Boswellia neglecta S.Moore 6333 Burseraceae

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	Boswellia neglecta is native to Ethiopia, Somalia, Kenya, Tanzania, and Uganda.
Legislation	The species is not protected by CITES.
Threat Category	Not assessed globally by IUCN. Not found in recent national red lists.
Threat	Several threat causes exist: (i) continuous tapping through the year with no rest periods; (ii) grazing of livestock; (iii) cutting branches for fodder in times of drought. Severe drought also affects the trees directly.
Abundance	Locally common in Kenya; abundance unknown for the rest of its range.
Habitat	Boswellia neglecta is found in Acacia-Commiphora bushland at altitudes from 130 to 1350m.
Regeneration	It may be inferred from another species (B. papyrifera) that propagation from rooted cuttings and the production of root suckers are possible.
Reproduction	Flowers bisexual.
Lifeform	Shrub or small tree, up to 8m high.
Plant Parts	Gum-resin as an exudate from the bark is used.
Use	B. neglecta resin is of lower quality as that yielded by B. sacra and B. frereana. In general, the gum-resins are used for burning as incense, they are distilled to yield volatile oils in perfumery, used for chewing, and to a lesser degree in the preparation of traditional medicines.
Use Fields	Material; Social use; Medicine; Food.
Trade Trend	Demand seems to be stable or perhaps even decreasing.
Systematics	The genus Boswellia comprises some 20 species, most of them distributed in dry tropical Africa with eight endemics on the island of Socotra and one species in India (B.serrata).

Taxonomie and Indentification

Taxonomy	*Reference*	
genus: "c. 20 dry trop. Afr. (esp. NE; Socotra 8 endemics) & As."	3753	Mabberley, D.J. (2017): The plant-book. 4th ed
genus: "17 species in rather dry areas from the Ivory Coast to India and southwards to north-eastern Tanzania and northern Madagascar"	8889	Thulin, M. (1999): Flora of Somalia. Volume 2
genus: "19-20 species extending from the Ivory Coast to India and south to NE. Tanzania and N. Madagascar; most numerous in NE. tropical Africa."	8914	Gillett, J.B. (1991): Burseraceae. In: Flora of T
genus: "Despite their early recognition, classification and nomenclature of members of the two genera, Boswellia and Commiphora in tropical East Africa have remained unstable. They have been described by various botanists as taxonomically difficult […].The situation is worsened further by the fact that Commiphora is a gregarious genus and where one species is found, several others are likely to occur as well […]. This has led to the practice of describing species from inadequate and often sterile material. As a result some species have been described by different botanists under different names."	3944	Gachathi, F.N. (1997): Recent advances on cl
Flora Somalia treats this species in a wider sense and includes B. microphylla Chiov. as a synonym which is an accepted species in TPL.	8889	Thulin, M. (1999): Flora of Somalia. Volume 2

Synonyms

Synonym	Eval	Ref	
Boswellia hildebrandtii Engl.		1208	RBG Kew (2021): World Checklist of Vascular Plants (WCVP). - Download

Name Used in Pharmacopoeias and other References

Name as used in Source	*Status*	*Reference*	
Boswellia hildebrandtii		2095	Iwu, M.M. (1993): Handbook of African medicinal plants. CRC Press, Boca Raton.

Common Names

Common Name	Typ	Language	Country	Ref	
Bay-Bay	ver			8889	Thulin, M. (1999): Flora of Somalia. Volum
Frankincense	tra			8730	Brendler, T., Eloff, J.N., Gurib-Fakim, A. &
muqlay	ver			8889	Thulin, M. (1999): Flora of Somalia. Volum
murchen	ver	Somali		8889	
Olibanum	tra			8730	Brendler, T., Eloff, J.N., Gurib-Fakim, A. &

Distribution Range

Distribution Range	Ref	
"Native to: Ethiopia, Kenya, Somalia, Tanzania, Uganda"	8749	Maundu, P.M., Ngugi, G.W. & C.H.S. Kabuy
"Native: Ethiopia, Somalia, Kenya, Tanzania, Uganda"	1192	Plants of the World Online (POWO). Royal B
"Native: Ethiopia, Somalia, Kenya, Tanzania, Uganda"	1100	GRIN Database (Germplasm Resources Info

Distribution

Continent	Region	ICC	Status	Free Text	Ref
2 Africa	24 Northeast Tropical Afri	ET	native		1192
		ET	native		3799
		ET	native		8889
		ET	native	E	8914
		ET	native	"in the southern provinces of Bale, Gamo Gofa, Hararghe and Sidamo"	8919
		SO	native		1192
		SO	native		3799
		SO	native	N, C, and S	8914
	25 East Tropical Africa	KE	native		1192
		KE	native	N & E	3799
		KE	native		8914
		TZ	native		1192
		TZ	native	NE	3799
		TZ	native		8889
		TZ	native		8914
		UG	native		1100
		UG	native	NE	3799
		UG	native		8889
		UG	native		8914

Abundance / Local Population Size

ICC	Abundance	Reference	
KE	"May be locally common"	8749	Maundu, P.M., Ngugi, G.W. &

Ecology

TypeEc	ICC	Ecology	Ref	
alti		200-1350m	8914	Gillett, J.B. (1991): Burseraceae
alti	ET	600-1750m	3799	Vollesen, K. (1989): Burseracea
alti	SO	130-990m	8889	Thulin, M. (1999): Flora of Soma
habit		"Acacia, Commiphora bushland"	8914	Gillett, J.B. (1991): Burseraceae
habit	ET	"Acacia-Commiphora woodland, wooded grassland and bushland, Acacia-Boswe/lia-Tenninalia woodland and wooded grassland"	3799	Vollesen, K. (1989): Burseracea
habit	SO	"Acacia-Commiphora bushland"	8889	Thulin, M. (1999): Flora of Soma
repro		"Flowers bisexual"	8914	Gillett, J.B. (1991): Burseraceae

Life Form

Duration	Lifeform	Woodiness	Height	LF_free_txt	Ref	
	shrub or small tree		up to 8m	"shrub or small tree"	8914	Gillett, J.B. (1991): Burseracea
	shrub or tree		to 6m	"shrub or tree"	3799	Vollesen, K. (1989): Burserace
	shrub or tree		up to 6m	"tree or shrub"	8919	Moges, Y. (2004): Gum and in
	shrub or tree		up to 5m	"shrub or, less often, a tree"	8749	Maundu, P.M., Ngugi, G.W. &
	shrub or tree		up to 8m	"shrub or tree"	8889	Thulin, M. (1999): Flora of Som

Population Status / Threat Causes

ICC	PopulationStatus	Remark	Ref	
ET	"B. neglecta was found in all the districts with densities ranging between 600 and 95 trees/ha."		3787	Gachathi, F.N. & Eriksen, S. (2

ET	[non-species-specific information for Boswellia and Commiphora]: „Drivers of dryland degradation include population growth and farmland expansion, lack of regeneration, human-induced fires, improper use of woodlands, improper tapping, overgrazing and bush encroachment"	8898	Lemenih, M. & Kassa, L. (2010
ET	[non-species-specific information for Boswellia]: „Under best practice, a tree is tapped for no more than 3 consecutive years, and should be rested so it can recover and regain vigour. However, in most cases, Boswellia trees are repeatedly tapped at intervals of 15 days throughout the dry season for up to 7 or more years. This causes premature death and production of poor-quality seeds that are unable to regenerate	8898	
SO	[non-species-specific information for Boswellia and Commiphora]: "It is impossible to prevent grazing of livestock and in times of drought nomads cut branches for fodder. Severe drought also affects the trees directly, slowing their growth and causing problems of regeneration. The more accessible trees are often tapped continuously through the year, with no rest periods, and this puts them under further stress."	4187	Coppen, J.J.W. (1995): Flavou

Red List Status: Global and Supranational

Red List Status: Countries

Purpose: Free text

Purpose		Ref	
food	[non-species-specific information] "The 'clean', distinctive flavour of certain types of olibanum makes them highly valued for chewing and this constitutes an important use in some markets."	4187	Coppen, J.J.W. (1995): Flavou
material	"The bark is used for tanning."	8889	Thulin, M. (1999): Flora of Som
	Materials: gum/resin (fide Başer et al., Flav Fragr J 18:153-156. 2003)	1100	GRIN Database (Germplasm R
	Materials: essential oils (fide Başer et al., Flav Fragr J 18:153-156. 2003)	1100	GRIN Database (Germplasm R
	"[used] for making containers water-proof"	8889	Thulin, M. (1999): Flora of Som
medicine	[non-species-specific information] "The main use for olibanum, myrrh and opopanax imported into the People's Republic of China is in the preparation of traditional medicines."	4187	Coppen, J.J.W. (1995): Flavou
social use	[non-species-specific information] "Small amounts of resin are distilled to yield volatile oils [...] which find use in perfumery."	4187	Coppen, J.J.W. (1995): Flavou
	"The gum-resin is used locally as incense"	8889	Thulin, M. (1999): Flora of Som
	[non-species-specific information] "The major fragrance use is for burning as incense in religious ceremonies."	4187	Coppen, J.J.W. (1995): Flavou

Purpose: Standardized Fields of Use

Purpose: Fields of Use	Frequency
food - sweets industry	1
material - colouring & dye	1
material - general	3
medicine - used traditionally as herbal remedy	1
social use - cosmetics industry	1
social use - general	2

Purpose: Number of use fields

Purpose: Number of level-1 use fields
6

Plant Parts Used

Plant Part (standardized)	Plant Part (free text)	Remark	Ref	
exudate	gum-resin		8889	Thulin, M. (1999): Flora of Somalia. Volume 2

Scale and Trend of Trade

ICC	Trade Trend	Ref	
	[non-species-specific information for Boswellia and Commiphora]: "Demand today is believed to be less than was current in the late 1970s/early 1980s."	4187	Coppen, J.J.W. (1995): Flavours and fragrances of plant origin. FAO, Rome (Non-wood Forest Products 1). Retrieved from http://www.fao.org/docrep/V5350E/V5350e00.htm, viewed: 07.11.2012.

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

Type	ICC	Utilization	Ref	
com		"Frankincense obtained from Boswellia frereana known as maidi is the best and the most expensive; frankincense obtained from B. sacra known as beyo is the second best, and frankincense obtained from B. neglecta is known as fooh has the lowest quality."	3942	Hassan, B.A., Glover, E.K., Lu
com		"low-quality frankincense is obtained from Boswellia neglecta S. Moore and Boswellia ogadensis Vollesen in north-eastern Kenya, the Ogaden region in Ethiopia, and in Somalia"	3942	

com		"Olibanum of Middle Eastern origin is said by some sources to come principally from three species of Boswellia: B. carteri and B. frereana in Somalia and B. sacra in southern Arabia. Some other Boswellia spp. are minor sources of resin and these include B. bhau-dajiana and B. neglecta in Somalia and B. papyrrfera in Ethiopia."	4187	Coppen, J.J.W. (1995): Flavou
com		"The Ogaden type is gum-resin type produced in the east and south-eastern parts of the country. [...] However, some of the sources indicated that resins from B. rivae (Engl.), B. ogadensis (Vollesen) (Somali name 'Gended'), B. neglecta (S. moore) (Somali name 'Murufur') and B. microphylla (Chior.) (Somali name 'Muqlay') are collected and traded as frankincense in this area"	3786	Lemenih, M. &Teketay, D. (20(
com	KE	"B. neglecta produces two types of aromatic frankincense resins. The first type consists of pale-yellow droplets, which exude spontaneously from the surface of the bark, without there being any notable damage to the bark surface. This resin is chewed by Samburu collectors, as a type of chewing gum. The second type of resin is black and resembles sticky tar. It is produced in much bigger quantities and is harvested for commercial purposes."	3950	Sommerlatte, H. & Van Wyk, E
com	KE	"The species is the commonest source of frankincense in Kenya."	8749	Maundu, P.M., Ngugi, G.W. &
exp		[non-species-specific information for Boswellia and Commiphora]: "Somalia and Ethiopia are by far the biggest producers of the three resins [...]. Somalia is the only source of maidi-type olibanum, exports of which were estimated at 800-900 tonnes in 1987. Smaller quantities of the "beyo" type of olibanum are produced. Ethiopia and Sudan produce the most widely traded olibanum, the Eritrean type, and in 1987 this was reckoned to amount to some 2,000 tonnes."	4187	Coppen, J.J.W. (1995): Flavou
har	ET	[non-species-specific information for Boswellia and Commiphora]: „estimates for olibanum and myrrh show yields in the range of 0.07–1.0 kg per tree per year, with the average being 0.50 kg [...], whereas another report provides an estimate as high as 3.0 kg per tree per year	8898	Lemenih, M. & Kassa, L. (201(
har	ET	[non-species-specific information for Boswellia: Estimated potential and annual production of gum and incense in Ethiopia: Gum olibanum 2,284,000 ha and 57,100 tonnes	8898	
har	ET	„Ogaden and Borana types are gum resins produced from Boswellia species found in the dry forests of the eastern and southeastern lowlands. [...] gum resins from B. rivae, B. ogadensis, B. neglecta and B. microphylla are collected from these areas and traded as frankincense"	8898	
har	KE	"Annual production estimate: 100 tonnes for frankincense"	3787	Gachathi, F.N. & Eriksen, S. (2
har	KE	"Samburu resin harvesters in northern Kenya maintain that frankincense resin flow from Boswellia neglecta and Commiphora confusa is induced by insect larval activity. Observations on the insects' larval behaviour support these claims. During the frankincense harvest, buprestid beetle larvae, identified as a Sphenoptera species, are found under B. neglecta resin, eating the monoterpenerich inner bark, which apparently stimulates the trees to produce copious amounts of fresh resin. The same behaviour was observed with cerambycid beetle larvae, identified as Neoplocaederus benningseni Kolbe, on C. confusa trees."	3950	Sommerlatte, H. & Van Wyk, E
har	SO	[non-species-specific information for Boswellia]: "In some cases, as in Somalia, the wild Boswellia stands belong to extended families who live in the resin-producing areas. There is therefore some incentive on the part of those who tap the trees not to do it in such a way as to damage the trees and jeopardise their livelihoods."	4187	Coppen, J.J.W. (1995): Flavou
har	SO	[non-species-specific information for Boswellia]: "It is not possible from official records alone to estimate how much resin, on average, is obtained from a tree. Figures of 1-3 kg per tree per year have been cited for olibanum in Somalia."	4187	
imp		[non-species-specific information for Boswellia and Commiphora]: "The Middle East and the People's Republic of China are seen to be the major consumers. Germany has imported significant amounts of Ethiopian incense gum."	4187	
imp		[non-species-specific information for Boswellia and Commiphora]: "The People's Republic of China is the largest market for all three resins, mainly for use in traditional medicines. Imports of olibanum (mainly the Eritrean type from Ethiopia and Sudan) and myrrh were each significantly in excess of 1,000 tonnes in 1984. [...] In Europe and Latin America, substantial amounts of Eritrean-type olibanum are used as incense by the Orthodox and Roman Catholic Churches (approaching 500 tonnes in 1987). Similar quantities are imported into North African countries where it is used for chewing. The Middle East, particularly Saudi Arabia, is another important market for the chewing grade of olibanum, this time the higher quality "maidi" type from Somalia (approximately 500 tonnes in 1987). [...] Of the order of 50 tonnes pa [...] of olibanum [...] are used in Europe (mainly France) for the production of essential oils and extracts."	4187	
rem	KE	"True frankincense is resin of a more superior quality yielded by Boswellia carteri Birdw. and B. frereana Birdw. both occurring in northern Somalia."	8749	Maundu, P.M., Ngugi, G.W. &
tra		"There are six most common Boswellia species whose gum-resins are widely traded and these are: B. frereana Birdw. known only from Somalia; B. sacra Flueck. (syn. B. carteri) from Somalia, Yemen and Oman; B. papyrifera Hochst. from Ethiopia and Sudan; B. rivae Engl. from Ethiopia; B. neglecta S.Moore from Ethiopia and Kenya; and B. serrata Roxb. from India. They are all known as frankincense or olibanum."	8730	Brendler, T., Eloff, J.N., Gurib-
tra	ET	[non-species-specific information for Boswellia and Commiphora]: „The production and trade volumes of gums and resins in Ethiopia have been increasing since the 1990s. Between 1998 and 2007, Ethiopia exported about 25 192 tonnes – an average of approximately 2519 tonnes per year – of natural gums and resins with a value of [...] 34 138 670 USD [...]. The export volume increased on average by 12% each year from 1998 to 2007"	8898	Lemenih, M. & Kassa, L. (201(
tra	KE	"The species is the commonest source of frankincense in Kenya."	8749	Maundu, P.M., Ngugi, G.W. &

Legislation

Regulation

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3787 Gachathi, F.N. & Eriksen, S. (2011): Gums and resins. The potential for supporting sustainable adaptation in Kenya's drylands. Climate and Development 3: 59-70. Retrieved from https://www.tandfonline.com/doi/abs/10.3763/cdev.2010.0066, viewed: 04.07.2018.

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3942 Hassan, B.A., Glover, E.K., Luukkanen, O., Kanninen, M. & Jamnadass, R. (2019): Boswellia and Commiphora species as a resource base for rural livelihood security in the Horn of Africa. A systematic review. – Forests 10: 551. Retrieved from https://www.mdp

3944 Gachathi, F.N. (1997): Recent advances on classification and status of the main gum-resin producing species in the family Burseraceae. – In: Mugah, J.O., Chikamai, B.N., Mbiru, S.S. & Casadei, E. (ed.): Conservation, management and utilisation of plant gu

3950 Sommerlatte, H. & Van Wyk, B.-E. (2022): Observations on the association between some Buprestid and Cerambycid beetles and black frankincense resin inducement. – Diversity 14(1): 1-7. Retrieved from https://www.mdpi.com/1424-2818/14/1/58, viewed: 10.02.20

4187 Coppen, J.J.W. (1995): Flavours and fragrances of plant origin. FAO, Rome (Non-wood Forest Products 1). Retrieved from http://www.fao.org/docrep/V5350E/V5350e00.htm, viewed: 07.11.2012.

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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

Ecology: TypeEcol

TypeEcol	*Explanation*
alti	altitude
grow	growth rate
habit	habitat
morph	morphology

scn	standardized common name	regen	regeneration
tra	trade name	repro	reproduction
ver	vernacular name	soil	soil