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NOTE

Screening for Phenols from Few Medicinal Plants

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Phenols are very important, biologically active constituents, known for their antifungal and antiallergic properties. In the present study well known medicinal plants used in various systems of medicine to cure different ailments were screened qualitatively by using chromatographic method and estimated quantitatively by spectrophotometric studies.

Medicinal plants are gaining importance because of their commercial and therapeutic values. The demand for medicinal plants is very high as they are considered as warehouse of many secondary metabolites. Among many secondary metabolites, phenolic group play a key role, which needs much concentration and detailed study. When compared to the olden days, the scientific and commercial interest of the plant phenolics is increasing actively[1]. They are of great importance in pharmaceutical industries[2]. Keeping all these aspects in consideration, the quantitative and qualitative assessment of phenols is investigated in few of the important medicinal plants which are used to cure various diseases (ailments) of humans, as well as cattle and other domestic animals[3].

The plant materials were collected in and around the Gulbarga University Campus, Gulbarga, India. These plants were identified with the help of "Flora of Presidency of Madras"[4] and "Flora of Karnataka"[5]. The preliminary phyto-chemical tests were carried out according to Gibbs[6] to see the occurrence of phenols in the test samples. Quantitative estimation of phenols was carried out by using Folin-Denis[7] method.

Separation of Phenols: The plant materials were extracted with 95% ethanol using soxhlet apparatus and the extract was condensed to 1/4th of its volume[8] and was chromatographed by using the organic solvent like benzene and acetone at 60 : 40 ratio. The chromatographic plates were prepared as formulated by Stahl[9]. The R_f values of the chromatogram were compared with the R_f values of standard phenols.

The ethanolic extracts of few plants which are under study were tested for the occurrence of phenols by using phenol test and ellagic acid test. The plant extracts have shown intense colour when they are treated with $FeCl_3$ to indicate presence of phenols. Ethanolic plant extract when treated with 5% CH_3COOH and sodium nitrate produces muddy yellow colouration indicating the presence of ellagic acid

which is a phenol (Table-2). The R_f values of all the test samples as well as few standards were studied carefully; in some samples the R_f values were correlated with the R_f values of the standards, such as tannic acid, 2,6-dichlorophenol, catechol and 4-chloro-*m*-cresol (Table-4). Maximum amount of phenol content is observed in *Argemone mexicana* with 1.405 mg/100 g and minimum quantity in *Datura stramonium* having 0.36 mg/100 g of phenols in it. (Table-3).

TABLE-1
PLANTS AND THEIR PARTS

Sl. No.	Name of taxa	Family	Part used
1.	*Argemone mexicana* Linn.	Papaveraceae	Leaf
2.	*Datura stramonium*	Solanceae	Leaf
3.	*Papaver somniferum* Linn.	Papaveraceae	Poppy seeds
4.	*Strychnos nux-vomica* Linn.	Loganiaceae	Seeds
5.	*Trigonella foenum-graecum* Linn.	Leguminosae	Seeds
6.	*Withania somnifera* Dunal.	Solanaceae	Root

TABLE-2
SHOWING THE PRESENCE OF PHENOLS IN THE FOLLOWING PLANTS

Tests	Observation	1	2	3	4	5	6
Phenolic test *Ethanolic plant* extract + $FeCl_3$ solution	Intensive coloration	+	+	+	+	+	+
Ellagic acid test *Ethanolic plant* extract + few drops of 5% acetic acid + few drops of sodium nitrate	Muddy yellow Olive green	+	+	+	+	+	+

Note: + sign indicates the presence of phenols.

TABLE-3
SHOWING THE QUANTITY OF PHENOLS IN FOLLOWING PLANTS

	Plants	Quantity (mg/100 gm)
1.	*Argemone mexicana* Linn	1.405 ± 0.044
2.	*Datura stramonium*	0.36 ± 0.65
3.	*Papaver somniferum* Linn	0.45 ± 0.0346
4.	*Strychnos nux-vomica* Linn	1.045 ± 0.044
5.	*Trigonella foenum-graecum* Linn	0.195 ± 0.029
6.	*Withania somnifera* Dunal	0.195 ± 0.045

TABLE-4
QUALITATIVE SEPARATION OF PHENOLS OF THE FOLLOWING PLANTS

R_f value	1	2	3	4	5	6
06.6				+		
13.3	+					
18.5						+
35.5		+				
36.6				+	+	
42.3						+
70.3	+				+	
73.3	+			+		
76.5		+				
78.8						4-Chloro-*m*-cresol
85.0	Tannic acid					
90.5			Catechol			
93.3	2,6-Dichlorophenol	2,6-Dichlorophenol				
95.5			+			
96.6				+		
97.3		+				

Conclusion

Phytophenolics are known to combat diseases and are very good antifungal[1] and antiallergic agents[10]. In the present study *Argemone mexicana* has shown two phenols tannic acid and 2,6-dichlorophenol in it, *Datura stramonium* has got 2,6-dichlorophenol, *Papaver somniferum* contains catechol and *Withania somnifera* indicates the presence of 4-chloro-*m*-cresol in it which was confirmed by co-TLC.

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