

# Preliminary phytochemical analysis of some medicinal plants

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**Abstract:** - In the present study, leaf part of four medicinal plants such as *Murraya koenigii*, *Hibiscus rosa-sinensis*, *Lawsonia inermis* and *Eclipta prostrata* were analysed for the phytochemical screenings. Methanol was used as the solvent for the extraction of these plants. Phytochemicals are the chemical compounds present naturally in the plants. The various phytochemical compounds detected are known to beneficial importance in medicinal sciences. Hence above the plant extract could be expored for its highest therapeutic efficacy. The result showed that all the studies medicinal plants contain maximum classes of phytochemicals.

**Keywords:** leaf part, beneficial, naturally, medicinal sciences.

## I. INTRODUCTION

Medicinal plants play a major role in meeting the medical and health needs of about 70% of populations in developed and developing countries, which serve as an important resource of the treatment of various maladies and illnesses (Njoroge and Bussmann, 2007). Globally, about 85% of the traditional medicines used by different ethnic groups inhabiting various terrains for primary healthcare are derived from plants, especially in India; medicinal plants are widely used by all sections of the population with an estimated 7500 species of plants used by several ethnic communities (Farnsworth, 1988). The medicinal important of a plant is due to the presence of some special substances like alkaloids, glycosides, resins, volatile oils, gums and tannins etc. The active principles usually remain concentrated in the storage organs of the plants. The medicinal values of these plants lie in bioactive phytochemical constituents that produce specific physiological action on the human body (Akinmoladun et al., 2007).

Phytochemicals (From the Greek word phyto, meaning plant) are biologically active, naturally occurring chemical compounds found in plants, which provide health benefits for humans. In general, the plant chemicals that protect plant cells from environmental hazards such as pollution, stress, drought, UV exposure and pathogenic attack are called as phytochemical. They protect plants from disease and damage and contribute to the plants color, aroma and flavor. Photochemical accumulate in different parts of the plants, such as in the roots, stems and leaves. These compounds are known as secondary plant metabolites and have biological properties such as antioxidant activity, antimicrobial effect, modulation of detoxification enzymes, stimulation of the immune system, decrease of platelet aggregation and modulation of hormone metabolism and anti cancer property.

*Murraya koenigii*, belonging to the family Rutaceae is a small ever green tree native of India and found in Srilanka and other South Asian countries. Different parts of *M.koenigii* are used in folkloric medicine for treatment of various diseases. *Murrya koenigii* shows antioxidant activity with a high degree of radical-scavenging properties phytochemical screening is a method which exposes of reveals certain components or properties readily available in plants for bio-activity or ethno-medical applications. The leaves of *Murraya koenigii* commonly used in aromatic and some Asian cooking. Thus medicinal plants play an important role in the development of newer drugs because of their effectiveness, less side effects and relatively low cost when compared with synthetic drugs (Raj, 2011).

*Hibiscus rosa-sinensis*, Linn. (Malvaceae) is an evergreen woody, glabrous, showy shrub 5-8 feet in height. Leaves are bright green, short petiolated, ovate or lanceolate, more or less acuminate; irregularly and coarsely serrated towards the top, entire near base, glabrous on both sides. Flowers are solitary, axillary, bell shaped, large, 4-6 inches in diameter with pistil and stamens projecting from centre. Leaves are used as emollient, anodyne, and laxative in ayurveda. In south Asian traditional medicine, various parts of the plant is used in the preparation of a variety of foods. The flowers have been reported in the ancient Indian medicinal literature to have beneficial effects in heart diseases, mainly in ischemic disease and used in folklore medicine as demulscent, emollient, refrigerant, aphrodisiac, brain tonic and cardio tonic. A decoction of flower is also useful in bronchial catarrh menorrhagia and fertility control. The extracts showed hair growth potential anticonvulsive activity and hypoglycemic activity.

*Lawsonia innermis* L (Lythraceae,) is a tall shrub, commonly known as `Henna` or `Mehndi`. Leaves are small opposite, entire edge egg-shaped to largerly lanceolate, sub-sessile, about

1.5 to 5 cm long, 0.5 to 2 cm wide, greenish brown to dull green, petiole short and glabrous acute or obtuse apex with narrowing base.

This plant (leaves, flowers, seeds, stem bark and roots) are used in traditional medicine to treat variety of ailments like rheumatoid arthritis, headache, ulcers, diarrhea, leprosy, fever, leucorrhea, diabetes, cardiac diseases, oedema, bronchitis, menstrual disorder, rheumatism, hemorrhoids, jaundice, pain, spleen enlargement, dysentery, skin problem and pediculosis (Rahmoun et al., 2010) and used as a cosmetic agent for dyeing hair, nails and skin (Hanna et al., 1988).

Henna also exhibits antimicrobial and anti dermatological properties. The plant also has antidiarrhoeal, diuretic, emmenagogue and abortifacient properties and it is practically non-toxic. The majority of phytochemical constituents of *L. inermis* are found to possess significant anti inflammatory, analgesic and antipyretic activities. Currently henna is used as a counter stain in bacterial gram's staining.

*Eclipta prostrata* (compositae) is a herbaceous multibranched annual weed of moist places with long lanceolate leaves, hirsute stem and white flowers in axillary heads. The whole plant is astringent, depurative, emetic, febrifuge, ophthalmic, purgative, styptic and tonic. It is used internally in the treatment of dropsy and liver complaints, anemia, diphtheria, tinnitus, tooth loss and premature graying of the hair (Singh et al., 1993). Externally, it is used as an oil to treat hair dermatitis, wounds etc. (Chevallier, 1996). The plant juice, mixed with an essential oil, is used in the treatment of catarrhal problems and jaundice.

## MATERIALS AND METHODS:

### Collection of plant material

The leaves of *Hibiscus*, *Eclipta*, *Murraya* and *Lawsonia* were collected from different places in around the courtallam.

### Preparation of extract

Leaves were shade dried, powdered and stored in small vials. Five grams of leaf materials were extracted with 20ml of methanol for 48 hours using cold maceration methods. The extract was then filtered through Whatmann filter paper No.1 and the filtrate was evaporated. The solvent was evaporated under reduced pressure and the extract was analysed for phytochemical studies. The extract contains both polar and non-polar phytochemicals.

### Phytochemical screenings

The leaves extracts of viz., *Hibiscus*, *Murraya*, *Eclipta* and *Lawsonia* were analysed for the presence of flavonoids, alkaloids, glycosides, steroids, phenols, saponins, terpenoid, cardiac glycosides and tannins according to standard methods (Harborne, 1973 ; Sofowora, 1982; Trease and Evans, 1989).

## RESULTS AND DISCUSSION

Medicinal plants are being used by large proportion of Indian population. It has also been widely observed and accepted that the medicinal value of plants lies in the bioactive phytochemicals present in the plants. Phytochemicals are the chemical compounds present naturally in the plants. Some of the phytochemicals are alkaloids, Flavonoids, Saponins, phenol, tannins, protein, carbohydrate, cardiac glycosides, quinine, Terpenoids and steroids. Composition of phytochemical varied from plant to plant. In the present study the sample varieties showed the presence of various phytochemical compounds. Medicinal plants have potent phytochemical components which are important source of antibiotic compounds and are responsible for the therapeutic properties.

Methanol was used as a solvent for the extraction of different secondary metabolites of these plants. Phytochemical screening of different leaf samples using methanolic extract showed the presence of alkaloid, flavonoids, glycosides, saponins, tannins, steroids, phenols, cardiac glycosides and terpenoids.

The observations and inferences made in phytochemical tests of four medicinal plants such as *Murraya koengii*, *Hibiscus rosa-sinensis*, *Lawsonia inermis* and *Eclipta prostrata* is tabulated in table.1. These tests show the presence of various bioactive secondary metabolites which is responsible for the medicinal attributes.

### *Murraya koengii*

The results of phytochemical screening revealed the presence of Alkaloids, saponin, phenol, tannin, glycosides, steroids, flavonoids, Terpenoids and cardiac glycosides are present. Similar results also observed in acetone, chloroform and water extracts in Kumar et al., (2016). In flavonoids and alkaloids are found in *Lawsonia inermis* and *Murraya koengii* observed in Sohail et al., (2016). Flavonoids, phenolic compounds, alkaloids, glycosides and tannins are present in ethanolic extract *Murraya koengii* observed.

### *Hibiscus rosa-sinensis*

The results of the phytochemical screening revealed the presence of Saponin, glycosides, steroids, cardiac glycosides, tannins. Phenol and alkaloids are moderately present. Terpenoids and flavonoids are absent. Similar results were positively correlated with Gupta et al., 2009; Prasad (2014). But also contradictory results are observed in ethanolic extracts of *Hibiscus*.

### *Lawsonia inermis*

The results of the phytochemical screening revealed the presence of Alkaloids, phenols, saponin, tannin, glycosides,

flavonoids, terpenoids and cardiac glycosides. Steroids are absent. Similar results are observed in Raja et al., (2013).

#### **Eclipta prostrata**

The results of the phytochemical screening revealed the presence of Alkaloids, phenols, tannins, glycosids, terpenoids and cardiac glycosides. The test for Saponin and flavonids are showed negative results. Similar results also observed in ethanolic extract of Eclipta prostrata by Rajamurugan et al., 2013.

#### **Mixed leaf samples**

The results of phytochemical screening revealed the presence of all (Hibiscus, Murraya, Lawsonia, Eclipta) except in terpenoids. The Cardiac - glycosides are present in all the plants leaf extracts. These similar results are observed in hot extracts (Sermakani and Thangapandian, 2013).

The various phytochemical compounds detected are known to have beneficial importance in medicinal sciences. For instance, flavonoids have been referred to as nature's biological response modifiers, because of their inherent ability to modify the body's reaction to allergies and virus and they showed their anti-allergic, anti-inflammatory, anti-microbial and anti-cancer activities.

Alkaloids have been used to treat diseases like malaria, pain killers and managing heart diseases. Generally, glycosides are non volatile and lack fragrance cleaving the glycosidic bond yields the aglycone, which itself may be volatile and fragrant. Glycosides serve as defense mechanisms against predation by many microorganisms, insects and herbivores.

Saponin is used as mild detergent and in intracellular histochemical staining. It is also used to allow antibody access in intracellular proteins. In medicine, it is used in hypercholesterolemia, hyperglycaemia, antioxidant, anticancer, antiinflammatory, weight loss, etc. it is also known to have antifungal properties. Phenolic compounds are the largest group of phytochemicals and accounts for most of the antioxidant activity in plants or plant products.

Cardiac glycosides on the other hand are known to work by inhibiting the Na<sup>+</sup>/K<sup>+</sup> pump. This causes an increase in the level of sodium ions in the calcium ion. This inhibition increases the amount of Ca<sup>2+</sup> ions available for concentration of the heart muscle which improves cardiac output and reduces distention of heart; thus are used in the treatment of congestive heart failure and cardiac arrhythmia (Schneider and Wolfling, 2004)

Tannins are known to possess general antimicrobial and antioxidant activities (Rievere et al., 2009). Recent reports show that tannins may have potential value as cytotoxic and antineoplastic agents (Aguinaldo et al., 2005). Plant derived natural products such as flavonoids, terpenoids and steroids etc have received considerable attention in recent years due to

their diverse pharmacological properties including antioxidant and antitumor activity (De Feudis et al., 2003).

Conclusion to the results of the present investigation screening of four selected medicinal plants clearly reveals that maximum classes of phytoconstituents are present in all the studied plants. Hence above plant extract could be explored for its highest therapeutic efficacy by pharmaceutical companies in order to develop safe cure for various ailments. The presence of most general phytochemical might be responsible for their therapeutic effects.

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