/(20R,22R)-16β,22:16α,18-diepoxydammar-24-ene-3β,20-diol-3-*O*-(α-L-arabinopyranosyl-(1→6)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(→2)]-β-D-galactopyranoside (**928**)	HL60 K562	NA NA	
	Gouaniaside VI (6)/(20R,22R)-16β,22:16α,18-diepoxydammar-31-methyl-25(26)-methylene-3β,20-diol-3-*O*-(α-L--arabinopyranosyl-(1→6)-β-D-glucopyranosyl-(1→3)-[α-L-rhamnopyranosyl-(1→2)]-β-D-galactopyranoside (**929**)	HL60 K562	NA NA	
	Jujuboside I (**930**)	HL60 K562	13.5±0.12 13.5±0.11	
Gynostemma pentaphyllum	Gypenoside C (**931**)	t-HSC/Cl-6	269.5	243

	Gypenoside D (**932**)	t-HSC/Cl-6	71.4	
	Gypenoside E (**933**)	t-HSC/Cl-6	170.3	
Ziziphus glaziovii Warm.	Ziziglaziovigenin (**934**)	PC-3 HT-29	101±5 68±13	246
	Ziziglaziovigenin 3-*O*-α-L-arabinopyranoside (**935**)	PC-3 HT-29	103±7 76±4	
	Ziziglaziovigenin 3-*O*-α-L-arabinofuranosyl-(1→2)-α-L-arabinopyranoside (**936**)	PC-3 HT-29	130±7 113±12	
	Ziziglaziovigenin 3-*O*-β-D-glucopyranosyl-(1→3)-α-L-arabinopyranoside (**937**)	PC-3 HT-29	121±2 98±5	
	16β,22:16α,20-diepoxy-24-methylidenedammaren 3-*O*-α-L-arabinofuranosyl-(1→2)-[(4-sodium-sulfate)-β-D-glucopyranosyl-(1→3)]-α-L-arabinopyranoside (**938**)	PC-3 HT-29	87±20 98±3	
	16,22:16,30-diepoxy-20-hydroxydammar-24-methylidene 3-*O*-β-D-apiofuranosyl-(1→3)-*O*-[6-(3-methoxy-4-hydroxybenzoate)-β-D-glucopyranosyl-(1–2)]-β-D-glucopyranosyl-(1→2)-glucopyranoside (**939**)	PC-3 HT-29	94±7 106±2	
	16,22-Epoxy-15,16,20-trihydroxydammar-24-methylidene 3-*O*-β-D-apiofuranosyl-(1→3)-*O*-[6-(3-methoxy-4-hydroxybenzoate)-β-D-glucopyranosyl-(1→2)]-β-D-glucopyranosyl-(1→2)-glucopyranoside (**940**)	PC-3 HT-29	93±7 96±2	
Vallaris glabra	20,22-dihydrodigitoxigenin-3-*O*-α-L-vallaropyranoside (**941**)	HT29 KB HeLa Vero	**4.1±0.7** **1.9±0.1** **9.3±0.8** **9.2±0.8**	244
	20,22- dihydrodigitoxigenin-3-*O*-α-L-acofriopyranoside (**942**)	HT29 KB HeLa Vero	**0.2±0.02** **0.03±0.001** **0.5±0.4** **0.6±0.1**	
	20,22-dihydrodigitoxigenin-3-*O*-β-D-glucopyranosyl-(1→4)-α-L-*O*-vallaropyranoside (**943**)	HT29 KB HeLa Vero	**7.1±0.9** **1.7±0.1** **1.1±0.2** **0.5±0.02**	
	20,22-dihydrodigitoxigenin-3-*O*-β-D-glucopyranosyl-(1→4)-α-L-acofriopyranoside (**944**)	HT29 KB HeLa Vero	>10 **6.6±0.5** **6.2±0.6** >10	
	Gitoxigenin-3-*O*-α-L-vallaropyranoside (**945**)	HT29 KB HeLa Vero	**0.3±0.03** **0.5±0.04** **6.2±0.6** **0.02±0.003**	
	Gitoxigenin-3-*O*-α-L-acrofriopyranoside (**946**)	HT29 KB HeLa	**0.2±0.03** **1.7±0.1** **0.08±0.006**	

		Vero	**1.3±0.1**	
Salvia russellii Benth	Russelliinoside A/ 1-*O*-[β-D-glucopyranosyl]-3β-O-acetoxy-23-hydroxydammar-12, 24-diene (**947**)	MCF-7 A549	**10.67** 51.20	245
	Russelliinoside B/ 1-*O*-[β-D-glucopyranosyl]-3β,23 dihydroxydammar-12,24-diene (**948**)	MCF-7 A549	49.55 111.86	
	Russelliinoside C/1-*O*-[β-D-glucopyranosyl]-3-*O*-acetoxy-23-*O*-[6-*O*-acetoxy-β-D-glucopyranosyl]-dammar-12,24-diene (**949**)	MCF-7 A549	NA NA	
Gynostemma pentaphyllum	(3*S*,20*R*)-21-cyclopentenone-3, 25-dihydroxydammar-23-en 3-*O*-β-D-glucopyranoside (**950**)	MCF-7 HepG2 DU14	> 100 > 100 > 100	223
	(3*S**,20*R**,23*S**,23*S**,24*R**)-20,25-oxa-3,20,23-trihydroxy-21,24-cyclodammar 3-*O*-β-D-glucopyranoside (**951**)	MCF-7 HepG2 DU145	> 100 > 100 > 100	
Cyclocarya paliurus	Cypaliuruside V/ (20S,24R)-epoxydammarane-(3β,11α)-25-hydroxyl-11-*O*-β-D-quinovo pyranosyl-3-*O*-(4'-*O*-acetyl)-β-D-xylopyranoside (**952**)	HepG2	NA	241
	Cyclocarioside H (**953**)	HepG2	strong effect	
	Cyclocarioside N (**954**)	HepG2	strong effect	
	Cyclocarioside C (**955**)	HepG2	NA	
	Cyclocarioside I (**956**)	HepG2	NA	
Zizyphus spinachristi	3-*O*-β-D-glucopyranosyl-(1–3)-α-L-arabinopyranosyl-jujubogenin-20-*O*-α-L-rhamnopyranoside/ Sidroside (**957**)	myeloma THP-1 HeLa	**3.6** **2.7**	179

Table 33. The cytotoxicity of tirucallane-type triterpenoids **(958-1069)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Luvunga scandens	3-oxotirucalla-7,24-dien-21-oic-acid (**958**)	MCF-7	27.5	253
Toona sinensis	(20*S*)-3-oxo-tirucalla-25-nor-7-en-24-oic acid (**959**)	A549 HeLa HepG2 SGC-7901 SW-480	>40 >40 >40 >40 >40	231
	(20*S*)-5*α*,8*α*-epidioxy-3-oxo-24-nor-6,9(11)-dien-23-oic acid (**960**)	A549 HeLa HepG2 SGC-7901 SW-480	20.3 >40 >40 >40 >40	
	Piscidinol A (**961**)	A549 HeLa HepG2 SGC-7901	>40 >40 >40 >40	

		SW-480	>40	
	Hispidol B (**962**)	A549	**6.4**	
		HeLa	>40	
		HepG2	>40	
		SGC-7901	>40	
		SW-480	>40	
	4,4,14-trimethyl-3-oxo-24-nor-5*α*,13*α*,14*β*,17*α*,20*S*-chol-7-en-23-oic acid (**963**)	A549	23.2	
		HeLa	>40	
		HepG2	>40	
		SGC-7901	>40	
		SW-480	>40	
	Bourjotinolone B (**964**)	A549	**5.2**	
		HeLa	>40	
		HepG2	>40	
		SGC-7901	**6.1**	
		SW-480	>40	
Picrasma quassioides	Picraquassin E (**965**)	MKN-28	8.8	247
		A-549	>10	
		MCF-7	>10	
	Picraquassin F (**966**)	MKN-28	9.8	
		A-549	>10	
		MCF-7	>10	
	Picraquassin G (**967**)	MKN-28	>10	
		A-549	>10	
		MCF-7	>10	
	Picraquassin H (**968**)	MKN-28	>10	
		A-549	>10	
		MCF-7	>10	
	Picraquassin I (**969**)	MKN-28	7.9	
		A-549	8.3	
		MCF-7	>10	
	Picraquassin J (**970**)	MKN-28	>10	
		A-549	>10	
		MCF-7	>10	
	21β-ethoxybourjotinolone A (**971**)	MKN-28	>10	
		A-549	>10	
		MCF-7	>10	
	6-oxo-21β-ethoxybourjotinolone A (**972**)	MKN-28	8.2	
		A-549	>10	
		MCF-7	>10	
	9,11-dehydrotoonaciliatin K (**973**)	MKN-28	8.3	
		A-549	>10	
		MCF-7	>10	
	21β-ethoxy-20α-hydroxymelianodiol (**974**)	MKN-28	9.0	
		A-549	>10	
		MCF-7	>10	
	Picraquassin K (**975**)	MKN-28	9.1	
		A-549	>10	
		MCF-7	>10	
	Xanthocerasic acid methyl ester (**976**)	MKN-28	8.3	
		A-549	>10	
		MCF-7	>10	

	11-Oxobrumollisols A (**977**)	MKN-28 A-549 MCF-7	>10 >10 >10	
	(21R,23R)-epoxy-21α-ethoxy-24S,25-dihydroxytirucalla-7-en-3-one (**978**)	MKN-28 A-549 MCF-7	>10 >10 >10	
	Toonaciliatin K (**979**)	MKN-28 A-549 MCF-7	>10 >10 >10	
	21-methoxy-21,23-epoxytirucalla-7,24-dien-3α-ol (**980**)	MKN-28 A-549 MCF-7	>10 >10 >10	
	Bourjotinolone A (**981**)	MKN-28 A-549 MCF-7	6.7 7.0 9.9	
	Sapelin B (**982**)	MKN-28 A-549 MCF-7	>10 >10 >10	
	3β,29-dihydroxytirucalla-7,24-dien-21-oic acid (**983**)	MKN-28 A-549 MCF-7	9.1 >10 >10	
	Piscidinol A (**961**)	MKN-28 A-549 MCF-7	6.9 8.0 8.5	
	Brumollisol B (**984**)	MKN-28 A-549 MCF-7	>10 >10 >10	
	24S,25-dihydroxytirucall-7-en-3-one (**985**)	MKN-28 A-549 MCF-7	9.1 >10 >10	
Euphorbia resinifera Berg	3β,25-dihydroxy-tirucalla-7,23-diene (**986**)	U937 MCF-7 C6	>100 49.81±1.01 >100	
Peganum harmala	3-oxotirucalla-7,24-dien-21-oic-acid (**958**)	A549 H460 U-937 KG1 3T3	36.21±2.04 40.01±2.32 31.24±1.53 27.35±1.38 > 100	106
Cornus walteri	Cornusalterin M (**987**)	A549 SK-OV-3 SK-MEL-2 HCT-15	NA NA NA NA	182
Melia toosendan	Indicalilacol B (**988**)	U2OS	NA	254
	Mesendanin U (**989**)	U2OS	NA	
	Mesendanin S (**990**)	U2OS	NA	
Ailanthus altissima	Ailanaltiolide I (**991**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	218

	3-oxo-*threo*-23,24,25-trihydroxytirucall-7-ene (**992**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	
	Bourjotinolone A (**981**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	
Picrasma quassioides	Kumuquassin A (**993**)	HepG2 Hep3B	>50 >50	248
	Kumuquassin B (**994**)	HepG2 Hep3B	>50 39.34±2.88	
	Kumuquassin C (**995**)	HepG2 Hep3B	21.72±1.21 46.04±2.65	
	Kumuquassin D (**996**)	HepG2 Hep3B	>50 >50	
	Kumuquassin E (**997**)	HepG2 Hep3B	>50 >50	
	Kumuquassin F (**998**)	HepG2 Hep3B	43.79±2.66 43.36±1.58	
	Compound **999**	HepG2 Hep3B	>50 >50	
	Kumuquassin G (**1000**)	HepG2 Hep3B	>50 >50	
	Melianone (**1001**)	HepG2 Hep3B	>50 >50	
	Flindissone (**1002**)	HepG2 Hep3B	>50 >50	
	3-*epi*-flindissol (**1003**)	HepG2 Hep3B	>50 >50	
	Melianodiol (**1004**)	HepG2 Hep3B	43.89±2.33 48.96±1.92	
	21α-methylmelianodiol (**1005**)	HepG2 Hep3B	44.19±0.89 >50	
	3β,25-dihydroxy-tirucalla-7,23-diene (**986**)	HepG2 Hep3B	>50 >50	
	3β-hydroxyl-tirucalla-7,24-dien-21-ol (**1006**)	HepG2 Hep3B	>50 >50	
	3-oxotirucalla-7, 24-dien-23-ol (**1007**)	HepG2 Hep3B	>50 >50	
	3β,23-dihydroxy-tirucalla-7, 24-diene (**1008**)	HepG2 Hep3B	>50 >50	
	(24*Z*)-7,24-tirucalladiene-3β,27-diol (**1009**)	HepG2 Hep3B	>50 >50	
	29-hydroxy-3-oxotirucalla-7,24-diene 21-methyl ester (**1010**)	HepG2 Hep3B	>50 42.08±3.02	
	Altissimanins B (**1011**)	HepG2 Hep3B	>50 >50	
	Bourjotinolone A (**981**)	HepG2 Hep3B	38.26±3.65 >50	

	Sapelin A (**1012**)	HepG2 Hep3B	>50 >50	
	3-episapelins A (**1013**)	HepG2 Hep3B	>50 >50	
	Niloticin (**1014**)	HepG2 Hep3B	>50 49.26±0.78	
	Dihydroniloticin (**1015**)	HepG2 Hep3B	>50 >50	
	Dyvariabilins G (**1016**)	HepG2 Hep3B	>50 >50	
	Hispidone (**1017**)	HepG2 Hep3B	>50 >50	
Camptotheca acuminata,	(23*R*,24*S*)-23,24,25-trihydroxytirucall-7-ene-3,6-dione (**1018**)	HepG2 Hep3B	76.9±2.49 94.5±3.50	74
Picrasma quassioides	Kumuquassin I (**1019**)	Hep3B HepG2	65.09 49.73	249
	Compound **1020**	Hep3B HepG2	NA NA	
	Piscidinol A (**961**)	Hep3B HepG2	NA NA	
	Phellochin (**1021**)	Hep3B HepG2	63.62 66.71	
	24-*epi*-piscidinol A (**1022**)	Hep3B HepG2	NA NA	
	3β-hydroxy-3-decarbonyl-24-*epi*-piscidinol A (**1023**)	Hep3B HepG2	NA NA	
	Hispidol A (**1024**)	Hep3B HepG2	NA NA	
	23,24,25-trihydroxytirucall-7-en-3, 6-dione (**1018**)	Hep3B HepG2	NA NA	
	Dysolenticin G (**1025**)	Hep3B HepG2	NA NA	
Toona ciliata	Toonamicrocarpavarin (**1026**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	255
	Piscidinol A (**961**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
	Toonaciliatavarin E (**1027**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
	Hispidol A (**1024**)	HL-60 SMMC-7721 A-549 MCF-7	NA NA NA NA	

		SW480	NA	
	Odoratone (**1028**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
	Phellochin (**1021**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
	Toonaciliatavarin D (**1029**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
Pistacia lentiscus	3-oxo-tirucalla-7,11,24-trien-26-oic acid (**1030**)	HepG2	**4.92±0.24**	250
	3-oxo-tirucalla-6,8,24*Z*-trien-26-oic acid (**1031**)	HepG2	**11.78±0.12**	
	(9R)-3,6-dioxo-tirucalla-7,24*Z*-dien-26-oic acid (**1032**)	HepG2	NA	
	(3S,9R)-3-acetoxy-6-oxo-tirucalla-7,24*Z*-dien-26-oic acid (**1033**)	HepG2	**9.56±0.19**	
	(3S,11S)-3-acetoxy-11-hydroxy-7-oxo-tirucalla-8,24*Z*-dien-26-oic acid (**1034**)	HepG2	NA	
	(3S)-3-acetoxy-7,11-dioxo-tirucalla-8,24*Z*-dien-26-oic acid (**1035**)	HepG2	NA	
	(3S)-3-acetoxy-7-oxo-tirucalla-8,24*Z*-dien-26-oic acid (**1036**)	HepG2	NA	
	(3S,7R)-3-acetoxy-7-hydroxy-11-oxo-tirucalla-8,24Z-dien-26-oic acid (**1037**)	HepG2	NA	
	(7R)-7-hydroxy-3,11-dioxo-tirucalla-8,24*Z*-dien-26-oic acid (**1038**)	HepG2	NA	
	(7R,11R)-7-hydroxy-11-methoxy-3-oxo-tirucalla-8,24Z-dien-26-oic acid (**1039**)	HepG2	NA	
	(7R)-7-methoxy-3-oxo-tirucalla-8,24*Z*-dien-26-oic acid (**1040**)	HepG2	30.89±0.58	
	Mastichinoic acid (**1041**)	HepG2	NA	
	3,7-dioxo-8, 24*Z*-tirucalladien-26-oic acid (**1042**)	HepG2	NA	
Chukrasia tabularis	Hispidol C (**1043**)	K562 Hela BEL-7402 SGC-7901 A549	NA NA NA NA NA	256
	Piscidinol A (**961**)	K562 HeLa	**10.45±0.04** 35.03±0.08	

		BEL-7402 SGC-7901 A549	23.49±0.08 20.24±0.06 30.38±0.06	
Euphorbia fischeriana	Euphorfistrine D / (3*S*,5*R*,9*R*,10*R*,13*S*,14*S*,17*S*,20*S*)-3-hydroxy tirucallane-7,24-diene-6-one (**1044**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	22.36±1.14 16.33±0.82 15.2±0.38 **10.55±0.93** **10.95±0.56** 16.75±0.67 50.64±2.37	83
Boswellia sacra	Boscartene D (**1045**)	HepG2 HCT-116	NA NA	251
	Sacraoic acid A (**1046**)	HepG2 HCT-116	NA NA	
	Sacraoic acid B/ 7-oxo-3-hydroxy-tirucallane-8,24-dien-21-oic acid (**1047**)	HepG2 HCT-116	NA NA	
	Sacraoic acid C / s 7-oxo-3,11-dihydroxy-tirucallane-8,24-dien-21-oic acid (**1048**)	HepG2 HCT-116	NA NA	
	Sacraoic acid D / 7-oxo-3-hydroxy-tir ucallane-8,24-dien-21-oic acid (**1049**)	HepG2 HCT-116	NA NA	
	Sacrate A / (3S,5R,10S,13S,14S,17S,20S,24S,)-3,24,25-trihydroxy-tirucallane-8-en-21-oic acid methyl ester(**1050**)	HepG2 HCT-116	NA NA	
	Sacrate B/ (5R,10S,13S,14S,17S,20S,24S,)-3-oxo-24,25-dihydroxy-tirucallane-8- en-21-oic acid methyl ester(**1051**)	HepG2 HCT-116	NA NA	
	Sacrate C / (5R,10S,13S,14S,17S,20S,24S,)-3-oxo-24,25-dihydroxy-tirucallane-7,9- dien-21-oic acid methyl ester (**1052**)	HepG2 HCT-116	28.01±7.07 NA	
Euphorbia tirucalli	Euphorol L (**1053**)	MCF-7 HepG2	NA NA	257
	Euphorol M (**1054**)	MCF-7 HepG2	NA NA	
Melia azedarach L.	Meliazedarachin A (**1055)**	HCT116 RKO A549 BEL7402 MCF-7	>40 >40 >40 >40 >40	252
	Meliazedarachin B (**1056**)	HCT116 RKO A549 BEL7402 MCF-7	>40 >40 >40 >40 >40	
	Meliazedarachin C (**1057**)	HCT116 RKO A549 BEL7402 MCF-7	>40 >40 >40 >40 >40	

	Meliazedarachin D (**1058**)	HCT116	>40	
		RKO	>40	
		A549	>40	
		BEL7402	>40	
		MCF-7	>40	
	Meliazedarachin E (**1059**)	HCT116	>40	
		RKO	>40	
		A549	>40	
		BEL7402	>40	
		MCF-7	>40	
	Meliazedarachin F (**1060**)	HCT116	>40	
		RKO	>40	
		A549	>40	
		BEL7402	>40	
		MCF-7	>40	
	Meliazedarachin G (**1061**)	HCT116	**13.61±1.36**	
		RKO	>40	
		A549	>40	
		BEL7402	>40	
		MCF-7	>40	
	Meliazedarachin H (**1062**)	HCT116	>40	
		RKO	>40	
		A549	29.62±2.31	
		BEL7402	>40	
		MCF-7	>40	
	21α-methyl-25-ethylmelianodiol (**1063**)	HCT116	>40	
		RKO	>40	
		A549	>40	
		BEL7402	>40	
		MCF-7	>40	
	21α-methylmelianodiol (**1064**)	HCT116	**10.16±1.22**	
		RKO	**8.57±0.80**	
		A549	>40	
		BEL7402	>40	
		MCF-7	>40	
Aphanamixis polystachya	Polystanin F (**1065**)	RT112	NA	258
		HCT-116	NA	
		M231	NA	
	Polystanin G (**1066**)	RT112	NA	
		HCT-116	NA	
		M231	NA	
Turraea delphinensis	(5R,9R,10R,13S,14S,17S,22S)-22-hydroxytirucall-7-en-3,23-dione (**1067**)	A549	>10	259
		MDA-MB-231	>10	
		MCF-7	>10	
		KB	>10	
		KB-VIN	>10	
	(5R,9R,10R,13S,14S,17S,20S,22S*,23R*,24R*)-(22,23),(24,25)-diepoxytirucall-7-en-3-one (**1068**)	A549	>10	
		MDA-MB-231	>10	
		MCF-7	>10	
		KB	>10	
		KB-VIN	>10	
	(5R,9R,10R,13S,14S,17S,20S,22R*,23S*,24S*)-22,25-epoxy-23,24-	A549	>10	
		MDA-MB-231	>10	

	dihydroxytirucall-7-en-3-one (**1069**)	MCF-7 KB KB-VIN	>10 >10 >10	

Table 34. The cytotoxicity of apotirucallane-type triterpenoids **(1071-1101)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Picrasma quassioides	Picraquassin A (**1070**)	MKN-28 A-549 MCF-7	NA NA NA	247
	Picraquassin B (**1071**)	MKN-28 A-549 MCF-7	**2.5** **5.6** **9.1**	
	Picraquassin C (**1072**)	MKN-28 A-549 MCF-7	NA NA NA	
	Picraquassin D (**1073**)	MKN-28 A-549 MCF-7	NA NA NA	
	6β-Hydroxypicraquassin C (**1074**)	MKN-28 A-549 MCF-7	NA NA NA	
Ailanthus tryphysa	Ailanthusin A (**1075**)	HepG2 MOLT-3 A549 HuCCA-1 MDA-MB-321 HeLa T47-D MRC-5	NA 30.0 NA NA NA NA NA NA	181
	Ailanthusin B (**1076**)	HepG2 MOLT-3 A549 HuCCA-1 MDA-MB-321 HeLa T47-D MRC-5	NA NA NA NA NA NA NA NA	
	Ailanthusin C (**1077**)	HepG2 MOLT-3 A549 HuCCA-1 MDA-MB-321 HeLa T47-D MRC-5	NT NT NT NT NT NT NT NT	
	Ailanthusin D (**1078**)	HepG2 MOLT-3 A549	NT NT NT	

		HuCCA-1 MDA-MB-321 HeLa T47-D MRC-5	NT NT NT NT NT	
Aglaia argentea	Argentinin A (**1079**)	P-388	**3.05**	232
Ailanthus altissima	Ailanaltiolide A (**1080**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	218
	Ailanaltiolide B (**1081**)	A549 786-O HepG2 HeLa	**12.5** **8.2** 38.8 38.4	
	Ailanaltiolide C (**1082**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	
	Ailanaltiolide D (**1083**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	
	Ailanaltiolide E (**1084**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	
	Ailanaltiolide F (**1085**)	A549 786-O HepG2 HeLa	>40 >40 >40 >40	
	Ailanaltiolide G (**1086**)	A549 786-O HepG2 HeLa	39.8 34.4 38.8 33.2	
Melia toosendan	Toosendine E (**1087**)	U2OS	NA	254
	Toosendine F (**1088**)	U2OS	NA	
	Toosendine G (**1089**)	U2OS	NA	
	Toosendine H (**1090**)	U2OS	NA	
	Toosendine I (**1091**)	U2OS	NA	
Picrasma quassioides	Picraquassin D (**1073**)	Hep3B HepG2	NA NA	249
Walsura trichostemon	Compound **1092**	 A549	Inhibition (%) 38.8±5.1	225
	Compound **1093**	A549	50.0±4.1	
Chisocheton pentandrus	Pentandrucine K (**1094**)	MCF-7	19.30	226
	Prototiamin A (**1095**)	MCF-7	76.08	
	Neemfruitins A (**1096**)	MCF-7	181.12	
	Desmethyllimocin B (**1097**)	MCF-7	98.18	

	Protoxylocarpin G (**1098**)	MCF-7	90.24	
Melia azedarach L.	Meliazedarachin I (**1099**)	HCT116 RKO A549 BEL7402 MCF-7	>40 >40 >40 36.39±0.96 26.41±2.76	252
	Meliazedarachin J (**1100**)	HCT116 RKO A549 BEL7402 MCF-7	>40 >40 >40 >40 >40	
	Mesendanin N (**1101**)	HCT116 RKO A549 BEL7402 MCF-7	26.33±3.48 26.40±1.35 20.28±2.79 21.58±3.95 28.80±2.49	

Table 35. The cytotoxicity of *seco*-tirucallane -type triterpenoids **(1102-1112)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Picrasma quassioides	Picraquassin L (**1102**)	MKN-28 A-549 MCF-7	>10 >10 >10	247
Aglaia argentea	Argentinin B (**1103**)	P-388	NA	232
Entandrophragma congoënse	Seco-tiaminic acid B (**1104**)	L6 myoblast	21.0	260
	Seco-tiaminic acid C (**1105**)	L6 myoblast	22.8	
	3,4-secotirucalla-21-formyl-23-oxo-4(28),7,24-trien-3-oic acid (**1106**)	L6 myoblast	NA	
Ailanthus altissima	Ailanaltiolide H (**1107**)	A549 786-O HepG2 HeLa	38.6 27.4 35.5 38.4	218
Chukrasia abularis	7β,25-dihydroxy-7,9-cycro-7,8-seco-tirucallane-3,8-dione (**1108**)	K562 Hela BEL-7402 SGC-7901 A549	NA NA NA NA NA	256
Pistacia lentiscus	3,8-dioxo-7*β*-hydroxy-7,9-cycro-7,8-seco-24*Z*-tirucalladien-26-oic acid (**1109**)	HepG2	NA	250
Munronia pinnata	Munropene A (**1110**)	HCT116 A549 HepG2 MCF7	19.13 >160 >160 >160	261

		MDAMB	>160	
	Munropene B (**1111**)	HCT116 A549 HepG2 MCF7 MDAMB	40.9 >160 >160 >160 >160	
	Munropene C (**1112**)	HCT116 A549 HepG2 MCF7 MDAMB	>160 >160 >160 >160 >160	

Table 36. The cytotoxicity of *seco*-apotirucallane-type triterpenoid (**1113**) against cancer cell lines

Plant source	Name and number of compound	Types of cancer cell lines	IC_{50} (μM)	References
Aglaia angustifolia	Angustifolianin (**1113**)	MCF-7	100.6	262

Table 37. The cytotoxicity of *abeo*-tirucallane triterpenoids (**1114-1117**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Pistacia lentiscus	(7S, 9R)-7-hydroxy-3,8-dioxo-7(8→9) *abeo*-tirucalla-24Z-ene-26-oic acid (**1114**)	HepG2	NA	250
	(3S, 7S, 9R)-3-acetyl-7-hydroxy-8-oxo-7(8 →9) *abeo*-tirucalla-24Z-ene-26-oic acid (**1115**)	HepG2	NA	
Chukrasia tabularis	(24S)-7α,8α-epoxy-24-hydroxy-21α,25-dimethoxy-19 (10→9β) *abeo*-tirucallane-5(10)-en-3-one (**1116**)	K562 Hela BEL-7402 SGC-7901 A549	NA NA NA NA NA	256
	(24R)-7α,8α-epoxy-24-hydroxy-21α-methoxy-19 (10 → 9β) *abeo*-tirucallane-5(10),25-dien-3-one (**1117**)	K562 Hela BEL-7402 SGC-7901 A549	NA NA NA NA NA	

Table 38. The cytotoxicity of tirucallane-type triterpenoid glycosides **(1118-1121)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Swietenia macrophylla	Swietesenin (**1118**)	HL-60	NA	263
		A-549	NA	
		SMMC-7721	NA	
		MCF-7	NA	
		SW-480	NA	
Munronia pinnata	Munropene D (**1119**)	HCT116	17.66	261
		A549	>160	
		HepG2	>160	
		MCF7	>160	
		MDAMB	>160	
	Munropene E (**1120**)	HCT116	57.9	
		A549	>160	
		HepG2	>160	
		MCF7	>160	
		MDAMB	>160	
	Munropene F (**1121**)	HCT116	32.62	
		A549	>160	
		HepG2	>160	
		MCF7	>160	
		MDAMB	>160	

Table 39. The cytotoxicity of euphane-type triterpenoids **(1122-1148)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Euphorbia resinifera Berg	Euphorol A (**1122**)	U937	74.70±1.15	264
		MCF-7	79.07±0.77	
		C6	76.12±0.69	
	Euphorol B (**1123**)	U937	90.28±1.52	
		MCF-7	>100	
		C6	57.86±0.81	
	Euphorol C (**1124**)	U937	>100	
		MCF-7	>100	
		C6	60.24±1.47	
	Euphorol D (**1125**)	U937	NA	
		MCF-7	NA	
		C6	NA	
	11-oxo-kansenonol (**1126**)	U937	65.85±0.87	
		MCF-7	90.61±1.58	
		C6	55.50±0.69	
	Kansenone (**1127**)	U937	63.40±0.59	
		MCF-7	62.47±0.69	
		C6	62.32±1.11	
	Kansenonol (**1128**)	U937	NA	
		MCF-7	NA	

		C6	NA	
	(20R,23*E*)-eupha-8,23-diene-3β,25-diol (**1129**)	U937 MCF-7 C6	82.85±0.73 70.56±0.78 67.21±0.83	
	(24R)-eupha-8,25-diene-3β,24-diol (**1130**)	U937 MCF-7 C6	56.18±1.58 34.55±0.95 49.63±0.79	
	Kansenol (**1131**)	U937 MCF-7 C6	52.17±0.92 49.30±1.23 >100	
	Euphorol E (**1132**)	U937 MCF-7 C6	>100 >100 >100	
	Euphorol F (**1133**)	U937 MCF-7 C6	>100 >100 >100	
Melia toosendan	Toosendine A (**1134**)	U2OS	**12.63±0.28**	254
	Toosendine B (**1135**)	U2OS	NA	
	Toosendine C (**1136**)	U2OS	NA	
	Toosendine D (**1137**)	U2OS	21.37±1.28	
Euphorbia tirucalli	Euphorol N (**1138**)	MCF-7 HepG2	NA NA	257
Euphorbia resinifera	Euphatexol A (**1139**)	HepG2	1.0	217
Chisocheton patens Blume	Chisopaten A /3α-hydroxyeupha-7,24-*Z*-diene-26-oic acid (**1140**)	MCF-7	4.01±0.008	265
	Chisopaten D/ 3-oxoeupha-7α-ol,13,24-*Z*-diene-26-oic acid (**1141**)	MCF-7	9.23±0.008	
Euphorbia resinifera	Euphorol J / 11β-hydroperoxyeupha-8,24-diene-3β-ol (**1142**)	MCF-7 U937 C6	37.36±0.79 47.17±0.93 46.89±0.97	266
Tripterygium wilfordii	Wilfordeuphone (**1143**)	HL-60 A-549 SMMC-7721 MCF-7 SW-480	14.5 26.7 14.0 24.0 24.1	195
Melia azedarach L.	Meliazedarachin K (**1144**)	HCT116 RKO A549 BEL7402 MCF-7	**9.02±0.84** **19.46±2.05** **19.41±1.14** 26.37±2.65 31.31±4.59	252
	Methylkulonate (**1145**)	HCT116 RKO A549 BEL7402 MCF-7	>40 >40 >40 >40 >40	
	Meliastatin 3 (**1146**)	HCT116 RKO A549 BEL7402 MCF-7	17.15±3.56 24.43±4.23 >40 >40 31.79±3.06	

	Meliastatin 2 (**1147**)	HCT116 RKO A549 BEL7402 MCF-7	>40 34.39±2.17 >40 >40 >40	
Turraea delphinensis	(5R,9R,10R,13S,14S,17S,20R,23R*,24S*)-23,24,25-trihydroxyeuph-7-en-3-one (**1148**)	A549 MDA-MB-231 MCF-7 KB KB-VIN	>10 >10 >10 >10 >10	259

Table 40. The cytotoxicity of apo-euphane-type triterpenoids **(1149** and **1150)** against cancer cell lines

Plant source	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Chisocheton patens Blume	Chisopaten B/3-oxo-*apo*-eupha-7α-ol,14,24-*Z*-diene-26-oic acid (**1149**)	MCF-7	**6.98±0.008**	265
	Chisopaten C/3α,7α-diol-*apo*-eupha-14,24-*Z*-diene-26-oic acid (**1150**)	MCF-7	**4.34±0.009**	

Table 41. The cytotoxicity of apo-euphane-type triterpenoid (**1151**) against cancer cell lines

Plant source	Name and number of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Trichilia dregeana	(3*S*,5*S*,8*R*,9*R*,10*R*,13*S*,14*R*,17*S*,20*S*,23*E*)-3β,10β-epoxy-19(10→9)*abeo*-euphan-23-en-25-ol (**1151**)	RAW264.7	>100	267

Table 42. The cytotoxicity of protostane-type triterpenoids (**1152-1167**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Alisma orientale	16-oxo-11-anhydroalisol A -24-acetate (**1152**)	H460 MCF-7 PC-3	NA NA NA	268
	16-oxo-11-anhydroalisol A (**1153**)	H460 MCF-7 PC-3	NA NA NA	
	13β,17β-epoxy-24,25,26,27-tetranor-alisol A 23-oic acid (**1154**)	H460 MCF-7 PC-3	NA NA NA	
	13β,17β-epoxyalisol A (**1155**)	H460 MCF-7 PC-3	NA NA NA	

	Alisol A (**1156**)	H460 MCF-7 PC-3	33.1±1.4 43.6±2.7 27.3±3.1	
	Alisol A 24-acetate (**1157**)	H460 MCF-7 PC-3	30.5±1.5 43.1±0.7 28.5±1.7	
	25-*O*-ethylalisol A (**1158**)	H460 MCF-7 PC-3	32.5±2.3 57.7±5.0 33.4±4.0	
	11-deoxyalisol A (**1159**)	H460 MCF-7 PC-3	43.9±0.3 61.9±4.0 40.7±2.5	
	Alisol E 24-acetate (**1160**)	H460 MCF-7 PC-3	27.7±0.6 32.9±4.0 26.3±3.8	
	Alisol G (**1161**)	H460 MCF-7 PC-3	11.5±1.7 16.3±0.9 11.7±1.7	
	Alisol F (**1162**)	H460 MCF-7 PC-3	NA NA NA	
	Alisol F 24-acetate (**1163**)	H460 MCF-7 PC-3	NA NA NA	
	25-anhydroalisol F (**1164**)	H460 MCF-7 PC-3	NA NA NA	
	Alisol B 23-acetate (**1165**)	H460 MCF-7 PC-3	56.7±0.0 59.2±4.2 32.1±1.7	
	Alisol C 23- acetate (**1166**)	H460 MCF-7 PC-3	NA NA NA	
	Alismaketone B 23-acetate (**1167**)	H460 MCF-7 PC-3	NA NA NA	

Table 43. The cytotoxicity of cucurbitane-type triterpenoids (**1168-1240**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Hemsleya penxianensis	Jinfushanencins C (**1168**)	HeLa	**5.1**	270
	Jinfushanencins E (**1169**)	HeLa	>50	
	Jinfushanencins F (**1170**)	HeLa	>50	
	Cucurbitacin IIa (**1171**)	HeLa	**8.7**	
	Jinfushanencins B (**1172**)	HeLa	>50	
	16,25-*O*-diacetyl-cucurbitane F (**1173**)	HeLa	**1.2**	
Hemsleya penxianensis	Pengxianencins A (**1174**)	HeLa	**1.67±0.30**	271

		MCF-7 A-549	**3.22±0.80** **4.53±0.40**	
	Pengxianencins C (**1175**)	HeLa MCF-7 A-549	> 50 > 50 > 50	
	Pengxianencins D (**1176**)	HeLa MCF-7 A-549	27.32±1.5 35.75±2.7 45.28±2.1	
	Pengxianencins E (**1177**)	HeLa MCF-7 A-549	> 50 > 50 > 50	
	Pengxianencins F (**1178**)	HeLa MCF-7 A-549	12.42±1.5 20.70±1.1 22.72±1.7	
	Pengxianencins G (**1179**)	HeLa MCF-7 A-549	**3.87±0.50** **4.65±0.45** **6.82±0.60**	
Echinochloa utilis Ohwi & Yabuno	Echinochlorin D (**1180**)	HeLa HL-60 MCF-7	>50 >50 36.7± 3.1	122
Hemsleya amabilis	Hemslelis A (**1181**)	HeLa HCT-8 HepG-2	**12.5±0.56** **14.7±1.2** **13.4±0.54**	272
	Hemslelis B (**1182**)	HeLa HCT-8 HepG-2	26.8±1.1 **5.9±0.85** 24.2±2.2	
	Hemslelis C (**1183**)	HeLa HCT-8 HepG-2	22.3±0.89 **6.1±0.2**6 28.6±1.1	
	Hemslelis D (**1184**)	HeLa HCT-8 HepG-2	31.5±0.74 > 50 33.9±2.0	
Hemsleya pengxianensis	Hemslepencin A / 2β,3α,20(S),27-tetrahydroxy-16α,23(S)-epoxycucurbita-5,24(Z)-diene-11-one (**1185**)	HepG2	NA	273
	Hemslepencin B / 3β,11α,20,26-tetrahydroxycucurbita-5,24(E)-diene (**1186**)	HepG2	NA	
	Hemslepencin C / 3β,11α,26,27-tetrahydroxycucurbita-5,24-diene(**1187**)	HepG2	**14.14**	
	Hemslepencin D / 11α-hydroxy-25-*O*-acetyl-23,24-dihydrocucurbitacin F (**1188**)	HepG2	NA	
Momordica charantia L.	19R,23S)-5β,19-epoxy-19,23-dimethoxycucurbita-6,24-dien-3β-ol (**1189**)	t-HSC/Cl-6 Hep3B HepG2	> 200 > 100 > 100	274
	19(R)-5β,19-epoxycucurbita-6,23-diene-3β,19,25-triol (**1190**)	t-HSC/Cl-6 Hep3B HepG2	28.13±3.21 32.55±3.68 84.72±6.76	

	19(S)-5β,19-epoxycucurbita-6,23-diene-3β,19,25-triol (**1191**)	t-HSC/Cl-6 Hep3B HepG2		
	7β,25-dimethoxycucurbita-5(6),23(E)-dien-19-al (**1192**)	t-HSC/Cl-6 Hep3B HepG2	29.64±2.22 48.36±5.41 **14.59±3.7**	
	Karavilagenin B (**1193**)	t-HSC/Cl-6 Hep3B HepG2	23.81±0.63 68.42±4.97 24.76±2.9	
Momordica charantia L.	Charantoside XI (**1194**)	HeLa Caco2 U87	>200 >200 >200	279
	Charantoside XII (**1195**)	HeLa Caco2 U87	89.75±6.12 173.6±22.37 98.21±5.89	
	Charantoside XIII (**1196**)	HeLa Caco2 U87	11.18±0.77 116±9.58 62.26±7.37	
	Charantoside XIV (**1197**)	HeLa Caco2 U87	69.16±5.53 135.4±11.43 146.4±22.68	
Momordica balsamina	Balsaminaepoxide / 24(S),25-epoxy-7β-methoxycucurbit5-ene-3β,23(R)-diol(**1198**)	L5178Y- MDR COLO 320	70.9 23.8	275
	Balsaminatriol / 7β-methoxycucurbita-5,25-diene-3β,23(R),24(R)-triol (**1199**)	L5178Y- MDR COLO 320	74.0 29.8	
	Balsaminol G 25-methoxycucurbita-5,23(E)-diene-3β-hydroxy-7-one (**1200**)	L5178Y- MDR COLO 320	> 100 **14.7**	
	Karavilagenin A (**1201**)	L5178Y- MDR COLO 320	55.0 7.4	
	Karavilagenin B (**1193**)	L5178Y- MDR COLO 320	91.3 18.2	
	Karavilagenin C (**1202**)	L5178Y- MDR COLO 320	46.0 21.8	
	Kuguacin B (**1203**)	L5178Y- MDR COLO 320	57.0 **7.6**	
Siraitia grosvenorii	Siragrosvenin A (**1204**)	MGC-803 MCF-7 CNE-1	68.54±0.33 >100 >100	276
	Siragrosvenin B (**1205**)	MGC-803 MCF-7 CNE-1	34.14±0.88 14.79±1.22 13.75±1.87	
	Siragrosvenin C (**1206**)	MGC-803 MCF-7 CNE-1	>100 >100 >100	
	Siragrosvenin D (**1207**)	MGC-803 MCF-7 CNE-1	**12.30±0.61** **8.04±0.63** **8.86±0.22**	
	Siragrosvenin E (**1208**)	MGC-803 MCF-7 CNE-1	>100 >100 >100	

	Siragrosvenin F (**1209**)	MGC-803 MCF-7 CNE-1	8.40±5.08 34.80±3.50 31.65±2.25	
	23,24-dihydrocucurbitacin F (**1210**)	MGC-803 MCF-7 CNE-1	48.24±4.42 >100 35.58±1.81	
	Cucurbitacin IIa (**1171**)	MGC-803 MCF-7 CNE-1	**3.96±1.78** 93.08±3.62 >100	
	Cucurbitacin Q1 (**1211**)	MGC-803 MCF-7 CNE-1	**12.89±4.98** **7.49±0.07** **2.14±0.39**	
	Jinfushanencin F (**1212**)	MGC-803 MCF-7 CNE-1	>100 >100 >100	
	Siraitic acid A (**1213**)	MGC-803 MCF-7 CNE-1	46.54±1.94 >100 55.32±3.32	
	Siraitic acid B (**1214**)	MGC-803 MCF-7 CNE-1	>100 >100 >100	
	Cucurbitacin E (**1215**)	MGC-803 MCF-7 CNE-1	**2.48±0.48** **3.24±0.35** **1.44 0.31**	
	23,24-dihydrocucurbitacin E (**1216**)	MGC-803 MCF-7 CNE-1	**9.99±2.79** 46.93±2.55 **5.99±0.50**	
Momordica charantia	Momordicine I (**1217**)	 IEC-18 FL83B	GI_{50}, μM 25.19 NA	280
	(23*E*) 3β,7β,25-trihydroxycucurbita-5,23-dien-19-al (**1218**)	ND ND	NA NA	
Aquilaria sinensis	Cucurbitacin E (**3**) (**1215**)	A549 NCI-H520 SPC-A-1 A549/Taxol BEAS-2B	**0.02±0.00** **0.001±0.000** **0.005±0.000** **0.002±0.000** **3.46±0.13**	281
	Cucurbitacin B (**1219**)	A549 NCI-H520 SPC-A-1 A549/Taxol BEAS-2B	**0.03±0.00** **0.002±0.000** **0.016±0.000** **0.007±0.001** **14.42±1.36**	
	Aquilarolide A (**1220**)	A549 NCI-H520 SPC-A-1 A549/Taxol BEAS-2B	**0.35±0.06** **0.16±0.01** **0.56±0.02** **0.20±0.01** 17.93±0.3	
Citrullus colocynthis	Colocynin I (**1221**)	PACA A431 HepG2	> 50 > 50 > 50	215
	23,24-dihydroisocucurbitacin B (**1222**)	PACA A431 HepG2	> 50 > 50 > 50	

	Dihydro-*epi*-isocucurbitacin D (**1223**)	PACA A431 HepG2	> 50 > 50 > 50	
	Dihydrocucurbitacin Q (**1224**)	PACA A431 HepG2	> 50 > 50 > 50	
	23,24-dihydro-3-*epi*-isocucurbitacin D (**1225**)	PACA A431 HepG2	24.88 > 50 > 50	
	Cucurbitacin E (**1215**)	PACA A431 HepG2	**0.042** **0.60** **0.12**	
	Dihydrocucurbitacin E (**1226**)	PACA A431 HepG2	> 50 > 50 > 50	
Citrullus colocynthis	Neocucurbitacin D (**1227**)	PACA A431 HepG2	> 50 > 50 > 50	
	Neocucurbitacin C (**1228**)	PACA A431 HepG2	> 50 > 50 > 50	
Elaeocarpus dubius	Elaeocarpudubin A (**1229**)	HL-60 A549 SMMC-7721 MCF-7 SW480 A549/Taxol	NA NA NA NA NA NA	282
	Elaeocarpudubin B (**1230**)	HL-60 A549 SMMC-7721 MCF-7 SW480 A549/Taxol	NA NA NA NA NA NA	
	Cucurbitacin F (**1231**)	HL-60 A549 SMMC-7721 MCF-7 SW480 A549/Taxol	**11.30±1.54** **6.81±0.20** 38.11±2.54 **5.58±0.65** **8.86±0.43** **4.98±0.37**	
	Cucurbitacin D (**1232**)	HL-60 A549 SMMC-7721 MCF-7 SW480 A549/Taxol	**0.63±0.01** **0.16±0.01** **4.40±0.20** **0.03±0.09** **0.31±0.03** **0.24±0.03**	
Chrysosplenium axillare Maxim. (Yajima)	Chrysosaxillin A / (3*R*,8*S*,9*R*,10*R*,13*R*,14*S*,16*R*,17*R*,20*R*)-25-acetoxy-3*α*,16*α*,20-trihydroxy-10*α*-cucurbita-5*t*,23*t*-diene-11,22-dione (**1233**)	HepG2 MCF7 PC3 A549	**9.56** **6.31** **6.86** **0.05**	277
	Chrysosaxillin D/ (3*R*,8*S*,9*R*,10*R*,13*R*,14*S*,16*R*,17*R*,20*R*)-25-acetoxy-3α,16α,20-trihydroxy-10α-	HepG2 MCF7 PC3	38.20 **13.84** **8.78**	

	cucurbita-5t-ene-11,22-dione (**1234**)	A549	**11.51**	
	Kinoin B (**1235**)	HepG2 MCF7 PC3 A549	49.88 40.40 **15.27** > 50	
	16α,23α-epoxy-3β,20β-dihydroxy-10α*H*,23β*H*-cucurbit-5,24-dien-11-one (**1236**)	HepG2 MCF7 PC3 A549	45.87 > 50 > 50 > 50	
Hemsleya chinensis	Hemslyencin C / 2β,3α,20β,26-tetrahydroxy-16α,23α-epoxycucurbita-5,24(*E*)-diene-11-one (**1237**)	MCF-7 HCT-116 HeLa HepG2	>50 >50 >50 >50	278
	Hemslyencin D/ 2β,3α,20β-trihydroxy-16α,23α-epoxycucurbita-5,24-diene-11-one (**1238**)	MCF-7 HCT-116 HeLa HepG2	>50 >50 >50 >50	
	Hemslyencin E / 2β,3α,16α,20(*R*),22(*S*)-25-trihydroxy-cucurbita-5,23(*E*)-diene (**1239**)	MCF-7 HCT-116 HeLa HepG2	45.11±3.29 35.57±3.40 40.98±5.23 39.60±3.86	
	Hemslyencin F / 3β,20(*S*),21,26-tetrahydroxycucurbita-5,24(*E*)-diene (**1240**)	MCF-7 HCT-116 HeLa HepG2	**17.67±1.36** **15.92±1.56** 30.63±1.97 **15.82±1.88**	

Table 44. The cytotoxicity of *nor*-cucurbitane-type triterpenoids **(1241-1244)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Momordica balsamina	Balsaminoic acid / 24,25,26,27-tetranor-7β-methoxycucurbit-5-ene-3β-hydroxy-23-oic acid (**1241**)	L5178Y- MDR COLO 320	**1.6** **1.6**	275
	Balsaminal / 24,25,26,27-tetranor-7β-methoxycucurbit-5-ene-3β-hydroxy-23-al (**1242**)	L5178Y- MDR COLO 320	58.2 **4.9**	
	Kuguacin C (**1243**)	L5178Y- MDR COLO 320	**16.4** **2.2**	
Citrullus colocynthis	(9β,10α)-25-(acetyloxy)-2,20-dihydroxy-9-methyl-19-norlanosta-1,5-diene-3,11,16,22-tetrone (**1244**)	PACA A431 HepG2	> 50 > 50 > 50	215

Table 45. The cytotoxicity of *seco*-cucurbitane-type triterpenoids **(1245-1248)** aganist cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Russula lepida	(24E)-3,4-seco-cucurbita-4,24-diene-3,26,29-trioic acid (**1245**)	A549 MCF-7 K562	>10 >10 >50	283
	(24E)-3,4-seco-cucurbita-4,24-diene-3-hydroxy-26,29-dioic acid (**1246**)	A549 MCF-7 K562	>10 >10 >50	
Hemsleya chinensis	Hemslyencin A 2*β*,3*α*,16*α*-trihydroxy-9,11-*seco*-cucurbita-5-ene-11,20(*R*)-ester-22-one-25-acetate (**1247**)	MCF-7 HCT-116 HeLa HepG2	30.52±3.13 18.36±2.53 31.23±1.74 22.41±2.11	278
	Hemslyencin B/ 2*β*,3*α*,16*α*-trihydroxy-9,11-*seco*-cucurbita-5-en-11,20(*R*)-ester-22-one (**1248**)	MCF-7 HCT-116 HeLa HepG2	32.53±3.24 37.32±2.34 28.57±2.61 36.29±2.21	

Table 46. The cytotoxicity of cucurbitane triterpenoid glycosides (**1249-1285**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Hemsleya amabilis	3β,11α-dihydroxycucurbita-5,24(E)-diene-3,26-glucosides (**1249**)	HepG2 HeLa	47.1 **9.8**	285
	3β,11α-dihydroxycucurbita-5,24(Z)-diene-3,27-glucosides (**1250**)	HepG2 HeLa	55.3 **15.7**	
Hemsleya pengxianensis	Hemslepenside F (**1251**)	HepG2	NA	273
	Hemslepenside G (**1252**)	HepG2	NA	
	Hemslepenside H (**1253**)	HepG2	NA	
	Hemslepenside I (**1254**)	HepG2	NA	
Momordica charantia L.	Furpyronecucurbitane A (**1255**)	t-HSC/Cl-6 Hep3B HepG2	71.00±1.06 24.14±3.07 23.06±6.68	274
	Goyaglycoside I (**1256**)	t-HSC/Cl-6 Hep3B HepG2	24.72±1.10 50.75±0.56 58.13±7.4	
	Charantagenin F (**1257**)	t-HSC/Cl-6 Hep3B HepG2	41.20±7.89 55.93±4.37 25.8±2.57	
	Charantagenin E (**1258**)	t-HSC/Cl-6 Hep3B HepG2	58.78±3.76 > 100 86.67±5.35	
	Charantoside D (**1259**)	t-HSC/Cl-6 Hep3B HepG2	63.934±8.29 > 100 68.89±4.37	

	Charantoside E (**1260**)	t-HSC/Cl-6 Hep3B HepG2	> 200 > 100 > 100	
	7*β*,25-dimethoxycucurbita-5(6),23(E)-dien-19-al 3-O-*β*-D-allopyranoside (**1261**)	t-HSC/Cl-6 Hep3B HepG2	59.50±7.58 44.46±1.11 89.89±10.3	
	Karaviloside III (**1262**)	t-HSC/Cl-6 Hep3B HepG2	**3.74±0.13** **16.68±2.07** **4.12±0.27**	
Hemsleya amabilis Diels	Xuedanoside A/ 3α,7β,16α,20β-tetrahydroxycucurbita-5(E)-diene-11,22-dione-25-*O*- acetate- 2-*O*- β- D-glucopyranoside (**1263**)	HeLa HCT-8 MCF-7 HepG2	**3.21±0.13** 24.72±0.52 >50 18.62±1.67	286
	Xuedanoside B / 2β,3α,20β,25-tetrahydroxycucurbita- 5(E)-diene-11,22-dione-16-*O*-acetate-24-*O*-β-D-glucopyranoside (**1264**)	HeLa HCT-8 MCF-7 HepG2	**8.57 ± 0.34** >50 >50 >50	
	Xuedanoside C / 2β,3α,20β-trihydroxycucurbita-5-(E)-diene-11,22-dione-16-*O*-acetate-25-*O*-β-D-glucopyranoside(**1265**)	HeLa HCT-8 MCF-7 HepG2	**12.86±0.25** 36.24±1.27 >50 >50	
	Xuedanoside D/ 16*α*,20*β,25*-trihydroxycucurbita- 5 (E)-diene-11,22-dione-3-*O*-β-D-glucopyranoside (**1266**)	HeLa HCT-8 MCF-7 HepG2	18.37±0.35 >50 >50 >50	
	Xuedanoside E/2β,20β,26-trihydroxycucurbita- 16α-23α-epoxy-5,24 (E)-diene-11-one-3-*O*-α-D-glucopyranoside (**1267**)	HeLa HCT-8 MCF-7 HepG2	**10.29±0.44** 19.36±0.92 >50 37.44±2.16	
Hemsleya penxianensis	Pengxianencins B (**1268**)	HeLa MCF-7 A-549	> 50 > 50 > 50	271
Citrullus colocynthis	2-*O*-β-*D*-glucopyranosyl-cucurbitacin E (**1269**)	PACA A431 HepG2	**3.6** **14.1** **14.4**	215
Elaeocarpus dubius	Elaeocarpudoside A (**1270**)	HL-60 A549 SMMC-7721 MCF-7 SW480 A549/Taxol	NA NA NA NA NA NA	282
	Elaeocarpudoside B (**1271**)	HL-60 A549 SMMC-7721 MCF-7 SW480 A549/Taxol	NA NA NA NA NA NA	
Hemsleya penxianensis	Xuedanoside F / 2β,3α,20β-trihydroxycucurbita-16α-23α-epoxy-5, 24(*E*)-diene-11-one-26-*O*-D-glucopyranoside (**1272**)	HeLa MCF-7 A-549	34.38±2.05 45.09±3.52 49.44±2.67	284
	Xuedanoside G / 3β, 20β-	HeLa	31.75±1.45	

	dihydroxycucurbita-16α-23α-epoxy-5, 24(*E*)-diene-11-one-26-*O*-D-glucopyranoside (**1273**)	MCF-7 A-549	45.88±0.92 47.58±0.84	
	Xuedanoside H / 26-hydroxycucurbita-5,24(*E*)-diene-11-one-3-*O*-β-D-glucopyranoside (**1274**)	HeLa MCF-7 A-549	**7.55±1.75** **10.88±2.77** **8.55±1.78**	
	Xuedanoside I / 11α,26-dihydroxycucurbita-5,24(*E*)-diene-3-*O*-β-D-glucopyranoside (**1275**)	HeLa MCF-7 A-549	**14.77±2.15** **12.54±1.32** 18.72±2.35	
	Xuedanoside J / 26,27-dihydroxycucurbita-5,24(*E*)- diene-7,11-dione-3-*O*-β-D-glucopyranoside(**1276**)	HeLa MCF-7 A-549	**2.25±0.42** **4.72±0.54** **5.33±0.68**	
Hemsleya amabilis	Hemslelis E (**1277**)	HeLa HCT-8 HepG-2	> 50 18.2±1.3 > 50	272
Momordica charantia	Momordicine II (**1278**)	 IEC-18 FL83B	GI_{50}/μM 76.31 NA	280
	Momordicine IV (**1279**)	IEC-18 FL83B	NA NA	
Chrysosplenium axillare Maxim. (Yajima)	Chrysosaxillin B/ (3*R*,8*S*,9*R*,10*R*,13*R*,14*S*,16*R*,17*R*,20*R*)-25-acetoxy-16α,20-dihydroxy-3α-(β-*D*-glucopyranosyloxy)-10α-cucurbita-5t,23*t*-diene-11,22-dione (**1280**)	HepG2 MCF7 PC3 A549	17.42 10.50 41.72 14.24	277
	Chrysosaxillin C / (3*R*,8*S*,9*R*,10*R*,13*R*,14*S*,16*R*,17*R*,20*R*)-16*α*,20,25-trihydroxy-3*α*-(β-*D*-glucopyranosyloxy)-10α-cucurbita-5 t,23 t-diene-11,22-dione (**1281**)	HepG2 MCF7 PC3 A549	37.65 > 50 > 50 > 50	
	Chrysosaxillin E /(3*R*,8*S*,9*R*,10*R*,13*R*,14*S*,16*R*,17*R*,20*R*)-25-acetoxy-16*α*,20-dihydroxy-3*α*-(*β*-*D*-glucopyranosyloxy)-10*α*-cucurbita-5t-ene-11,22-dione (**1282)**	HepG2 MCF7 PC3 A549	> 50 > 50 25.69 > 50	
Hemsleya chinensis	Hemslyencoside A/ 3-*O*-β-D-glucopyranosyl-3β,20(*S*), 21-trihydroxycucurbita-5,24-diene (**1283**)	MCF-7 HCT-116 HeLa HepG2	>50 >50 >50 >50	278
	Hemslyencoside B / 2-*O*-[6-*O*-acetyl-β-D-glucopyranosyl]-2α,3β,16α,20(*R*)-tetrahydroxycucurbita-5-ene-11,22-dione-25-acetate (**1284**)	MCF-7 HCT-116 HeLa HepG2	>50 >50 >50 >50	
	Hemslyencoside C/ 3-*O*-β-D-glucopyranosyl-3β,16α,20(*R*)-trihydroxycucurbita-5-ene-11, 22-dione-25-acetate (**1285**)	MCF-7 HCT-116 HeLa HepG2	>50 >50 >50 >50	

Table 47. The cytotoxicity of cycloartane-types triterpenoids (**1286-1346**) agaisnt cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Sonneratia paracaseolaris	Cycloartenol (**1286**)	P388 HeLa A549 K562	>50 >50 >50 >50	65
	24-methylenecycloartanol (**1287**)	P388 HeLa A549 K562	>50 >50 >50 >50	
Propolis from Vietnamese *Trigona minor*	27-acetoxymangiferonic acid (**1288**)	PANC-1	PC_{50} (μM) 77.5	288
	27-methoxycarbonyloxymangiferonic acid (**1289**)	PANC-1	32.9	
	27-acetoxymangiferolic acid (**1290**)	PANC-1	22.6	
	23-hydroxyisomangiferolic acid A (**1291**)	PANC-1	16.1	
	23-hydroxyisomangiferolic acid B (**1292**)	PANC-1	**4.3**	
	Mangiferonic acid (**1293**)	PANC-1	>100	
	23-hydroxymangiferonic acid (**1294**)	PANC-1	16.8	
	27-hydroxymangiferonic acid (**1295**)	PANC-1	93.8	
	mangiferolic acid (**1296**)	PANC-1	>100	
	23-hydroxymangiferolic acid (**1297**)	PANC-1	64.4	
	27-hydroxymangiferolic acid (**1298**)	PANC-1	47.6	
	27-hydroxyisomangiferolic acid (**1299**)	PANC-1	**3.7**	
	(24*E*)-3β-hydroxycycloart-24-en-26-al (**1300**)	PANC-1	19.7	
Caragana sukiensis	Sukienside D (**1301**)	HeLa A-549 MCF-7 DU-145 HEK-293	55.27 36.72 38.85 53.68 >100	107
	Sukienside E (**1302**)	HeLa A-549 MCF-7 DU-145 HEK-293	17.78 16.32 24.81 22.45 79.33	
	Sukienside F. (**1303**)	HeLa A-549 MCF-7 DU-145 HEK-293	63.29 29.38 27.16 36.08 >100	
	Sukienside A (**1304**)	HeLa A-549 MCF-7 DU-145 HEK-293	63.75 51.10 58.22 62.09 >100	

	Cyclosiversigenin (**1305**)	HeLa A-549 MCF-7 DU-145 HEK-293	**2.198** **1.542** **1.778** **7.258** **>100**	
	3β-hydroxy-25-methylenecycloartan-24-ol (**1306**)	HeLa A-549 MCF-7 DU-145 HEK-293	16.90 23.38 28.82 25.87 >100	
Cimicifuga frigida	Cimifrigine A (**1307**)	HL-60 SMMC-7721 A549 MCF-7 SW-480	**19.3±1.3** 25.7±0.7 24.1±1.4 > 30 > 30	219
	Cimifrigine B (**1308**)	HL-60 SMMC-7721 A549 MCF-7 SW-480	**18.4±0.7** 23.8±1.2 25.3±2.0 > 30 > 30	
	Cimifrigine C (**1309**)	HL-60 SMMC-7721 A549 MCF-7 SW-480	25.9±1.1 > 30 > 30 > 30 > 30	
Euphorbia clementei Boiss.	Cycloartenol (**1286**)	HL60 K562	53 NA	289
	24-methylenecycloartanol (**1287**)	HL60 K562	NA NA	
	24-methylenecycloartan-3β,25-diol (**1310**)	HL60 K562	40 77.9	
	Cycloeucalenol (**1311**)	HL60 K562	NA NA	
	Cycloart-22*E*-ene-3β,25-diol (**1312**)	HL60 K562	45 78.1	
	(3β,9β,24*R*) 9,19-cyclolanostane-3,24,25-triol (**1313**)	HL60 K562	40 77	
	Cycloartenylacetate (**1314**)	HL60 K562	58 NA	
Euphorbia schimperi	Cycloschimperol A (**1315**)	HCT-116 HepG2 MCF-7	20.25±5 19.7±3 55.4±3	291
	Cycloschimperol B (**1316**)	HCT-116 HepG2 MCF-7	**1.8±0.1** **1.4±0.1** **2.1±0.01**	
	24-methylenecycloartanol /3β-hydroxy-24-methylenecycloartane (**1287**)	HCT-116 HepG2 MCF-7	>100 >100 >100	
	Cycloart-25-en- 3-one (**1317**)	HCT-116 HepG2 MCF-7	**1.9±0.4** **2.3±0.2** **4.7±0.1**	
Abies fargesii	(24*E*)-3α,15β-dihydroxycycloart-24-en-26-oic acid (**1318**)	B16 MCF7	>100 86.9	290

		HepG2	>100	
	(24R)-cycloartane-3β,24,25-triol (**1313**)	B16 MCF7 HepG2	32.9 52.0 19.5	
	(24R)-cycloartane-3α,24,25-triol (**1319**)	B16 MCF7 HepG2	45.2 67.9 >100	
	Abiesatrine I (**1320**)	B16 MCF7 HepG2	>100 81.1 >100	
	(24R)-cycloartane-24,25-diol-3-one (**1321**)	B16 MCF7 HepG2	67.8 62.1 43.0	
	Neoabiestrine I (**1322**)	NT	NT	
	(24R)-cycloartane-3β,24,25,28-tetrol (**1323**)	B16 MCF7 HepG2	26.4 40.4 21.5	
Gardenia sessiliflora	Sessiliflorin (**1324**)	P-388 KB HT-29 MCF-7 A549 ASK HEK 293	> 10 > 10 > 10 > 10 > 10 > 10 > 10	293
	(23*E*)-25-hydroxycycloart-23-ene-3β,25-diol (**1325**)	P-388 KB HT-29 MCF-7 A549 ASK HEK 293	> 10 > 10 > 10 > 10 > 10 > 10 > 10	
	3β-hydroxy-5α-cycloart-24(31)-en-28-oic acid (**1326**)	P-388 KB HT-29 MCF-7 A549 ASK HEK 293	7.5 > 10 > 10 > 10 > 10 > 10 > 10	
	23-deoxojessic acid (**1327**)	P-388 KB HT-29 MCF-7 A549 ASK HEK 293	4.1 > 10 > 10 > 10 > 10 > 10 > 10	
Combretum quadrangulare	Combretanone G (**1328**)	K562 HepG2 MCF-7 hAdCs	28.2 42.4 >100 82.4	294
	Combretanone H (**1329**)	K562 HepG2 MCF-7	44.5 79.0 >100	

		hAdCs	>100	
Markhamia stipulata var. canaense	24-epimarkhacanasin C (**1330**)	MCF-7	96.70	295
Schisandra chinensis	Schisandronic acid (**1331**)	MCF-7 A549 HeLa RPMI8226	>100 >100 >100 >100	296
	Schizandrolic acid (**1332**)	MCF-7 A549 HeLa RPMI8226	>100 >100 >100 76.6	
Euphorbia fischeriana	Euphorfistrine A (**1333**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	**13.38±0.42** **16.48±0.67** 22.6±0.72 59.41±1.34 >100 25.52±0.74 68.45±3.14	83
	Euphorfistrine B (**1334**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	**8.02±0.35** **10.55±0.72** **8.83±0.22** >100 >100 **8.7±0.32** 73.54±2.18	
	Cycloart-25-methoxy-3*S*,24*R*-diol (**1335**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	52.36±2.61 >100 >100 >100 >100 >100 >100	
	24-methylenecycloartan-3β-ol (**1287**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	>100 96.85±0.67 >100 >100 >100 >100 >100	
	Cycloartane-24-methylene-3β,25-diol (**1310**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	**11.25±0.67** 20.04±0.83 **9.02±0.62** 31.47±0.67 18.97±0.31 **9.45±0.37** 47.64±1.62	
	Cycloeucalenol (**1311**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	96.31±1.37 >100 >100 >100 >100 >100 >100	

	Cycloartenol (**1286**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	42.1±0.94 96.65±1.92 >100 >100 >100 >100 >100	
	Cycloart-25-en-3β,24-diol (**1306**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	21.02±0.67 20.97±1.37 >100 >100 >100 **3.75±0.17** 68.53±1.68	
Euphorbia dendroides	23*R*/*S*-3β-hydroxycycloart-24-ene-23-methyl ether (C-23 epimeric mixture) (**1336**)	HepG2 Huh-7 KLM-1 1321N1 HeLa	20.67±0.72 16.24±0.53 22.59±0.94 25.99±0.31 40.50±3.14	297
Macrosolen bidoupensis	Macrobidoupoic acid A (**1337**)	A549 RD	5.44±0.02 14.16±0.05	298
	3β-hydroxy-24-methylenecycloartane (**1287**)	A549 RD	NA NA	
	1α,3β-dihydroxycycloart-24-en-28-oic acid (**1338**)	A549 RD	27.54±0.37 39.52±0.39	
Aphanamixis polystachya	(24*R*)-cycloartane-3β,24,25,30-tetrol (**1339**)	HL-60 A-549 SMMC-7721 MCF-7 SW480	**3.16** **14.02** **2.59** **17.26** 30.17	292
	(24*R*)-24,25,30-trihydroxy-9,19-cycloartane-3-one (**1340**)	HL-60 A-549 SMMC-7721 MCF-7 SW480	NA NA 28.13 NA NA	
Turraea delphinensis	(5R,8S,9S,10R,13R,14S,17R, 20R*,23R*)-23,25-epidioxy-21,23-epoxycycloart-3-one (**1341**)	A549 MDA-MB-231 MCF-7 KB KB-VIN	>10 >10 >10 >10 >10	259
	(5R,8S,9S,10R,13R,14S,17R,23R*,24S*)-24,25-epoxy-23-hydroxycycloart-3-one (**1342**)	A549 MDA-MB-231 MCF-7 KB KB-VIN	>10 >10 >10 >10 >10	
	(5R,8S,9S,10R,13R,14S,17R,23R*,24R*)-24,25-epoxy-23-hydroxycycloart-3-one (**1343**)	A549 MDA-MB-231 MCF-7 KB KB-VIN	>10 >10 >10 >10 >10	
	(5R,8S,9S,10R,13R,14S,17R,23R*)-21,23-dihydroxycycloart-24-en-3-one (**1344**)	A549 MDA-MB-231 MCF-7	>10 >10 >10	

		KB KB-VIN	>10 9.9	
	(5R,8S,9S,10R,13R,14S,17R,20R*,24S*)-21,24-epoxy-25-hydroxycycloart-3-one (**1345**)	A549 MDA-MB-231 MCF-7 KB KB-VIN	9.1 >10 >10 >10 >10	
	(5R,8S,9S,10R,13R,14S,17R,20R*,21R*,23R*)-21,23-epoxy-21-methoxycycloart-24-en-3-one (**1346**)	A549 MDA-MB-231 MCF-7 KB KB-VIN	>10 >10 >10 >10 >10	

Note: NT= not test

Table 48. The cytotoxicity of *nor*-cycloartane triterpenoids **(1347-1349)** against cancer cell lines

Plant sources	Names and numbers of ompounds	Types of cancer cell lines	IC_{50} (μM)	References
Streptocaulon griffithii Hook	28,29-nor-3β,4β-dihydroxyl-9,19-cycloartan-26-acid (**1347**)	HL-60 P388 SMMC7721 Bcap37	26.37 31.48 45.09 36.70	184
	28,29-nor-3β,4β-dihydroxyl-9,19-cycloartan-26-acid methylester (**1348**)	HL-60 P388 SMMC7721 Bcap37	36.00 57.65 51.59 44.30	
Propolis from Vietnamese *Trigona minor*	(23E)-27-nor-3β-hydroxycycloart-23-en-25-one (**1349**)	PANC-1	PC_{50} (μM) 16.4	288

Table 49. The cytotoxicity of *seco*-cycloartane-types triterpenoids **(1350-1369)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Umbelopsis dimorpha SWUKD3.1410	3,4-secocycloarta-4(28),24-(*Z*)-diene-3,26-dioic acid (**1350**)	HL-60 HepG2	98.08 99.76	301
	7β-hydroxynigranoic acid (**1351**)	HL-60 HepG2	>100 >100	
	15β-hydroxynigranoic acid (**1352**)	HL-60 HepG2	95.24 87.43	
	Abiesatrine J (**1353**)	HL-60 HepG2	78.34 86.55	
Schisandra chinensis	Kadsuphilactone B (**1354**)	A2780	23.25±1.46	302
Kadsura heteroclita (Roxb.) Craib.	Xuetonglactone E (**1355**)	HeLa BCG-823	38.92 33.28	299
	Xuetonglactone F (**1356**)	HeLa BCG-823	**4.0** **2.0**	

Kadsura heteroclita	Xuetongsu E (**1357**)	HL-60	NA	303
		HepG-2	NA	
		HCT-16	NA	
		BGC-823	NA	
	Polysperlactone B (**1358**)	HL-60	50	
		HepG-2	NA	
		HCT-16	NA	
		BGC-823	NA	
	Heteroclitalactone P (**1359**)	HL-60	NA	
		HepG-2	NA	
		HCT-16	NA	
		BGC-823	NA	
	Kadsuphilactone B (**1354**)	HL-60	NA	
		HepG-2	NA	
		HCT-16	NA	
		BGC-823	NA	
Schisandra chinensis	Schinensin C /Xuetonglactone E (**1355**)	MCF-7	**12.5**	296
		A549	82.1	
		HeLa	>100	
		RPMI8226	24.1	
	3-*O*-methylchangnanic acid (**1360**)	MCF-7	59.8	
		A549	99.8	
		HeLa	78.7	
		RPMI8226	29.3	
	Kadsuphilactone B (**1354**)	MCF-7	**10.7**	
		A549	40.0	
		HeLa	40.3	
		RPMI8226	33.2	
	Schisanbilactone A (**1361**)	MCF-7	**9.3**	
		A549	89.3	
		HeLa	>100	
		RPMI8226	23.8	
	3,4-*seco*-(24*Z*)-cycloart-4(28),24-diene-3,26-dioic acid 3-methyl ester (**1362**)	MCF-7	55.5	
		A549	>100	
		HeLa	97.0	
		RPMI8226	38.8	
	Schiglasusin L (**1363**)	MCF-7	78.3	
		A549	>100	
		HeLa	>100	
		RPMI8226	>100	
Kadsura coccinea	Schisanlactone B (**1364**)	HCT-15	**2.67±0.02**	300
		NUGC-3	**1.80±0.02**	
		NCI-H23	**1.28±0.01**	
		ACHN	**2.63±0.01**	
		PC-3	**2.33±0.01**	
		MDA-MB-231	**2.38±0.02**	
Gardenia sessiliflora	Sootepenoic acid (**1365**)	P-388	1.2	293
		KB	> 10	
		HT-29	> 10	
		MCF-7	> 10	
		A549	> 10	
		ASK	> 10	
		HEK 293	5.3	

	Coronalolide methyl ester (**1366**)	P-388 KB HT-29 MCF-7 A549 ASK HEK 293	ND ND ND ND ND ND ND	
	Sootepin A (**1367**)	P-388 KB HT-29 MCF-7 A549 ASK HEK 293	0.6 4.8 3.2 2.8 > 10 4.4 4.0	
	Tubiferolide methyl ester (**1368**)	P-388 KB HT-29 MCF-7 A549 ASK HEK 293	ND ND ND ND ND ND ND	
	Coronalolide (**1369**)	P-388 KB HT-29 MCF-7 A549 ASK HEK 293	ND ND ND ND ND ND ND	

Table 50. The cytotoxicity of cycloartane triterpenoid glycosides (**1370-1408**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Souliea vaginata	Soulieoside M (**1370**)	HT-29 A549 MDA-B231	20.4±3.4 42.7±8.8 17.3±4.3	304
	Beesioside I (**1371**)	HT-29 A549 MDA-B231	31.5±6.2 64.7±11.3 27.5±4.3	
	Soulieoside Q (**1372**)	HepG2 A549	> 50 > 50	
	Beesioside O (**1373**)	HepG2 A549	> 50 > 50	
	(20*S*,24*S*)-15α-acetoxy-16β,24;20,24-diepoxy-3β-(β-D-xylopyranosyloxy)-9,19-cycloartane-18,25-diol (**1374**)	HepG2 A549	> 50 > 50	
	Beesioside M (**1375**)	HepG2 A549	> 50 > 50	
	Beesioside K (**1376**)	HepG2 A549	> 50 > 50	

Cimicifuga frigida	Cimifrigine D (**1377**)	HL-60 SMMC-7721 A549 MCF-7 SW-480	**10.4±0.8** **11.2±1.0** **9.3±0.6** **12.7±0.7** **13.2±0.8**	219
	Cimifrigine E (**1378**)	HL-60 SMMC-7721 A549 MCF-7 SW-480	**1.2±0.1** **4.5±0.2** **4.0±0.3** **5.8±0.6** **6.3±0.3**	
	Cimifrigine F (**1379**)	HL-60 SMMC-7721 A549 MCF-7 SW-480	**12.5±1.3** **14.3±1.2** **9.8±1.0** **11.4±0.8** **8.9±0.9**	
	Cimifrigine G (**1380**)	HL-60 SMMC-7721 A549 MCF-7 SW-480	**0.8±0.09** **2.6±0.1** **1.4±0.08** **3.7±0.07** **4.3±0.4**	
Souliea vaginata	Soulieoside P (**1381**)	HT-29 A549 MDA-MB231	**11.2±2.9** **9.7±6.5** **7.6±3.6**	153
Caragana sukiensis	Sukienside B (**1382**)	HeLa A-549 MCF-7 DU-145 HEK-293	57.00 37.54 43.17 59.25 79.17	107
	20(R), 24(S)-epoxycycloartane-3β,6α,16β,25-tetraol-3β-*O*-D-(2-*O*-acetyl)-xylopyranoside (**1383**)	HeLa A-549 MCF-7 DU-145 HEK-293	9.710 **2.238** **2.931** 11.31 >100	
	3-*O*-β-D-xylocyclosiversigenin (**1384**)	HeLa A-549 MCF-7 DU-145 HEK-293	17.35 29.00 31.18 19.62 99.40	
Cimicifuga foetida	Cimitriteromone A (**1385**)	A-549/Taxol	>40	305
	Cimitriteromone B (**1386**)	A-549/Taxol	15.73±0.59	
	Cimitriteromone C (**1387**)	A-549/Taxol	>40	
	Cimitriteromone D (**1388**)	A-549/Taxol	24.2±0.61	
	Cimitriteromone E (**1389**)	A-549/Taxol	>40	
	Cimitriteromone F (**1390**)	A-549/Taxol	>40	
	Cimitriteromone G (**1391**)	A-549/Taxol	>40	
	24-*O*-acetylhydroxyshenhmanal-3-*O*-β-*D*-xyloside **(1392)**	A-549/Taxol	>40	
	(23R,24S)-16β,23;16α,24-diepoxy-cycloart-7-en-3β,11β,25-triol 3-*O*-β-*D*-xyloside (**1393**)	A-549/Taxol	>40	

Cimicifuga foetida	Acteol-3-*O*-2′-*O*-[(*E*)-2-butenoyl]-β-D-xylopyranoside (**1394**)	HL-60 A-549 SMMC-7721 MCF-7 SW480	16.79 **7.64** **5.86** 10.77 14.47	306
	25-*O*-acetylcimigenol-3-*O*-[2′-*O*-3-methoxy- 3-oxo-propionyl]-β-D-xylopyranoside (**1395**)	HL-60 A-549 SMMC-7721 MCF-7 SW480	14.82 **9.87** **4.02** 14.93 14.50	
	25-*O*-acetylcimigenol-3-*O*-[3′-*O*-3-methoxy-3-oxopropionyl]-β-D-xylopyranoside (**1396**)	HL-60 A-549 SMMC-7721 MCF-7 SW480	14.74 14.59 15.76 16.31 14.65	
	25-*O*-methylcimigenol-3-*O*-[4′-*O*-acetyl]-β-D-xylopyranoside (**1397**)	HL-60 A-549 SMMC-7721 MCF-7 SW480	15.80 14.35 14.21 13.52 13.43	
	25-*O*-acetylcimigenol-3-*O*-[2′-*O*-butenoyl]-*α*-L-arabinopyranoside (**1398**)	ND		
	Soulieoside A (**1399**)	ND		
	3′-*O*-acetyl-actein (**1400**)	ND		
	25-*O*-acetylcimigenol-3-*O*-*β*-D-xylopyranoside (**1401**)	ND		
Ligularia przewalskii	(20S*,24R*)-epoxy-9β,19-cyclolanostane-3β,16β,25,28-tetrol-3-*O*-β-D-glucopyranoside (**1402**)	HeLa HepG2 SGC7901 MDA231 HL60 Lewis	18.56 **8.59** 24.39 15.80 19.32 13.65	159
Thalictrum atriplex	Cycloartioside A (**1403**)	A549 MDA-MB-231 HepG2	NA NA NA	166
	Cycloartioside B (**1404**)	A549 MDA-MB-231 HepG2	NA NA NA	
Actaea vaginata	Soulieoside T (**1405**)	HepG2 A549 MDA-MB231	67.9±2.7 81.5±3.1 **7.6±1.9**	307
Actaea cimicifuga L.	Cimitriteromone H (**1406**)	NT		308
	Cimitriteromone I (**1407**)	A-549/Taxol	27.14±1.38	
	Cimitriteromone A (**1385**)	NT		
	Cimifoetidanoside G (**1408**)	NT		

Table 51. The cytotoxicity of lanostane-type triterpenoids (**1409-1647**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Ganoderma hainanense	Ganoderense A (**1409**)	TrxR	NA	318
	Ganoderense B (**1410**)	TrxR	NA	
	Ganoderense C (**1411**)	TrxR	NA	
	Ganoderense D (**1412**)	TrxR	NA	
	Ganoderense E (**1413**)	TrxR	NA	
	3β,7β-dihydroxy-11,15,23-trioxolanost-8,16-dien-26-oic acid (**1414**)	TrxR	NA	
	3β,7β,15α-trihydroxy-11,23-dioxolanost-8,16-dien-26-oic acid (**1415**)	TrxR	NA	
	Ganoderenic acid H (**1416**)	TrxR	NA	
	Ganoderic acid I (**1417**)	TrxR	NA	
	20-hydroxy-ganoderic acid AM1 (**1418**)	TrxR	NA	
	3β,7β,15α,24-tetrahydroxy-11,23-dioxo-lanost-8-en-26-oic acid (**1419**)	TrxR	NA	
	Ganoderic acids C2 (**1420**)	TrxR	NA	
	Ganoderic acid B (**1421**)	TrxR	NA	
Abies fargesii	(23R,24*E*)-23-hydroxy-3-oxo-lanosta-8,24-dien-26-oic acid (**1422**)	B16 MCF7 HepG2	>100 69.0 63.9	290
	(23R,24*E*)-3β,23-dihydroxy-lanosta-8,24-dien-26-oic acid (**1423**)	ND		
	(24R)-3α-methoxylanost-9(11)-en-24,25-diol (**1424**)	ND		
Phellinus rhabarbarinus	Phellibarin A (**1425**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	6
	Phellibarin B (**1426**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	**13.9** 28.8 **15.0** **10.2** **14.5**	
	Phellibarin C (**1427**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	33.1 **10.7** **13.7** 18.6 22.7	
	Igniaren D (**1428**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	>40 19.1 20.0 14.3 39.1	

	24-methylenelanost-8-ene-3β,22-diol (**1429**)	HL-60	NA	
		SMMC-7721	NA	
		A-549	NA	
		MCF-7	NA	
		SW480	NA	
	Igniaren C (**1430**)	HL-60	15.5	
		SMMC-7721	>40	
		A-549	22.4	
		MCF-7	>40	
		SW480	>40	
	Gilvsin A (**1431**)	HL-60	**14.6**	
		SMMC-7721	**17.7**	
		A-549	**18.5**	
		MCF-7	**8.8**	
		SW480	**17.8**	
	Gilvsin C (**1432**)	HL-60	NA	
		SMMC-7721	NA	
		A-549	NA	
		MCF-7	NA	
		SW480	NA	
	Igniaren B (**1433**)	HL-60	NA	
		SMMC-7721	NA	
		A-549	NA	
		MCF-7	NA	
		SW480	NA	
	Gilvsin D (**1434**)	HL-60	22.9	
		SMMC-7721	23.7	
		A-549	**11.4**	
		MCF-7	**12.5**	
		SW480	35.0	
Flavodon flavus BCC 17421	Trametenolic acid B (**1435**)	KB	> 50	319
		MCF-7	> 50	
		NCI-H187	> 50	
		Vero	> 50	
	Pinicolic acid A (**1436**)	KB	> 50	
		MCF-7	> 50	
		NCI-H187	> 50	
		Vero	> 50	
Astraeus odoratus	Astraeusin A (**1437**)	NCI-H187	>50	320
		MCF-7	>50	
		KB	>50	
		Vero	41.3	
	Astraeusin B (**1438**)	NCI-H187	> 50	
		MCF-7	>50	
		KB	38.8	
		Vero	> 50	
	Astraeusin C (**1439**)	NCI-H187	>50	
		MCF-7	>50	
		KB	>50	
		Vero	> 50	
	Astraeusin D (**1440**)	NCI-H187	>50	
		MCF-7	>50	
		KB	>50	

		Vero	>50	
	Astraeusin E (**1441**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 >50	
	Astraeusin F (**1442**)	NCI-H187 MCF-7 KB Vero	ND ND ND ND	
	Astraeusin G (**1443**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 > 50	
	Astraeusin H (**1444**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 > 50	
	Astraeusin I (**1445**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 >50	
	Astraeusin J (**1446**)	NCI-H187 MCF-7 KB Vero	40.4 >50 38.2 40.4	
	Astraeusin K (**1447**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 >50	
	Astraeusin L (**1448**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 >50	
	Astraodoric acid A (**1449**)	NCI-H187 MCF-7 KB Vero	37.1 >50 >50 >50	
	Astraodoric acid B (**1450**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 >50	
	Astraodoric acid D (**1451**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 >50	
	Artabotryol B (**1452**)	NCI-H187 MCF-7 KB Vero	34.9 >50 28.4 19.7	
	Artabotryol A (**1453**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 >50	

	Lanosterol (**1454**)	NCI-H187 MCF-7 KB Vero	>50 >50 >50 >50	
Tyromyces sambuceus	Tyrosamic acid A (**1455**)	HL-60 HCT-15 T98G	16.8 53.9 29.6	309
	Tyrosamic acid B (**1456**)	HL-60 HCT-15 T98G	157.0 177.9 NA	
	Tyrosamic acid C (**1457**)	HL-60 HCT-15 T98G	NA NA NA	
	Tyrosamic acid D (**1458**)	HL-60 HCT-15 T98G	NA NA NA	
	Tyrosamic acid E (**1459**)	HL-60 HCT-15 T98G	214.8 NA NA	
	Tyrosamic acid F (**1460**)	HL-60 HCT-15 T98G	48.3 103.2 137.0	
	Saponaceoic acid I (**1461**)	HL-60 HCT-15 T98G	111.3 NA ND	
	15α-hydroxytrametenolic acid (**1462**)	HL-60 HCT-15 T98G	NA NA ND	
	Trametenolic acid (**1435**)	HL-60 HCT-15 T98G	18.0 NA ND	
	Pinicolic acid A (**1436**)	HL-60 HCT-15 T98G	74.2 NA ND	
	Fomefficinic acid D (**1463**)	HL-60 HCT-15 T98G	NA NA ND	
	Sulfurenic acid (**1464**)	HL-60 HCT-15 T98G	NA NA ND	
	Eburicoic acid (**1465**)	HL-60 HCT-15 T98G	25.1 NA ND	
	Fomefficinic acid A (**1466**)	HL-60 HCT-15 T98G	74.2 NA ND	
	Saponaceoic acid III (**1467**)	HL-60 HCT-15 T98G	115.7 NA ND	
Garcinia celebica	(*E*)-3β,9α-dihydroxylanosta-24-en-26-oic acid (**1468**)	MCF-7	NA	321
	3,23-dioxo-9,16-lanostadien-26-oic acid (**1469**)	MCF-7	NA	

Fusarium sp	Integracide F (**1470**)	BT-549 SKOV-3	3.54 0.23	322
	Integracide G (**1471**)	BT-549 SKOV-3	3.17 0.18	
	Integracide H (**1472**)	BT-549 SKOV-3 KB	1.82 1.32 0.18	323
	Integracide I (**1473**)	BT-549 SKOV-3 KB	NA NA NA	
	Integracide J (**1474**) *p*-hydroxy benzoyl moiety reduce the cyotoxic effect	BT-549 SKOV-3 KB	2.46 3.01 2.54	
Propolis from Vietnamese *Trigona minor*	Lanosterol (**1454**)	 PANC-1	PC_{50} (μM) 68.7	288
Piptoporus betulinus	Piptolinic acid A/ (3R,12S,25S,30 S)-3-(30 -hydroxy-40 -methoxycarbonyl-30 -methylbutyryloxy)-12-methoxy-24-methyllanost-7,9(11),24(31)-trien26-oic acid (**1475**)	HL-60 THP-1	**1.77±0.11** **8.21±0.37**	311
	Piptolinic acid D / 3,16-dioxo-lanost-7,9(11),24- trien-21-oic acid (**1476**)	HL-60 THP-1	52.43 84.41	
	Piptolinic acid E/ (16R,23*E*)-16,25-dihydroxy-3-oxo- lanost-7,9(11),23-trien-21-oic acid (**1477**)	HL-60 THP-1	>100 >100	
	3-*epi*-(3'-hydroxy-3'-methylglutaryloxyl)-dehydrotumulosic acid (**1478**)	HL-60 THP-1	42.32 47.33	
	Dehydroeburiconic acid (**1479**)	HL-60 THP-1	**18.28** 61.34	
	Polyporenic acid C (**1480**)	HL-60 THP-1	>100 48.15	
	6*α*-hydroxypolyporenic acid C (**1481**)	HL-60 THP-1	34.73 42.84	
	3-*epi*-dehydropachymic acid (**1482**)	HL-60 THP-1	>100 52.51	
Poria cocos	3β-acetyloxy-16-hydroxy-24-methylenelanosta-5,7(9),11-tetraene-21-oic acid (**1483**)	MGC-803 HepG2 VERO	42.90±4.59 44.07±2.67 > 100	324
Ganoderma calidophilum	Spiroganocalitone A/ (15S,17S,20R,23S,25S)- 3,11-dioxo-17,23-epoxy-15-hydroxylanosta-8-en-26,23-olide (**1484**)	K562 BEL7402 SGC7901	NA NA NA	310
	Spiroganocalitone B /(7S,15S,17S, 20R,23S,25S)-3,11-dioxo-17,23-epoxy7,15-dihydroxylanosta-8-en-26,23-olide (**1485**)	K562 BEL7402 SGC7901	NA NA NA	
	Spiroganocalitone C / (15S,17S,20R,23S,25S)-3,11-dioxo17,23-epoxy-15-acetoxylanosta-8-en-26,23-olide (**1486**)	K562 BEL7402 SGC7901	NA NA NA	

	Spiroganocalitone D /(7S,15S,17S,20R,23S,25S)-3,11-dioxo-17,23-epoxy-7- acetoxy-15-hydroxylanosta-8-en-26,23-olide (**1487**)	K562 BEL7402 SGC7901	NA NA NA	
	Ganodecalone A/(17R,20R,24*E*)-26-hydroxy-lanosta-8,24-dien-3,11-dione (**1488**)	K562 BEL7402 SGC7901	17.22 NA NA	
	(15α,24*E*)-15-hydroxyl-lanosta-8,24-diene-3,7-dione (**1489**)	K562 BEL7402 SGC7901	17.64 NA NA	
	Ganoderone A (**1490**)	K562 BEL7402 SGC7901	**7.62** **6.28** **3.55**	
	Ganodermanondiol (**1491**)	K562 BEL7402 SGC7901	25.27 NA NA	
	Ganoderiol F (**1492**)	K562 BEL7402 SGC7901	NA 29.30 33.00	
	Ganoderol B (**1493**)	K562 BEL7402 SGC7901	NA NA NA	
Chisocheton cumingianus	3β-hydroxy-25-ethyl-lanost-9(11),24(24′)-diene (**1494**)	P-388	61.5	312
	3β-hydroxy-lanost-7-ene (**1495**)	P-388	**10.0**	
Ganoderma theaecolum	Ganoderic acid XL3 (**1496**)	H460 HepG2 MDA-MB-231 BGC823 HCT116	NA NA NA NA NA	325
	Ganoderic acid XL4 (**1497**)	H460 HepG2 MDA-MB-231 BGC823 HCT116	NA NA NA NA NA	
	Ganoderic acid XL5 (**1498**)	H460 HepG2 MDA-MB-231 BGC823 HCT116	NA NA NA NA NA	
	Ganoderic acid Y **(1499)**	H460 HepG2 MDA-MB-231 BGC823 HCT116	22.4 NA 49.1 NA NA	
	7-oxo-ganoderic acid Z **(1500)**	H460 HepG2 MDA-MB-231 BGC823 HCT116	NA NA 75.8 NA NA	
	7-oxo-ganoderic acid Z_2 **(1501)**	H460 HepG2	43.1 NA	

		MDA-MB-231 BGC823 HCT116	NA NA NA	
Ganoderma lucidum	Ganodermanontetrol (**1502**)	MDA-MB-231 HepG2	53.4±9.9 43.7±1.4	326
	3β, 24, 25, 26-tetradroxy-7α-methoxy-8-ene-lanost-ol (**1503**)	MDA-MB-231 HepG2	35.9±0.4 39.3±1.3	
	12α-methoxy-ganodermanondiol (**1504**)	MDA-MB-231 HepG2	21.2±0.7 41.5±3.2	
	15β-hydroxy-lucidumol A (**1505**)	MDA-MB-231 HepG2	75.7±1.9 82.6±5.8	
	15α-hydroxy-ganodermanontriol (**1506**)	MDA-MB-231 HepG2	112.1±2.1 56.8±1.7	
Ganoderma luteomarginatum	(+)-(5α,23R,24*Z*)-lanosta-8,24-dien-3,7-dioxo-23,26-γ-lactone (**1507**)	HGC-27 HeLa A549 SMMC-7721 LO2	> 50 > 50 > 50 > 50 > 50	313
	(+)-(5α,24*E*)-3β,11α-dihydroxylanosta-8,24-dien-7-oxo-26-al (**1508**)	HGC-27 HeLa A549 SMMC-7721 LO2	**8.47±1.14** **11.21±1.47** 20.26±3.66 22.33±2.72 41.88±1.62	
	(+)-(5α,24*E*)-3β-acetoxyl-7β-hydroxylanosta-8,24-dien-11-oxo-26-al (**1509**)	HGC-27 HeLa A549 SMMC-7721 LO2	**6.80±1.11** > 50 > 50 40.52±4.62 > 50	
	(+)-(5α,24*E*)-3β-acetoxyllanosta-8,24-dien-7-oxo-26-al (**1510**)	HGC-27 HeLa A549 SMMC-7721 LO2	> 50 > 50 > 50 > 50 > 50	
	(+)-(5α,24*E*)-3β-acetoxyl-26-hydroxylanosta-8,24-dien-7-one (**1511**)	HGC-27 HeLa A549 SMMC-7721 LO2	**5.01±0.57** **1.29±0.13** **1.50±0.19** **2.47±0.42** 36.22±3.41	
	Lucialdehyde C (**1512**)	HGC-27 HeLa A549 SMMC-7721 LO2	> 50 > 50 > 50 > 50 > 50	
	Ganoderone A (**1490**)	HGC-27 HeLa A549 SMMC-7721 LO2	**9.72±0.36** > 50 25.95±6.27 19.26±3.50 > 50	
	3,7,24-trioxo-5α-lanost-8,25-dien-26-ol (**1513**)	HGC-27 HeLa A549 SMMC-7721 LO2	**4.23±0.63** **12.54±0.40** **13.03±1.52** **11.14±1.54** **13.53±1.23**	

	Lucialdehyde A (**1514**)	HGC-27 HeLa A549 SMMC-7721 LO2	> 50 > 50 > 50 > 50 > 50	
	Ganodermadiol (**1515**)	HGC-27 HeLa A549 SMMC-7721 LO2	**16.15±1.39** **12.64±0.70** **9.77±2.03** > 50 > 50	
	(+)-(5α,24*E*)-3β-acetoxyllanosta-7,9(11),24-triene-26-ol (**1516**)	HGC-27 HeLa A549 SMMC-7721 LO2	> 50 > 50 > 50 > 50 > 50	
	(+)-(5α,24*E*)-15α-hydroxylanosta-7,9(11),24-trien-3-oxo-26-al (**1517**)	HGC-27 HeLa A549 SMMC-7721 LO2	**13.04±1.45** > 50 > 50 > 50 > 50	
Ganoderma capense	26-methy-15α,22β-diacetoxy-7,9(11),24-trien-26-oic ester (**1518**)	HepG2 Daoy NCI-H1650 NCI-H460, HCT116 BGC823	NA NA 22.3 NA NA NA	327
	15α-acetoxy-3α-hydroxylanosta-8,24-dien-26-oic acid (**1519**)	HepG2 Daoy NCI-H1650 NCI-H460, HCT116 BGC823	NA NA NA NA NA NA	
	(24*E*)-15α-acetoxy-3-oxolanosta-8, 24-dien-26-oic acid (**1520**)	HepG2 Daoy NCI-H1650 NCI-H460, HCT116 BGC823	NA NA NA NA NA NA	
	(24*E*)-15α-acetoxy-3β-hydroxylanosta-8, 24-dien-26-oic acid (**1521**)	HepG2 Daoy NCI-H1650 NCI-H460, HCT116 BGC823	NA NA NA NA NA NA	
Fomitopsis sp.	Fomitopsin I (**1522**)	NCI-H187 MCF-7 KB Vero	> 50 > 50 > 50 > 50	328
	Fomitopsin J (**1523**)	NCI-H187 MCF-7 KB Vero	> 50 > 50 > 50 > 50	
	Palustrisoic acid F (**1524**)	NCI-H187	35.8	

		MCF-7 KB Vero	> 50 37.4 28.0	
	Palustrisoic acid B (**1525**)	NCI-H187 MCF-7 KB Vero	> 50 > 50 > 50 > 50	
	(25S,3'S)-(+)-12R-hydroxy-3R-(3'-hydroxy-3'-methyl glutaryloxy)-24-methyllanosta-8,24(31)-dien-26-oic acid (**1526**)-**Compound 5**	NCI-H187 MCF-7 KB Vero	> 50 > 50 > 50 > 50	
	(25S,3'S)-(+)-12R-hydroxy-3R-(3'hydroxy-4'-methoxycarbonyl-3'-methylbutyryloxy)-24-methyllanosta-8,24(31)-dien-26-oic acid (**1527**)-Compound **6**	NCI-H187 MCF-7 KB Vero	> 50 27.9 45.0 27.9	
	Fomefficinic acid G (**1528**)	NCI-H187 MCF-7 KB Vero	> 50 > 50 > 50 > 50	
	Polyporenic acid A (**1529**)	NCI-H187 MCF-7 KB Vero	> 50 > 50 > 50 > 50	
	3-*O*-acetylpolyporenic acid A (**1530**)	NCI-H187 MCF-7 KB Vero	ND ND ND ND	
Omphalia lapidescens	Eburicoic acid (**1465**)	MDA-MB-231 HGC-27 GES-1	NA 90.48±46.14 ND	329
	Eburicoic acid acetate (**1531**)	MDA-MB-231 HGC-27 GES-1	29.63±1.69 **16.03±1.30** 22.45±8.50	
Poria cocos	Ceanphytamic acid A (**1532**)	A549 HeLa MDA-MB-231 SK-OV-3 SW579	>100 54.41±7.01 >100 72.38±8.77 69.52±8.19	330
	Ceanphytamic acid B (**1533**)	A549 HeLa MDA-MB-231 SK-OV-3 SW579	>100 >100 >100 70.01±2.29 81.62±6.26	
Fomitopsis pinicola	Formipinic Acid A/ 3α-[(3'S)-4'-carboxyl-3'-hydroxy-3' methylbutanoyloxy]-lanosta-8,24-dien-21-oic acid(**1534**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	331
	Formipinic Acid B / 3α-[(3'S)-4'-methoxylcarbony-3'-hydroxy-3'-methylbutanoy loxy]-15-hydroxy-lanosta-8,24-dien-21-oic acid (**1535**)	HL-60 A549 SMMC-7721 MCF-7	NA NA NA NA	

		SW480	NA	
	Formipinol / 3α [(3'S)-4'-methoxylcarbonyl-3'-hydroxy-3'-methylbutanoy loxy]-15α-hydroxy-lanosta-8,24-dien-21-ol (**1536**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Formipiniate / 3α-[(3'S)-4'-methoxylcarbony-3'-hydroxy 3'-methylbutanoyl]-21-(3''-methoxylcarbonylpropinonyl)-15α hydroxy-lanosta-8,24-dien (**1537**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Formipinic Acid C/ 3α-acetoxyl-16α-hydroxylanosta 8,24-dien-21-oic acid (**1538**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Formipinic Acid D / 3α-acetoxy-16-oxo-lanosta-8,24-dien-21-oic acid (**1539**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Formipinic Acid E /6α-hydroxy-3,16-dioxoxlanosta-8,24 dien-21-oic acid (**1540**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Formipinic Acid F / 6α-hydroxy-3,16-dioxolanosta 7(8),9(11),24-trien-21-oic acid (**1541**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Forpinic Acid A / 16α-acetoxy-3α [(3'S)-4'-methoxycarbonyl-3'-hydroxy-3'-methylbutanoy loxy]-24-methyllanosta-8,24(31)-dien-21-oicacid (**1542**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Forpinic Acid B / 15α-hydroxy-3α-[(3'S)-4'-methoxycar bonyl-3'-hydroxy-3'-methylbutanoyloxy]-24-methyllanosta 8,24(31)-dien-21-oicacid (**1543**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Forpinic Acid C /16α-hydroxy 3,7-dioxo-24-methyllanosta-8,24(31)-dien-21-oic acid (**1544**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Fomiroid A (**1545**)	HL-60 A549 SMMC-7721 MCF-7 SW480	**3.92±0.21** 22.19±0.76 **12.81±0.17** 18.73±0.53 16.35±1.37	
	15α-hydroxy-3-oxolanosta-8,24-dien-21-oic acid (**1546**)	HL-60 A549	NA NA	

		SMMC-7721 MCF-7 SW480	NA NA NA	
	Pinicolic acid E (**1547**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	15α-hydroxytrametenolic acid (**1462**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	3β-acetoxy-15α-hydroxylanosta-8,24-dien-21-oic acid (**1548**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Piptolinic acid D (**1476**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	16α-hydroxy-3-oxolanosta-7,9(11),24-trien-21-oic acid (**1549**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	3β-hydroxy-16-oxolanosta-7,9(11),24-trien-21-oic acid (**1550**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	3β-*O*-acetyl-16α-hydroxydehydrotrametenolic acid (**1551**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	3β,16α-dihydroxylanosta-7,9(11),24-trien-21-oic acid (**1552**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	3-*epi*-dehydropachymic acid (**1482**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Polyporenic acid C (**1480**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	

	16α-hydroxy-24-methylene-3-oxolanost-8-en-21-oic acid (**1553**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	6α-acetoxy-24-methylene-3-oxolanost-8-en-21-oic acid (**1554**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	13-*epi*-pachymic acid (**1555**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	Palustrisoic acid H (**1556**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
Garcinia wallichii	Wallichinane F (**1557**)	P-388 KB Col-2 MCF-7 Lu-1 ASK HEK-293	NA NA NA NA NA NA NA	314
	Wallichinane G (**1558**)	P-388 KB Col-2 MCF-7 Lu-1 ASK HEK-293	**4.28±0.05** 27.12±1.67 26.45±0.94 20.07±0.35 20.73±0.09 34.26±2.29 **17.62±0.38**	
	Wallichinane H (**1559**)	P-388 KB Col-2 MCF-7 Lu-1 ASK HEK-293	**3.44±0.11** 27.26±1.33 29.36±1.89 19.37±0.11 22.86±0.05 NA 17.84±0.37	
	Wallichinane I (**1560**)	P-388 KB Col-2 MCF-7 Lu-1 ASK HEK-293	ND ND ND ND ND ND ND	
	Wallichinane A (**1561**)	P-388 KB Col-2 MCF-7 Lu-1	NA NA NA NA NA	

		ASK HEK-293	NA NA	
	Wallichinane B (**1562**)	P-388 KB Col-2 MCF-7 Lu-1 ASK HEK-293	NA NA NA NA NA NA NA	
Diplodia cupressi	Lanost-8-en-3b,22S,23S-triol (**1563**)	A549 Hep G2 Hepa 1c1c7 HeLa	NA NA 35.0±2.3 NA	332
Fomitopsis betulina	Polyporenic acid E (**1564**)	HL-60 A549 MRC-5	72.28±3.85 115.68±14.56 109.18±3.65	315
	Polyporenic acid F (**1565**)	HL-60 A549 MRC-5	56.45±3.71 72.86±2.85 65.46±2.63	
	Polyporenic acid G (**1566**)	HL-60 A549 MRC-5	93.79±10.76 151.39±4.16 101.04±10.16	
	Polyporenic acid H (**1567**)	HL-60 A549 MRC-5	72.19±3.79 126.80±0.75 83.18±4.67	
	Polyporenic acid I (**1568**)	HL-60 A549 MRC-5	26.00±1.42 61.22±5.71 51.37±3.54	
	Polyporenic acid J (**1569**)	HL-60 A549 MRC-5	36.96±1.80 102.75±10.90 86.21±7.23	
	Polyporenic acid K (**1570**)	HL-60 A549 MRC-5	33.04±2.03 112.55±0.04 86.72±5.69	
	Polyporenic acid L (**1571**)	HL-60 A549 MRC-5	76.02±3.14 146.71±11.54 122.11±11.22	
	Polyporenic acid M (**1572**)	HL-60 A549 MRC-5	37.14±0.85 77.56±8.74 73.55±4.62	
	Palustrisoic acid F (**1524**)	HL-60 A549 MRC-5	31.53±2.24 61.83±2.13 41.91±2.36	
	Dehydropachymic acid (**1573**)	HL-60 A549 MRC-5	**10.90±0.68** 114.68±11.69 93.71±9.20	
	Pachymic acid (**1574**)	HL-60 A549 MRC-5	**11.01±0.52** 84.66±3.42 107.57±9.36	
	3α-(acetyloxy)-16α-hydroxy-24-methylene-lanost-8-en-21-oic acid (**1575**)	HL-60 A549 MRC-5	27.51±3.41 106.92±9.54 127.61±13.45	

	3-*epi*-dehydropachymic acid (**1482**)	HL-60 A549 MRC-5	41.54±2.18 142.59±4.97 106.19±4.19	
	dehydrotumulosic acid (**1576**)	HL-60 A549 MRC-5	**19.93±1.74** 84.92±5.54 115.43±10.92	
	3-*epi*-dehydrotumulosic acid (**1577**)	HL-60 A549 MRC-5	42.50±3.28 119.03±7.09 90.57±2.53	
	16*α*-hydroxyeburiconic acid (**1578**)	HL-60 A549 MRC-5	47.81±2.60 81.27±1.22 94.78±5.40	
	Polyporenic acid C (**1480**)	HL-60 A549 MRC-5	40.90±3.35 88.62±3.33 124.72±15.58	
	Polyporenic acid A (**1529**)	HL-60 A549 MRC-5	34.24±1.52 69.08±6.37 65.87±3.93	
	3*α*-[4-carboxy-3-hydroxy-3-methyl-1-oxobutoxy]-12*α*-hydroxy-24-methylene-lanost-8-en-26-oic acid (**1579**)	HL-60 A549 MRC-5	75.22±0.31 134.95±1.64 95.33±8.13	
	(25S,3'S)-(+)-12R-hydroxy-3R-(3'-hydroxy-4'-methoxycarbonyl-3'-methylbutyryloxy)-24-methyllanosta-8,24(31)-dien-26-oic acid (**1527**)-Compound **6**	HL-60 A549 MRC-5	**19.23±1.13** 65.99±3.60 41.70±0.25	
Poria cocos	3β-acetoxy-24-methyllanosta-8,16,24(31)-trien-21-oic acid (**1580**)	A549 SMMC-7721 MCF-7 SW480	19.87±0.51 26.23±1.22 22.49±1.08 25.89±0.62	316
	3β-acetoxylanosta-7,9(11),16,23-tetraen-21-oic acid (**1581**)	A549 SMMC-7721 MCF-7 SW480	21.96±1.14 27.74±1.12 21.15±1.43 20.50±0.45	
	Dehydrotrametenolic acid (**1582**)	A549 SMMC-7721 MCF-7 SW480	ND ND ND ND	
	Trametenolic acid (**1435**)	A549 SMMC-7721 MCF-7 SW480	ND ND ND ND	
	Dehydroeburicoic acid (**1583**)	A549 SMMC-7721 MCF-7 SW480	ND ND ND ND	
	Pachymic acid (**1574**)	A549 SMMC-7721 MCF-7 SW480	ND ND ND ND	
Ganoderma luteomarginatum	(17*Z*)-3β,7β,15β-trihydroxy-11,23-dioxolanost-8,17(20)-dien-26-oate	A549 HGC-27	>50 **6.82±0.77**	317

	(**1584**)	SMMC-7721 LO2	>50 > 50	
	(17*E*)-3β,7β,15β-trihydroxy-11,23-dioxolanost-8,17(20)-dien-26-oate (**1585**)	A549 HGC-27 SMMC-7721 LO2	>50 >50 >50 >50	
	(20*E*)-3β,7β,15β-trihydroxy-11,23-dioxolanost-8,20(22)-dien-26-oate (**1586**)	A549 HGC-27 SMMC-7721 LO2	>50 >50 >50 >50	
	(20*E*)-3β,15β-dihydroxy-7,11,23-trioxolanost-8,20(22)-dien-26-oate (**1587**)	A549 HGC-27 SMMC-7721 LO2	>50 >50 >50 >50	
	(20*E*)-3β,7β-dihydroxy-11,23-dioxolanost-8,20(22)-dien-26-oic acid (**1588**)	A549 HGC-27 SMMC-7721 LO2	>50 >50 >50 >50	
	(20*E*)-15β-hydroxy-3,7,11,23-tetraoxolanost-8,20(22)-dien-26-oic acid (**1589**)	A549 HGC-27 SMMC-7721 LO2	>50 >50 >50 >50	
	(20*E*)-7β,15β,28-trihydroxy-3,11,23-trioxolanost-8,20(22)-dien-26-oate (**1590**)	A549 HGC-27 SMMC-7721 LO2	>50 >50 >50 >50	
	(20*E*)-15β-hydroxy-3,7,11,23-tetraoxolanost-20(22)-en-26-oate (**1591**)	A549 HGC-27 SMMC-7721 LO2	**13.67±1.04** >50 >50 >50	
	7β,15β,28-trihydroxy-3,11,23-trioxolanost-8-en-26-oate (**1592**)	A549 HGC-27 SMMC-7721 LO2	>50 >50 >50 >50	
	3β,7β,15β-trihydroxy-11,23-dioxolanost-8-en-26-oate (**1593**)	A549 HGC-27 SMMC-7721 LO2	37.93±3.22 >50 46.21±1.37 40.00±3.89	
	15β,20-dihydroxy-3,7,11,23-tetraoxolanost-8-en-26-oate (**1594**)	A549 HGC-27 SMMC-7721 LO2	>50 >50 >50 >50	
	7β,15β,28-trihydroxy-3,11-dioxo-25,26,27-trinorlanost-8-en-24-oate (**1595**)	A549 HGC-27 SMMC-7721 LO2	>50 >50 >50 >50	
Laetiporus sulphureus	Laetiporin C (**1596**)	L929 A431 A549 PC-3 MCF-7	NA NA NA NA NA	333
	Laetiporin D (**1597**)	L929 A431	NA NA	

		A549	NA	
		PC-3	NA	
		MCF-7	NA	
	Fomefficinic acid A (**1466**)	L929	NA	
		A431	NA	
		A549	NA	
		PC-3	NA	
		MCF-7	NA	
	Eburicoic acid (**1465**)	L929	ND	
		A431	ND	
		A549	ND	
		PC-3	ND	
		MCF-7	ND	
	15α-hydroxytrametenolic acid (**1462**)	L929	ND	
		A431	ND	
		A549	ND	
		PC-3	ND	
		MCF-7	ND	
	Trametenolic acid (**1435**)	L929	ND	
		A431	ND	
		A549	ND	
		PC-3	ND	
		MCF-7	ND	
Ganoderma australe	Ganodaustralic acid A (**1598**)	HeLa	NA	334
		A549	NA	
		Bel	NA	
		SGC7901	NA	
		K562	NA	
	Ganodaustralic acid B (**1599**)	HeLa	NA	
		A549	NA	
		Bel	NA	
		SGC7901	NA	
		K562	NA	
	Ganodaustralic acid C (**1600**)	HeLa	NA	
		A549	NA	
		Bel	NA	
		SGC7901	NA	
		K562	NA	
	Ganodaustralic acid D (**1601**)	HeLa	NA	
		A549	NA	
		Bel	NA	
		SGC7901	NA	
		K562	NA	
	Ganodaustralic acid E (**1602**)	HeLa	NA	
		A549	NA	
		Bel	NA	
		SGC7901	NA	
		K562	NA	
	Ganodaustralic acid F (**1603**)	HeLa	NA	
		A549	NA	
		Bel	NA	
		SGC7901	NA	
		K562	NA	

	Ganodaustralic acid G (**1604**)	HeLa A549 Bel SGC7901 K562	NA NA NA 44.4±2.23 NA	
Euphorbia fischeriana	Euphorfistrine C/ Lanostane-3*S*,20*R*-dihydroxy-24-ene (**1605**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	**7.72±0.82** **8.25±0.31** **10.81±0.64** >100 >100 **9.7±0.41** 64.57±2.51	83
	Lanosta-7,24-dien- 3β-ol (**1606**)	MCF-7 HeLa HCC1806 PC3 A549 H460 LO2	>100 >100 >100 >100 >100 >100 43.67±2.64	1
Kadsura heteroclita (Roxb.) Craib.	Xuetonglactone A (**1607**)	HeLa BCG-823	NA NA	299
	Xuetonglactone B (**1608**)	HeLa BCG-823	48.22 24.38	
	Xuetonglactone C (**1609**)	HeLa BCG-823	NA NA	
	Xuetonglactone D (**1610**)	HeLa BCG-823	NA NA	
Polyalthia simiarum	Polysimiaric acid A/3β-hydroxy-16,20-lactolanost-7,24(28)-diene-21-oic acid (**1611**)	HL-60 A549 SMMC7721 MCF-7 SW480	NA NA NA NA NA	335
	Polysimiaric acid B/ s (3β,22R)- 20,28-cyclolanosta-7,23-diene-3,22-diol (**1612**)	HL-60 A549 SMMC7721 MCF-7 SW480	NA NA NA NA NA	
Ganoderma weberianum	Ganodeweberiol A (**1613**)	A549 BEL-7402 HeLa SGC-7901	NA NA **31.6±0.1** NA	178
	Ganodeweberiol B (**1614**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	Ganodeweberiol C (**1615**)	A549 BEL-7402 HeLa SGC-7901	NA NA **17.0±1.3** NA	
	Ganodeweberiol D (**1616**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	

	Ganodeweberiol E (**1617**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	Ganodeweberiol F (**1618**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	Ganodeweberiol G (**1619**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	Ganodeweberiol H (**1620**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	3-acetyllucidumol B (**1621**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	Ganoderiol B (**1622**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	lanosta-7,9(11)-dien-3β-acetyloxy-24,25,26-trihydroxy (**1623**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	(24*E*)-3β-acetoxylanosta-7,9(11),24-trien-26-oic acid (**1624**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	24-*epi*-alismanol D (**1625**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
	(24*E*)-3β,15*α*,26-trihydroxylanosta-,9(11),24-triene (**1626**)	A549 BEL-7402 HeLa SGC-7901	NA NA NA NA	
Leplaea mayombensis	15α-acetoxyl-3β-hydroxytrametenolic acid (**1627**)	HepG2 CAL-27 CaCo2 Skov-3	142.60±0.64 78.25±0.30 150.55±0.33 171.35±0.45	336
	Lanosta-7,24-dien-3-one (**1628**)	HepG2 CAL-27 CaCo2 Skov-3	63.01±0.56 174.65±4.43 39.42±1.47 63.30±0.56	
	Leplaeric acid C (**1629**)	HepG2 CAL-27 CaCo2 Skov-3	29.16±0.46 **12.30±0.08** 180.12±5.07 44.94±0.63	
Leplaea	Leplaeric acid C (**1629**)	MDA MB 231	NA	337

mayombensis				
Pholiota populnea	Pholiol A (**1630**)	Colo 205 Colo 320 MRC-5	NA NA NA	338
	Pholiol B (**1631**)	Colo 205 Colo 320 MRC-5	NA NA NA	
	Pholiol C (**1632**)	Colo 205 Colo 320 MRC-5	NA NA NA	
	Pholiol D (**1633**)	Colo 205 Colo 320 MRC-5	NA NA NA	
Schisandra viridis	6-hydroxylschiglausin A (**1634**)	A-549 BGC-823 HepG2 HL-60 MCF-7 W480	**8.1** **7.3** **7.9** **8.6** **9.7** **7.9**	339
Ganoderma lucidum	12β-acetoxy-3,7,11,15,23-pentaoxolanosta-8,20*E*(22)-dien-26-oic acid methyl ester (**1635**)	A549 HepG2	15.38±0.34 18.61±0.55	340
Fomitopsis carnea	3-*epi*-pachymic acid (**1555**)	L929 KB3.1 PC-3 MCF-7 SKOV-3 A431 A549	15.2 **7.0** 18.9 17.6 47.3 **5.7** 47.3	341
	(3α,25*S*)-3-*O*-malonyl-23-oxolanost-8,24(31)-dien-26-oic acid (**1636**)	L929 KB3.1 PC-3 MCF-7 SKOV-3 A431 A549	NA NA ND ND ND ND ND	
Buglossoporus quercinus	Polyporenic acid N (**1637**)	Colo 320	85.65	342
	Polyporenic acid O (**1638**)	Colo 320	106.20	
	Polyporenic acid P (**1639**)	Colo 320	29.78	
	Polyporenic acid Q (**1640**)	Colo 320	69.16	
	Polyporenic acid R (**1641**)	Colo 320	36.55	
	(25S)-(+)-12R-hydroxy-3R-malonyloxy-24-methyllanosta-8,24(31)-dien-26-oic acid (**1642**)	Colo 320	87.37	
	(25S,3'S)-(+)-12R-hydroxy-3R-(3'-hydroxy-3'-methyl glutaryloxy)-24-methyllanosta-8,24(31)-dien-26-oic acid (**1526**)-**Compound 5**	Colo 320	61.71	
	(25S)-(+)-12α-hydroxy-3α-methylcarboxyacetate-24-ethyllanosta-8,24(31)-diene-26-oic acid (**1643**)	Colo 320	36.18	

	Polyporenic acid H (**1567**)	Colo 320	39.46	
	Polyporenic acid A (**1529**)	Colo 320	48.97	
	3α-*O*-acetylpolyporenic acid A (**1530**)	Colo 320	29.74	
	Polyporenic acid C ((**1480**)	Colo 320	20.71	
Schisandra chinensis	Schisanchinoid A (**1644**)	MDA-MB231 MCF-7 HeLa	NA NA NA	343
	Schisanchinoid B (**1645**)	MDA-MB231 MCF-7 HeLa	21.14±1.59 12.79±0.30 NA	
	Schisanchinoid C (**1646**)	MDA-MB231 MCF-7 HeLa	NA **14.16±1.61** NA	
	Schisanchinoid D (**1647**)	MDA-MB231 MCF-7 HeLa	NA NA NA	

Table 52. The cytotoxicity of *nor*-lanostane-type triterpenoids (**1648-1667**) against cencer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Ganoderma hainanense	Ganoderense F (**1648**)	TrxR	NA	318
	Ganoderense G (**1649**)	TrxR	NA	
	Lucidone D (**1650**)	TrxR	NA	
	Lucidone A (**1651**)	TrxR	NA	
	Lucidone C (**1652**)	TrxR	NA	
	Lucidone B (**1653**)	TrxR	NA	
	Lucidadone H (**1654**)	TrxR	NA	
Ganoderma calidophilum	Ganodecalone B/ (17R,20R,23E)-27-nor-lanosta8,23-dien-3,11,25-trione (**1655**)	K562 BEL7402 SGC7901	NA NA NA	310
Omphalia lapidescens	(20*S*)-3*β*-Hydroxy-24,25,26,27-tetranorlanost-8-ene-21(23)-lactone (**1656**)	MDA-MB-231 HGC-27 GES-1	NA NA ND	329
Ganoderma luteomarginatum	(+)-(5α,23*E*)-27-nor-lanosta-8,23-dien-3,7,25-trione (**1657**)	HGC-27 HeLa A549 SMMC-7721 LO2	33.22±3.59 > 50 > 50 > 50 > 50	313
	(−)-(5α,23*E*)-27-nor-3β-hydroxylanosta-8,23-dien-7,25-dione (**1658**)	HGC-27 HeLa A549 SMMC-7721 LO2	**7.19±0.58** **11.60±1.09** **12.84±0.65** **8.64±0.09** > 50	
Diplodia cupressi	23,24,25,26,27-pentanorlanost-7,9(11)-dien-3β,22-diol (**1659**)	A549 Hep G2	NA NA	332

		Hepa 1c1c7 HeLa	NA NA	
	23,24,25,26,27-pentanorlanost-8-en-3β,22-diol (**1660**)	A549 Hep G2 Hepa 1c1c7 HeLa	NA NA NA NA	
Poria cocos	Poricolide A (**1661**)	A549 SMMC-7721 MCF-7 SW480	16.19±0.38 17.34±0.20 18.82±1.03 19.43±0.74	316
	Poricolide B (**1662**)	A549 SMMC-7721 MCF-7 SW480	21.49±0.77 24.83±1.16 22.94±0.92 23.50±0.57	
Fuscoporia torulosa	22*S*-hydroxy-8,24-dien-3-norlanosta-28-oic acid (**1663**)	Colo 205 Colo 320 MRC-5	>100 >100 >100	344
	Natalic acid (**1664**)	Colo 205 Colo 320 MRC-5	>100 >100 >100	
Phlogacanthus turgidus	Turgidol (**1665**)	K562	NA	345
Commiphora myrrha	3β-isovaleroyloxy-29-nor-lanost-8,24-diene-1α,2α-diol (**1666**)	HeLa	ND	346
	29-nor-1,2-*cis*-epoxy-lanost-8,24-diene-3β-triol (**1667**)	HeLa	ND	

Table 53. The cytotoxicity of *seco*-lanostane triterpenoids **(1668-1709)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Abies fargesii	(25R)-3,4-seco-lanosta-4(28),8-dien-3,26-dioic acid 3-methyl ester (**1668**)	ND		290
	Dimethyl (25R)-3,4-seco-lanosta-4(28),8-dien-3,26-dioate (**1669**)	ND		
	(25R)-3,4-seco-lanosta-4(28),8-dien-3,26-dioic acid 3-ethyl este (**1670**)	ND		
	(22*Z*)-3-methoxycarbonyl-3,4-seco-lanosta-4(28),8,22,25-tetraen-23,26-olide (**1671**)	ND		
Piptoporus betulinus	Piptolinic acid B (**1672**)	HL-60 THP-1	34.92 58.26	311
	Piptolinic acid C (**1673**)	HL-60 THP-1	32.82 69.85	
Poria cocos	16α-hydroxy-3,4-seco-lanosta-4(28),8,24-triene-3,21-dioic acid-3-ethyl ester (**1674**)	MGC-803 HepG2 VERO	> 100 > 100 > 100	324
	16α-hydroxy-3,4-seco-lanosta-4(28),7(9),11,24-tetraene-3,21-dioic acid- 3-ethyl ester (**1675**)	MGC-803 HepG2 VERO	ND ND ND	

	16α-hydroxy-3,4-seco-lanosta-4(28),7,9(11),24(31),25(27)-pentaene-3,21−dioic acid (**1676**)	MGC-803 HepG2 VERO	> 100 > 100 > 100	
Leplaea mayombensis	Leplaeric acid A (**1677**)	MDA MB 231	127	337
	Leplaeric acid B (**1678**)	MDA MB 231	55.0	
	Leplaeric acid 3,21-dimethyl ester (**1679**)	MDA MB 231	63.5	
Poria cocos	11β-ethoxydaedaleanic acid A (**1680**)	A549 HeLa MDA-MB-231 SK-OV-3 SW579	61.05±2.51 >100 >100 81.13±10.76 >100	330
Kadsura heteroclita	Xuetongsu A (**1681**)	HL-60 HepG-2 HCT-16 BGC-823	NA NA NA NA	303
	Xuetongsu B (**1682**)	HL-60 HepG-2 HCT-16 BGC-823	NA NA NA NA	
	Xuetongsu C (**1683**)	HL-60 HepG-2 HCT-16 BGC-823	NA NA NA NA	
	Xuetongsu D (**1684**)	HL-60 HepG-2 HCT-16 BGC-823	NA NA NA NA	
	Xuetongsu F (**1685**)	HL-60 HepG-2 HCT-16 BGC-823	NA NA NA NA	
	Heteroclitalactone J (**1686**)	HL-60 HepG-2 HCT-16 BGC-823	NA NA NA NA	
	Heteroclitalactone K (**1687**)	HL-60 HepG-2 HCT-16 BGC-823	NA NA NA NA	
Kadsura coccinea	*Seco*-coccinic acid A (**1688**)	 HCT-15 NUGC-3 NCI-H23 ACHN PC-3 MDA-MB-231	GI_{50} (μM) NA NA NA NA NA NA	300
	Seco-coccinic acid F (**1689**)	HCT-15 NUGC-3 NCI-H23 ACHN PC-3 MDA-MB-231	NA NA NA NA NA NA	

Fomitopsis betulina	Poricoic acid H (**1690**)	HL-60 A549 MRC-5	47.97±2.19 107.80±3.45 79.72±4.74	315
	Piptolinic acid B (**1672**)	HL-60 A549 MRC-5	31.68±2.42 78.97±8.15 74.41±7.23	
Leplaea mayombensis	Leplaeric acid E (**1691**)	HepG2 CAL-27 CaCo2 Skov-3	41.53±0.46 52.67±0.80 23.95±0.53 **19.32±0.30**	336
	Leplazarin (**1692**)	HepG2 CAL-27 CaCo2 Skov-3	NA NA NA NA	
	21-epileplazarin (**1693**)	HepG2 CAL-27 CaCo2 Skov-3	NA NA NA NA	
	15α-hydroxy-3,4-*seco*-lanosta-4(28),8,24-triene-3,21-dioic acid (**1694**)	HepG2 CAL-27 CaCo2 Skov-3	43.32±2.61 111.85±2.90 33.78±1.47 160.38±0.48	
	15α-hydroxy-3,4-*seco*-lanosta-4(28),8,24-triene-3,21-dioic acid 3-methyl ester (**1695**)	HepG2 CAL-27 CaCo2 Skov-3	61.35±0.46 72.44±0.80 **14.07±0.03** **17.26±0.30**	
	Mayomlactone A (**1696**)	HepG2 CAL-27 CaCo2 Skov-3	75.90±0.45 96.20±0.80 82.17±0.03 181.88±0.39	
	Mayomlactone B (**1697**)	HepG2 CAL-27 CaCo2 Skov-3	28.28±0.46 70.79±0.11 **15.98±0.53** **16.78±0.20**	
	Leplaeric acid A (**1677**)	HepG2 CAL-27 CaCo2 Skov-3	150.31±0.46 98.33±0.80 **16.88±0.53** **18.34±0.30**	
	Leplaeric acid B (**1678**)	HepG2 CAL-27 CaCo2 Skov-3	49.13±0.46 110.47±1.46 33.21±0.37 106.12±1.56	
Glomerella sp. F00244	Glometenoid A (**1698**)	HepG2 HeLa	NA NA	347
	Glometenoid B (**1699**)	HepG2 HeLa	NA NA	
Schisandra viridis	29-hydroxylschiglausin D (**1700**)	A-549 BGC-823 HepG2 HL-60 MCF-7 W480	42.1 NA NA 44.6 NA 42.9	339

	6-hydroxylschiglausin G (**1701**)	A-549 BGC-823 HepG2 HL-60 MCF-7 W480	NA 49.3 42.9 NA 43.1 NA	
Schisandra chinensis	Schisanchinoid E (**1702**)	MDA-MB231 MCF-7 HeLa	NA 9.90±1.81 NA	343
	Schisanchinoid F (**1703**)	MDA-MB231 MCF-7 HeLa	**4.65±0.49** **3.27±0.08** **1.68±0.27**	
	Schisanchinoid G (**1704**)	MDA-MB231 MCF-7 HeLa	19.71±0.87 13.51±1.49 9.28±0.26	
	Schisanchinoid H (**1705**)	MDA-MB231 MCF-7 HeLa	19.19±3.36 14.12±0.58 NA	
	Schisanchinoid I (**1706**)	MDA-MB231 MCF-7 HeLa	10.91±0.31 9.52±1.08 11.22±1.60	
	Schisanchinoid J (**1707**)	MDA-MB231 MCF-7 HeLa	NA NA NA	

Table 54. The cytotoxicity of *seco*-lanostane-type triterpenoid glycosides (**1708** and **1709**) agaisnt cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Fomitopsis betulina	Fomitoside O (**1708**)	HL-60 A549 MRC-5	32.37±2.25 107.50±9.66 68.01±5.83	315
Fomitopsis pinicola	Formipinioside / 3,4-seco-lanosta 4(28),8,24-trien-3-oate-21-oic acid 21-*O*-β-D-glucoside (**1709**)	HL-60 A549 SMMC-7721 MCF-7 SW480	**15.48±0.34** >40 32.59±0.78 26.05±1.18 >40	331

Table 55. The cytotoxicity of lanostane-type triterpenoid glycosides (**1710-1722**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Fomitopsis pinicola	Forpinioside A/ 3α-[(3'S)-4'-methoxycarbonyl-3'-hydroxy-3'-methylbutanoy loxy]-24-methyllanosta-8,24(31)-dien-21-oic acid 21-*O*-β-D xylopyranoside (**1710**)	HL-60 A549 SMMC-7721 MCF-7 SW480	**11.42±0.39** 19.95±0.41 **14.68±0.26** 21.06±0.76 17.90±1.17	331
	Ganosinoside A (**1711**)	HL-60 A549 SMMC-7721 MCF-7 SW480	**16.20±0.21** **17.52±0.27** **13.62±0.27** **15.72±0.14** **15.26±0.29**	
	Fomitoside C (**1712**)	HL-60 A549 SMMC-7721 MCF-7 SW480	**14.67±0.22** 26.58±1.10 28.51±0.92 27.07±2.43 27.05±0.73	
	Fomitoside I (**1713**)	HL-60 A549 SMMC-7721 MCF-7 SW480	NA NA NA NA NA	
	3α-acetoxy-5α-lanosta-8,24-dien-21-oic acid ester β-D-glucoside (**1714**)	HL-60 A549 SMMC-7721 MCF-7 SW480	**11.47±0.49** **16.74±0.09** **14.10±0.19** **12.40±0.65** **14.08±0.55**	
	Fomitoside H (**1715**)	HL-60 A549 SMMC-7721 MCF-7 SW480	**11.10±0.81** 23.87±0.71 **18.03±0.38** 21.30±0.48 21.77±1.06	
	Fomitoside K (**1716**)	HL-60 A549 SMMC-7721 MCF-7 SW480	**13.57±0.85** >40 36.01±0.75 25.79±1.69 >40	
Fomitopsis betulina	Fomitoside L (**1717**)	HL-60 A549 MRC-5	**15.80±0.83** ND ND	315
	Fomitoside M (**1718**)	HL-60 A549 MRC-5	37.01±2.15 78.07±0.91 59.03±6.12	
	Fomitoside N (**1719**)	HL-60 A549 MRC-5	23.72±2.57 ND ND	
	Fomitoside J (**1720**)	HL-60 A549 MRC-5	**19.56±2.80** 43.54±1.27 35.45±0.09	
Fomitopsis carnea	Forpinioside B (**1721**)	L929	NA	341

		KB3.1	NA	
		PC-3	ND	
		MCF-7	ND	
		SKOV-3	ND	
		A431	ND	
		A549	ND	
	Forpinioside C (**1722**)	L929	NA	
		KB3.1	NA	
		PC-3	ND	
		MCF-7	ND	
		SKOV-3	ND	
		A431	ND	
		A549	ND	

Table 56. The cytotoxicity of friedolanostane-types triterpenoids (**1723-1731**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Abies fargesii	(24*E*)-3α-hydroxy-23-oxo-8,14,24-mariesatrien-26-oic acid (**1723**)	B16 MCF7 HepG2	66.1 57.0 38.1	290
	(24*E*)-3β-hydroxy-23-oxo-8,14,24-mariesatrien-26-oic acid (**1724**)	B16 MCF7 HepG2	56.7 54.8 76.9	
	Methyl (24*E*)-3α-hydroxy-23-oxo-8,14,24-mariesatrien-26- oate (**1725**)	B16 MCF7 HepG2	>100 56.1 >100	
	3α-hydroxy-23-oxo-8,14,25(27)-mariesatrien-26-oic acid (**1726**)	B16 MCF7 HepG2	75.6 64.7 54.3	
	(22*Z*)-3α-hydroxy-8,14,22,24-mariesatetraen-26,23-olid (**1727**)	ND		
Garcinia celebica	(24*E*)-3-oxo-17,14-friedolanosta-8,14,24-trien-26-oic acid (**1728**)	MCF-7	NA	321
	(22*Z*,24*E*)-9a-hydroxy-3-oxo-17,13-friedolanosta-12,22,24-trien-26-oic acid (**1729**)	MCF-7	NA	
	(22*Z*,24*E*)-3-oxo-17,14-friedolanosta-8,14,22,24-tetraen-26-oic acid (**1730**)	MCF-7	NA	
	(22*Z*,24*E*)-9a-hydroxy-3-oxo-13a,30-cyclo-17,13-friedolanosta-22,24-dien-26-oic acid (**1731**)	MCF-7	NA	

Table 57. The cytotoxicity of *seco*-friedolanostane triterpenoids (**1732-1746**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Abies fargesii	(25R)-23-oxo-3,4-seco-8(14 / 13R)abeo-17,13-friedolanosta-4(28),8,14(30)-trien-3,26-dioic acid (**1732**)	ND		290

	(25R)-23-oxo-3,4-seco-8(14 / 13R)abeo-17,13-friedolanosta-4(28),8,14(30)-trien-3,26-dioic acid 3-methyl ester **(1733)**	ND		
	Dimethyl (25R)-23-oxo-3,4-seco-8(14 / 13R)abeo-17,13-friedolanosta-(28),8,14(30)-trien-3,26-dioate (**1734**)	ND		
	(25R)-23-oxo-3,4-seco-8(14 / 13R)abeo-17,13-friedolanosta-4(28),8,14(30)-trien-3,26-dioic acid 3-ethyl ester (**1735**)	B16 MCF7 HepG2	>100 >100 87.1	
	(24*Z*)-23-oxo-3,4-seco-8,14,24-mariesatrien-3,26-dioic acid 3-methyl ester (**1736**)	B16 MCF7 HepG2	>100 86.9 >100	
Abies holophylla	Holophyllane C (**1737**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	348
	Holophyllane D (**1738**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	
	Holophyllane E (**1739**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	
Abies koreana	Abikorane A/ (23*R*, 25*R*)-nor-3,4-*seco*-17-hydroxy-17,14-*friedo*-9*β*H-lanosta-14 (15)-ene-26,23-olide-3-oic acid (**1740**)	A549 SK-OV-3 SK-MEL-2 HCT15	**8.04** >10 >10 >10	349
	Abikorane B/ (15*S*,23*R*,25*R*)-3,4-*seco*-17,14-*friedo*-9*β*H-15-methoxy-lanosta ne-4(28),6,8(14)-triene-26-olide-3-oate (**1741**)	A549 SK-OV-3 SK-MEL-2 HCT15	7.46 >10 9.62 4.36	
	Abikorane C / (23*R*,25*R*)-3,4-*seco*-17,13-*friedo*-lanosta-4(28),6(7),8(9),14-tetraene-26,23-olide-3-oic acid (**1742**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	
	Abikorane D/ (25*R*)3,4-*seco*-8 (14→13*R*)*abeo*-17, 13-*friedo*-23-oxo-9*β*H-lanosta-4(28),7,14(30),25-triene-3,26-dioic acid (**1743**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	
	Abikorane E/(25*R*)-3,4-*seco*-8 (14→13*R*)*abeo*-17,13-*friedo*-9*β*H-lanosta-4(28),7,14(30)-triene-3,26-dioic acid (**1744**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	
	Abikorane F/ (23*R*,25*R*)-3,4-*seco*-8 (14→13*R*)*abeo*-17,13-*friedo*-9*β*H-lan osta-4(28),7,14(15)-triene-26,23-olide-3-oic acid (**1745**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	
	Abikorane G/ (23*R*,25*R*)-3,4-*seco*-17,13-*friedo*-9*β*H-lanosta-4(28),7,16-triene-26,23-olide-3-oic acid (**1746**)	A549 SK-OV-3 SK-MEL-2 HCT15	NA NA NA NA	

Table 58. The cytotoxicity of limonoid-type triterpenoids (**1747-1779**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Walsura trichostemon	Compound **1747**	A549	Growth inhibition (%) 69.4±4.1	226
Chisocheton pentandrus	Pentandricine (**1748**)	MCF-7	369.84	350
	Ceramicines B (**1749**)	MCF-7	150.86	
	6-de(acetyloxy)-23-oxochisocheton (**1750**)	MCF-7	208.93	
	6-de(acetyloxy)-23-oxo-7-*O*-deacetylchisocheton (**1751**)	MCF-7	120.09	
Chisocheton paniculatus	6α,7α-diacetoxy-23-hydroxy-3-oxo-24,25,26,27-tetranorapotirucall-1,14,20(22)-trien-21,23-olide (**1752**)	A549 HeLa GSU	**7.3** **8.8** 31.7	76
Toona ciliata	Toononoid H (**1753**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	>10 >10 >10 >10 >10	355
Walsura cochinchinensis	Walsucochinone A (**1754**)	MCF-7	> 100	351
	Walsucochinone B (**1755**)	MCF-7	> 100	
	Walsucochinone C (**1756**)	MCF-7	**16.4±0.2**	
Chisocheton pentandrus	Pentandricine B (**1757**)	MCF-7	212.02±0.015	352
	Pentandricine C (**1758**)	MCF-7	122.02±0.006	
	Pentandricine D (**1759**)	MCF-7	313.92±0.015	
	6α-acetoxy-14β,15β-epoxyazadirone (**1760**)	MCF-7	93.13±0.011	
	Paniculatin (**1761**)	MCF-7	64.88±0.015	
	14β,15β-epoxynimonol (**1762**)	MCF-7	32.22±0.025	
	Nimonol (**1763**)	MCF-7	22.03±0.026	
Toona ciliata	Toonayunnanin A (**1764**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	255
	7-acetyneotrichilenone (**1765**)	HL-60 SMMC-7721 A-549 MCF-7 SW480	NA NA NA NA NA	
Walsura yunnanensis	Walsurauia A (**1766**)	CNE-2 HCT116 p21 KO HepG2 A549	**1.53±0.01** **1.42±0.11** **1.51±0.18** **0.81±0.18**	353

	Walsurauia B (**1767**)	CNE-2 HCT116 p21 KO HepG2 A549	**1.85±0.02** **1.61±0.02** **3.69±0.44** **2.33±0.30**	
	Walsurauia C (**1768**)	CNE-2 HCT116 p21 KO HepG2 A549	**5.06±0.26** **5.73±0.12** **1.57±0.20** **4.83±0.16**	
	Cedrelone (**1769**)	CNE-2 HCT116 p21 KO HepG2 A549	**3.37±0.01** **2.04±0.27** **2.83±0.33** **3.52±0.13**	
	12*α*-acetoxycedrelone (**1770**)	CNE-2 HCT116 p21 KO HepG2 A549	**1.77±0.01** **1.39±0.05** **2.57±0.13** **0.90±0.14**	
	Dysoxylumosin J (**1771**)	CNE-2 HCT116 p21 KO HepG2 A549	69.03±3.42 30.18±0.65 10.58±0.69 21.39±3.42	
	Walsuranolide B (**1772**)	CNE-2 HCT116 p21 KO HepG2 A549	**4.92±0.14** **3.61±0.37** **1.55±0.06** **3.68±0.15**	
Chisocheton pentandrus (Blanco) Merr	Pentandricine F (**1773**)	MCF-7	54.18	354
	Pentandricine G (**1774**)	MCF-7	48.11	
	Pentandricine H (**1775**)	MCF-7	187.18	
	23-oxoazadirone (**1776**)	MCF-7	120.12	
	6α-*O*-acetyl-7-deacetylnimoconol (**1777**)	MCF-7	149.91	
	Ceramicine I (**1778**)	MCF-7	245.10	
	Ceramicine B (**1779**)	MCF-7	149.02	

Table 59. The cytotoxicity for *nor*-limonoid triterpenoids **(1780** and **1781)** against cancer cell lines

Plant source	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Picramnia glazioviana	Picraviane A (**1780**)	MDA-MB-231	72.62±0.18	356
	Picraviane B (**1781**)	MDA-MB-231	> 100	

Table 60. The cytotoxicity of *seco*-limonoid triterpenoids (**1782-1834**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Entandrophragma congoënse	Moluccensins N (**1782**)	L6 myoblast	NA	260
	Moluccensins O (**1783**)	L6 myoblast	NA	

Trichilia emetica Vahl	Trichirokin (**1784**)	KB-3-1	NA	358
	Rohituka-9 (**1785**)	KB-3-1	NA	
	Rohituka-3 (**1786**)	KB-3-1	NA	
Toona ciliata	Toononoid A (**1787**)	HL-60	>10	355
		SMMC-7721	>10	
		A-549	>10	
		MCF-7	>10	
		SW-480	>10	
	Toononoid B (**1788**)	HL-60	>10	
		SMMC-7721	>10	
		A-549	>10	
		MCF-7	>10	
		SW-480	>10	
	Toononoid C (**1789**)	HL-60	>10	
		SMMC-7721	>10	
		A-549	>10	
		MCF-7	>10	
		SW-480	>10	
	Toononoid D (**1790**)	HL-60	>10	
		SMMC-7721	>10	
		A-549	>10	
		MCF-7	>10	
		SW-480	>10	
	Toononoid E (**1791**)	HL-60	>10	
		SMMC-7721	>10	
		A-549	>10	
		MCF-7	>10	
		SW-480	>10	
	Toononoid F (**1792**)	HL-60	>10	
		SMMC-7721	>10	
		A-549	>10	
		MCF-7	>10	
		SW-480	>10	
	Toononoid G (**1793**)	HL-60	>10	
		SMMC-7721	>10	
		A-549	>10	
		MCF-7	>10	
		SW-480	>10	
	Toonanoronoid A (**1794**)	HL-60	>10	
		SMMC-7721	>10	
		A-549	>10	
		MCF-7	>10	
		SW-480	>10	
	Toonanoronoid B (**1795**)	HL-60	>10	
		SMMC-7721	>10	
		A-549	>10	
		MCF-7	>10	
		SW-480	>10	
	Toonanoronoid C (**1796**)	HL-60	>10	
		SMMC-7721	**2.4±0.4**	
		A-549	**3.7±0.2**	
		MCF-7	>10	

		SW-480	>10	
	Toonanoronoid D (**1797**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	>10 **2.1±0.1** **2.3±0.6** >10 >10	
	Toonanoronoid E (**1798**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	>10 >10 >10 >10 >10	
	Toonanoronoid F (**1799**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	>10 >10 >10 >10 >10	
	Toonanoronoid G (**1800**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	>10 >10 >10 >10 >10	
	Toonanoronoid H (**1801**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	>10 >10 >10 >10 >10	
	Ouabanginone (**1802**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	>10 >10 >10 >10 >10	
	5α,6β,8α,12α-tetrahydroxy-28-norisotoonafolin (**1803**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	**0.9±0.1** **3.0±0.1** **2.5±0.5** >10 >10	
	Toonacilidin B (**1804**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	**1.6±0.1** **3.7±0.4** **4.0±0.7** >10 >10	
	Toonaciliatin G (**1805**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	**0.6±0.1** **0.9±0.1** **0.9±0.1** >10 >10	
	5α,6β,8α-trihydroxy-28-norisotoonafolin (**1806**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	**0.8±0.1** **4.0±0.2** **2.3±0.6** >10 >10	
	Ciliatonoid C (**1807**)	HL-60 SMMC-7721	**2.3±0.1** **2.1±0.3**	

		A-549 MCF-7 SW-480	**1.5±0.1** >10 >10	
	Toonaciliatin J (**1808**)	HL-60 SMMC-7721 A-549 MCF-7 SW-480	>10 >10 >10 >10 >10	
Entandrophragma candollei	Prieurianin (**1809**)	KB3-1	**1.47**	359
Aglaia edulis	Agleduline A (**1810**)	MCF-7 MCF-7/Dox	≥50 ≥50	357
	Agleduline B (**1811**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	Agleduline C (**1812**)	MCF-7 MCF-7/Dox	**10.05±2.68** ≥50	
	Agleduline D (**1813**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	Agleduline E (**1814**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	Agleduline F (**1815**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	Agleduline G (**1816**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	Agleduline H (**1817**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	Agleduline I (**1818**)	MCF-7 MCF-7/Dox	≥50 **5.05±0.60**	
	Agleduline J (**1819**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	Agledulines K (**1820**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	Nymania(**1821**)	MCF-7 MCF-7/Dox	≥50 **6.05±0.50**	
	6α,11β-diacetoxygedunin (**1822**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	6α-acetoxygedunin (**1823**)	MCF-7 MCF-7/Dox	26.48±3.53 **11.83±1.16**	
	11α-acetoxygedunin (**1824**)	MCF-7 MCF-7/Dox	≥50 **1.49±0.48**	
	Gedunin (**1825**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	7-acetoxydihydronoinilin (**1826**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	Toonin A (**1827**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	11β-acetoxyobacunyl acetate (**1828**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	11β-hydroxy-7α-obacunyl acetate (**1829**)	MCF-7 MCF-7/Dox	≥50 ≥50	
	11β-acetoxyobacunol (**1830**)	MCF-7 MCF-7/Dox	≥50 ≥50	

	7α-obacunyl acetate (**1831**)	MCF-7 MCF-7/Dox	**9.65±0.92** ≥50	
	6α-acetoxyobacunol acetate (**1832**)	MCF-7 MCF-7/Dox	≥50 ≥50	
Citrus trifoliata	Limonin (**1833**)	MRC-5 COLO 205 COLO 320	NA NA NA	360
	Deacetyl nomilin (**1834**)	MRC-5 COLO 205 COLO 320	NA NA NA	

Table 61. The cytotoxicity of preurianin-type limonoids **(1835-1841)** against cancer cell lines

Plant source	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Dysoxylum parasiticum	Paraxyline A (**1835**)	MCF-7 HeLa	28.2±0.3 38.2±0.9	361
	Paraxyline B (**1836**)	MCF-7 HeLa	67.6±0.8 >100	
	Paraxyline C (**1837**)	MCF-7 HeLa	35.1±0.4 43.5±1.0	
	Paraxyline D (**1838**)	MCF-7 HeLa	23.1±0.8 27.1±0.7	
	Paraxyline E (**1839**)	MCF-7 HeLa	63.1±1.0 >100	
	Paraxyline F (**1840**)	MCF-7 HeLa	57.9±0.2 51.4±0.2	
	Paraxyline G (**1841**)	MCF-7 HeLa	34.1±0.5 30.2±0.3	

Table 62. The cytotoxicity of phragmalin-class limonoids (**1842-1853**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Swietenia macrophylla	Swieteliacate C (**1842**)	HL-60 A-549 SMMC-7721 MCF-7 SW-480	NA NA NA NA NA	263
	Swieteliacate D (**1843**)	HL-60 A-549 SMMC-7721 MCF-7 SW-480	NA NA NA NA NA	
	Swieteliacate E (**1844**)	HL-60 A-549 SMMC-7721 MCF-7	NA NA NA	

		SW-480	NA NA	
	Swietenolide (**1845**)	ND		
	Mahagonin (**1846**)	ND		
	Swietenine (**1847**)	ND		
	Proceranolide (**1848**)	ND		
Entandrophragma candollei	Encadollen C (**1849**)	KB3-1	NA	359
	Encadollen D (**1850**)	KB3-1	NA	
	Encadollen E (**1851**)	KB3-1	NA	
Cedrela odorata L.	15-*O*-acetyl-12-oxo-fissinolide (**1852**)	HT-29 MDA-MB-231 SW 1353 hFOB	NA NA NA NA	362
	15-*O*-acetyl-fissinolide (**1853**)	HT-29 MDA-MB-231 SW 1353 hFOB	NA NA NA NA	

Table 63. The cytotoxicity of limonoid triterpenoid glycosides **(1854-1855)** against cancer cell lines

Plant source	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Swietenia macrophylla	Swieteliacate A (**1854**)	HL-60 A-549 SMMC-7721 MCF-7 SW-480	NA NA NA NA NA	263
	Swieteliacate B (**1855**)	HL-60 A-549 SMMC-7721 MCF-7 SW-480	30.59 NA NA NA 32.86	

Table 64. The cytotoxicity of schinortriterpenoids (**1856-1863**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Schisandra propinqua var. propinqua	Propinqtrilactone A (**1856**)	ND		365
	Propinqtrilactone B (**1857**)	ND		
	Propindilactone V (**1858**)	ND		
	Propindilactone W (**1859**)	HL-60 SMMC-7721 A-549	> 40 > 40 > 40	

		MCF-7 SW-480	> 40 > 40	
	Propindilactone X (**1860**)	ND		
Schisandra chinensis	Schindilactone L (**1861**)	HeLa	> 100	366
	Schindilactone M (**1862**)	HeLa	> 100	
	Wuweizidilactone S (**1863**)	HeLa	> 100	
	Schindilactone G (**1864**)	HeLa	> 100	
	Wuweizidilactone A (**1865**)	HeLa	> 100	
	Wuweizidilactone L (**1866**)	HeLa	> 100	
	Wuweizidilactone C (**1867**)	HeLa	> 100	
	Schisanartanin (**1868**)	HeLa	> 100	
Kadsura longipedunculata	Kadlongilactone A (**1869**)	APAP-induced HepG2	Cell survival rates (%) 29.74±2.963	363
	Kadlongilactone B (**1870**)	APAP-induced HepG2	NA	
	Micrandilactone I (**1871**)	APAP-induced HepG2	53.04±4.507	
Kadsura heteroclita	Xuetongdilactone A (**1872**)	HL-60 HepG-2 HCT-16 BGC-823	> 100 > 100 > 100 > 100	303
	Xuetongdilactone B (**1873**)	HL-60 HepG-2 HCT-16 BGC-823	> 100 > 100 > 100 > 100	
	Xuetongdilactone C (**1874**)	HL-60 HepG-2 HCT-16 BGC-823	> 100 > 100 > 100 > 100	
	Xuetongdilactone D (**1875**)	HL-60 HepG-2 HCT-16 BGC-823	> 100 > 100 > 100 > 100	
	Xuetongdilactone E (**1876**)	HL-60 HepG-2 HCT-16 BGC-823	> 100 > 100 > 100 > 100	
	Xuetongdilactone F (**1877**)	HL-60 HepG-2 HCT-16 BGC-823	> 100 > 100 > 100 > 100	
	Wuweizidilactone B (**1878**)	HL-60 HepG-2 HCT-16 BGC-823	> 100 > 100 > 100 > 100	
	Micrandilactone B (**1879**)	HL-60 HepG-2 HCT-16 BGC-823	> 100 > 100 > 100 > 100	

Schisandra chinensis	Schinensin A (**1880**)	MCF-7 A549 HeLa RPMI8226	>100 >100 >100 >100	296
	Schinensin B (**1881**)	ND	ND	
	Wuweizidilactone H (**1882**)	MCF-7 A549 HeLa RPMI8226	>100 >100 >100 >100	
	Kadsuphilactone A (**1883**)	ND	ND	
Kadsura coccinea	Kadcoccilactone V (**1884**)	 HCT-15 NUGC-3 NCI-H23 ACHN PC-3 MDA-MB-231	GI_{50} (μM) >30 >30 >30 >30 >30 >30	300
	Micrandilactone H (**1885**)	HCT-15 NUGC-3 NCI-H23 ACHN PC-3 MDA-MB-231	>30 >30 >30 >30 >30 >30	
	Kadnanolactone H (**1886**)	HCT-15 NUGC-3 NCI-H23 ACHN PC-3 MDA-MB-231	>30 >30 >30 >30 >30 >30	
	Kadnanolactone I (**1887**)	HCT-15 NUGC-3 NCI-H23 ACHN PC-3 MDA-MB-231	>30 >30 >30 >30 >30 >30	
	Propindilactone I (**1888**)	HCT-15 NUGC-3 NCI-H23 ACHN PC-3 MDA-MB-231	>30 >30 >30 >30 >30 >30	
Schisandra chinensis	Schinensilactone C (**1889**)	LN229	>50	364
	Schilancitrilactone A (**1890**)	LN229	43.26±1.77	
	Wuweizidilactone H (**1882**)	LN229	**0.36±0.11**	
	Wuweizidilactone S (**1863**)	LN229	48.30±1.16	

Table 65. The cytotoxicity of spirotriterpenoids **(1891-1897)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Abies faxoniana Rehd	Spiroabieslanostanes A and A'/17β,23-epoxy-3-oxo-9β-lanosta-7,24-diene-26,23R-olide and 17β,23-epoxy-3-oxo-9β-lanosta-7,24-diene-26,23S-olide (**1891** and **1891'**)	Huh7 HepG2 SMMC7721 HCT-116 MCF-7 A549	10.0 19.0 12.3 >50 48.6 40.5	367
	Spiroabieslanostanes B and B' /17β,23-epoxy-3α-hydroxy-9β-lanosta-24-ene-26,23R-olide and 17β,23-epoxy-3α-hydroxy-9β-lanosta-24-ene-26,23S-olide (**1892** and **1892'**)	Huh7 HepG2 SMMC7721 HCT-116 MCF-7 A549	39.7 >50 44.0 >50 >50 >50	
Euphorbia pedroi	Spiropedroxodiol (**1893**).	L5178Y-MDR Colo320	NA NA	368
Euphorbia resinifera	Euphorol K / Tirucall-spiro[5,6]-24-methylene-3β,7β-diol-8-one (**1894**)	MCF-7 U937 C6	66.96±1.31 >100 >100	266
	Kansuinone (**1895**)	MCF-7 U937 C6	46.99±1.05 >100 90.21±1.43	
Boswellia sacra	Spirosacraoic acid A / (5R,7R,9S,10S,13S,14S,17S,20S)-3,8-dioxo-7-hydroxy-7(8 → 9)abeotirucallane-24-en-21-oic acid (**1896**)	HepG2 HCT-116	NA NA	251
	Spirosacraoic acid B / (5R,7R,9R,10S,13S,14S,17S,20S)-3,8-dioxo-7-hydroxy-7(8 → 9)abeotirucallane-24-en-21-oic acid (**1897**)	HepG2 HCT-116	NA NA	

Table 66. The cytotoxicity of dichapetalin-type triterpenoids **(1898-1926)** against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Phyllanthus hainanensis	Phainanolide A (**1898**)	HL-60 A-549	**0.079±0.037** 8.957±0.519	371
	Phainanoid G (**1899**)	HL-60 A-549	10.036±0.307 20.900±10.282	
	Phainanoid H (**1900**)	HL-60 A-549	**0.025±0.007** 11.266±3.049	
	Phainanoid I (**1901**)	HL-60 A-549	**2.340±1.383** 32.802±3.931	
Dichapetalum gelonioides	Compound **1902**	NAMALWA A549 Hep G2	**0.18±0.051** **3.0±0.61** **3.7±0.69**	372

	Compound **1903**	NAMALWA A549 Hep G2	**0.078±0.025** **2.4±0.30** **7.0±3.2**	
	Compound **1904**	NAMALWA A549 Hep G2	**0.15±0.089** **2.8±0.26** **2.6±0.41**	
	Compound **1905**	NAMALWA A549 Hep G2	**0.0678±0.015** **2.08±0.17** **2.18±0.50**	
	Compound **1906+1907**	NAMALWA A549 Hep G2	**4.6±0.25** > 10 > 10	
	Compound **1908+1909**	NAMALWA A549 Hep G2	**5.6±1.8** **4.0±0.35** **6.6±2.5**	
	Compound **1910+1911**	NAMALWA A549 Hep G2	**3.7±0.45** **5.9±1.9** **6.6±3.2**	
	Compound **1912+1913**	NAMALWA A549 Hep G2	**7.8±3.5** > 10 > 10	
	Compound **1914**	NAMALWA A549 Hep G2	> 10 > 10 > 10	
	Compound **1915**	NAMALWA A549 Hep G2	**5.0±0.098** **6.9±1.2** **6.0±1.5**	
	Compound **1916**	NAMALWA A549 Hep G2	**3.9±0.72** **5.1±2.5** **4.2±3.1**	
	Compound **1917**	NAMALWA A549 Hep G2	> 10 > 10 8.8±1.0	
	Compound **1918**	NAMALWA A549 Hep G2	9.8±0.16 > 10 > 10	
	Compound **1919**	NAMALWA A549 Hep G2	8.9±0.37 > 10 > 10	
	Compound **1920**	NAMALWA A549 Hep G2	> 10 > 10 > 10	
	Compound **1921**	NAMALWA A549 Hep G2	> 10 > 10 > 10	
Dichapetalum gelonioides	Dichagelinoid A (**1922**)	A549 HL-60	**1.62** **0.62**	373
	Dichagelinoid B (**1923**)	A549 HL-60	**2.19** **0.92**	
	Dichagelinoid C (**1924**)	A549 HL-60	**1.98** **6.87**	
	Dichagelinoid D (**1925**)	A549 HL-60	>10 >10	

	Dichagelinoid E (**1926**)	A549	>10	
		HL-60	>10	

Table 67. The cytotoxicity of iridal-type triterpenoids (**1927-1940**) against cancer cell lines

Plant sources	Names and numbers of compounds	Types of cancer cell lines	IC_{50} (μM)	References
Belamcanda chinensis	Belamcanoxide B (**1927**)	HCT-116	5.58	374
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	3.35	
	16-*O*-acetylbelamcanoxide B (**1928**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	Belamcanolide B (**1929**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	Belamcanolide C (**1930**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	8-Hydroxylisoiridogermanal (**1931**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	Belamcandal A (**1932**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	Belamcandane A (**1933**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	3-O-acetyliridobelamal A (**1934**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	Belamcanolide A (**1935**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	

		MCF-7	>10	
	Iridobelamal A (**1936**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	Isoiridogermanal (**1937**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	16-*O*-acetyliridobelamal A (**1938**)	HCT-116	>10	
		HepG2	>10	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	
	16-*O*-acetylisoiridogermanal (**1939**)	HCT-116	>10	
		HepG2	7.66	
		BGC-823	>10	
		A549	>10	
		MCF-7	6.43	
	3-*O*-acetyliridobelamal A (**1940**)	HCT-116	8.71	
		HepG2	7.22	
		BGC-823	>10	
		A549	>10	
		MCF-7	>10	

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