Lepidagathis Keralensis: An Overview

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***Abstract*: *Lepidagathiskeralensis* family Acanthaceaeis a plant endemic to Kerala. The genus comprises about 110 species, mainly distributed in tropical and subtropical countries with 33 species in India. It is a hard prostrate shrub with woody root stalk. It is found in lateritic hills near sea coast mainly in exposed lateritic rocks. Commonly it is known as Paramullu. Previous studies showed that, plant is a rich source of many bioactive constituents and it possesses medicinal properties. Here the review designed to point out the pharmacological effect of *Lepidagathiskeralensis*.**

***Keywords*: *Lepidagathiskeralensis*, Acanthaceae, Pharmacology**

I. INTRODUCTION

Medicinal plants also called medicinal herbs. An herb can be any form of a plant or plant product, including leaves, stems, flowers, root, and seeds. An herbal medicine may be defined as a plant derived products for medicinal and health purpose. Natural products, mainly plant have been used for the treatment of various disease for thousands of years. The secondary metabolites produced by the plants are responsible for the biological activity of the plant and used synthesis of different drugs. According to WHO, 80% of the people are depends on medicinal herb as a primary health care system. Drugs of natural origin can be safe, cost effective, easily available and more potent. [1, 2]

Lepidagathis genus represented by 100 of species widely spread in tropical and subtropical regions of Asia and Africa.*Lepidagathiskeralensis*(Acanthaceae) is less explored plant for research studies.The family known to contain bio-active components likes cytotoxic, anti-fungal, anti-inflammatory, anti-oxidant and insecticidal properties. The plant had many medicinal properties. The spines of the plant used by Paniya tribes for digestive disorders. The plant is also used for kidney stone, asthma, chest pain, blood purifieretc.The major isolated chemical constituents of the genus include essential oils, sesquiterpenes, flavanoids, phenolics, alkaloids, inorganic minerals and saponins. [3,4]

Fig 1: *Lepidagathiskeralensis*

II. SCIENTIFIC CLASSIFICATION[5,6]

Kingdom: Plantae

Phylum: Tracheophyta

Class: Magnolisidae

Order: Laminale

Family: Acanthaceae

Genus: Lepidagathis

Species: *Lepidagathiskeralensis*

Common Name

- ✓ Kerala Lepidagathis

Vernacular Name

- ✓ Nonganampullu
- ✓ Paramullu
- ✓ Venappacha

Part used: Whole plant, stem, root and leaves

Flowering and fruiting: December-April

III. DISTRIBUTION

Global Distribution: South India (Kerala)

Indian Distribution: Kerala (Kannur- Ezhimala, Madayipara, Pazhayangadi)

Endemic Distribution: Southern Western Ghats

IV. DESCRIPTION [5, 6]

Habit	Herb
Habitat	Laterirte hills near sea cost
Root	Woody rootstock
Stem	Glabrous, Quadrangular, More or less winged
Leaves	Simple, Opposite, 10mm×3mm, narrowly oblong-lanceolate, Acute or blunt-acuminate at apex, Dark green with purple margins
Flowers	Sessile,1cm long, Pink, Sterile bracts(5-8), Oblong-lanceolate, sharply pointed spine
Fruit	Compressed capsule, 6mm long
Seed	2 seeds, flat, softly hairy with white aril

Calyx	Deeply 5-lobed, Lobe's unequal, Persistent, Similar to bracts
Corolla	10cm long, 2-lipped, upper lip 2-lobed, pink, lower lip 3-lobed, pink with white to yellow palate
Stamens	4, up to 6mm long, Purple to deep violet color
Ovary	Compressed ovoid,2mm long, 2-celled with one ovule in each
Style	Slender,7-8mm long

V. PHYTOCHEMICAL COMPOSITION[7]

Previous studies of researchers on Lepidagathiskeralensis revealed different phytochemical composition. Different parts of Lepidagathiskeralensis are reported with alkaloids, carbohydrates, tannins, glycosides, saponins, phlobatannins, flavanoids, resins, sterols, amino acids, protein, phytosterols, phenols, Terpenes.

VI. PHARMACOLOGICAL ACTIVITY

Antimicrobial Activity[8]

- *Antibacterial activity*

Antibacterial activity was done by Agar well diffusion method in the plant parts of *Lepidagathiskeralensis*.Two-gram negative strains (Pseudomonas aeroginosa and Klebsiella pneumonia), two-gram positive strains (Streptococcus aureus, Streptococcus mutants) are used. 20ml of prepared Muller Hinton Agar medium was added to petriplate while it is hot. Nutrient agar was dispensed evenly as required. It is then autoclaved at 121˚c for 15 minutes. The plates were then inoculated with bacterial culture. Wells are prepared on the plate, different concentration (25µg, 50µg, 100µg) of sample were added to this. Petri plates were incubated at 37˚c for 24 hr and zone of inhibition (ZOI) around the well is measured.

Gram negative bacterium Klebsiella pneumonia is inhibited by acetone extract of the stem and methanol extract of leaf and the ZOI was found to be 16mm and 15mm respectively. Methanol extract of the leaf shows maximum zone of inhibition 20 mm against pseudomonas aeroginosa compared to acetone extract of the stem.

All extracts of leaf and stem were effective against gram positive bacteria Streptococcus mutans. Methanol extract showing maximum ZOI of 15mm.In the case of Staphylococcus aureus all extract showed similar activity. The present study high light the importance of plant against microbial infections.

- *Antifungal activity[7]*

Antifungal activity is done by agar well diffusion method. Potato Dextrose agar plates were prepared and inoculated with fungus Candida albicans. Well, are prepared on the plates and different concentrations (25µg, 50µg, 100µg) of samples were added. The plates were incubated and zone of inhibition was measured. Methanol extracts of leaf and stem are effective against fungus. Zone inhibition was found to be 15mm and 16 mmrespectively.

Antioxidant Activity[9]

- *DPPH Assay*

Different extract (Pet.ether, acetone, methanol, aqueous) of leaf and stems of *Lepidagathiskeralensis* is used for measurement of antioxidant activity. DPPH is a stable free radical; the scavenging potential of the extract is measured by discoloration of DPPH in methanol. Different extracts of leaf and stem were tested for antioxidant activity. Decrease in absorbance indicates increase in antioxidant activity. Methanol extract of leaf and acetone extract of stem shows maximum inhibition of activity. Methanol extract shows 96.38% (IC_{50} - 122.46±0.85),acetone extract shows 86.46%(IC_{50}-231.87±1.69). Therefore, different part of the plant mainly stems and leaf shows potent antioxidant activity.

- *Reducing Power*

Antioxidant potential of the extract is determined by reduction of ferricyanide complex to ferrous, indicated by the color change from yellow to Perl Prussian blue colored complex. Absorbance is determined at 700 nm. Comparing to the ascorbic acid standard (1.462); methanol extract of leaf(1.226) and acetone extract of stem(0.826) shows highest antioxidant potential.

- *Determination of Total Phenolic Content (TPC)*

It is based on Folin-ciocalteu reagent method. 500µl of Folin-ciocalteu is mixed with 100 ml of plant extract. To this mixture add 1.2ml of 20% sodium carbonate. Make up to 10 ml using distilled water. Absorbance is measured at 765 nm using Gallic acid equivalent. Among the different extract (Pet. Ether, acetone, methanol, aqueous) tested for leaf and stem, methanol extract of leaf (139.76±0.41 mg GAE/g) and acetone extract of stem (102.00±1.40) contain maximum amount of TPC.

- *Determination Of Total Flavanoid Content (TFC)*

Different plant extract (pet. Ether, acetone, methanol, aqueous) are tested for total flavanoid content by Aluminum chloride colorimetric method.1ml of sample was dissolved in 4ml distilled water.0.3ml of $NaNO_2$ solution was added, 0.3ml of $Alcl_3$ was added. After 6 min 2ml of NaOH solution was added, mix well and absorbance of the solution is measured at 510nm. Rutin is used as standard. Different extract tested, methanol extract of leaf contained highest amount of TFC (258.33±1.47mg RE/g) and acetone extract of stem (240.00±2.42 mg RE/g)

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