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PHYTOCHEMICAL AND BIOCHEMICAL ANALYSIS OF THE PLANT EXTRACT OF *Acacia concinna* (Wild)

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ABSTRACT

Phytochemical and biochemical screening of Acacia concinna belonging to the family Fabaceae was carried out for its medical values. A qualitative phytochemical analysis was performed for the presence of Alkaloids, Flavanoids, Glycosides, Phenol, Quinone, Saponin, Tannin, and Terpenoids. Different observation revealed the presence of biologically active compounds and chemicals exhibited changes in reactivity of powders. The biochemical parameters such as protein, total carbohydrates, total free phenolics, reducing sugar and total soluble sugars were assessed using standard procedures.

Key words: Medicinal plants, *Acacia concinna*, Phytochemical parameters and biochemical activities.

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INTRODUCTION

Knowledge of the chemical constituent of plants is desirable for the discovery of therapeutic agents and in discovering the actual value of folklore remedies. Traditionally, screening methods have been used to study the pharmacological effects of phytochemical compounds. *Acacia concinna* is a tree native of Asia. Its parts used as bark, leaves and pods. It is a common, prickly, scandent shrub, occurring in tropical jungles throughout India, especially in the Deccan. An infusion of the leaves is used in malarial fever. A decoction of the pods relieves biliousness and acts as a purgative. The pods are reported to be used in north Bengal for poisoning fish (Nathawat and Deshpande, 1973).

MATERIALS AND METHODS:

SAMPLE COLLECTION AND PREPARATION:

Acacia concinna pods were collected from Coimbatore district, Tamilnadu, India. The plants pods selected for the study were washed, air dried and powdered. 250 g of *Acacia concinna* pods yields 200 g powder.

PREPARATION OF THE EXTRACT:

About 50 g of dried powder samples were weighed and extraction process was carried out by using 200 ml of solvents (Formaldehyde,

Hexane, Alcohol, Petroleum ether, Chloroform and Water) in soxhlet apparatus for 18 hours. The extract was concentrated by evaporation at 100° C for 8 hours and then air dried. The concentrated extract were made in to a fine powder form and stored at room temperature prior to phytochemical screening.

PHYTOCHEMICAL AND BIOCHEMICAL ANALYSIS:

The phytochemical tests were carried out using different solvents extracts using standard procedures to identify the constituents as described by Harbone.J.U 1973. To assess the activity of selected medicinal plants, preliminary phytochemical analysis studies and phytochemical analysis were carried out. The biochemical parameters like Total protein (Lowry *et al.,* 1951), Total carbohydrates (Hedge and Hofreiter, 1962), Total reducing sugar (Miller, 1972), Total soluble sugar (Mahadevan and Sridhar, 1986) and Total phenol (Malick and Singh, 1980) were analysed.

RESULTS AND DISCUSSION:

Behavior of the pod powders

From the results it was proved that the pods powder of the plant were treated with chemicals like $FeCl_3$, NaOH, H_2O, I_2, HCl, KOH, Ethanol, HNO_3 and H_2SO_4 various shades of brown colours were obtained. The powder as such expressed light brown (Sand like) colour and when it was dissolved in water, no colour change was observed. Various colour changes were observed when treated with different chemical reagents are depicted in Table 01.

Table 01: Behavior of pod powder with different chemical reagents

	Powder as such	Brown
	Powder + 2% $FeCl_3$	Yellowish brown
	Powder + 10% NaOH	Yellow
	Powder + 5% KOH	Yellow
	Powder + water shake	Brown
	Powder + Iodine	Yellow
	Powder + NaOH + H_2O	Yellow
	Powder + C_2H_5OH	Light brown
	Powder + HNO_3	Orangish red
	Powder + H_2SO_4	Light Yellow

During a pharmacognostic study carried out on the flower of *Pterospermum cicerifolium* (L.) by Shome and Mehrotra (1990) greenish purple colour was noted on treatment with 1N HCl and nitro-cellulose.

PHYTOCHEMICAL SCREENING:

Phytochemical analysis plays a major resource for information on analytical and instrumental methodology in plant sciences. A preliminary study was done to identify the active constituents of *Acacia concinna*. Some of the phytochemical tests showed positive results Table 02. The phytochemical screened were protein, fat and oil, flavonoids, saponin, steroid, phenol, quinone and tannin.

Table 02: Phytochemical screening of *Acacia concinna* pods

S.No	Reagent	Nature of colour change	Inference	Phytochemical changes
1.	Substance + alcohol + $FeCl_3$	Greenish yellow	Present	Presence of phenol
2.	0.5g substance + 20mL H_2O is boiled. Then 0.1% $FeCl_3$	Brownish green	Present	Presence of tannin
3.	Substance + Sudan III	Shining orange colour	Present	Presence of fat and fixed oil
4.	Substance + 10% NaOH	Green brown	Present	Presence of flavonoids

5.	Substance shaken in water	Frothing present	Present	Presence of saponin
6.	Substance + chloroform+ drop of acetic acid, heated + conc. H_2SO_4	Orange	Absent	Absence of steroids
7.	Substance + conc. HCl	Green	Present	Presence of quinone
8.	Substance + Iodine followed by H_2SO_4	Brown	Absent	Absence of cellulose
9.	Substance + 2 mL chloroform + conc. H_2SO_4	Light orange	Absent	Absence of terpenoids
10.	Substance + 2 mL glacial acetic acid + 1 drop of $FeCl_3$ + 1 mL conc. H_2SO_4	Brown	Absent	Absence of glycosides

The preliminary phytochemical investigation of selected ethano-medicinal plants on Dindigul district showed the presence of phenolics, Flavonoids, Terpenoids and Alkaloids respectively.

Phytochemicals like alkaloids, phenol, Tannin, Fixed oil and Fat, Flavanoid, Saponin, Steriod, Quinone, Cellulose were analysed and present in *Acalypha indica,Vitex negundo and Coriandrum sativum* by (Vijayakumari and Hiranmai Yadav, (2008).

BIOCHEMICAL PARAMETERS OT TEST PLANTS:

Total Protein content

Biochemical studies on the pods powder on the plant *Acacia concinna* revealed that the protein content has been found to be 766 mg per 100ml (Table03).Slight variations was observed in the values of protein in water and powder extract.Udayakumar *et al*., (2003) studied the amount of protein present in *Solanum xanthocarpum*.

Total carbohydrates content

The total carbohydrate content in *Acacia concinna* has been found to be 400 mg per 100ml. (Table 03).

Naseer Banu *et al*. (2003) estimated carbohydrates contents in *Amaranthus viridis* and *Spinacea oleracea* in which, *A.viridis* showed higher carbohydrate (3.562 mg/g) than *Spinacea oleracea*.

Total Phenol content

The total Phenol content in *Acacia concinna* has been found to be 650mg per 100ml. (Table 03).

Amudhan *et al.* (1999) estimated the total phenol profile in some rice varieties in relation to infestation by Asian rice gall or *seolia oryzae*.

Reducing sugar and total soluble sugars

100 g of the powder of *Acacia concinna* pods showed 10.09 mg g^{-1} reducing sugars. The amount of total soluble sugar present in the plant pods of Acacia showed 56.54 mg g^{-1}. (Table 04).

The presence of reducing sugars and resins were reported by Wahi *et al*. (1984) in *Aganosma dichotoma* (Roth).Amount of total soluble sugar present in extracts and dried powders of *A.vera, A.calamus* and *S.racemosa* was observed.

Table 03 Estimation of total protein, total carbohydrates and total phenol.

S.No	Volume of sample taken	Protein (mg/100ml)	Carbohydrates (mg/100ml)	Phenol (mg/100ml)
1.	0.1	260	400	350
2.	0.2	390	275	535
3.	0.3	766	110	650

Table 04 Estimation of reducing sugar and total soluble sugar

S.No	Reducing sugar ($mg\ g^{-1}$)	Total soluble sugar ($mg\ g^{-1}$)
1.	10.09	56.54

CONCLUSION:

As the powders of the test plant were treated with chemicals like $FeCl_3$, NaOH, H_2O, I_2, HCl, KOH, Ethanol, HNO_3 and H_2SO_4, the colour changes were observed in the treated powders and the colour varied from yellow to brown shades.

The phytochemical screening of the test plant was done for their active components present for their medicinal values. Many of the phytochemical analysis showed positive results which render the presence of their active compounds. The biochemical analysis of the test plant showed the maximum Protein content compared to carbohydrates and phenol components. The presence of total soluble sugars is higher than the reducing sugar.

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