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Review Article

A COMPREHENSIVE REVIEW OF *JATAMANSI* (NARDOSTACHYS JATAMANSI)

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ABSTRACT

Jatamansi, that is *Nardostachys jatamansi,* is a well-known plant used in Ayurveda classics, which is used in "nervous headache, excitement, menopausal symptoms, flatulence, epilepsy and intestinal colic". A lot of research has also been conducted on this plant exploring its pharmacological utilization. Though there are many review articles available on this plant but no review has comprehensively covered all aspects of *Jatamansi.* **Objectives:** This article is thus aim to collect and comprehensively review information available regarding the medicinal use of *Jatamansi* and identify areas that need further research. **Data source:** *Jatamansi* (*Nardostachys jatamansi)* was reviewed from *Samhitas* and from more than 55 research articles for medicinal uses and other important aspects. **Review methods:** This review is in a narrative format and done from literature and publications relevant to *Jatamansi* that were identified through a systematic search of major computerized medical databases. **Result:** *Jatamansi* (*Nardostachys jatamansi)* is concluded to have indications- *Vatavyadhi, Shotha, Shoola, Daha, Varnavikara, Swedadhikya, Apasmara, Apatantraka, Unmada, Manasavikara, Mastishkadaurbalya, Shirahshoola, Agnimandya, Anaha, Udarashoola, Chhardi, Kamala, Hriddrava, Raktabharadhikya, Arsha, Hikka, Kasa, Shwasa, Mootrakrichchhra, Klaibya, Sadyovrana, Bhagna, Garbhashayashotha, Twagvikara, Vatarakta, Sannipatika jwara, Mukharoga, Netraroga, Vishavikara & Bhootabadha. Jatamansi* also possesses activities like hepatoprotective, antifungal and antibacterial, cardio protective, hypolipidemic, antidepressant, antioxidant, neuroprotective, antiparkinson, anticonvulsant, antihyperglycemic, nootropic, anticancer and radioprotective. **Conclusion:** Ayurvedic indications of *Nardostachys jatamansi* are compared with Article concluded effect and then areas of further research are identified.

INTRODUCTION

Nardostachys jatamansi DC. From Valerianaceae family, is commonly known as Indian spikenard. *Jatamansi* is found in Himalayas and used for spinal headache, excitement, menopausal symptoms, flatulence, cardiac disease, epilepsy and intestinal colic etc. The roots and rhizomes of *Jatamansi* have been used to treat hysteria, syncope epilepsy, and mental weakness.[1]

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Jatamansi oil in combination with cold water, is effective against nausea, stomach ache, liver problems, kidney complaints, insomnia and headache.[2] Externally, the oil is used to treat uterine inflammation as added to steam bath and also used in eye compounds, atrial flutter and as poison antidotes.[3]

METHODOLOGY

This literature review was compiled from Ayurvedic text, relevant modern science books, research published articles both from print and electronic resources. Computerized medical databases E-Samhita, PubMed., Google Scholar, Medline, Embase, Mantis were searched using these keywords: *Nardostachys jatamansi,* sesquiterpenes, jatamansone, pharmacology etc. Results of these

searches were reviewed with respect to medicinal uses of *Jatamansi* and other important aspects.

OBSERVATIONS AND RESULTS

Plant Distribution

Jatamansi consists of dried rhizome of *Nardostachys jatamansi* (Family-Valerianaceae), is an erect perennial herb, growing at an altitude of 3000-5000 m, on the sub-alpine Himalayan tracts.[4] *Jatamamsi* grows in moist and grassy slopes of India, Nepal, China and Bhutan.[5]

Vernacular Names [6]

Sanskrit: *Jatamamsi*

English: Spikenard, Indian Nard, Musk root, Nardus root

Hindi: *Balchar, Balchir, Baluchar, Jatalasi, Jatamansi, Kanuchara*

Gujarati: *Jatamasi, Kalichad, Baalchad*

Bengali: *Jatamamsi*

Kannada: *Jatamamsi, Jatamavsi, Bhootajata, Ganagila maste*

Malayalam: *Jetamanshi, Manchi, Jatamanchi*

Punjabi: *Billilotan, Balchhar, Charguddi*

Tamil: *Jatamashi, Jatamanji*

Telugu: *Jatam-imshi, Jatamamsi, Jatamsi*

Oriya: *Jatmansi*

Marathi: *Jatamavshi, Jataman*

Taxonomical Classification[7]

Kingdom: Plantae

Division: Tracheopyta

Class: Magnoliopsida

Order: Dipsacales

Family: Valerianaceae

Genus: Nardostachys

Species: N. jatamansi

Latin name: *Nardostachys jatamansi DC*.

Botanical Description[8]

Morphology- It is an erect, perennial, aromatic herb. Plant height is 10-70cm. Plant has long, woody greyish, rhizomatous, tail-like rootstock covered with reddish-brown hairs or tufted fibrous remains of the petioles of withered radical leaves.

Leaves- Radical leaves are 15-20x2.5cm, longitudinally nerved, glabrous, narrowed into the petiole. While cauline leaves 1 or 2 pairs, 2.5-7.5 cm, sessile, oblong or subovate.

Flowers- Flower is pale-white or pink coloured in terminal corymbose cymes.

Fruit- Fruit 4mm long, covered with ascending white hairs. They are crowned by ovate, acute, dentate calyx teeth.

Flowering - June-July; Fruiting: September-October.

Picture 1: Leaves & Flowers of *Jatamansi*

Ayurvedic Properties[9]

Rasa (taste) - *Tikta, Kashaya*

Guna (qualities) - *Laghu*

Virya (potency) - *Sheeta*

Vipaka - Katu

Prabhava - Bootaghna (Manasdoshahar)

Doshaghnta - Tridoshashamaka

Part used- Rhizome

Chemical Constituents[10]

Actinidine, carotene, aristolens, calarene, calarenal, elemol, droaristolene, b-udesmol, jatamols A & B, jatamansic acid, jatamansone, nardol, nardostachonol, nardostachone, seychellane, spiro jatamol, valeranal, valeranone, virolin, angelicin, jatamansin, jatamansinol, orosenol etc.

Medicinal Uses In Ayurveda Classics[11]

Karma: *Sheetala, Varnya, Vedanasthapana, Sangyasthapana, Medhya, Bhutaghna, Balya, Akshepashamana, Nidrajanana, Shamaka, Deepana,*

Pachana, Yakriduttejaka, Dahaprashamana, Anulomana, Shoolaprashamana, Hrid-balya, Raktabharaniyamaka, Vajikara, Pittasaraka, Artavajanana, Swedajanana, Kushthaghna, Nadibalya, Keshavardhana, Jwaraghna, Udveshthananirodhi, Mootrala, Mridurechana, Soumyanasyajanana.

Traditional Uses[12]

Sannipatikavikara, Vatavyadhi, Shotha, Unmada, Murchha, Chitodvega, Manasavikara, Vismriti, Shoola, Daha, Visphota, Vranashotha, Varnavikara, Swedadhikya, Sweda-daurgandhya, Apasmara, Apatantraka, Mastishka daurbalya, Shirahshoola, Kampavata, Nidranasha, Agnimandya, Anaha, Udarashoola, Amashayashotha, Chhardi, Kamala, Hriddrava, Raktabharadhikya, Arsha, Hikka, Kasa, Shwasa, Mootrakrichchhra, Bastishotha, Klaibya, Piditartava, Sadyovrana, Bhagna, Garbhashaya shotha, Twagvikara, Vatarakta, Visarpa, Daurbalya, Sannipatika jwara, Raktaprakopa, Bhrama, Dantashoola, Mukharoga, Mukhadaurgandhya, Netraroga, Vishavikara, Ashmari, Kushtha, Bhootabadha.

Pharmacological Activities

Hepatoprotective Activity[13]

Pre-treatment of rats with 800mg/kg, per oral of 50% ethanolic root extract of *Nardostachys jatamansi,* significantly lowers the elevated levels of serum transaminases and alkaline phosphatase in thioacetamide induced Liver damage.

Antifungal and Antibacterial Activity[14]

Nardostachys jatamansi root extract when tested against *Saccharomyces cerevisiae, Aspergillus niger, Candida albicans, Streptococcus faecalis, Klebsiella pneumonia, Klebsiella pneumonia, Staphylococcus epidermidis* by dilution of agar by 500 ig/ml and 1000 ig/ml.

Cardio Protective Activity[15]

Nardostachys jatamansi root extract showed significant changes in antioxidant enzymes and lipid peroxidation levels in rats with myocardial damage that was demonstrated by elevated serum marker enzymes by Doxorubicin at the dose of 15mg/kg, i.p. administered.

Hypolipidemic Activity[16]

Nardostachys jatamansi extract pre treatment at the dose of 500mg/kg orally for a week in Doxorubicin induced rats at the dose of 15mg/kg, i.p. administer, showed a significant drop in serum low density lipoproteins, very low density lipoproteins and rise in high density lipoproteins levels, resulting in alteration of serum and cardiac lipid metabolizing enzymes.

Antidepressant Activity[17]

"Nardostachys jatamansi root extract at dose of 200 and 400mg/kg, p. o. was compared with standard drug imipramine [10mg/kg, p. o.] in normal and sleep deprived mice and it produced significant [P<0.001] antidepressant like effect in both TST and FST and their efficacies were found to be comparable to imipramine at the dose of 10mg/kg, p.o."

Antioxidant, Neuroprotective Activity and Stress Relieving Activity[18]

*W*istar rats divided into four groups native, stressed, T-200 and T-500 stressed, with oral pre-treatment of *Nardostachys jatamansi* root extract 200 and 500mg/kg, respectively showed potent antioxidant activity and significantly reversed stress-induced elevation of LPO and NO levels and decrease in catalase activity in brain.

Antiparkinson Activity[19]

Nardostachys jatamansi root extract used in rats at 200, 400 and 600mg/kg for 3 weeks, dose-dependently restored increase in drug-induced rotations and decrease in locomotor activity and muscular coordination due to 6-OHDA [12mg in 0.01% in ascorbic acid-saline] injections.

Anticonvulsant Activity [20]

Rats Pre-treated with phenytoin at doses of 12.5, 25, 50 and 75mg/kg with 50mg/kg of *Nardostachys jatamansi* root extract resulted in a significant increase in the protective index of phenytoin from 3.62 to 13.17, clearly demonstrated the synergistic action of both drugs.

Anti-hyperglycemic Effect/ Antidiabetic Activity[21]

Nardostachys jatamansi root extract used at 200mg/kg, 800mg/kg and 1200mg/kg dose for 10 days, depict that 1200mg/kg dose had significant antihyperglycemic effects as compared to disease model rats and no toxicity effect even at 3000mg/kg dose.

Effect on Estrogen and Hair Growth[22]

Nardostachys jatamansi root extract was studied for the growth of hairs due to cancer treatment and showed hair growth promotion activities.

Nootropic Activity[23-24]

Nardostachys jatamansi root extract at 3 doses 50, 100, and 200mg/kg, p.o for 7 days was administered to both young and aged mice and at 200mg/kg dose it significantly improved learning and memory in young mice and reversed diazepam induced amnesia at 1mg/kg, i.p. and scopolamine 0.4mg/kg.

Anticancer Activity[25]

Nardostachys jatamansi root extract at 30mg/ml and 100µg/ml explored for *in vitro* anti proliferative potential against two neuroblastoma human cancer cell lines using SRB assay and showed growth inhibition of 54% and 91% against IMR-32 and 45% and 82% against SKN- SH cancer cell lines respectively.

Radioprotective Activity[26]

Nardostachys jatamansi root extract was studied in swiss albino mice exposed to 6Gy in electron beam radiation (EBR). Survival assay was depicted lethal dose for EBR and dose reduction factor (DRF) of *Jatamansi* extract was calculated by taking the ratio between LD_{50} of EBR with and without *Jatamansi* extract treatment.

DISCUSSION

It is the need of time to explore research of various traditional medicines on scientific background. *Jatamansi*, that is *Nardostachys jatamansi,* is a well-known plant used in Ayurveda classics for various ailments. It is used in "nervous headache, excitement, menopausal symptoms, flatulence, epilepsy and intestinal colic etc." This pharmacological review of *N. jatamansi* demonstrated that it is having hepatoprotective activity, antifungal and antibacterial activity, cardio protective activity, hypolipidemic activity, antidepressant activity, antioxidant, neuro-protective activity and stress relieving activity, antiparkinson activity, Anticonvulsant activity, antihyperglycemic effect/ antidiabetic activity, effect on estrogen and hair growth, nootropic activity, anticancer activity and radioprotective activities, which are correlated with Ayurvedic indications and further researches will needed to be carried out to explore other Ayurvedic indications like *Vatavyadhi, Shoola, Daha, Visphota, Arsha, Hikka, Kasa, Shwasa, Mootrakrichchhra, Bastishotha, Sannipatika jwara, Dantashoola, Mukharoga, Mukhadaurgandhya, Netraroga, Vishavikara, Ashmari, Kushtha, Bhootabadha.*

Conclusion

Table 1: Comparison between Ayurvedic Indications and Article Concluded Effects

Ayurvedic Indication	Article Concluded Effects
Agnimandya, Anaha, Udarashoola, Amashayashotha, Chhardi, Kamala, Hriddrava	Hepatoprotective activity
Shotha, Vranashotha, Varnavikara, Swedadhikya, Sweda-daurgandhya, Sadyovrana, Bhagna, Garbhashayashotha, Twagvikara, Vatarakta, Visarpa	Antifungal and antibacterial activity
Raktabharadhikya, Raktaprakopa, Bhrama	Cardio protective activity Hypolipidemic activity
Apasmara, Apatantraka, Unmada, Murchha, Chitodvega, Manasavikara, Vismriti, Mastishkadaurbalya, Shirahshoola, Kampavata, Nidranasha	Antidepressant activity Antioxidant, Neuroprotective activity and stress relieving activity, Antiparkinson activity Anticonvulsant activity
-	Antihyperglycemic effect / Antidiabetic activity
Klaibya, Piditartava, Daurbalya,	Effect on Estrogen and hair growth
-	Nootropic activity
-	Anticancer activity
-	Radioprotective activity

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