



REVIEW ARTICLE

A General Appraisal of *Leonotis nepetifolia* (L) R. Br: An Essential Medicinal Plant

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ABSTRACT

The total plant species which India harbors includes many important medicinal plants some of whose potential is yet to be explored. As the demand of medicinal plants has increased globally due to insurgence of interest in and acceptance of herbal medicines, there is an urgent need to develop and implement cultivation of important medicinal plants on commercial scale. But, the most limiting factor for the plant production on commercial scale is the insufficient knowledge of agrotechniques including the balanced fertilizer management. The cultivation of medicinal plants is the key to meet the raw material needs of the industry based on the medicinal plant products. The review of literature reveals that *Leonotis nepetifolia* which belongs to family Lamiaceae needs special attention for its promotion of cultivation on a large scale. The present review scrutinizes the important medicinal properties of the plant.

KEYWORDS: medicinal plants, agrotechniques, *Leonotis nepetifolia*, medicinal properties

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INTRODUCTION

Since the dawn of human civilization mankind has used plant material not only as a source of nutrition but also for numerous purposes including medicines. Nature has gifted India with immense edaphic and climatic resources for agricultural productivity. India (8°-30° N and 68-97.5° E) exhibits a wide range in topography and climate, which has a bearing on its vegetation and floristic composition. This subcontinent is one of the world's twelve leading biodiversity centers. India has a wide range of environmental conditions ranging from sea level to high altitudes of Himalayas. The plant species which India harbors include many important medicinal plants some of whose potential is yet to be explored.

The genus *Leonotis* has 12 species widely distributed in Pan Tropics and is represented by one species, *Leonotis nepetifolia* in India. It belongs to family Lamiaceae. *Leonotis nepetifolia* is an important medicinal plant of repute in Indian traditional systems of medicine such as Ayurveda, Unani and Siddha. The Ayurvedic name of the plant is *Granthiparni*, while the Trade name is *Barchi Buti*. Common names of the plant are Knod Grass (English), Lion's ear (English), Gathivan (Hindi), *Matijer* (Gujrati), *Dipmal* (Marathi) and *Ranabheri* (Telugu). Medicinal uses of the plant are reported in Madagascar, Brazil, Canada, Kenya and many African Countries to treat diseases, rheumatism, dysmenorrhoea, bronchial asthma, fever and diarrhoea [1].

MORPHOLOGY AND ANATOMY

Leonotis nepetifolia generally grows in patches along roadside or barren unused agriculture waste land during rainy season. The mature plant attains the height up to 2 meter. The orange yellow coroneted verticillaster inflorescence and distinct odor are amongst the unique characters of this plant [2].

GEOGRAPHICAL DISTRIBUTION

The plant is widely distributed in Pantropics and is represented by 1 species - *Leonotis nepetifolia* (L.) R. Br. in India with bright orange scarlet flowers [3]. It is originally native to tropical and subtropical Africa; it is now naturalized all over the world. In India it grows along road sides in abandoned fields and in disturbed areas in hotter parts of the country.

MEDICINAL PROPERTIES

L. nepetifolia (Lamiaceae) is an important medicinal plant which has been used to treat bronchial asthma, diarrhoea, fever, influenza and malaria and is also an analgesic. This plant exhibited various biological

activities such as antifungal and anti bacterial activities. Phytochemical examination of this plant parts indicated the presence of different bioactive compounds. Traditionally, it was used to treat kidney diseases, rheumatism, dysmenorrhoea, bronchial asthma, diarrhoea, fever, influenza.

In India, the medicinal uses of the selected plant are reported for burns, breast swelling, ring worm, scalds, skin afflictions, malaria and rheumatic pain. Roots of *Leonotis nepetifolia* is considered as the botanical sources of *Granthiparna* (An ayurvedic herb) which is included in the formulations such as *Brihat Guduchi taila*, *Himasagar taila*, *Nakula taila* and *Mritasanjivani sura* [4].

The studies have reported that the plant exhibits following important constituents and activities:

The antioxidant and antiproliferative potential of the plant have been reported [5]. The wound healing capabilities of drug obtained from *Leonotis nepetifolia* has also been reported [6]. Researchers have reported the anti bacterial properties from the drug obtained from the plant [7]. The anti-rheumatic and anti-inflammatory action of plant has been described by researchers [8;9]. The analgesic and anti-cancer activities of the plant were demonstrated by the studies undertaken on selected cell lines [10]. The works supporting the anti-bacterial activity of *Leonotis nepetifolia* have been reported [9;11]. The traditional utilization of the plant as a medicine, an infusion is used against fever, cough, womb prolapsed and malaria has been presented [12]. It has been reported that plant exhibit various biological activities viz. antifungal, analgesic, anti-cancer, hypotensive, laxative, narcotic, antimicrobial [13;14].

The plant is used in cases of asthma and also for epilepsy in S. Africa [15; 16; 17]. The decoction of the leaves is used to treat coughs, burns and skin ailments. Other species of the *Leonotis* were reported to possess anti-malarial activity [18]. The earlier phytochemical studies carried out have reported the presence of Labdanic acid, Laballenic acid [19] nepetaefolinol and leonotin and a coumarin, characterized as 4, 6, 7-trimethoxy-5-methylchromen-2-one [20]. The plant is used in traditional medicine in therapy of bronchial asthma, diarrhoea, fever, malaria and as an analgesic agent in menstrual pains; also to treat common cold and to alleviate cough [15; 21; 22]. Researchers have reported the presence of antidiabetic activity of ethanolic whole plant extract of *Leonotis nepetifolia* in alloxan induced diabetic rats. [23]

The whole plant is used for menstrual pain and unspecified female complaints. [24] The plant has been evaluated for its hypotensive potential [25], anti inflammatory activity [26], anti plasmodial activity [18], and anti bacterial activity [27]. The flowers of the plant are used in case of hardly healing wounds, scars and burns. To burn healing, the seeds are used as well [28; 29; 30]. Researchers have reported the use of the plant ash, paste and leaf steam bath for the cure of paralysis, skin diseases, rheumatism and post natal swelling [31].

The plant has been reported to possess the qualities that can regulate periods and can control diarrhoea [32]. Workers have reported the febrifuge properties of *L. nepetifolia* [33]. The role of paste from plant in controlling the body swelling has also been described by some workers [34]. The decoction of the plant has inhibitory effects on the joint pain as believed by the tribes of Andhra Pradesh [35].

Various workers reported the utilization of flowers from the plant in scalds and burns as followed in the Ethnomedicinal system followed in India [36; 37; 38]. Kokani tribals of Nasik region of India region has been utilizing the paste of inflorescence of the plant with groundnut oil for wound healing [39; 40]. The possible role of root paste and flower ash of the plant for breast inflammation has been described by some researchers [41; 42].

The potential role of plant flower juice with sugar as a cure of night blindness has been described in Ethno-pharmaceutical claims by the Vanjari of Maharashtra State, India [43]. The role of plant inflorescence ash mixed with mustard oil for the post natal breast pain as followed and prescribed by the Tribals of Kota Hills in Andhra Pradesh, India [44]. The possible role of plant flowers and seed paste with Ghee for controlling cough and curing cuts, wounds and burns has also been reported [45]. Workers reported the possible treatment of Eczema by leaf paste of *L. nepetifolia* [46].

Workers reported the possible role of leaf juice from *L. nepetifolia* for curing malaria.[4, 12, 18] The depurative, febrifuge and antihelminthic properties of plant leaf infusion have been described by [32]. The tribes of Andhra Pradesh have been utilizing the plant leaf paste to treat the burning sensation of scorpion sting [47]. The possible role of decoction of plant (leaf, stem, and flower) has been reported [32]. The tribe culture of Adilabad district, Andhra Pradesh has records of utilization of root of this plant to control pre-natal vomiting [48]. The traditional knowledge of Bidar district of Karnataka state has been utilizing the plant seed paste for curing head sores [49]. Workers have reported the ethno medicinal utilization of the plant roots for burn cure from the Eastern Himalayan region of India [30].

Despite its luxurious growth in the tropical and sub tropical regions of South East Asia, the plant merits consideration due to its over exploitation. The national Medicinal Plant Board has prioritized and recommended this herb for cultivation [50]. The over exploitation of the plant duly necessitates a proper investigation of the available genotypic diversity and its conservation through commercial cultivation by

employing proper agrotechniques. The exploration of best varieties and improved cultivation practices would ease off the pressure on natural collection help to achieve to urgent goal of its conservation.

CULTIVATION AND PROPOGATION

The review of literature reveals that development of agronomic packages that can improve and stabilize production of the selected plant (*Leonotis nepetifolia*) needs special attention. The important components are selection of suitable genotypes, appropriate planting date(s), optimum nutrient doses and plant density coupled with judicious and timely supply of required amount of water.

CONCLUSION

Leonotis nepetifolia has appropriately been used in various traditional systems of medicine. Review of literature shows a very large scale of pharmacological activities of the studied plant. Considering the wide range of advantages of *L. nepetifolia* against common human ailments further studies are called for the development of its agrotechniques to cater the demand for the plant in various traditional systems of medicines. However the efficacy of *L. nepetifolia* needs verification through continued experimentation and clinical trials on human populations. Studying the genetic diversity in different populations of the species and genetic control of the active constituent of the plant may help in planning the conservation strategies. Developing tissue culture methods for mass production and improvement of the agro techniques in order to meet the increasing market demand which in turn will save the wild populations from extinction and decrease the pressure on the already fragile ecosystem is the need of the hour. Considering the wide range of benefits that this marvel herb possesses, an increase in research on this plant is expected in the time to come.

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