Pelargonium sidoides DC. 1094 Geraniaceae

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	The natural range of Pelargonium sidoides is restricted to the coastline regions of South Africa and Lesotho. In South Africa it is distributed in the Cape Provinces, Free State, KwaZulu-Natal, Northern Provinces, and Swaziland.
Abundance	A 2010 study indicated that populations of Pelargonium sidoides are sparsely distributed and represented by isolated and mostly small subpopulations in Gauteng, Mpumalanga and Western Cape. It is, however, abundant to extremely abundant in the north-eastern and south-eastern Free State and Lesotho. It is also abundant in the Eastern Cape. In the Free State and Lesotho, many subpopulations were estimated to have more than 100 000 plants, sometimes even much larger.
Habitat	Pelargonium sidoides grows in open grassland but is also found in a range of other habitat types in South Africa (Albany Thicket, Fynbos, Grassland, Nama Karoo, Succulent Karoo).
Regeneration	The plants regenerate well after harvest when parts of the main root are left in the ground. Regeneration growth is however very slow.
Reproduction	Possibly pollinated by bees and flies. Reproduction by seed, but viability and germination of seeds is low.
Plant Parts	The rhizome of the plant is used.
Lifeform	Pelargonium sidoides is a rhizome geophyte.
Systematics	The genus Perlargonium comprises 280 species. Most of them are distributed in Africa, only few in other tropical areas. The Cape region alone holds 148 species of the genus, 79 of them are endemic there.

Extrinsic Traits

Threat Status	Pelargonium sidoides has not been assessed globally by IUCN. It was assessed nationally as Least Concern in South Africa in 2012.
Threats	Typically, because of its brittleness only parts of the root can be harvested. The individuals are able to resprout after harvesting and the majority of plants recover from harvesting. Localized declines in populations occur where repeated harvesting takes place within too short time frames. The bigger threat to the species are habitat conversion and degradation as a result of urban development and agriculture. In some range areas, overgrazing is leading to dense acacia bush encroachment, which creates unsuitable habitat for P. sidoides.
Purpose	Traditionally Pelargonium sidoides extracts are used in herbal medicine for the treatment of upper respiratory infections and also to treat various illnesses such as diarrhoea, dysentery, and tuberculosis. In modern phytomedicine it is used to treat bronchitis.
Use Fields	Medicine (phytomedicine; traditional medicine; veterinary medicine).
Trade Trend	Since the 1990s Umckaloabo has become a successful phytomedicine in the German market. Comprehensive data on annual harvest and trade is lacking. Estimates of annual harvested fresh material in various sources range from 9 to 45t and 26 to 440t. The material is mostly wild collected but cultivation efforts are underway and increasing. The largest import market for Pelargonium sidoides is Germany. The annual sales in Germany are estimated at 80 million Euro (2013).
Legislation	The species is not protected by CITES. The collection is regulated in South Africa and Lesotho.

Taxonomy and Identification

Taxonomy	*Reference*
[Genus:] "280 trop. (few) & S (most) Afr (Cape 148, 79 endemic)"	3753 Mabberley, D.J. (2017): The plant-book. 4th e

"The closely related Pelargonium reniforme is morphologically very similar but has pink flowers […]. Morphological distinction of the dried product is extremely difficult, so that chemical analysis is the only reliable method."	9389	van Wyk, B.E. (2008): A broad review of comr
"The pink flowered Pelargonium reniforme must not be harvested."	3937	Parceval (2019): Harvesting guidelines for Pel
"Morphologically it is very similar to its close relative Pelargonium reniforme but it is readily distinguished by its dark red rather than pink petals"	3934	Lewua, F.B., Adebolab, P.O. & Afolayan, A.J.

Synonyms

Taxon Present in Pharmacopoeias and other References

Name as used in Source	Status	Reference	
Pelargonium sidoides		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.
Pelargonium sidoides		3751	van Wyk, B.-E. & Wink, M. (2017): Medicinal plants of the world. 2nd edition. CABI, Wallingford & Boston.
Pelargonium sidoides DC		8375	Medicines and Healthcare Products Regulatory Agency (2008): British Pharmacopoeia 2009. 4 volumes. Stationery Office, London.
Pelargonium sidoides DC		8875	European Directorate for the Quality of Medicines & Health Care (EDQM) (2012): European Pharmacopoeia. Pharmacopée Européenne. 7.8 edition. USB stick version. Council of Europe, Strasbourg.
Pelargonium sidoides 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
Pelargonium sidoides DC.		1241	United States Pharmacopeial Convention (2024): Herbal Medicines Compendium (HMC). https://hmc.usp.org/
Pelargonium sidoides DC.		3561	Quattrocchi, U. (2012): World dictionary of medicinal and poisonous plants. Common names, scientific names, eponyms, synonyms, and etymology. CRC Press, Boca Raton.
Pelargonium sidoides DC.		6796	Arnold, T.H., Prentice, C.A., Hawker, L.C., Snyman, E.E., Tomalin, M., Crouch, N.R. & Pottas-Bircher, C. (2002): Medicinal and magical plants of southern Africa. An annotated checklist. Strelitzia 13: 1-203.
Pelargonium sidoides DC.		7279	van Wyk, B.-E. & Wink, M. (2004): Medicinal plants of the world. Timber Press, Portland.
Pelargonium sidoides DC.		8380	European Directorate for the Quality of Medicines & Health Care (EDQM) (ed.) (2007-2009): European Pharmacopoeia. 6th edition. 2 volumes and 8 supplements. Council of Europe, Strasbourg.
Pelargonium sidoides DC.		8730	Brendler, T., Eloff, J.N., Gurib-Fakim, A. & Phillips, L.D. (ed.) (2010): African Herbal Pharmacopoeia. Graphic Press, Mauritius.
Pelargonium sidoides DC.		9301	Comisión Permanente de la Farmacopea de los Estados Unidos Mexicanos (ed.) (2013): Farmacopea herbolaria de los Estados Unidos Mexicanos. Ed. 2. Secretaria de Salud, México D.F.

Common Names

Common Name	Typ	Language	Country	Ref	
Kalwerbossie	ver			9551	Street, R.A. & Prinsloo, G. (2013): Comme
kalwerbossie	ver			1180	GRIN (17.3.2015): Download World Econo
Kalwerbossie	ver	Africaans		3847	de Castro, A., Vlok, J.H., Newton, D., Motj
Khoara-e-nyenyane	ver			3847	
mörk pelargon	ver			1180	GRIN (17.3.2015): Download World Econo
rabas	ver			1180	
rabassam	ver			1180	
Umckaloabo	tra			9551	Street, R.A. & Prinsloo, G. (2013): Comme
umckaloabo	ver			1180	GRIN (17.3.2015): Download World Econo

Distribution Range

Distribution Range	Ref	
"Cape Provinces, Free State, KwaZulu-Natal, Lesotho, Northern Provinces, Swaziland "	1192	Plants of the World Online (POWO). Royal B
"native to the coastline regions of South Africa and Lesotho"	9551	Street, R.A. & Prinsloo, G. (2013): Commerc
"Native: Africa: Southern Africa: Lesotho; South Africa - KwaZulu-Natal, - Free State, - Eastern Cape, - Mpumalanga, - North West; Swaziland"	1100	GRIN Database (Germplasm Resources Info
"Uniondale in the Western Cape eastwards throughout the Eastern Cape, Lesotho and the Free State as far north as Lichtenburg in North West Province and the Lydenburg district in Mpumalanga."	1164	Red List of South African Plants. - http://redli
endemic to South Africa and Lesotho	9392	Brendler, T. & van Wyk, B.E. (2008): A histo
widely distributed in five South African provinces and Lesotho with an Extent of Occurrence of c. 600 000 km²"	3933	Newton, D., Raimondo, D., Motjotji,L. & Lipp

Distribution

Continent	Region	ICC	Status	Free Text	Ref
2 Africa	27 Southern Africa	LS			6796
		LS	native		1100
		LS	native		1164
		ZA			6796
		ZA	native		1100
		ZA	native	Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Mpumalanga, North West	1164

Abundance / Local Population Size

ICC	Abundance	Reference	
	"within the central parts of its range in the South African provinces of the Free State and the Eastern Cape, as well as throughout Lesotho, P. sidoides is abundant to extremely abundant"	9064	Newton, D.J. & Timoshyna, A.
LS	"The average density of plants (or ramets) in this area is estimated from transect data to be approximately 5,000 plants or ramets per hectare (0.5 plants or ramets per square metre)."	8533	Newton, D. & al. (s.dat. [2008])
ZA	"A 2010 resource assessment […], which sampled 103 sites across this species' range indicate that it is sparsely distributed and represented by isolated and mostly small subpopulations in Gauteng, Mpumalanga and Western Cape. It is however abundant to extremely abundant in the north-eastern and south-eastern Free State and Lesotho. It is also abundant in the Eastern Cape from around Grahamstown eastwards and northeastwards to about King William's Town. In the Free State and Lesotho, 60% of surveyed sites were estimated to have more than 100 000 plants occurring within a 100 ha area, and at one site near Harrismith, the size of the population within a 100 ha survey plot was estimated to be 652 400 plants. At five of the 30 sites where density counts were conducted in the Eastern Cape, more than 100 000 plants were estimated to occur within 100 ha survey sites, and near Hogsback up to 297 500 plants. A total of 17.8 million plants were estimated to occur in a 50 000 ha area near Cathcart, whilst the number of plants in an area of approximately 45 000 ha south of Bedford was estimated to be approximately 4 million."	3847	de Castro, A., Vlok, J.H., Newt
ZA	"very widespread (EOO >600 000 km²) and common species across eastern South Africa and Lesotho"	1164	Red List of South African Plant
ZA	"In South Africa, plant densities determined […] ranged from 0.2 ramets per square metres to 7.7 ramets per square metre."	8533	Newton, D. & al. (s.dat. [2008])

Ecology

TypeEc	ICC	Ecology	Ref	
alti		"in küstennahen Regionen bis in Höhenlagen von 2300 m"	9935	Kolodziej & Kayser, O. (1998): F
alti		"The altitude ranges from near sea level to more than 2300 m in Lesotho."	9392	Brendler, T. & van Wyk, B.E. (2(
habit		"found in short grassland as well as in association with shrubs and trees."	3933	Newton, D., Raimondo, D., Motj
habit		"found in short grassland, sometimes with occasional shrubs or trees"	8533	Newton, D. & al. (s.dat. [2008]):
habit		"It typically grows in short, open grassland, often in rocky places […] Most of the distribution area receives rainfall of about 200–800mm per year, mainly in summer (November to March)."	9392	Brendler, T. & van Wyk, B.E. (2(
habit	LS	"found predominantly in Lesotho Highland Basalt grassland"	8533	Newton, D. & al. (s.dat. [2008]):
habit	ZA	"Albany Thicket, Fynbos, Grassland, Nama Karoo, Succulent Karoo [...] Usually in short grassland, sometimes with occasional shrubs or trees"	1164	Red List of South African Plants
regen		"although tuber fragments remaining in the soil following harvest resprouted very quickly, it took 10 to 15 years for wild plants to recover their original tuber biomass."	9064	Newton, D.J. & Timoshyna, A. (2
regen		"Pelargonium sidoides can recover from harvesting and the majority of harvested plants in the survey areas (average 75%) were observed to be resprouting after being harvested."	9064	
regen		"plants coppice after harvesting"	8533	Newton, D. & al. (s.dat. [2008]):
regen		"The majority of harvested plants (average 75%) were observed to be resprouting after being harvested."	3847	de Castro, A., Vlok, J.H., Newto
regen		"very slow regrowth of tuber material left in the ground by harvesters"	8533	Newton, D. & al. (s.dat. [2008]):
regen		"very slow regrowth of tuber material left in the ground"	9064	Newton, D.J. & Timoshyna, A. (2
regen		"Wenn die Hauptwurzel bestehen bleibt, kann sich die Pflanze erholen."	8558	Biermann, D. (2010): Zwischen
regen	ZA	"plants are able to coppice after harvesting and the majority of plants recover from harvesting"	1164	Red List of South African Plants
regen	ZA	"plants are able to regrow rapidly within two weeks to one year after harvesting, due to lignotuber segments that commonly break off during extraction and remain buried. Although plant remnants left in the soil after harvest resprout well, the regrowth of the commercially valuable lignotuber is very slow"	1164	
repro		"regeneration of the species is by seed and from the development of perennates through the underground root system"	3931	Lewu, F.B., Grierson, D.S. & Afc
repro		"viability of seeds collected from the wild is low coupled with very low seed germination"	3931	
repro		[Genus]: "Pelargonium species appear to be essentially pollinated by (long-proboscid) bees and long-proboscid flies."	3676	Struck, M. (1997): Floral diverge

Life Form

LF_Standard	Duration	Lifeform	Woodiness	Height	Ref	
perennial herb				20-50cm	8533	Newton, D. & al. (s.dat. [2008])
perennial herb		geophyte			9392	Brendler, T. & van Wyk, B.E. (
	perennial				8730	Brendler, T., Eloff, J.N., Gurib-

Threat Situation

ICC	PopulationStatus	Ref	
	"As wild harvesting appears to be limited to the Free State, Eastern Cape and Lesotho, a large part of its range is currently not affected by harvest."	3933	Newton, D., Raimondo, D., Mo
	"bush encroachment on this habitat leads to a decline in the vigour of plants and eventually elimination"	8533	Newton, D. & al. (s.dat. [2008])
	"greatest threat to P. sidoides is currently not harvesting, but habitat transformation and degradation. Loss of populations to habitat transformation as a result of urban development and agriculture has occurred in most of the historic sites in Gauteng Province as well as at many sites in the Free State. In the Eastern Cape, north-eastern Free State and Lesotho, many of the known localities are situated on communal grazing land, much of which has been degraded by historical and ongoing overgrazing and erosion. In the Eastern Cape, overgrazing is leading to dense acacia bush encroachment, which creates unsuitable habitat for P. sidoides."	3847	de Castro, A., Vlok, J.H., Newt
	"greatest threats to the overall survival of P. sidoides are habitat transformation and degradation mainly due to livestock grazing"	9064	Newton, D.J. & Timoshyna, A.
	"it is under severe harvesting pressure"	8533	Newton, D. & al. (s.dat. [2008])
	"local extirpations can occur when harvesting takes place too regularly and in the absence of adequate rainfall"	8533	
	"Population decline is also taking place as a result of habitat conversion for crop cultivation and habitat degradation due to livestock overgrazing, and these threats are currently more severe than the threat of harvesting. We however suspect that despite these threats the population has been reduced by less than 10%."	9064	Newton, D.J. & Timoshyna, A.
	"population declines were recorded in areas where repeat harvesting occurred frequently"	9064	
	"The majority of harvested plants (average 75%) were observed to be resprouting after being harvested. Some localized population declines and extirpations are however taking place."	3847	de Castro, A., Vlok, J.H., Newt
LS	"main threats to wild populations of P.sidoides in Lesotho are habitat loss due mainly to encroachment by human settlements and harvest for commercial use in medicinals."	8533	Newton, D. & al. (s.dat. [2008])
LS	"there have been two cursory field surveys of P. sidoides populations in Lesotho. […] The findings of both these studies indicate that there is limited localised decline due to incorrect harvesting practises and that rangeland degradation due to overgrazing is also a threat to this species."	3933	Newton, D., Raimondo, D., Mo
ZA	"Although harvesting is currently a threat to this species it is only impacting a small proportion of the total population. Even in regions where harvesting is most active, e.g. in the Eastern Cape, harvesting was only recorded […] from 6% of sites where P.sidoides occurs. […] The majority of harvested plants (average 75%) were observed to be resprouting after being harvested. However population decline due to harvesting is taking place."	3933	
ZA	"In 2010, a detailed survey across this species' range showed that it is still abundant in many parts of its range and only a very small proportion (<5%) of the population is being impacted by harvesting."	1164	Red List of South African Plant
ZA	"local wild populations may be lost entirely if too frequent harvesting occurs, especially in periods of drought. Minimizing tuber damage, implementing minimum return harvest intervals and establishing harvest quotas or implementing other appropriate management interventions are high priorities."	1164	
ZA	"Localized declines in subpopulations do occur where repeat harvesting takes place within short time frames (<10 years) but this is occurring at less than 2% of known sites."	1164	
ZA	"Population decline is also taking place as a result of habitat conversion for crop cultivation and habitat degradation due to livestock overgrazing, and these threats are currently more severe than the threat of harvesting."	1164	
ZA	"Population declines due to too regular return harvests have been observed on commonage areas in the Eastern Cape Province of South Africa and in communally owned areas, particularly those close to large towns."	3847	de Castro, A., Vlok, J.H., Newt
ZA	"Population trend: Decreasing"	1164	Red List of South African Plant
ZA	"Surveys of the population have […] shown that harvesting is currently impacting only a very small proportion of the population. Even in regions where harvesting is most active, e.g. in the Eastern Cape, an extensive survey recorded harvesting in only 6% of sites."	3847	de Castro, A., Vlok, J.H., Newt

Threat Status: Global and Supranational

Glo	Threat Category		Criteria	Ass.	Publ.	Ref	
glo	LC	Least Concern		2022	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:	Pelargonium sidoides DC.	Accepted		Name used in redlist:	Pelargonium sidoides DC.

Threat Status: Countries

ICC	Region	Threat Category		Assd.	Publ.	Ref	
ZA		LC	Least Concern	2012	2012	3847	de Castro, A., Vlok, J.H., Newton, D., Motjotji, L. & R
			Name used in redlist: Pelargonium sidoides DC.	Accepted		Accepted Name:	Pelargonium sidoides DC.
ZA		Declinin	Declining		2009	8950	Raimondo, D., von Staden, L., Foden, W., Victor, J.E
			Name used in redlist: Pelargonium sidoides DC.	Accepted		Accepted Name:	Pelargonium sidoides DC.

Purpose of Use

Purpose		Ref
medicine - general	"A preparation of P. sidoides mother tincture is marketed in Ukraine, Russia, and Latvia as Umkalor"	9551
	"natural antibiotic; immune stimulant; bronchitis in children"	3751
medicine - phytomedicinal product	"In more recent times the species has become an ingredient in a number of commercially produced medicinal remedies, including one called 'Umckaloabo' used to treat bronchitis in both adults and children."	8533
	"Über die Therapie von Atemwegs- und HNO-Erkrankungen hat sie als wirksamer Bestandteil des Fertigarzneimittels Umckaloabo® Eingang in die moderne Phytotherapie Europas gefunden."	9935
medicine - traditional herbal medicine	"extracts are used in herbal medicine for the treatment of upper respiratory infections"	3847
	"highly esteemed by traditional healers for its therapeutic and palliative effects in the treatment of gastrointestinal disorders."	9551
	"In the eastern Cape, the crushed roots of P. sidoides are mixed with water after which a teaspoon is given orally to infants with upset stomachs"	9551
	"In the first half of the 20th century, a product made from the root was used in Europe to treat tuberculosis"	9551
	"The fleshy, bright red tubers or rhizomes have been widely used by different cultural groups, mainly to treat diarrhoea and dysentery."	9392
	"The plant is widely used by local communities as a traditional medicine for curing various ailments, including diarrhoea, colic, gastritis, tuberculosis, cough, hepatic disorders, menstrual complaints and gonorrhoea."	9569
	"The plant is widely used by local communities as a traditional medicine for curing various ailments,including diarrhoea, colic, gastritis, tuberculosis, cough, hepatic disorders, menstrual complaints and gonorrhoea […]. The roots are also the main ingredient in a remedy used to treat a stomach ailment known as instila in infants [...]. Powdered plant materials which are soaked in water are used as a facial cream in the treatment of skin pimples [...] Probably the most compelling ethnobotanical use of Pelargonium sidoides has been in the treatment of tuberculosis"	9569
	"The traditional medicinal uses of Pelargonium sidoides are poorly recorded. The plant is traditionally used by Zulu people to treat gonorrhoea, diarrhoea, and dysentery. A large number of Pelargonium species with tuberous rhizomes are used in traditional medicine against diarrhoea and dysentery, and only this use is well documented."	8730
	"Traditionally, infusions made from the tuberous, woody roots of P. reniforme and P. sidoides are used for the treatment of diarrhoea, dysentery, colds and lung infections, including tuberculosis. [...] In addition to these traditional uses, commercial P. sidoides root extracts have become popular (e.g. Pelargonium, Medicherb UK; Pelargonium Syrup, Bioharmony Africa and Umckaloabo®, Spitzner) for the treatment of upper-respiratory tract infections."	3936
	"used predominantly to treat diarrhoea and dysentery"	9551
	Traditional African medicine	3751
	Traditional European medicine	3751
medicine - veterinary medicine	"Kalwerbossie is a local name used for P. sidoides because the plants were traditionally used as a remedy for worms in calves (kalwers)."	9551

Purpose: Standardized Use Fields

Purpose: Fields of Use	Frequency
medicine - general	2
medicine - phytomedicinal product	2
medicine - traditional herbal medicine	12
medicine - veterinary medicine	1

Purpose: Number of Use Fields

Purpose: Number of use fields
Taxon used in 4 different standardized use categories (max. 27 categories possible).

Plant Parts Used

Plant Part (standardized)	Plant Part (free text)	Remark	Ref	
root			3751	van Wyk, B.-E. & Wink, M. (2017): Medicinal
root	"tuberous rhizomes"		8730	Brendler, T., Eloff, J.N., Gurib-Fakim, A. & Pl
root	"rhizome, tuber"		9392	Brendler, T. & van Wyk, B.E. (2008): A histor

Scale and Trend of Trade

ICC	Trade Trend	Ref	
	"Although the benefit of this remedy has been known for many years, it is only since 2001 that large-scale commercial wild harvesting of the root tubers commenced in South Africa and more recently in Lesotho, to supply a growing international market for commercially produced remedies to treat bronchitis and other respiratory tract infections. The dominant export destination for this plant and its products is Germany."	9064	Newton, D.J. & Timoshyna, A. (2012): Sustainable management of Pelargonium sidoides in South Africa and Lesotho. TRAFFIC Bulletin 24 (2): 47.

DE	"In December 2005, the Federal Institute for Drugs and Medical Devices (BfArM, Bonn) approved a new license for the use of Umckaloabo as a drug [...]. It is a fully licensed liquid herbal medicine on the German market and Germany is still by far the largest market (Euro 80,000,000 turnover in 2006)."	9392	Brendler, T. & van Wyk, B.E. (2008): A historical, scientific and commercial perspective on the medicinal use of Pelargonium sidoides (Geraniaceae). Journal of Ethnopharmacology 119 (3): 420-433. Retrieved from http://www.sciencedirect.com/science/article/pii/S0378874108004054.
DE	"Since the 1990s, a prodelphinidin-rich ethanolic extract, made from the tuberous roots of P. sidoides called EPs 7630 (Umckaloabo), licensed to treat respiratory tract infections such as acute bronchitis, has become one of the most successful phytomedicines in the world [...]. The annual sales in Germany alone exceed € 80 million."	9551	Street, R.A. & Prinsloo, G. (2013): Commercially important medicinal plants of South Africa. A review. Journal of Chemistry ID 205048: 16.

Utilization: Commodity, Cultivation, Harvest, Sustainability, Trade

Type	*ICC*	*Utilization*	*Ref*	
com		"Drogenmaterial wird durch Trocknung der sehr massiven Wurzeln gewonnen"	9935	Kolodziej & Kayser, O. (1998):
com		"Roots must be red to dark red when broken – light coloured roots will not be purchased as they are too young and do not make good medicine."	3937	Parceval (2019): Harvesting gu
com		"The dried product may be adulterated with the very similarlooking P. reniforme. Morphological distinction of the dried product is extremely difficult, so that chemical analysis is the only reliable method."	8730	Brendler, T., Eloff, J.N., Gurib-
cul		"crop development has progressed to a point where significant quantities of raw material will soon be produced from cultivated, seed-propagated plants."	9392	Brendler, T. & van Wyk, B.E. (
cul		"Cultivation trials to date indicate that it takes several years for plants to generate mature tubers with the desirable commercial characteristics […]. In addition, industry players have often reported that less active ingredient is found in the cultivated crop as compared to that collected in the wild. […] Cultivation efforts have commenced in the Eastern Cape. […] The main drawback to cultivating P.sidoides for the medicinal industry is that the tubers do not develop the same concentration of the active substance Umckalin as occurs in wild populations."	3933	Newton, D., Raimondo, D., Mo
cul		"harvest of agriculturally produced roots occurs in the Western Cape and Free State provinces of South Africa but not thus far in Lesotho."	8533	Newton, D. & al. (s.dat. [2008])
cul		"plants can be easily propagated by planting excised petioles, which would otherwise be discarded following root harvest. Such practice is applicable to the ex situ cultivation of plants,"	3936	White, A.G., Davies-Coleman,
cul		"This is the first report on the propagation of P. sidoides under marginal input. The results obtained from this work indicated that 6 cm vine length is the minimum length that could give substantial survivability and that the use of petioles, which are largely wasted during harvesting, has the best potential for rooting in the clonal propagation of P. sidoides. The encouragement of vegetative propagation of P. sidoides could serve as a viable option for the ex situ conservation of this plant in the Eastern Cape."	3931	Lewu, F.B., Grierson, D.S. & A
cul	DE	cultivated: Controlled Cultivation	3145	Brinckmann, J.A., Kathe, W.,
cul	ZA	cultivated: Clocolan	3145	
cul	ZA	cultivated: Intensive Farming	3145	
cul	ZA	cultivated: Piketberg	3145	
har		"harvested from the wild mainly in the Eastern Cape Province of South Africa and in the South-eastern and North-western districts of Lesotho."	8533	Newton, D. & al. (s.dat. [2008])
har		"In recent years, the number of plant gatherers intending to supply markets and generate incomes have increased."	3935	Motjotji, L. (2011): Towards su
har		"it is only since 2001 that large scale commercial wild harvesting commenced in South Africa and more recently in Lesotho"	8533	Newton, D. & al. (s.dat. [2008])
har		"Pelargonium can be harvested all year round. It is however preferably harvested in the rainy months of October to May when plants can be replanted easily and will re-sprout for future harvesting."	3937	Parceval (2019): Harvesting gu
har	ZA	"Most of the material is still wild-crafted in the Eastern Cape Province."	9392	Brendler, T. & van Wyk, B.E. (
imp	DE	"The dominant export destination for this plant and its products is Germany."	8533	Newton, D. & al. (s.dat. [2008])
socu	ZA	"Most of the gatherers in the Eastern Cape are from the rural communities without defined source of income and have little access to formal employment; hence, they rely on natural resources for subsistence through direct use or resale."	3935	Motjotji, L. (2011): Towards su
sus		"Although plant remnants left in the soil after harvest re-sprout well, the regrowth of the commerciallly valuable lignotuber is very slow, severely limiting opportunities for return harvest. Under the harsh in situ conditions of wild plants new lignotuber formation from previously harvested re-sprouting plants has been estimated to only reach harvestable size after four to seven or more years […]. Based on recent research […] appears that seven years may be too short a time period for recovery with 10 and 15 years being suggested depending on environmental conditions."	3933	Newton, D., Raimondo, D., Mo
sus		"Mostly, after 2-3 years of harvesting in an area, the number of mature and therefore harvestable plants are becoming less. This is a good time to stop harvesting. Ideally, the next harvesting in the same area takes place 7 – 10 years later again."	3937	Parceval (2019): Harvesting gu

sus		"P. sidoides plants were found to require ≥8 years for tuber recovery to develop the dark-red colouration and ≥10-15 years for previously wild-harvested plants to reach pre-harvest biomass. […] Hence this confirms that even a single return harvest event within a 10 to 15 post harvest period can negatively affect wild populations of P. sidoides. This period is however too long for a sustainable Pelargonium industry thus questioning wild harvest as a viable methodology without rigorous ongoing monitoring and management of wild harvest sites. […] Conversely, prospects for cultivation as a viable alternative to wild harvest seem promising since cultivated plants only required ≥9 years to attain similar biomass to that of unharvested wild plants."	3935	Motjotji, L. (2011): Towards su
sus		"Typically, because of its brittleness and tendency to grow under rocks, only part of a ligno-tuber system is harvested. The ligno-tuber stem sections remaining in the soil often resprout within weeks to months after harvest."	8533	Newton, D. & al. (s.dat. [2008])
sus	ZA	"Although plant remnants left in the soil after harvest resprout well, the regrowth of the commercially valuable lignotuber is very slow, severely limiting opportunities for return harvest. Under the harsh in situ conditions of the wild, new lignotuber formation from previously harvested resprouting plants has been estimated to only reach harvestable size again between 10 and 15 years after initial harvesting, depending on environmental conditions"	1164	Red List of South African Plant
tra		"As a result of this growing market, large quantities are being harvested and exported. Some estimates are as high as 50 000 kg of tubers annually."	7685	Wet, L.-A. de (2005): Is Pelarg
tra		"estimate for tonnages of wet material collected in southern Africa ranges from 26 to 440 tonnes."	3932	Niekerk, M.J. van (2009): The
tra		"harvest volume [...] that ranges from 17,000 kg to 36,000 kg"	8533	Newton, D. & al. (s.dat. [2008])
tra		"Official annual harvest data are not available but are estimated to be between 9,00[0] kg and 45,000 kg"	9551	Street, R.A. & Prinsloo, G. (20
tra		"The production figures given for 10 rural centres show an estimated total of 26,354 kg, harvested over a period of 4 weeks. At a total price of US$ 13,915.35, this represents an average of about 53 US cents per fresh kg"	9392	Brendler, T. & van Wyk, B.E. (
tra		"There is a conspicuous lack of comprehensive data on annual harvested and traded volumes of Pelargonium sidoides. Varying estimates derived from data collected through interviews have been reported in literature.The estimates of annual harvested fresh material range from 9 to 45t […] and 26 to 440t."	9569	Moyo, M. & Van Staden, J. (20

Legislation

Regulation

ICC	Regulation	Ref	
	"Current legislative measures in South Africa and Lesotho generally require permits for harvest, transport and export. However, legislative and institutional constraints in Lesotho and the lack of effective management systems in both countries has resulted in the issuance of few permits and confusion about the permit issuance procedure. This has led to the situation where a large portion of the harvest conducted to date in both countries has been regarded as illegal."	8533	Newton, D. & al. (s.dat. [2008])

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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
man	management
price	price
rem	remark
socu	socio-cultural significance
sus	sustainability
tra	trade
trend	trend and scale of trade

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

Ecology: TypeEcol

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

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