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PRELIMINARY PHYTOCHEMICAL SCREENING OF FOUR COMMON PLANTS OF FAMILY CAESALPIMACEAE

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ABSTRACT

Preliminary phytochemical screening of *Bauhinia variegata,* Cassia *fistula,* Cassia *tora* and Tamarindus indica did not reveal alkaloids and unbound anthraquinones while glycosides as well as flavonoids were present in all the four species of the family caesalpiniaceae. Cardiac glycosides were absent only in *C.tora* and saponins were present only in *T. indica' B. variegata* and *T. indica* were devoid of bound anthraquinones while bound anthraquinones were present in *C. fistula* and *C. tora.* Paper chromatography revealed 6 spots in solvent system I, and 5 spots in solvent system 2, showing different R_r values.

The per cent yield of crude glycosides was 3.18 in *B.* variegata, 4.03 in *C. fistula,* 4.45 in *C. tora* and 4.14 in *T. indica.*

Introduction

Pakistan is rich in rare and useful herbs from which medicines can be prepared. The pharmaceutical industry which should be using these herbs is dubious about the potentials of this source of drugs. Some of these herbs are exported to technically advanced countries and medicines in raw or finished form are imported from those countries. This way Pakistan is loosing by selling herbs cheep, and importing costly medicines. There is a need that the local herbs be evaluated for phytochemistry so as to determine the potentials of this indigenous source of medicines. Therefore, in present study four common plants of Faisalabad suburbs belonging to the family caesalpiniaceae were selected for phytochemical screening.

Materials & Methods

Four plants namely *Bauhinia variegata (Kachnar). Cassia fistula* (Amaltas), *Cassia tora* (Pawar), and *Tamarindus indica* (Imli), belonging to the family caesalpiniaceae were obtained from Faisalabad suburb. The plants were taken in flowering stage during the months of July and August. Theft taxonomic identifications were done with the help of the Department of Botany, University of Agriculture, Faisalabad. The whole plant comprising of root, stem bark, flower, leaves and fruit were dried to a constant weight in shade. The total dried mass was ground into a fine uniform powder. The following methods were employed for the identification of the seven phytochemical constituents.

Alkaloids were identified by the method of Brain and Turner (1975); using Dragendroffs (Harbome, 1973), (Mayer's 1963) and Wagner's Jenkins et al 1967) reagents.

Stas-Otto's procedure, as described by Brain and turner (1975) was employed for the detection of glycosides. Presence of reducing sugars in the concentrated filtrate as indicated by Fehling's solution and Benedict's reagent meant the presence of glycosides. Furthermore, dry glycoside contents in pigment and lead acetate free alcohol extract gave percentage of crude glycosides in the sample Descending paper chromatographic technique of Stock and Rice (1974) was employed for the identification of different glycosides, their rate of relative flow or R_f value was determined by the formula:

$$R_f \text{ value} = \frac{\text{Distance traveled by the component}}{\text{Distance traveled by the solvent}}$$

The two solvent systems comprised of 2, ethyl acetate: 1, pyridine: 2, water (No. 1); and 6, n-propanol: 1, ethyl acetate: 3, water (No. 2) The spraying reagent consisted of Analine (0.93gm), pthalic acid (1.80 gm) and n-butanol saturated with water (100 ml).

Cardiac glycosides were also identified by the method as detailed in Brain and turner (1975). The final appearance of a brown colour at the interface due to deoxy sugar and a pale green colour in the upper layer due to the steroid nucleus indicated the presence of cardiac glycosides.

Unbound as well as bound anthraquinones and saponins were identified by the methods described by Brain and turner (1975). Pink to cherry red colouration or precipitate with the addition of 0.5 percent NH4 OH solution to carbon tetrachloride extract of plant both with water and ferric chloride respectively, meant the presence of two types of anthraquinones.

Saponins were identified by the method of Brain and Turner (1975). The red blood cell haemolysis by the aqueous extract of powdered plant material indicated the presence of saponin.

Flavonoids were identified by the method of Willstatter (1966). Appearance of orange red to crimson colour on the addition of pieces of magnesium ribbon and drop by drop conc. HC1 in the alcohol extract indicated the presence of flavonoids.

Results and Discussion

The alcoholic extract of all the four plants *B. variegata C. fistula, C. tora* and *T. indica* did not show any precipitate either with Dragendroffs reagent or Mayer's reagent. This indicated the total absence of alkaloids in these four plants.

Glycosides were identified from all the four plants, as the Stas-Otto procedure give yellowish green precipitate with Fehling's solution and orange red precipitate with Benedict's reagent The presence of glycosides in *B. variegate* was reported earlier by Gupta et al (1980) and in *C. tora* Nadkami (1945).

Paper chromatography of alcoholic extracts of the plants in solvent system No. 1, showed six spots with R_f values 0.69 *(B. variegab),* 0.60, 0.90 *(C. fistula),* 0.63 *(C. tora)* and 0.64, 0.43 (*T. indica*). In the solvent system no. 2, 0.57 *(B. variegate),* 0.56, 0.96 (C. *fistula),* 0.62 (C. *tora)* and 0.57 *(T. indica).* Furthermore, percent yield of glycosides were 3.18 in *B. variegata* 4.03 in *C. fistula,* 4.45 in *C. tora* and 4.14 in *T. indica.*

A brown colour at the inter face and green colour in the upper layer was developed in a alcoholic extracts of *B. variegata, C. fistula* and *T. indica* which indicated the presence of cardiac glycosides in these three plants. Gupta et al (1980) also found cardiac glycosides in *B. variegata* in the form of beta sitosterol. Cardiac glycosides were absent in C. *tora.*

None of the four plants under scrutiny contained unbound anthraquinones in the composite sample. However, bound anthraquinones were noticed both in *C. fistula* and *C. tora.* Patil and Deshpande (1982) recorded bound anthraquinone in the form of 1,8 dihydroxy-3-methylanthraquinone in *C. fistula.* Pal and Pal (1984) and Chibilayer (1984) found this constituent in *C. tora,* while *B. variegata* and *T. indica* were devoid of bound anthraquinones.

Saponins were only present in *T. indica* while the water extract of the remaining three plant did not haemolyse red blood cells.

Orange red to crimson colour obtained when the alcoholic extracts of all the four plants being investigated were treated with magnesium ribbon and concentrated HCl: indicating the presence of flavonoids. Chakrabarty and Chawla (1983) also recorded 3,5,83',4',5',-hexahydroxy flavone in *c. tora.*

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