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OCCURRENCE OF A RARE DIHOLOSYLFLAVONE, 2″-O-GLUCOSYLVITEXIN IN *DESMODIUM TRIFLORUM*

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THE genus *Desmodium* is rich in alkaloids. Previous investigations[1,2] on *Desmodium triflorum* revealed the presence of β-phenylamine, 5-indole-3-alkylamine, indole-3-acetic acid, tyramine, trigonelline, stachydrine, betaine, choline, hypaphorine, N,N-dimethyltryptophane and N,N-dimethyltryptamine oxide. *D. canadense*[3,4] and *D. caudatum*[5] are the only species which contain the flavonoid C-glycosides. We report here the isolation and identification of the C-glycosides, vitexin, isovitexin, 2″-O-glucosylvitexin and the flavone apigenin and also the polyhydric alcohol (+)-pinitol from the entire plant of *D. triflorum*. The presence of the rare diholosylflavone, 2″-O-glucosylvitexin is observed for the first time in this genus.

The plant material *D. triflorum* (Leguminosae) was collected in the campus of Sri Venkateswara University, Tirupati, South India. the entire plant (500 g) was extracted successively with petroleum ether, benzene, acetone and methanol. Two-dimensional paper chromatography showed that the flavonoids were mainly in the acetone and methanol extracts. The polyhydric alcohol (+)-pinitol (m.p. 185–6°) was isolated during concentration of the acetone extract. The flavonoids A, B, C and D were separated by preparative paper chromatography using BAW (4:1:5) and 15% AcOH as the irrigating systems. The compounds were purified on polyamide column chromatography.

The flavonoids A, B and C were identified as apigenin, vitexin and isovitexin respectively and confirmed by m.m.p., UV spectra with shift reagents[6] and co-chromatography with authentic samples.

Compound D gave glucose and vitexin on acid hydrolysis. The lack of acetyl signal at δ 1.76 in the NMR spectrum of its acetyl and derivative established the 2″-O-attachment of the second sugar and confirmed its structure as 2″-O-glucosylvitexin.

2″-O-glucosylvitexin: m.p. 235-6°. UV λ MeOH-/max 270, 305 (sh), 335 nm; +$AlCl_3$ 277, 303, 347, 386 nm, +$Alcl_3$/ HCL: 277, 302, 344, 385 nm; + NaOAc: 278, 392 nm; +NaOAc/ H_3BO_3: 270, 300(sh), 330 nm; +NaOAc: 269, 302(sh), 330(sh), 330 nm. Acetyl derivative (Py/ Ac_2O): m.p. 234 5°. NMR ($CDCl_3$, TMS): δ 8.1-6.7 (6H,CH-aromatic), 536 (*d,j* 10Hz, H-″), 5.30-3.30 (13H, aliphatic CH), 2.42, 2.35 (9H,5,7,4′-OAc), 2.16, 2.11, 2.07, 2.02, 1.96, 1.93, 1.89 (21 H, 3″, 4″, 6″, 2‴, 3‴, 4‴, 6‴—OAc). The Ms data of the permethylated compound is in good agreement with the reported data[7].

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LACTIC DEHYDROGENASE ISOENZYMES IN TUMOURS ASSOCIATED WITH CYST FLUID

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DESPITE great progress in understanding the energy metabolism of tumours, the fundamental nature of the neoplastic process remains unknown. However the biochemical approach to tumour metabolism represents one of the most promising areas in understanding the neoplastic process.

Since Warburg reported that tumour tissue has high anerobic glycolysis, lactic acid dehydrogenase (LDH) has been the subject of most investigators in tumour metabolism. The knowledge about the presence of multiple isozymic forms of LDH and its variations in different disease states has enhanced the potentialities of understanding the neoplastic process. Much attention has been given to biochemical studies in tumour tissue but cystic fluids surrounding the tumours has so far received less attention. Very few reports are available on biochemical studies in cystic fluids. Cummings[1] was the first to report that biochemical study of cystic fluid might indicate the degree of malignancy or nature of tumour in association with cyst. A few other workers have noted increased LDH activity in cystic fluid derived from neoplastic lesions[2,3]

The present paper reports the LDH isoenzyme studies in cyst fluids and tumour tissues of the cystic neoplasms of the central nervous system, in an attempt

TABLE 1

Lactic Dehydrogenase isoenzymes in tumour and cyst fluid*

T. No.	Diagnosis		LDH (U/L)	LDH_1	LDH_2	LDH_3	LDH_4	LDH_5	LDH_1/LDH_5
1.	Malignant Astrocytoma	C	534	6.4	15.0	20.1	28.6	29.9	0.21
2.	Malignant Astrocytoma	C	415	13.1	19.3	20.1	22.0	25.3	0.52
3.	PNET	T	450	24.2	23.5	25.7	15.0	11.6	2.09
		C	210	20.9	22.4	22.4	20.1	14.2	1.47
4.	Oligodendroglioma	T	1080	25.5	33.5	19.8	7.9	3.3	10.80
		C	305	25.2	20.9	18.4	17.8	17.7	1.42
5.	Mixed glioma	T	788	32.0	26.0	23.2	15.6	3.2	10.00
		C	172	57.0	20.3	14.4	6.7	1.6	35.60
6.	Craniopharyngioma	T	890	6.4	13.8	25.5	27.0	27.3	0.23
		C	490	8.3	5.0	6.7	55.0	25.0	0.33
7.	Carniopharyngioma	T	1060	23.4	20.6	21.3	15.6	19.1	1.23
		C	963	29.6	22.1	27.0	7.4	13.9	2.12
8.	Carniopharyngioma	T	515	44.0	18.5	20.0	12.5	5.0	8.80
		C	272	49.5	17.6	19.0	2.4	11.5	4.30
9.	Craniopharyingioma	T	532	6.8	9.7	19.0	20.4	44.1	0.15
	(recurrent)	C	320	52.0	21.0	17.0	3.0	7.0	7.43
10.	Schwanomma	T	386	8.6	22.6	34.4	24.9	9.5	0.91
		C	790	31.5	32.6	25.5	7.1	3.3	9.55
11.	Schwanomma	T	177	9.3	27.2	55.7	6.2	1.6	5.80
		C	144	33.1	33.1	16.5	9.0	8.3	3.99
12.	Colloid cyst	C	—	35.0	17.5	26.3	14.0	7.2	4.86

*(% of total LDH; T – Tumour tissue; C – Cyst fluid. Samples 8 and 9 belong to same patient but obtained at different time intervals.