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## Research Article

### PHARMACOGNOSTIC AND PRELIMINARY PHYTOCHEMICAL STUDIES ON THE LEAF EXTRACTS OF CADABA FRUTICOSA (L.) DRUCE

Karthiyayini R\* and Dhanya P

Department of Botany, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore-641043, Tamilnadu, India

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#### ABSTRACT

*Cadabafruticosa* (L.) Druce. leaves were selected to screen pharmacognostic and phytochemical studies. Plant material was collected from forest areas in Coimbatore district, Tamilnadu, India. *Cadabafruticosa* (L.) Druce is a well-known medicinal plant, which has been valued in ancient system of medicine. The leaf extracts of various solvents were subjected to organoleptic, fluorescence analysis, and preliminary phytochemical screening. The study contributes to the development of standardization parameters of herbal drugs used in our system of medicine

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#### INTRODUCTION

Medicinal plants are a source of important therapeutic aid for alleviating human ailments. With increasing realization of the health hazards and toxicity associated with the indiscriminate use of synthetic drugs and antibiotics, interest, in the use of plants and plant-based drugs revived throughout the world. However, a large number of medicinal plants remain to be investigated, for their possible pharmacological value. Most of the pharmaceutical industry is highly dependent on wild population for the supply of raw materials for extraction of medicinally important compounds. A growing body of evidence indicates that secondary plant metabolites play critical roles in human health (Hertog *et al.*, 1993). Considering the adverse effects of synthetic drugs, the western population is looking for natural remedies, which are safe and effective (Saha *et al.*, 2011). It is believed that crude extract from medicinal plants are more biologically active than isolated compounds due to their synergistic effects (Jana and shekhawat, 2010). Secondary metabolites of plants serve as defence mechanisms against predation by many microorganisms, insects and herbivores (Cowan, 1999).

*Cadabafruticosa* (L.) Druce is one of the ancient medicinal plant belonging to the family Cappariaceae. In Siddha, the leaf

and fruit are used to treat worm infestation. The plant leaves are also used to treat gastrointestinal problems and urinary complaints (Jain, 1991). Leaf juice is used as a remedy for dysentery, stimulant, fever and lung problem (Watt and Breyer, 1962). Bark is useful in boils and cuts (Sreeramulu *et al.*, 2013). The present study aims to understand the pharmacognostical and phytochemical screening of *Cadabafruticosa* (L.) Druce. leaves.

#### MATERIALS AND METHODS

##### Organoleptic Study

The leaf powder of *Cadabafruticosa*, was used for these studies. The colour variation, taste and texture were the basis for this test as given by Jackson and Snowdown (1968).

##### Fluorescence Analysis

The fluorescence properties were studied under Ultra-Violet (UV) light adopting the method described by Kokosi *et al.* (1958), Chase and Pratt (1949). The behaviour of the leaf powder with different chemical reagents was studied and the fluorescence characters were observed under visible light and long UV light at 245 nm.

\*Corresponding author: Karthiyayini R

Department of Botany, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore-641043, Tamilnadu, India

### Preliminary Phytochemical Analysis

For the preliminary phytochemical analysis, the extract was prepared by weighing 100 gm of dried powdered leaf and were subjected to maceration with different solvents as per the polarity, methanol, petroleum ether and finally aqueous. The extracts were filtered in each step, concentrated and the solvent was removed by rotary evaporator. The extracts were dried over desiccators and the residues were weighed. The presence and absence of the primary and secondary phytoconstituents was detected by usual prescribed methods (Harbone, 1998).

#### Test of Alkaloids

Mayer's reagent: To 1 ml of the extract, 2 ml of Mayer's reagent was added. Appearance of dull white precipitate indicated the presence of alkaloids.

#### Test for Flavonoids

To 1 ml of extract, 1 ml of neutral ferric chloride was added. The formation of brown colour confirmed the presence of flavonoids.

#### Test for Tannin

To 1 ml of the extract, few ml of 5 per cent neutral ferric chloride was added. The development of a dark bluish colour indicated the presence of tannins.

#### Test for Phenols

To 1 ml of extract, lead acetate solution was added and the precipitate formation indicated the presence of phenolic compounds.

#### Test for Steroids

Liebermann-Burchard's test: The extracts were dissolved in 2 ml of chloroform to which 10 drops of acetic acid and 5 drops of conc. Sulphuric acid were added and mixed. The change of red colour through blue to green indicated the presence of steroids.

#### Test for Terpenoids

Salkowski test: 5 ml of each extract was mixed in 2 ml of chloroform and conc. H<sub>2</sub>SO<sub>4</sub> (3 ml) was carefully added to form a layer. A reddish brown colouration of the interface was formed to show positive results for the presence of terpenoids.

#### Test for Quinine

To 1 ml of extract, a few drops of conc. HCl is added. An yellowish brown colour is observed which shows the presence of quinine.

#### Test for Starch

To 1 ml of extract, a few drops of iodine solution. Any characteristic colour change shows the presence of starch.

#### Test for Cellulose

To 1 ml of extract, a few drops of iodine solution is added followed by a few drops of H<sub>2</sub>SO<sub>4</sub>. Dark brown or red colour observed shows the presence of cellulose.

### Test for Fixed Oil and Fat

To 1 ml of extract, a few drops of sudan III solution is added. A shining orange colour obtained shows the presence of fixed oil and fat.

## RESULTS AND DISCUSSION

### Pharmacognostic Study

The pharmacognostic characters of the leaf powder have been studied by screening the same through the following parameters.

### Organoleptic Study

The investigation on organoleptic study of the leaf powders of *C. fruticosa* (L.) Druce. indicated the characters like colour, odour, taste and texture. The colour of the dried leaf powder was dark green. The taste of the leaf is bitter and odour was very pleasant, whereas the texture was smooth (Table 1).

**Table 1** Organoleptic study of the *C. fruticosa* (L.) Druce leaf powder

1	Colour	Dark green
2	Odour	Pleasant
3	Taste	Bitter
4.	Texture	Smooth

### Fluorescence Analysis

The fluorescence analysis was observed in day / visible light and UV light when treated with different chemical reagents, is depicted in Table-2. Some constituents show fluorescence in the visible range in daylight. The ultra violet light produces fluorescence in many natural products, which do not visibly fluoresce in daylight. If substance themselves are not fluorescent, they may often be converted into fluorescent derivatives or decomposition products by applying different reagents. Hence crude drugs are often assessed qualitatively in this way and it is an important parameter for pharmacognostic evaluation of crude drugs. The present observation shows that in all the treatments (powder with different extracts) have some marked colour difference when compared to T<sub>1</sub> (powder as such). Similar works was carried out in the following plants *Nerium indicum* (Shah and Chakraborty, 2010) and *Cleome gynantra* (Anbazhahi et al., 2008).

**Table 2** Fluorescence analysis of the *C. fruticosaleaf* powders

Treatment	Treatment with chemical reagent	Observation	
		Day light	UV light
T 1	As such powder	Light green	Brownish green
T2	Ammonia	Lime green	Light green
T3	Iodine	Lime green	Lime green
T4	Fe Cl <sub>3</sub>	Light green	Lime green
T5	H <sub>2</sub> SO <sub>4</sub>	Lime green	Light green
T6	Ethanol	Lime green	Dark green
T7	Benzene	Lime green	Light green
T8	Acetic acid	Lime green	Light green
T 9	Chloroform	Dark green	Dark green
T10	Petroleum ether	Lime green	Dark green
T11	HCl	Lime green	Dark green
T12	H <sub>2</sub> O	Lime green	Light green

**Preliminary Phytochemical Study**

Pharmaceutical preparations derived from natural sources such as vegetables often contain compounds that contribute to the antioxidant defence systems and apparently play a role in the protection against degenerative diseases. The phytochemical screening of various extracts revealed presence of alkaloids, cellulose, flavonoids, phenols, steroids, starch, terpenoids, and tannins (Table 3).

**Table 3** Preliminary phytochemical analysis of *C. fruticosa* leaf extracts

Name of the compound	Aqueous	Chloroform	Ethanol
Alkaloids	+	+	+
Flavonoids	++	+	+
Tannin	++	+	-
Phenols	++	+	+
Steroids	-	-	+
Terpenoids	+	-	+
Cardiac glycosides	+	+	+
Starch	-	-	-
Cellulose	+	+	+
Carbohydrate	+	-	-
Fixed oil and fat	+	-	+
Protein	+	-	+
Quinone	-	-	-

+ - present; - - absence.

**CONCLUSION**

The comparative and multidisciplinary approach to the study of *C. fruticosa* does help in understanding their identification and medicinal importance. The adulterants in drugs obtain from *C. fruticosa* can be identify by this investigation. Adulterants if any can be easily identified using these parameters.

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