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Review Article

Comprehensive Study of Nirgundi Plant: A Survey Report

Rakesh Tiwle*[1], D. K. Sanghi [1]

[1]Shri Laxmanrao Mankar Institute of Pharmacy, Amgoan, Gondia, Maharashtra, India- 441902.

Abstract

The genus Vitex contains 270 species distributed around the world. It is an interesting source of potential bioactive molecules, as iridoids compounds, flavonoids, diterpenoids derivatives, phytosteroids, with antioxidant, anti-inflammatory, antimicrobial, Hepatoprotective activity, analgesic and antihistamine. It is a large aromatic shrub distributed throughout India. In ancient times it is used as a female remedy and also for pains in Ayurveda and also in Roman medicine. It is distributed through Indo-Malesia, Europe, Asia, West Indies and india, in india it is found in the outer Himalayas. It is also called as village pharmacy because it is used for the many disease like antibacterial, astringent, febrifuge, vermifuge, sedative, antitumor, tonic various chemical constituents like flavones, glycosides, volatile oil, flavonoids, tri terpenes, and tannins many others were identified in this plant.

Key words: Nirgundi, Antibacterial Activity, Anticulscunt Activity.

***Corresponding Author: Rakesh Tiwle,** Shri Laxmanrao Mankar Institute of Pharmacy, Amgoan, Gondia, Maharashtra, India- 441902

1. Introduction

Vitex negundo L. comanly known as Nirgundi belongs to family Verbenaceae it is used for the treatment of Analgesic, Antibacterial, Anticonvulsant, dengue, rheumatism, dyspepsia and diarrhea in a folkloric history it is used for cold, cough, asthma and also it strengthen the immune and inhibitory effect on *Xanthomonas axonopodis* and *Pseudomonas solanacearum* and Anticonvulsant activity were examine in the serve report from the local region in the qualitative examination constituents like alkaloids, carbohydrates, glycosides, phenolic compounds, saponins etc[1]



Figure No. 1 Nirgundi plant (Shri Laxmanrao Mankar Institute of Pharmacy, Amgoan)

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Geography Condition

Vitex usually grows from three to nine feet tall; under cultivation it can develop to 20 feet tall. This species is globally distributed in Indo-Malaysia, cultivated in America, Europe, Asia and West Indies. [2] Within India, it is found throughout the greater part of India, ascending to an altitude of 1.500m.

Cultivation

It prefers a light well-drained loamy soil.[3] It is widely planted as a hedge plant in between the fields and usually not browsed by the cattle. It produces root suckers which can also be utilized as planting material. An easily grown plant, plants tolerate temperatures down to about 10°C.

Leaf

Leaves are palmately compound, long; 3-5 foliate, petiole 2.5-3.8 cm the middle leaflet is petiolate; in trifoliate leaf, leaflet lanceolate middle leaflet 5-10 cm long and 1.6-3.2 cm broad, with 1-1.3 cm long it consist of β-caryophyllene; sabinene; 4-terpineol; gamma-terpinene; caryophyllene oxide; 1-oceten-3-ol; globulol; 5,3′-dihydroxy-7,8,4′-trimethoxyflavanone; 6-p-hydroxybenzoyl mussaenosidic acid; 2′-p-hydroxybenzoyl mussaenosidic acid viridiflorol; 5,3-dihydroxy,6,7,4 trimethoxyflavanone; 5hydroxy-7,4' dimethoxy flavones; 5,3'-dihydroxy-7,8,4'-trimethoxy flavanone; betulinic acid [3β-hydroxylup-20-(29)-en-28-oic acid]; 5-hydroxy-3,6,7,3',4'-pentamethoxy flavones; 5,7dihydroxy-6,4' dimethoxy flavonone; ursolic acid [2β - hydroxyurs-12-en-28-oic acid]; n-hentriacontanol; β-sitosterol; p-hydroxybenzoic acid; protocatechuic acid; oleanolic acid; flavonoids angusid; casticin; vitamin-C.[3,4]

Root

Roots are woody, fairly thick, 8-10 cm in diameter; external surface brownish, rough due to the presence of longitudinal fissures and a small rootlets.[5] The bark is very thin and corky portion can be scrapped off easily it consist of chemical constituent like 2α,3α-dihydroxyoleana-5,12-dien-28-oic acid; 2α,3β-diacetoxy-18-hydroxyoleana-5,12- dien-28-oic acid; 2β,3α-diacetoxyoleana-5,12-dien-28-oic acid; isovitexin, negundin-A; vitexin; (+)-diasyringaresinol; (+)- lyoniresinol; vitrofolal-E; vitrofolal-F, acetyl oleanolic acid; negundin-B; sitosterol; 3-formyl-4.5-dimethyl-8- oxo-5H-6,7-dihydronaphtho (2,3-b)furan.[6]

Bark

It is about 0.3- 0.5 cm thick; rough, lenticelular, outer surface yellowish grey, smooth; fracture short and splintery, longitudinally channeled and transversely cracked; inner surface darker than outer, blackish in colour.[7]

Lamina

shows single layered epidermis having mostly unicellular hairs, bi and multicellular and glandular trichomes being rare; hypodermis 1-3 layered interrupted at places by 4-8 palisade layers containing chlorophyll; [8] a large number of veins enclosed by bundle sheath traverse mesophyll; stomata present only on the ventral surface, covered densely with trichomes; vein-islet of leaf are 23-25 and vein termination number are 5-7 respectively.[9]

Dosage: Nirgundi Juice - 20 to 30 ml per day. Nirgundi leaf Powder - 3 to 6 grams.

Comman name of *Vitex negundo* Nirgundi in different languages.[10]

Sanskrit, *Indrani, Nilanirgundi, Nilapushpa, Nirgundi, Nirgundika, Renuka, Sephalika, Shephali, Shvetasurasa, Sindhooka, Sindhuvaram*. **Malyalam** [11] *Bem-nosi, Indrani, Karunocci, Noch-chi, Nochi, Vella-noch-chi* **Marathi** [12] *Nirgunda, Nengar, Nirgur, Lingur, Nirguda, Nirgundi, Limgud, Negumd*. **Hindi** [13] *Mewri, Nengar, Ningori, Nirgandi, Nirgunda, Nisinda, Panikisambhalu, Sambhal, Sambhalu, Nirgundi, Shimalu* **Urdu** [14] *Sambhalu, Tukhm sambhalu.* **Bengali** [15] *Nisinda, Sinduari, Beguna, Nishinda, Nishinde.* **Kannada** [16] *Bile-nekki, Bilenekki. Karilakki, Lakkagida, Lakki, Lakki-gida, Lakkili* **Oriya** [17] *Thingkhawilupa, Niligundi* **Tamil** [18] *Nallanocci, Nirkkundi, Nirkundi, Nochi, Sinduvara*.

Essential oil of fresh leaves, flowers and dried fruits[19]

β-guaiene; guaia-3,7-dienecaryophyllene epoxide; ethyl-hexadecenoate; α-selinene; germacren-4-ol; caryophyllene epoxide; (E)-nerolidol; β-selinene; α-cedrene; germacrene D; hexadecanoic acid; p-cymene and valencene. viridiflorol (19.55%), β-caryophyllene (16.59%), sabinene (12.07%), 4-terpineol (9.65%), γ-terpinene (2.21%), caryophyllene oxide (1.75%), 1-oceten-3-ol (1.59%), and globulol (1.05%).[20]

2. Methodology

Preparation of extracts

1. **Antibacterial Activity**[21]

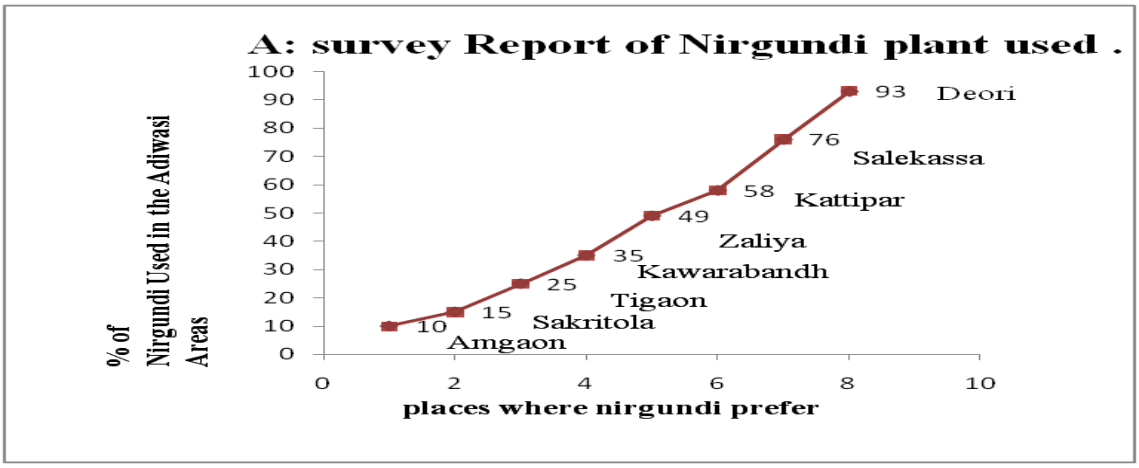
Leaf of Nirgundi plant dried in the atmosphere followed by it will be crusheds [22]. 50g powder was initially soaked in 200 ml of DCM (Dicholoro methane) in airtight conical flask in a shaker for 72 hours and then it was filtered through by muslin cloth and then filtered it through Whatman filter paper.[23] The filtrate was collected into airtight brown bottle, similar process was repeated thrice with fresh DCM and the filtrates were pooled together. Followed by the DCM can be removed by using rotary evaporator at low temperature and these dried extract material was stored in the refrigerator.[24] These exctract can be sprayed in to the plant important crop plants including potato, tobacco, tomato and groundnut to prevent the pathogenic bacteria, inhibitory effect on Xanthomonas axonopodis and Pseudomonas solanacearum[25].



Figure No. 2 Antibacterial activity on Tomato plant

2. **Anticulscunt Activity** [26]

Almost all parts of plant are used in the Ayurvedic and Unani system of medicines.[27] *Vitex negundo* (Verbenaceae), is used for inflammatory swelling of joints from acute rheumatism, healing wounds, ulcers and hepatic disorders.[28] Hence it was thought worthwhile to investigate the anti epileptic activity of alcoholic extract of roots of *Vitex negundo.*[29] A servey report of nirgundi plants used in the adivasi areas is shown in the following survey report [30].



MARKETED FORMULATION OF NIRGUNDI PLANTS [31]



Figure No. 3 Marketed formulation of Nirgundi.

3. Conclusion

Ethno botanical and traditional uses of *Vitex negundo* Nirgundi the fact that it is a popular remedy. The above study revealed the antibacterial activity and anticulscunt activity of *Vitex negundo* and *Allium sativum* against *Pseudomonas solanacearum* and *Xanthomonas axonopodis* extract of flower of *Vitex*

negundo showed higher inhibitory effect. Further, this is the first report that demonstrates the inhibitory effect of *Vitex* the results of this study provide support for the traditional use of *Vitex negundo* as an anticonvulsant drug. Phytochemical screening has shown the presence of alkaloids, carbohydrates, glycosides, phenolic compounds, saponins and sterols in alcoholic extract. The potent activity may be attributed to the presence of these phytoconstituents.

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