



IJREB

ISSN 2321-743X

International Journal of Research in
Engineering and Bioscience

Volume 3 (Issue 2) Pages (54-63)

Journal home page: www.ijreb.org

SURVEY OF LAMIACEAE MEMBERS IN MAR THOMA COLLEGE CAMPUS AT KOLLAM DISTRICT, KERELA

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ABSTRACT

Surver of Lamiaceae family plants were undertaken in the locality of Mar Thoma College Campus in Kollam District, Kerala. The work is undertaken in this economically, more specifically, medicinally important family with a view to estimate their presence in the College campus. The frequency of Lamiaceae members in the Campus is higher when compared to other families. Out of the collected members *Leucas aspera* is found in highest frequency, next to *Leucas is Ocimum* and *Hyptis*. *Hptis* is mostly found on the road sides. Most collected species are highly medicinal and the preservation of these floras can enhance good health conditions, *Leucas aspera*

KEYWORDS: Mar Thoma College, Surver of Lamiaceae, *Leucas aspera* and *Hptis*



INTRODUCTION

Lamiaceae are cosmopolitan in their distribution and their chief centre is the Mediterranean region and Asia Minor. This is a predominantly herbaceous family which includes 200 genera and 3200 species. Willis (1966) mentioned 180 genera and 3500 species in India, the family is represented by about 69 genera and 421 species, of these 261 are endemic. Deccan and North Western India are chief centers of concentration. In South India, the family is restricted to dry eastern half (Vasishta, 1972). Sharma (2000) mentioned the largely distributed genera are Lamiaceae members and they include *Salvia* (500-700), *Hyptis* (400), *Thymus* (300-400), *Teucrium* (300), *Stachys* (300), *Scutellaria* (200), *Oscimum* (150), *Basil* (333), *Nepatha* (150), *Lavandula* (20), *Mentha* (25) and *Rosmarinus* (3).

Lamiaceae is related to Boraginaceae and Acanthaceae, but differs from the first in the ventral raphe and inferior micropyle of the ovule. Ovary characters separate it from Acanthaceae. According to Hutchinson, Lamiaceae is the most advanced family of the herbaceous dicots. It certainly competes with Asteraceae for that status. It is not easy to

choose between the two, because both have a large set of characters accepted as advanced and specialized.

Bentham and Hooker included 4 families in the order Lamiales (Lamiaceae, Verbenaceae, Selaginaceae, Myoporaceae). According to Hutchinson, this is eighty second order of the phylum Angiospermae, sub phylum Dicotyledoneae and division Herbaceae. This order comprises of four families eg: Myosporaceae, Selaginaceae, Globulariaceae and Lamiaceae. Engler and Prantl have placed the Lamiaceae along with 19 other families including Convolvulaceae, Verbenaceae, Solanaceae, Scrophulariaceae, Pedaliaceae, Acanthaceae etc in the sixth order of the tubiflorae of class Dicotylidoneae and sub class Sympetalae (Pandey, 2005).

Economic Importance

Many of the members are useful on account of volatile oils that are used in perfumery, medicine and as condiments. The leaves of *Mentha spicata* (Pudina) is used for fever, bronchitis and for preparing chutney help in indigestion and rheumatism. The leaves of *Thymus vulgaris* are effective against hook worm. The volatile oil extracted from



Manthaaquatic is used as a remedy for headache. The leaves of *Mentha longifolia* are used in rheumatic pain and some heart diseases and also as a carminative. The flowers of *Ocimum basilicum* are carminative, diuretic and stimulant; seeds are given in infusions to cure gonorrhoea, dysentery and chronic diarrhoea. The aromatic oil extracted from *Origanum vulgare* is given in colic and hysteria. *Nepeta glomerulosa* is used to cure Pneumonia. The ashes of flowers of *Leonotis nepetaefolia* are applied to burns and scalds and when mixed with curd are a cure for ring worm and some skin diseases. Mint oil extracted from *Mentha arvensis* is used in nausea and vomiting. The lavender oil extracted from *Lavandula latifolia* is used in perfumery and cosmetics. The peppermint oil extracted from *Mentha piperata* is used in pharmaceuticals and confectionery. *Coleus blumei*, *Lavandula officinalis*, *Ocimum basilicum*, *Rosemarinus officinalis*, *Salvia officinalis*, *Salvia splendens* are some of the plants of the Lamiaceae which are used as garden ornamentals.

Morphological Characters

Majority of the plants are annual or perennial herbs (*Ocimum*, *Salvia*, *Mentha*)

rarely shrubs as Brazilian species of *Hyptis* and some species of *Leucas* inhabiting the temperate region. In warmer climate, the plants become shrubby (*Teurium*, *Rosmarinus*, *Lavandula dentata*) in nature, wild or cultivated (*Salvia*, *Ocimum*, rarely climbers or twinnings, some species of *Scutellaria*). Majorities are aromatic and yield ethereal oils. *Manthaaquatic* grows in water, in clutches or wet places.

Root: Branched tap roots, but adventitious roots are found in some stoloniferous species and in *Mentha*, which propagate by suckers.

Stem: Aerial, erect, or sub erect, prostrate (*Glechoma hederacea*) or stoloniferous species (some species of *Ajuga*, underground sucker in *Mentha*, woody or herbaceous, hairy, squarish, branched solid or hollow. In *Hedeoma*, the stems are green and assimilatory because the leaves are reduced. The young shoots are usually four sided quadrangular.

Leaf: Usually the leaves are cauline and ramal, radical in *Horminum*, exstipulate, petiolate or sessile, opposite or decussate, simple, entire, serrate or pinnatifid (*perovskia*),



kidney shaped in *Glechoma hederacea* (ground ivy) hairy or glabrous, reticulate unicostate, green or variegated (*Coleus*), highly aromatic. In *Rosmarinus*, the leaf margins are revolute and the leaves are persistent. The leaves are reduced in some species of *Hedeoma* (Vasishta, 1972). A whorled leaf arrangement of 3-8 leaves is found in some genera. eg:- *Ocimum*. All parts of the plants such as stem, leaves and inflorescence are more or less hairy and possess glandular hairs which secrete characteristic scent of the genus or species. Sessile scented oil secreting glands are also found on the epidermis (Pandey and Diwakar, 2008).

Salvia bears bilipped brightly coloured flowers. It shows a special type of turn-pipe floral mechanism. Insects attracted by the inflorescence, colour and nectar glands on the lower lip. There are 2 stamens in the flowers each with a lever mechanism. Each stamen has a short epipetalous filament. One of the anther's lobes is sterile. Two anther lobes are separated by a long connective. The flowers are protandrous. An insect moves towards nectar, its head strikes with sterile anther lobe, thereby back of insect get the blow of fertile anther lobe. Pollen covered insects, when the flowers with older anthers withered (being

protandrous), pollinate the flowers from elongated style and get the nectar from nectar lying below the ovary (Arora and Ashok, 2002).

MATERIALS AND METHODS

The members of the family Lamiaceae, were collected from the Mar Thoma College Campus. The specific methods of study consistently used in the course of work as follows:

- 1) Collection of plant
- 2) Identification
- 3) Herbarium preparation
- 4) Photographs

Collection of plant

An extensive survey of various members of the family Lamiaceae was conducted during the month of July-August. The plant twig with the flowers, fruit etc. were collected and given the field number. Four specimens of a species were collected and given the same field number. The details such as habit, habitat, flowering and fruiting time. Dates of collection etc. were noted. Their vernacular names were also noted. Plants collected are; *Leucas aspera* (Wild.) Link, *Ocimum sanctum* Linn., *Ocimum gratissimum*



Linn., *Hyptis capitata* Poit; F.B.I, *Hyptis suaveolens* Jacq., *Coleus rotundifolius* (Poir.) A.Chev & Perrot. & *Orthosiphon thymiflorum* Benth.

Identification

Morphological identification of the collected species was done with the help of volume of 11 of Van rheed's *Hortus Malabaricus* (Manilal, 2003; Gamble, 1921).

Herbarium preparation

Herbariums of the collected species are prepared according to standard procedures (Pandey, 2005). The procedure is as follows,

- The plants specimens were sprayed with 2% solution of mercuric chloride.
- The specimens are pressed in the field press for 24 hrs.
- After 24 hours, they are transferred to an ordinary press.
- After drying, plant specimens are mounted on herbarium sheets.
- Specimens are labelled.

Photographs

The collected specimens are photographed in its natural habitats using a pentax-MZ 50 camera.

RESULTS AND DISCUSSION

Leucas aspera (Tumba)



Stalks and shoots slender, green, slightly rough, somewhat hairy, quadrangular, striated, knotted, and furnished with pith, which is aqueous in the upper or tender once, white in the lower or older ones. A coarse erect, diffusely branched annual herb with white flowers, the stems hispid or scab rid. The leaves are attached to the nodes of stalks in two or singly, are oblong narrow, slightly rough in the margin, incised with small teeth on the lower side striated rib-lets, with strong smell with very sharp and slightly bitter taste. Calyx tube tubular is 8-9 mm long.

Flowers come out from spiked heads, or also surround the stalk intermingled with leaves and are always attached around the apex of stalks, from which at random stand out four leaves flowers are two pedalled, irregular very white, one of which is more long and plain. The



other is very short, hood like downy on the outside with the orifice facing the open (petal). In them there are four stamens, short slender, white, where the apices are round and the style is thin and white.

Four seeds are found in the calyx, mutually adjacent to each other, are oblong, conical in some way and three sided with two sides plain and even, the third round, of very black colour is found the whole year, always flowering.

Uses: From the foot of the flowers honey like liquid is extracted. Boiled in oil, heals scabies, the juice kills worms in ulcers with lime heals the bite of dogs put into nostrils relieves headache, root given in decoction removes leprosy, the roots chewed are also the breath of chewed leaves removes 'dark spots'. They are cooked. Syrup made from its flowers is a remedy for cough and cold.

***Ocimum Sanctum* (Tulasi)**



Herbs, undershrub or shrubs are strongly aromatic from oil-glands. All plains districts, cultivated in pots or on pedestals at all Hindu houses and in temples and frequently found run wild. It's an aromatic herb cultivated for its medicinal value and for some religious background. The herb is worshiped in many parts of India by women folk. It grows as tall as 4.5 feet and is a sacred basil with erect much branch softly pubescent undershrub with red or purple small flowers.

It has much branched tap roots, aerials, erect four angled solid branched, hairy, woody below and herbaceous above and aromatic. Leaf is cauline and ramal, enstipulate, petiolate, opposite and decessate, simpliovate, semate, acute, reticulate, unicostate hairy herbaceous. The inflorescence is raceme of verticillasters, flowers are ebracteate, pedicellate, ebracteolate, complete; zygomorphic, bisexual, hipogynous, tetracyclic, pink, small, aromatic. Calyxes are ovoid or campanulate, deflexed in through and then usually enlarged and hardened (Manilal, 2003).

Uses: It is cultivated throughout India as culinaryherbsand medicinal plants. They are highly aromatic. The flowers are carminative



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diuretic and stimulant. Seeds are mucilaginous and are given in infusion to cure gonorrhoea, dysentery and chronic diarrhoea. Juice of leaves is used in cataract and bronchitis. It is also dropped in ear to stop ear ache. An infusion of leaves is useful in gastric and liver disorders. Seeds are given in disorders of genito- urinary system. Its roots are given in decoction in malarial fevers. Fresh roots, stems and leaves are applied in bites of mosquitos (Vasishta, 1972).

Ocimum gratissimum (Cattu- tirtava)



It is the second species of tirtava, in the language of the Brahmins Rama- tolasi is a plant five or six feet in height growing in sandy soils. Roots are fibrous, black stalks, quadrangular, slightly hairy, striates with a furrow, knotted.

Leaves arise both in twos and threes or also solitarily, are very broad, round, somewhat

oblong, serrate in the margin, thin, larger than those of the first species of very strong and pleasing smell with sharp taste. The rib with veinlets conspicuous on the upper surface slightly covered with hairs.

Flowers the same, but white, and in the incised petal from white to light green. Their stamens are four, white, whose apices as also the bifurcate style is white. Calyces are large, and apex striated with the nerve of the tongue shaped petal. Seeds are round, dark red, verging on brown.

Uses: It is a common ornamental aromatic shrub. The plant possesses medicinal properties. The seeds are given in head ache. It is also used as a mosquito repellent. It is cultivated as a culinary herb and the oil extracted from the root by distillation is very light, clear and a bit greenish, if very sharp taste rises up with water and floats over it. Root boiled heals fever with cough, and the oil extracted from root is pectoral (expectorant) promotes the digestion of the food, prevents the spoiling of liver, promotes urine and helps in strangury (painful retention of, or difficulty in discharging urine), gout, pleuritis, cleanses phlegmatic and coughly fluids.

***Hyptis capitata***

These are mostly herbs or shrubs, Leaves are opposite and Flowers small and medium sized variously arranged, often capitate. Calyx ovoid campanulate or tubular, subequally five lobed. Corolla tube cylindrical, five lobed, the lower lobe or lip deflexed and saccate.

Stamens are didynamous, declinate, filaments free and a four in number, Anther cells are confluent, Ovary four partite, styles with a sub entire or shortly bifid stigma, Fruit of four-dry ovoid or oblong nutlets, smooth and rugulose.

Hyptis suaveolens

It is mostly found in plains districts, on road sides and waste ground. It is introduced from tropical America and run wild. It is tall, sweet smelling herb with tetragonal hispid

stem; ovate, cordate, denticulate leaves reaching 4.5 inch long and small blue flowers, the fruiting calyx campanulate and ribbed with five aristate teeth. Its vernacular name is Wilayati tulsi (Gamble, 1921).



Uses: Decoction of leaves used to clean wounds. Decoctions of roots are used for amenorrhea. It is also used by the Maranaor for dry cough and tooth-aches; gas pains in infants and convulsions in children.

***Coleus rotundifolius* (Kurka)**



Mostly herbs are rounder shrubs, usually aromatic often fleshy. These are grown in sandy soils; root is rounding, bulbous, very fibrous, hairy, in the fibres furnished with new bulbs, inside thick and watery. The stalks are four cornered and light green. Leaves arise from the side of the stalks, in pairs, in a decussate order, on long, plain, thick petiole, furrowed on the inside and somewhat downy are oblong, round, minutely serrate, having in the margin, beset with very minute and hirsute hairs, thick, soft and green. From the mid rib, lateral ribs run out obliquely towards the anterior end.

Calyx is two lipped and tubes are usually decurved, upper lip broad and lower of four usually acuminate lobes. Corolla are two lobed; tube exserted, decurved; upper lip short and slightly four lobed, recurved, lower lip long, entire, boat shaped, narrow or stipitate at base. Stamens are four, didynamous, connate below in a sheath around the style. Other cells are confluent. Disc enlarged in front; ovary four partite; style slender, two-fid at tip. Fruit of four orbicular or ovoid nutlets, smooth; the basal scar small.

Uses: The underground tuberous stems are eaten as vegetables. The leaves of some other species are used as good ornamentals due to their variegated leaves.

Orthosiphon thymiflorum



Erect shrubs having 70-90 cm tall, leaves are 2.5-8*1.3-5.5 cm, puberulous on both surfaces, broadly ovate, denate, acute at apex, truncate or slightly cordate at base. Flowers are arranged in whorls and are purple with terminal racemes. Leaves are opposite and floral leaves are bract-like, usually short and reflexed, sometimes large and coloured. Corolla is two lipped; tube as long as or longer than the calyx, upper lip sub equally four lobed, lower declinate, entire, concave. Stamens are four in number, didynamous, declinate, and filaments are without appendages at the base and anther cells are confluent. Disc is usually gibbous; ovary four partite; style slender with



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ISSN 2321-743X

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capitate or clavate stigma. Fruits are usually smooth, the basal scar small.

Uses: It is used for treating the ailments of the kidney, since it has a mild diuretic effect. It is also claimed to have anti-allergic, anti-hypersensitive and anti-inflammatory properties, and is commonly used for kidney stones and nephritis. It is also used to treat gout, diabetes, hypertension and rheumatism.

CONCLUSION

The work is undertaken in this economically, more specifically, medicinally important family with a view to estimate their presence in Mar Thoma College Campus. The major conclusions drawn are as follows:

- The frequency of Lamiaceae members in the Campus is higher when compared to other families.
- Out of the collected members *Leucas aspera* is found in highest frequency.
- Next to *Leucas* is *Ocimum* and *Hyptis*. *Hyptis* is mostly found on the road sides.
- Least found are *Coleus* and *Orthosiphon*.

- Most collected species are highly medicinal and the preservation of these floras can enhance good health conditions.

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