Review Article

Phytochemicals and Pharmacological Properties of Urginea Species

Virpal Singh[1], Lokesh Kumar Soni[1], Sonal Dobhal[1], Satyendra Kumar Jain[1], Pradeep Parasher[2] and M.P. Dobhal[1,*]

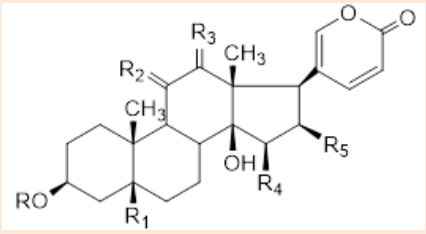
[1]Natural Products Laboratory, Department of Chemistry, University of Rajasthan, India
[2]Department of Chemistry, Govt. P.G. College, Jhalawar, Rajasthan

Abstract

Urginea is polytypic genus of family hyacinthaceae *Urgineaindica* is one of the important species of family hyacinthaceae and commonly known as sea onion, wild onion, Indian squill and Jangali piyaz. It is found in India, Africa and Meditteranian Regions. It is a vital Medicative plant. Bulb and leaf of the plant are being employed in medication. It is also being used as cough medicine, gastrointestinal stimulant and in the cure of renal failure, cronic rhinitis, cronic pulmonary and respiratory disorders. Various biological activities like antifungal, cardiac tonic, antioxidant, antiascites, antiworm infestation, antijaundice, antidiaorrhea, antidropsy, antiasthamatic, antiepileptic, antiinflamatory, antiamenorrhoea, dermatological and diuretic properties, abortifacient effects and affects on menstrual cycle have been reported from different plant extracts. Various phytoconstituents i.e. bufadienolides, scillarenin, quecertin, flavonoid, sitosterol, β-sitosterol, stigmasterol, campesterol, para-aldehyde, pentatricontanol, tartronic, lauric, octacosanoic acid, vitamin C, E, and K, raphides etc, have been reported in different of parts of *Urgineaindica*. The intent of this review is to grant an in-depth survey of the literature on its phytochemistry and medicinal utility.

Keywords: *Crataeva nurvala*, Lupeol, 3a, 5a, 5b, 8, 8, 11a-Hexamethyl-1-(2-methyl-oxiranyl)-icosa hydrocyclopenta[a] chrysen-9-ol, Lupeol acetate

***Correspondence**
Author: Mahabeer Prasad Dobhal
Email: mpdobhal@yahoo.com, veerpalsingh123@gmail.com



Introduction

Urginea is a polytypic genus belonging to the family hyacinthecae. Urginea belongs to division Liliophyta, class Liliopsida, orderLiliales, tribe Scilleae. Hundreds of species of Urginea are found in India, Africa and Mediterranean region [1]. *Urgineaindica*is a perennial herb and is found in desert, shrub, grassland, dunes and forests. It is a perennial geophyte with dark green leaves with whitish flowers which are bisexual, hypogynous, companulate, bracteate and dropping. The bracts are solitary with long or short pedical. Fibrous roots are six to ten inches in length, protruding from the base of a large, tunicated, nearly globular bulb. The outer scales of bulb are thin and papery with red or orange-brown color. *U. indica* is highly polymorphic with two distinct categories. The first category is very unique with underground bulbs producing inflorescence without vegetative leaves, immediately after the first shower followed by severe summer. The second category produces vegetative leaves along with the inflorescence axis soon after the first monsoon showers.

U. indica is reputed for a number of therapeutic benefits. The bulb of the plant has long been used as a source of medicinal product with pharmaceutical and biocidal applications. Bufadienolides of the squill are used as cardio-tonic agents. According to literature survey the extracts of *Urgineaindica*bulbs have been reported for pharmacological and biological activities which are antifungal [2-8], antioxidant [9-10], gastrointestinal stimulant [11], anti-inflammatory [12], anti-carcinomic [13], cardio-tonic [14], antimicrobial [15], anti-insecticidal [16], anti-arthritic [17] and anti-diabetic [18]. The plant extracts is also reported for dermatological, diuretic properties, abortifacient effects and affects on menstrual cycle, as cough expectorant, cure for renal failure, cronic rhinitis, cronic pulmonary disorder and

respiratory disorder, anti-ascites, anti-worm infestation, anti jaundice, anti-diaorrhea, anti- dropsy, anti-asthmatic, anti-epileptic, anti-amenorrhoea, anti-dysmenorrhoea and rodenticide activities [12].

Phytochemical constituents

A lot of work on genus Urginea has been carried out on phytochemical investigation and evaluation of their biological activity. Various phytochemicals such as steroids [19-40, 43-58], alkaloids [41], terpenes [42], flavonoids [43-57], phenolic [46-59] have been isolated and characterized from the bulbs of various Urginea species. Their structures, names and the corresponding species are compiled in **Table 1**.

Table 1 Chemical constituents from bulb of genus *Urginea*

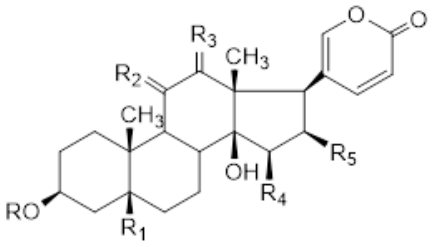
S. No. of isolated compounds and its structure	Name of isolated compounds	Sourceof compound	Reference
	Steroids		
1.	16β-Acetoxygamabufotalin-O-α-L-rhamnoside.	*U. aphylla*	[19]
2.	Gamabufotalin-3-O-β-D-glucosyl-(1-4)-α–L-rhamnoside.	*U. aphylla*	[19]
3.	Gamabufotalin-3-O-α-L-rhamnoside.	*U. aphylla*	[19]
4.	12β-Hydroxyscilliroside.	*U. aphylla*	[19]
5.	Proscillaridin A.	*U. aphylla*	[19]
6.	Scillarenin-3-O-β-D-glucoside.	*U. aphylla*	[19]
7.	Scillicyanoside.	*U. aphylla*	[19]
8.	Scilliphaeosidin-3-O-β-D-glucoside.	*U. aphylla*	[19]
9.	Scilliphaeoside.	*U. aphylla*	[19]
10.	Scilliglaucoside.	*U. aphylla*	[19]
11.	Hellebrigenin.	*U. altissima*	[20-22]
12.	Hellebrigenin-3-O-β-D-glucoside.	*U. altissima*	[20-22]
13.	Scilliglaucosidin.	*U. altissima*	[20-22]
14.	Scilliglaucosidin-3-one.	*U. altissima*	[20-22]
15.	Scilliglaucosidin-3-O-β-D-glucoside (altosid).	*U. altissima*	[20-22]
16.	Scilliglaucosidin-3-O-α-L-glucoside.	*U. altissima*	[20-22]
17.	6β-Acetosy-3β,8β,12β,14β-tetrahydroxybufa-4,20,22-trienolide (12β-hydroxyscillirosidin).	*U. altissima*	[20-22]
18.	14β-Hydroxyl-bufa-4,20,22-trienolide-3-β-O-{α-L-rhamnopyranosyl-[(1→4)-β-D-glucopyranosyl]-(1-3)-α-L-rhamno-pyranoside} (urginin).	*U. altissima*	[20-22]
19.	Arenobufagin-3-O-α-L-rhamnopyranoside.	*U. altissima*	[20-22]
20.	Gamabufotalin-3-O-α-L-rhamno-pyranoside.	*U. altissima*	[20-22]
21.	Scillarenin.	*U. burkei*	[23]
22.	Scillarenin A (transvaalin).	*U. burkei*	[23]
23.	6β-Acetoxy-3β,8β,14β-trihydroxy-12-oxobufa-4,20,22-trienolide.	*U. epigea*	[24]
24.	14β-Hydroxybufa-3,5,20,22-tetraenolide.(scillaridin)	*U. epigea*	[24]
25.	12α,14β-Dihydroxy-2α,3β-{tetrahydro-3',5'-dihydroxy-4'-methoxy-6'-methyl-2H-pyran-2',4'-diylbisoxy)card-4,20-dienolide (fugaxin).	*U. fugax*	[25]

26.	11α-Hydroxyscilliglaucosidin-3-O-α-L-rhamnoside.	*U. hesperia*	[26]
27.	Scilliphaeosidin.	*U. hesperia*	[26]
28.	Scillaren A.	*U. indica*	[27-30]
29.	Scilliglaueosidin-3-O-α-L-rhamnoside.	*U. indica*	[27-30]
30.	6-Desacetoxyscillirosidin.	*U. indica*	[27-30]
31.	16β-Acetoxy-3β,14β-dihydroxy-19-formylbufa-4,20,22-trienolide (scillicyanosidin).	*U. lydenburgersis*	[31]
32.	4β,8β,11α,14β-Tetrahydroxy-bufa-5,20,22-trienolide-12-one.	*U. lydenburgersis*	[31]
33.	Scillicyanosidin-3-O-α-D-glucoside.	*U. lydenburgersis*	[31]
34.	11α-Hydroxy-scilliglaucoside.	*U. lydenburgersis*	[31]
35.	5α-4,5-Dihydro-19-oxoproscillaridin A.	*U. lydenburgersis*	[24-32]
36.	5α-4,5-Dihydroproscillaridin A.	*U. maritime*	[24-32]
37.	5α-4,5-Dihydroglucoscillaren A.	*U. maritime*	[24-32]
38.	5α-4,5-Dihydroproscillaren A	*U. maritime*	[24-32]
39.	Scilliroside.	*U. maritime*	[24-32]
40.	5α-4,5-Dihydro-scillirosidin-glucoside.	*U. maritime*	[24-32]
41.	16β-Acetoxyglucoscillaren A.	*U. maritime*	[24-32]
42.	16β-Acetoxyproscilliridin A.	*U. maritime*	[24-32]
43.	16β-Acetoxyscillarenin-3-O-β-D-glucoside.	*U. maritime*	[24-32]
44.	16β-Acetoxyscillirubroside.	*U. maritime*	[24-32]
45.	6-Deacetyl-12β-hydroxylscilliroside.	*U. maritime*	[24-32]
46.	5α-4,5-Dihydro-12β-hydroxy-scillirosidin-3-O-α-L-thevetoside.	*U. maritime*	[24-32]
47.	5α-4,5-Dihydro-16β-hydroxyscillirosidin-3-O-α-L-thevetoside.	*U. maritime*	[24-32]
48.	5α-4,5-Dihydro-scillirosidin-3-O-α–L-glucomethyloside.	*U. maritime*	[24-32]
49.	5α-4,5-Dihydro-scillirosidin-3-O-β-D-glucoside.	*U. maritime*	[24-32]
50.	5α-4,5-Dihydro scillirosidin-3-O-α-L-thevetoside.	*U. maritime*	[24-32]
51.	Glucoscilliroside.	*U. maritime*	[24-32]
52.	16β-Hydroxy-glucoscillaren A.	*U. maritime*	[24-32]
53.	16β-Hydroxyproscillaridin A.	*U. maritime*	[24-32]
54.	12β-Hydroxy-scillirubrosidin-3-O-α-L-rharnnoside	*U. maritime*	[24-32]
55.	12β-Hydroxyl-5α-4,5-dihydroscillirosidin.	*U. maritime*	[24-32]
56.	12β-Hydroxydesacetyl-scillirosidin.	*U. maritime*	[24-32]
57.	16β-O-Acetylscillarenin.	*U. maritime*	[24-32]
58.	16β-Hydroxy-5α-4,5-dihydroscillirosidin.	*U. maritime*	[24-32]
59.	16β-Hydroxyscillarenin.	*U. maritime*	[24-32]
60.	16β-O-acetylscillirubrosidin.	*U. maritime*	[24-32]
61.	9-Hydroxy-scilliphaeosidine.	*U. maritime*	[24-32]
62.	6-Deacetylscilliroside.	*U. maritime*	[24-32]
63.	Scillirosidin.	*U. maritime*	[24-32]
64.	5α-4,5-Dihydroscillaren A.	*U. maritime*	[24-32]
65.	12-Episcilliphaeaside.	*U. maritime*	[24-32]
66.	11α-Hydroxyscilliglaucoside.	*U. maritime*	[24-32]
67.	Glucoscillaren A.	*U. maritime*	[24-32, 34, 35]
68.	Glucoscilliphaeoside.	*U. maritime*	[24-32]
69.	9-Hydroxyscilliphaeoside.	*U. maritime*	[24-32]
70.	Scillirubroside.	*U. maritime*	[24-32, 34,

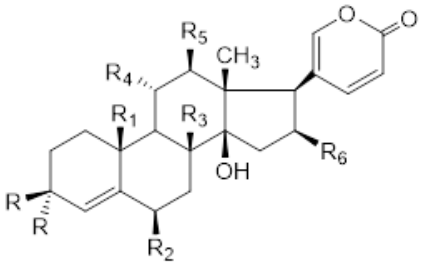
			35]
71.	Scillirubrosidin.	*U. maritime*	[24-32]
72.	11α-Acetylgamabufotalin-3-O-(4-O-β-D-glucosyl)-α-L-rhamnoside.	*U. maritime*	[24-32]
73.	12-Epiglucoscilliphaeoside.	*U. numidica*	[28][30][33]
74.	12-Episcilliphaeosidin-3-O-β-D-glucoside.	*U. numidica*	[28][30][33]
75.	12-Episcilliphaeosidin-3-O-[α-L-rhamnosyl-(1→4)-α-L-rhamnoside].	*U. numidica*	[28][30][33]
76.	Scilliglaucogenin.	*U. numidica*	[28][30][33]
77.	Physodine A.	*U. phyrodes*	[36]
78.	Physodine B.	*U. phyrodes*	[36]
79.	Physodine C.	*U. phyrodes*	[36]
80.	Physodine D.	*U. phyrodes*	[36]
81.	Rubellin.	*U. rubella*	[37-38]
82.	12β-Hydroxyscillirosidin-3-on.	*U. sanguine*	[39-40]
83.	12β-Hydroxyscillirubrosidin-3-on.	*U. sanguine*	[39-40]
84.	Stigmasterol.	*U. maritima*	[43-45]
85.	Campesterol.	*U. maritime*	[43-45]
86.	β-Sitosterol.	*U. maritime*	[43-45]
87.	Cholesterol.	*U. maritime*	[46-57]
88.	Δ-5-Avenasterol.	*U. maritime*	[46-57]
89.	Δ-7-Avenasterol.	*U. maritima*	[46-57]
90.	12*β*, 14*β*-dihydroxybufa-3, 5, 20, 22-tetraenolide	*U. indica*	[58]
91.	16*β*-O-acetyl-10-*β*-formyl-3-*β*, 8-*β,* 14-*β*-trihydroxybufa-20, 22-dienolide	*U. indica*	[58]
92.	14*β*-hydroxybufa-20, 22-dienolide-3-O-α-L-thevetoside	*U. indica*	[58]
	Alkaloids		
93.	Lycorine.	*U. altissima*	[41]
	Terpenes		
94.	1β,6α-Dihydroxy-4(15)-eudesmene.	*U. epigea*	[41]
95.	6α-Hydroxy-4(15)-eduesmen-1-one.	*U. epigea*	[42]
	Flavanoids		
96.	5,4'-Dihydroxy-3-O-α-L-rhamno-pyranosyl-6-C-glucopyranosyl-7-O-(6"-para-coumaroyl–β-D-glucopyranosyl) flavone.	*U. indica*	[43-45]
97.	Kaempferol-7-glucoside-3-triglucoside.	*U. maritima*	[46-57]
98.	Kaempferol-7-glucoside-3-rhamnoglucoside.	*U. maritime*	[46-57]
99.	Kaempferol-7-glucoside-3-diglucoside.	*U. maritime*	[46-57]
100.	Kaempferol-7-rhamnoside-3- rhamnoglucoside.	*U. maritime*	[46-57]
101.	Kaempferol-7-glucoside.	*U. maritime*	[46-57]
102.	Quercetin.	*U. maritime*	[46-57]
103.	Quercetin-3-monoglucoside (Isoquercetin).	*U. maritime*	[46-57]
104.	Dihydroquercetin(Taxifolin).	*U. maritime*	[46-57]
105.	Vitexin.	*U. maritime*	[46-57]
106.	Vicenin-2.	*U. maritime*	[46-57]
107.	Isoorientin.	*U. maritime*	[46-57]
108.	Scoparin.	*U. maritime*	[46-57]
	Phenolic		
109.	Cyaniding-3-monoglucoside.	*U. maritime*	[46-57]
110.	Cyaniding-3,5-diglucoside.	*U. maritime*	[46-57]

111.	Pelargonidin-3-monoglucoside.	*U. maritime*	[46-57]
112.	Caffeic acid.	*U. maritime*	[46-57]
113.	*p*-Coumaric acid	*U. maritime*	[46-57]
114.	Chrystanthemin.	*U. sanguine*	[58-59]
115.	Phloroglucinol.	*U. sanguine*	[58-59]
116.	Cyanidin.	*U. sanguine*	[58-59]

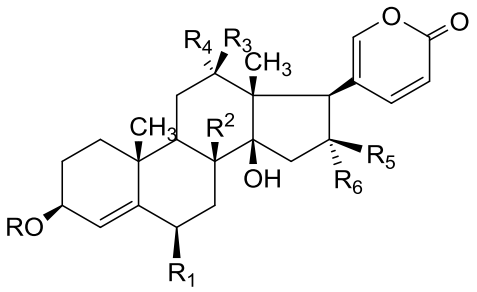
Structures of phytochemicals isolated from bulb of Urginea species



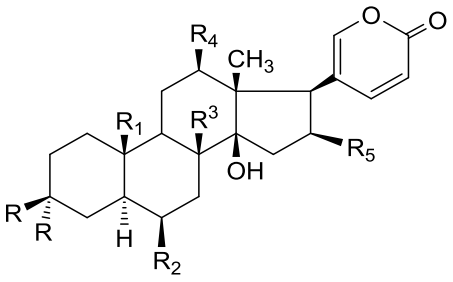
No.	R	R_1	R_2	R_3	R_4	R_5
1	rhamnosyl	H	α-OH, H	H, H	H	OAc
2	rhamnosyl-glucosyl	H	α-OH, H	H, H	H	H
3	rhamnosyl	H	α-OH, H	H, H	H	H
19	rhamnosyl	H	α-OH, H	=O	H	H
20	rhamnosyl-glucosyl	H	α-OH, H	=O	H	H



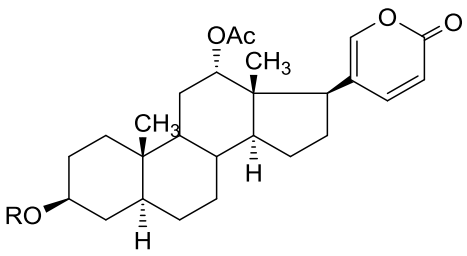
No.	R	R_1	R_2	R_3	R_4	R_5	R_6
13	β-OH, -α-H	CHO	H	H	H	H	H
14	=O	CHO	H	H	H	H	H
15	β-O-glucosyl,α-H	CHO	H	H	H	H	H
16	β-O-glucosyl,α-H	CHO	H	H	H	H	H
26	β-O-rhamnosyl,α-H	CHO	H	H	OH	H	H
29	β-O-rhamnosyl,α-H	CHO	H	H	H	H	H
31	β-OH,α-H	CHO	H	H	H	H	OAc
33	β-O-glucosyl,α-H	CHO	H	H	H	H	OAc
34	β-O-glucosyl,α-H	CHO	H	H	OH	H	H
82	=O	CH3	OAc	OH	H	OH	H
83	=O	CH3	OH	H	H	OH	H



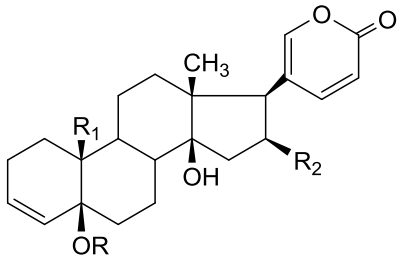
No.	R	R_1	R_2	R_3	R_4	R_5	R_6
4	glucosyl	OAc	OH	OH	H	H	H
5	rhamnosyl	H	H	H	H	H	H
6	glucosyl	H	H	H	H	H	H
8	glucosyl	H	H	OH	H	H	H
9	rhamnosyl	H	H	OH	H	H	H
17	H	OAc	OH	OH	H	H	H
21	H	H	H	H	H	H	H
27	H	H	H	OH	H	H	H
28	rhamnosyl -glucosyl	H	H	H	H	H	H
30	H	OH	OH	H	H	H	H
39	rhamnosyl	OAc	OH	H	H	H	H
41	rhamnosyl-glucosyl-glucosyl	H	H	H	H	OAc	H
42	rhamnosyl	H	H	H	H	OAc	H
44	rhamnosyl	H	OH	OH	H	H	H
45	glucosyl	H	OH	H	H	OAc	H
51	glucosyl	OAc	OH	H	H	H	H
52	rhamnosyl-glucosyl -glucosyl	H	H	H	H	OH	H
53	rhamnosyl	H	H	H	H	OH	H
56	H	OH	OH	OH	H	H	H
57	H	H	H	H	H	OAc	H
59	H	H	H	H	H	H	H
60	H	OAc	OH	H	H	OAc	H
62	glucosyl	OH	OH	H	H	H	H
63	H	OAc	OH	H	H	H	H
65	rhamnosyl	H	OH	H	OH	H	H
67	rhamnosyl-glucosyl-glucosyl	H	H	H	H	H	H
68	rhamnosyl-glucosyl	H	H	OH	H	H	H
70	glucosyl	H	OH	H	H	H	H
71	H	H	OH	H	H	H	H
73	rhamnosyl-glucosyl	H	H	H	OH	H	H
74	glucosyl	H	OH	H	OH	H	H
75	rhamnosyl-rhamnosyl	H	OH	H	OH	H	H



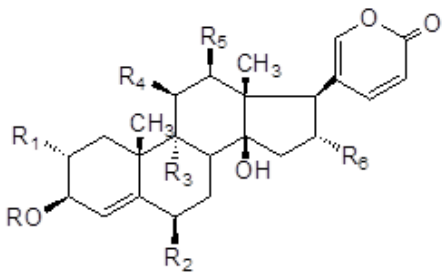
No.	R	R_1	R_2	R_3	R_4	R_5
35	β-O-rhamnosyl, α-H	CHO	H	H	H	H
36	β-O-rhamnosyl, α-H	H	H	H	H	H
37	β-O-rhamnosyl-glucosyl-glucosyl, α-H	CH_3	H	H	H	H
38	β-O-rhamnosyl, α -H	H	H	H	H	H
46	β-O-thevetosyl, α-H	CH_3	OAc	OH	OH	H
47	β-O-thevetosyl, α-H	CH_3	OAc	OH	H	OH
48	β-O-glucomethylosyl,-α-H	CH_3	OAc	OH	H	H
49	β-O-glucosyl, -α-H	CH_3	OAc	OH	H	H
50	β-O-thevetosyl, α-H	CH_3	OAc	OH	H	H
55	β-OH, α-H	CH_3	OAc	OH	H	H
58	β-OH, α-H	CH_3	OAc	H	OH	H
64	β-rhamnosyl-glucosyl, α-H	CH_3	H	H	H	H



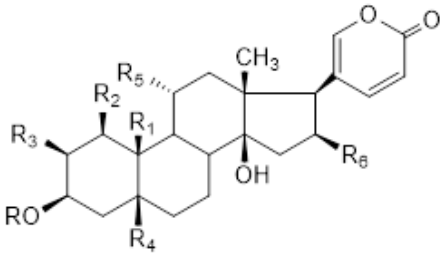
No.	R
79	rhamnosyl-(4 1)-xylosyl
80	(4-OAc)-rhamnosyl-(3 1)-glucosyl



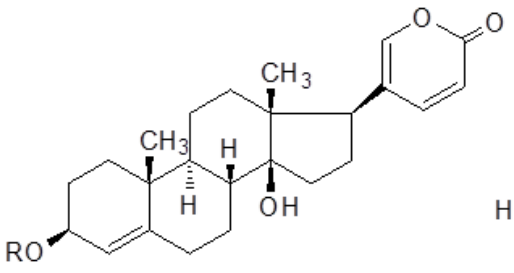
No.	R	R1	R2
76	H	CHO	H
10	glucosyl	CHO	H
7	glucosyl	CHO	OAc



No.	R	R1	R2	R3	R4	R5	R6
61	H	H	H	OH	H	OH	H
69	rhamnosyl	H	H	OH	H	OH	H



No.	R	R_1	R_2	R_3	R_4	R_5	R_6
11	H	CHO	H	H	OH	H	H
12	Glucosyl	CHO	H	H	OH	H	H
77	Digitatosyl	CHO	H	H	OH	H	H
78	glucosyl-(2-OAc)-rhamnosyl	CHO	H	OAc	OH	H	H



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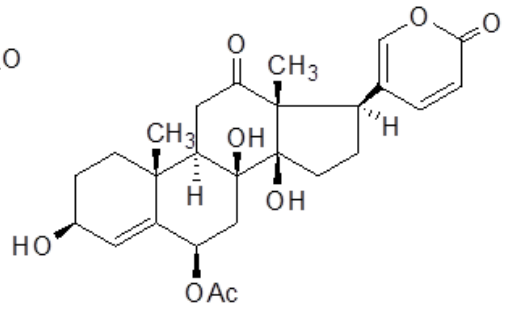

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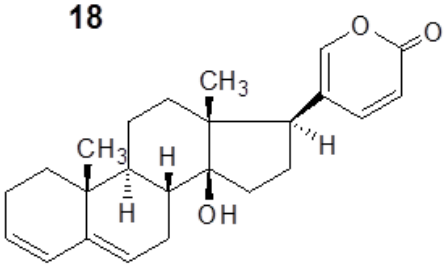

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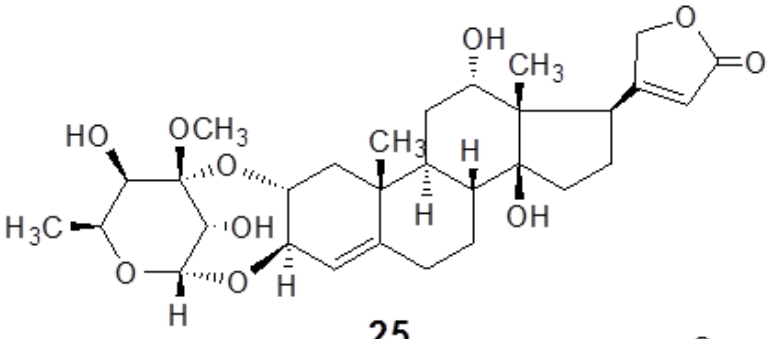

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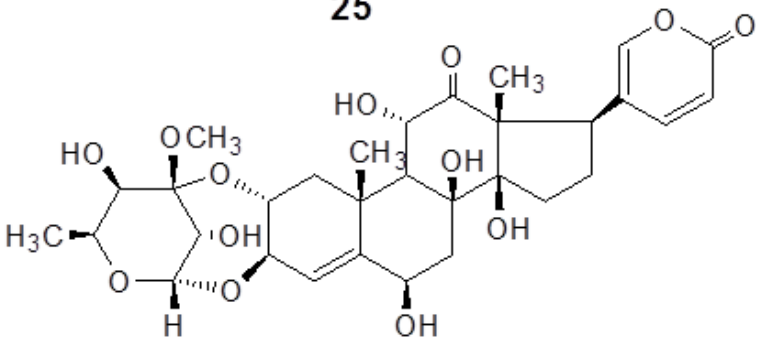

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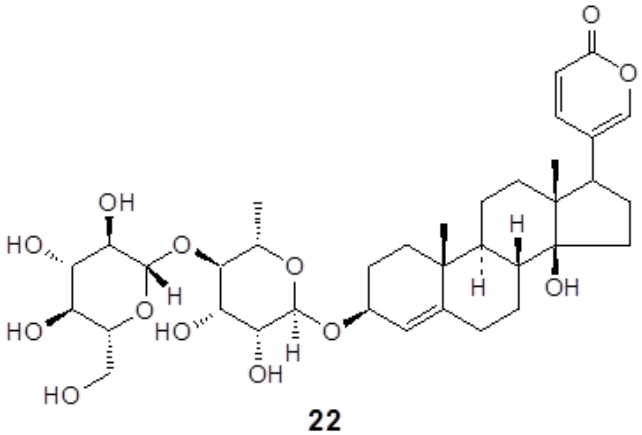

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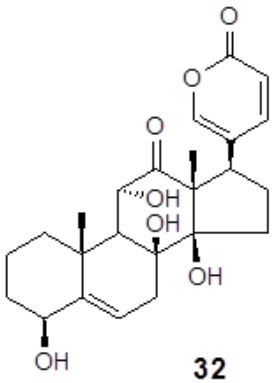

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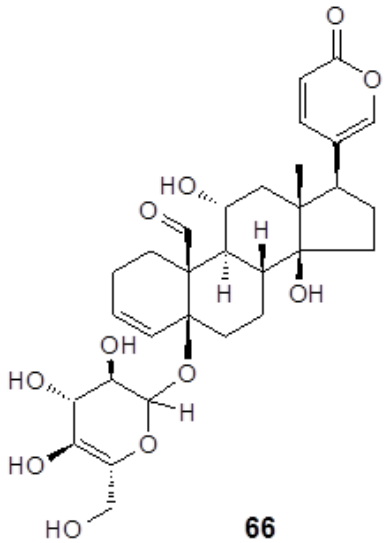

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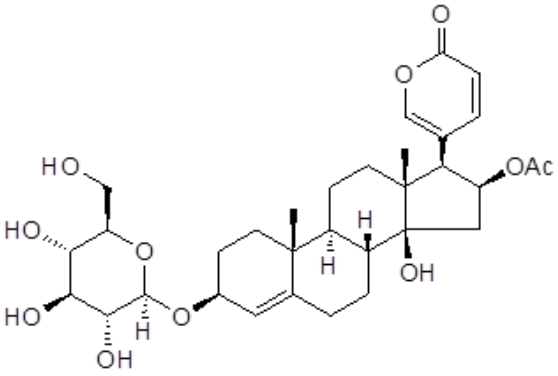

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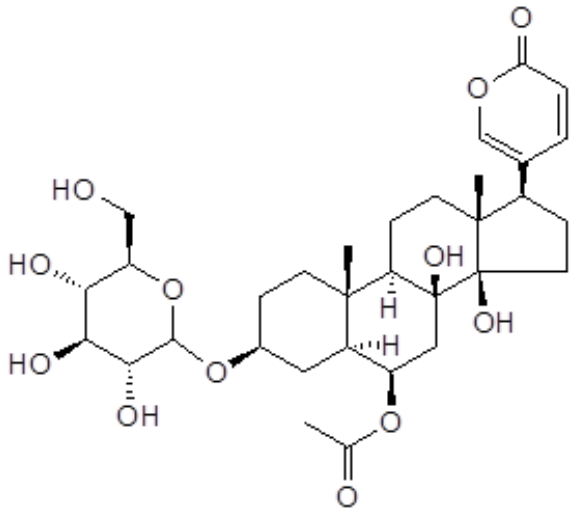

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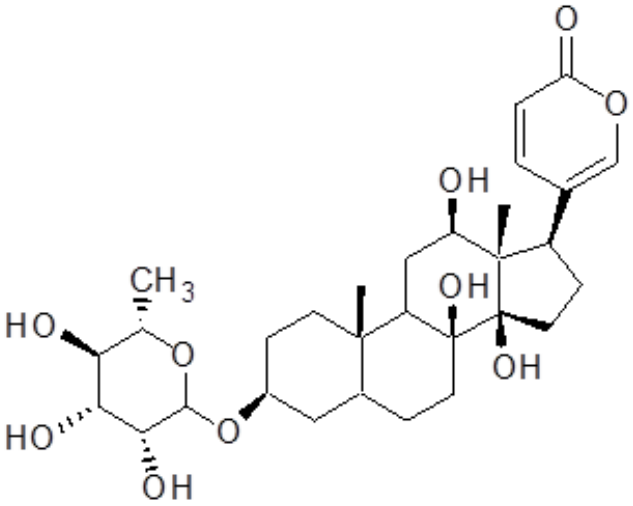

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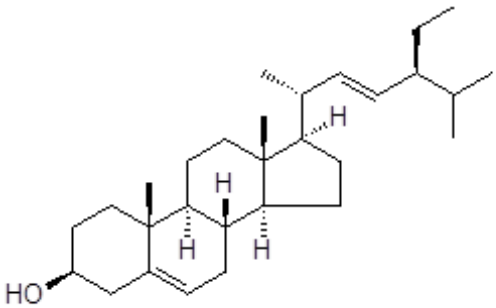

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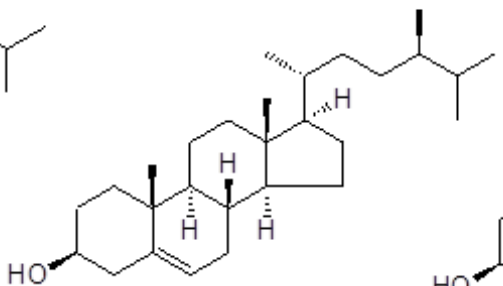

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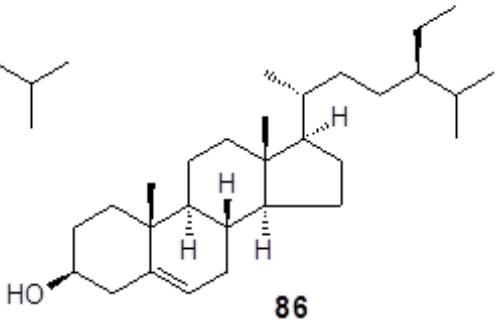

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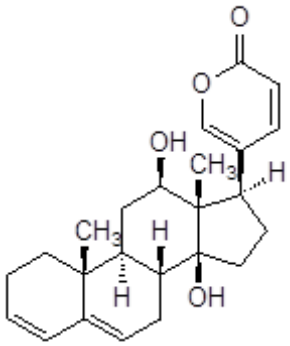

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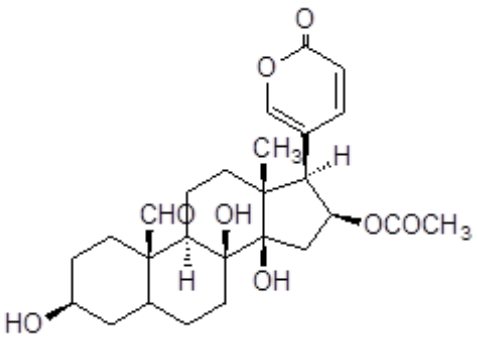

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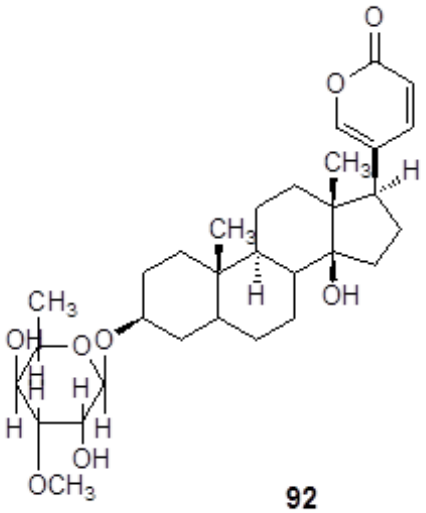

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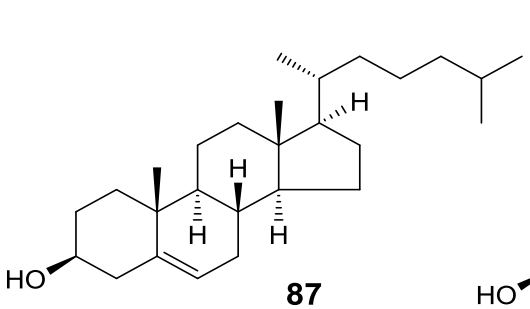

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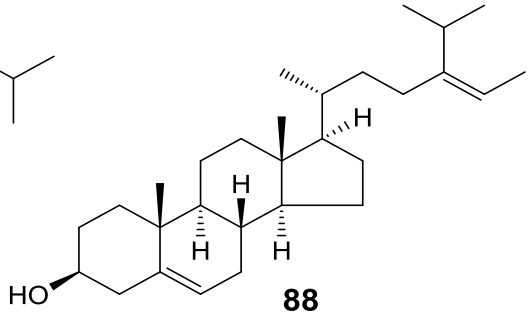

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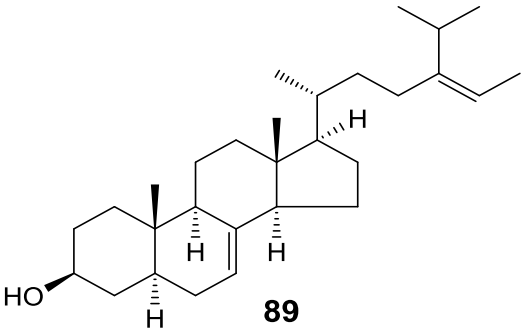

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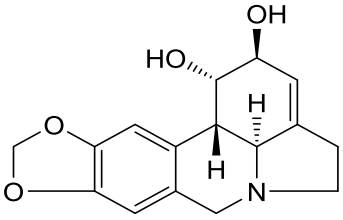

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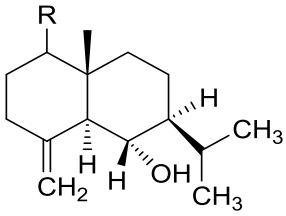
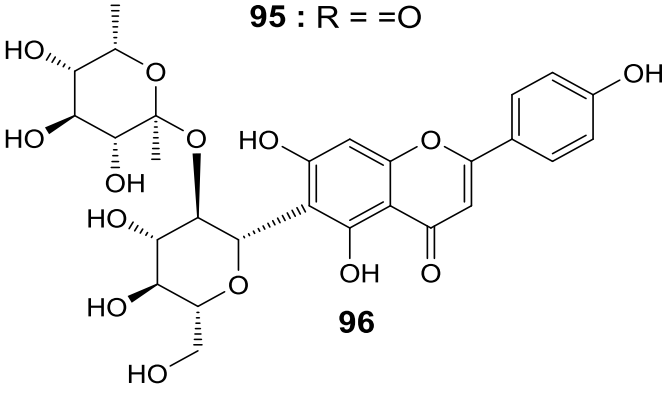


94: R = β-OH

95 : R = =O



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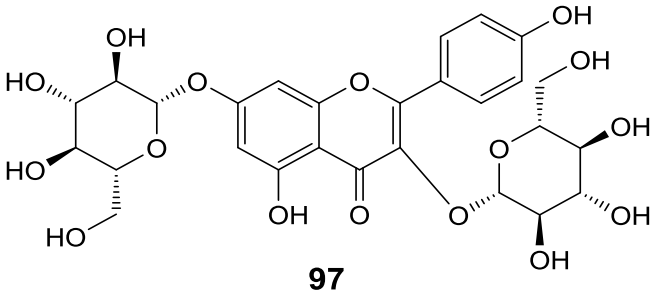

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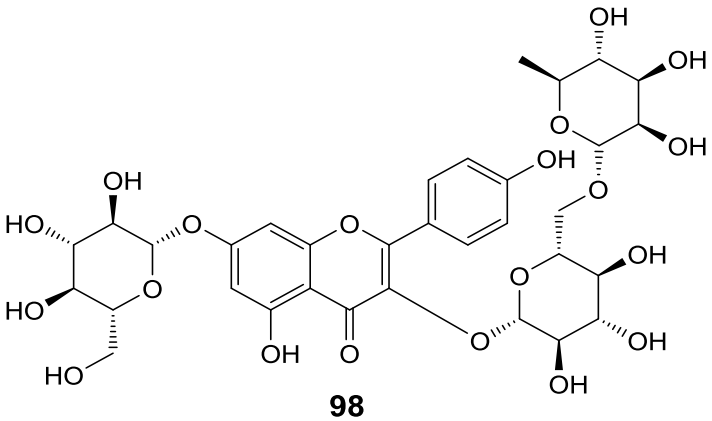

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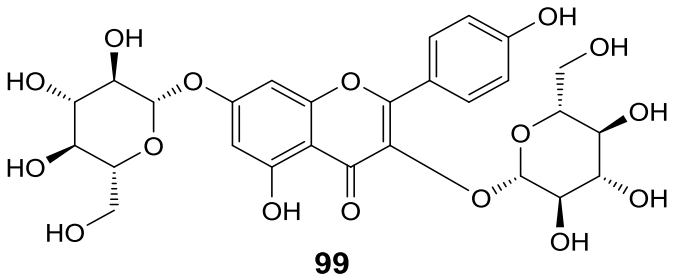

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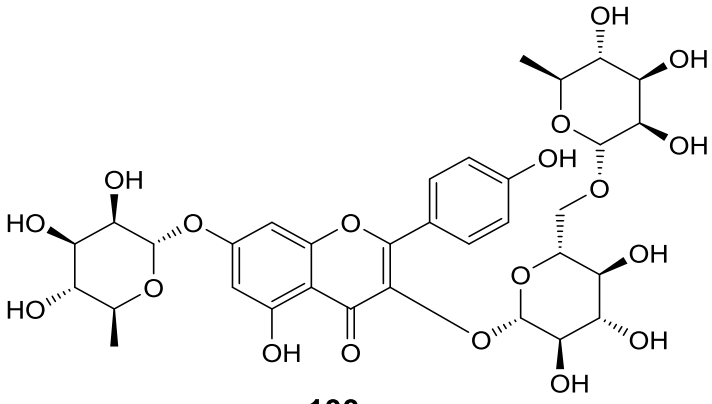

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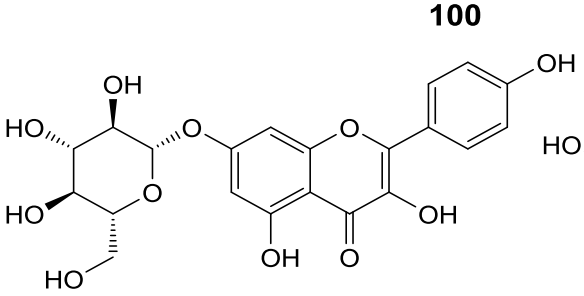

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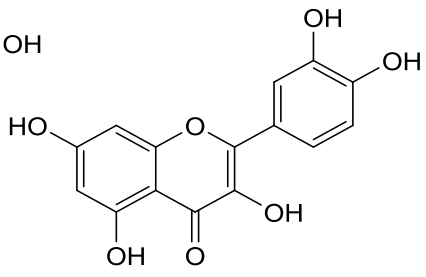

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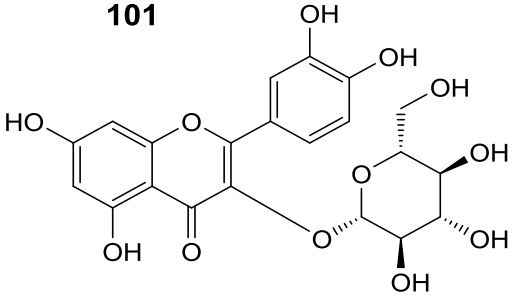

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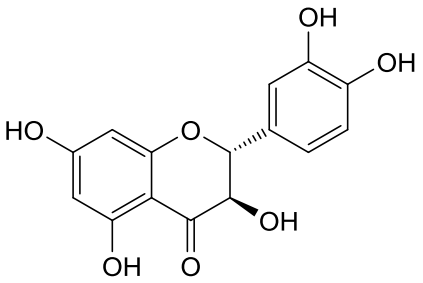

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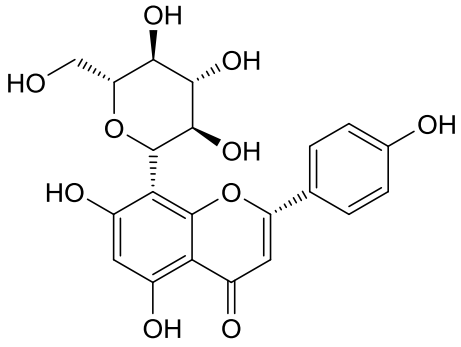

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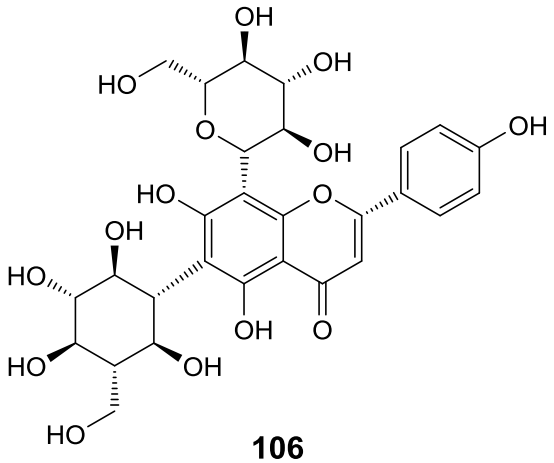

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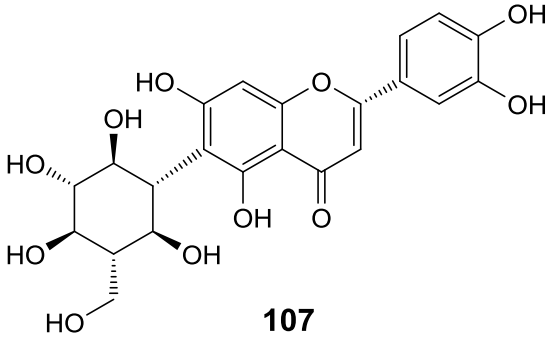

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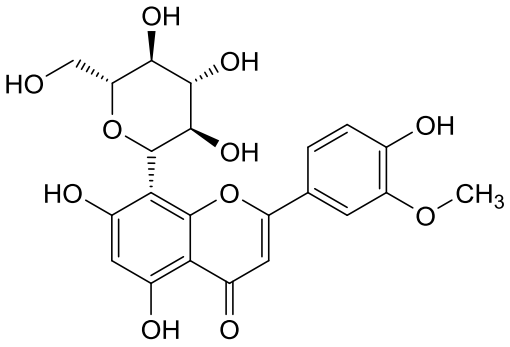

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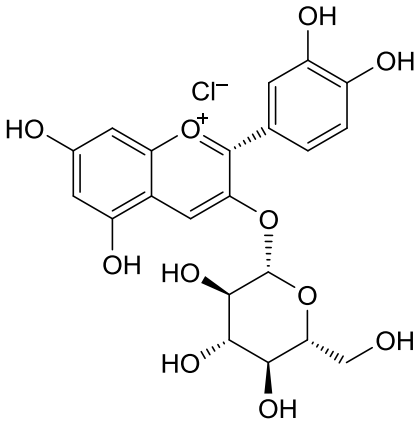

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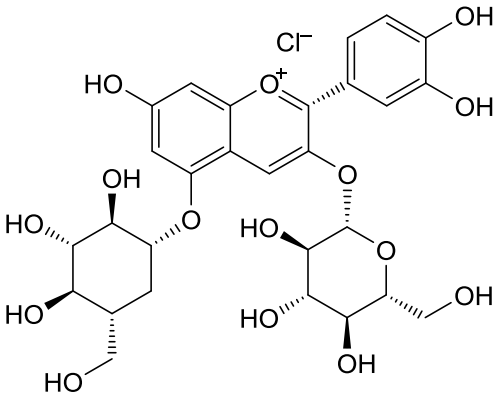

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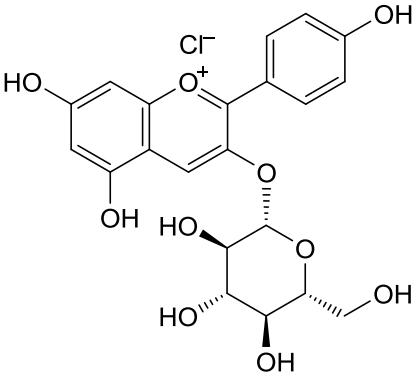

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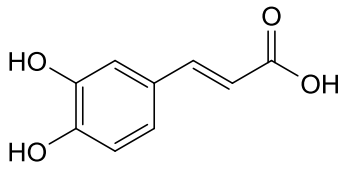

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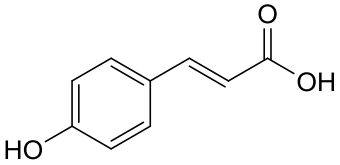

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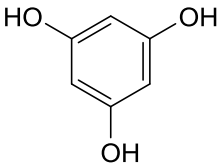

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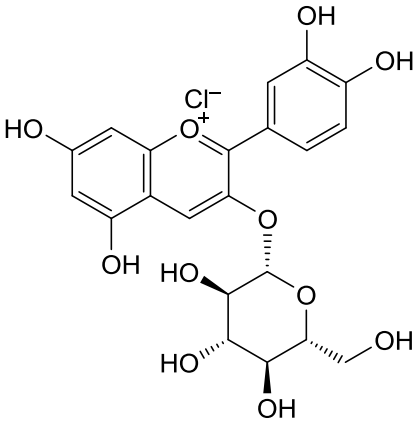

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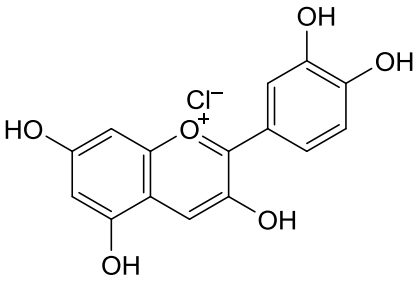

116

Biological Activities

Anti-fungal activity

The antifungal activity of extracts of bulb of*Urgineaindica*was recorded against two pathogenic fungi viz., *Aspergillus niger* and *Candida albicans* by agar-well diffusion method. The results showed that the acetone extract ofbulb was effective against both the fungal species with maximum zone of inhibition against *Candida albicans* (14.06±0.06) and *Aspergillus niger* (13.26± 0.26). The antifungal activity was compared with standard antifungal agents. [2-8]

Anti-oxidant activity

The antioxidant capacity of *Urginea indica* bulbs extracts was measured by DPPH method and the results showed that ethanolic and aqueous extracts displayed significant antioxidant activity.[9-10]

Gastrointestinal stimulant activity

Gastrointestinal stimulant effect of the crude aqueous-methanol extract of *Urginea indica* bulb was studied on mice and isolated gut preparations. *Urginea indica* bulb extract, which was tested positive for alkaloids, tannins and coumarins, increased faecal output and accelerated charcoal meal transit in mice (6–12 mg/kg, p.o.), similar to that caused by carbachol (10 mg/kg). The Urginea indica bulb extract enhanced the intestinal transit of charcoal and caused a significant increase in the number of feces when administered orally to mice. Pre treatment of mice with atropine blocked the laxative effect of *Urginea indica* bulb extract similar to carbachol [11].

Anti-inflamatory activity

Anti-inflammatory activity of the alcoholic extract of the bulb of *Urginea indica*was evaluated in rats against carrageenan induced edema by using plethysmographic, cotton pellet test and hot plate test. Standard anti-inflammatory drug ibuprofen was used to compare with the effects of the extract. The crude extract and the standard drug were administered orally [12].

Anti-carcinomic-activity

Urginea indica has been used traditionally as a cancer remedy and silliglaucosidin has been isolated as an active constituent, has shown anti-carcinomic activity. The activity has conducted in vivo and in vitro against mouse mammary carcinoma cells. The isolated protein has assayed against cloned line of human colon adinocarcinomatic GC3/C17, KB Chr- 8-5 and KB-3-1strain, using DMEM and RPMI media [13].

Cardio- tonic activity

The phytochemicals present in mathenolic extract of the bulbs of *Urginea indica* were showed the presence of potentially bioactive. 2, 3-butanediol as a cardiac stimulant. The presence of high concentration of C-24 steroids in the bulb of *Urginea indica* are reported to be responsible for this activity [14].

Anti-bacterial activity

Anti-bacterial activity of the methanolic extracts of *Urginea indica* bulbs was assessed against gram positive and gram negative bacteria viz., Bacillus cerus, Bacillus subtilis, Staphylococcus aureus, Staphylococcus epidermidis, Escherichia coli, Proteusvulgaris, Pseudomonas aeruginosa, Klebsiella pneumoneae and against two fungi viz., Aspergillus niger and Candida albicans. The result showed that gram positive bacteria were more susceptible than gram negative bacteria [15].

Insecticidal activity

The biocative compounds extracted from *Urginea maritima* have excellent mosquito repellent activity. Recently, *Urgenia indica* is reported for its larvicidal action against Aedes larvae causingdengue fever. The aqueous lypholised

extract showed 100% mortality of the larvae within fifteen hours [16].

Anti-arthritic activity

The ethanolic extract of the bulb of *Urginea indica* showed significant anti-arthritic activity . In psoriatic arthritis joints and connective tissue inflammation severe cases of psoriasis [17].

Anti-diabetic activity

An acute toxicity study of ethanolic extract (UIEE) of *U. indica* was evaluated by oral glucose tolerance test in rats. Diabetes was induced by single intraperitoneal injection of streptozotocin (STZ, 40 mg/kg body weight). Glibenclamide drug (10 mg/kg) was used as standard. The acute toxicity study of UIEE revealed the nontoxic nature. Daily oral treatment with the extract and the standard drug for 14 days significantly reduced blood glucose, total cholesterol (TC), and triglyceride (TG) levels. High-density lipoprotein (HDL) levels were found to be improved as compared to the diabetic control group. The feed and water intake in diabetic rats was markedly reduced and weight loss was minimized. The results suggest that UIEE has significant antidiabetic effects on STZ-induced diabetic rats [18].

Conclusion

The genus Urginea is medicinally very important and rich source of C-24 steroids and flavanoids. It has many bufadienolides which are being used as cardiac stimulant and in cancer treatment. Considering the pharmaceutical prospects there's ample scope for future investigations on the genus Urginea.

Acknowledgement

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