Nardostachys jatamansi (D.Don) DC. 1016 Caprifoliaceae

Nomenclatural reference 1208 RBG Kew (2021): World Checklist of Vascular Plants (WCVP). - Download wcvp_v6_sep_2021, last modified 2021-09-15. Retrieved from http://sftp.kew.org/pub/data-repositories/WCVP/, viewed 15.10.2021.

Summary

Distribution	Nardostachys grandiflora is native to Himalayan regions of south-western China, Tibet, Bhutan, Nepal, India, possibly also in Myanmar.
Legislation	Nardostachys jatamansi (D.Don) DC. is protected by CITES Appendix II since 1997. It is listed in CITES under the synonym name N. grandiflora DC. It is clear that the other species traded locally as "jatamansi", Valeriana jatamansi Jones is not protected by CITES. According to the CITES Trade Database, source country exports in the years 2010-2017 are from NP only (more recent data for NP not yet available on website). All exports are from wild sources. Export as roots in this period only took place in 2011 and 2012 (77 mt and 93 mt). All other trade was declared as oil, derivatives or extracts. Exports of these derived products increased from 2010 to 2015 and dropped to 300 mt/year in 2016 and 2017. Between 2010-2017, an average of 252 mt per year was exported from NP with a maximum of 787 mt in 2015. Main importing countries of these products were IN (total 830 mt) and PK (total 386 mt).
Threat Category	Assessed globally as Critically Endangered by IUCN in 2015. Listed as Vulnerable in Nepal during a 2001 CAMP workshop and assessed as Vulnerable or even Endangered in NP, BT and in Indian Himalayan states according another source. Continuing decline in ist Himalayan range is stated by several authors.
Threat	Overharvesting, habitat loss, fragmentation and degradation due to over-grazing, forest degradation, fires and logging threaten the species. Excessive collection and harvesting of the plant without replanting a section of the rhizome has negative effects on the plants.
Abundance	In Nepal, it is found in most of the northernmost mountain districts and can be regarded as common in its high altitudinal range. It may grow in dense patches, but is not frequent in any habitats where it is found.
Habitat	Found in a variety habitats from rocky outcrops, ledges and open slopes in alpine and sub-alpine habitats, through open pine forests to alpine meadows. It grows at high altitudes from 2200 to 5000m.
Regeneration	The species shows extensive clonal (vegetative) growth through the multiplication of a vegetative offshoot (ramets). While sensitive to harvest, the plant regenerates easily when harvested in autumn. Replanting the upper 2 cm of the rhizome provided the fastest regeneration and rhizome biomass growth. Growth of seedlings to reproductive size may take 3-4 years.
Reproduction	Reproduction through seeds is limited, seed germination is low with no persistent seed bank.
Lifeform	Perennial, long lived, erect herb growing from about 10 to 60 cm.
Plant Parts	Rhizomes and roots and to a lesser extent the leaves are used.
Use	Indian Spikenard has a long history of use in traditional medicine for a wide range of ailments, e.g. in Ayurveda, Unani, Bhutanese, Chinese, Japanese, and Tibetan systems of medicine, as well as in current medicine. The essential oil obtained from the rhizomes is used as a flavouring agent and in the cosmetic and perfume industries. Rhizomes and dried leaves are highly used for incense in the Himalaya. The rhizomes and ist extracts are also highly valued as an ingredient in hair oil and as a substitute for valerian.
Use Fields	Medicine; Social Use; Food additive; Material.
Trade Trend	It has been reported that rhizomes originating from Nepal share about 82-95% of the total global export value, whereas India and Bhutan respectively share 13% and 5%. The unprocessed air-dried rhizomes and aromatic oil are exported mainly to India. In India, the annual demand of rhizomes has been reported to be 675t in 2001-2002 which increased to 867t in 2004-2005 with an annual growth rate of 8.7%. Small amounts of oil are exported to Pakistan, South Korea and Europe. The annual volume of rhizomes traded from Nepal to India is estimated to be 100-436t with an average export value of USD 603000.
Systematics	Jatamansi is a traditional Himalayan medicinal plant. Since its original botanical descriptions in the late 18th century it has taken until the late 20th century until the botanical identify could be revealed. This is mainly the merit of the work of Weberling (1978) and Mabberley & Noltie (2014). They made

clear that two separate species are used under the local name "jatamansi": The one entering in international trade is called Nardostachys jatamansi (D.Don) DC., the other species is Valeriana jatamansi Jones, a medicinal plant of more local use. The situation was blurred in the past by the existence of the name Valeriana jatamansi sensu D.Don. This name belongs in the synonymy of Nardostachys jatamansi (D.Don) DC. Another synonym of the latter is Nardostachys grandiflora DC, a name which until today is used for the taxon in the CITES context.

Taxonomie and Indentification

Taxonomy	Reference	
Weberling gives priority to the name N. jatamansi (D.Don) DC. for his taxon in which he also includes N. chinensis Batalin and N. gracilis Kitamura. His wide concept of only one accepted species in the genus is based on his observations that the morphological traits of all populations in the area are connected by transitions.	8213	Weberling, F. (1978): Monographie der Gattur
TPL regards Nardostachys jatamansi (D. Don) DC. as the accepted name and treats Nardostachys grandiflora DC. as a synonym.	1148	The Plant List - http://www.theplantlist.org/
Mabberley & Noltie make clear that "Valeriana jatamansi sensu D.Don, in Lamb. (1821) 180, t., non Jones (1790)" belongs in the synonymy of Nardostachys jatamansi (D.Don) DC. They clearly distinguish it from the accepted species Valeriana jatamansi Jones "a medicinal plant of more local importance".	3694	Mabberley, D.H. & Noltie, H.J. (2014): A note
"the local name […] for the important drug plant jatamansi is Nardostachys jatamansi (D.Don) DC., indeed the name in current use in the scientific literature"	3694	
"much of the conservation literature […] still uses the name N. grandiflora"	3694	
The name Valeriana jatamansi has been coined by different authors (=autonyms): Valeriana jatamansi Jones ex Roxb. is an accepted species (its native range is E. Afghanistan to Central & E. Central China and N. Indo-China). It is different from Valeriana jatamansi D.Don which is in the synonymy of Nardostachys jatamansi (D.Don) DC.	1126	World Checklist of Selected Plant Families, R
"1 Himal.: N. jatamansi (D. Don) DC. (N. grandiflora, jatamansi, Ind. nard, spikenard)"	3753	Mabberley, D.J. (2017): The plant-book. 4th e
The supporting statement of the 1997 proposal to include jatamansi in CITES Appendix II (under the name N.grandfolia DC.) clearly shows the intention of the Indian authorities which taxon they proposed for inclusion: They include "Valeriana jatamansi sensu D.Don" in the synonymy while Valeriana jatamansi Jones is not mentioned.	4755	India (1997): CITES Proposal. Inclusion of Na
Nardostachy grandiflora is the name used in as the accepted name in the CITES context until today.	7141	UNEP-WCMC (s.dat.): Species+. Retrieved fr

Synonyms

Synonym	Eval	Ref	
Nardostachys chinensis Batalin		1208	RBG Kew (2021): World Checklist of Vascular Plants (WCVP). - Download
Nardostachys grandiflora DC.		1208	
Nardostachys jatamansi C.B.Clarke		1208	
Valeriana jatamansi (D.Don) Wall.		1208	
Valeriana jatamansi D.Don		1208	
Valeriana jatamansi D.Don, in Lamb. (1821) 180, t., non Jones (1790)		3694	Mabberley, D.H. & Noltie, H.J. (2014): A note on Valeriana jatamansi

Name Used in Pharmacopoeias and other References

Name as used in Source	Status	Reference	
Nardostachys chinensis		8394	Therapeutic Goods Administration (ed.) (2007): Substances that may be used in listed medicines in Australia. Therapeutic Goods Administration, Symonston. Retrieved from http://www.tga.gov.au/cm/listsubs.pdf, viewed: 25.01.2009.
Nardostachys chinensis Batal		8389	Anon. (2002): The Korean Herbal Pharmacopoeia (English edition). Korea Food and Drug Administration, sine loco.
Nardostachys chinensis Batal.		5525	Penso, G. & Proserpio, G. (1997): Index plantarum medicinalium totius mundi eorumque synonymorum. 2nd edition. OEMF, Milano.
Nardostachys chinensis Batal.		8374	China Pharmacopoeia Commission (ed.) (2005): Pharmacopoeia of the People's Republic of China 2005. 3 volumes. People's Medical Publishing House, Beijing.
Nardostachys chinensis Batalin		6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. & Tucker, A.O. (2000): Herbs of commerce. 2nd edition. AHPA, Silver Spring, USA.
Nardostachys grandiflora		1199	Brinckmann, J., Kathe, W., Berhoudt, K. & Schippmann, U. (2020): Detailed analysis of global commercial cultivation of medicinal and aromatic plants (MAP). Unpublished project report for BfN. 36 pp. Bonn.
Nardostachys grandiflora		3751	van Wyk, B.-E. & Wink, M. (2017): Medicinal plants of the world. 2nd edition. CABI, Wallingford & Boston.
Nardostachys grandiflora		5641	Lange, D. (1998): Europe's medicinal and aromatic plants. Their use, trade and conservation. Traffic International, Cambridge.

Nardostachys grandiflora	7279	van Wyk, B.-E. & Wink, M. (2004): Medicinal plants of the world. Timber Press, Portland.
Nardostachys grandiflora DC	1199	Brinckmann, J., Kathe, W., Berhoudt, K. & Schippmann, U. (2020): Detailed analysis of global commercial cultivation of medicinal and aromatic plants (MAP). Unpublished project report for BfN. 36 pp. Bonn.
Nardostachys grandiflora DC.	1180	GRIN (17.3.2015): Download World Economic Plants report from GRIN Taxonomy for the query. Medizin = 'Alle Nutzungen'. Retrieved from http://www.ars-grin.gov/cgi-bin/npgs/html/taxecon.pl?language=de
Nardostachys grandiflora DC.	8874	Anon. (s.dat. [2008]): Siddha Pharmacopoeia of India. Vol. 1. Ministry of Health and Family Welfare, sine loco. Retrieved from http://www.comsys.com.sg/pdf/Siddha_Herbs.pdf, viewed: 14.05.2012.
Nardostachys grandiflora DC.	9003	Anon. (2009): Monograph on medicinal plants of Bhutan. Volume 2. Institut of Traditional Medicine Services, Thimphu. Retrieved from http://herbalnet.healthrepository.org/bitstream/123456789/2054/5/Monograph%20on%20Medicinal%20Plants%20of%20Bhutan%20Volume
Nardostachys grandiflora de Candolle	6667	Manandhar, N.P. & Manandhar, S. (2002): Plants and people of Nepal. Timber Press, Portland.
Nardostachys jatamansi (D.Don) DC.	1101	Hänsel, R. & al. (1992-1998): Hagers Handbuch der pharmazeutischen Praxis. 5. Auflage.5 volumes [4179, 4180, 4181, 6097, 6098]
Nardostachys jatamansi (D.Don) DC.	6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. & Tucker, A.O. (2000): Herbs of commerce. 2nd edition. AHPA, Silver Spring, USA.
Nardostachys jatamansi (D.Don) DC.	8547	Ved, D.K. & Goraya, G.S. (2008): Demand and supply of medicinal plants in India. FRLHT, Bangalore.
Nardostachys jatamansi DC.	8374	China Pharmacopoeia Commission (ed.) (2005): Pharmacopoeia of the People's Republic of China 2005. 3 volumes. People's Medical Publishing House, Beijing.
Nardostachys jatamansi DC.	8388	Anon. (1999-2011): The Ayurvedic Pharmacopoeia of India. Part I, Vol. I-VII, 1st edition. Government of India, Ministry of Health and Family Welfare, . Retrieved from http://www.ayurveda.hu/api.html, viewed: 14.05.2012.
Nardostachys jatamansi DC.	8871	China Pharmacopoeia Commission (ed.) (2010): Pharmacopoeia of the People's Republic of China. English edition. Ed. 9. Stationery Office Books, .
Nardostachys jatamansi DC.	9003	Anon. (2009): Monograph on medicinal plants of Bhutan. Volume 2. Institut of Traditional Medicine Services, Thimphu. Retrieved from http://herbalnet.healthrepository.org/bitstream/123456789/2054/5/Monograph%20on%20Medicinal%20Plants%20of%20Bhutan%20Volume
Nardostachys jatamansi Roxb.	8545	Anon. (2009): International Standard ISO 4720. Third edition 2009-08-15. Essential oils. Nomenclature (in English and French). International Organization for Standardization, Geneva.

Common Names

Common Name	Typ	Language	Country	Ref	
Akashamansi	ver	Sanskrit (Saṁskṛta		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Balchad	ver	<unknown>		5474	Ved, D.K. & Tandon, V. (ed.) (1998): Cons
Balchar	ver	<unknown>		5534	Sharma, M.P. (1996): Nomenclatural ambi
Bal-chhar	ver	Hindi		4755	India (1997): CITES Proposal. Inclusion of
Balchir	ver	Hindi		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
baluchar	ver	<unknown>	IN	4180	
Balu-char	ver	Hindi		4755	India (1997): CITES Proposal. Inclusion of
Bbultya	ver	Nepali		6667	Manandhar, N.P. & Manandhar, S. (2002):
bhultya	tra	Nepali	NP	6667	
Bhutajat	ver	Sanskrit (Saṁskṛta		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
bhutijatt	ver	<unknown>	IN	4180	
Bhutijatt	?	Kashmiri		5334	Anon. (1948-1997): Wealth of India. A dicti
Chinese nardostachys	scn			6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. &
Espica-nardo	ver	Spanish; Castilian		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
gan song	ver			1180	GRIN (17.3.2015): Download World Econo
Gan song	ver	Chinese		1122	Mansfeld's World Database of Agricultural
Gansong	tra	Chinese		5261	Pei Shengji, Li Yanhui & Yin Shuze (1996):
Haswa	ver	Nepali		5334	Anon. (1948-1997): Wealth of India. A dicti
Indian nard	ver			1180	GRIN (17.3.2015): Download World Econo
Indian nard	ver	English		5797	Wiersema, J.H. & Leon, B. (1999): World
Indian Nard	ver	English		4755	India (1997): CITES Proposal. Inclusion of

Indian nard	ver	English		1100	GRIN Database (Germplasm Resources In
Indian nard	ver	English		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Indian spikenard	ver			1180	GRIN (17.3.2015): Download World Econo
Indian spikenard	ver	English		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Indian Spikenard	ver	English		2248	Husain, A., Virmani, O.P., Popli, S.P., Misr
Indian spikenard	ver	English		1100	GRIN Database (Germplasm Resources In
Indische Narde	ver	German		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Jantamansi	?	<unknown>		5534	Sharma, M.P. (1996): Nomenclatural ambi
Jataamaansee	ver	Sanskrit (Saṁskṛta		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Jataamaansi	ver	Kannada		2248	Husain, A., Virmani, O.P., Popli, S.P., Misr
Jatamamshi	ver	Malay		5334	Anon. (1948-1997): Wealth of India. A dicti
Jatamamsi	ver	Sanskrit (Saṁskṛta		5044	Abdul Kareem, M. (1997): Plants in Ayurve
jatamanchi	ver	<unknown>	IN	4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Jatamangsi	ver	Nepali		4755	India (1997): CITES Proposal. Inclusion of
Jatamangsi	ver	Nepali		5334	Anon. (1948-1997): Wealth of India. A dicti
jatamanshi	ver	<unknown>	IN	4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Jatamanshu	ver	<unknown>		5503	Shah, N.C. (18.5.1998): in litt. to the Germ
jatamansi	scn			6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. &
jatamansi	ver			1180	GRIN (17.3.2015): Download World Econo
jatamansi	ver	<unknown>	IN	4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Jatamansi	ayn	<unknown>		6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. &
Jatamansi	ver	Bengali		4755	India (1997): CITES Proposal. Inclusion of
Jatamansi	ver	Bengali		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Jatamansi	ver	Bhutanese		4755	India (1997): CITES Proposal. Inclusion of
Jatamansi	ver	Bhutanese		5334	Anon. (1948-1997): Wealth of India. A dicti
jatamansi	ver	English		6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. &
Jatamansi	ver	Garhwali		5474	Ved, D.K. & Tandon, V. (ed.) (1998): Cons
Jatamansi	ver	Gujarati		4755	India (1997): CITES Proposal. Inclusion of
jatamansi	tra	Gurung	NP	6667	Manandhar, N.P. & Manandhar, S. (2002):
Jatamansi	ver	Hindi		2248	Husain, A., Virmani, O.P., Popli, S.P., Misr
Jatamansi	ver	Hindi		4755	India (1997): CITES Proposal. Inclusion of
Jatamansi	ver	Kannada		4755	
Jatamansi	ver	Malay		4755	
Jatamansi	ver	Marathi (Marāṭhī)		4755	
jatamansi	tra	Nepali	NP	6667	Manandhar, N.P. & Manandhar, S. (2002):
Jatamansi	ver	Sanskrit (Saṁskṛta		4755	India (1997): CITES Proposal. Inclusion of
Jatamansi	ver	Sanskrit (Saṁskṛta		2248	Husain, A., Virmani, O.P., Popli, S.P., Misr
Jatamansi	ver	Sinhala, Sinhalese		4755	India (1997): CITES Proposal. Inclusion of
Jatamansi	ver	Telugu		2248	Husain, A., Virmani, O.P., Popli, S.P., Misr
jatamashi	ver	<unknown>	IN	4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Jatamashi	ver	Hindi		4180	
Jatamashi	ver	Tamil		2248	Husain, A., Virmani, O.P., Popli, S.P., Misr
jatamasi	ver	<unknown>	IN	4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Jatamasi	ver	Gujarati		5334	Anon. (1948-1997): Wealth of India. A dicti
Jatamavshi	ver	Marathi (Marāṭhī)		5334	
jatmavshi	ver	<unknown>	IN	4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Jeta-manchi	ver	Malay		4755	India (1997): CITES Proposal. Inclusion of
Jetamansi	ver	Malay		2248	Husain, A., Virmani, O.P., Popli, S.P., Misr
Kalichhad	ver	Gujarati		5334	Anon. (1948-1997): Wealth of India. A dicti
Kalichhad	ver	Gujarati		4755	India (1997): CITES Proposal. Inclusion of
Kan sung	ver	Chinese		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
kukikipot	ver	<unknown>	IN	4180	
Kukilipot	ver	Kashmiri		5334	Anon. (1948-1997): Wealth of India. A dicti
Kukil-i-pot	ver	Kashmiri		4755	India (1997): CITES Proposal. Inclusion of
Mamsi	ver	Sanskrit (Saṁskṛta		5044	Abdul Kareem, M. (1997): Plants in Ayurve
Mansi	ver	<unknown>		5534	Sharma, M.P. (1996): Nomenclatural ambi
Mansi	ver	Sanskrit (Saṁskṛta		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Mashi	ver	Garhwali		2248	Husain, A., Virmani, O.P., Popli, S.P., Misr
Masi	ver	Garhwali		5334	Anon. (1948-1997): Wealth of India. A dicti
Masi	ver	Garhwali		4755	India (1997): CITES Proposal. Inclusion of
Masi	ver	Garhwali		5474	Ved, D.K. & Tandon, V. (ed.) (1998): Cons
Nahani	ver	<unknown>		5474	
Naharu	ver	<unknown>		5474	
naorochi	tra	Khalingi	NP	6667	Manandhar, N.P. & Manandhar, S. (2002):
nard	ver			1180	GRIN (17.3.2015): Download World Econo
nard	ver	English		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Nard	ver	English		6637	Erhardt, W., Götz, E., Bödeker, N. & Seyb
Nard indien	ver	French		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne

Nardenähre	ver			1180	GRIN (17.3.2015): Download World Econo
Nardenähre	ver	German		5797	Wiersema, J.H. & Leon, B. (1999): World
Nardenwurzel	tra	German		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Nardo indico	ver	Spanish; Castilian		4180	
Nardostachys jatamansi radix	pha	Latin		4180	
Nardostachys jatamansi rhizoma	pha	Latin		4180	
Nardostachys rhizome	ver	English		4806	Yen, Kun-Ying (1992): The illustrated Chin
Nardostachys-jatamansi-Rhizom	pha	Latin		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Naswa	ver	Nepali		4755	India (1997): CITES Proposal. Inclusion of
Naswa	ver	Nepali		5334	Anon. (1948-1997): Wealth of India. A dicti
naswan	tra	Newari	NP	6667	Manandhar, N.P. & Manandhar, S. (2002):
Nihanu	ver	<unknown>		5474	Ved, D.K. & Tandon, V. (ed.) (1998): Cons
Nihanu	ver	Hindi		5502	Tandon, V., FRLHT (23.5.1998): in litt. to t
Pampe	ver	<unknown>	IN	4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Pampe	ver	Bhutanese		5334	Anon. (1948-1997): Wealth of India. A dicti
Pampe	ver	Bhutanese		4755	India (1997): CITES Proposal. Inclusion of
pangbu	tra	Sherpa	NP	6667	Manandhar, N.P. & Manandhar, S. (2002):
paumpe	ver	<unknown>	IN	4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Paumpe	ver	Bhutanese		4755	India (1997): CITES Proposal. Inclusion of
poi	tra	Tamang	NP	6667	Manandhar, N.P. & Manandhar, S. (2002):
Radix Nardostachyos	pha	Latin		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Rhizoma Nardostachyos	pha	Latin		4180	
Sambul	ver	Arabic		4180	
spang-spos	tra	Tibetan	NP	6667	Manandhar, N.P. & Manandhar, S. (2002):
Spang-spos	ver	Tibetan		6667	
Speichenähre	ver			1180	GRIN (17.3.2015): Download World Econo
spicanard	ver	French		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Spike	?	English		5503	Shah, N.C. (18.5.1998): in litt. to the Germ
spikenard	ver			1180	GRIN (17.3.2015): Download World Econo
Spikenard	ver	English		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne
Spikenard	ver	English		1100	GRIN Database (Germplasm Resources In
Spikenard	ver	English		4755	India (1997): CITES Proposal. Inclusion of
spikenard	tra	English	NP	6667	Manandhar, N.P. & Manandhar, S. (2002):
Spikenard	ver	English		6637	Erhardt, W., Götz, E., Bödeker, N. & Seyb
spikenard	ver	English		5797	Wiersema, J.H. & Leon, B. (1999): World
Sumbulul-aasafter	ver	Arabic		4755	India (1997): CITES Proposal. Inclusion of
Sumbulu'l-hind	ver	Arabic		4755	
Sumbuluttibe-hind	ver	Arabic		4755	
Sunbuluttib	ver	Persian		4755	
Vahnini	ver	Sanskrit (Saṁskṛta		4180	Hänsel, R., Keller, K., Rimpler, H. & Schne

Distribution Range

Distribution Range	Ref	
"distributed in the Himalayas from Pakistan, India (Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim) to Nepal, Tibet and China between 3300 to 5000 m asl."	8695	Baniya, A. (2010): FairWild implementation i
"Distributed throughout Nepal […]; also in northern India, Bhutan, Tibet, and western China."	6667	Manandhar, N.P. & Manandhar, S. (2002): P
"E. Asia - Himalayas from Uttar Pradesh to S.W. China"	8592	Anon. (s.dat.): Plants for a future. Retrieved f
"eastern Himalayas to […] Tibet, its range including China, Bhutan, India and Nepal […]. Its occurrence in Afghanistan, Pakistan and Myanmar is questionable"	8347	Mulliken, T. & Crofton, P. (2008): Review of t
"endemic to Himalayan Mountain range, occurring in India, Nepal, Bhutan, Myanmar and southwest China. In India it is found in Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh."	3641	Ved, D., Saha, D., Ravikumar, K. & Haridasa
"Himalayas ([…] Nepal, […] Bhutan, South-West China, and Tibet)"	7688	Larsen, H.O. (2005): Impact of replanting on
"native range is Himalaya to W. & Central China"	1192	Plants of the World Online (POWO). Royal B
"Native to: Bangladesh, China North-Central, China South-Central, East Himalaya, Myanmar, Nepal, Qinghai, Tibet, West Himalaya"	1192	Plants of the World Online (POWO). Royal B
"Sino-Himalayan. NW India, Nepal (W, C & E), Sikkim, Bhutan, S & E Tibet, W China"	8619	Ghimire, S.K., Sapkota, I.B., Oli, B.R. & Par
Native to temperate zones of Asia (China) and tropical Asia (Bhutan, India, Nepal, Myanmar)	1100	GRIN Database (Germplasm Resources Info

Distribution

Continent	Region	ICC	Status	Free Text	Ref
3 Asia-Temperate	34 Western Asia	AF			5103
	36 China	CN			1106
		CN		"CHT-XI"	1109

				CN			1109
				CN		Uttar Pradesh bis SW-China	2185
				CN		Tibet und W-China	2246
				CN		SW	5103
				CN		Xizang	7141
4	Asia-Tropical	40	Indian Subcontinent	BT			1109
				BT			1109
				BT			7141
				IN		Uttar Pradesh // Garhwal; Kumaun	1109
				IN		"BHU-SI"	1109
				IN			1109
				IN		"JMK-OO"	1109
				IN		Uttar Pradesh	1109
				IN		Uttar Pradesh Himalaya bis E-Him.	2040
				IN		Uttar Pradesh bis SW-China	2185
				IN		Punjab	5103
				IN		Uttar Pradesh	7141
				NP			1109
				NP			1109
				NP			6667
				NP			7141
				PK	occurrence doubtful	Presence in Punjab (IN) suggests occurrence in PK	5103
		41	Indo-China	MM			5103

Abundance / Local Population Size

ICC	Abundance	Reference	
	"growing in clusters/patches that may cover the ground where it appears very dense [and] not very frequent in any of the habitats where it is found"	8365	Larsen, H.O & Olsen, C.S. (s.d
IN	"Sizeable subpopulations have been identified from western parts of Arunachal Pradesh, Sikkim, Himachal Pradesh and Uttarakhand in India."	3641	Ved, D., Saha, D., Ravikumar,
NP	"probably not an intrinsically rare plant in the alpine habitat"	8365	Larsen, H.O & Olsen, C.S. (s.d
NP	"Occurrence: common"	8619	Ghimire, S.K., Sapkota, I.B., O
NP	"It is found in most of the northernmost mountain districts of Nepal"	8619	

Ecology

TypeEc	ICC	Ecology	Ref	
alti		"2200-5000m, […] 3200-4500m and […] 3500 to over 5000m"	8347	Mulliken, T. & Crofton, P. (2008)
alti		3300-5200m	7688	Larsen, H.O. (2005): Impact of r
alti		3300-5100m	6337	Anon. (1970): Medicinal plants c
alti		2200-4800m	3641	Ved, D., Saha, D., Ravikumar, K
alti		3600-4800m	8592	Anon. (s.dat.): Plants for a future
alti	NP	3200-5000m	6667	Manandhar, N.P. & Manandhar,
alti	NP	3200-5300m	8619	Ghimire, S.K., Sapkota, I.B., Oli
habit		"rocks, ledges and open slopes"	8592	Anon. (s.dat.): Plants for a future
habit		"Typically grows on rocky outcrops, but can also be found in meadows, shrubland and forests"	8347	Mulliken, T. & Crofton, P. (2008)
habit		"alpine and sub-alpine habitats […] vary from open pine forests over dwarf Rhododendron and Juniper scrub to alpine meadows"	7688	Larsen, H.O. (2005): Impact of r
habit		"grows in dry, open pine forests, among dwarf rhododendron and juniper scrub, on open, stony and grassy slopes, in alpine meadows or small depressions, and on the turf of glacial flats"	8347	Mulliken, T. & Crofton, P. (2008)
habit		"growing in steep, moist, rocky, undisturbed grassy slopes"	3641	Ved, D., Saha, D., Ravikumar, K
habit		"more frequent on the western aspects in alpine zones, on moist rocky and undisturbed slopes or on stones with coarse sandy loam soils, occurring usually in random forms"	3641	
habit	NP	"Dry to moist open forests, dwarf rhododendron and juniper scrub, open dry to moist stony or rocky slopes, moss laden rocks, rock outcrops, alpine meadows. Most populations, however, occupy steep rocky slopes, outcrops and meadows."	8619	Ghimire, S.K., Sapkota, I.B., Oli
habit	NP	rocky hillsides	6667	Manandhar, N.P. & Manandhar,
regen		"plant regenerates easily from the underground propagules when harvested in autumn. There is high risk of underground rhizome decay when harvested in summer"	8607	Natural Resource Industries (s.c
regen		"known slow recovery after harvest of the […] rhizomes	8365	Larsen, H.O & Olsen, C.S. (s.da
regen		"harvesting 100% of the plants in plots followed by replanting of upper plant parts and two centimetres of the rhizome provided the fastest regeneration and rhizome biomass growth"	8347	Mulliken, T. & Crofton, P. (2008)
regen		"sensitive to harvest […] even low levels of harvesting had a strong negative effect on ramet density, recruitment and survival rate"	8347	
regen	NP	"slow growing and long-lived species with seasonal growth"	8619	Ghimire, S.K., Sapkota, I.B., Oli

regen	NP	"reproduces by sexual means, but also shows extensive clonal (vegetative) growth through the multiplication of a vegetative offshoot (ramets). A single plant produces many ramets in a dense clump, in which the successive ramets are compactly arranged and remain connected."	8619	
regen	NP	"vegetative spread is more economical than seed production and seedling recruitment, particularly in drier habitats"	8619	
repro		flowers hermaphrodite	8592	Anon. (s.dat.): Plants for a future
repro		"seed germination […] is very low, with no persistent seed bank"	8347	Mulliken, T. & Crofton, P. (2008)
repro		"It has a generation length of one year."	3641	Ved, D., Saha, D., Ravikumar, K
repro		"Reproduction is through vegetative means (clonal growth) and seeds, where pollinators are likely small insects, e.g. flies"	8365	Larsen, H.O & Olsen, C.S. (s.da
repro		"growth of seedlings to reproductive size may take 3-4 years"	8365	
repro	NP	"In field conditions, plant regeneration through seeds has been found to be low."	8619	Ghimire, S.K., Sapkota, I.B., Oli

Life Form

Duration	Lifeform	Woodiness	Height	LF_free_txt	Ref	
perennial		herb	10-60cm		8619	Ghimire, S.K., Sapkota, I.B., O
perennial		herb	about 35cm		6667	Manandhar, N.P. & Manandhar
perennial		herbaceous			6337	Anon. (1970): Medicinal plants
perennial		herbaceous	10-60cm		7688	Larsen, H.O. (2005): Impact of
perennial		herbaceous	10-60cm		8347	Mulliken, T. & Crofton, P. (200
perennial	herb		about 35 cm high	"Perennial herb"	6667	Manandhar, N.P. & Manandhar

Population Status / Threat Causes

ICC	PopulationStatus	Remark	Ref	
	"collection of rhizomes for sale in trade is a cause of conservation concern"		6667	Manandhar, N.P. & Manandhar
	"collectors rarely left any parts of the rhizome in the ground, leaving little chance for regeneration"		8347	Mulliken, T. & Crofton, P. (200
	"current population trend: decreasing"		3641	Ved, D., Saha, D., Ravikumar,
	"declining in many areas, particularly in India and Nepal, owing to overharvest and habitat loss […] In Nepal, overharvest of rhizomes […] seems to be the main threat. Habitat lost, fragmentation and degradation, due to over-grazing; and forest degradation, fires and logging were considered secondary threats to the species in the mid-1990s"		8347	Mulliken, T. & Crofton, P. (200
	"Due to high volume trade and demand, the species is collected from its wild habitat in an indiscriminate way and thus population is declining continuously […]. This has a severe impact on natural regeneration. Thus, the population of this species is declining very fast in the natural habitat."		3641	Ved, D., Saha, D., Ravikumar,
	"early snowfall in the autumn compels people to collect Jatamansi in May or June which affect the herb's regeneration"		8607	Natural Resource Industries (s
	"global population size is assumed to be declining primarily due to human induced habitat loss and degradation (India) and overharvest (Nepal)"		8365	Larsen, H.O & Olsen, C.S. (s.d
	"Habitat loss is continued due to road construction, agricultural invasion and human settlements. Unregulated grazing of yak, sheep and other cattle groups in high altitude areas has become a threat to this species."		3641	Ved, D., Saha, D., Ravikumar,
	"harvested destructively, i.e., up-rooted in large quantities, […] traded across national borders"		7677	Olsen, C.S. (2005): Trade and
	"high economic value combined with a lack of management had accelerated degradation of NTFPs such as N. grandiflora in community and government forests"		8347	Mulliken, T. & Crofton, P. (200
	"more than 80% of the wild population in the Himalayan region of India has declined over the last 10 years. The species is therefore assessed as Critically Endangered. Similar threats are ongoing in Bhutan, China, Myanmar and Nepal, and therefore the status in India is considered representative of that of the species globally."		3641	Ved, D., Saha, D., Ravikumar,
	"once abundant availability of […] Nardostachys grandiflora […] have declined drastically in recent years"		5232	Bhattarai, N.K. (1997): Medicin
	"status of the plant population is not known but it is suspected to be declining due to commercial trade"		8365	Larsen, H.O & Olsen, C.S. (s.d
	"Unregulated collection of roots for medicine and loss of habitat are the major threats to this species. Over exploitation is continued due to its several medicinal properties and high demand from the pharmaceutical industries […]. Habitat loss is continued due to road construction, agricultural invasion and human settlements. Unregulated grazing of yak, sheep and other cattle groups in high altitude areas has become a threat to this species."		3641	Ved, D., Saha, D., Ravikumar,
	"vulnerable (in Nepal and Bhutan [...]) to endangered (in some states of Indian Himalaya [...]) status in the Himalaya."		8619	Ghimire, S.K., Sapkota, I.B., O
	threatened in IN and NP		2210	Bajaj, M. & Williams, J.T. (199
IN	"has become critically endangered depending on habitats […] due to over-exploitation of rhizomes for medicinal use, habitat degradation and other biotic interferences"		3695	Chauhan, R.S., Nutiyal, M.C. &

IN	"Vulnerable, and much depleted due to over-exploitation of rhizomes for medical properties, and also due to habitat degradation and other biotic interferences in its distribution" [fide 3694]	2246	Nayar, M.P. & Sastry, A.R.K. (
NP	"assessed as Vulnerable in Nepal during a 2001 CAMP workshop" - however Olsen and Larson (2003) questioned the classification, considering empirical data to be scant and quantitative information on the status and harvest levels across Nepal to be lacking	8347	Mulliken, T. & Crofton, P. (200
NP	"grazing in the alpine meadows […] is considered a minor stress factor and is in some places reported minimised through rotational grazing practices"	8365	Larsen, H.O & Olsen, C.S. (s.d
NP	"highly threatened mainly due to unsustainable harvesting of its rhizome for international trade"	8619	Ghimire, S.K., Sapkota, I.B., O
NP	"large trade of rhizomes to India is assumed to be causing overharves"	8365	Larsen, H.O & Olsen, C.S. (s.d
NP	"largest threat to the N. grandiflora population in Nepal is without doubt the commercial trade, i.e. harvesting"	8365	
NP	"N. grandiflora is extremely sensitive to harvesting of rhizomes due to its show growth and low rates of natural regeneration. Harvesting reduces flowering and seedling recruitment and causes increased mortality of individuals remaining after harvest. This sensitivity to harvesting was found to be even higher in drier rocky slopes and outcrop habitats than in meadow and forest habitats [...]. Higher rates of population growth in meadows allows plants to withstand higher rates of harvest."	8619	Ghimire, S.K., Sapkota, I.B., O
NP	included in the table "Threatened or Endangered Plants of Nepal"	6667	Manandhar, N.P. & Manandhar

Red List Status: Global and Supranational

Glo	Threat Category		Criteria	Ass.	Publ.	Ref	
glo	CR	Critically Endangered	A2cd	2014-07-16	2015	1206	2020 IUCN Red List of Threatened Species. Version
Name used in redlist:	Nardostachys jatamansi (D.Don) DC.						
glo	CR	Cririically Endangered	A2cd	2014	2014	3641	Ved, D., Saha, D., Ravikumar, K. & Haridasan, K. (2
Name used in redlist:							

Red List Status: Countries

ICC	Threat Category		Assd.	Publd.	Ref	
BT	I	Indeterminate		1997	1109	UNEP-WCMC Threatened Species Database. Download o
Name used in redlist:	Nardostachys jatamansi DC.					
BT	V	Vulnerable		1997	1109	
Name used in redlist:	Nardostachys grandiflora DC.					
CN	LC	Least Concern – 无危		2013	3319	Chinese Academy of Sciences (2013): Chinese biodiversit
Name used in redlist:	Nardostachys jatamansi			Accepted		
IN	I	Indeterminate		1997	1109	UNEP-WCMC Threatened Species Database. Download o
Name used in redlist:	Nardostachys jatamansi DC.					
IN	I	Indeterminate		1997	1109	
Name used in redlist:	Nardostachys jatamansi DC.					
NP	VU	Vulnerable		1996	3359	Shrestha, T.B. Joshi, R.M. (1996): Rare, endemic and end
Name used in redlist:	Nardostachys grandiflora			Synonym		
NP	VU	Vulnerable			6664	Bhattarai, N. (2002): Conservation assessment and mana
Name used in redlist:						

Purpose: Free text

Purpose		Ref	
food additive	"The essential oil obtained from rhizomes is used as a flavoring agent"	8619	Ghimire, S.K., Sapkota, I.B., O
	"an important spice used as a seasoning in medieval European cuisines"	3698	Dhiman, N. & Bhattacharya, A.
material	"Tibetans […] use a red coloured dye obtained from the flowers of the plant"	3698	Dhiman, N. & Bhattacharya, A.
	Materials: essential oils (fide Wealth India RM, as Nardostachys jatamansi)	1100	GRIN Database (Germplasm R
medicine	"A paste of the rhizome is applied to treat hemorrhoids. Dried leaves are used as an incense."	6667	Manandhar, N.P. & Manandhar
	"The rootstocks and roots are medicinally used as an important Ayurvedic drug. They are a source of an essential oil for medical purposes."	1122	Mansfeld's World Database of
	Offered as medicinal plant at local market in NW Yunnan	5261	Pei Shengji, Li Yanhui & Yin S
	"sedative"	3751	van Wyk, B.-E. & Wink, M. (20
	"Rhizomes and its extracts are also highly valued [...] as a substitute for valerian."	8619	Ghimire, S.K., Sapkota, I.B., O

	Used in the "treatment of fits and heart palpitations, to treat constipation and regulate ruination, menstruation and digestion […] external pain killers, as an antiseptic, for the treatment of epilepsy, hysteria, convulsions [...] high blood pressure, fever, anxiety, insomnia, asthma and other bronchial problems [...] neurosis, insomnia, constipation and scorpion stings in Pakistan"	8347	Mulliken, T. & Crofton, P. (200
	Used in traditional medicine	5997	Mulliken, T. (2000): Implementi
	"very long history of use as medicine in Ayurveda, Homeopathy, ethno medicine and Indian System of Medicine (ISM) to modern medicine industry"	3695	Chauhan, R.S., Nutiyal, M.C. &
	"Records on the traditional uses of Nardostachys jatamansi (D.Don) DC. in India dates back to 500 to 1000 BCE i.e., during Vedic times. These uses are well documented in Ayurvedic classics like ‘Sushruta Samhita’, ‘Nighantus Chikitsa Granthas’ and ‘Charak Samhita’. Ever since that time, the dried roots and rhizomes of N. jatamansi have constituted an important part of the ‘havan samagri’ or powdered mixture of medicinal herbs/plants, used in religious pyres of Hindus in India. There is a belief that the burning of these herbs/plants have curative properties against many diseases."	3698	Dhiman, N. & Bhattacharya, A.
	"The Tibetan system of medicine […] uses the rhizomes for curing wounds, cough, cold, chronic fever, inflammation, intestinal worms, high blood pressure, food poisoning, gastritis, etc. Like the Dolpo communities of Nepal, the Amchis or the agro-pastoralist Tibetan community of Poksundo use the leaves […] for curing headaches, high altitude sickness, fever and wounds"	3698	Dhiman, N. & Bhattacharya, A.
	Used in traditional medicine in BT, IN, NP and CN (Tibet)"	5103	IUCN & TRAFFIC (1997): Anal
	Traditional European medicine	3751	van Wyk, B.-E. & Wink, M. (20
	"Rhizomes are highly used for incense in the Himalaya. In amchi medicine in Dolpa, rhizomes are used in wounds, cough and cold, chronic fever, fever due to poisoning, spleen disease, intestinal parasites, high blood pressure, tumors, stomach diseases and swellings"	8619	Ghimire, S.K., Sapkota, I.B., O
	Medic. (folklore)	1180	GRIN (17.3.2015): Download
social use	"The essential oil obtained from rhizomes is used [...] in the cosmetic and perfume industries. Rhizomes and its extracts are also highly valued as an ingredient in hair oil"	8619	Ghimire, S.K., Sapkota, I.B., O
	perfumery	1122	Mansfeld's World Database of
	in perfumes	5997	Mulliken, T. (2000): Implementi
	"hair tonic to stimulate hair growth and dye the hair black"	8347	Mulliken, T. & Crofton, P. (200
	"also as stick incense to be sold in countries of the Middle East"	5103	IUCN & TRAFFIC (1997): Anal
	"incense"	8347	Mulliken, T. & Crofton, P. (200

Purpose: Standardized Fields of Use

Purpose: Fields of Use	Frequency
food additive - flavouring & spice	2
material - colouring & dye	1
material - general	1
medicine - general	6
medicine - used traditionally as herbal remedy	8
social use - cosmetics industry	5
social use - general	1

Purpose: Number of use fields

Purpose: Number of level-1 use fields
7

Plant Parts Used

Plant Part (standardized)	Plant Part (free text)	Remark	Ref	
leaf			8619	Ghimire, S.K., Sapkota, I.B., Oli, B.R. & Para
leaf			6667	Manandhar, N.P. & Manandhar, S. (2002): Pl
root	"rhizomes and, to a lesser extent, roots"		8347	Mulliken, T. & Crofton, P. (2008): Review of t
root	"rootstock"		1122	Mansfeld's World Database of Agricultural ar
root	rhizome		6198	Lange, D. (1996): MAPCIS. Medicinal and Ar
root	rhizome		8619	Ghimire, S.K., Sapkota, I.B., Oli, B.R. & Para
root	root		3751	van Wyk, B.-E. & Wink, M. (2017): Medicinal

Scale and Trend of Trade

ICC	Trade Trend	Ref	
	"estimated consumption of rhizomes by herbal manufacturing units is about 500–1000 metric tons"	3698	Dhiman, N. & Bhattacharya, A. (2020): Nardostachys jatamansi (D.Don) DC. Challenges and opportunities of harnessing the untapped medicinal plant from the Himalayas. Journal of Ethnopharmacology 246 (112211): 1-18. Retrieved from

			https://www.researchgate.net/publication/335832211_Nardostachys_jatamansi_DDon_DC-Challenges_and_opportunities_of_harnessing_the_untapped_medicinal_plant_from_the_Himalayas, viewed: 28.02.2021.
	According to the CITES Trade Database, source country exports in the years 2010-2017 are from NP only (more recent data for NP not yet available on website). All exports are from wild sources. Export as roots in this period only took place in 2011 and 2012 (77 mt and 93 mt). All other trade was declared as oil, derivatives or extracts. Exports of these derived products increased from 2010 to 2015 and dropped to 300 mt/year in 2016 and 2017. Between 2010-2017, an average of 252 mt per year was exported from NP with a maximum of 787 mt in 2015. Main importing countries of these products were IN (total 830 mt) and PK (total 386 mt).	1167	UNEP-WCMC. CITES Trade Database. - https://www.unep-wcmc.org/resources-and-data/cites-trade-database
IN	"listed in the top 20 most traded plants in India"	3696	Kaur, H., Lekhak, M.M., Chahal, S., Goutam, U., Jha, P., Naidoo, D., Ochatt, S.J. & Kumar, V. (2020): Nardostachys jatamansi (D.Don) DC. An invaluable and constantly dwindling resource of the Himalayas. South African Journal of Botany 135(2020): 1-16. Retrieved from https://www.researchgate.net/publication/344283764_Nardostachys_jatamansi_DDon_DC_An_invaluable_and_constantly_dwindling_resource_of_the_Himalayas, viewed: 28.02.2021.
NP	"growing trade from Nepal of N. grandiflora oil"	8347	Mulliken, T. & Crofton, P. (2008): Review of the status, harvest, trade and management of seven Asian CITES-listed medicinal and aromatic plant species. Bundesamt für Naturschutz, Bonn (BfN-Skripten 227). Retrieved from http://www.bfn.de/fileadmin/MDB/documents/service/skript227.pdf, viewed: 05.02.2010.
NP	"harvest and trade were believed to be increasing in the Jumla District from the mid-late 1990s, rising from 14 tons in 1995 to 66 tons in 1996 and 124 tons in 1997"; "reliable figures on harvest and trade are lacking"	8347	
NP	"some 19,000 households obtain 18-30% of their annual cash income from harvest and sale of N. grandiflora and Neopicrorhiza scrophulariiflora"	8365	Larsen, H.O & Olsen, C.S. (s.dat. [2008]): Towards valid non-detrimental findings for Nardostachys grandiflora. Case study for International Expert Workshop on CITES Non-Detriment Findings, 17-22 Nov 2008, Cancun. WG 2 - Perennials. Case Study 3. sine loco. Retrieved from http://www.conabio.gob.mx/institucion/cooperacion_internacional/TallerNDF/Links-Documentos/WG-CS/WG2-Perennials/WG2-CS3%20Nardostachys/WG2-CS3.pdf, viewed: 28.02.2021.

Utilization: commodity, cultivation, harvest, socio-cultural significance, sustainability, trade

Type	*ICC*	*Utilization*	*Ref*	
com		"rhizomes are easily confused with those of Valeriana jatamansi Jones"	8365	Larsen, H.O & Olsen, C.S. (s.d
com		"roots […], because of high commerce, are often fraudulently adulterated with other species"	3697	Cornara, L., Ambu, G., Trombe
com		Dried, mainly whole rootstocks and roots (crude drug); in addition the powdered rootstock and the essential oil.	7143	Lange, D. & Schippmann, U. (
com		Droge sind die getrockneten Rhizome und Wurzeln als Ganz-, Schnitt- und Pulverdroge.	4180	Hänsel, R., Keller, K., Rimpler,
com		Main products in international trade are unprocessed rhizomes with smaller amounts in processed products such as oil.	5997	Mulliken, T. (2000): Implement
com		'Marc', the root after the essential oil has been extracted	5997	
com		Mostly traded as rhizomes and extracts, also stick incense	5103	IUCN & TRAFFIC (1997): Anal
com		Plant parts in trade are principally the rhizomes; other authors cited in this review use both 'roots' and 'rhizomes' to refer to the plant parts in trade.	5997	Mulliken, T. (2000): Implement
com		Roots: major export term used in CITES Annual Trade Reports 1977-2002	7150	UNEP-WCMC (8.1.2004): CIT
com	NP	Oleoresin and oil are exported.	5103	IUCN & TRAFFIC (1997): Anal
cul		"no cultivation seems to take place, only small eforts in IN and NP"	5103	
cul		"Sometimes cultivated in N India, China and Japan"	2032	Mansfeld, R. (1986): Verzeichr
cul		North India, China, Japan (sometimes cultivated there), Nepal	4180	Hänsel, R., Keller, K., Rimpler,
cul	IN	"cultivated in the State of Uttarakhand in India"	3641	Ved, D., Saha, D., Ravikumar,
cul	NP	Propagated by seeds or rhizomes.	6667	Manandhar, N.P. & Manandha

exp		"non-processed rhizomes are exported in large quantities from Nepal, and to a smaller extent Bhutan, to India"	8365	Larsen, H.O & Olsen, C.S. (s.c
exp	CN	Country of export	7143	Lange, D. & Schippmann, U. (
exp	CN	Country of export (Sechuan)	4180	Hänsel, R., Keller, K., Rimpler,
exp	CN	Exported from Tibet to NP, where the oil is extracted	5997	Mulliken, T. (2000): Implement
exp	IN	"80% of the imported N. grandiflora rhizomes are consumed locally (in processed form), while the rest is exported as manufactured medicines"	8365	Larsen, H.O & Olsen, C.S. (s.c
exp	IN	"dry powder and extracts […] are exported to different medicinal markets of Canada, Ireland, Netherlands, Singapore, Turkmenistan and USA and sold for 2972 US$/kg"	3696	Kaur, H., Lekhak, M.M., Chaha
exp	IN	Country of export	4180	Hänsel, R., Keller, K., Rimpler,
exp	IN	Exports of 34 tonnes of rhizomes from Sikkim between Apr 1993 and Apr 1995 acc to Indian CITES proposal	5103	IUCN & TRAFFIC (1997): Anal
exp	IN	Re-export: 17% of the estimated 1000 tonnes/yr. from NP	5997	Mulliken, T. (2000): Implement
exp	IN	Relatively small share of imports are re-exported	5997	
exp	NP	"annual volume of N. grandiflora rhizomes traded from Nepal to India [estimated] to be 100-436 ton with an average export value of US $ 603 thousand."	8619	Ghimire, S.K., Sapkota, I.B., O
exp	NP	"main supplier to the large Indian wholesale market"	7688	Larsen, H.O. (2005): Impact of
exp	NP	"More than half of the national collection of N. grandiflora is estimated to be exported to India"	8365	Larsen, H.O & Olsen, C.S. (s.c
exp	NP	"N. grandiflora was the second highest export earning Medicine plants in Nepal next to chirayito (Swertia chirayita) before its ban on export [...]. Still large amount of unprocessed air-dried rhizomes are traded through illegal channel."	8619	Ghimire, S.K., Sapkota, I.B., O
exp	NP	"rhizomes of jatamansi originated from Nepal share about 82-95% of the total global export value, whereas India and Bhutan respectively share 13% and 5%"	8619	
exp	NP	"The non-processed rhizomes are exported in large quantities from Nepal, and to a smaller extent Bhutan, to India."	8365	Larsen, H.O & Olsen, C.S. (s.c
exp	NP	"The unprocessed air-dried rhizomes and aromatic oil are exported mainly to India. Small amounts of oil are exported to France, England, Pakistan, Spain, Germany and South Korea."	8619	Ghimire, S.K., Sapkota, I.B., O
exp	NP	200 tons exported/yr.	4140	Malla, S.B., Shakya, P.R., Raj
exp	NP	Export of the 'marc' from NP to IN	5997	Mulliken, T. (2000): Implement
exp	NP	Exports of 220 tonnes for the period 1989-1994 acc. to Nepali export figures	5103	IUCN & TRAFFIC (1997): Anal
exp	NP	Exports of 3202 kg of oil to IN during 1996/1997 acc. to Nepali customs data	5997	Mulliken, T. (2000): Implement
exp	NP	main exporter, app. 1000 tonnes/yr of dried rhizomes to India acc. to study by Olsen	5997	
exp	NP	Major country of export	7143	Lange, D. & Schippmann, U. (
har		"collection of wild N. grandiflora in Nepal is highly dependent upon snowfall" - could be sensitive to climate change, less snowfall = longer collecting season	8347	Mulliken, T. & Crofton, P. (200
har		"the older the rhizomes […] the higher the precentage of essential oil in plants of up to two or three years"	8347	
har		"vary greatly from 0.57-1.67% of dry weight […] can be up to 2.9% […] after distillation period of 15 hours"	8347	
har		Harvesting in fall produces better oil quality due to low moisture content and less damage through fungi.	6035	Subedi, B. & Koontz, A. (1999)
har	NP	"All collection is from the wild with only negligible cultivation taking place"	8365	Larsen, H.O & Olsen, C.S. (s.c
har	NP	"Harvest is undertaken by digging with a hand tool"	8365	
har	NP	"harvest season is from August to October, but may start earlier depending on the number of harvesters and the economic needs of harvesters"	8365	
har	NP	"typically harvesters make trips exclusively for harvest or harvest while herding in the alpine meadows"	8365	
har	NP	[also: IN] "Collection conditions at high altitude are very strenuous: collectors often stay in rock caves, the weather is cold and treacherous, and the working environments dangerous. Collection is usually done using a one-handed hoe, kodhalo, for digging. Bamboo baskets are used for storage: a doko for products collected in large volumes and a phurlung for high value, low volume products. Collection usually focuses on a single product: most commonly Nardostachys grandifloraif large scale, long term collection is undertaken"	5651	Olsen, C.S. (1998): The trade i
imp	IN	"The Indian market is supplied primarily from Nepal, with some products from Bhutan and India"	8365	Larsen, H.O & Olsen, C.S. (s.c
imp	IN	Primary country of import, 80% processed and consumed locally	5997	Mulliken, T. (2000): Implement
price		"average purchase price paid […] to middle level traders was estimated ad USD 2.2/kg during 1997/98, the value of the harvest during that year therefore estimated to be on the order of USD 400000."	8347	Mulliken, T. & Crofton, P. (200
price		"European and North American cosmetic companies involved in the selling of ‘Spikenard essential oils’ at a price of about 70 USD/kg"	3698	Dhiman, N. & Bhattacharya, A.
price		"extracts and powder of the plant are exported to markets in Singapore, Netherlands, Ireland, Canada, the United States and Turkmenistan […] and sold for 29 to 72 USD per unit"	3698	
price		"In Europe and North America, ‘Spikenard oil’ was sold for 70 US$/kg by cosmetic companies"	3696	Kaur, H., Lekhak, M.M., Chaha

price	IN	"dried roots and rhizomes […] are sold for 3501000 INR/kg at different places of India […]. Essential oil from the plant also sells at 12,0003000 INR/l"	3696	
price	IN	"Oil from the plant fetches a price of Rs. 12,000–30,000 per liter […] The dried rhizomes of the plant […] sell at Rs. 350–1100 per kg at local markets of Amritsar, Himachal Pradesh, Bengaluru, Chennai, Dehradun, Jaipur, Kolkata, Lucknow, Mumbai, Guwahati, Hyderabad, Kanpur, Madurai, Ramnagar, Shillong, Siliguri, Tanakpur, and Khari Baoli in Delhi, the largest wholesale market for medicinal plants"	3698	Dhiman, N. & Bhattacharya, A.
price	NP	"significant price increases […] from 1994/95 to 1997/98, but […] harvester prices were constant. This indicates that increasing demand and wholesaler prices do not necessarily directly affect the harvesters' incentive to collect"	8291	Larsen, H.O. & Olsen, C.S. (20
socu		"in ancient times, the plant was a critical part of various drugs and perfumes in countries like Greece, Arabia, Egypt, Rome, and […] Europe. The great physician, Hippocrates sweetened and spiced his drinks with the plant and its parts for health benefits"	3698	Dhiman, N. & Bhattacharya, A.
socu		"Jatamansi (Nardostachys jatamansi) is a traditional Indian drug plant used for incense and medicine […]. It is harvested from the wild in the Western Himalayas, where over-exploitation and degradation of ist natural habitats give rise to concerns about ist conservation status. However, proper assessment of the conservation status of jatamansi is hampered by confusion with Valeriana jatamansi, a medicinal plant of more local importance. The item of materia medica traded is, in the case of both species, the upper part of the rhizome and stem base."	3694	Mabberley, D.H. & Noltie, H.J.
socu		"prized in salves in Roman society"	3753	Mabberley, D.J. (2017): The pl
socu		"Traditional records for medicinal uses […] in India date back to Vedic times (500-1000 BCE) […] and are well documented in ayurvedic classics such as Charak Samhita, Nighantus Chikitas Granthas and Sushruta Samhita […]. Ancient scriptures confirmed that underground tissues (roots/rhizomes) of N. jatamansi are also extensively used in Unani, Bhutanese, Chinese, Japanese, and Tibetan medicinal system."	3696	Kaur, H., Lekhak, M.M., Chaha
socu		"Traditional records for medicinal uses […] in India date back to Vedic times (500-1000 BCE) […] and are well documented in ayurvedic classics such as Charak Samhita, Nighantus Chikitas Granthas and Sushruta Samhita […]. Ancient scriptures confirmed that underground tissues (roots/rhizomes) of N. jatamansi are also extensively used in Unani, Bhutanese, Chinese, Japanese, and Tibetan medicinal system."	3696	
socu	IN	"an extremely important part of the folklore medicine of Kumaon in Uttrakhand and is used in various magico-religious ceremonies […]. Like the Bhotias, the Kumaonies burn incense sticks or dhoop prepared using the subterranean parts of N. jatamansi […] in the room of ailing patients. The Kumaonese believe that these incense sticks can cure 50% of the illnesses in their community"	3698	Dhiman, N. & Bhattacharya, A.
socu	NP	[also IN] "unemployed and poor locals harvest almost all the traded material, illegally. Although the governments of both India and Nepal have banned the harvesting and trading of the plant, illegal trading, [contributes] towards 35 million workdays per year"	3698	
sus		"During collection whole plants are uprooted and disturbed."	3641	Ved, D., Saha, D., Ravikumar,
sus		"harvested before they are mature partly owing to concern that others will harvest them first, with entire plants uprooted"	8347	Mulliken, T. & Crofton, P. (200
sus		"Harvesting should follow a combination of selective collection of matured rhizomes and replanting of the younger ones in situ. The whole rhizome should not be harvested from the clone and other plants in the vicinity should not be removed. Harvesting should be done on a rotational basis."	8619	Ghimire, S.K., Sapkota, I.B., O
sus		"observed slow recovery of populations after harvest […] that is often indiscriminately removing juvenile and mature plants"	8365	Larsen, H.O & Olsen, C.S. (s.c
sus		"regeneration following harvest using traditional methods was very low (16.3%) compared to harvest in conjunction with replanting (upper parts of the rhizomes replanted after collection) and rotational harvesting systems (left untouched)"	8347	Mulliken, T. & Crofton, P. (200
sus		"traditional harvest methods were very detrimental to plant regeneration in a natural state"	8347	
sus		optimal harvest season: fall	6035	Subedi, B. & Koontz, A. (1999)
sus		optimal percentage of plants not harvested: 20%	6035	
sus		optimal rotational interval: 5 years	6035	
sus	NP	"Local harvest management is typically reported to be based on a fixed starting date rather than maximum amounts"	8365	Larsen, H.O & Olsen, C.S. (s.c
sus	NP	"N. grandiflora has been recommended for strict management, with low harvest rates and fairly long rotations (at least 5 years) between successive harvests. [...] a harvesting rate of <10% rhizomes [is recommended] from mature plants in drier habitats, such as rocky slopes and outcrops; and <25% rhizomes from mature plants in moister habitats, such as meadows."	8619	Ghimire, S.K., Sapkota, I.B., O
sus	NP	"What former rules (e.g. agreed starting dates after seed fall, allowed tools, exclusion of outsiders) may have been in practice are now assumed to have disappeared due to increasing potentials for commercialisation"	8365	Larsen, H.O & Olsen, C.S. (s.c
tra		"large-scale trade has been found to take place outside the control of CITES"	7688	Larsen, H.O. (2005): Impact of
tra	IN	"In domestic markets, estimated annual trade of […] rhizomes is around 200-500 tnes (mt)"	3696	Kaur, H., Lekhak, M.M., Chaha
tra	IN	"In India, the annual demand of Nardostachys rhizome has been reported to be 674.9 ton in 2001-2002 which increased to 866.8 ton in 2004-2005 with an annual growth rate of 8.7%"	8619	Ghimire, S.K., Sapkota, I.B., O
tra	NP	"80t […] processed annually by the private sector in Nepal". Total collected from 1987 to 1994 was 940.45t"	5232	Bhattarai, N.K. (1997): Medicir

tra	NP	"estimated annual trade level of air-dry N. grandiflora rhizomes from Nepal at 100-500 tonnes, with trade in 1997/98 of 350-400 tonnes. Official records for the same year put national harvest at only 97 tonnes […]. and legal trade can in some areas be as little as 12% of the total trade"	8365	Larsen, H.O & Olsen, C.S. (s.c
tra	NP	"increasing export from Nepal to India and overseas destinations of essential oil produced from N. grandiflora rhizomes is reported […] on the basis of data from the Nepalese Customs Department. Export of 21 tonnes essential oil from the years 2000/01 and 2001/2 is reported, and it is mentioned that Nepal imported between 50 and 100 tonnes N. grandiflora rhizomes per year between 2001/2 and 2003/4 from Tibet for this production"	8365	
tra	NP	"trade (domestic and export) of dried rhizomes of N. grandiflora in Nepal for 1997/1998 was in the order of 300t"	8347	Mulliken, T. & Crofton, P. (200
tra	NP	In the table "Estimated annual potential N. grandiflora collection in Nepal (mid-1990s)" a total of 750-900 tons is given	8347	

Legislation

Legislation	Annex	Source	Taxon
CITES	II	6386	UNEP-WCMC (2001): Annotated CITES Appendices and Reservations. C

Regulation

ICC	Regulation	Ref	
	National laws are in place in Nepal and India. However, enforcement is limited and there seem to be reports of a large amount of illegal trade.	8347	Mulliken, T. & Crofton, P. (200
	"CITES implementation seems to be vertually non-existent"	8347	
	Nardostachy grandiflora is the name used in the Indian CITES listing proposal and has since been accepted as the accepted name in the CITES context until today.	1169	WCMC Species+ Database -
	"Despite the fact that N. grandiflora has been on Appendix II of CITES since 1997 [it has been made] clear that international trade (e.g., between Nepal, Bhutan and India) is taking place on a large scale"	3694	Mabberley, D.H. & Noltie, H.J.
	In 2020, Nepal has issued an export quota 382.700 kg of rhizomes.	7141	UNEP-WCMC (s.dat.): Specie
	"The status of the plant population is not known but it is suspected to be declining due to commercial trade. N. grandiflora was listed on CITES appendix II in 1997. At present no purposeful management of the species is taking place."	8365	Larsen, H.O & Olsen, C.S. (s.d
	A CITES proposal by IN in 1979 for inclusion of Nardostachys spp. in CITES App. I was rejected. Later proposals by IN in 1989 and 1994 for inclusion of N. grandiflora in CITES App. II were both withdrawn. In 1997, the inclusion in App. II was accepted.	7141	UNEP-WCMC (s.dat.): Specie
IN	"Even the legally collected rhizomes have no official records in India because the harvesters usually avoid paying taxes for their collection"	3698	Dhiman, N. & Bhattacharya, A.
NP	"export of unprocessed rhizomes of N. grandiflora is banned"	8365	Larsen, H.O & Olsen, C.S. (s.d
NP	"While no comprehensive management plan exists, some regulatory mechanisms are in place. Commercial collection of medicinal plants requires a licence (collection permit) specifying collection area, period of harvest, species, quantities, and methods of harvest"	8365	
NP	"Medicinal plant harvest and trade from forests in Nepal is regulated by the Forest Act of 1993 and the Forest Regulations of 1995. Alpine meadows where N. grandiflora occurs are legally categorised with forest land"	8365	
NP	"Export of N. grandiflora was banned in 1995 as specified in the Forest Regulations. An amendment in 2001 allowed export of processed plant material, provided the processing had taken place in Nepal and was authorised by the Department of Forest (advised by the Department of Plant Resources and Herbs Production & Processing Co. Ltd. – a company started by the Nepalese government in 1981 to pioneer commercial cultivation of medicinal plants)"	8365	
NP	"Collection of medicinal plants is not allowed in National parks, conservation areas and protected areas according to the National Parks and Wildlife Conservation Act (1973)"	8365	
NP	"The de facto implementation of the forest law regarding export of medicinal plants in Nepal is weak: customs officers are unable to distinguish rhizomes from various species […], deputed forest rangers are not actually working at customs offices […] and forest and police officers reportedly extract rents for letting medicinal plant consignments pass the control posts"	8365	
NP	"The purpose of current regulations (collection license, transport permit, banned export of unprocessed rhizomes) appears to be collection of fees"	8365	
NP	"Harvest is not managed by the national authorities, no quotas or maximum amounts are specified. In practice, traders bulk the harvested rhizomes and apply for collection license and transport permit at the same time, meaning that officially recorded data is valid at the district level at best"	8365	
NP	[also IN] "According to National Medicinal Plant Board (NMPB), Government of India, plants sold in the market are mainly harvested from natural habitat and traded illegally. […] there is lack of official records regarding legal collection of rhizomes. In this regard, both Indian and Nepalese governments have banned the illegal harvesting and trading of this high value plant"	3696	Kaur, H., Lekhak, M.M., Chaha

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Abbreviations and Standards

ICC = ISO Country Codes Ref = literature reference

Altitude: Low / High = minimum and maximum limits of altitude range [m]

Legislation: Source Taxon = name of taxon as contained in legislation

Utilization: TypeUtil

TypeUtil	*TypeUtilLong*
com	commodity
cul	cultivation
exp	export
har	harvest
imp	import
price	price
pur	purpose
rem	remark
socu	socio-cultural significance
sus	sustainability
tra	trade
trend	trend and scale of trade
use	uses

Distribution Status: Standard

Status	*Explanation*
chk	check entry
nat	native
int	introd., established
adv	introduced, not established
ocd	occurrence doubtful
unc	status unclear
ext	extinct
cul	cultivated
sou	source doubtful
ica	introduced (casual or naturalized)
don	doubtfully native
pex	(presumably) extinct
ali	casual alien

nzd	naturalized
nna	not native
dpn	status doubtful, possibly native
abs	absent but reported in error

Common names: Type

TypeShort	*Type*
?	<unknown>
ayn	ayurvedic name
hom	homoeopathic name
pha	pharmaceutical name
scn	standardized common name
tra	trade name
ver	vernacular name

Ecology: TypeEcol

TypeEcol	*Explanation*
alti	altitude
grow	growth rate
habit	habitat
morph	morphology
regen	regeneration
repro	reproduction
soil	soil