

**MONTH: JULY: AUG -2015**

**VOLUME: 3, ISSUE: 2**

**ISSN: 2348-1846**



# Punarna V

**TITLE**

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**AN INTERNATIONAL PEER REVIEWED AYURVED JOURNAL  
ON LINE BI-MONTHLY AYURVED JOURNAL**

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## A REVIEW ARTICLE ON PHARMACOGNOSTIC AND PHARMACOLOGICAL PROFILES OF JATAMANSI (NARDOSTACHYS JATAMANSI DC)

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### ABSTRACT:

*Jatamansi (Nardostachys jatamansi) is a perennial herb found in Alpine regions of Himalayas. Ayurvedic ancient text and modern system of medicine mentioned Jatamansi (N. jatamansi), having an antihypertensive property. As this is having Laghu, Snigdha Guna, Tikta, Kashaya, Madhura Rasa, Katu Vipaka, Shita Virya and Bhutaghna (manasadoshahara) Prabhava. By the virtue of above property this is Tridoshahara. Nardostachys jatamansi contains a number of bioactive chemicals, including crystalline acid, Jatamansic acid, hydrocarbons, a polyoxygenated crystalline solid together with A-endesmol, B-eudesmol, ethanol, angelicin, 4-hydroxythymol dimethyl ether. It helps to reduce blood pressure, antiseptic, appetizer, aromatic, carminative, diuretic, expectorant, nervine tonic, sedative to spinal cord, stimulant, tranquilizer and vermifuge. The present review is therefore, an effort to give a detailed focus on its pharmacognostical, pharmacodynamics, pharmacological studies and its therapeutic importance.*

**KEYWORDS:** *Jatamansi, Nardostachys jatamansi, Pharmacological, Pharmacognostic.*

### INTRODUCTION

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*Nardostachys jatamansi* Dc. (Family: Valerianaceae) is a herb with woody rootstock, long, stout, covered with fibers from the petioles of withered leaves commonly known as Spikenard, occurs

naturally in the alpine regions of Himalayas at the height of 11-17 thousand feet, ascending eastwards Punjab, Kumaon to Sikkim and Bhutan regions. The drug *Jatamansi* is an effective anti-hypertensive medicine and recommended particularly in treatment of *Raktabharashamaka*, *Bhutaghna* (*manasadosahara*), *Sajanasthapana*, as mentioned in classical texts of Indian medicine. Accordingly the drug is useful in inflammatory conditions and blood disease. It is useful in high blood pressure, cold and cough, colic, diabetes insipidus, diarrhoea, digestive and respiratory disorders, distribution of the flow of blood, dysmenorrhoea, epilepsy, erysipelas, flatulence, headache, nervousness, hysterical convulsions, leprosy, nervous excitement, palpitation of heart and ailing or abnormalities of the hairs.

## 2. History

The literary review of the *Jatamansi* was started right from the *Samhitas* up to recent research works to obtain thorough knowledge of drug. On comprehensive review of Ayurvedic classics it was found that *Jatamansi* is described in *Charaka Samhita*, *Sushruta Samhita*, *Nighantus* and *Chikitsagranthas*. In *Charaka Samhita*, it is described in *Sangyasthapana Mahakashaya* (C.Su.4/48), used as *dhumvarti* for *hikkashwasa* (C.Ci.17-78), used in

*Kushtha* (C.Ci.7-87). *Hriveradighrita* used in *arsha* (C.Ci.14-230/231), used in *vatika shotha* (C.Ci.12-65), used in *kasa* (C.Ci.18-61). *Mahapaishachikaghrita* used in *unmada* (C.Ci.9-45/48). *Abhyjanataila* is used in *apasmara* (C.Ci.10-34/36). In *Sushruta Samhita*, it is described as *Kumararasayana* (S.Ci.10/45), used in *kasa* (S.U.52-22). In *Ashtanga Hridaya*, it is described as *Changerighrita* in *arsha* (A.H.Ci.8-131/133). In *Kaiyadeva Nighantu*, described as the properties and uses in *kushtha* (K.N.Osh.v.1364-1363). In *Bhavaprakash Nighantu*, it is described as the properties as *medhya* and uses in *daha*, *visarpa* and *kushtha* (B.N.Kar.v.89). In *Raj Nighantu*, it is described as the properties of *jatamansi* as *jatila*, *gandhamansi* (R.N.Cha.v. 95-99). It is also mentioned in *Chikitsa Granthas* like *Chakradatta*, it is described as *mansyadi kanduhara yoga* in *kushtha* (C.D.Ku.50/49). Its properties uses in *visarpa*, *kushtha*, *bhutabadha*, *jvara*, *raktadosha* and *vishahara* (Nibandha Sangraha).

## 3. Pharmacognostic profile

### 3.1 Botanical classification<sup>1,2</sup>

*Nardostachys jatamansi* DC belongs to the family Valerianaceae.

Kingdom : Plantae

Division : Magnoliophyta

Class : Magnoliopsida

Order : Dipsacales

Family : Valerianaceae

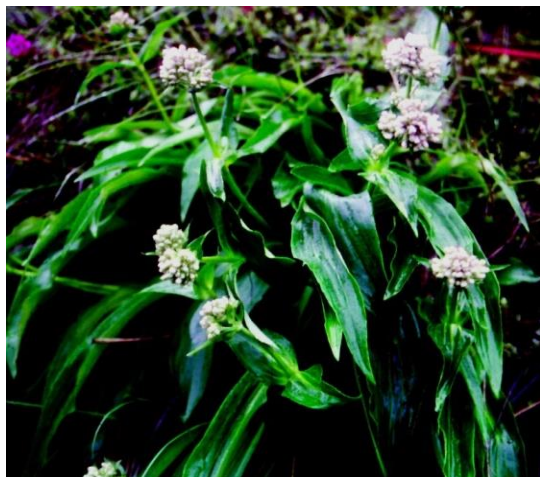
Genus : Nardostachys

Species : Jatamansi

Part used : Rhizomes.

Doses 1-3 gms.

Specific formulations : *Mamsyadighrta*,  
*Raksoghna ghrta*, *Bhutaghna dhu*



**Fig:** Different Parts of *Nardostachys jatamansi* dc



### 3.2 Vernacular Names<sup>3</sup>

Sanskrit : Jatamamsi, Mamsi, Jatila, Surabhi, Tapasvini, Sulomasa, Nalada, Bhutajata.

English : Indian Valerian, Indian Spikenard

Hindi : Balchhad, jatamansi

Gujarati : Jatamansi

Marathi : Jatamansi

camarese : Bhutjata

Arabic : Sumbulutik, Sumbule Hindi

Persian : Narad Hindi

### 3.3 Pharmacodynamics<sup>4</sup>

*Rasa:* Tikta, kashaya, madhura

*Guna:* Laghu, snigdha, tikshna

*Virya:* Shita

*Vipaka* : Katu

*Doshakarma:* Kaphapittashamaka,

*Tridosahara*

### 3.4 Macroscopic Characters<sup>5,6</sup>

The leaves are rosy, slightly pink or blue in dense cymes. Colour: Dark grey rhizomes are crowned with reddish brown tufted fibers. Odour: Highly agreeable, aromatic. Size: Rhizomes are 2.5 to 7.5 cm in length. Shape: Elongated and cylindrical.

### 3.5 Microscopical Character<sup>7</sup>

A transverse section of the rhizome shows a thin periderm, a large parenchymatous cortex which is rich in starch and an endodermis containing globules of volatile oil. Within a ring of collateral vascular bundles lies a large pith containing scattered groups of sclerenchymatous cells.

### 3.6 Chemical Constituents

*Jatamansi* consist of following constituents. Roots contain a crystalline acid and Jatamansic acid. A new oxide, hydrocarbons, a polyoxygenated crystalline solid together with A-endesmol, B-eudesmol, ethanol,



angelicin, 4-hydroxythymol dimethyl ether. Roots yield an essential oil, which has weak anti-bacterial and anti-protozoal activities. Acaciin, ursolic acid, octacosanol, kanshone A, nardosinonediol, nardosinone, aristolen-9beta-ol, oleanolic acid, beta-sitosterol<sup>8</sup>.

### 3.7 Phyto-Chemistry

The rhizomes and roots of the plant have medicinal value and, therefore, have been the focus of chemical studies<sup>9</sup>. Chatterjee *et al.* undertook the chemical examination of the rhizomes in detail leading to the isolation of a new terpenoid ester, nardostachysin<sup>10</sup>. *N. jatamansi* has been discovered with both volatile and non-volatile constituents. Sesquiterpenes contribute to the major portion of the volatile compounds while sesquiterpene, coumarins, lignans, neolignans, alkaloids form the major components of the nonvolatile extracts<sup>11, 12</sup>. Sesquiterpenes and coumarins are present in considerable amount in the roots of *jatamansi* plant mainly responsible for its essential oil<sup>13</sup>.

### 3.8 Adulterant<sup>14</sup>

It is adulterated with rhizomes of *Selinum vaginatum* (Apiaceae) which contains a volatile oil.

### 3.9 Therapeutic uses

It is antiseptic, appetizer, aromatic, carminative, deobstruent, diuretic, emmenagogue, expectorant, nervine tonic, sedative to spinal cord, stimulant,

tranquilizer and vermifuge. It is a good promotive, protective and restorative herbal material much used as a hair tonic, health, based on ethnobotanical as well as classical sources and it is utilized in pharmaceuticals and cosmetics in formulating hair oils, hair washes as well as skin health. It is used to promote and protect skin health to make it lustrous and full of complexion; the paste, oil and other, suitable formulations used as skin cosmetics. The rhizome of the herb is an esteemed, efficacious and potent drug in mental derangement, loss of memory, headache, hysteria, nervous and convulsive disorders, certain disturbances caused or related with menopause, psychological problems, excitement, psychic and imbalance, (milder forms of) delirium. It is quite effective and palliatives, to help maintain tranquility of the mind and mental normalcy. This herbal drug used in medical practice for treatment of mental and nervous disorders (including cardio-vascular system). It is used in cholera, dysmenorrhoea, flatulence, jaundice, palpitation of heart, bronchitis, disorders of digestive system, worms, constipation, worms affections (specially thread worms), chronic headache, insomnia, impotency, general debility, liver disorders, poisoning, calculus and insanity<sup>15</sup>.

## 4. Pharmacological Activity

### 4.1 Antifungal-Activity

*N. jatamansi* essential oil demonstrated fungi static activity against *Aspergillus flavus*, *Aspergillus niger* and *Fusarium oxysporum*<sup>16</sup> *Mucor fragilis*, *Rhizopus stolonifer* and this oil was found to be fungi static of fungicidal to one or the molds, depending upon the concentration<sup>17</sup>.

#### 4.2 Hepatoprotective Activity

The roots extract of *jatamansi* also possess the hepatoprotective activities and it has been proved by several studies. Pre-treatments of rats with 800 mg/kg body wt of the 50% ethanolic extract of *N. jatamansi* DC demonstrated significant hepatoprotective activity against thioacetamide induced hepatotoxicity. Marked reduction in raised levels of serum transaminase and alkaline phosphatase was observed. Pre treatment of the animals with the extract further resulted in an increase in survival in rats intoxicated with LD<sub>90</sub> dose of the hepatotoxic drug<sup>18</sup>.

#### 4.3 CNS Activity

Valeranone prolonged barbiturate anesthesia, impaired rotarod performance, inhibited electroshock convulsions, and Potentiated the hypothermic effects<sup>19</sup>. Limited results from behaviour- ral tests revealed that an extract from *N. jatamansi* exhibited significant antidepressant activity<sup>20</sup>. Studied the effect of acute and sub chronic administration of alcoholic extract of the roots of *N. jatamansi* DC on

nor epinephrine (NE), dopamine (DA), serotonin (5-HT), 5- hydroxyindoleacetic acid (5-HIAA), gamma-amino butyric acid (GABA), and taurine on male albino Wistar rats. The acute oral administration of the extract did not change the level of NE and DA but resulted in a significant increase in the level of 5-HT and 5-HIAA. A significant increase in the level of GABA and taurine was observed in the drug-treated groups when compared to the controls. A 15-day treatment resulted in a significant increase in the levels of NE, DA, 5-HT, 5-HIAA, and GABA<sup>21</sup>.

#### 4.4 Anticonvulsant Activity

Rao VS *et al.* studied ethanol extract of the roots of *N. jatamansi* DC was studied for its anticonvulsant activity and neurotoxicity, alone and in combination with phenytoin in rats. The results demonstrated a significant increase in the seizure threshold by *N. jatamansi* DC root extract against maximal electroshock seizure (MES) model as indicated by a decrease in the extension/flexion ratio. However, the extract was ineffective against pentylenetetrazole- induced seizures. Further, pre-treatment of rats with phenytoin at a dose of 12.5, 25, 50 and 75 mg/kg in combination with 50 mg/kg of *N. jatamansi* DC root extract resulted in a significant increase in the protective index (PI) of phenytoin from 3.63 to 13.18<sup>22</sup>.

#### 4.5 Neuroprotective Activity

Salim S *et al* pre treatment with an alcoholic extract of *N. jatamansi* DC dosed at 250 mg/kg of for 15 days protected rats against focal ischemia caused by middle cerebral artery occlusion. The protective effect may be associated with improving glutathione content, inhibiting lipid peroxidation, and activity on the Na<sup>+</sup>/K<sup>+</sup> ATP ase and catalase enzyme systems<sup>23</sup>.

#### 4.6 Antiparkinson's Activity

Parkinson's disease is a most common neurodegenerative diseases, and oxidative stress has been evidenced to play a vital role in its causation. It was evaluated that the ethanolic extract can slow the neuronal injury in caused by parkinson's rats. Ahmad M *et al.* treated with 200, 400, and 600 mg/kg of *N. jatamansi* DC roots for 3 weeks in rats. Antiparkinsonism activity was studied on 6-OHDA (12 µg in 0.01% in ascorbic acid-saline) induced Parkinsonism. Three weeks after the 6- OHDA injection, the rats were tested for neuro behavioural activity and quantification of catechol amines, antioxidants, dopaminergic D2 receptor binding and tyrosine hydroxylase expression were also estimated. The increase in drug-induced rotations and deficits in locomotor activity and muscular coordination due to 6-OHDA injections were significantly and dose-dependently restored by *N. jatamansi* DC<sup>24</sup>.

#### 4.7 Tranquilizing Activities

German R *et al* investigated sesquiterpene valeranone (Yatamanson) isolated from *Nardostachys jatamansi* DC rhizomes for tranquilizers activity in rodents and significantly the prolongation of barbiturate hypnosis, the impairment of rotarod performance, as regards the hypotensive property was demonstrated<sup>25</sup>.

#### 4.8 Antioxidant Activity

The antiperoxidative property of jatamansi was investigated as an iron-induced lipid peroxidation model in rat liver, quantified by thiobarbituric acid reactive substance (TBARS) content. They have observed in their study that the extract provide protection against lipid peroxidation<sup>26</sup>. In other study an aqueous root extract of jatamansi was investigated for its antioxidant and anticataleptic effects on haloperoidal-induced catalepsy rat model of the disease by measuring various behavioral and biochemical parameters<sup>27</sup>.

#### 4.9 Antidiabetic activity

The extract of jatamasni has been shown to a significant hypoglycemic activity. It decreases glucose level significantly in diabetic and non-diabetic rats as compared to respective controls<sup>28</sup>. The present study was carried out to evaluate the antidiabetic activity of *N. jatamansi* ethanolic extract in alloxan induced diabetic rats for 7 days. The ethanolic extract at high dose (1200 mg/kg)

exhibited significant antihyperglycemic activity in diabetic rats. The results showed that it has significant antihyperglycemic effect in experimental model of diabetes mellitus<sup>29</sup>.

#### 4.10 Others activity

Animal studies done on jatamansone have reported anti estrogenic activity<sup>30</sup>, moreover, jatamansone have reported antiarrhythmic and antihypertensive activity<sup>31</sup>, Anti asthmatic activity<sup>32</sup>, nematicidal activity<sup>33</sup> and antibacterial activity<sup>34</sup>.

### 5. CONCLUSION

*Jatamansi* is a herb with multiple therapeutical importance of Ayurvedic material medica. Present review states that the *N. jatamansi* has so many pharmacological activity with its pharmacognostical importance, thereby

increasing the use of it. Conservation and sustainable use of biodiversity is the basic requirement to save the valuable plant *N. jatamansi* is one of them. It is very useful plant due to several medicinal properties including anti-hypertensive properties.

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