Dendrobium officinale Kimura & Migo 1982 Orchidaceae

Nomenclatural reference 1217 Govaerts, R. (2022): The World Checklist of Vascular Plants (WCVP). – Royal Botanic Gardens, Kew. Checklist dataset of 2022-12-08. Retrieved from https://sftp.kew.org/pub/data-repositories/WCVP/, viewed 4.3.2023.

Summary

Intrinsic Traits

Distribution	Dendrobium catenatum is found in south-east China, Taiwan and southern Japan, and extends to the northern parts of Myanmar, Sikkim (northwest India) and Nepal.
Abundance	Remaining populations are small and sparsely distributed.
Habitat	The species grows on tree trunks, rocks and cliffs in sparse limestone area woodlands up to 1600 m.
Regeneration	Slow vegetative propagation (one clone per stem and year).
Reproduction	Very low fruit and seed set, probably due to limited numbers of simultaneously open flowers and low pollinator visitation. Long maturation period.
Plant Parts	The stems are used.
Lifeform	Lithophytic perennial herb.
Systematics	

Extrinsic Traits

Threat Status	Assessed globally as Critically Endangered by IUCN in 2004; needs updating.
Threats	Has increasingly suffered from overexploitation for medicinal purposes.
Purpose	The species is used in TCM.
Use Fields	
Trade Trend	Increasing demand and diminishing natural resources have led to establishments of modern large scale industrial propagation and cultivation facilities (4000 ha cultivated area in China with at least US$39 billion market value).
Legislation	The species is listed in CITES Appendix II.

Taxonomy and Identification

Synonyms

Synonym	Eval	Ref	
Dendrobium catenatum Lindl.		1217	Govaerts, R. (2022): The World Checklist of Vascular Plants (WCVP). –
Dendrobium tosaense Makino		1217	

Taxon Present in Pharmacopoeias and other References

Name as used in Source	*Status*	*Reference*	
Dendrobium tosaense Makino		3586	Zhonghua Bencao Editorial Committee, Chinese State Administration of TCM (ed.) (1998): Zhonghua Bencao (Materia Medica of China), Vol. 1-10. Shanghai Scientific and Technical Press, Shanghai. Retrieved from http://www.zysj.com.cn/zhongyaocai/zhonghuabenca
Dendrobium catenatum Lindl.		3575	Eng Soon Teoh (2016): Medicinal orchids of Asia. Springer, sine loco.
Dendrobium catenatum Lindl.		3749	Leon, C. & Lin Yu-Lin (2017): Chinese medicinal plants, herbal drugs and substitutes. An identification guide. Kew Publishing, Royal Botanic Gardens, Kew.
Dendrobium officinale		5888	Traffic East Asia (1999): Medicinal plant significant trade study (phase 2). Final report submitted to the Bundesamt für Naturschutz, Germany. TRAFFIC East Asia. Unpublished report, sine loco.
Dendrobium officinale		9698	Brinckmann, J.A. (2014): Quick scan of Orchidaceae species in European commerce as components of cosmetic, food and medicinal products. Report for Bundesamt für Lebensmittelsicherheit und Veterinärwesen, Bern.
Dendrobium officinale K.Kimura & Migo		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

Dendrobium officinale Kimura & Migo	3091	National Pharmacopoeia Commission (ed.) (2020): Zhōnghuá rénmín gònghéguó yàodiǎn. 2020 Niánbǎn. Yī bù [Pharmacopoeia of the People's Republic of China. 2020 edition. Volume 1; in Chinese]. China Medical Science and Technology Press, Beijing.
Dendrobium officinale Kimura & Migo	3145	Brinckmann, J.A., Kathe, W., Berkhoudt, K, Harter, D.E.V. & Schippmann, U. (2022): A new global estimation of medicinal and aromatic plant species in commercial cultivation and their conservation status. Economic Botany 22(10): 1-15.
Dendrobium officinale Kimura & Migo	3439	Shih-Chung Chen (ed.) (2019): Taiwan Herbal Pharmacopoeia. 3rd edition. English version. Ministry Health and Welfare, Taipei. Retrieved from https://www.mohw.gov.tw/lp-3690-2.html, viewed: 28.04.2020.
Dendrobium officinale Kimura & Migo	6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. & Tucker, A.O. (2000): Herbs of commerce. 2nd edition. AHPA, Silver Spring, USA.
Dendrobium officinale Kimura & Migo	8871	China Pharmacopoeia Commission (ed.) (2010): Pharmacopoeia of the People's Republic of China. English edition. Ed. 9. Stationery Office Books, s.loc.
Dendrobium tosaense Makino	3439	Shih-Chung Chen (ed.) (2019): Taiwan Herbal Pharmacopoeia. 3rd edition. English version. Ministry Health and Welfare, Taipei. Retrieved from https://www.mohw.gov.tw/lp-3690-2.html, viewed: 28.04.2020.
Dendrobium tosaense Makino	5888	Traffic East Asia (1999): Medicinal plant significant trade study (phase 2). Final report submitted to the Bundesamt für Naturschutz, Germany. TRAFFIC East Asia. Unpublished report, sine loco.

Common Names

Common Name	Typ	Language	Country	Ref	
Chinese orchid	ver	English		6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. &
dendrobium	scn			6369	
dendrobium	scn	English		6369	
hei jie cao	ver	Chinese		2413	Anon. (1976): Iconographia Cormophytoru
hek dzik tsou	ver	Chinese		2413	
Herba Dendrobii	pha	Latin		5935	Hu Shiu-Ying (1999): An enumeration of C
Officinal Dendrobium	ver	English		5935	
shi hu	ver	Chinese		6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. &
tie pi shi hu	ver	Chinese		1180	GRIN (17.3.2015): Download World Econo
tie pi shi hu	ver	Chinese		2414	Tsi, Z.H., Chen, S.C., Luo, Y.B. & Zhu, G.
tie pi shi hu	ver	Chinese		6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. &
T'ieh-p'i-shih-hu	ver	Chinese		5935	Hu Shiu-Ying (1999): An enumeration of C
tit pei sek huk	ver	Chinese		2414	Tsi, Z.H., Chen, S.C., Luo, Y.B. & Zhu, G.
wan nam tit pei	ver	Chinese		2414	
yun nam tie pi	ver	Chinese		2414	

Distribution Range

Distribution Range	Ref	
“ASIA-TEMPERATE: China: China - Anhui, Fujian, Guangxi, Sichuan, Yunnan, Zhejiang”	1100	GRIN Database (Germplasm Resources Info
China	1180	GRIN (17.3.2015): Download World Econom
China (Anhui, Zhejiang, Fujian, Guangxi, Yunnan, Sichuan), Myanmar, Sikkim/India and Nepal and southern Japan	3575	Eng Soon Teoh (2016): Medicinal orchids of
S. China, S. Japan to EC. Taiwan; 36 CHC CHS 38 JAP NNS TAI	1126	World Checklist of Selected Plant Families,

Distribution

Continent	Region	ICC	Status	Free Text	Ref
3 Asia-Temporate	36 China	CN		Anhui, Fujian, Guangxi, Sichuan, Yunnan, Zhejiang	1100
		CN			1109
		CN		"CHT-XI"	1109
		CN		"CHC-GU"	1109
		CN		Guangxi	1109
		CN		"CHC-YU"	1109
		CN			1109
		CN		Hunan	1109
		CN		"CHS-AN"	1109
		CN			1109
	38 Eastern Asia	JP			1109
		TW			1109

Abundance / Local Population Size

ICC	Abundance	Reference	
CN	"Known remaining populations of D. catenatum are small and sparsely distributed."	9450	Hong Liu, Yi-Bo Luo, Heinen, J

CN	"Patchy distribution in Anhui province and harsh conditions; rapidly dimishing occurrencesof D. catenatum; requires protection and simultaneous development of alternative supply through cultivation [...]"	3575	Eng Soon Teoh (2016): Medici

Ecology

TypeEc	ICC	Ecology	Ref	
alti	CN	up to 1600 m	3575	Eng Soon Teoh (2016): Medicin
grow		deciduous	3575	
habit	CN	"occurs on tree trunks and on rocks in sparse woods in limestone areas up to 1600 m."	3575	
habit	CN	Lithophytic in moderately damp mountains; ca. 1600 m.	1117	eFloras. Flora of China. http://w
repro	CN	"... ; its two- or three-years-old stems could be bloomed; higher seed-setting rate would be obtained when pollinated in time; the ovary began swelling after pollinated four or five days, until about 185 days later, the fruit matured; the seed-setting rate was very low (0.31%) in natural environment; only one clone was generated from one stem in a clump in annual. CONCLUSION: D. officinale mainly reproduces by clonal propagation;"	3600	He. P., Song, X., Luo, Y. & He,
repro	CN	"Several pockets of orchids that were under investigation suffer from extremely low pollinator visitation and fruit set, likely the result of too small a flowering display, with only a small number of open flowers in a given area in any given day during the flowering season [...]."	9450	Hong Liu, Yi-Bo Luo, Heinen, J,

Life Form

LF_Standard	Duration	Lifeform	Woodiness	Height	Ref	
					1126	World Checklist of Selected Pl
perennial herb				9-35cm	3575	Eng Soon Teoh (2016): Medici

Threat Situation

ICC	PopulationStatus	Ref	
CN	"In Hainan regarded as endangered due to its overcollection in the past."	3601	Paul, A., Bharali, S., Latif Khar
CN	"Wild populations of D. catenatum have declined rapidly due to overexploitation, as China's human population and purchasing power increased [...]"	3603	Osewa, S.O., Alamu, O., Inegb

Threat Status: Global and Supranational

Glo	Threat Category	Criteria	Ass.	Publ.	Ref	
glo	CR Critically Endangered		2004	2023	1223	2023 IUCN Red List of Threatened Species. Version 2023-1. www.iucnredlist.org. Download of plant data received from IUCN website 16.12.2023.
	Name used in redlist: Dendrobium officinale Kimura & Migo Accepted					Name used in redlist: Dendrobium officinale Kimura & Migo
glo	CR Cririically Endangered	A4c	2004	2004	3626	China Plant Specialist Group (2004): Dendrobium officinale. The IUCN red list of threatened species 2004. e.T46665A11074270. Retrieved from http://dx.doi.org/10.2305/IUCN.UK.2004.RLTS.T46665A11074270.en, viewed: 07.10.2016.
	Name used in redlist: Dendrobium officinale					Name used in redlist: Dendrobium officinale
glo	CR Critically Endangered	A4c	2004-04-30	2004	1206	2020 IUCN Red List of Threatened Species. Version 2020-3. www.iucnredlist.org. Download of plant data received from IUCN 14.1.2021.
	Name used in redlist: Dendrobium officinale Kimura & Migo Accepted					Name used in redlist: Dendrobium officinale Kimura & Migo

Threat Status: Countries

ICC	Region	Threat Category	Assd.	Publ.	Ref	
CN	CR	Critically Endangered		2017	3293	Haining Qin & al. (2017): Threatened species list of
	Name used in redlist: Dendrobium catenatum		Synonym		Accepted Name: Dendrobium officinale Kimura & Migo	
CN	CR	Critically Endangered – 极危		2013	3319	Chinese Academy of Sciences (2013): Chinese biodi
	Name used in redlist: Dendrobium catenatum		Synonym		Accepted Name: Dendrobium officinale Kimura & Migo	
JP	EN	Endangered Class I B – 絶滅危惧IB類		2019	3373	Biodiversity Center of Japan & Japanese Ministry of
	Name used in redlist: Dendrobium catenatum		Synonym		Accepted Name: Dendrobium officinale Kimura & Migo	
TW	NVU	Vulnerable		2017	3358	Editorial Committee of the Red List of Taiwan Plants
	Name used in redlist: Dendrobium catenatum		Synonym		Accepted Name: Dendrobium officinale Kimura & Migo	

Purpose of Use

Purpose		Ref
medicine - traditional Asian medicine	"The stems of D. officinale are used as a traditional Chinese hygienic food named "Tiepi Fengdou". It is beneficial to human health in many ways, such as nourishing yin and clearing away unhealthy heat, benefiting the stomach, resisting cancer and prolonging life"	3176
	Used in TCM	5888
	Used in TCM	5888
	Used in TCM	5888
	Used in traditional Chinese medicine	5888

medicine - traditional herbal medicine	Medic. (folklore)	1180
	Medicines: folklore (fide Herbs Commerce ed2)	1100

Purpose: Standardized Use Fields

Purpose: Fields of Use	Frequency
medicine - traditional Asian medicine	5
medicine - traditional herbal medicine	2

Purpose: Number of Use Fields

Purpose: Number of use fields
Taxon used in 2 different standardized use categories (max. 27 categories possible).

Plant Parts Used

Plant Part (standardized)	Plant Part (free text)	Remark	Ref	
stem			3176	Ding, G., Xu, G., Zhang, W., Lu, S., Li, X., Gu

Scale and Trend of Trade

Utilization: Commodity, Cultivation, Harvest, Sustainability, Trade

Type	ICC	Utilization	Ref	
cul		"..., motivated by market demands in the face of depleted natural resources, mass artificial cultivation of Dendrobium orchids, including that of D. catenatum, using modern in vitro seed germination and tissue culture techniques, was developed recently. This mass production, mostly done in industrial shade houses and currently estimated to be around 500 ha in area with a total market value of ¥250 billion RMB (US $39 billion), seems to have satisfied most of the market demand [...]."	9450	Hong Liu, Yi-Bo Luo, Heinen, J
cul	CN	"A large scale tissue-culture factory and plant production facility for D. officinale has been built in China. The cultivated area was over 60,000 mu (4000 ha) in 2014. Key technologies employed for cultivation of improved varieties of D. officinale have been developed by studying the relationship between factors such as growth medium, light, water, air and temperature on plant growth and development."	3602	Yi-bo Luo (2015): Major breakt
cul	CN	Controlled Cultivation; Yunnan, Zhejiang, and Tibet	3145	Brinckmann, J.A., Kathe, W.,
cul	CN	cultivated	3145	
cul	CN	Natural Fostering; Yunnan, Guizhou, Zhejiang, Jiangxi and Fujian	3145	
tra		"At present, the natural resources of D. officinale are so limited that the great demand has led to a severe shortage and high price,"	3176	Ding, G., Xu, G., Zhang, W., L
tra		CITES Trade data: 1 international transaction under the term "derivatives" between 1975 and 2017	7150	UNEP-WCMC (2019): CITES
tra		CITES Trade data: 1 international transaction under the term "stems" between 1975 and 2017	7150	
tra		CITES Trade data: 10 international trade transaction under the term "powder" between 1975 and 2017	7150	
tra		CITES Trade data: 3 international trade transactions under the term "medicine" between 1975 and 2017	7150	
tra		CITES Trade data: 7 international trade transactions under the term "stems" between 1975 and 2017	7150	
tra		Leaf; Stem used in European commerce as component in cosmetics	9698	Brinckmann, J.A. (2014): Quic
tra		Stem used in European commerce as component in medicinals	9698	
tra	US	"sold in this country"	6369	McGuffin, M., Kartesz, J.T., Le

Legislation

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

Regulation

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1126 World Checklist of Selected Plant Families, RBG Kew. apps.kew.org/wcsp/home.do

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3091 National Pharmacopoeia Commission (ed.) (2020): Zhōnghuá rénmín gònghéguó yàodiǎn. 2020 Niánbǎn. Yī bù [Pharmacopoeia of the People's Republic of China. 2020 edition. Volume 1; in Chinese]. China Medical Science and Technology Press, Beijing.
3145 Brinckmann, J.A., Kathe, W., Berkhoudt, K, Harter, D.E.V. & Schippmann, U. (2022): A new global estimation of medicinal and aromatic plant species in commercial cultivation and their conservation status. Economic Botany 22(10): 1-15.
3176 Ding, G., Xu, G., Zhang, W., Lu, S., Li, X., Gu, S. & Ding, X-Y. (2008): Preliminary geoherbalism study of Dendrobium officinale food by DNA molecular markers. European Food Research and Technology 227: 1283-1286.
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3600 He. P., Song, X., Luo, Y. & He, M. (2009): Reproductive biology of Dendrobium officinale (Orchidaceae) in Danxia landform [Article in Chinese]. China Journal of Chinese Materia Medica (Zhongguo Zhong Yao Za Zhi) 34 (2): 124-127. Retrieved from https://ww
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3602 Yi-bo Luo (2015): Major breakthroughs with Dendrobium officinale conservation made by a team in China. Orchid Conservation News 1: 3.
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3749 Leon, C. & Lin Yu-Lin (2017): Chinese medicinal plants, herbal drugs and substitutes. An identification guide. Kew Publishing, Royal Botanic Gardens, Kew.
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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

Distribution Status: Standard

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

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