

**COMPARATIVE PHYTOCHEMICAL SCREENING OF FLOWERS OF A FEW
MEDICINAL PLANTS**

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ABSTRACT : The flowers of a few medicinal plants such as *Calotropis gigantea*, *Caesalpinia pulcherrima*, *Cassia auriculata*, *Azadiracta indica*, *Catharanthus roseus* and *Nerium oleander* were collected, air dried, pulverized and subjected to methanol extraction. Methanol extracts were screened phytochemically for its chemical components. This revealed the presence of steroids, reducing sugars, triterpenoids, sugars, alkaloids, phenolic compounds, flavonoids, catechins, saponins, tannins, anthroquinons and amino acids. This study provides some scientific bases for the use of these flowers as a remedy for some infectious diseases in folkloric medicine. The phytochemicals observed could be attributed to the presence of some of the active compounds which will be used for the treatment of various diseases.

Key words: Phytochemicals, folkloric medicine, infectious diseases.

INTRODUCTION

India is a varietal emporium of medicinal plants and is one of the richest countries in the world in regard to genetic resources of medicinal plants. It exhibits a wide range in topography and climate, which has a bearing on its vegetation and floristic composition. Moreover, the agro-climatic conditions are conducive for introducing and domesticating new exotic plant varieties (Martins *et al.*, 2001). In recent years, secondary plant metabolites (phytochemicals), previously with unknown pharmacological activities, have been extensively investigated as a source of medicinal agents (Krishnaraju *et al.*, 2005). Thus, it is anticipated that phytochemicals with adequate antibacterial efficacy will be used for the treatment of bacterial infections (Balandrin *et al.*, 1985). Since time immemorial, man has used various parts of plants in the treatment and prevention of various ailments (Tanaka *et al.*, 2002).

Medicinal plants have been of age long remedies for human diseases because they contain components of therapeutic value (Nostro *et al.*, 2000). Medicinal plants are a source of great economic value all over the world. Nature has bestowed on us a very rich botanical wealth and a large number of diverse types of plants grow in different parts of the country. According to world health organization (WHO), more than 80% of the world's population relies on traditional medicines for their primary health care needs. The medicinal value of plants lies in some chemical substances that produce a definite physiologic action on the human body. The most important of these bioactive compounds of plants are alkaloids, flavonoids, tannins and phenolic compounds. The phytochemical research based on ethno-pharmacological information is generally considered an effective approach in the discovery of new anti-infective agents from higher plants (Duraipandiyani *et al.*, 2006). Hence this study focused the detection of phytochemical compounds present in the selected flowers of medicinal plants. The species tested were: Flowers of *Calotropis gigantea* L., *Caesalpinia pulcherrima* (L) Sw, *Cassia auriculata* L., *Azadiracta indica* A Juss., *Catharanthus roseus* (L.) G. Don and *Nerium oleander* L.

MATERIALS AND METHODS

Collection of plant materials

Fresh flowers of different medicinal plants were collected randomly from the region of Tirunelveli, India. The flowers screened together with their families and local names (Tamil) are given in Table 1. Fresh flowers were washed; shade dried and then powdered using the blender and stored in air tight bottles.

Methanol extraction

10 g of powder was added to 100 ml of methanol in a conical flask and plugged with cotton wool. After 24 hours the supernatant was collected and the solvent was evaporated to make the crude extract and stored at 4°C (Harbone JB, 1973).

Phytochemical analysis

Phytochemical analysis of methanol extracts of flowers of different medicinal plants was conducted following the procedure of Brindha *et al.* (1981) for detecting the phyto constituents.

RESULTS AND DISCUSSION

The preliminary phytochemical test was performed on the methanol extracts of flowers of six different medicinal plants followed by the procedure of Brindha *et al.* (1981). The results showed that all the phyto constituents are present in the selected flowers (Table 2). The development of different colours (Blue, Green, Red, Orange, and Purple) indicates the presence of appropriate chemical compounds. Appearance of blue colour indicates the presence of Steroids in the samples. Steroid was present in all the six flowers. Appearance of violet colour indicates the presence of triterpinoids in the flowers. It was present in the flowers of all the medicinal plant except *C. auriculata*. Development of reddish orange and purple colour represents the presence of reducing sugars and sugars respectively. These phytochemical compounds are present in all the selected flowers except *N. oleander* flowers. Development of white turbidity reveals the occurrence of alkaloids. Alkaloids are present in all the selected flowers. Appearance of intense colour and red colour represents the presence of phenolic compounds and flavonoids respectively. These two compounds are present in all the selected flowers. Appearance of dark pink and pink colour reveals the presence of catechins and anthroquinons respectively. These compounds are present only in the flowers of *C. pulcherrima*, *A. indica* and *C. roseus*. Presence of saponins, tannins and amino acids are revealed by the appearance of foams, white precipitate and blue or violet colour solution respectively. These phyto chemical compounds are present in all the flowers except *N. oleander*.

Table 1: Flowers of medicinal plant species selected for preliminary phytochemical test

Plant species	Family	Local name (Tamil)
<i>Azadiracta indica</i> A Juss.	Meliaceae	Vembu
<i>Cassia auriculata</i> L.	Caesalpiniaceae	Aavarai
<i>Caesalpinia pulcherrima</i> (L) Sw.	Caesalpiniaceae	Mayilkontrai
<i>Catharanthus roseus</i> (L) G. Don	Apocyanaceae	Nithya kalyani
<i>Calotropis gigantea</i> L.	Asclepiadaceae	Erukku
<i>Nerium oleander</i> L.	Apocyanaceae	Sewarali

Table 2: Preliminary phytochemical tests for methanol extracts of selected flowers

Compounds	<i>A.indica</i>	<i>C.auriculata</i>	<i>C. pulcherrima</i>	<i>C. roseus</i>	<i>C.gigantea</i>	<i>N. oleander</i>
Steroids	+	+	+	+	+	+
Triterpenoids	+	–	+	+	+	+
Reducing sugars	+	+	+	+	+	–
Sugars	+	+	+	+	+	–
Alkaloids	+	+	+	+	+	+
Phenolic compounds	+	+	+	+	+	+
Flavonoids	+	+	+	+	+	+
Catechins	+	–	+	+	–	–
Saponins	+	+	+	+	+	–
Tannins	+	+	+	+	+	–
Anthroquinones	+	–	+	+	–	–
Amino acids	+	+	+	+	+	–

(+): Present (-): Absent

Rembold (1989) reported that *A.indica* contains substances like nimbin, terpenoids, azadirone, azadiractin and these substances are useful in antimicrobial activities and treating various infectious diseases. Pranithanchai *et al.* (2009) reported that the flowers, leaves-sap, and other parts of *C. pulcherrima* are used to treat swelling, earache, muscular and rheumatic pain and various cardiovascular diseases. Various constituents like diterpenoids, and flavonoids has been isolated from the plant (Rao *et al.*, 2005). Hence this study suggests that the presence of various phytochemicals in the selected flowers may exhibits the medicinal uses for treating various infectious diseases.

CONCLUSION

The preliminary phytochemical analysis revealed the presence of steroids, reducing sugars, triterpenoids, sugars, alkaloids, phenolic compounds, flavonoids, catechins, saponins, tannins, anthroquinons and amino acids in the methanol extracts of all the selected flowers except *N. oleander*. Due to the presence of active phytochemicals the flowers of *Calotropis gigantea*, *Caesalpinia pulcherrima*, *Cassia auriculata*, *Azadiracta indica*, and *Catharanthus roseus* may be used medicinally in future.

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