

A REVIEW OF *LEPIDAGATHIS CRISTATA*Purma Aravinda Reddy<sup>1</sup>, J. Venkateshwar Rao<sup>2\*</sup><sup>1</sup>Associate professor, Talla Padmavathi College of Pharmacy, Warangal, AP, India<sup>2</sup>Principal, Talla Padmavathi College of Pharmacy, Warangal, AP, India

\*Corresponding Author Email: purmarddy@gmail.com

Article Received on: 20/10/13 Revised on: 11/11/13 Approved for publication: 20/11/13

DOI: 10.7897/2230-8407.041102

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## ABSTRACT

The medicinal plants are widely used by the traditional medicinal practitioners for treating various diseases in their day to day practice and in the traditional medicine different parts of the plant are used (leaves, flowers, roots, barks, seeds, fruits). *Lepidagathis cristata* willd is traditionally used by yanadi tribal people in Andhra Pradesh, India in pain, inflammation and fever and itchy affections. In this plant phytoconstituents like alkaloids and glycosides are identified so far and the pharmacological studies proved its immunosuppressive, antipyretic and above therapeutic effects. The present article highlights the phytochemical and pharmacological studies including folklore medicinal practice of the tribal people of the *Lepidagathis cristata* willd

**Keywords:** *Lepidagathis cristata*, Acantheaceae, Immunosuppressive Activity, Antipyretic, Analgesic, Anti-inflammatory.

## INTRODUCTION

Plants are one of the most important source of medicines and these are said to be bio synthetic lab for the most of the active principles like Alkaloids, Glycosides, Resins, Tannins, Flavonoids, Volatile oils, Gums and Oleo- resins etc, exhibit different dose dependant pharmacological and therapeutic effects<sup>1</sup>. Today a large number of drugs in the market are derived from plants, like Morphine (*Papaver somniferum*), Atropine (*Atropa belladonna*), Digoxin (*Digitalis purpurea*), Chloroquine (*Cinchona*), Reserpine (*Rauwolfia serpentina*), Sennosides (*senna*) etc. The plants are rich in secondary metabolites of therapeutic importance and the advantage is safety, economical and easy availability<sup>2</sup>. Because of these advantages medicinal plants are widely used by the traditional practitioners but still some inherent knowledge about medicinal plants was localized in some races like yanadi tribals for which they use *Lepidagathis cristata* as flokular medicine<sup>3</sup>. *Lepidagathis cristata* willd belongs to the family Acantheaceae commonly known as Nakkapidi, Lankapindi (yanadi tribal), Mullabanthi (Telugu), Karappan poondu (Tamil), Karappanundu (Malayalam), Otdhomp (Santhal). It is a perennial procumbent herb, braches numerous from highly reduced main stem; Leaves – sessile, 3- 6 x 0.5- 1 cm, linear – lanceolate, pubescent, acute at both ends, margin entire to serrulate; Flowers- In globose heads, crowded at the base of the stem; bracts elliptic, spinescent; bracteolate. Calyx – lobes 5, hairy. Corolla – white with brown or purple spots. The plant Stemens 4, exerted; Capsule oblong; seeds 2. It appears in dry places and waste lands in most districts like Boadh (Adilabad), Reddipalli (Ananthapure), Kodur (Cuddapha), Macherla, Gani (Guntur), Chandrasagar (Mahabubnagar), Nagarjuna Konda (Nalgonda), Pakal (Warangal). The other species of *Lepidagathis cristata* are also available those are

*Lepidagathis cuspidate*

An erect undershurb, up to 90 cm tall; Leaves of the main stem lanceolate, up to 15 x 5 cm, base long decurrent, apex acuminate; upper leaves smaller, linear. Flowers in elongate villous spikes, bracts coriaceous, 3- ribbed. Corolla white with purple spots, tube short. Stamens 4, didynamous. Capsule 4 – seeded. Rare in North costal Andhra and Kurnool

in forests that is Nallamala (Kurnool), Sapparala (Visakhapatnam). Fl: and Fr: December – January.

*Lepidagathis fasciculate*

Softly villous herb, 20 – 30 cm tall; Leaves in pairs, 3-8 x 1-3 cm, ovate – lanceolate, acuminate at both ends, margin deeply crenate; Flowers in terminal or axillary condensed spikes; bracts ovate, 3-ribbed. Calyx – lobes 5, slightly united at the base. Corolla white with purple spots, Stamens 4, Capsule pubescent, ellipsoid; seeds 4, sub orbicular, hairy when wetted; Occasionally in low hills of north costal Andhra Pradesh, India and Chittoor i.e. Talakona (Chittoore), Ramapa (East Godavari), Minimuiluru (Visakhapatnam).

*Lepidagathis hamiltoniana*

A stiff under shrub; Leaves linear or narrowly oblong; Scabrous on the nerves beneath, ciliate on the margin, up to 10 x 1 cm, nerves 5-7 pairs, distant. Flowers in heads, both at base of the stem and on the branches; bracts lanceolate, long spinous – acuminate, Stamens 4, Capsule 2- seeded. These plants are distributed in East Godavari and Visakhapatnam in Sal Forests i.e. exactly Ramapa (East Godavari), Chinagora (Srikakulam), Mangapedu (Visakhapatnam).

*Lepidagathis incurve*

A small perennial herb with woody root stock; Leaves very variable, up to 15 x 6 cm, lanceolate, decurrent at base, apex acuminate, Flowers in axillary and terminal heads; bracts hyaline, Corolla white with purple brown spots on the tip, tube long, glabrous; capsule 4- seeded, Occasional on road sides in dry places in all districts, especially at Rapur (Nellore), Galikonda (Visakhapatnam). Fl. and Fr.: December – March

*Lepidagathis mitis*

A stiff under shrub, the branches procumbent from a hard central root stock, Leaves up to 4 x 1.5 cm, oblong or obviate, pubescent scabrous on the nerve beneath, Shortly spinous mucronate, Corolla white or pale pink, spotted with brown or purple, Stamens 4, Capsule ovoid, 2 – seeded and it is available in dry sandy places in, Amudalakonda (Chittoor), Balapalli (Cuddaph), Karemudi (Guntur), Nagarjunakonda

(Nalgonda), Nellore and Medak districts.

### *Lepidagathis subramata*

A stiff under shrub, up to 1 m tall; Leaves sessile, 1-3 x 0.5-1.5 cm, linear-oblong, pubescent, prominently 5-6 nerved, apex acute, Flowers in elongate villous spikes; bracts ovate, suddenly long spinous- acuminate. Corolla pale pink with maroon spots near the throat. Stamens 4, Capsule 4- seeded. It is occasional in Kurnool and cuddapaha on black cotton soils. But particularly available at Cuddapah Forests, Guntur, Chelema, Velugode (Kurnool)<sup>4,5</sup>.

### Traditional Uses

The *Lepidagathis cristata* has been widely used by the yanadi tribal of Andhra Pradesh, India which is localized in Chittoor, Cuddaph, Anthapur, Kurnool districts in Seshachala hill ranges. It is used to cure fever, the aqueous extract of leaves mixed with Ocimum juice in 10:1 ratio and the tuberous flower ash mixed with coconut oil is applied externally on inflamed area. In Chhattisgarh, India the people use leaf extract especially for malarial fever and leaf extract is used to clean the cattle in rainy season and it is also used for skin itchy affection, burns and wounds<sup>3,4</sup>.

### Phytochemistry

The plant contains an tryptophan-derived alkaloid cristatin A and two known compounds, cycloartenol and stigmasta-5, 11(12)-diene-3 beta-ol, were isolated from the whole plant extract and flavonoids. The plant contains an tryptophan-derived alkaloid cristatin A and two known compounds, cycloartenol and stigmasta-5, 11(12)-diene-3 beta-ol, and flavonoids 6-hydroxyluteolin and its 7-O-apioside<sup>6,7</sup>.

### Pharmacological Activities

#### Immunosuppressive activity

The immunosuppressive activity (IC<sub>50</sub>) of alkaloid- I (cristatin) was assayed against con – A (2 µg/ml, T-cells) and LPS – induced (B- cells) proliferation of mouse splenic lymphocytes, here con- A and LPS were used as controls and cyclosporine A was used as standard drug. The immunosuppressive activity of alkaloid -I (IC<sub>50</sub>) against Con A and LPS induced proliferation is higher (1 µg/ml) than the immunosuppressive activity of tardiioxopiperzine A against the Con A LPS induced proliferation and lower than that of cyclosporine A (IC<sub>50</sub> 0.06 and 0.10 µg/ml)<sup>6</sup>.

#### Antipyretic Activity

The pharmacological study by B. Deepak Kumar *et al* on albino rats proved that then petroleum ether extracts of *Lepidagathis cristata* at the dose of 100 and 200 mg/kg body weight are significant in reducing the yeast induced pyrexia up to 4<sup>th</sup> h, with reference to the paracetamol as standard drug at 150 mg/kg body weight orally<sup>8</sup>.

#### Anti-inflammatory Activity

The anti-inflammatory activity<sup>9</sup> by Venkateswar Rao and Aravind Reddy *et al* proved that the methanoloic, ethyl acetate and chloroform extracts of leaf, flower and root extracts were showed significant activity at the dose of 200 and 400 mg/kg body weight on wistar rats with the standard drug diclofenac. Almost all the extracts were exhibited maximum protection at 120 and 180 minutes but leaf ethyl acetate extract was showed 44.8 % at 240 minutes time interval with significance of P < 0.001.

### Analgesic Activity

The pharmacological study by Aravinda Reddy Purma *et al* proved the analgesic activity of *Lepidagathis cristata* wild methanol, ethyl acetate, chloroform extracts of leaf flower and root at 200 and 400 mg/kg body weight p.o were administered in Eddy's Hot Plate and Tail Immersion methods were delayed the reaction time and exhibited good analgesic activity at 60 and 90 minutes time interval. The maximum activity exhibited by ethyl acetate and chloroform extracts<sup>10-12</sup>.

### Toxicology

#### Acute toxicity study

Acute toxicity study was carried out using female Albino Rats (150-200 g) by up and down/staircase method as per OECD guidelines. All the extracts were orally administered to different groups of rats at the doses of 50, 300, 1000, 2000 and 5000 mg kg observed for 48 h to study the general behavior of animals, sign of discomfort and nervous manifestation. All the extract was found devoid of mortality of animals at the dose of 2000 mg/kg body weight. Hence the 1/10<sup>th</sup> (200 mg/ kg, p.o.) and 1/5<sup>th</sup> (400 mg/kg, p.o.) of the dose selected for the screening of Analgesic and Anti-inflammatory activity<sup>13</sup>.

### CONCLUSION

The plant *Lepidagathis cristata* exclusively identified. The leaves are used internally for reducing fever and the flower ash mixed with coconut oil and used for external application for inflammation, wound healing and skin itchy skin affections by Yandi tribal people for longer time. The research study further may be continued in identifying the new phytoconstituents and other pharmacological studies to explore its utilization.

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**Cite this article as:**

Purma Aravinda Reddy, J. Venkateshwar Rao. A review of *Lepidagathis cristata*. Int. Res. J. Pharm. 2013; 4(11):6-8 <http://dx.doi.org/10.7897/2230-8407.041102>