

Preliminary phytochemical screening of different solvent extracts of leaves and stem of *Crataeva religiosa* Hook & Frost

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Abstract

In the present study we carried out the qualitative phytochemical screening of *C. religiosa* leaves and stem were studied. Five solvents such as Aqueous, Methanol, Ethyl acetate and Chloroform, Acetone were used to obtain extracts from powdered plant parts. The extracts were subjected to qualitative phytochemical screening using standard procedures. Results showed that the nine phytochemicals screened for were present. These are alkaloids, flavonoids, phenols, tannins, steroids, terpenoids, coumarins, quinones and saponins. However, catechin was absent in leaves and stem extracts. The diversity of phytochemicals present suggests that *C. religiosa* leaves and stem could serve as a source of useful drugs.

Keywords: *Crataeva religiosa*, Phytochemicals, Leaves and Stem.

1. Introduction

Crataeva religiosa Hook & Frost belongs to family Cappariaceae. *Crataeva religiosa* commonly known as Mavilankai in Tamil is a common medicinal plant distributed throughout India and is known to have versatile medicinal values. The plant parts used for the medicinal purposes includes Leaves, stem bark and Root bark. The plant is used ethnopharmacologically as a diuretic, laxative, lithonotriptic, antirheumatic, antiperiodic, bitter tonic, rubifacient and counterirritant ^[1, 2]. The fruit juice, leaves and bark are used to cure snakebite, infected wounds and cuts. It increases the appetite and controls other skin diseases ^[3].

2. Material and methods

2.1 Plant material

Crataeva religiosa plant was collected from the natural population growing in the Sadhuragiri hills forest Area, Tamil nadu, India, during October 2014. The plant sample was taken to the Botany Research Laboratory and a Voucher specimen of the plant was deposited in the Botany research laboratory of V.H.N.S.N. College (Autonomous) for further references.

2.2 Preparation of extract

The dried leaves and stem extracts were treated to sequential extraction using five organic solvents on the basis of polarity of solvents (Acetone, Chloroform, Ethyl acetate, Methanol and Aqueous). 30g of the leaves and stems sample was taken in a separate conical flask and 200 ml of acetone was added. The conical flask was kept on mechanical shaker for 24 hours, after which the extract was filtered through Whatman filter paper 1. The pellet was allowed to dry and this pellet was used for the next solvent extraction (Chloroform, Ethyl acetate, Methanol and Aqueous). The dried extract was recovered and stored in Refrigerator for further analysis.

2.3 Phytochemical Screening

The collected plant extracts were subjected to qualitative phytochemical analysis for identification of various classes of active chemical constituents, carried out using standard methods.

2.4 Test for Alkaloids (Mayer's Test)

To 1 ml of leaf extract, 6 drops of Mayer's reagent was added. The formation of yellowish creamish precipitate indicated the presence of alkaloids ^[4, 5].

2.5 Test for Saponins (Foam Test)

1ml of leaf extracts was mixed with 5ml of distilled water. The contents were heated in a boiling water bath. Frothing indicated the presence of saponins ^[4, 5].

2.6 Test for Tannins (Braymer's Test)

1ml of the leaf extract was mixed with 2ml of water. To this 2 drops of 5% ferric chloride solution was added. Appearance of dirty green precipitate indicated the presence of tannins ^[4, 5].

2.7 Test for steroids (Salkowski Test)

To 2ml of the leaf extract, 2ml of chloroform was added followed by concentrated sulphuric acid. Formation of reddish brown ring at the junction showed the presence of steroids ^[6].

2.8 Test for terpenoids

To 2ml of the leaf extract 2ml acetic acid was added. Then concentrated sulphuric acid was added. Deep red color development showed the presence of terpenoids ^[6].

2.9 Test for Coumarins

2ml of the leaf extract was taken and 3ml of 10% sodium hydroxide was added. Appearance of yellow coloration indicates the presence of coumarins ^[6].

2.10 Test for Catechins

2ml of alcoholic leaf extract solution was treated with few drops of Ehrlich reagent and few drops of concentrated HCL. The formation of pink color indicates the presence of catechin [6].

2.11 Test for phenols

1ml of the leaf extracts was treated with 3% ferric chloride. The appearance of deep blue color shows the presence of phenol [7, 8].

2.12 Test for flavonoids

1ml of the leaf extracts was added with 1ml of sulphuric acid. Orange color formation confirmed the presence of flavonoids [7, 8].

2.13 Test for Quinones

1ml of the leaf extracts was treated with 5ml of HCL. Formation of yellow color precipitate indicates the presence of quinone [7, 8].

3. Results and Discussions

Results obtained for qualitative screening of phytochemicals in leaves and stem of *C. religiosa* are presented in table 1. Of the ten phytochemicals screened for, nine were found present in various solvent extracts. They are alkaloids, flavonoids, phenols, tannins, steroids, terpenoids, coumarins, quinones and saponins. In all, more phytochemicals were found present in the leaves than in the stem. Remarkably, Catechin was not present in leaves and stem. In a previous report bark extract of *Crataeva religiosa* was found to contain similar compounds [9].

Table 1: Result of phytochemical screening of leaves and stem extract of *Crataeva religiosa*.

Phytochemical Test	Leaves extract					Stem extract				
	Aqueous	Methanol	Ethyl acetate	Chloroform	Acetone	Aqueous	Methanol	Ethyl acetate	Chloroform	Acetone
Alkaloid	+	-	-	-	-	-	-	-	+	-
Catechin	-	-	-	-	-	-	-	-	-	-
Coumarin	+	+	-	+	-	-	+	-	-	-
Flavonoid	-	+	-	-	+	-	+	+	-	-
Phenol	-	+	-	-	+	+	+	-	-	+
Quinone	-	-	+	+	-	-	+	+	+	-
Saponin	+	-	+	+	+	+	-	+	+	-
Steroid	-	-	+	+	-	-	-	-	+	-
Tannin	-	-	+	+	-	-	+	+	+	-
Terpenoid	-	-	+	+	+	-	+	-	+	+

+ = indicates presence of phytochemicals, - = indicates absence of phytochemicals.

In the leaves, aqueous and methanol extracts showed the presence of alkaloids, flavonoids, phenols, coumarins and saponins. Ethyl acetate, chloroform and acetone extracts had coumarins, flavonoids, phenols, tannins, steroids, terpenoids, quinones and saponins.

In the stem, aqueous and methanol extracts showed the presence of flavonoids, phenols, tannins, terpenoids, coumarins, quinones and saponins. However, ethyl acetate and chloroform extracts had alkaloids, flavonoids, tannins, steroids, terpenoids, quinones and saponins. The stem acetone extract showed the presence of phenols and terpenoids.

The results indicate that *C. religiosa* leaves and stems hold promise as a source of pharmaceutically important phytochemicals. Flavonoids have been reported to have both antibacterial and antifungal activities [10]. The flavonoids and terpenoids properties in plants have been reported to exert multiple biological effects including antioxidant, free radical scavenging abilities and reduction in cell damage [11]. Alkaloids present in both stem and leaves plays a metabolic role in controlling development in living systems [12].

4. Conclusion

Phytochemicals found present in leaves and stem extracts of *C. religiosa* indicate its potential as a principle source for novel medicines. Furthermore, isolation purification and

characterization of the phytochemicals found in the present study will be of interest for further studies.

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6. References

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