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ARTICLE

Historical profile of *Nardostachys jatamansi*: an ancient incense & aromatic medicinal herb from Kumaon, Uttarakhand

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Abstract
Nardostachys jatamansi or *jaṭāmānsī* from India was known to the Mesopotamian, one of the earliest civilizations of the world. Its name was found in their cuneiform script. It was exported to Assyria, in the Arabian countries and to Egypt, where it was known as *Sumbul-e-Hind* and, in Greece under the name *Nardus*. The plant is also mentioned in the Bible as *Spikenard*. In Germany, it was known as *Nardus indica*. It was a reputed as costly incense-herb, perfume, and used as a nerve tonic in hysteria, epileptic fits, palpitations of heart, etc. in the middle-east countries since time immemorial. Its botanical identity, history and use are mentioned in the ancient Ayurvedic & Unani literature. In India, this herb's distribution is naturally restricted to the state of Uttarakhand, where its use as incense and medicine originated. This plant is not only mentioned in the folk tales of the state but also forms part of their cultural affinity. Despite being part of their culture, this herb is endangered in Uttarakhand. Therefore serious efforts should be made by the state government for its conservation and cultivation.

Keywords Ayurvedic & Unani uses · Bower's manuscript · Cultural song · Cuneiform-script · Endemic · *Nardus indica* · *Spikenard* · *Sumbul-e-Hind*

1 Introduction

Nardostachys jatamansi or *jaṭāmānsī* from India was known to the Mesopotamian, the earliest civilization of the world where first written script in the form of the wedge-shaped marks pressed into clay tablets was developed around 3000 BCE. According to Speiser (1951), the name *jaṭāmānsī* was found in this script. However, it is not included or mentioned in the Assyrian Botany (Thompson, 1949). In about 2500 BCE, it was exported to Assyria and Egypt, where it was known as *Sumbul-e-Hind* and in Greece under the name *Nardus*. The plant is also mentioned in the Bible as *Spikenard*, wherein it is mentioned that when groups of people gathered for religious or social functions, they made incense of this herb (Modenke, 1954). The plant books of the medieval period in Germany mentioned *Nardus indica* as a costly fragrant brought by Alexander the Great and described the internal and external uses of the plant (Rücker & Glauch, 1967).

In this communication, the Indian history of the plant, its botany with detailed description, local names, etymology, philology and cultural affiliation in the form of a song composed in praise of the plant in Kumaon (Uttarakhand) is discussed. The past indigenous uses of the plant in Uttarakhand and in the rest of the country and in Ayurvedic and Unani systems of medicine are discussed. The evidence of origin of incense and medicinal use of *jaṭāmānsī* in Uttarakhand with examples are given. Further, it has also been noted that the species is on the verge of depletion and immediate efforts for its conservation and cultivation are needed.

2 Indian history and identification

Ṛgveda does not mention anything about *jaṭāmānsī*. In the *Atharvaveda*, some authorities state that it was known as *naladā* (Sharma, 1969), and it grows near the river Ganges (possibly Gangotri) in the state of Uttarakhand. The efforts were made to identify the herbal plants prevalent in middle-east countries by Sir William Jones, an orientologist, and a judge of the Supreme Court of India, Calcutta (Royle, 1839, p. 242). After its identification as *jaṭāmānsī* in 1790, an active search for the botanical identity of the plant began.

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Consequently, Sir William Jones received a botanical specimen from Bhutan under the name *jaṭāmānsī*; unfortunately, it had two plant portions; the aerial portion was of the present *Valeriana jatamansi* Jones (V. wallichii DC.) and the other was the root-stock portion of *Nardostachys jatamansi* (DC) Royle. In 1835, Jones named this specimen *Valeriana jatamansi* (Figs. 1, 2, 3).

In 1795, Roxburgh, on the basis of this specimen, completed the nomenclatural formalities and published a figure of *Nardostachys jatamansi,* but he described it again erroneously as *Valeriana jatamansi* and then as *Patrinia jatamansi*. Later, in 1830, De Candolle described it as a new genus, *Nardostachys,* under the name *Nardostachys jatamansi.* Accounting for the difference in inflorescences, De Candolle regarded *N. jatamansi* and *N. grandiflora* as two distinct species in later years. However, it was Weberling (1975) who concluded that not only *N. jatamansi* but also *N. chinensis* Batalin and *N. gracilis* Kitamura fall within the range of variability of *N. grandiflora* and suggested a study of the environmental factors in which the genus *Nardostachys* grows. As mentioned, some authors still regard *N. jatamansi* and *N. grandiflora* as two distinct species. Since it has already been clarified by Weberling (1975), we would consider and follow *Nardostachys jatamansi* as the correct botanical name for this paper.

Fig. 2 The Sir Jone's real Herbarium sheet showing *Valaeriana jatamansi* as an aerial part and rhizome of *Nardostachys jatamansi* as a root part (Source: Website)

3 The ecological profile, distribution, and phenology

The plant is generally found in the Kumaon Himalayas (Uttarakhand) at 3000 m to 4000 m in wet alpine rocky meadows clinging to cliffs and on rocky and steep grassy slopes. It is lithophilous (stone-loving) in nature and associated with

Fig. 1 Imaginative reconstruction of Sir Jones *Valeriana jatamansi* showing an aerial part of *Valeriana wallichii* and root underground part of *Nardostachys jatamansi* (Source: Created by the author to see how the plant might had looked like to Jones)

Fig. 3 The plant of *jaṭāmānsī* at fruiting stage with fruit and seed. The fruit plays an important part in the distribution of the species along with the wind during the dispersal time of the fruit. (Source: Author's thesis)

Anaphalis sp., *Picrorhiza kurroa, Bergenia stracheyii*, and sometimes growing in the shade of *Betula sp.* It flowers during July to August and bears fruit during September to October. Its roots are extracted for trading from mid-October to November. In India, it is reported to be found in the Uttarakhand Himalayas (Uttarkashi, Chamoli, Tehri, Bageshwar & Pithoragarh); Sikkim, and NEFA (Assam Himalayas) and the other parts of the world including Nepal, Bhutan, China, and Tibet. The total number of species found in the world is four, and only one is found in India. However, there is certain information given by the Government of India about the distribution of *N. jatamansi.* It is said to be distributed in Pakistan and the Punjab Himalayas. This statement has no validity and is not evidenced by any documented proof from any of the herbaria of the world and is not mentioned in the *Annotated Catalogue of Pakistan* (Stewart, 1972).

It might have been mentioned in some of the literature about its distribution in the Punjab Himalayas (Himachal Pradesh). Somewhere, in the past, it was reported as a minor forest produce in Himachal Pradesh. Actually, the species does not occur in Himachal Pradesh but, in earlier days, it was collected from the Harki-Doon area of Uttakashi (Uttarakhand) and brought by the traders to Himachal after crossing the river Tons. The forest officials regarded and listed it as their own minor forest produce and charged octroi.

3.1 Distribution in Uttarakhand and its cause

The species is restricted to Uttarkhand and not found in the adjoining state of Himachal Pradesh. According to Shah (2007), *Nardostachys jatamansi* propagates by means of underground rhizomes for very limited distances or by the dispersal of fruits over long distances by winds. The fruit is winged as shown in Fig. 2 and matures during October to November, which is dispersed by high mountain winds. Topographically, the Kumaon Himalayas in Uttarakhand are separated from the Punjab Himalayas by the west defile of the river Sutlej, and Himachal Pradesh is separated by the Tons river valley. These two river valleys are the main barriers to the dispersal of fruits of *Nardostachys jatamansi* towards the west of the Kumaon Himalayas (Uttarakhand). The author had studied the wind direction based on a report from the meteorological department. Not only because of the topographical barriers but also possibly due the direction of high mountain winds blowing from west to north towards the Tibet Plateau during September to November, the seeds are not dispersed towards the western side, i.e., Himachal Pradesh. This could be one of the reasons that *Nardostachy jatamansi* is not found in neighbouring Himachal Pradesh. However, this requires further detailed study and investigation. It is one of the examples of strictly endemic genera of the Sino-Himalayan mountain system (range) (Good, 1964). The range of the genus assumes, a shortly elliptic shape extending along south-western, the north-eastern direction between longitude 100–1400º E and latitude 22–400º N (Weberling, 1975).

3.2 The local names and etymology

The plant is known by various local names as *mānsī*, *jaṭāmānsī bālcara*. In Sanskrit, it is known as *bhūta jaṭā*, *jaṭālā*, *tapasvini*, *keśinī*, *karvyādi*, *piśitā* and *meṣī* and in English as *spike nard*, *Indian nard* and in middle-east countries as *sumbul e hind*. The etymologically *jaṭāmānsī* stands for *jaṭa* meaning the hermit's hairs and *mānsī* meaning *manśala* or thick or stout. In *bhūta jaṭā bhūta* means (the devil) and *jaṭā* (locks of hair). *Jaṭālā* indicates having intricate locks of hair and *tapasvini*, the female hermit and *keśinī* as the bearer of the hairs. In Hindi, *bālcara* means the stick of hair, which keeps the hair fit. *Naladā* stands for *nala* meaning aroma and *da* (giver) which gives aroma. *Karvyādi* is the one which could be purchased and sold (Chunekar & Pandey, 1969, p. 240; Sarma, 1969, p. 28; Trivedi, 1965). The Sanskrit name *karvyādi* reflects that *jaṭāmānsī* was a very important commodity in the past.

3.3 Traditional, cultural and medicine uses in Kumaon

The earlier settlers in Uttarakhand were either Mongoloids or the Indo-Aryans, who might have discovered the utility of *jaṭāmānsī*. Abu'l-Fazl in *Ain i Akbari* mentioned that it was used in making royal perfume during the time of Akbar. It is also stated that the King of Kumaon used to send *kastūrī*, *jaṭāmānsī*, and *śīlājita* with other costly presents like silk, etc. to king Akbar (Jarett, 1948) (Fig. 4).

The *Indian nard* is said to come from the Ganges in the Middle East. They actually referred to Gangotri, which is in Uttarakhand (Garhwal), where *jaṭāmānsī* is found. The first report of the use of *jaṭāmānsī* in magico-religious rites known as *jaga* is from Kumaon. It was meant to promote

Fig. 4 The rhizome and root part of the *jaṭāmānsī* with scale. (Source: Author's thesis)

hair growth and for trade purpose, and to appease their gods with its incense (Shah & Joshi, 1970, 1971). A detailed study on the plant was conducted by Shah (1987, 2007).

About 65–70 years ago, in all the temples at high altitudes like Kedarnath, Rudranath,Tungnath, Madhymaheshwar, Badrinath, etc., which are above 10,000 ft. the temples were incensed by the dried *jaṭāmānsī* and *guggul*, also known as *dhoop* (*Jurinea macrocephala*) rhizomes and roots mixed with clarified butter or ghee. The temples were filled with the aroma of *jaṭāmānsī* and *guggul*. It is believed that the smoke drives away the evil spirits. The flowers and rhizomes were offered to *Ghantakaran*, the local deity of *Bhotias* at Mana near Badrinath, and for this offering, the plant material was brought from Rudranath (Shah, 1987).

It was a tradition to collect the plants for trade purposes from this region to cater to the needs of Ayurvedic, Unani, and Tibetan systems of medicine and for the extraction of essential oils to be used in very high-grade perfumery. The rhizome powder is taken or inhaled in hysteria (Badoni, 1989–90). The root extract with ghee is topically applied to joint pains in rheumatism (Nautiyal et al., 2000), roots and rhizomes are crushed in water and used to treat rheumatic pains (Nautiyal et al., 2001). It may be asserted that the use of the plant as incense possibly originated in Uttarakhand, as it has a social, cultural, and religious bearing on the lives of the people of this region. However, it has not been reported from Nepal, which has become the only source of *jaṭāmānsī* for India and other countries.

3.4 Kumaoni song on *jaṭāmānsī*

Jaṭāmānsī not only has religious sanctity but also a high place in the Kumaoni culture. A song had been composed in its praise in the past due to its sanctity and uniqueness. It states that the *jaṭāmānsī* flower is supposed to be unparalleled in purity and beauty and is described in a song sung in the Danpur area in the district of Bageshwar. The song is in the Kumaoni language and is seldom sung at fairs and festivals in small towns and villages. The main theme of the song is that the *mānsī* flower is found in the places where plants, *nair* (*Skimmia laureola*), *guggul* (*Jurinea macrocephala*) and birds, *longa* and *dafia* (Imphegan peasants, male and female) are found. The song reflects the colour of the flower and the habitat of the plant. It also narrates the eligible local deities to whom the flower of *mānsī* could be offered. The U.P. Government Forest Secretary, Prakash Kishen, first learned about this song from the late Shri B. L. Shah. He then noted it and published it in his book, *Broad Spectrum* (Prakash Kishen, 1973). He was of the opinion that the plant *mānsī* does not exist at all and is a fictitious creation in the song. He did not even credit Shri B.L. Shah anywhere in his book. The author, in 1976, approached the late Shri B.L. Shah, Director, Song & Drama Division of U.P. at Lucknow, who got acquainted with it at the local festival of Bageshwar, called the '*Uttairini'*, in which it was sung in the Kumaoni language, with narrations, rhymes, rhythm, and tune, (Shah, 1987). The author presented a paper on *jaṭāmānsī* at the International Congress on Ethnobiology in 1994, at Lucknow and before presenting the paper, spread the essential oil of the plant in the lecture room, and in no time, its sweet and peculiar smell spread all over. It was the same smell with which Mesopotamians and Assyrians in the middle-east and Europe were familiar with (Shah, 1994). The song in Kumaoni language and its roman transliteration and translation is provided as a Supplement at the end of the paper (Fig. 5).

4 *Jaṭāmānsī* use in ayurvedic and unani systems of medicine

The herb is mentioned in *Caraka* and *Suśruta saṁhitā* ca. 1000–800 BCE as *mānsī*, *bhoot jaṭa*, etc. to be used for insomnia, insanity, epilepsy, and as a tranquillizer and sedative (Arora, 1965). It is mentioned in the *Caraka saṁhitā* as a disinfectant to fumigate the beds and clothes of patients. *Nāvanītaka*, (Bower's manuscript) discovered in Mongolia and translated by Hoernule mentioned the use of *jaṭāmānsī* in diseases of the eye and derangement of bile. It is mixed with turmeric powder to prepare '*haridra* powder of Asvins' which is regarded as a cure for indigestion, retention of discharges, and costiveness. The same drug described as *nalada* is used in the preparation of *asvagandha* oil to be used as a remedy for apathy,

Fig. 5 Flowering plant of *jaṭāmānsī*. (Courtesy: Vinod Upreti, Pithoragarh, Uttarakhand)

dumbness, lameness, stammering, and paraplegia. A few other preparations and uses in other diseases are also mentioned (Sinha, 1926). The paste of the rhizome is applied on boils and carbuncles as an anti-inflammatory and is used to remove the blemishes on the face. If there is an inflammation in any part of the body, then its powder is taken with honey 2–3 times a day. It is used in powder form for toothaches and as a mouthwash. It is used in melancholia and further the rhizome mixed with oil is used for treatment of hair fall and making them black and long (Trivedi, 1965).

Jaṭāmānsī is also mentioned in works on Unani medicine, such as *Meat-e-Mashi* of Abu Sahalica bin Yaha Masihi (950 CE), which refers to the drug as temperamentally hot and useful for the head, stomach, liver and also as a diuretic. *Tazkarale-e-olil-albab* by Sheikh Dawood Aritalic in 1008 CE states that it was mixed with wine and was known as *Sarabe-Sumbul* to cure many ailments and diseases (Arora & Arora, 1963). The Arabian and Persian physicians describe *jaṭāmānsī* under the name *sumbul-e-Hind*. The author of the *Mukhzan–el-Adwiya* compared *jaṭāmānsī* root to the tail of the sable. He described it as deobstruent, stimulant, diuretic, emmenagogue, and recommended it for various disorders of the digestive and respiratory organs and as a nerve tonic in hysteria. He also noted the popular opinion that it promotes the growth and blackness of the hair. It is reported that Avicenna in his *Al Qanun 'al Qanun* in 980–1033 CE referred to it as an important cardiac drug, hypotensive and useful in heart palpitations (Arora & Arora, 1963).

Ibne Baitar in his book in the Persian, *Jame-le-Mufradat* (vol. III, pp. 36–38) mentioned that it cures wounds when taken with cold water. It stops vomiting, cures palpitation of the heart and flatulence. It is used for liver problems like jaundice and kidney troubles. It is boiled in water, and the woman with a swollen uterus is seated in a tub in which the hot water is kept to cure the swelling of the uterus. It is also used for eye troubles.

It is used in proprietary medicines in various Ayurvedic preparations like *mansyādi kvāth*, *mansyādi cūrṇa*, *taila-keśa-vilāsa*, *rakṣoghna-ghṛta*, *sarvoauṣadhi-snāna*, *saśaṅga-lepa*, *laghu-viṣa-garva-taila*, *pippalāyasava* (Trivedi, 1965; Dey, 1980) and *mahānārayaṇa taila*, *daśmulariṣṭa*, *mṛtya sañjivinīsura* (Sharma et al., 1977). These drugs are seldom seen in the market and the only available option is to procure *jaṭāmānsī cūrṇa* online. The oil is reported to be used in high-grade perfumery and in aromatherapy for calming nervous tension, rejuvenation, stress reduction, etc. It is advertised under the name Spikenard essential oil with skin benefit like skin cleanser and purifier and is best to reduce wrinkles and fine lines. One can add the oil to the anti-aging product. It can be used as a moisturiser to have smooth and soft skin. It helps to promote relaxation. The cost of the oil is Rs. 1273/- for 10 ml.

5 Indigenous historical uses

Sir Whitelaw Ainslie the writer of *material medica* mentioned a fragrant formulation prepared from this drug as cooling liniment for the headache and also prescribe its internal use as a blood purifier (Ainsile, 1813). According to Royle, (1839), the Arabian and Persian physicians in India considered the drug very useful in digestion and problems associated with respiratory system and as a nerve tonic in hysteria. Based on his long experience, O'Shaughnessy (1841) concluded that *jaṭāmānsī* was a perfect representative of the drug Valerian. Watt (1889–93), compiled the available data and described that the roots possessed tonic, stimulant, and antispasmodic properties to be used in the treatment of epilepsy, hysteria, and convulsive affections and in palpitation of the heart. Dymock et al. (1891) opined that it was prescribed by Hindu physicians as a nerve tonic and a carminative and aromatic adjunct in the preparation of medicinal oils and *ghṛtas*. Sen Gupta, (1909) states that the old cases of epilepsy are considerably alleviated by an errhine (snuff) and also by inhaling the smoke. Dutt (1922) agrees with the opinion of Dymock et al. Sinha (1926) and stated that the clothing of the newly born baby was disinfected by fumigating it with *jaṭāmānsī* and anointed on the body to bring down the body temperature of the new-born.

Apart from this, the plant was reported to be used as incense by the Monpas tribe of Kameng district in Arunachal Pradesh (Dam & Hajra, 1981).The Santhal tribe of Santhal Pargana district in Bihar used it for various ailments and diseases such as madness, epilepsy, mad convulsions and delirium in fevers, unconsciousness after childbirth, smallpox, ulcer, cholera, dysentery, dry cough, and bronchitis (Bodding, 1925–1926).

6 Adulterants of *jaṭāmānsī* and its chemical analysis

It is very interesting to note that for a long time, adulterants of *Nardostachys jatamansi* have been sold in the market. The rhizomes of *Selinum vaginatum* and *S. candolleii* having similar looks like the rhizomes of *Nardostachys jatamanshi* are used knowingly or unknowingly under the names *bhutakeśī* or *nakli-jatamanshi* in market. The adulterants are cheaper than the original. In *Nardostachys jatamanshi*, the rhizome is covered with reddish brown fibres and has a sweet-smelling aroma, while the rhizomes of *Selinum vaginatum* and *S. candolleii* are covered with bristly dirty brown fibres with a pungent aroma.

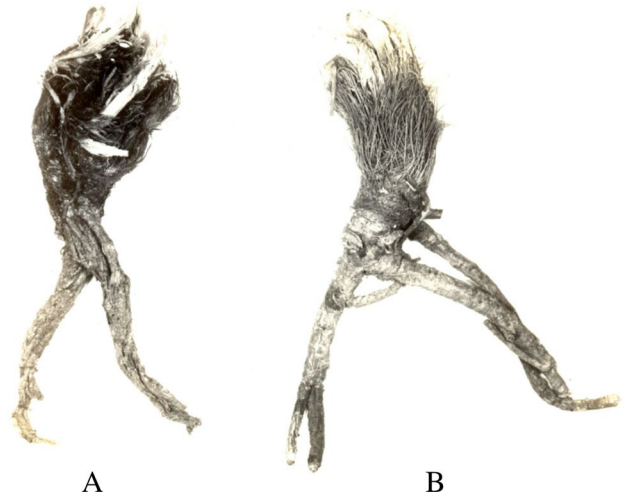

Fig. 6 **A** Genuine and **B** adulterated *jaṭāmānsī*. (Source: Author's thesis)

Fig. 7 Grading of the crude drug of *jaṭāmānsī* rhizomes. (Source: Author's thesis)

A good account of pharmacognostic (anatomical), macroscopic and microscopic studies of *Selinum vaginatum* as an adulterant of *jaṭāmānsī* and *Nardostachys jatamanshi* for identification purposes has been provided by Mehra and Garg (1962) and Mehra and Jolly (1963), respectively (Figs. 6, 7).

7 Collection

In Uttarakhand, the plant has been much depleted in the past sixty years due to unscientific collection. Its depletion and endangerment have been reported from time to time (Shah, 1975, 1981, 1983, 1997; Shah & Kapoor, 1978; Jain & Sastry, 1980). It appears strange that such an important herb as *jaṭāmānsī* has never been domesticated or tried to be domesticated scientifically. At least in our country, the scientific method of exploitation has never been seriously questioned and the industry has never graduated from the hunting and gathering stage. Nepal is doing its systematic cultivation and collection in a good way. Its extraction in Kumaon Himalayas and other states such as Sikkim and Arunachal Pradesh (NEFA) have long back been declared illegal and banned. Now, India mostly meets its demand for internal consumption entirely from Nepal, which exports more than 100 million tonnes of rhizomes each year (Amatya & Sthapit, 1994). It has also been listed among the threatened species (Tandon, 1997) and critical plants of India (BCPP CAMP, 1996). It has also been included in the banned export item list of the Government of India (Anonymous, notification, 1998).

However, at the Xth meeting of the Conference of Parties to CITES, two Himalayan plant species, *N. grandiflora* (*N. jatamanshi*) and *P. kurrooa* were accepted for inclusion in Appendix II on account of different parameters such as distribution, habitat availability, population status, utilization, trade and conservation management (IUCN Analysis, 1999).

According to Airi et al. (2000), it is a critically endangered plant. Its existing state and variation in performance in different habitats were studied in the Kumaon region in the West Himalayas, and the most preferred habitat of this plant was found to be moss-laden rocks and boulders.

It would be pertinent to consider the specific environmental and ecological requirements of the species before developing improved technologies for the cultivation, keeping in mind plant's restriction to some specialised habitats and destructive harvesting, i.e., removal of roots and rhizomes from the wild. In Nepal, a detailed study on the accurate description of the plant, its growth locations, uses, and other associated information that could help to establish its permanent cultivation was conducted by Amatya and Sthapit (1994). It suggested that such studies should have been conducted in Uttarakhand by the Herbal Research & Development Institute at Gopeshwar.

8 Conclusions

It is estimated that the annual consumption of this plant is 1500 quintals for the preparation of Ayurvedic and Unani medicines in our country and for the oil used in high-grade perfumery at Kannauj. As stated earlier, the herb is available only in Uttarakhand, Sikkim, and North East Frontier Areas, and the quantity collected from all these places is insufficient to meet the demand of the country. Therefore, the drug is imported from Nepal, and since there is a complete ban on its collection from Uttarakhand, along with other

wild-growing herbs, India has to depend solely on Nepal. Further, only a meagre quantity of the herb is collected from Sikkim and North East Frontier Areas in our country. At present, Nepal exports around 1200 quintals of *jaṭāmānsī* to India. The major portion is exported to India, and the rest goes to other countries like Ceylon, Indonesia, Pakistan, etc. It is the high time that efforts should be made to domesticate *N. jatamanshi* in Uttarakhand and in other states to sustainably manage the various industries such as perfumery, Ayurveda, Unani, etc. in the country. It can be concluded that *N. grandiflora* (*N. jatamanshi*) may become endangered unless international trade is regulated. Furthermore, trade should permitted but with an export permit from the country of origin and a re-export permit, if exported from a country other than where it originated. On the other hand, the population of these species in India will ultimately decide, whether the species population in India are sustainably managed. It is important to note that export and re-export from India are of minor importance compared to Indian domestic demand (Olsen, 1999). However, it may be noted that the export of *N. grandifora* (*N. jatamanshi*) is banned from Bhutan, Nepal and India (TRAFFIC, 1999). Further, in Mesopotamia, *jaṭāmānsī's* name is found in the cuneiform wedge-shaped script. The only sources were from Uttarakhand and Nepal, but there is no mention of any historical literature in Nepal. It is possible that Uttarakhand and Nepal were a single entity in ancient times. It may inferred that the use of *jaṭāmānsī* as incense originated in Uttarakhand as it has a social, cultural, and religious bearing on the lives of the people of this region. Unfortunately, it has not been reported from Nepal, which has become the only source of *Jaṭāmānsī* for India and other countries.

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