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PHYTOCONSTITUENTS OF *SYMPLOCOS PANICULATA* AND THEIR ANTI-EMETIC ACTIVITY

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ABSTRACT

Phytochemical analysis of methanolic extract of *Symplocos paniculata* resulted in the isolation of Crysophanol (1), emodin (2), Hydroquinone -1-O-β-D-galactopyranoside (3), crysophanol-8–O–β-D-galactopyranoside(4), and emodin-8–O–β-D-galactopyranoside (5). All the five compounds (1-5) were tested for anti-emetic activity on copper sulphate included –emesis in young Chicks. They exhibited anti-emetic effects.

Key Words - *Symplocos paniculata* (Symplocaceae), Phytoconstituents, anti-emetic activity.

INTRODUCTION

The Phytochemical investigation of the dried and powdered stem of *Symplocos paniculata* (Symlocaceae) is being reported here for the first time. This is wild growing plant distributed in western Himalaya, Punjab, Bengal and Assam with an abundant growth in Garhwal hills. The plant has antioxytocic activity making it medicinally useful (Chopra, 1956). A literature search revealed that no phytochemical work has been reported on *Symplocos paniculata*, although flavonoid and flavonoid glycoside have been reported from the stem of *Symplocos lanciflora* (Licchwin, 1996). This paper describes the isolation and identification of crysophanol, emodin, hydroquinone-1-O-β- D-galactopyranoside, crysophanol-8–O–β-D-galactopyranoside, and emodin-8–O–β-D-galactopyranoside and anti-emetic activity determination (Akita *et.al,* 1998).

MATERIAL AND METHODS

The melting points were measured on Kofler block. IR spectra were recorded on MIDAC, M series FTIR instrument. The ^{1}H-NMR spectra were run at 400MHz and ^{13}C-NMR at 100.53MHz in pyridine-d_5 with TMS as internal standard. FABMS with a positive mode at an accelerating voltage 2.5 KV, gas Xe. Column chromatography silica gel (Merk 60-120 mesh), T L C Kiesel gel 60 G (Merk). The spots on T L C were visualized

by spray with 10% H_2So_4 and 5% Alcoholic $FeCl_3$. Paper chromatography Whatman No.1 paper using the descending mode and aniline hydrogen phthalate as the visualiser. The following systems were used (A) C_6H_6 – EtOAc (9:1) (B) C_6H_6 –Me_2CO (7:3) (C) $CHCl_3$ – MeOH (95:5) (D) $CHCl_3$ – MeOH(90:10) (E) $CHCl_3$ – MeOH (85:15) (F)$CHCl_3$ – MeOH – H_2O (65:25:10) (G) n BaOH – EtOH-H_2O (5: 1:4).

The Plant Material was collected from Dhanolti, (Tehri, Uttrakhand, India).The authentification of plant material was made at the Botany Department, Garhwal University S.R.T.Campus Badshahithaul, Tehri and Taxonomy section, F.R.I. Dehradun.

The air dried and powdered stem bark (3 Kg) was defatted with petrol in a soxhlet. The solvent free stem bark was exhaustively extracted with 90% MeOH. The MeOH extract was concentrated under reduced pressure to afford a yellow solid mass.The solid mass on chromatographic resolution afforded compounds (1-5).

Compound 1: Pale yellow needles, m.p. 195-196°C; UV: λmax MeOH nm: 224, 252, 276, 285, 436; IR υKBr max Cm^{-1}: 3400, 1650, 1600, 1510, 1550; EIMS (m/z):254(M^+) 237; 226, 211,197and 181. ^1H – NMR: (ppm) δ 2.45 (Ar – CH_3, C-3), 7.05 (C-2, C-7), 7.6 (C-6), 7.8 (C-4, C-5); ^{13}C – NMR: δ 162.37, 119.85, 149.28, 121.25, 113.68, 136.85, 108.08, 162.66, 192.42, 181.77, 133.58, 115.81, 119.85, 133.21, 22.19(Ar –CH_3).

Compound 2: Yellow needles, m.p. 258-259 °C; UV: λmax MeOH nm: 224, 276, 286, 430 nm; IR υKBr max Cm^{-1}:3400, 1630, 825; EIMS (m/z): 270, 254, 226, 197, 183 and 152. ^1H – NMR: (ppm): δ 2. 5 (s, CH3, C-3), 7.0 (br - s, C-2), 7.50 (br - s, C-4), 7.87(d, J= 8.0 Hz, C-5), 7.55 (d, J= 7.8 Hz, H-7); ^{13}C – NMR: δ 161.42, 124.20, 148.24, 120.45, 108.83, 165.65, 107.92, 164.46, 189.55, 181.19, 134.96, 119.33, 131.98, 21.57(Ar – CH_3).

Compound 3: Pale yellow solid, m.p. 190-192 °C; FAB-MS (m/z) : 272 (M^+), 110 (M-162)$^+$; ^1H – NMR (δ ppm) : 9.00 (1H, s, OH), 6.86 (1H, d, J= 8.8 Hz, H-2, H-6), 6.64 (2H, d, J=8.8 Hz , H- H - 5) : Glc 1 to Glc 6 : 4.62 (1H, d, J = 7.3 Hz, H-1), 3.36 (1H, dd, J = 7.3 Hz , H-2),3.35-3.45 (m, sugar protons, H-3, H-4, H-5, H-6); ^{13}C – NMR (δ ppm) : Aglycone 152.2 (C-1), 117.7(C-3, C-5), 115.5 (C-2, C-6), 150.4(C-4) Glu 1 to Glu 6: 101.7 (C-1), 76.7 (C-2), 76.6 (C-3), 73.3 (C-4), 69.8 (C-5), 60.8 (C-6).

Table 1- Anti – emetic effect of 5 compounds, 1 to 5 against copper sulphate included emesis in young chicks.

Compounds	Dose Mg/Kg	No of Young Chicks	No.of retches (mean ± SEM)	Percentage of inhibition
Control		6	60.0 ± 4.73	
	10	6	54.5 ± 7.58	9.2
Crysophanol (1)	20	6	50.3 ± 6.90	16.2
	50	6	36.0 ± 3.69**	40.0
Control		6	67.2 ± 2.81	
	10	6	40.8 ± 4.79**	39.3
emodin (2)	20	6	38.8 ± 8.73*	42.3
	50	6	38.2 ± 6.13***	43.2
Control		6	67.0 ± 6.63	
Hydroquinone-1-O-β-D-	10	6	49.0 ± 6.97	22.4
galactophyranoside (3)	20	6	48.0 ± 4.97*	28.9
	50	6	36.7 ± 3.21***	45.6
Control		6	55.7 ± 4.6	
crysophanol-8–O–β-D-	10	6	54.9 ± 8.80	1.4
galactopyranoside (4)	20	6	39.6 ± 7.48	28.9
	50	6	24.7 ± 1.21***	55.7
Control		6	56.6 ± 3.93	
emodin-8–O–β-D-	10	6	53.4 ± 3.93	5.7
galactopyranoside (5)	20	6	44.6 ± 7.27	21.2
	50	6	28.0 ± 3.09***	50.5

Significant different from the control value, *P< 0.05, **P < 0.01 and **P< 0.001.

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