

Glycyrrhiza glabra L.

718

Fabaceae

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	Glycyrrhiza glabra is native to central and southwestern Asia and to the central and eastern Mediterranean region. It is introduced and established elsewhere, e.g. in the whole Mediterranean region. Widely cultivated in many countries, often escaped from cultivation and naturalised.
Legislation	The species is not protected by CITES. In China, the collection of wild Glycyrrhiza plants has been restricted by the Chinese government.
Threat Category	Not assessed globally by IUCN but assessed as Least Concern in Europe. Assessed nationally as Endangered in Bulgaria in 2015, as Critically Endangered in Romania (2009) and in Serbia (1999), also as Least Concern in Armenia, China, Iran, and Tajikistan and as Lower Risk in Iran.
Threat	Apart from uncontrolled and destructive harvesting from the wild, the intensification of agriculture, changes in river hydrological regimes, and also desertification processes cause local declines.
Abundance	No data found, but has potential to become invasive forming large stands. Therefore it is inferred that populations are often large and spread homogeneously.
Habitat	Dry open places in steppes and semi-deserts; on sandy ground and on subsaline soils; also on banks of rivers and near the sea; not very habitat specific.
Regeneration	The plant develops a taproot and an extensive root system with stolons of several meters in length. Once established, it can be difficult to eradicate; it is considered a weed in some parts of its present distribution.
Reproduction	Hermaphrodite flowers, pollinated by insects.
Lifeform	Perennial shrub of up to 2m height.
Plant Parts	The rhizomes and roots are used.
Use	The roots contain glycyrrhizin, which is 50 times sweeter than cane sugar. Licorice is traditionally used in medicine but has also industrial uses for flavouring beverages. The dried rhizomes and roots are used to flavor candy, chocolate, maple and tobacco.
Use Fields	Animal food; environmental use; food; food additive; material; medicine; social use.
Trade Trend	Main importing countries are United States (83,820 mT; 13.81% share), Germany (74,500 mt; 12.05%), and Japan (29,410 mt; 7.62%). Import values and import prices in these countries have remained fairly stable in the years 2012-2019. The biggest trade flows are from China to Japan (5.8% share), and from India to United States (3.39%).
Systematics	The genus Glycyrrhiza comprises 36 species of mostly Eurasian distribution, five of them occur in Europe.

Taxonomie and Identification

Taxonomy	Reference
Genus: 36 Euras. (Eur. 5) with few in Aus., N Am. & temp. S Am.	3753 Mabblerley, D.J. (2017): The plant-book. 4th ed.
Spanish or Greek licorice is obtained from var. glabra, Russian or Anatolian licorice from var. glandulifera (Waldst. & Kit.) Herd. & Regel and Persian or Turkish licorice from var. violacea (Boiss.) Boiss.	1122 Mansfeld's World Database of Agricultural and Horticultural Crops
"Glycyrrhiza plants collected in Kazakhstan could be divided into three groups: G. uralensis-type, G. glabra-type and the intermediate-type, by comparison of their morphological characteristics and HPLC profiles of their underground parts and leaves. [...] These results suggest that the intermediate plants are hybrids of G. uralensis and G. glabra, which form a mixed population in this region, although further studies are necessary to confirm this hypothesis."	8696 Hiroaki Hayashi, Sayaka Hattori, Kenichiro Inoue
"1st scientific name is taken from the Greek for sweet root (glykys, meaning sweet, and rhiza, meaning root)."	1192 Plants of the World Online (POWO). Royal Botanic Gardens, Kew

"Botanically, [*G. glabra* and *G. uralensis*] can be told apart by the appearance of their fruit, the shape of their leaves and the size of their flowers, although their main difference is in their seed pods. Those of *G. uralensis* are rectangular, strongly crescent-shaped, and with thick glandular spines, while those of *G. glabra* are rectangular, straight or slightly curved, and bare or with sparse glandular spines."

3906 Gemedzhieva, N., Khrokov, A., Heral., E. & Ti

Synonyms

Synonym	Eval	Ref
<i>Glycyrrhiza glabra</i> var. <i>glabra</i>	3408	Taxonomic Name Resolution Service (18.2.2018): Download of TNRS v4.0
<i>Glycyrrhiza glabra</i> var. <i>glandulifera</i> (Waldst. & Kit.) Boiss.	1148	The Plant List - http://www.theplantlist.org/

Name Used in Pharmacopoeias and other References

Name as used in Source	Status	Reference
<i>Glichirrizza glabra</i>	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.
<i>Glycyrrhiza gabra</i> L. var. <i>glandulifera</i> (Waldst. & Kit.) Boiss.	5253	Özhatay, N., Koyuncu, M., Atay, S. & Byfield, A.J. (1997): The wild medicinal plant trade in Turkey. Dogal Hayati Koruma Dernegi, Istanbul.
<i>Glycyrrhiza glabra</i>	3751	van Wyk, B.-E. & Wink, M. (2017): Medicinal plants of the world. 2nd edition. CABI, Wallingford & Boston.
<i>Glycyrrhiza glabra</i>	5641	Lange, D. (1998): Europe's medicinal and aromatic plants. Their use, trade and conservation. Traffic International, Cambridge.
<i>Glycyrrhiza glabra</i>	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.
<i>Glycyrrhiza glabra</i> L.	1101	Hänsel, R. & al. (1992-1998): Hagers Handbuch der pharmazeutischen Praxis. 5. Auflage. 5 volumes [4179, 4180, 4181, 6097, 6098]
<i>Glycyrrhiza glabra</i> L.	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
<i>Glycyrrhiza glabra</i> L.	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.
<i>Glycyrrhiza glabra</i> L.	2095	Iwu, M.M. (1993): Handbook of African medicinal plants. CRC Press, Boca Raton.
<i>Glycyrrhiza glabra</i> L.	2302	Native American Ethnobotany Database - http://naeb.brit.org/
<i>Glycyrrhiza glabra</i> L.	5473	Moerman, D.E. (1998): Native American ethnobotany. Timber Press, Portland.
<i>Glycyrrhiza glabra</i> L.	5525	Penso, G. & Proserpio, G. (1997): Index plantarum medicinalium totius mundi eorumque synonymorum. 2nd edition. OEMF, Milano.
<i>Glycyrrhiza glabra</i> L.	5806	Anon. (1999): WHO monographs on selected medicinal plants 1. WHO, Geneva.
<i>Glycyrrhiza glabra</i> L.	6369	McGuffin, M., Kartesz, J.T., Leung, A.Y. & Tucker, A.O. (2000): Herbs of commerce. 2nd edition. AHPA, Silver Spring, USA.
<i>Glycyrrhiza glabra</i> L.	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. <i>Strelitzia</i> 13: 1-203.
<i>Glycyrrhiza glabra</i> L.	7279	van Wyk, B.-E. & Wink, M. (2004): Medicinal plants of the world. Timber Press, Portland.
<i>Glycyrrhiza glabra</i> L.	8374	China Pharmacopoeia Commission (ed.) (2005): Pharmacopoeia of the People's Republic of China 2005. 3 volumes. People's Medical Publishing House, Beijing.
<i>Glycyrrhiza glabra</i> L.	8375	Medicines and Healthcare Products Regulatory Agency (2008): British Pharmacopoeia 2009. 4 volumes. Stationery Office, London.
<i>Glycyrrhiza glabra</i> L.	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.
<i>Glycyrrhiza glabra</i> L.	8396	International Organization for Standardization (s.dat.): ISO Catalogue. Retrieved from http://www.iso.org/iso/iso_catalogue.htm , viewed: 22.01.2009.

<i>Glycyrrhiza glabra</i> L.	8418	Brandão, M.G.L., Cosenza, G.P., Assis Moreira, R. & Monte-Mor, R.L.M. (2006): Medicinal plants and other botanical products from the Brazilian Official Pharmacopoeia. <i>Revista Brasileira de Farmacognosia</i> 16 (3): 408-420.
<i>Glycyrrhiza glabra</i> L.	8429	Fleurentin, J. & Pelt, J.-M. (1982): Repertory of drugs and medicinal plants of Yemen. <i>Journal of Ethnopharmacology</i> 6: 85-108.
<i>Glycyrrhiza glabra</i> L.	8431	Said, O., Khalil, K., Fulder, S. & Azaizeh, H. (2002): Ethnopharmacological survey of medicinal herbs in Israel, the Golan Heights and the West Bank region. <i>Journal of Ethnopharmacology</i> 83 (3): 251-265.
<i>Glycyrrhiza glabra</i> L.	8432	Al-Qura'n, S. (2009): Ethnopharmacological survey of wild medicinal plants in Showbak, Jordan. <i>Journal of Ethnopharmacology</i> 123: 45-50.
<i>Glycyrrhiza glabra</i> L.	8450	Homoeopathic Pharmacopoeia of the United States (s.dat.): HPUS Online Database. Retrieved from http://www.hpus.com , viewed: 26.10.2009.
<i>Glycyrrhiza glabra</i> L.	8547	Ved, D.K. & Goraya, G.S. (2008): Demand and supply of medicinal plants in India. FRLHT, Bangalore.
<i>Glycyrrhiza glabra</i> L.	8871	China Pharmacopoeia Commission (ed.) (2010): Pharmacopoeia of the People's Republic of China. English edition. Ed. 9. Stationery Office Books, .
<i>Glycyrrhiza glabra</i> L.	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.
<i>Glycyrrhiza glabra</i> L.	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.
<i>Glycyrrhiza glabra</i> L.	8876	United States Pharmacopoeia Convention (2013): The United States Pharmacopoeia USP 37. The National Formulary 32. 2014. United States Pharmacopoeial Convention, Rockwell, MD.
<i>Glycyrrhiza glabra</i> L.	8913	Anon. (s.dat.): Farmacopea Argentina, edition 8, 4 volumes. Ministerio de Salud, sine loco. Retrieved from http://www.anmat.gov.ar/webanmat/fna/octava_edicion/Primer_Volumen.pdf , viewed: 09.09.2012.
<i>Glycyrrhiza glabra</i> L.	9445	Eisenman, S.W., Zurov, D.E. & Struwe, L. (ed.) (2013): Medicinal Plants of Central Asia. Uzbekistan and Kyrgyzstan. Springer, New York.
<i>Glycyrrhiza glabra</i> L. var. <i>glabra</i>	5253	Özhatay, N., Koyuncu, M., Atay, S. & Byfield, A.J. (1997): The wild medicinal plant trade in Turkey. <i>Dogal Hayati Koruma Dernegi</i> , Istanbul.
<i>Glycyrrhiza glabra</i> L. var. <i>glandulifera</i> (Waldemann et Kit.) Regel et Herder	5525	Penso, G. & Proserpio, G. (1997): Index plantarum medicinalium totius mundi eorumque synonymorum. 2nd edition. OEMF, Milano.
<i>Glycyrrhiza glabra</i> Linn.	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.
<i>Glycyrrhiza glabra</i> Linn.	8390	Anon. (2007-2008): The Unani Pharmacopoeia of India. Vols. 1-5. Government of India, Ministry of Health and Family Welfare, New Delhi.
<i>Glycyrrhiza glabra</i> Linne	8379	United States Pharmacopoeial Convention (ed.) (2008): The United States Pharmacopoeia USP 32. The national formulary NF 27. 2009. 3 volumes. United States Pharmacopoeial Convention, Rockwell, MD.
<i>Glycyrrhiza glabra</i> Linné	8382	Committee of the Japanese Pharmacopoeia (ed.) (2006): The Japanese Pharmacopoeia. 15th edition English version. Ministry of Health Labour and Welfare, Tokyo. Retrieved from http://jpdn.nihs.go.jp/jp15e/JP15.pdf .
<i>Glycyrrhiza glabra</i> Linné	8869	Anon. (2007): Korean Pharmacopoeia. 9th edition. Korea Food and Drug Administration, sine loco. Retrieved from http://eng.kfda.go.kr/board/board_view.php?av_seq=23&av_pg=1&board_id=ENG_RULE&textfield=&keyfield= , viewed: 06.08.2015.
<i>Glycyrrhiza glabra</i> Linné	8870	Anon. (2012): The Japanese Pharmacopoeia. 16th edition. English edition. sine loco. Retrieved from http://www.pmda.go.jp/english/pharmacopoeia/pdf/jpdata/JP16eng.pdf , viewed: 07.05.2012.
<i>Glycyrrhiza glabra</i> var. <i>calabria</i>	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.

Common Names

Common Name	Typ	Language	Country	Ref
alçaçuz				1180 GRIN (17.3.2015): Download World Econo
Fen zao	ver	Chinese		1122 Mansfeld's World Database of Agricultural
lakritsrot	ver	Swedish		1180 GRIN (17.3.2015): Download World Econo
Lakritze	ver	German		1180
Lakritzenstaude	ver	German		1122 Mansfeld's World Database of Agricultural
licorice	scn			6369 McGuffin, M., Kartesz, J.T., Leung, A.Y. &
licorice-root	ver	English		1180 GRIN (17.3.2015): Download World Econo
liquirizia	ver	Italian		1180
Liquorice	ver	English		1122 Mansfeld's World Database of Agricultural
orozuz	ver	Spanish		1180 GRIN (17.3.2015): Download World Econo
pau-doce	ver	Portuguese		1180
Radix Liquiritiae	pha	Latin		1132 Hegi, Illustrierte Fora von Mitteleuropa
regaliz	ver	Spanish		1180 GRIN (17.3.2015): Download World Econo
Réglisse	ver	French		1122 Mansfeld's World Database of Agricultural
Süßholz	ver	German		1122

Distribution Range

Distribution Range	Ref
"Ab(A N) AE(G) Al Ar Bu Cy Gg(G) Gr Ir It Jo Ju Le Mo Rf(C CS E S) Rm Sa Si(S) Sy Tu(A) Uk(K U) [Ag Au(A) Cr Cz Eg He Hu Lu]"	1147 Euro+Med PlantBase - http://ww2.bgbm.org/
"Afghanistan (native); Albania (native); Algeria (introduced); Armenia (native); Australia (introduced); Austria (introduced); Azerbaijan (native); Bulgaria (native); China (native); Cyprus (native); Czechoslovakia (introduced); East Aegean Is(Greek) (native); Egypt (introduced); France (uncertain); Greece (native); Gruzia (native); Hungary (introduced); India (introduced); Iran (native); Iraq (native); Israel (native); Italy (native); Jordan (native); Kazakhstan (native); Kirgizstan (native); Kriti (introduced); Lebanon (native); Libya (native); Maldives (native); Moldova (native); Mongolia (native); Pakistan (native); Portugal (introduced); Romania (native); Russia in Asia (native); Russia in Europe (native); Sardegna (native); Sicilia (native); Spain (uncertain); Switzerland (introduced); Syria (native); Tadjikistan (native); Turkey in Asia (native); Turkmenistan (native); Ukraine (native); United States (introduced); Uzbekistan (native); Yugoslavia (native)"	8601 Bisby, F.A., Roskov, Y.R., Orrell, T.M., Nicol
"Afghanistan, Albania, Armenia, Australia, Austria, Azerbaijan, Bolivia, China, Czech Republic, Ecuador, France, Georgia, Germany, Greece, Hungary, India, Iran, Israel, Italy, Kazakhstan, Kyrgyzstan, Lebanon, New Zealand, Pakistan, Poland, Russian Federation, Serbia, Spain, Sweden, Tajikistan, Turkmenistan, Ukraine, United States, Uzbekistan"	1121 GBIF - Global Biodiversity Information Facilit
"Europe, Caucasus, Central Asia, West Siberia"	8746 Afonin, A.N., Greene, S.L., Dzyubenko, N.I.
"Medit. to C.As."	8359 Mabberley, D.J. (2008): The plant-book. 3rd
"N. Afr.; Asia-Temp.; Ind. Subcont.; E. Eur., S.E. Eur., S.W. Eur.; widely cult."	1180 GRIN (17.3.2015): Download World Econom
"Native to central and south-western Asia and the Mediterranean region"	5806 Anon. (1999): WHO monographs on selecte
"Native to: Afghanistan, Albania, Bulgaria, Central European Rus, China North-Central, Cyprus, East Aegean Is., East European Russia, Greece, Iran, Iraq, Italy, Kazakhstan, Kirgizstan, Krym, Lebanon-Syria, Mongolia, North Caucasus, Pakistan, Palestine, Romania, Sardegna, Saudi Arabia, Sicilia, South European Russi, Tadjikistan, Transcaucasus, Turkey, Turkmenistan, Ukraine, Uzbekistan, West Siberia, Xinjiang, Yugoslavia. Introduced into: Algeria, Austria, Bangladesh, Cape Provinces, Czechoslovakia, Egypt, France, Hungary, Maldives, New South Wales, Portugal, South Australia, Spain, Switzerland, Victoria"	1192 Plants of the World Online (POWO). Royal B
"Native: AFRICA: Libya; ASIA-TEMPERATE: Afghanistan; Cyprus; Iran; Iraq; Israel; Jordan; Lebanon; Syria; Turkey; Armenia; Azerbaijan; Georgia; Russian Federation, Dagestan; Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan; Uzbekistan; Mongolia; China; ASIA-TROPICAL: India; Pakistan; EUROPE: Moldova; Ukraine; Albania; Bulgaria; Former Yugoslavia; Greece [incl. Crete]; Italy [incl. Sardinia, Sicily]; Romania; France; Cultivated: widely cultivated"	1100 GRIN Database (Germplasm Resources Info
"Wirklich einheimisch wohl nur im östlichen Mittelmeergebiet, nördlich bis Mittelitalien, Dalmatien, Ungarn, bis zur Ukraine, Mittelrussland und zum Kaukasus, in Asien in Kleinasien, Persien, Babylonien, Turkestan, Afghanistan und der Dsungarei. In Istrien, Oberitalien [...], Südfrankreich, Spanien und Nordwestafrika wahrscheinlich nur aus der Kultur verwildert, aber stellenweise völlig eingebürgert."	1132 Hegi, Illustrierte Fora von Mitteleuropa
"A widespread species, it is considered native to north Africa, many parts of the Middle East and eastwards to Russia, Mongolia, China and south to Pakistan and India. In Europe it occurs mainly in the southeast [...] from southern France (origin uncertain) through Italy to the Balkans, Ukraine and European parts of Russia. Although it is difficult to accurately determine the native range as it has been widely cultivated."	3496 Chadburn, H. (2014): Glycyrrhiza glabra. Th
CN: "Xinjiang [Afghanistan, India, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Rus-sia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia, E and S Europe, Indian Ocean islands (Maldives); introduced in Australia, C Europe, and North America]"	1117 eFloras. Flora of China. http://www.efloras.or

Südosteuropäisch-ostasiatische Pflanze. Südosteuropa (westwärts bis Mittelitalien; nordwärts bis Dalmatien, Donaubecken, Mittelrußland); Westasien (ostwärts bis Afghanistan); heute im ganzen Mittelmeergebiet eingebürgert.

8701 Heß, H.E., Landolt, E. & Hirzel, R. (1972-197

Distribution

Continent	Region	ICC	Status	Free Text	Ref			
1	Europe	10	Northern Europe	SE		1121		
		11	Middle Europe	AT		1108		
				AT	introduced (casual or naturalized)		1147	
				AT	introd., established		8601	
				CH			1108	
				CH	introduced (casual or naturalized)		1147	
				CH	introd., established		8601	
				CS			1108	
				CS	introduced (casual or naturalized)		1147	
				CS	introd., established		8601	
		12	Southwestern Europe	HU			1108	
				HU	introduced (casual or naturalized)		1147	
				HU	introd., established		8601	
				ES			1108	
				ES	status unclear	"Dispersa por la mitad S de laPenínsula Ibérica"		1157
				ES	status unclear	"probablemente originaria del E de la Région Méditerranea"		8963
				FR				1108
				FR		S-Frankreich		2054
				FR	status unclear			8601
				IT				1108
		13	Southeastern Europe	PT			1108	
				AL				1108
				AL	introd., established			8601
				AL	native			1147
				AL	native			8601
				BG				1108
				BG		Northern - seven sites and one area		1109
				BG	native			1147
				BG	native			8601
				BG	native	only 4 known populations		9643
		GR				1108		
		GR				1108		
		IT				1108		
		IT				1108		
		IT	native	Sardinia		1147		
		IT	native			1147		
		IT	native	Sicily		1147		
		IT	native	Sardegna, Sicilia		8601		
		IT	native			8601		
		RO				1108		
		RO	native			1147		
		RO	native			8601		
		TR				1108		
		YU				1108		
		YU	native			1147		
		YY	native			8601		
		14	Eastern Europe				1108	
				BY				1108
				MD	native			1147
				MD	native			8601
	UA						1108	
	UA						1108	
	UA			native			1147	
	UA			native			8601	

2	Africa	20	Northern Africa	DZ	introduced (casual or naturalized)		1147	
				LY	native		8601	
3	Asia-Temperate	21	Macaronesia	PT	introduced (casual or naturalized)		1147	
				27	Southern Africa	ZA	introd., established	
		32	Middle Asia	KG			1117	
				KG	native		8601	
		32	Middle Asia	KZ			1117	
				KZ	native	"found in western (Ural and Bolshoi valleys, Maliy Uzen, Kushum, and Ilek rivers), southern (Syrdarya floodplain), south-eastern (Shu and Ili river valleys) Kazakhstan"	3906	
		32	Middle Asia	KZ	native		8601	
				TJ			1117	
		32	Middle Asia	TM			1117	
				TM	native		8601	
		32	Middle Asia	UZ			1117	
				UZ	native		8601	
		33	Caucasus	AM	AM	native		1147
					AM	native		8601
				AM	AZ		1121	
					AZ	native		8601
GE	GE				8444			
	GE			native		1147		
GE	GE			native		8601		
	PT			native		1147		
RU	RU				1117			
	RU			native	European part	1147		
RU	RU			native		8601		
	RU			native		8601		
34	Western Asia	AF			1117			
		AF	native		8601			
		CY	native		1147			
		CY	native		8601			
		EG	introduced (casual or naturalized)		1147			
		EG	introd., established		8601			
		GR	introduced (casual or naturalized)	Crete and Karpathos island groups	1147			
		GR	introd., established	Crete	8601			
		GR	native	East Aegean Islands	1147			
		GR	native		1147			
		GR	native		8601			
		IL			8431			
		IL	native		8601			
		IQ	native		8601			
		IR	native		1147			
		IR	native		8601			
JO			8432					
JO	native		1147					
JO	native		8601					
LB			1121					
LB	native		1147					
LB	native		8601					
SY	native		1147					
SY	native		8601					
TR	native		1147					
TR	native		8601					
36	China	CN		only in Xinjiang	1117			
		CN		Xinjiang	1117			
		CN		Xinjiang Uygur Autonomous region; this province also home of G. inflata and G. uralensis	8697			
37	Mongolia	CN	native		8601			
		MN			1117			
37	Mongolia	MN	native		8601			
		40	Indian Subcontinent	MV	native		8601	
4	Asia-Tropical	40	Indian Subcontinent	MV	native		8601	

			NP			1114	
			PK			1117	
			PK			1119	
			PK	native		8601	
	41	Indo-China	IN			1117	
			IN	introd., established		8601	
5	Australasia	50	Australia	AU	introd., established	8601	
7	Northern America	76	Southwestern U.S.A.	US	introd., established	California	1107
				US	introd., established	Utah	1107
				US	introd., established	Nevada	1107
		78	Southeastern U.S.A.	US	introd., established		8601

Abundance / Local Population Size

ICC	Abundance	Reference
	"Difficult to eradicate once it is established."	1123 Plants for a Future - www.pfaf.
	"infolge seiner Bodenausläufer auch als schwer ausrottbares Unkraut"	1132 Hegi, Illustrierte Flora von Mittel
	"can become a weed"	1113 Ecocrop. FAO. http://ecocrop.f
	"can be invasive"	1111 Ecoport. www.ecoport.org/
RU	"In Central Asia as a weed in crops"	8746 Afonin, A.N., Greene, S.L., Dz
SU	"In central Asia it is a noxious weed in cotton and other cultivated plants"	8699 Komarov, V.L., Shishkin, B.K.

Ecology

TypeEc	ICC	Ecology	Ref
alti		5-1500m	9774 Allen, D., Bilz, M., Leaman, D.J.
alti	CN	500-1300m	1117 eFloras. Flora of China. http://w
alti	ES	0-1200m	1157 Flora Vascular de Andalucía Oc
alti	SU	"Extends in mountains up to 1800m"	8699 Komarov, V.L., Shishkin, B.K. &
alti	TR	0-1800m	8698 Davis, P.H. (ed.) (1970): Flora o
habit		"Dry open places, especially in sandy places near the sea"	1123 Plants for a Future - www.pfaf.or
habit		"An ausgesprochen trockenen Stellen, in trockenen Gebüschern oder zwischen Zwergsträuchern, allg. auf Sand- und Lehmböden, auch [...] an Flussufern"	1101 Hänsel, R. & al. (1992-1998): H:
habit	AF	"growing in open fields close to running water"	9657 Tawab Stanikzai, M. (2007): Ma
habit	CN	"Margins of farms, roadsides, saline areas"	1117 eFloras. Flora of China. http://w
habit	ES	"Herbazales de vegas y márgenes de arroyos, frecuentemente en zonas nitrificadas"	1157 Flora Vascular de Andalucía Oc
habit	KZ	"in steppes, semi-deserts and deserts"	3906 Gemedzhieva, N., Khrokov, A., I
habit	RU	"In steppes and semideserts, solonetz meadows, ravines, by roadsides, on banks of canals and trenches"	8700 Fedorov, A.A. (ed.) (2002): Flor
habit	RU	"In steppes on sandy and subsaline sites, in semideserts and deserts in oases"	8746 Afonin, A.N., Greene, S.L., Dzy
habit	SU	"Steppes, semideserts, desert oases"	8699 Komarov, V.L., Shishkin, B.K. &
regen		"The plant develops a taproot and an extensive root system, the stolons from one plant may extend as much as 7 m in all directions."	1113 Ecocrop. FAO. http://ecocrop.f
repro		"Flowers are hermaphrodite [...] and are pollinated by insects"	1123 Plants for a Future - www.pfaf.or

Life Form

Duration	Lifeform	Woodiness	Height	LF_free_txt	Ref
perennial			30-80(-159)cm	"perennial herb"	3906 Gemedzhieva, N., Khrokov, A.,
perennial			40-70cm		8746 Afonin, A.N., Greene, S.L., Dz
perennial			30-60cm		8698 Davis, P.H. (ed.) (1970): Flora
perennial			50-80(-150)cm		8699 Komarov, V.L., Shishkin, B.K.
perennial			120-180cm		8701 Heß, H.E., Landolt, E. & Hirzel,
perennial			up to 120cm		1123 Plants for a Future - www.pfaf.
perennial	shrub		50-200cm		1113 Ecocrop. FAO. http://ecocrop.f

Population Status / Threat Causes

ICC	PopulationStatus	Remark	Ref
	"over-collection from the wild and intensification of agriculture may cause local declines"		3496 Chadburn, H. (2014): Glycyrrhi
	Europe: "Decreasing"		9774 Allen, D., Bilz, M., Leaman, D.
CN	risk of desertification		8697 Yamamoto, Y. & Tani, T. (2006)

KZ	[gla & ura]	"By 1970, the largest liquorice populations had been identified in the valleys of Kazakhstan's biggest rivers: the Ural, Syrdarya, Ili, Irtysh, Chu, and Karatal and in several regions: West Kazakhstan (now known as the Ural region), Kyzylordy, South Kazakhstan. Estimated stocks of dry liquorice root in Kazakhstan amounted to 175,200 tonnes in an area of 50,200 ha [...]. Stocks of liquorice root during the 20-year Soviet rule decreased by almost half and amounted to 78,100 tonnes in an area of 32,500 ha. The period was associated with intensive economic activities of construction of irrigation facilities, ploughing of liquorice meadows for grain and vegetable crops, and intensive livestock raising. In addition, intensive and destructive harvesting of liquorice took place [...].After the collapse of the former Soviet Union (USSR), agricultural lands were not used, livestock farming decreased, the demand for liquorice dropped, and liquorice factories in the cities of Uralsk and Chardzhou closed. Consequently, liquorice stands began regenerating, and in some parts of Kyzylordy and South Kazakhstan (now Turkistan), estimated reserves even exceeded their 1970 levels. [...] According to data presented [...] in 2017 [...], reserves of liquorice root in 21 districts within four (out of five key areas) regions of Kazakhstan totalled 120,700 tonnes in a total area of 17,722.9 ha."	3906	Gemedzhieva, N., Khrokov, A.,
KZ	[gla & ura]	"Uncontrolled and destructive harvesting of liquorice root in Kyzylordy, South Kazakhstan (now Turkistan), Zhambyl, West Kazakhstan, and Almaty, for export of raw materials are also current threats to the species. In recent decades, this has been exacerbated by global desertification processes, changes in river hydrological regimes during the construction of dams and other facilities and the ploughing of liquorice stands for agricultural crops."	3906	

Red List Status: Global and Supranational

Glo	Threat Category	Criteria	Ass.	Publ.	Ref
Eur	LC	Least Concern		9774	Allen, D., Bilz, M., Leaman, D.J., Miller, R.M., Timos
Name used in redlist:		Glycyrrhiza glabra L.			

Red List Status: Countries

ICC	Threat Category	Assd.	Publ.	Ref
AM	LC	Least Concern	2012	3236 Tamanyan, K., Fayush, G., Nanagyulyan & Danielyan, T. (
Name used in redlist:		Glycyrrhiza glabra L. Accepted		
BG	EN	Endangered	2015	3235 Peev, D., Petrova, A.S., Anchev, M., Temniskova, D., Den
Name used in redlist:		Glycyrrhiza glabra Accepted		
BG	R	Rare	1997	1109 UNEP-WCMC Threatened Species Database. Download o
Name used in redlist:		Glycyrrhiza glabra L.		
CH	DD	Data Deficient	2002	8119 Moser, D.M., Gygax, A. & Bäumler, B. (2002): Rote Liste d
Name used in redlist:				
CN	LC	Least Concern – 无危	2013	3319 Chinese Academy of Sciences (2013): Chinese biodiversit
Name used in redlist:		Glycyrrhiza glabra Accepted		
IR	LR	Lower Risk	1999	5977 Jalili, A. & Jamzad, Z. (ed.) (1999): Red data book of Iran.
Name used in redlist:		Glycyrrhiza glabra L. Accepted		
RO	CR	Critically Endangered – Critic periclitata	2009	8949 Dihoru, G. & Negrean, G. (2009): Cartea Rosie a plantelor
Name used in redlist:		Glycyrrhiza glabra L. Accepted		
RO	I		1994	5362 Dihoru, G.H. & Dihoru, A. (1994): Plante rare, periclitata si
Name used in redlist:				
SI	K	Insufficiently Known - Premalo Znana	2010	3460 Anon. (2015): Pravilnik o uvrstitvi ogrozenih rastlinskih in z
Name used in redlist:		Glycyrrhiza glabra Accepted		
SI	K	Insufficiently Known – Nezadostno Znana Vrsta	1989	2123 Wraber, T. & Skoberne, P. (1989): Rdeci seznam ogrozeni
Name used in redlist:		Glycyrrhiza glabra L. Accepted		
TJ	LC	Least Concern	2020	3438 Nowak, A., Świerszcz, S., Nowak, S., Hisorev, E., Klichow
Name used in redlist:		Glycyrrhiza glabra L. Accepted		
UA	HE	Indeterminate – неоцінені	2012	3354 Saparenko, S.O. (ed.) (2012): Červona kniga Ukrajini. Von
Name used in redlist:		Glycyrrhiza glabra L. Accepted		

Purpose: Free text

Purpose	Ref
"The majority of liquorice extract is used in the food, pharmaceutical and tobacco industries. The application of liquorice extract in cosmetics is relatively small. In cosmetics, liquorice is used primarily in skincare and haircare products, as it has several properties."	3489 Ecovia Intelligence (2020): The
animal food forage	1147 Euro+Med PlantBase - http://w
"can also be fed to livestock"	1113 Ecocrop. FAO. http://ecocrop.f
forage	8746 Afonin, A.N., Greene, S.L., Dz

	Forage	1110	ILDIS - International Legume D
environmental use	environmental	1147	Euro+Med PlantBase - http://w
	Environmental	1110	ILDIS - International Legume D
food	"brewing stout root beer"	8359	Mabberley, D.J. (2008): The pl
	Food and Drink	1110	ILDIS - International Legume D
	Food and Drink	1147	Euro+Med PlantBase - http://w
	food	8746	Afonin, A.N., Greene, S.L., Dz
	"tea made from the roots is [a] thirst quencher"	3476	Rahman, I.U., Sher, H. & Buss
	"confectionary"	8359	Mabberley, D.J. (2008): The pl
food additive	"also industrial uses for flavouring beverages, chocolate and tobacco (especially in USA)"	1122	Mansfeld's World Database of
	"In addition to its medicinal uses, Liquorice has been used as a flavouring ingredient."	9657	Tawab Stanikzai, M. (2007): M
	Food additives: flavoring (for candies fide Crops US; Herbal Drugs)	1100	GRIN Database (Germplasm R
	"It has been used for more than 4,000 years as a flavouring agent in foods, beverages, and tobacco."	1111	Ecoport. www.ecoport.org/
	"Chinese cuisine uses liquorice as a culinary spice for savory foods [and] to flavor broths and foods simmered in soya sauce"	3476	Rahman, I.U., Sher, H. & Buss
	"The dried rhizomes and roots are used to flavor candy, chocolate, maple and tobacco. The roots contain glycyrrhizin, which is 50 times sweeter than cane sugar."	1113	Ecocrop. FAO. http://ecocrop.f
	Additive (flavoring)	1180	GRIN (17.3.2015): Download
	"root can have either a salty or sweet taste [...] flavor is common in medicines to disguise unpleasant flavors"	3476	Rahman, I.U., Sher, H. & Buss
material	fibre	1147	Euro+Med PlantBase - http://w
	fibre	1110	ILDIS - International Legume D
	"The manufactured excess is used as fire extinguishing agents, insulation for fiberboards, or compost for mushrooms."	1113	Ecocrop. FAO. http://ecocrop.f
	chemical products, domestic	1147	Euro+Med PlantBase - http://w
	Chemical products	1110	ILDIS - International Legume D
	Mater. (essential oils)	1180	GRIN (17.3.2015): Download
	"shoe polish, fire-extinguishers, fibre for plastic & fibreboard (US)"	8359	Mabberley, D.J. (2008): The pl
	Materials: essential oils (used in pharmacy fide Ency CNatIn)	1100	GRIN Database (Germplasm R
	"as stabilizer in fire extinguishers"	1122	Mansfeld's World Database of
	Wood	1110	ILDIS - International Legume D
	wood	1147	Euro+Med PlantBase - http://w
medicine	[Roots and rhizomes] "find wide application in medicine preparation, for relief of sore throats but also to disguise unpleasant flavours of certain medicine."	9657	Tawab Stanikzai, M. (2007): M
	"wood [is used] for teething children and also used as a tooth cleaner"	3476	Rahman, I.U., Sher, H. & Buss
	"inhibits Helicobacter pylori, aiding in healing stomach and duodenal ulcers, and may sooth an upset stomach, as it is antispasmodic in the bowel [...] used for auto-immune conditions including lupus, scleroderma, rheumatoid arthritis [...] shown to modulate airway constriction, lung inflammation and infiltration of eosiniphils in bronchial areas"	3476	Rahman, I.U., Sher, H. & Buss
	"Ayurveda [...] considers Glycyrrhiza glabra to be a tonic, expectorant and a demulcent. A demulcent has soothing, coating properties, while an expectorant eliminates phlegm and mucous from the respiratory tract. These properties account for the traditional use of licorice as a cough reliever and an asthma treatment"	3476	Rahman, I.U., Sher, H. & Buss
	"Chinese use liquorice to treat tuberculosis"	3476	Rahman, I.U., Sher, H. & Buss
	"glycyrrhizic acid, found in liquorice, is used throughout Japan for the treatment and control of chronic viral hepatitis"	3476	Rahman, I.U., Sher, H. & Buss
	Medicine	1110	ILDIS - International Legume D
	medicine	8746	Afonin, A.N., Greene, S.L., Dz
	"slows tooth decay"	3753	Mabberley, D.J. (2017): The pl
	"It is also used as an alternative medicine for the treatment of gastric and duodenal ulcers, sore throat, bronchitis, cough, arthritis, adrenal insufficiency, and allergic diseases."	1111	Ecoport. www.ecoport.org/
	"cough mixtures, lozenges & other medicine esp. for sore throats & mouth ulcers"	8359	Mabberley, D.J. (2008): The pl
	medicine	1147	Euro+Med PlantBase - http://w
	"expectorant, anti-inflammatory, antispasmodic"	3751	van Wyk, B.-E. & Wink, M. (20
	"The underground peeled or unpeeled stems or roots are used for the treatment of upper respiratory tract ailments including coughs, hoarseness, sore throat and bronchitis"	8727	Saxena, S. (2005): Glycyrrhiza
	Medic. (source of glycyrrhizin)	1180	GRIN (17.3.2015): Download

	Licorice is traditionally used in medicine"	1122	Mansfeld's World Database of
	Traditional European medicine	3751	van Wyk, B.-E. & Wink, M. (20
	Traditional Indian medicine	3751	van Wyk, B.-E. & Wink, M. (20
social use	soap	8359	Mabberley, D.J. (2008): The pl
	"in cosmetics"	1122	Mansfeld's World Database of
	"in plug tobacco"	8359	Mabberley, D.J. (2008): The pl
	roots are often chewed with betel quids in India.	1113	Ecocrop. FAO. http://ecocrop.f
	"Furthermore, liquorice preparations are used a as a conditioning and flavouring agent in tobacco products"	9657	Tawab Stanikzai, M. (2007): M

Purpose: Standardized Fields of Use

Purpose: Fields of Use	Frequency
animal food - general	4
environmental use - general	2
food - beverage industry	1
food - general	4
food - sweets industry	1
food additive - flavouring & spice	6
food additive - general	2
material - fiber	2
material - general	7
material - timber industry	2
medicine - general	14
medicine - source of pharmaceutical agent	1
medicine - used traditionally as herbal remedy	3
social use - cosmetics industry	2
social use - stimulants	3

Purpose: Number of use fields

Purpose: Number of level-1 use fields
15

Plant Parts Used

Plant Part (standardized)	Plant Part (free text)	Remark	Ref
stem	"underground peeled or unpeeled stems or roots"		8727 Saxena, S. (2005): Glycyrrhiza glabra. Medic
root	"underground peeled or unpeeled stems or roots"		8727 Saxena, S. (2005): Glycyrrhiza glabra. Medic
rhizome	rhizome		3751 van Wyk, B.-E. & Wink, M. (2017): Medicinal
root	rhizome		8701 Heß, H.E., Landolt, E. & Hirzel, R. (1972-197
root	rhizome		8359 Mabberley, D.J. (2008): The plant-book. 3rd €
root	root		3751 van Wyk, B.-E. & Wink, M. (2017): Medicinal

Scale and Trend of Trade

ICC	Trade Trend	Ref
	Between 2001-2005 annual growth of trade in roots was zero, annual growth in extracts trade was 6%.	9657 Tawab Stanikzai, M. (2007): Market report Liquorice. Retrieved from http://www.tloafghanistan.org/Liquorice%20Market%20Report.pdf , viewed: 22.08.2014.
	Main importing countries are United States (83,820 mT; 13.81% share), Germany (74,500 mt; 12.05%), and Japan (29,410 mt; 7.62%). Import values and import prices in these countries have remained fairly stable in the years 2012-2019. The biggest trade flows are from China to Japan (5.8% share), and from India to United States (3.39%).	3490 Tridge Market Intelligence (2020): Licorice Root. Retrieved from https://www.tridge.com/intelligences/licorice-root2/import , viewed: 25.01.2021.
DE	"German imports of liquorice extract increased in volume and value between 2011 and 2018. The volume of liquorice extracts to Germany reached 43,200 tonnes in 2018, an increase of 3% from 2011. The value of imports increased by 13% over the same period."	3489 Ecovia Intelligence (2020): The European market potential for liquorice. Updated on 18 March 2020. Retrieved from https://www.cbi.eu/market-information/natural-ingredients-cosmetics/licorice/market-potential , viewed: 26.01.2021.
JP	"Although the total amount of licorice imported in Japan was 10,723,342 kg in 1987, it decreased to 1,377,213 kg in 2007. Currently, a major proportion of glycyrrhizin is extracted and then purified in manufacturing plants in China and other licorice-producing countries; therefore, the import of licorice for glycyrrhizin production has decreased in Japan. A proportion of the licorice imported from China is medicinal licorice, which is used in Kampo medicines. Medicinal licorice is more expensive than licorice used for the production of glycyrrhizin and other licorice products; the latter is imported from other licorice-producing countries such as Afghanistan and Australia."	3488 Hayashi, H. & Sudo, H. (2009): Economic importance of licorice. Plant Biotechnology 26: 101-104.

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

Type	ICC	Utilization	Ref	
com		"Licorice extract is produced by boiling liquorice root and subsequently evaporating most of the water, and is traded both in solid and syrup form."	1135	Wikipedia. www.wikipedia.org
cul		"average yield per acre is from 4 to 5 tons"	9657	Tawab Stanikzai, M. (2007): M
cul		"content of much of the cultivated root is not matching that of wild quality and thus is usually diverted to non-medicinal, food, or confectionary uses"	3803	Brinckmann, J.A. (2020): The I
cul		"Cultivated in the Mediterranean basin of Africa, in southern Europe, and in India"	5806	Anon. (1999): WHO monograp
cul		"cultivation is now established in central Asia, Australia, Brazil, Southern France, Italy and Spain [...] most Licorice is produced in Italy, Spain, Greece, Turkey, and Asia"	9657	Tawab Stanikzai, M. (2007): M
cul		"Cultivations on a larger scale are reported from different Mediterranean countries, from Near and Middle East (Turkey, Syria, Iraq, Afghanistan, Turkmenia, Uzbekistan, Kazakhstan), Australia, Brazil, California, more recently also from N India, E Africa etc."	1122	Mansfeld's World Database of
cul		"In southern Italy, large quantities of Licorice root are grown, but it is chiefly converted into extract, though some of the root is exported. Spain is the main supplier of dried licorice. [...] In Asia, Pakistan, India, China, Iran and Turkmenistan are the main producers of licorice extracts." roots"	9657	Tawab Stanikzai, M. (2007): M
cul		"licorice is being cultivated [...] in China (about 20% of China's annual licorice usage of about 300 million kg is now cultivated), [...] Italy, Egypt, Tajikistan, Turkey, Uzbekistan, South Africa, and Australia"	3803	Brinckmann, J.A. (2020): The I
cul		"The yield of fresh root is 20-50 t/ha per harvest."	1113	Ecocrop. FAO. http://ecocrop.f
cul		Cultivated in C Asia	2032	Mansfeld, R. (1986): Verzeichr
cul		Cultivated in CN, ES, GR, IQ, IT, SU, SY, TR	2011	Bajaj, Y.P.S. (ed.) (1991): Med
cul		esp. Russia, Spain, Middle E	8359	Mabberley, D.J. (2008): The pl
cul		propagation by cutting	2011	Bajaj, Y.P.S. (ed.) (1991): Med
cul		widely cultivated	1100	GRIN Database (Germplasm F
cul	BR	Cultivated	2032	Mansfeld, R. (1986): Verzeichr
cul	US	California	2032	
har		"harvested in the autumn, two to three years after planting"	3476	Rahman, I.U., Sher, H. & Buss
har		"the majority of licorice root in global trade is harvested from wild populations situated in extremely remote areas within republics of the former Soviet Union (e.g. especially Uzbekistan and Azerbaijan, but also Armenia, Georgia, Tajikistan, Turkmenistan, Kazakhstan, and Kyrgyzstan); frontier areas of the People's Republic of China (e.g. Inner Mongolia Autonomous Region, Ningxia Hui Autonomous Region, and Xinjiang Uyghur Autonomous Region); and other major licorice-producing countries [...], especially Afghanistan, Pakistan, Iran, Iraq, and Syria [...]. There is [...] some wild collection of licorice in parts of Europe (e.g. Italy, Spain, and Turkey)"	3803	Brinckmann, J.A. (2020): The I
har		Major part of the supply is coming still from wild populations	1122	Mansfeld's World Database of
har		Ready to harvest in 3-5 year	1113	Ecocrop. FAO. http://ecocrop.f
har		Wildvorkommen werden auch heute noch z.T. stark genutzt (TR, GR, ES IQ)	1101	Hänsel, R. & al. (1992-1998):
har		Wildvorkommen werden trotz Kultur immer noch sehr stark genutzt.	2032	Mansfeld, R. (1986): Verzeichr
har	IR	Wild collection	2032	
har	KZ	[gla & ura] "Commercial harvesting of liquorice root is carried out mechanically with a plantation plough pulled by a tractor. Ploughing for liquorice root harvesting must be carried out to a depth of 40 cm in river floodplains, to 60 cm in steppe depressions while for small liquorice stands the roots are dug out by hand, with shovels. [...] The harvested roots and rhizomes should be 5 to 50 mm (or more) thick and the length can also vary. Only three-quarters of all the roots and rhizomes should be selected, leaving a quarter of rhizomes in the soil to regenerate the liquorice population by vegetative propagation."	3906	Gemedzhieva, N., Khrokov, A.
imp	FR	imports 3500 t/a	2011	Bajaj, Y.P.S. (ed.) (1991): Med
imp	JP	"China is by far the largest exporter. This indicates that Japan is highly dependent on China for its supply of licorice. [...] the volume of Japanese imports of licorice from China peaked in 2012. This is likely an indication of a decrease in the supply of licorice in China. [...] in the period between 2007 and 2015, Japanese reliance of China to procure licorice became stronger."	3491	Oishia, R. (2017): Trading of Li
imp	JP	"Japan imports large quantities of licorice derived from <i>G. glabra</i> and <i>G. inflata</i> (Xinjiang-Gancao) as raw materials for the production of glycyrrhizin, cosmetics, and food additives. On the other hand, Dongbei-Gancao (Tohoku-Kanzo in Japanese) and Xibei-Gancao (Seihoku-Kanzo in Japanese), which are imported from China, are mainly used in the preparation of Japanese Kampo medicines; these medicinal licorices are derived from <i>G. uralensis</i> ."	3488	Hayashi, H. & Sudo, H. (2009)
imp	JP	„licorice used in Japan is imported from countries such as China, Afghanistan, Turkmenistan, Uzbekistan, and Pakistan"	3488	
imp	US	"Millions of pounds of licorice are imported into the United States each year, about 90% for use in flavoring tobacco products"	3829	American Botanical Council (2
imp	US	main importer with 20,000 t/a directly from Syria, TR and SU or after 1st extraction in CN	2011	Bajaj, Y.P.S. (ed.) (1991): Med

price	JP	"the import price of licorice from China has been increasing for several years. In particular, the dramatic rise in the price of imported Chinese licorice after 2012 is remarkable, with the price in 2015 being nearly three times that in 2007."	3491	Oishia, R. (2017): Trading of Li
socu		"A 15-year-old healthy boy has been reported to develop hypertension encephalopathy after ingestion of 0.5 kg licorice candy. About 3 h later he developed a serious headache, nausea, vomiting, and right-sided weakness. His general practitioner measured a blood pressure of 200-130 mm Hg. The next morning the hemiparesis was increased and the patient was admitted to the hospital. He recovered completely in the course of 5 months. [...] A 44-year-old previously healthy woman experienced severe licorice-induced hypokalaemia resulting in ventricular fibrillation. The resolution of most of the symptoms after licorice cessation suggested that licorice was the major culprit. She chronically consumed 250 – 500 g of licorice daily for several years."	3831	Delbò, M. (2013): Assessment
socu		"A man died after eating a bag of Black Licorice every day. Doctors at Massachusetts General Hospital said the unusual case highlighted the risk of consuming too much glycyrrhizic acid, which is found in black licorice."	3832	Cramer, M. (26.9.2020): A mar
socu		"glycyrrhizin 50 times sweeter than sugar"	3753	Mabberley, D.J. (2017): The pl
socu		"It is cultivated for its rhizomes (underground stems) that contain the compound glycyrrhizin, which is 50 times sweeter than sugar."	1192	Plants of the World Online (PC
socu		"Short-term use (not more than 4-6 weeks) of licorice preparations is safe. Serious side effects reported following chronic use of high dose of licorice root are: hypokalaemia and hypertension. More rarely cardiac rhythm disorders can occur."	3831	Delbò, M. (2013): Assessment
socu		"The FDA has issued warnings about the rare but serious effects of too much black licorice, advising that people avoid eating more than two ounces of black licorice a day for two weeks or longer. The agency states that if you have been eating a lot of black licorice and experience an irregular heart rhythm or muscle weakness, stop eating it immediately and contact your health care provider."	3833	Sullivan, B. (27.10.2020): The
socu		"used by Roman soldiers to combat thirst (steroid causing water retention)"	3753	Mabberley, D.J. (2017): The pl
socu	KZ	[gla & ura] "In Kazakhstan, most wild licorice harvesters are from rural villages, typically with low income, where yearly harvest of the wild root is the only source of stable income. The only option to maximise income is to harvest as much as possible, at highly unsustainable rates, much of which is traded internationally through illegal supply chains."	3906	Gemedzhieva, N., Khrokov, A.
sus		Die Hauptwurzel bleibt i.d.R. stehen; es kommen nur Nebenwurzeln zur Ernte. Diese werden mit dem Messer abgeschnitten und mit der Hand aus der Erde herausgezogen. Geerntet wird regelmäßig in dreijährigem Turnus.	1101	Hänsel, R. & al. (1992-1998):
sus		If only the offshoot roots are harvested, the taproot will regenerate the plant in 2-3 years.	1113	Ecocrop. FAO. http://ecocrop.f
sus	KZ	"Although the total amount of licorice imported in Japan was 10,723,342 kg in 1987, it decreased to 1,377,213 kg in 2007. Currently, a major proportion of glycyrrhizin is extracted and then purified in manufacturing plants in China and other licorice-producing countries; therefore, the import of licorice for glycyrrhizin production has decreased in Japan. A proportion of the licorice imported from China is medicinal licorice, which is used in Kampo medicines. Medicinal licorice is more expensive than licorice used for the production of glycyrrhizin and other licorice products; the latter is imported from other licorice-producing countries such as Afghanistan and Australia."	3906	Gemedzhieva, N., Khrokov, A.
tra		"Spain and Italy have long been major producers of Licorice."	1136	EoL - Encyclopedia of Life. htt
tra		"The value of the licorice trade in 2007 was estimated at 42 million US\$."	3488	Hayashi, H. & Sudo, H. (2009)
tra		Global exports of licorice in 2005 were 23 204 tons in roots and 29 960 tons of extracts. [G. glabra & G. uralensis]	9657	Tawab Stanikzai, M. (2007): M
tra		Spanisches Süßholz (var. glabra) kommt hauptsächlich aus Tartosa in Katalonien und Alicante in Valencia, ferner aus IT, S-FR, DE (?), russisches Süßholz (var. glandulifera-tax. Status unsicher) aus dem Wolgagebiet, Batum oder dem Ural, IR, CN	2049	Wagner, H. (1985): Pharmaze
tra		Spanish or Greek licorice is obtained from var. glabra, Russian or Anatolian licorice from var. glandulifera (Waldst. & Kit.) Herd. & Regel and Persian or Turkish licorice from var. violacea (Boiss.) Boiss.	1122	Mansfeld's World Database of

Legislation

Regulation

ICC	Regulation	Ref
CN	"Because of the risk of desertification in the northern region of China and the need to protect wild medicinal plant resources, the collection of wild Glycyrrhiza plants has recently been restricted by the Chinese government."	8697 Yamamoto, Y. & Tani, T. (2006)
KZ	[gla & ura] "export of licorice root is subject to mandatory licensing"	3906 Gemedzhieva, N., Khrokov, A.,
KZ	[gla & ura] "The collection of medicinal plants such as licorice in Kazakhstan is regulated only on state-owned lands of the Forest Fund and protected areas. On state-owned lands the harvest is regulated through specific legislation [Forest Code of the Republic of Kazakhstan» from 08.07.2003], for example there is resource monitoring by state forest service control and designation of sustainable harvest volumes of licorice root. [...] The measures applied in the state-owned lands cannot be implemented for the agricultural lands, since there is no legislative document to reference. [...] harvesting licorice on agricultural lands is considered to be an agricultural resource use."	3906

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- 1113 Ecocrop. FAO. <http://ecocrop.fao.org/>
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- 1117 eFloras. Flora of China. http://www.efloras.org/flora_page.aspx?flora_id=2
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- 1132 Hegi, Illustrierte Flora von Mitteleuropa
- 1135 Wikipedia. www.wikipedia.org
- 1136 EoL - Encyclopedia of Life. <http://www.eol.org/>
- 1147 Euro+Med PlantBase - <http://ww2.bgbm.org/EuroPlusMed/query.asp>
- 1148 The Plant List - <http://www.theplantlist.org/>
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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