ATLAS FLORAE EUROPAEAE 19

Leguminosae (Fabaceae) (*Astragalus* to *Erophaca*)

Draft text June 2017 (compiled by Arto Kurtto)

The taxonomy and order of the *Astragalus* taxa follow principally D. Podlech & S.H. Zarre (with collaboration of M. Ekici, A.A. Maassoumi & A. Sytin), A taxonomic revision of the genus Astragalus L. (Leguminosae) in the Old World. I–III. – 2439 pp. Bad Vöslau 2013. The taxonomy and order of the *Oxytropis* taxa follow principally Flora Europaea, but many eastern species have been added as floristic or taxonomic novelties. Of the genera accepted in Fl. Eur., *Biserrula* is included in *Astragalus*. On the other hand, *Erophaca* is here treated as a genus separate from *Astragalus*.

Unlike in previous volumes, (1) the author and publication abbreviations follow the standards of IPNI, (2) the section 'Biosystematics' is replaced by 'Phylogenetics', and (3) the territory abbreviations Uk (K) and Uk (U) are replaced by Cm and Uk, respectively.

The text still includes items to be checked. Some of them are indicated by double asterisks (**). Comments on the marked and other items are welcome to arto.kurtto@helsinki.fi.

Deviations from Flora Europaea

Additions

1. Previously described European taxa included as species or subspecies, although not recognised or not recognised separately in *Fl. Eur.*

Astragalus angustifolius Lam. subsp. *echinoides* (L'Her.) Brullo, Giusso & Musarella
A. angustifolius subsp. *erinaceus* (C. Presl) Brullo, Giusso & Musarella
A. clausii C.A. Mey.
A. hypoglottis L. subsp. *gremlii* (Burnat) Greuter & Burdet
A. ictericus Dingler
A. exscapus L. subsp. *transsilvanicus* (Schur) Nyár.
A. filiformis (DC.) Poir.
A. maritimus Moris
A. monspessulanus L. subsp. *gypsophilus* Rouy
A. nebrodensis (Guss.) Strobl
A. nitidiflorus Jiménez Mun. & Pau
A. pseudoglaucus Klokov
A. pseudotataricus Boriss.
A. scopaeformis Ledeb.
A. tarchankuticus Boriss.
A. thracicus Griseb. subsp. *monachorum* (Širj.) Strid
A. tymphresteus Boiss. & Spruner
A. ucrainicus Popov & Klokov
A. verrucosus Moris
Oxytropis campestris (L.) DC. subsp. *scotica* Jalas
O. cretacea N. Basil.
O. dinarica (Murb.) Wettst.

O. gmelinii Fisch. ex Boriss.
O. halleri Bunge ex W.D.J. Koch subsp. *korabensis* (Kümmerle & Jáv.) Chrtek & Chrtková
O. jabalambrensis (Pau) Podlech
O. teres (Lam.) DC.

2. Taxonomic novelties described during or after the editing of *Fl. Eur.*

Astragalus angustifolius Lam. subsp. *balcanicus* Brullo, Giusso & Musarella 2012
A. angustifolius subsp. *odonianus* Brullo, Giusso & Musarella 2012
A. aquilanus Anzal. 1970
A. astrachanicus Sytin & Laktionov 2007
A. baeri Sytin & Laktionov 2007
A. cavanillesii Podlech 1988
A. creticus Lam. subsp. *minoicus* Brullo & Giusso 2003
A. croaticus Alegro, Bogadanović, Brullo & Giusso 2009
A. devesae Talavera, A. González & G. López 1999
A. dolinicola (Brullo & Giusso) Brullo & Giusso 2003
A. ergenensis Kamelin & Sytin 2003
A. gines-lopezii Talavera, Podlech, Devesa & F.M. Vázquez 1999
A. gennarii Bacch. & Brullo 2006
A. glacialis Lovrić 1972
A. gorodkovii Jurtzev 1968
A. gracaninii Micevski 1971
A. greuteri Bacch. & Brullo 2006
A. igoschinae Kamelin & Jurtzev 1982
A. kamarinensis C. Brullo, Brullo, Giusso, Miniss. & Sciandr. 2013
A. laconicus Iatrou & Kit Tan 1999
A. lagobromus Knjaz. & Kulikov 2011
A. maniaticus Kit Tan & Strid 1997
A. muelleri Steud. & Hochst. subsp. *etruscus* Peruzzi, Gestri & Pierini 2014
A. neokarelinianus Knjaz. 2009
A. nevadensis Boiss. subsp. *andresmolinae* (Díez-Garretas & Asensi) Mota & F.J. Pérez-García 2012
A. oropolitanus Knjaz. & Kulikov 2002
A. raphaelis G. Ferro 1980
A. silvisteppaceus Knjaz. 2007
A. storozhevae Knjaz. 2002
A. taygeteus Jim. Perss. & Strid 1982
A. tegulensis Bacch. & Brullo 2010
A. terracianoi Vals. 1994
A. thermensis Vals. 1994
A. varius S.G. Gmel. subsp. *eupatoricus* Sytin 1999
Oxytropis baschkiriensis Knjaz. 2001
O. dinarica (Murb.) Wettst. subsp. *velebitica* Chrtek & Chrtková 1983
O. dinarica subsp. *weberi* Chrtek & Chrtková 1983
O. ivdelensis Knjaz. 1999
O. knjazevii Vasjukov 2014
O. kozhuharovii D.K. Pavlova, D. Dimitrov & M. Nikolova 1999
O. kungurensis Knjaz. 1999
O. lessingiana Knjaz. 2001

O. pilosa (L.) DC. subsp. *caputoi* (Moraldo & La Valva) Brilli-Catt., Di Massimo & Gubellini 2001
O. ponomarjevii Knjaz. 2001
O. sibajensis Knjaz. 2001
O. wologdensis Knjaz. 2005

3. Floristic novelties (taxa not, incorrectly or only incidentally mentioned in *Fl. Eur.*)

Astragalus ammodendron Bunge
A. calycinus M. Bieb.
A. commixtus Bunge
A. crenatus Schult.
A. depauperatus Ledeb.
A. filicaulis Kar. & Kir.
A. flexus Fisch.
A. gorczakovskii L.I. Vassiljeva
A. lehmannianus Bunge
A. microcephalus Willd.
A. mugosaricus Bunge
A. pallasii Spreng.
A. peregrinus subsp. *warionis* (Gand.) Maire
A. permiensis C.A. Mey.
A. solandri Lowe
A. stenoceras C.A. Mey.
A. subarcuatus Popov
A. temirensis Popov
Oxytropis approximata Less.
O. campanulata Vassilcz.
O. glabra DC.

4. Informal groups not presented in *Fl. Eur.*

Astragalus pallescens group
A. sirinicus group
A. tragacantha group

Exclusions

1. Species and subspecies deleted on taxonomical grounds

Astragalus ajubensis Bunge (included in *A. macrocephalus* Willd. subsp. *finitimus* (Bunge) D.F. Chamb.)
A. angustifolius Lam. subsp. *pungens* (Willd.) Hayek (European material refered to *A. angustifolius* subsp. *balcanicus*)
A. centralpinus Braun-Blanq. (included in *A. alopecurus*)
A. epiglottis subsp. *asperulus* (Dufour) Nyman
A. frigidus subsp. *grigorjewii* (B. Fedtsch.) Chater
A. incanus L. subsp. *incurvus* (Desf.) Rivas Goday & Borja ("(Desf.) Chater"; included in *A. incanus* subsp. *incanus*)

A. incanus subsp. *macrorhizus* (Cav.) Laínz ("(Cav.) Chater"; included in *A. incanus* subsp. *nummularioides* (Desf.) Maire)
A. giennensis Heywood (included in *A. nevadensis* Boiss. subsp. *nevadensis*)
A. glaucus M. Bieb. (included in *A. albicaulis* DC.)
A. hellenicus Boiss. (included in *A. exscapus* subsp. *exscapus*)
A. polyactinus Boiss. (included in *A. stella* L. ("Gouan"))
A. sempervirens Lam. subsp. *cephalonicus* (C. Presl) Asch. & Graebn
A. tenuifolius L. (included in *A. austriacus* Jacq.)
A. trojanus Steven ex Fisch. (included in *A. thracicus* Griseb. subsp. *thracicus*)

Further deviations

1. Change of genus or/and rank

Astragalus alopecuroides L. subsp. *grosii* (Pau) Rivas Goday & Rivas Mart. (instead of *A. grosii* Pau ("grossii"))
A. angustiflorus K. Koch subsp. *anatolicus* (Boiss.) D.F. Chamb. (instead of *A. anatolicus* Boiss.)
A. caprinus L. subsp. *huetii* (Bunge) Podlech (instead of *A. huetii* Bunge)
A. cylleneus Boiss. & Heldr. ex Fisch. (instead of *A. parnassi* Boiss. subsp. *cylleneus* (Boiss. & Heldr. ex Fisch.) Hayek)
A. exscapus L. subsp. *pubiflorus* (DC.) Soó (instead of *A. pubiflorus* DC.)
A. genargenteus Moris (instead of *A. sirinicus* Ten. subsp. *genargenteus* (Moris) Arcang.)
A. pelecinus (L.) Barneby (instead of *Biserrula pelecinus* L.)
A. rumelicus Bunge (instead of *A. creticus* Lam. subsp. *rumelicus* (Bunge) Maire & Petitm.)
A. siculus Biv. (instead of *A. granatensis* Lam. subsp. *siculus* (Biv.) Franco & P.C. Silva)
A. suberosus Banks & Sol. subsp. *haarbachii* (Spruner ex Boiss.) V.A. Matthews (instead of *A. haarbachii* Spruner ex Boiss.)
Erophaca baetica Boiss. (instead of *Astragalus lusitanicus* Lam.)
Oxytropis xerophila Gutermann (instead of *O. halleri* Bunge ex W.D.J. Koch subsp. *velutina* O. Schwartz)

2. Nomenclatural deviations

Astragalus alpinus L. subsp. *arcticus* (Sondén) Lindm. (author citation corrected)
A. austroaegeus Rech. f. (orthography of the specific epithet corrected)
A. buchtormensis Pall. (instead of *A. henningii* (Steven) Boriss.)
A. clusianus Soldano (instead of *A. clusii* Boiss. 1849 [non Pollini 1816])
A. gladiatus Boiss. (instead of *A. pugionifer* Fisch. ex Bunge)
A. guttatus Banks & Sol. (instead of *A. striatellus* Pall. ex Bieb.)
A. hypoglottis L. (instead of *A. purpureus* Lam.)
A. nevadensis Boiss. subsp. *muticus* (Pau) Zarre & Podlech (instead of *A. sempervirens* Lam. subsp. *muticus* (Pau) M. Lainz ("(Pau) Rivas Goday & Borja"))
A. nevadensis Boiss. subsp. *nevadensis* (instead of *A. sempervirens* Lam. subsp. *nevadensis* (Boiss.) P. Monts.)
A. parnassi Boiss. subsp. *calabricus* (Fisch.) Maassoumi (instead of *A. parnassi* subsp. *calabrus* "(Fiori) Chater")
A. stella L. (author citation corrected)
A. verrucosus Moris (instead of *A. suberosus* sensu Fl. Eur.)
Oxytropis campestris (L.) DC. subsp. *tyroliensis* (Sieber ex Fritsch) Leins & Merxm. (orthography

of the specific epithet corrected)
O. helvetica Scheele (instead of *O. gaudinii* Bunge)
O. montana (L.) DC. (instead of *O. jacquinii* Bunge)
O. neglecta Ten. (instead of *O. pyrenaica* Godr.)

LEGUMINOSAE (Fabaceae) (cont.)

Astragalus L. – Map 0000.

Acanthophaca Nevski
Ailuroschia Steven
Alopecias Steven
Ammodytes Steven
Ankylobus Steven
Astenolobium Nevski
Astracantha Podlech
Astragalina Bubani, nom. illeg.
Astragaloides Boehm., nom. illeg.
Atelophragma Rydb.
Aulosema Walp.
Batidophaca Rydb.
Brachyphragma Rydb.
Caryolobium Steven
Chondrocarpus Steven, nom. illeg.
Cnemidophacos Rydb.
Contortuplicata Medik.
Craccina Steven
Cryptorrhynchus Nevski
Cymbicarpos Steven
Cystium Steven
Didymopelta E. Regel & Schmalh. (Dipelta E. Regel & Schmalh., nom. illeg.)
Diplotheca Hochst.
Euilus Steven
Feidanthus Steven
Geoprumnon Rydb.
Glandula Medik.
Glaux Medik., nom. illeg.
Glottis Medik.
Hamosa Medik. (Hamaria Fourr., nom. illeg.)
Hedyphylla Steven
Hesperastragalus A. Heller
Hesperonix Rydb.
Holcophacos Rydb.
Homalobus Nutt.
Hypoglottis Fourr.
Kentrophyta Torr. & A. Gray
Kirschneria Opiz
Lithoon Nevski
Macrosema Steven
Medyphylla Opiz
Myctirophora Nevski
Myobroma Steven
Neodielsia Harms
Oedicephalus Nevski
Onix Medik.
Oxyglottis (Bunge) Nevski
Pedina Steven
Phaca L.
Phacomene Rydb.

Philammos (Steven) Steven
Pisophaca Rydb.
Podochrea Fourr.
Podolotus Royle
Poecilocarpus Nevski
Proselias Steven
Sewerzowia E. Regel & Schmalh.
Solenotus Steven
Stella Medik.
Thlaspidium (Lipsky) Rassulova
Tium Medik.
Tragacantha Mill.
Triquetra Medik.
Xerophysa Steven
Xylophacos Rydb.

Incl. Biserrula L.

Excl. Erophaca Boiss.

Phylogenetics and generic delimitation. M.J. Sanderson, Syst. Bot. 16: 414–430 (1991) (phylogenetic relationships within North American *Astragalus*); A. Liston, Amer. J. Bot. 79: 953–961 (1992) (utility of restriction site analysis of PCR-amplified chloroplast DNA to the study of phylogenetic relationships); M.J. Sanderson & J.J. Doyle, Syst. Bot. 18: 395–408 (1993) (phylogenetic relationships in North American *Astragalus*); M.F. Wojciechowski et al., Amer. J. Bot. 80: 711–722 (1993) (monophyly of aneuploid *Astragalus*), Syst. Bot. 24: 409–437 (1999) (evidence on the monophyly of *Astragalus* and its major subgroups based on molecular data); A. Liston & J.A. Wheeler, Biochem. Syst. Ecol. 22: 377–388 (1994) (molecular phylogeny; recognition of the segregate genera *Astracantha* and *Biserrula* making *Astragalus* paraphyletic; *Astragalus* as currently circumscribed is polyphyletic [since then some more segregate genera have been recognized to gain monophyly]); M.J. Sanderson & M.F. Wojciechowski, Amer. J. Bot. 83: 1488–1502 (1996) (diversification rates in the "Astragalean clade"); M. Zarre & D. Podlech, Sendtnera 4: 243–250 (1997) (*Astracantha* "must be included in the genus *Astragalus* again"); T.T.X. Dong et al., J. Agric. Food Chem. 51: 6709–6714 (2003) (phylogeny of *Astragalus* in China); S. Kazempour Osaloo et al., Pl. Syst. Evol. 242: 1–32 (2003) (phylogenetic analyses), Brittonia 57: 367–381 (2005) (molecular systematics of the Old World *Astragalus*); S. Zarre, Bot. J. Linn.Soc. 143: 323–330 (2003) (hair micromorphology and its phylogenetivc application in thorny species of *Astragalus*); R.A. Scherson et al., Brittonia 57: 354–366 (2005) (phylogenetics of New World *Astragalus*), Amer. J. Bot. 95: 1030–1039 (2008) (phylogeny, biogeography, and rates of diversification of New World *Astragalus*); M.F. Wojciechowski, Brittonia 57: 382–396 (2005) ("A molecular phylogenetic perspective"); F. Taeb et al., Feddes Repert. 118: 206–227 (2007) (phylogeny of annual species in the Old World using hair micromorphology and other morphological characters); M. Kazemi et al., Nordic J. Bot. 27: 425–436 (2009) (molecular phylogeny of selected Old World *Astragalus*); L. Hardion et al., Ecol. Medit. 36: 99–106 (2010) (phylogenetic relationships and infrageneric classification of *A. tragacantha* [s. lato] based on molecular data; existence of four clades within *Astragalus* s. str. supported); M. Riahi et al., Pl. Syst. Evol. 293: 119–133 (2011) (phylogeny of sect. *Caprini* and its allies); L. Bartha et al., Stud. Univ. Babeş-Bolyai, Biol. 57: 33–45 (2012) (new PCR primers for monophyly testing and sectional delimitation), Botany 91: 702–714 (2013) (molecular evidence for reticulate speciation and allopolyploidy in sect. *Dissitiflori*); N. Ghorbani Nohooji et al., Iran. J. Bot. 18: 239–248 (2012) (phylogeny of sect. *Onobrychoidei*); R. Sheikh Akbari Mehr et al., Iran. J. Bot. 18: 1–9 (2012) (phylogeny of sect. *Dissitiflori*); A. Dastpak et al., Biochem. Syst. Ecol. 50: 459–466 (2013) (phylogenetic analysis, with emphasis on the sect. *Ammodendron*); F. Javanmardi et al., Biochem. Syst. Ecol. 45: 171–178 (2012) (molecular phylogeny, with emphasis on the sect. *Alopecuroidei*);

A. Dizkirici Tekpinar et al., Pl. Syst. Evol. 300: 163–175 (2014) (comparative molecular phylogenetics of sections from Turkey with New World species), Turkish J. Bot. 40: 250–263 (2016) (phylogenetic relationships between *Oxytropis* and *Astragalus* species native to an Old World diversity center [Turkey]; monophyly of *Astragalus* confirmed); S.M. Sharawy & A. Badr, Bangladesh J. Pl. Taxon. 21: 1–12 (2014) (relationships in sect. *Sesamei* based on morphological criteria and molecular markers).

Notes. The map includes extant native and possibly native occurrences with certain identification and locality, thus principally showing the present, confirmed native range of the genus. – For distribution patterns in the Old World based on some selected sections, see M. Mahmoodi et al., Rostaniha 13: 39–56 (2012).

Astragalus sect. **Harpilobus** Bunge

Sect. Falcinellus Bunge
Sect. Fedtschenkoana Širj.

Astragalus arpilobus Kar. & Kir. – Map 0000.

Astragalus gyzensis Bunge var. arpilobus (Kar. & Kir.) Boiss.
A. achzaensis Litv.
A. drobovii Popov & Vved. (A. arpilobus subsp. drobovii (Popov & Vved.) Podlech)
A. harpilobus auct.
A. hauarensis Boiss. (A. arpilobus subsp. hauarensis (Boiss.) Podlech)

Taxonomy and nomenclature. Podlech & Zarre 2013: 48–51.

Diploid and hexaploid. 2n=16 A. Badr & S.M. Sharawy, Int. J. Bot. 3: 149 (2007), for material from Egypt (as *A. hauarensis*). – 2n=48 G.A. Malallah & G. Brown, Cytologia 64: 183 (1999), for material from Kuwait (as *A. hauarensis*).

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.). – For reproductive biology of the species, see Y. Long et al., S. African J. Bot. 83: 68–77 (2012).

Total range. From S.E. Russia and Iran to N.W. China (as subsp. *arpilobus* and subsp. *drobovii* (Turkmenistan)), and from N. Africa to Afghanistan and Pakistan (as subsp. *hauarensis*).

Data wanted: Rus (C, E)

Astragalus crenatus Schult. – Map 0000.

Astragalus corrugatus Bertol. (Tragacantha corrugata (Bertol.) Kuntze)
A. cruentus Balb.
A. cruciatus Link (Tragacantha cruciata (Link) Kuntze)
A. quadrisulcatus Bunge (Tragacantha quadrisulcata (Bunge) Kuntze)
A. tenuirugis Boiss. (A. corrugatus subsp. tenuirugis (Boiss.) Eig; Tragacantha tenuirugis (Boiss.) Kuntze)

Taxonomy and nomenclature. A. Badr et al., Cytologia 61: 105–111 (1996) (chromosomal relationships and their taxonomic inferences; as *Astragalus tenuirugis*); Podlech & Zarre 2013: 54–56; K. Baziz et al., Turk. J. Bot. 38: 1248–1258 (karyotype analysis, physical rDNA mapping, genome size; as *A. cruciatus*).

Diploid to tetraploid. 2n=16 reported by K. Baziz et al., Turk. J. Bot. 38: 1251 (2014), for material from Algeria (as *Astragalus cruciatus*). – 2n=24 reported by A. Badr et al., Cytologia 61: 106 (1996), for material from Egypt (as *A. tenuirugis*). – 2n=32 reported by G.A. Malallah et al., Willdenowia 31: 414, 415 (2001), for material from Kuwait, and Badr & S.M. Sharawy, Int. J. Bot. 3: 149 (2007), for material from Egypt (in both as *A. corrugatus*).

Notes. Tu (floristic novelty): Fl. Turkey 1970: 65 (as *Astragalus corrugatus*); F. Taeb et al., Feddes Repert. 123: 13(map) (2012).

Total range. Outside Europe, present from Tschad, N. Africa, Anatolia and Caucasia to Pakistan, Afghanistan and Uzbekistan.

Data wanted: Tu

Astragalus longidentatus Chater – Map 0000.

Astragalus mauritanicus Coss. 1857 non Steven 1832 (Tragacantha mauritanica (Coss.) Kuntze)
A. pauciflorus Lázaro Ibiza 1906 non Pall. 1800

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; as *Astragalus pauciflorus* with 2n=28); Fl. Iber. 1999: 283–285; Podlech & Zarre 2013: 60–61.

Tetraploid (x=7) with 2n=28 (Hs): A. Pretel Martínez, Taxon 23: 805 (1974); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978) (in both as *Astragalus pauciflorus*).

Total range. Outside Europe, present in Algeria and Morocco.

Data wanted: Hs

Astragalus reticulatus M. Bieb. – Map 0000.

Ankylobus reticulatus (M. Bieb.) Steven
Astragalus oliganthus Kar. & Kir.

Taxonomy and nomenclature. Podlech & Zarre 2013: 62–63.

Total range. Outside Europe, present in Asiatic Kazakhstan.

Data wanted: Kaz, Rus (E)

Astragalus sect. **Sesamei** DC. – Map 0000.

Sect. Onycholobium Pomel

Taxonomy. M. Gazer, Sendtnera 1: 69–155 (1993) (revision of the section); C. Brullo et al., Nord. J. Bot. 29: 518–533 (2011) (differential characters of species; phenetic and phylogenetic trees (based on morphological data); all European species of the section except *Astragalus filicaulis* and *A. kamarinensis* included in the study, *A. raphaelis* and *A. stella* being treated more accurately than the others), Ann. Bot. Fenn. 50: 61–67 (2013) (phenetic analysis); S.M. Sharawy & A. Badr, Bangladesh J. Pl. Taxon. 21: 1–12 (2014) (relationships based on morphological criteria and molecular markers).

Astragalus filicaulis Kar. & Kir. – Map 0000.

Tragacantha filicaulis (Kar. & Kir.) Kuntze
Astragalus agrestis Freyn 1904 non G. Don 1832
A. leptodermus Bunge
A. nawabianus Aitch. & Baker
A. rytilobus Bunge (A. filicaulis subsp. rytilobus (Bunge Popov)

Taxonomy and nomenclature. M. Gazer, Sendtnera 1: 94–98 (1993); Podlech & Zarre 2013: 73–74.

Diploid chromosome number 2n=16 reported by H.K. Karshibaev in Tezisy III Soveshchanie po Kariologii Rastenii, pp. 26–27, for material from Uzbekistan (as *Astragalus rytilobus*).

Notes. Rus (E) (floristic novelty).

Total range. Main range extending from N. Iran and N. Pakistan northeast to Asiatic Kazakhstan: M. Gazer, Sendtnera 1: 96(map) (1993).

Data wanted: Rus (E)

Astragalus kamarinensis C. Brullo, Brullo, Giusso, Miniss. & Sciandr. 2013

Taxonomy. C. Brullo et al., Ann. Bot. Fenn. 50: 61–67 (2013).

Notes. Si (S) (taxonomic novelty).

Endemic to Sicily (Ragusa Province).

Data wanted: Si (S)

Astragalus raphaelis G. Ferro 1980 – Map 0000.

Taxonomy and nomenclature. G. Ferro, Atti Ist. Bot. Lab. Univ. Pavia, ser. 6, 13: 45–50 (1980); Podlech & Zarre 2013: 81.

Diploid with 2n=16 (Si (S)): P. Colombo et al., Inform. Bot. Ital. 12: 173–180 (1981).

Notes. Si (S) (taxonomic novelty). – For details of the distribution, ecology and vulnerability of the species, see C. Brullo et al., Nord. J. Bot. 29: 523–528 (2011).

Endemic to Sicily (Caltanissetta, Enna and Palermo Provinces).

Data wanted: Si (S)

Astragalus scorpioides Pourr. ex Willd. – Map 0000.

Tragacantha scorpioides (Pourr. ex Willd.) Kuntze
Astragalus canaliculatus Willd.
A. uncinatus Bertol., 1851 non Moench 1794

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology); M. Gazer, Sendtnera 1: 120–122 (1993); Podlech & Zarre 2013: 84–85.

Hexaploid with 2n=48 (Hs): A. Pretel Martínez, Taxon 23: 805 (1974).

Notes. For phytosociology of the species, see S. Rivas Goday & J. Borja Carbonell, Anales Inst. Bot. Cavanilles 16: 473–484 (1959).

Total range. Outside Europe, present in Algeria and Morocco.

Data wanted: Co, Hs, †It

Astragalus sesameus L. – Map 0000.

Astragalus mediterraneus Bubani, nom. illeg.; Stella sesamea (L.) Medik.; Tragacantha sesamea (L.) Kuntze

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology); M. Gazer, Sendtnera 1: 122–127 (1993); F. Taeb et al., Feddes Repert. 123: 5–6 (2012); Fl. Iber. 1999: 297–299; Podlech & Zarre 2013: 86–87.

Diploid (x=8) **and tetraploid** (x=7). 2n=16 (Hs, It, Lu): A. Pretel Martínez, Taxon 23: 805 (1974); Fernandes & Quieros 1978: 141; T. Luque & Z. Díaz Lifante, Bocconea 1: 354 (1991); S. Brullo et al., Inform. Bot. Ital. 26: 200–213 (1995). – 2n=28 (Hs): A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978).

Notes. Al, Bl and Cr added (not given in Fl. Eur.): Podlech & Zarre 2013: 86–87; Z. Barina et al., Studia Bot. Hung. 46(2): 123 (2015).

Total range. Outside Europe, present in Algeria, Morocco, Tunisia, East Aegean Islands and N.W. Anatolia: M. Gazer, Sendtnera 1: 125(map) (1993).

Data wanted: Al, BH, Bl, Bu, Cg, Cr, Ct, Ga, Gr, Hs, It, Lu, Mk, Sa, Si (×M, S)

Astragalus sinaicus Boiss. – Map 0000.

Astragalus pseudostella Bunge, nom. illeg.

Taxonomy and nomenclature. M. Gazer, Sendtnera 1: 129–131 (1993); A. Badr et al., Cytologia 61: 105–111 (1996) (chromosomal relationships and their taxonomic inferences); F. Taeb et al., Feddes Repert. 123: 6–7 (2012); Podlech & Zarre 2013: 88–90.

Diploid with 2n=16 (Cr, Gr): H. Runemark, Fl. Medit. 16: 409–410 (2006). The same number reported by B. Djerdjour & G.-G. Guittonneau, Taxon 25: 342 (1976), for material from Algeria, A. Badr et al., Cytologia 61: 106 (1996), for material from Egypt, and A. Badr & S.M. Sharawy, Int. J. Bot. 3: 149 (2007), for material from Egypt.

Total range. Outside Europe, present in East Aegean Islands, Anatolia, Cyprus and Egypt (for discrepancies concerning the last mentioned country, see S.M. Sharawy & A. Badr, Bangladesh J. Pl. Taxon. 21: 10 (2014)).

Data wanted: Cm, Cr, Gr, Mk

In Podlech & Zarre 2013: 89, given from 'Bosnia: Tananadia'. Where is such a place?

Astragalus stella L. – Map 0000.

Astragalus stellatus Lam., nom. illeg.; Tragacantha stella (L.) Kuntze
A. ambiguus (Rouy) Sennen 1922 non Pall. 1800
A. arenicola Pomel
A. castroviejoi Talavera & Sánchez-Gómez
A. geniculatus auct. hisp. non Desf.
A. polyactinus Boiss. (A. asterias Steven ex Ledeb. subsp. polyactinus (Boiss.) Greuter)
Stella radiata Fourr.
Tragacantha acutifolia (DC.) Kuntze

Taxonomy and nomenclature. In Fl. Eur. treated as *Astragalus polyactinus* and *A. stella.* Author citation corrected (L. instead of Gouan). – A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; as *A. polyactinus* ("poliactinus") and *A. stella*); M. Gazer, Sendtnera 1: 131–137 (1993); Fl. Iber. 1999: 298–300; A. Badr & S.M. Sharawy, Int. J. Bot. 3: 147–159 (2007) (karyotype analysis and systematic relationships); S. Talavera Lozano et al., Anal. Jard. Bot. Madrid. 67: 41–47 (2010) (*A. castroviejoi* described as a distinct species); F. Taeb et al., Feddes Repert. 123: 10–11 (2012); Podlech & Zarre 2013: 90–92 ("The characters by which *A. castroviejoi* should be different from *A. stella*, can be found commonly in plants of all parts of the distribution of *A. stella*."); Fl. Gallica 2014: 715.

Diploid (x=8) **and tetraploid** (x=7). 2n=16 (Hs): A. Pretel Martínez, Taxon 23: 805 (1974) (as *Astragalus polyactinus* and *A. stella*); T. Luque & Z. Díaz Lifante, Bocconea 1: 354 (1991); S. Talavera Lozano et al., Anal. Jard. Bot. Madrid. 67: 44–45 (2010) (as *A. castroviejoi*). The same number reported by V. Dalgaard, Taxon 36: 660 (1987), for material from Lanzarote, Canary Islands (as *A. polyactinus*), C. Oberprieler & R. Vogt, Willdenowia 25: 670, 671 (1996), for material from Morocco, and A. Badr & S.M. Sharawy, Int. J. Bot. 3: 149 (2007), for material from Egypt. – 2n=28 (Hs): A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978) (as *A. polyactinus* and *A. stella*).

Notes. Bl added (not given in Fl. Eur.): Podlech & Zarre 2013: 91.

Total range. Outside Europe, present in the Canary Islands, N. Africa and W. and C. Anatolia: M. Gazer, Sendtnera 1: 134(map) (1993).

Data wanted: Bl, Ga, Gr, Hs, Lu **In Podlech & Zarre 2013: 91, given also from Italy. Truly present there?**

Astragalus tribuloides Delile – Map 0000.

Tragacantha tribuloides (Delile) Kuntze
Astragalus ammocryptus Boiss.
A. erpocaulos Boiss.
A. kirghisicus Stschegl.
A. kofensis Velen.
A. minutus Boiss.
A. perpusillus Bertol.

Taxonomy and nomenclature. M. Gazer, Sendtnera 1: 139–149 (1993); A. Badr et al., Cytologia 61: 105–111 (1996) (chromosomal relationships and their taxonomic inferences; with three varities); A. Badr & S.M. Sharawy, Int. J. Bot. 3: 147–159 (2007) (karyotype analysis and systematic relationships; with var. *minutus* and var. *mareoticus*); F. Taeb et al., Feddes Repert. 123: 4–5 (2012); Podlech & Zarre 2013: 93–96.

Diploid (x=7, 8) chromosome number reported from outside Europe. – 2n=14 reported by A. Badr et al., Cytologia 61: 106 (1996), for material from Egypt (as *Astragalus tribuloides* var. *mareoticus*, var. *minutus* and var. *platycarpos*). – 2n=16 reported by E. Kliphuis & Y.I. Barkoudah, Acta Bot. Neerl. 26: 243 (1977), for material from Syria, A.A. Ramak Maassoumi, Iran. J. Bot. 3: 119 (1987), for material from Iran (as *Astragalus tribuloides* var. *leiocarpus*), G.A. Malallah et al., Willdenowia 31: 414, 415 (2001), for material from Kuwait, and A. Badr & S.M. Sharawy, Int. J. Bot. 3: 149 (2007), for material from Egypt (also for var. *mareoticus* and var. *minutus*).

Total range. From N. Africa, Middle East, Anatolia, Caucasia and S.E. European Russia to India and N.W. China: M. Gazer, Sendtnera 1: 142(map) (1993).

Data wanted: Rus (E)

Astragalus sect. **Oxyglottis** Bunge

Astragalus oxyglottis Steven ex M. Bieb. – Map 0000.

Tragacantha oxyglottis (Steven ex M. Bieb.) Kuntze
Astragalus abbas-riazi Parsa
A. psiloglottis DC.

Taxonomy and nomenclature. F. Taeb et al., Feddes Repert. 123: 11–12 (2012); Podlech & Zarre 2013: 100–101.

Diploid with 2n=16 (Hs): J. Fernandez Casas, Anales Inst. Bot. Cavanilles 32: 301–307 (1975). The same number reported by A.A. Ramak Maassoumi, Iran. J. Bot. 3: 119 (1987), for material from Iran (as *Astragalus oxyglottis* var. *polyglottis*).

Notes. Hs and ?Rus (C) added (Hs, ?Rs (C) not given in Fl. Eur.).

Total range. Outside Europe, present from the Middle East, Anatolia and Caucasia to Pakistan and N.W. China.

Data wanted: Cm, Hs, Rus (?C, E)

Astragalus sect. **Bucerates** DC. – Map 0000.

Astragalus algarbiensis Bunge – Map 0000.

Tragacantha algarbiensis (Bunge) Kuntze

Taxonomy and nomenclature. Fl. Iber. 1999: 287–289; Podlech & Zarre 2013: 106–107.

Notes. Probably extinct in Lu (in Fl. Eur. given as extant).

Total range. Outside Europe, present in Morocco.

Data wanted: Hs, ×Lu

Astragalus cymbicarpos Brot. – Map 0000.

Tragacantha cymbicarpa (Brot.) Kuntze
Astragalus castellanus Bunge
A. clandestinus Roth
A. cymbaecarpos auct.
A. cymbiformis Willd.

Taxonomy and nomenclature. M.L. Díaz & E. Domínguez, Mot. Macaronés. 8–9: 79–87 (1981) (cleistogamy and dimorphic pollen); R. Gallardo et al., Amer. J. Bot. 80: 814–823 (1993) (flower types), 81: 1611–1619 (1994) (breeding system); Podlech & Zarre 2013: 107–108.

Tetraploid (x=7) with 2n=28 (Lu): A. Fernandes & M.F. Santos, Bol. Soc. Brot. ser. 2, 49: 176, 177 (1975); Fernandes & Quieros 1978: 141.

Notes. Bl added (not given in Fl. Eur.): Podlech & Zarre 2013: 107–108.

Total range. Outside Europe, present in Morocco.

Data wanted: Bl, Hs, Lu

Astragalus edulis Durieu ex Bunge – Map 0000.

Tragacantha edulis (Durieu ex Bunge) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 108–109.

Diploid chromosome number 2n=16 reported by E. Kreuter, Planta 11: 25 (1930), for cultivated material.

Notes. For details of the distribution in Hs and elsewhere, see A. Pallarés Navarro, Anal. Jard. Bot. Madrid 43: 174–177 (1986), and J. Peñas et al., PeerJ 4:e1474; DOI 10.7717/peerj.1474 (2016) (designing conservation strategies to preserve the genetic diversity). – For reproduvtive biology of the species, see R. Gallardo et al., Amer. J. Bot. 81: 1611–1619 (1994).

Total range. Outside Europe, present in the Canary Islands, Morocco and Algeria.

Data wanted: Hs

Astragalus hamosus L. – Map 0000.

Ankylobus hamosus (L.) Steven; Hamosa astragalus Medik.; Tragacantha hamosa (L.) Kuntze
Astragalus aegyptiacus Mill.
A. ancistron Pomel
A. arnoceras Bunge (Tragacantha arnoceras (Bunge) Kuntze)
A. brachyceras Ledeb. (A. hamosus subsp. brachyceras (Ledeb.) Batt.; Tragacantha brachyceras (Ledeb.) Kuntze)
A. buceras Willd. (Tragacantha buceras (Willd.) Kuntze)
A. dorcoceras Bunge (Tragacantha dorcoceras (Bunge) Kuntze)
A. embergeri Jahand., Maire & Weiller (A. hamosus subsp. embergeri (Jahand., Maire & Weiller) Maire
A. oncocarpus Pomel
A. paui Pau
A. stribrnyi Velen.
A. taeckholmianus Oppenh.
A. volubilitanus J. Braun & Maire
Hamaria uncinata Fourr.

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; with 2n=44 in Spain); K.A. Ahmed & A.H. Mohamed, Ann. Agric. Sci. (Cairo) 33:

745–760 (1988) (comparative anatomical studies; with var. *buceras*); A. Badr et al., Cytologia 61: 105–111 (1996) (chromosomal relationships and their taxonomic inferences; with 2n=32 and 40, the latter number for var. *buceras*); A. Zoghlami & M. Zouaghi, Euphytica 134: 137–147 (2003) (morphological variation in Tunisia); A. Badr & S.M. Sharawy, Int. J. Bot. 3: 147–159 (2007) (karyotype analysis and systematic relationships; with var. *brachyceras* and var. *buceras*; tetraploid to octoploid with 2n=32, 40, 64 in Egypt; "…, the variation in chromosome number … is not associated with morphological and anatomical resemblances … and similarities in the electrophoretic profiles of seed protein …"); F. Dane et al., Phytol. Balcan. 13: 387–391 (2007) (karyology and palynology); M.M. Morad & S.M. Sharawy, Feddes Repert. 120: 307–316 (2009) (relationships assessed by morpho-anatomical characters of the pod; with var. *brachyceras* and var. *buceras*); F. Taeb et al., Feddes Repert. 123: 19–21 (2012); Podlech & Zarre 2013: 109–113.

Diploid to endecaploid (with aneuploidy) with 2n=14, 16, 32, 34, 40, 42, 44, 46, 48, 88. – 2n=14 (Sa): C. Del Prete & P. Miceli, Fl. Medit. 4: 296, 297 (1994). – 2n=16 reported by A.A. Ramak Maassoumi, Iran. J. Bot. 3: 118 (1987), for material from Iran, and S. Rani et al., Taxon 60: 1794 (2011), for material from India. – 2n=32 (Bu, Hs, Si (S)): B. Kuzmanov & S. Georgieva, Taxon 25: 500 (1976); M. Horjales, Trab. Dept. Bot. Fisiol. Veg. Madrid 9: 13–18 (1976) (also 2n=34); P. Colombo et al., Anales Jard. Bot. Madrid 39: 521, 522 (1983). The same tetraploid number reported by N.A. Chuksanova, Bot. Zhurn. (Moscow & Leningrad) 52: 1125 (1967), for material from Turkmenistan, L. Borgen, Norw. J. Bot. 21: 199–200 (1974), for material from Lanzarote, Canary Islands, V. Dalgaard, Taxon 36: 660 (1987), for material from Lanzarote, Canary Islands, A. Badr et al., Cytologia 61: 106 (1996) (also 2n=40 for var. *buceras*), for material from Egypt, and A. Badr & S.M. Sharawy, Int. J. Bot. 3: 149 (2007), for material from Egypt (also for var. *brachyceras* and var. *buceras*). – 2n=42 (Bu, Lu): Fernandes & Quieros 1978: 141; D. Pavlova, Fl. Medit. 5: 319 (1995) (also 2n=40). – 2n=44 (Bu, Cr, Gr, Hs, Tu): A. Pretel Martínez, Taxon 23: 804 (1974); M. Horjales, Trab. Dept. Bot. Fisiol. Veg. Madrid 9: 13–18 (1976) (also 2n=40); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978); T. Luque & Z. Díaz Lifante, Bocconea 1: 353 (1991); D. Pavlova, Fl. Medit. 5: 319 (1995); H. Runemark, Fl. Medit. 16: 409 (2006) (c. 44); F. Dane et al., Phytol. Balcan. 13: 387–391 (2007). The same number reported by Z. Díaz Lifante et al., Bocconea 3: 240 (1992), for material from Israel, and C. Oberprieler & R. Vogt, Willdenowia 25: 669, 670 (1996), for material from Morocco. – 2n=48 (Bu, Hs, Lu): A. Fernandes & M.F. Santos, Bol. Soc. Brot., ser. 2, 45: 181, 182 (1971); Á. Löve & E. Kjellqvist, Lagascalia 4: 157 (1974); A. Fernandes & M.F. Santos, Bol. Soc. Brot., ser. 2, 49: 177 (1975); D. Pavlova, Fl. Medit. 5: 319 (1995) (also 2n=46). The same octoploid number reported by E. Kreuter, Planta 11: 25 (1930), for cultivated material. – 2n=88 (Bu): D. Pavlova, Fl. Medit. 5: 319 (1995).

Notes. **†Ge** – For reproductive biology of the species, see R. Gallardo et al., Amer. J. Bot. 81: 1611–1619 (1994), and C. Patanè & F. Gresta, J. Arid. Environ. 67: 165–173 (2006) (germination as affected by seed-coat dormancy).

Total range. Outside Europe, present in the Canary Islands and from N. Africa, Cyprus, East Aegean Islands and Caucasia to Pakistan and Turkmenistan.

Data wanted: Al, BH, Bl, Bu, Cg, Cm, Co, Cr, Ct, Ga, †Ge, Gr, Hs, It, Lu, Mk, Rm, Rus (E), Sa, Se, Si (M, S), †Sl, Tu

** Given as 'extinct native or archaeophyte' in the data from Ge. Is this really correct?**

Astragalus solandri Lowe – Map 0000.

Astragalus canescens Sol. ex Lowe 1831 non DC. 1802; Tragacantha solandri (Lowe) Kuntze
Astragalus bubaloceras Maire
A. bubaloceras subsp. pseudohamosus Širj.

Taxonomy and nomenclature. Podlech & Zarre 2013: 114–115.

Notes. ×Hs (floristic novelty).

Total range. Outside Europe, present in Madeira, the Canary Islands and Morocco.

Data wanted: ×Hs

Astragalus sect. **Cyamodes** Bunge

Astragalus boeticus L. – Map 0000.

Astragalus uncinatus Moench, nom. illeg.; Tragacantha boetica (L.) Kuntze; Triquetra boetica (L.) Medik.

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; with 2n=30 in Spain); A. Badr et al., Cytologia 61: 105–111 (1996) (chromosomal relationships and their taxonomic inferences); A. Badr & S.M. Sharawy, Int. J. Bot. 3: 147–159 (2007) (karyotype analysis and systematic relationships; "most likely pentaploid" with 2n=30 and with extremely short chromosomes compared to other species of the genus in Egypt); M.M. Morad & S.M. Sharawy, Feddes Repert. 120: 307–316 (2009) (relationships assessed by morpho-anatomical characters of the pod); F. Taeb et al., Feddes Repert. 123: 17–18 (2012); Podlech & Zarre 2013: 116–118; Fl. Gallica 2014: 715 (with two varieties, of which var. *subinflatus* Rouy only in S. Corsica).

Pentaploid with 2n=30 (Hs, Lu): A. Pretel Martínez, Taxon 23: 804 (1974)**;** A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978); Fernandes & Quieros 1978: 141. The same number reported by A. Badr et al., Cytologia 61: 106 (1996), and A. Badr & S.M. Sharawy, Int. J. Bot. 3: 149 (2007), for material from Egypt.

Notes. Possibly not native in Ga (in Fl. Eur. given as native): Fl. Gallica 2014: 715. – For the history of cultivation of the species as a coffee substitute, see J. Prohens et al., Genet. Resour. Crop. Evol. 61: 287–297 (2014).

Total range. Outside Europe, present from Madeira and the Canary Islands through N. Africa to the Near East.

Data wanted: Bl, Co, Cr, Ct, Ga, Gr, Hs, It, Lu, Sa, Si (M, S)

Astragalus sect. **Ankylotus** Bunge

Astragalus ankylotus Fisch. & C.A. Mey. – Map 0000.

Tragacantha ankylotus (Fiech. & C.A.Mey.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 128–129.

Total range. Outside Europe, present in Asiatic Kazakhstan, Turkmenistan and Mongolia.

Data wanted: Kaz, Rus (E)

Astragalus commixtus Bunge – Map 0000.

Tragacantha commixta (Bunge) Kuntze
Astragalus brahuicus Boiss. 1872 non Bunge 1868 (A. affghanus Boiss. (Tragacantha affghana (Boiss.) Kuntze); A. afghanicus Bornm., nom. illeg.)
A. intermedius Boiss. 1843 non Host 1831

Taxonomy and nomenclature. F. Taeb et al., Feddes Repert. 123: 16–17 (2012); Podlech & Zarre 2013: 129–131.

Diploid chromosome number 2n=16+2B reported by D. Podlech & A. Dieterle, Candollea 24: 185–243 (1969), for material from Afghanistan.

Notes. Rus (?C, E) (floristic novelty).

Total range. Outside Europe, present from C. Anatolia and Caucasia to Pakistan and N.W. China.

Data wanted: Rus (?C, E)

Astragalus stalinskyi Širj. – Map 0000.

Astragalus brachymorphus Nikif.

Taxonomy and nomenclature. Podlech & Zarre 2013: 132–133.

Diploid chromosome number 2n=16 reported by A.A. Ramak Maassoumi, Iran. J. Bot. 3: 119 (1987), for material from Iran.

Total range. Outside Europe, present from Iran, Turkmenistan and Asiatic Kazakhstan to N.W. China.

Data wanted: Kaz, Rus (E)

Astragalus sect. **Platyglottis** Bunge – Map 0000.

Astragalus devesae Talavera, A. González & G. López 1999 – Map 0000.

Taxonomy and nomenclature. F.M. Vázquez et al., Acta Bot. Malac. 16: 486–490 (1991) (as *Astragalus nitidiflorus* pro parte); S. Talavera & F.J. Salgueiro, Lagascalia 21: 193–196 (1999); Podlech & Zarre 2013: 138–139.

Notes. Hs (taxonomic novelty). – For the distribution and ecology of the species, see P. Vargas & B. García, Anal. Jard. Bot. Madrid 65: 355–359 (2008).

Endemic to Europe (Spain: Ávila Province).

Data wanted: Hs

Astragalus gines-lopezii Talavera, Podlech, Devesa & F.M. Vázquez 1999 – Map 0000.

Taxonomy and nomenclature. F.M. Vázquez et al., Acta Bot. Malac. 16: 486–490 (1991) (as *Astragalus nitidiflorus* pro parte); Fl. Iber. 1999: 295–297; S. Talavera, Anal. Jard. Bot. Madrid 57: 219–220 (1999); S. Talavera & F.J. Salgueiro, Lagascalia 21: 193–196 (1999); Podlech & Zarre 2013: 139.

Diploid with 2n=16 (Hs): F.M. Vázquez et al., Acta Bot. Malac. 16: 486–490 (1991) (as *Astragalus nitidiflorus*).

Notes. Hs (taxonomic novelty). – For the distribution, ecology and reproduction of the species, see S. Ramos et al., Ann. Bot. Fenn. 47: 330–336 (2010), and V. Martínez-Fernández et al., Turkish J. Bot. 38: 686–695 (2014).

Endemic to Europe (Spain: Badajoz Province).

Data wanted: Hs

Astragalus nitidiflorus Jiménez Mun. & Pau – Map 0000.

Taxonomy and nomenclature. D. Podlech, Mitt. Bot. Staatssamml. München 29: 553–554 (1990); F.M. Vázquez et al., Acta Bot. Malac. 16: 486–490 (1991) (as *Astragalus nitidiflorus* pro parte); Fl. Iber. 1999: 294–296; S. Talavera & F.J. Salgueiro, Lagascalia 21: 193–196 (1999); G. Bacchetta et al., Flora, Morphol. Distrib. Funct. Ecol. Pl.203: 669–682 (2008) (morpho-colorimetric

characterization by image analysis to identify seeds); Podlech & Zarre 2013: 139–140.

Notes. Hs (the species not recognized in Fl. Eur.). – For the distribution, ecology, reproduction and conservation of the species, see M.A. Carrión et al., Conserv. Veg. 11: 35–37 (2007), J.J. Martínez-Sánchez et al., Flora 206: 423–432 (2011), M.J. Vicente et al., Biochem. Syst. Ecol. 39: 175–182 (2011) (genetic diversity and implications for its conservation), and F. Segura et al., J. Arid Environ. 110: 75–78 (2014) (seed bank), Flora 216: 71–76 (2015).

Endemic to Europe (Spain: Murcia Province).

Data wanted: Hs

Astragalus peregrinus Vahl – Map 0000.

Taxonomy and nomenclature. K.A. Ahmed & A.H. Mohamed, Ann. Agric. Sci. (Cairo) 33: 745–760 (1988) (comparative anatomical studies); D. Podlech, Mitt. Bot. Staatssamml. München 29: 558–562 (1990); A. Badr et al., Cytologia 61: 105–111 (1996) (chromosomal relationships and their taxonomic inferences); A. Badr & S.M. Sharawy, Int. J. Bot. 3: 147–159 (2007) (karyotype analysis and systematic relationships); M.M. Morad & S.M. Sharawy, Feddes Repert. 120: 307–316 (2009) (relationships assessed by morpho-anatomical characters of the pod); Podlech & Zarre 2013: 142–144.

Diploid chromosome number 2n=16 reported by S. Brullo et al., Candollea 45: 65–74 (1990), for material from Libya, and A. Badr & S.M. Sharawy, Int. J. Bot. 3: 149 (2007), for material from Egypt.

Notes. Hs and Si (S) added (Hs and Si not given in Fl. Eur.): J. Peñas et al., Phyton (Horn) 48: 155–160 (2008).

A. peregrinus subsp. **peregrinus** – Map 0000.

Tragacantha peregrina (Vahl) Kuntze
Astragalus kuphoensis Gand.

Notes. Cr (subspecies not recognized in Fl. Eur.).

Total range. Outside Europe, present in Tunisia, Libya, Egypt, Israel and Jordan.

Data wanted: Cr

A. peregrinus subsp. **warionis** (Gand.) Maire – Map 0000.

Astragalus warionis Gand. (A. peregrinus subsp. warioni Eig)
A. font-queri Maire & Sennen

Notes. Hs, Si (S) (floristic novelty). – For details of the distribution and ecology, see J. Peñas et al., Phyton (Horn) 48: 155–160 (2008).

Total range. Outside Europe, present in Morocco, Algeria, Tunisia and Libya.

Data wanted: Hs, Si (S)

Astragalus suberosus Banks & Sol. subsp. **haarbachii** (Spruner ex Boiss.) V.A. Matthews – Map 0000.

Astragalus haarbachii Spruner ex Boiss. (Tragacantha haarbachii (Spruner ex Boiss.) Kuntze)
A. argolicus Hausskn. (A. pamphylicus Boiss. subsp. argolicus (Hausskn.) Hayek)
Phaca bayeri Janka

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus haarbachii*. *A. suberosus* sensu Fl. Eur. is referable to *A. verrucosus*. – D. Podlech, Mitt. Bot. Staatssamml. München 29: 562–568

(1990); F. Taeb et al., Feddes Repert. 123: 22–24 (2012); Podlech & Zarre 2013: 144–148.

Diploid with 2n=16 (Bu): D. Pavlova, Fl. Medit. 5: 318 (1995).

Notes. Cr omitted (given in Fl. Eur.). Mk added (Ju not given in Fl. Eur.): Podlech & Zarre 2013: 147–148.

Total range. Outside Europe, present in Anatolia. – The range of subsp. *suberosus* extends from Anatolia and Cyprus to Iran and Iraq.

Data wanted: Bu, Gr, Mk

Astragalus verrucosus Moris – Map 0000.

Tragacantha verrucosa (Moris) Kuntze

Taxonomy and nomenclature. In Fl. Eur. discussed under *Astragalus suberosus* sensu Fl. Eur. – D. Podlech, Mitt. Bot. Staatssamml. München 29: 569–571 (1990); G. Bacchetta et al., Flora, Morphol. Distrib. Funct. Ecol. Pl.203: 669–682 (2008) (morpho-colorimetric characterization by image analysis to identify seeds); E. Mattana et al., Anal. Jard. Bot. Madrid 65: 149–155 (2008) (morphometric and colorimetric features of seeds and fruits confirming "the validity of the species"); Podlech & Zarre 2013: 149.

Diploid with 2n=16 (Sa): S. Diana Corrias, Inform. Bot. Ital. 10: 94–101 (1978).

Notes. Sa (in Fl. Eur. mentioned in a note under *Astragalus suberosus* sensu Fl. Eur.). – For the distribution, ecology and vulnerability of the species, see G. Fenu et al., Inform. Bot. Ital. 42: 549–551 (2010), and G. Bacchetta et al., Acta Bot. Gallica 158: 79–91 (2011).

Endemic to Sardinia.

Data wanted: Sa

Astragalus sect. **Pentaglottis** Bunge

Astragalus echinatus Murray – Map 0000.

Astragalus dasyglottis Pall., nom. illeg.; A. pentaglottis L., nom. illeg. (Glottis pentaglottis (L.) Medik.; Tragacantha pentaglottis (L.) Kuntze); Glottis echinata (Murray) Medik.
A. capitatus L., nom. rej.
A. cephalotes Pall. 1800 non Banks & Sol. 1794
A. cristatus Gouan
A. stenorrhinus Pau

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; with 2n=28 in Spain); F. Taeb et al., Feddes Repert. 123: 12–13 (2012); Podlech & Zarre 2013: 150–151.

Tetraploid (x=7) with 2n=28 (Hs, Lu): A. Pretel Martínez, Taxon 23: 804 (1974); A. Fernandes & M.F. Santos, Bol. Soc. Brot. ser. 2, 49: 176 (1975); Fernandes & Quieros 1978: 141; A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978).

Total range. Outside Europe, present in N.W. Africa and Asiatic Turkey.

Data wanted: Cr, Ga, Gr, Hs, It, Lu, Si (S)

Astragalus sect. **Aulacolobus** Bunge

Astragalus guttatus Banks & Sol. – Map 0000.

Astragalus aulacolobus Boiss. (Tragacantha aulacoloba (Boiss.) Kuntze)

A. conduplicatus Bertol.
A. guttatus subsp. latileguminis Ponert
A. phaulanthus Turrill
A. pictus Boiss.
A. striatellus Pall. ex M. Bieb. (Feidanthus striatellus (Pall. ex M. Bieb.) Steven; Tragacantha striatella (Pall. ex M. Bieb.) Kuntze)

Taxonomy and nomenclature. In Fl. Eur., given as *Astragalus striatellus*. – F. Taeb et al., Feddes Repert. 123: 18–19 (2012); Podlech & Zarre 2013: 152–153.

Diploid chromosome number 2n=16 reported by N.A. Chuksanova, Bot. Zhurn. (Moscow & Leningrad) 52: 1125 (1967), for material from Turkmenistan (as *Astragalus striatellus*), and A. Sahin et al. in Ulusal Biyoloji Kongresi (18–20 Temmus 1990, Erzurum) Botanik Bildirileri 1, pp. 75–83, for material from Anatolia.

Notes. Hs added (not given in Fl. Eur.). – For details of the distribution and ecology in Hs, see J. Peñas et al., Phyton (Horn) 48: 164–165 (2008), and D. López García et al., Acta Bot. Malac. 37: 235–237 (2012).

Total range. Outside Europe, present from the Near East, S. and E. Anatolia and Caucasia to Iran and Turkmenistan.

Data wanted: Cm, Hs, Uk

Astragalus sect. **Cycloglottis** Bunge

Astragalus contortuplicatus L. – Map 0000.

Ankylobus contortuplicatus (L.) Steven; Tragacantha contortuplicata (L.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 153–155.

Notes. Cs or Sk not confirmed (?Cz given in Fl. Eur.). It omitted (given in Fl. Eur.). – According to Podlech & Zarre 2013: 153, "mostly sporadical and ephemeric". Seeds of the species can survive more than 130 years of dry storage (see A. Molnár et al., Preslia 87: 319–328 (2015)) and show strong potential for endozoochory by waterfowl (see Á. Lovas-Kiss et al., Acta Soc. Bot. Poloniae 84: 321–326 (2015) (distribution regarded as "unpredictable")). – For details concerning Hu, see V.A. Molnár & N. Pfeiffer, Kitaibelia 4: 396–398 (1999)).

Diploid with 2n=16 (Bu): D. Pavlova, Fl. Medit. 5: 317, 318 (1995).

Total range. Outside Europe, present in Egypt and from Caucasia to Pakistan, China, Mongolia and S.W. Siberia: Á. Lovas-Kiss et al., Acta Soc. Bot. Poloniae 84: 322(map) (2015).

Data wanted: Bu, Cm, Hu, Kaz, Rm, Rus (E), Se, Uk

Astragalus sect. **Epiglottis** Bunge

Astragalus epiglottis L. – Map 0000.

Astragalus epiglossus St-Lag., nom. illeg.; Biserrula epiglottis (L.) P. Coulot, P. Rabaute & J.-M. Tison; Glottis epiglottis (L.) Medik.; Tragacantha epiglottis (L.) Kuntze
Astragalus asperulus Dufour (A. epiglottis subsp. asperulus (Dufour) Nyman; Tragacantha asperula (Dufour) Kuntze)
A. ephippium Pomel
A. epiglottoides Willk.

Phylogenetics. F. Abdel Samad et al., Pl. Syst. Evol. 300: 819–830 (2014) (genome size and phylogeny; an exceptionally small genome size in the genus detected; "… could be removed from *Astragalus* genus and affected to another old or new one after deeper investigations").

Taxonomy and nomenclature. In Fl. Eur., divided into subsp. *epiglottis* ("Throughout the range of the species") and subsp. *asperulus* ("S. Spain"), but subspecies are not recognized in Podlech & Zarre 2013: 161–164. – A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; as *Astragalus epiglottis* subsp. *asperulus*); Fl. Iber. 1999: 292; F. Taeb et al., Feddes Repert. 123: 3–4 (2012); Fl. Gallica 2014: 716 (as *Biserrula epiglottis*).

Diploid with 2n=16 (Bl, Hs, Lu, Si (S)): R. Dahlgren et al., Bot. Not. 124: 254, 256 (1971) (as *Astragalus epiglottis* subsp. *epiglottis*); A. Pretel Martínez, Taxon 23: 804 (1974) (as *A. epiglottis* subsp. *asperulus*); A. Fernandes & M.F. Santos, Bol. Soc. Brot., ser. 2, 49: 176 (1975); Fernandes & Quieros 1978: 141 (as *A. epiglottis* subsp. *epiglottis*); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978) (as *A. epiglottis* subsp. *asperulus*); S. Brullo et al., Inform. Bot. Ital. 26: 200–213 (1995) (as *A- epiglottis* subsp. *epiglottis*). The same number reported by R. Vogt & C. Oberprieler, Taxon 58: 1283 (2009), for material from Morocco.

Notes. Native and extant in Ga ([†Ga] given in Fl. Eur.). – For reproduvtive biology of the species, see R. Gallardo et al., Amer. J. Bot. 81: 1611–1619 (1994).

Total range. Outside Europe, present in N. Africa, Cyprus, the Near East, East Aegean Islands and W. and S. Anatolia.

Data wanted: Bl, Cr, Gr, Hs, It, Lu, Sa, Si (S)

Astragalus sect. **Biserrula** (L.) Barneby

Biserrula L.; Pelecinus Medik.

Astragalus pelecinus (L.) Barneby – Map 0000.

Biserrula pelecinus L.; Pelecinus vulgaris Medik.
B. leiocarpa A. Rich. (Astragalus pelecinus subsp. leiocarpus (A. Rich.) Podlech; B. pelecinus subsp. leiocarpus (A. Rich.) Chiov.)
B. pelecinus subsp. dalmatica Trinajstic

Taxonomy and nomenclature. In Fl. Eur., given as *Biserrula pelecinus*. – A. Loi et al., Plant Breeding 116: 171–176 (1997) (morphological characterization of Mediterranean population in cultivation; as *B. pelecinus*); Fl. Iber. 1999: 285–287; F. Dane, Bot. Chron. (Patras) 16: 47–52 (2003) (karyological and palynological suvey; as *B. pelecinus*); Podlech & Zarre 2013: 164–167.

Diploid with 2n=16 (Bu, Co, Gr, Hs, Lu, Sa, Tu): A. Fernandes & M.F. Santos, Bol. Soc. Brot. ser. 2 45: 177 (1971); Fernandes & Quieros 1978: 141; A. Loi et al., Plant Breeding 116: 171–176 (1997); D. Pavlova & A. Tosheva, Fl. Medit. 11: 455–456, 458 (2001); F. Dane et al., Bot. Chron. (Patras) 16: 49, 50 (2003) (in all five as *Biserrula pelecinus*); Fl. Medit. 16: 409 (2006). The same number reported by E. Kreuter, Planta 11: 27 (1930), for cultivated material, C.J. Humphries et al., Bot. Not. 131: 404 (1978), for material from Morocco, A. Loi et al., Plant Breeding 116: 171–176 (1997), for material from Morocco (in all three as *B. pelecinus*), and H. Runemark, Fl. Medit. 16: 409 (2006), for material from Ikaria, E. Aegean Islands.

Notes. Bl, Mk and Tu added (Bl, Ju and Tu not given in Fl. Eur.): F. Dane et al., Bot. Chron. 16: 47–52 (2003) (as *Biserrula pelecinus*).

Total range. Outside Europe, present in the Canary Islands, Madeira, N. Africa, Eritrea, Ethiopia, Cyprus, the Near East and Asiatic Turkey, and, as subsp. *leiocarpa*, in E. Africa from Sudan southwards.

Data wanted: Al, Bl, Bu, Co, Cr, Ga, Gr, Hs, It, Lu, Mk, Sa, Si (M, S), Tu

Also in other parts of former Ju than in Makedonia?

Astragalus sect. **Cenantrum** Bunge

Neodielsia Harms
Phaca L.
Sect. Albiflorus Y.C. Ho
Sect. Alexandri N. Ulziykh.
Sect. Cenantroides N.D. Simpson
Sect. Monadelphia K.T. Fu
Sect. Monotheca N. Ulziykh.
Sect. Phaca (L.) Halácsy
Sect. Polyphyllae N.D. Simpson
Sect. Stenophysa Vved. & Zakirov

Astragalus frigidus (L.) A. Gray – Map 0000.

Phaca frigida L. (Astragaloides frigida (L.) Medik.; Colutea frigida (L.) Poir.; Tragacantha frigida (L.) Kuntze)
Astragalus exaltatus (Ledeb.) Bunge
A. frigidus subsp. minutulus Kuvajev
A. grigorjewii B. Fedtsch. (A. frigidus subsp. grigorjewii (B. Fedtsch.) Chater)
A. kolaënsis Kuzen.
A. pubescens Schrank
A. secundus DC. (A. frigidus subsp. secundus (DC.) Worosch.; Tragacantha secunda (DC.) Kuntze)
Phaca ochreata Crantz
P. parviflora Turcz. 1840 non Nutt. ex Torr. & A. Gray 1838 (A. frigidus subsp. minutulus Kuvaev; A. frigidus subsp. parviflorus (Turcz.) Hultén)

Taxonomy and nomenclature. In Fl. Eur., divided into subsp. *frigidus* ("Throughout the range of the species") and subsp. *grigorjewii* ("N. Russia (Poluostrov Kanin"), but no subspecies are recognized in Podlech & Zarre 2013: 183–185. – N. Hylander, Uppsala Univ. Årsskr. 1945(7): 228–229 (1945); O.I. Kuzeneva in Pojark., Fl. Murmansk. 4: 133–136 (1959) (as *Astragalus frigidus* and *A. kolaënsis*); Hultén CP 1970: 70, 328 (with subsp. *frigidus*, subsp. *parviflorus* and subsp. *americanus*); Fl. Arct. URSS 1986: 28–33 (with two subspecies in N. Russia; *A. grigorjewii* included in subsp. *frigidus*); O. Sidneva, Turczaninowia 8: 73–82 (2005) (aglycon and glycoside composition; "typical flavonoid profile" revealed) (as *A. frigidus* s. str. and *A. frigidus* subsp. *secundus*); O.S. Dymshakova et al., Russ. J. Genet. 51: 757–764 (2015) (genetic differentiation).

Diploid with 2n=16 (Fe, No, Sk): T. Engelskjøn, Opera Bot. 52: 26 (1979); A. Murín & J. Májovský, Acta Fac. Rerum Nat. Univ. Comen., Bot. 30: 2 (1983); Uotila & Pellinen 1985: 17. The same number reported by, e.g., A.P. Sokolovskaya, Bot. Zhurn. (Moscow & Leningrad) 53: 99–105 (1968) (for material from Russian Far East), J. Měsíček & J. Soják, Folia Geobot. Phytotax. 4: 56 (1969) (for material from Mongolia), P.G. Zhukova et al., Bot. Zhurn. (Moscow & Leningrad) 58: 1335 (1976), for material from Russian Far East, P.G. Zhukova & V.V. Petrovsky, Bot. Zhurn. (Moscow & Leningrad) 61: 967 (1976), for material from Russian Far East, N.N. Gurzenkov & N.S. Pavlova, Bot. Zhurn. (Moscow & Leningrad) 69: 1569 (1983) (for material from Russian Far East), S.A. Krasnikova et al., Bot. Zhurn. (Moscow & Leningrad) 68: 829 (1983) (for material from S. Siberia), P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 68: 927 (1983) (for material from many localities in N.E. Asia; as *Astragalus frigidus* subsp. *parviflorus*), A.P. Sokolovskaya et al., Bot. Zhurn. (Moscow & Leningrad) 74: 268 (1989) (for material from Russian Far East), and D.A. Krivenko et al., Taxon 65: 1072 (2015) (for material from S. Siberia). – Tetraploid number 2n=32 reported by A.P. Sokolovskaya et al., Bot. Zhurn. (Moscow & Leningrad) 74: 268 (1989), for material from Russian Far East.

Notes. Fa omitted (given in Fl. Eur.).

Total range. Europe, Siberia, Mongolia and Far East, when *Astragalus americanus* (Hook.) M.E. Jones is excluded. – MJW 1965: map 242b; Hultén Alaska 1968: 647; Hultén CP 1970: map 61; Hultén & Fries 1986: map 1187.

Data wanted: Au, Fe, Ga, Ge, He, It, No, Po, Rm, Rus (N), Sk, Su

Astragalus penduliflorus Lam. – Map 0000.

Phaca alpina L. (Astragalina alpina (L.) Bubani; Astragaloides alpina (L.) Medik.; Colutea alpina (L.) Lam.); P. penduliflora (L.) Becherer, nom. illeg.; Tragacantha penduliflora (L.) Kuntze

Taxonomy and nomenclature. X.Y. Zhu, Nordic J. Bot. 23: 283–294 (2005) (revision of "the *Astragalus penduliflorus* complex"; the widespread Asian *A. mongholicus* Bunge included in *A. penduliflorus* as a subspecies); Podlech & Zarre 2013: 193–195, 197–199 (*A. mongholicus* and *A. penduliflorus* as distinct species).

Diploid with 2n=16 (Po, Sk): E. Pogan et al., Acta Biol. Cracov. Ser. Bot. 24: 159–189 (1982); J. Kochjarová, Acta Fac. Rerum Nat. Univ. Comen., Bot. 38: 90 (1991); J. Májovský et al., Oecol. Mont. 5: 90–91 (1996).

Notes. For details concerning Rm, see A. Bartók & I. Irimia, Anelele Stiint. Univ. Al. I. Cuza Iaşi, Biol. Veg. 61: 57–65 (2015).

Endemic to Europe (not indicated as such in Fl. Eur., probably due to the inclusion of *Astragalus mongholicus*).

Data wanted: Au, Ga, Ge, He, Hs, It, Po, Rm, Sk, Sl, Su

Astragalus umbellatus Bunge – Map 0000.

Phaca umbellata (Bunge) Nyman
Astragalus littoralis (Hook.) Mertie; Phaca littoralis (Hook.) Rydb.

Taxonomy and nomenclature. Fl. Arct. URSS 1986: 33–35; O. Sidneva, Turczaninowia 8: 73–82 (2005) (aglycon and glycoside composition; "typical flavonoid profile" revealed); Podlech & Zarre 2013: 210–211.

Diploid chromosome number 2n=16 reported by K. Holmen, Bot. Not. 115: 88, 89 (1962), and A.W. Johnson & J.G. Packer, Bot. Not. 121: 429 (1968), for material from Alaska, as well as by G.A. Mulligan & A,E. Porsild, Canad. J. Bot. 47: 659 (1969), for material from N.W. Canada, and P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 68: 927 (1983), for material from N.E. Asia.

Total range. From arctic Russia to Alaska and adjacent Canada, mountains of S. Siberia: Hultén Alaska 1968: 647; Hultén & Fries 1986: map 1189.

Data wanted: Rus (N)

Astragalus sect. **Galegiformes** DC.

Sect. Chlorostachys Bunge
Sect. Diplotheca Bunge
Sect. Phlebophace Bunge
Sect. Sesbanella Bunge
Sect. Nigricantes N.D. Simpson

Astragalus galegiformis L. – Map 0000.

Glycyphylla galegiformis (L.) Steven; Onix galegiformis (L.) Medik.; Tragacantha galegiformis (L.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 225–226.

Diploid chromosome number 2n=16 reported by E. Kreuter, Planta 11: 26 (1930), for cultivated material, and A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 65: 837 (1980), for material from Caucasia.

Total range. Outside Europe, present in Caucasia and N.E. Anatolia.

Data wanted: Rm, Uk

Is the species truly native in Europe?

Astragalus sect. **Glycyphyllus** Bunge

Hedyphylla Steven (Sect. Hedyphylla (Steven) Bunge, nom. illeg.)

Astragalus glycyphylloides DC. – Map 0000.

Astragalus glycyphyllos L. subsp. glycyphylloides (DC.) Maire & Petitm.; Hedyphylla recta Steven, nom. illeg.; Tragacantha glycyphylloides (DC.) Kuntze
A. glycyphylloides var. serbicus Pančić ex Beck (A. glycyphylloides subsp. serbicus (Pančić ex Beck) Vasić & Niketić; A. serbicus (Pančić ex Beck) Pančić ex Beck)
A. petrovicii Velen.

Taxonomy and nomenclature. In Fl. Eur., *Astragalus serbicus* is discussed as an unclear taxon in a note under *A. glycyphylloides*. – Fl. Turkey 1970: 96–97 (as *A. glycyphyllos* subsp. *glycyphylloides*, with intermediates to subsp. *glycyphyllos* [= *A. glycyphyllos*]); Eur. Garden Fl. 1995: 508 (as *A. glycyphyllos* var. *glycyphylloides*); Podlech & Zarre 2013: 258–259; M. Niketić, Bot. Serbica 38: 211, 227 (2014) (as *A. glycyphylloides* subsp. *serbicus* needing additional studies "to determine the actual subspecific status").

Diploid with 2n=16 (Bu): D.K. Pavlova & S.I. Kozhuharov, Fitologija 44: 75 (1993). The same number reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 65: 837 (1980), for material from Caucasia.

Notes. Tu and Uk added (Tu and Rs (W) not given in Fl. Eur.): Fl. Turkey 1970: 96 (as *Astragalus glycyphyllos* subsp. *glycyphylloides*).

Total range. Outside Europe, present in Anatolia, Caucasia and Iran: MJW 1965: map 242d, Hultén & Fries 1986: map 1192.

Data wanted: Al, BH, Bu, Cm, Gr, Ko, Mk, Se, Tu, Uk

Astragalus glycyphyllos L. – Map 0000.

Hamosa glycyphyllos (L.) Medik.; Hedyphylla glycyphylla (L.) Rydb.; H. vulgaris Steven, nom. illeg.; Tragacantha glycyphylla (L.) Kuntze
Astragalus rotundifolius J. Presl & C. Presl 1819 non Willd. 1802
Phaca baetica L.

Taxonomy and nomenclature. M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 273–274 (1957) (with two varieties); Fl. Turkey 1970: 96–97 (as *Astragalus glycyphyllos* subsp. *glycyphyllos*, with intermediates to subsp. *glycyphylloides* [= *A. glycyphyllooides*]); F. Dvořák & B. Dadácová, Biologia (Bratislava) 35: 69–73 (1989) (karyotype); F. Dane et al., Phytol. Balcan. 13: 387–391 (2007) (karyology and palynology); E.S. Nemirova & N.V. Martynov, Bull. Moscow Reg. State Univ, Nat. Sci. 2009(1): 75–80 (2009) (morphology and anatomy of seeds), 2009(4): 149–154 (2009) (pollen morphology); Podlech & Zarre 2013: 260–263.

Diploid with 2n=16 (Au, Bu, By, Cs, *Fe, It, Lu, Po, Sk, Su, Tu): K. Larsen, Bot. Not. 108: 266 (1955); J. Májovsky et al., Acta Fac. Rerum Nat. Univ. Comen., Bot. 16: 2 (1970); K. Bijok et al., Acta Soc. Bot. Pol. 41: 463–464 (1972); S.I. Kozuharov et al., Taxon 21: 336 (1972); A. Fernandes et al., Bol. Soc. Brot., ser. 2, 51: 137–186 (1977); G.-H. Leute, Taxon 26: 451 (1977); F. Dvořák & B. Dadáková, Biologia (Bratislava) 35: 69–73 (1980); E. Pogan et al., Acta Biol. Cracov. Ser. Bot. 22: 37–69 (1980); Á. Löve & D. Löve, Taxon 31: 584 (1982); Uotila & Pellinen 1985: 17; L.V. Semerenko, Bot. Zhurn. (Moscow & Leningrad) 74: 1671 (1989); G. D'Amato & A. Pavesi, Inform. Bot. Ital. 22: 244–246 (1991); D.K. Pavlova & S.I. Kozhuharov, Fitologija 44: 75 (1993); C. Dobeš & B. Hahn, Newslett. Int. Organ. Pl. Biosyst. (Oslo) 26/27: 15–18 (1997); B. Lövkvist &

U.-M. Hultgård, Opera Bot. 137: 19 (1999); F. Dane et al., Phytol. Balcan. 13: 387–391 (2007); E.M. Temsch et al., J. Bot., Volume 2010, Article ID 596542, doi:10.1155/2010/596542. The same diploid number reported by, e.g., E. Kliphuis, Taxon 28: 399 (1979), for material from Azerbaijan, I.M. Krasnoborov et al., Bot. Zhurn. (Moscow & Leningrad) 65: 663 (1980), for material from S. Siberia, A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 65: 837 (1980), for material from Caucasia, and E. Nazarova, Fl. Medit. 7: 214 (1997), for material from Azerbaijan.

Notes. Hb omitted (given in Fl. Eur.). – For details concerning Cs, see Z. Kaplan et al., Preslia 88: 240–243 (2016).

Total range. Outside Europe, present in Anatolia, Caucasia, N. Iran and S.W. Siberia. – MJW 1965: map 242d; Hultén & Fries 1986: map 1192.

Data wanted: Al, Au, Be (B, L), BH, Br, Bu, By, Cg, Cm, Co, Cs, Ct, Da, Es, *Fe, Ga, Ge, Gr, He, Ho, Hs, Hu, It, Ko, La, Lt. Lu, Mk, No, Po, Rm, Rus (C, E, Ka), Se, Sk, Sl, Su, Tu, Uk

Astragalus sect. **Drepanodes** Bunge

Astragalus maritimus Moris – Map 0000.

Taxonomy and nomenclature. In Fl. Eur. discussed under *Astragalus suberosus* sensu Fl. Eur. – G. De Marco et al., Ann. Bot. (Rome) 35–36: 353–364 (1977); G. Bacchetta et al., Flora, Morphol. Distrib. Funct. Ecol. Pl.203: 669–682 (2008) (morpho-colorimetric characterization by image analysis to identify seeds); E. Mattana et al., Anal. Jard. Bot. Madrid 65: 149–155 (2008) (morphometric and colorimetric features of seeds and fruits confirming "the validity of the species"); Podlech & Zarre 2013: 305–306.

Diploid with 2n=16 (Sa): S. Diana Corrias, Inform. Bot. Ital. 10: 94–101 (1978); G. Bacchetta et al., Anales Jardin Botanico de Madrid 58: 342 (2001).

Notes. Sa (in Fl. Eur. mentioned in a note under *Astragalus suberosus* sensu Fl. Eur.). – For the distribution, ecology and vulnerability of the species, see G. De Marco et al., Ann. Bot. (Roma) 35–36: 353–364 (1977), G. Fenu et al., Inform. Bot. Ital. 42: 545–548 (2010), and G. Bacchetta et al., Acta Bot. Gallica 158: 79–91 (2011).

Endemic to Sardinia (Isola di San Pietro).

Data wanted: Sa

Astragalus sect. **Astragalus**

Sect. Christiani DC.
Sect. Christiania Bunge
Sect. Acanthochristianopsis Rech. f.
Sect. Cartilaginella Gontsch.
Sect. Centrolobium Pomel
Sect. Macrocarpon Gontsch.
Sect. Phacodes Bunge

Phylogenetics. F. Javanmardi et al., Biochem. Syst. Ecol. 45: 171–178 (2012) (molecular phylogeny; monophyly of sect. *Astragalus* not supported).

Taxonomy and nomenclature. C. Agerer-Kirchhoff, Boissiera 25: 1–197 (1976) (revision of the section).

Total range. Predominantly a South-West Asian section: C. Agerer-Kirchhoff, Boissiera 25: 21(map) (1976).

Astragalus drupaceus Orphan. ex Boiss. – Map 0000.
Tragacantha drupacea (Orphan. ex Boiss.) Kuntze

Taxonomy and nomenclature. C. Agerer-Kirchhoff, Boissiera 25: 94–96 (1976); Podlech & Zarre 2013: 331–332.

Endemic to Europe (Greece: Peloponnisos).

Data wanted: Gr

Astragalus graecus Boiss. & Spruner – Map 0000.
Tragacantha graeca (Boiss. & Spruner) Kuntze
Astragalus cyrenaicus Coss.

Taxonomy and nomenclature. C. Agerer-Kirchhoff, Boissiera 25: 104–106 (1976); Podlech & Zarre 2013: 338–339.

Diploid chromosome number 2n=16 reported by S. Brullo et al., Candollea 45: 65–74 (1990), for material from Libya (as *Astragalus cyrenaicus*).

Total range. Outside Europe, present in Libya: C. Agerer-Kirchhoff, Boissiera 25: 183(map) (1976).

Data wanted: Gr

Astragalus sect. **Alopecuroidei** DC.
Alopecias Steven (Sect. Alopecias (Steven) Bunge)
Christianophysa Podlech & Kirchhoff
Laxiflori Kirchhoff

Phylogenetics. M. Riahi et al., Pl. Syst. Evol. 293: 119–133 (2011) (phylogeny for section *Caprini* and its allies based on nuclear and plastid DNA sequences; sects. *Alopecuroidei* and *Laxiflori* as nested within sect. *Astragalus*); F. Javanmardi et al., Biochem. Syst. Ecol. 45: 171–178 (2012) (molecular phylogeny; sect. *Alopecuroidei* as a well-supported monophyletic group when sect. *Laxiflori* and sect. *Christianophysa* are included).

Taxonomy and nomenclature. C. Agerer-Kirchhoff & R. Agerer, Mitt. Bot. Staatssamml. München 13: 203–234 (1977) (sect. *Laxiflori*); R. Becht, Phanerog. Monog. 10: 1–227 (1978); M. Ranjbar et al., Willdenowia 32: 85–91 (2002); H. Akan et al., Int. J. Bot. 1: 50–58 (2005) (pollen morphology); H. Akan & Z. Aytaç, Turkish J. Bot. 38: 37–59 (2014).

Astragalus alopecuroides L. – Map 0000.

Incl. Astragalus grosii Pau

Taxonomy and nomenclature. In Fl. Eur. treated as *Astragalus alopecuroides* and *A. grosii* ("grossii"), the latter with a note "The status of this plant is uncertain; it may be only a variant of 70 [= *A. alopecuroides*]". – A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; as *A. alopecuroides* and *A. grosii* ("grossii")); Fl. Iber. 1999: 302–304; Podlech & Zarre 2013: 374–376 (in the two last with subsp. *alopecuroides* and subsp. *grosii*).

Diploid chromosome number 2n=16 reported by E. Kreuter, Planta 11: 26 (1930), for cultivated material.

A. alopecuroides subsp. **alopecuroides** – Map 0000.
Alopecias alopecuroides (L.) Steven; Astragaloides alopecuros Moench, nom. illeg.; Tragacantha alopecuroides (L.) Kuntze
Astragalus africanus Bunge (A. narbonensis subsp. africanus (Bunge) Ball)

A. marianorum Sennen
A. narbonensis Gouan (Alopecias narbonense (Gouan) Steven; Astragalus alopecuroides subsp. narbonensis (Gouan) Bonnier & Layens; Tragacantha narbonensis (Gouan) Kuntze)
A. narbonensis subsp. atlanticus Ball (A. atlanticus (Ball) Ball; Tragacantha atlantica (Ball) Kuntze

Diploid with 2n=16 (Hs): A. Pretel Martínez, Taxon 23: 804 (1974); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978); J.A. Elena Rosselló et al., Stud. Bot. Univ. Salamanca 4: 109–115 (1987) (in all three as *Astragalus alopecuroides*).

Total range. Outside Europe, present in Algeria and Morocco (in Fl. Eur. indicated as endemic to Europe (as *Astragalus alopecuroides*)).

Data wanted: Ga, Hs

A. alopecuroides subsp. **grosii** (Pau) Rivas Goday & Rivas Mart. – Map 0000.
Astragalus grosii Pau

Diploid with 2n=16 (Hs): A. Pretel Martínez, Taxon 23: 804 (1974); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978) (in both as *Astragalus grosii* ("grossii")).

Endemic to Europe.

Data wanted: Hs

Astragalus alopecurus Pall. – Map 0000.

Tragacantha alopecurus (Pall.) Kuntze
Astragalus dasysemius (Chamb. & Matthews) Ponert
A. dzhawakheticus Bordz.
A. maximus Willd. (Tragacantha maxima (Willd.) Kuntze)

Incl. Astragalus centralpinus Braun-Blanq.

Phylogenetics. A. Adiguzel et al., Biochem. Syst. Ecol. 34: 424–432 (2006) (fatty acid and RAPD profiles in revealing genetic relationships; as *Astragalus maximus* var. *maximus*).

Taxonomy and nomenclature. In Fl. Eur. treated as *Astragalus alopecurus* and *A. centralpinus*. – Eur. Garden Fl. 1995: 508 (as *A. centralpinus* ("centralalpinus")); Podlech & Zarre 2013: 376–378 (*A. centralpinus* as a synonym for *A. alopecurus*); H. Akan & Z. Aytaç, Turkish J. Bot. 38: 43–45 (2014) (*A. dasysemius* as a synonym for *A. alopecurus*).

Diploid with 2n=16 (Bu, Ga): S.I. Kožuharov et al., Taxon 22: 287 (1973) (as *Astragalus alopecuroides*); D. Cartier, Taxon 25: 493 (1976) (as *A. centralpinus*); D. Pavlova, Fl. Medit. 5: 317, 318 (1995).

Notes. Ga, It, Bu and Rus (E) added (Ga, It, Bu, Rs (E) not given in Fl. Eur.), the three first due to the inclusion of *Astragalus centralpinus*. – For the pollination ecology of the sole population in Bu, see E. Kozuharova & D.H. Firmage, Compt. Rend. Acad. Bulg. Sci. 60: 863–870 (2007).

Total range. Outside Europe, present in E. Anatolia, Caucasia, Asiatic Kazakhstan and N.W. China.

Data wanted: Bu, Ga, It, Rus (C, E)

RR Corse given in Fl. Gallica 2014: 713. Data available?

Astragalus macrocephalus Willd. subsp. **finitimus** (Bunge) D.F. Chamb. – Map 0000.

Astragalus finitimus Bunge (Tragacantha finitima (Bunge) Kuntze)
A. ajubensis Bunge (Tragacantha ajubensis (Bunge) Kuntze)
A. arbelicus Bornm.
A. ashuricus Parsa
A. durhamii Turrill
A. grandiflorus Freyn 1892 non L. 1753 nec Bunge 1880 (A. schuschnasensis Freyn. & Bornm.)
A. johannis Rzazade 1953 non Boiss. 1846
A. oloricus Manden.
A. sphaerocephalus Steven
A. vaccarii Pamp.

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus ajubensis*. – W.B. Turill, Bull. Misc. Inform. Kew 1922(9): 294–295 (1922) (as *A. durhamii*; "The affinity of our plant with the *A. ajubensis* of Bunge is undoubtedly very close. Indeed, a large series of specimens might make it advisable to consider them conspecific."); Fl. Turkey 1970: 190 (as *A. ajubensis*); M. Ranjbar et al., Willdenowia 32: 88–89 (2002); Podlech & Zarre 2013: 395–398; H. Akan & Z. Aytaç, Turkish J. Bot. 38: 53–55 (2014).

Total range. Outside Europe, present from Anatolia to Caucasia and Iran.

Data wanted: Tu

Astragalus ponticus Pall. – Map 0000.

Alopecias ponticus (Pall.) Steven; Tragacantha pontica (Pall.) Kuntze
Astragalus chartaceus Ledeb. (Tragacantha chartacea (Ledeb.) Kuntze)
A. chlorotaenius Freyn & Bornm.
A. idae Grossh. 1947 non Širj. 1939

Taxonomy and nomenclature. Podlech & Zarre 2013: 404–405; H. Akan & Z. Aytaç, Turkish J. Bot. 38: 41–43 (2014).

Diploid with 2n=16 (Bu): D. Pavlova, Fl. Medit. 5: 317, 318 (1995). The same number reported by O. Sz.-Borsos, Acta. Bot. Acad. Sci. Hung. 16: 261 (1970), for material from Nikita Botanical Garden, Crimea.

Notes. Gr and Mk added (Gr and Ju not given in Fl. Eur.): K. Micevski, Godišen Zborn. Prir.-Mat. Fak. Univ. Skopje, Biol., 24: 67–72 (1972); K. Tan & G. Vold, Willdenowia 30: 237 (2000). – For details of the European distribution, see V.V. Kucherevsky et al., Živye biokosnye sist. 2014(4) (2014).

Total range. Outside Europe, present in Caucasia, Anatolia and N.W. Iran.

Data wanted: Bu, Cm, Gr, Mk, Mo, Rm, Rus (E), Uk

Astragalus vulpinus Willd. – Map 0000.

Astragalus lagocephalus Fisch. & C.A. Mey. (Tragacantha lagocephala (Fisch. & C.A. Mey.) Kuntze)

Taxonomy and nomenclature. Podlech & Zarre 2013: 410–411.

Diploid chromosome number 2n=16 reported by E. Kreuter, Planta 11: 26 (1930), for cultivated material.

Total range. Outside Europe, present in Asiatic Kazakhstan, S. Siberia and N.W. China.

Data wanted: Kaz, Rus (E)

Astragalus sect. **Aberrantes** Podlech

Taxonomy. D. Podlech, Sendtnera 6: 136 (1999).

Astragalus clausii C.A. Mey. – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 413.

Notes. Kaz (the species not recognized in Fl. Eur.).

Endemic to Europe (Kazakhstan: W. edge of Atyray Province).

Data wanted: Kaz (In deserti caspii collibus gypsaceis Arsagar dictis)

Astragalus sect. **Eremophysa** Bunge

Taxonomy and nomenclature. D. Podlech, Sendtnera 1: 45–64 (1993).

Astragalus lehmannianus Bunge – Map 0000.

Phylogenetics. T.T.X. Dong et al., J. Agric. Food Chem. 51: 6709–6714 (2003).

Taxonomy and nomenclature. B. Li et al., Acta Bot. Boreal.-Occid. Sin. 22: 467–475 (2002) (karyological analysis); Podlech & Zarre 2013: 436–437.

Diploid chromosome number 2n=16 reported by B. Li et al., Acta Bot. Boreal.-Occid. Sin. 22: 467–475 (2002), for material from China.

Notes. Kaz, Rus (E) (floristic novelty).

Total range. Outside Europe, present from Caucasia and Asiatic Kazakhstan to N.W. China.

Data wanted: Kaz, Rus (E)

Astragalus sect. **Caprini** DC. – Map 0000.

Myobroma Steven (Sect. Myobroma (Steven) Bunge)
Sect. Campanella Gontsch.
Sect. Chamaelobium Pomel
Sect. Rhodophaca Boiss.
Sect. Xenophaca Rech. f.

Phylogenetics. M. Riahi et al., Pl. Syst. Evol. 293: 119–133 (2011) (phylogeny for section *Caprini* and its allies based on nuclear and plastid DNA sequences).

Taxonomy and nomenclature. D. Podlech, Mitt. Bot. Staatss. München. 25: 1–924 (1988).

Astragalus angustiflorus K. Koch subsp. **anatolicus** (Boiss.) D.F. Chamb. – Map 0000.

Astragalus anatolicus Boiss. (Tragacantha anatolica (Boiss.) Kuntze)
A. maroniensis Dingler

Taxonomy and nomenclature. In Fl. Eur., the taxon is given as *Astragalus anatolicus* and *A. maroniensis* is discussed under *A. exscapus* as its possible variant. – Fl. Turkey 1970: 109–110 (*A. angustiflorus* with three subspecies forming "an interrupted East-West cline in hairiness and standard shape"); R.S. Göktürk et al., Israel J. Pl. Sci. 51: 67–70 (2003); Podlech & Zarre 2013: 509–511.

Chromosome number not known, but 2n=16 (diploid) reported for *Astragalus angustiflorus* subsp, *angustiflorus* by A.A. Maassoumi, Iran. J. Bot. 4: 153–163 (1989), for material from Iran.

Notes. Gr added (not given in Fl. Eur.), due to the inclusion of *Astragalus maroniensis*.

Total range. Main range in the East Aegean Islands and W. and S. Anatolia. – MJW 1965: map 242a (as *Astragalus anatolicus*).

Data wanted: Gr, Tu

Astragalus caprinus L. subsp. **huetii** (Bunge) Podlech – Map 0000.

Astragalus huetii Bunge (Tragacantha huetii (Bunge) Kuntze)

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus huetii*. – Podlech & Zarre 2013: 527–531.

Diploid with 2n=16 (Si (S)): S. Brullo et al., Inform. Bot. Ital. 11: 161–171 (1979) (as *Astragalus huetii*).

Endemic to Sicily.

Data wanted: Si (S)

Astragalus cavanillesii Podlech 1988 – Map 0000.

Astragalus exscapus auct.

Taxonomy and nomenclature. Fl. Iber. 1999: 305, 306; Podlech & Zarre 2013: 532.

Notes. Hs (taxonomic novelty).

Endemic to Europe (Spain: Albacete and Granada Provinces).

Data wanted: Hs

Astragalus dasyanthus Pall. – Map 0000.

Tragacantha dasyantha (Pall.) Kuntze
Astragalus eriocephalus Waldst. & Kit. (Astracantha eriocephala (Waldst. & Kit.) Podlech; Astragalus pannonicus Schult., nom. illeg.)

Taxonomy and nomenclature. M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 274–276 (1957); J. Szujkó-Lacza, Ann. Hist.-Nat. Mus. Natl. Hung. 73: 83–100 (1981); Podlech & Zarre 2013: 536–538.

Notes. Cm added (Rs (K) not given in Fl. Eur.). Sk confirmed but as extinct (?Cz given in Fl. Eur.). – For details of the distribution and ecology, see M.V. Myrza, Ukrayins'k. Bot. Zhurn. 28: 718–720 (1971); J. Szujkó-Lacza, Ann. Hist.-Nat. Mus. Natl. Hung. 73: 83–100 (1981), Stud. Bot. Hung. 15: 57–64 (1981), A.S. Bădărău et al., Stud. Univ. Babeş-Bolyai, Geogr. 45: 119–122 (2000), E. Ermolaev, International Master Programme at the Swedish Biodiversity Centre, Master Theses No. 33 (Uppsala 2007), E. Kozuharova & D.H. Firmage, Compt. Rend. Acad. Bulg. Sci., Sci. Math. Nat. 62: 1079–1088 (2009), and Z. Bátori et al., Tiscia 38: 19–27 (2011). – For reproduvtive biology of the species, see E. Kozuharova & D.H. Firmage, Compt. Rend. Acad. Bulg. Sci., Sci. Math. Nat. 62: 1079–1088 (2009), and E. Kozuharova & A.J. Richards, op. cit. 69: 1571–1580 (2016).

Total range. In Fl. Eur. indicated as endemic to Europe, but also present in Caucasia.

Data wanted: Bu, Cm, Hu, Ko, Mo, Rm, Se, Rus (C, E), †Sk, Uk

Astragalus exscapus L. – Map 0000.

Incl. Astragalus hellenicus Boiss. and A. pubiflorus DC.

Taxonomy and nomenclature. In Fl. Eur. treated as *Astragalus pubiflorus* [= *A. exscapus* subsp. *pubiflorus*], *A. exscapus* [= *A. exscapus* subsp. *exscapus* pro parte] and *A. hellenicus* [= *A. exscapus* subsp. *exscapus* pro parte]. – M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 277–281 (1957) (as *A. pubiflorus* and *A. exscapus*, the latter with var. *transsilvanicus*); F. Dvořák et al., Folia Geobot. Phytotax. 12: 347–350 (1977) (karyotype); J. Szujkó-Lacza, Ann. Hist.-Nat. Mus. Natl. Hung. 73: 83–100 (1981); J.V. Fernández Palacio, Collect. Bot. (Barcelona) 26: 119–124 (2003); Podlech & Zarre 2013: 545–548.

Notes. Hs added (given in Fl. Eur. for *Astragalus exscapus* [s. str.], but the records are now referred to *A. cavanillesii*; *A. exscapus* was first recorded from the territory by J.V. Ferrández Palacio, Collect. Bot. (Barcelona) 26: 119–124 (2003)). Rus (C) and Se added (Ju and Rs (C) not given in Fl. Eur. for *A. exscapus* [s. str.], *A. pubiflorus* or *A. hellenicus*). – For details concerning the Carpathian Basin and Carpathians, and Ge, Sk, Hu and Cs, see J. Szujkó-Lacza, Ann. Hist.-Nat. Mus. Natl. Hung. 73: 83–100 (1981), Stud. Bot. Hung. 15: 57–64 (1981), and T. Becker, Diss. Bot. 380: 1–210 (2003), Folia Geobot. 45: 303–321 (2010), T. Becker & N. Voss, Feddes Repert. 114: 142–165 (2003), J. Drobná, Czech J. Genet. Plant Breed. 46(Special Issue): S14–S18 (2010), J.K. Sallainé, Crisicum 6: 117–121 (2010), and P. Dřevojan, Zprávy Českoslov. Bot. Společn. Českoslov. Akad. Věd. 47: 291–296 (2012), Z. Kaplan et al., Preslia 88: 240–241 (2016), respectively.

Data wanted: Al, Au, Bu, Cm, Cs, Ge, Gr, He, Hs, Hu, It, Mo, Rm, Se, Sk, Uk

A. exscapus subsp. **exscapus** – Map 0000.

Astragaloides siphilitica Moench, nom. illeg.; Myobroma exscapa (L.) Steven; Tragacantha exscapa (L.) Kuntze
Astragalus hellenicus Boiss. (A. angustiflorus K. Koch subsp. hellenicus (Boiss.) Ponert; Tragacantha hellenica (Boiss.) Kuntze)
A. leiocarpus Shuttlew.

Diploid with 2n=16 (Cs): F. Dvořák et al., Folia Geobot. Phytotax. 12: 347 (1977); Měsíček & Jarolímová 1992: 62 (in both as *Astragalus exscapus*).

Notes. Mo and Uk added (Rs (W) not given in Fl. Eur. for *Astragalus exscapus* [s. str.] or *A. hellenicus*).

Total range. Outside Europe, present in W. Anatolia.

Data wanted: ?Al, Au, Bu, Cs, Ge, Gr, He, Hs, Hu, It, Mo, Rm, Se, Sk, Uk

A. exscapus subsp. **pubiflorus** (DC.) Soó – Map 0000.

Astragalus pubiflorus DC. (Myobroma pubiflora (DC.) Steven; Tragacantha pubiflora (DC.) Kuntze)

Taxonomy. K. Szabo et al., Bull. Univ. Agr. Sci. Vet. Med. Cluj-Napoca, Hortic. 72: 187–190 (2015) (genetic diversity).

Diploid with 2n=16+2B (Bu): D. Pavlova & A. Tosheva, Fl. Medit. 12: 451–453 (2002) (as *Astragalus pubiflorus*).

Notes. Al, Rus (C) and Se added (Al, Ju and Rs (C) not given in Fl. Eur. for *Astragalus pubiflorus*).

Endemic to Europe.

Data wanted: Al, Bu, Cm, Mo, Rm, Rus (C, E), Se, Uk

A. exscapus subsp. **transsilvanicus** (Schur) Nyár. – Map 0000.
Astragalus transsilvanicus Schur

Notes. Rm (the taxon not recognized in Fl. Eur.). – For details of the distribution and ecology, see A.S. Bădărău et al., Stud. Univ. Babeş-Bolyai, Geogr. 45: 119–122 (2000).

Endemic to Europe (Romania: Câmpia Transilvaniei).

Data wanted: Rm

Astragalus flexus Fisch. – Map 0000.
Tragacantha flexa (Fisch.) Kuntze
Astragalus pentapetaloides Bunge
A. stenanthus Freyn 1904 non Bunge 1880 (A. aquae-rubrae B. Fedtsch.)

Taxonomy and nomenclature. M.S. Knyasev & P.V. Kulikov, Bot. Zhurn. (Moscow & Leningrad) 96: 1357–1369 (2011); Podlech & Zarre 2013: 549–551.

Diploid chromosome number 2n=16 reported by R.O. Zakirova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 13: 71–73 (1983), for material from **

Notes. Rus (C) (floristic novelty).

Total range. Main range from Iran and Asiatic Kazakhstan to N.W. China.

Data wanted: Rus (C)

Astragalus ictericus Dingler – Map 0000.

Taxonomy and nomenclature. In Fl. Eur. mentioned in a note under *Astragalus exscapus* as its possible variant. – Podlech & Zarre 2013: 558.

Notes. Gr (the species not recognized in Fl. Eur.).

Endemic to Europe (Greek Rhodopes).

Data wanted: Gr

Astragalus longipetalus Chater – Map 0000.
Astragalus longiflorus auct. plur.

Taxonomy and nomenclature. M.S. Knyasev & P.V. Kulikov, Bot. Zhurn. (Moscow & Leningrad) 96: 1357–1369 (2011); M.F. Kozak & I.A. Skvortsova, Estestvennye nauki: Zhurnal fundamental′nykh i prikladnykh issledovanii, Izdatel′skii dom, "Astrakhanskii universitet" 4(41): 58–66 (2012) (karyology); Podlech & Zarre 2013: 579–580.

Diploid with 2n=16 (Rus (E)): M.F. Kozak & I.A. Skvortsova, Estestvennye nauki: Zhurnal fundamental′nykh i prikladnykh issledovanii, Izdatel′skii dom, "Astrakhanskii universitet" 4(41): 58–66 (2012). The same number reported by R.O. Zakirova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 13: 71–73 (1983), for material from ** (as *Astragalus longiflorus*), and A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1520 (1989), for material from Caucasia.

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.).

Total range. Outside Europe, present in Caucasia, Orenburg Region south of the River Ural and Asiatic Kazakhstan.

Data wanted: Kaz, Rus (C, E)

Astragalus nummularius Lam. – Map 0000.
Tragacantha nummularia (Lam.) Kuntze
Astragalus trichopterus Boiss. (A. nummularius subsp. trichopterus (Boiss.) Thiébaut)

Taxonomy and nomenclature. The European plant (endemic to Crete) is subsp. *nummularius*. – Podlech & Zarre 2013: 591–593.

Total range. Outside Europe, present in Lebanon and Syria as subsp. *trichopterus*. [In Fl. Eur., *Astragalus nummularius* is indicated as endemic to Europe.]

Data wanted: Cr

Astragalus tanaiticus K. Koch – Map 0000.
Tragacantha tanatica (K. Koch) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 641–642.

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.).

Endemic to Europe.

Data wanted: Rus (C, E), Uk

Astragalus tremolsianus Pau – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 645–646.

Notes. For details of the distribution and ecology, see A. Pallarés Navarro, Anal. Jard. Bot. Madrid 43: 174–177 (1986).

Endemic to Europe (Spain: Sierra de Gadór in Almeria Province).

Data wanted: Hs

Astragalus buchtormensis Pall. – Map 0000.
Astragalus dubius DC., nom. illeg.; Myobroma buchtormensis (Pall.) Steven; Tragacantha buchtormensis (Pall.) Kuntze
A. buchtormensis var. fuscescens Knjaz. & Kulikov
A. lignosus DC. (Myobroma lignosa (DC.) Steven)
Myobroma henningii Steven (Astragalus henningii (Steven) Boriss.)
Astragalus novoascanicus Klokov

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus henningii*. – O.D. Visjulina in Fl. RSS Ucr. 6: 458–461 (1954) (as *A. henningii* and *A. novoascanicus*); M.S. Knyasev & P.V. Kulikov, Bot. Zhurn. (Moscow & Leningrad) 96: 1357–1369 (2011) (as *A. henningii* and *A. buchtormensis*, the latter with var. *fuscescens*); Podlech & Zarre 2013: 661–662.

Notes. Cm and Rus (C) added (Rs (C, K) not given in Fl. Eur.).

Total range. Outside Europe, present in Caucasia, Orenburg Region south of the River Ural, Asiatic Kazakhstan, S.W. Siberia and N.W. China. [In Fl. Eur., *Astragalus henningii* is indicated as endemic to Europe.]

Data wanted: Cm, Kaz, Rus (C, E), Uk

Astragalus utriger Pall. – Map 0000.
Myobroma utrigera (Pall.) Steven; Tragacantha utrigera (Pall.) Kuntze
Astragalus cernjavskii Stoj.

Taxonomy and nomenclature. Podlech & Zarre 2013: 704–705.

Diploid chromosome number 2n=16 reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1521 (1989), for material from Caucasia.

Notes. Mk added (Ju not given in Fl. Eur.).

Total range. Outside Europe, present in N.W. Caucasia.

Data wanted: Cm, Mk

Astragalus wolgensis Bunge – Map 0000.

Tragacantha wolgensis (Bunge) Kuntze
Astragalus kungurensis Boriss.

Taxonomy and nomenclature. M.S. Knyasev & P.V. Kulikov, Bot. Zhurn. (Moscow & Leningrad) 96: 1357–1369 (2011) (as *Astragalus wolgensis* and *A. kungurensis)*; Podlech & Zarre 2013: 708–709.

Total range. Outside Europe, present in S.W. Siberia and Asiatic Kazakhstan. – MJW 1965: map 242a.

Data wanted: Kaz, Rus (C, E)

Astragalus lagobromus Knjaz. & Kulikov 2011 – Map 0000.

Astragalus wolgensis auct.

Taxonomy. M.S. Knyasev & P.V. Kulikov, Bot. Zhurn. (Moscow & Leningrad) 96: 1357–1369 (2011).

Notes. Rus (C) (taxonomic novelty).

Total range. Main range in S.W. Siberia just east of the S. Urals and extending to N. Kazakhstan and the Orenburg Province of Russia S. of the River Ural.

Data wanted: Rus (C)

Astragalus sect. **Pogonotropis** Bunge

Sect. Stereocalyx Bornm.

Astragalus physocalyx Fisch. – Map 0000.

Tragacantha physocalyx (Fisch.) Kuntze
Astragalus stereocalyx Bornm.
A. villosidentatus Podlech

Taxonomy and nomenclature. Podlech & Zarre 2013: 753–754.

Diploid with 2n=16 (Bu): S. Kožuharov & B. Kuzmanov, Caryologia 18: 350 (1965).

Notes. Gr and Mk added (Gr and Ju not given in Fl. Eur.): K. Micevski, Godišen Zborn. Prir.-Mat. Fak. Univ. Skopje, Biol., 24: 67–72 (1972); J.R. Akeroyd, Willdenowia 16: 108 (1986).

Total range. Outside Europe, present in W. Anatolia. [In Fl. Eur. indicated as endemic to Europe, evidently due to the exclusion of *Astragalus stereocalyx*.]

Data wanted: Bu, Gr, Mk

Astragalus sect. **Hemiphragmium** (W.D.J. Koch) Bunge

Phaca L. sect. Hemiphragmium W.D.J. Koch

Astragalus australis (L.) Lam. – Map 0000.

Phaca australis L. (Astragalina australis (L.) Bubani; Astragaloides australis (L.) Medik.; Colutea australis (L.) Lam.; Tragacantha australis (L.) Kuntze)
A. krajinae Domin
Phaca gerardii Vill. (Astragalus australis subsp. gerardii (Vill.) Arcang.; Phaca australis subsp. gerardii (Vill.) Bonnier & Layens)
P. glabra Clarion (Colutea glabra (Clarion) Poir.)
P. glabra Simonkai 1866 non Clarion 1811
P. halleri Vill.
P. helvetica Hartm. (Astragalus helveticus (Hartm.) O. Schwarz)

Taxonomy and nomenclature. O.D. Visjulina in Fl. RSS Ucr. 6: 453–454 (1954) (as *Astragalus krajinae* ("krajnae")); M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 265–266 (1957) (with two varieties); Podlech & Zarre 2013: 807–810; Fl. Gallica 2014: 714 ("subsp. *gerardii*" as a valueless taxon).

Tetraploid and hexaploid. 2n=32 (Ga, Hs, It): C. Favarger & K.L. Huynh, Taxon 13: 205 (1964); C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 88: 60 (1965), 92: 17 (1969); C. Favarger & P. Küpfer, Collect. Bot. 7: 354 (1968); P. Küpfer, Boissiera 23: 3–322 (1974). – 2n=48 (He, Po, Sk): C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 82: 271, 273 (1959), 88: 24–25, 60 (1965); E. Pogan et al., Acta Biol. Cracov. Ser. Bot. 24: 91–126 (1982); J. Májovský et al., Oecol. Mont. 5: 91–92 (1996).

Notes. Rus (C, N) omitted (Rs (C, N) given in Fl. Eur.), the material being referable to *Astragalus gorczakovskii*.

Endemic to Europe (not indicated as such in Fl. Eur.), but closely related if not partly conspecific plants are present in Siberia (e.g. *Astragalus gorczakovskii* and *A. gorodkovii*), Mongolia and Russian Far East, as well as in Alaska, Canada and W. United States (e.g. *A. aboriginorum* Richardson).

Data wanted: Au, BH, Bu, Cg, Ct, Ga, Ge, He, Hs, It, Mo, Po, Rm, Sk, Sl, Uk

Astragalus gorczakovskii L.I. Vassiljeva – Map 0000.

Astragalus uralensis Litv. 1893 non L. 1753

Taxonomy and nomenclature. P.V. Kulikov et al., Endemichnye rasteniya Urala vo flore Sverdlovskoi oblasti, pp. 197–201 (Ekaterinburg 2013); Podlech & Zarre 2013: 813.

Tetraploid with 2n=32 (Rus (C, N)): B.A. Yurtsev & P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 53: 1534 (1968) (as *Astragalus uralensis*).

Notes. Rus (C, N) (floristic novelty).

Total range. Outside Europe, present on E. slopes of the cental Ural Mountains.

Data wanted: Rus (C, N)

Astragalus gorodkovii Jurtzev 1968 – Map 0000.

Taxonomy and nomenclature. B.A. Yurtsev & P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 53: 1534–1535 (1968); Fl. Arct. URSS 1986: 47, 48; Podlech & Zarre 2013: 813–814.

Diploid with 2n=16 (Rus (N)): A.N. Lavrenko et al., Bot. Zhurn. (Moscow & Leningrad) 75: 1624 (1990). The same number reported by B.A. Yurtsev & P.G. Zhukova, Bot. Zhurn. (Moscow &

Leningrad) 53: 1534 (1968), for material from Asian side of Polar Ural.

Notes. Rus (N) (taxonomic novelty).

Total range. Outside Europe, present in Novaya Zemlya and W. Siberia.

Data wanted: Rus (N)

Astragalus sect. **Oroboidei** A. Gray
Sect. Hemiphaca Bunge

Astragalus norvegicus Grauer – Map 0000.
Astragalus giganteus (Pall.) E. Sheld. 1894 non S. Watson 1891
A. oroboides Hornem. (Tragacantha oroboides (Hornem.) Kuntze)

Taxonomy and nomenclature. N. Hylander, Uppsala Univ. Årsskr. 1945(7): 228 (1945); Fl. Arct. URSS 1986: 42–43; Podlech & Zarre 2013: 846–848.

Diploid with 2n=16 (No, Sk): T. Engelskjön & G. Knaben, Acta Boreal., A, Scientia No. 28: 1–30 (1971); T. Engelskjøn, Opera Bot. 52: 26 (1979); J. Kochjarová, Acta Fac. Rerum Nat. Univ. Comen., Bot. 39: 70 (1992). The same number reported by V.A. Belaeva & V.N. Siplivinsky, Bot. Zhurn. (Moscow & Leningrad) 60: 869 (1975), for material from the Baikal area, and P.G. Zhukova et al., Bot. Zhurn. (Moscow & Leningrad) 58: 1335 (1976), for material from Russian Far East (in both as *Astragalus oroboides*).

Notes. Rm not confirmed (?Rm given in Fl. Eur.). – For details concerning Au, see H. Melzer, Not. Flora Steiermark 15: 51–54 (1998).

Total range. Outside Europe, present in the arctic and mountains of Siberia and Russian Far East and in mountains of S. Siberia and Mongolia: MJW 1965: map 242c; Hultén Alaska 1968: 648 [in both two the North American range shown belongs to related species, mainly to *Astragalus eucosmos* B.L. Rob.]; Hultén CP 1970: map 36; Hultén & Fries 1986: map 1191.

Data wanted: Au, No, ?Rm, Rus (C, N), Sk, Su

Astragalus sect. **Komaroviella** Gontsch.
Sect. Parvistipula K.T. Fu

Astragalus alpinus L. – Map 0000.
Astragalus grossheimianus Sosn.
A. salicetorum Kom.
A. variocarinus Khokhr.
Phaca astragalina DC. (Astragalus astragalinus (DC.) Sheldon, nom. illeg.);

Taxonomy and nomenclature. In Fl. Eur., two subspecies are recognized, viz. subsp. *alpinus* ("Throughout the range of the species except for much of arctic Europe") and subsp. *arcticus* "Lindm." ("Arctic Europe"). According to Podlech & Zarre 2013: 907–910, the latter name belongs to the synonymy of *Astragalus norvegicus* and the diagnostic characters postulated for the subspecies are "not always clear, especially in North America and Asia". However, at least in European context two distinct races, though connected by intermediates in Scandinavia, can indeed be separated, and we map them as subspecies in accordance with Fl. Eur. – N. Hylander, Uppsala Univ. Årsskr. 1945(7): 228 (1945); J. Jalas, Ann. Bot. Soc. Zool.-Bot. Fenn. "Vanamo" 24(1): 54–57, 283–291 (1950) (with "subsp. *typicus*" and "subsp. *arcticus*", the latter with "konvergente Formen" more or less identical with the former in Finland); O.I. Kuzeneva in Pojark., Fl. Murmansk. 4: 136–138 (1959) (as *A. subpolaris*); Hultén CP 1971: 319; R.C. Barneby, Taxon 25: 628 (1976) (nomenclature); Fl. Arct. URSS 1986: 35–42 (with three subspecies in N. Russia, of

which only subsp. *arcticus* on both sides of the Urals and subsp. *alpinus* only in Siberia); J. Májovský et al., Oecol. Mont. 5: 87–92 (1996) (karyotaxonomic analysis of Slovakian accessions; as *A. alpinus*, *A. subpolaris* and *A. astragalinus*); R. Elven & T. Alm in R. Elven et al. (ed.), Distribution maps of Norwegian vascular plants, IV The eastern and northeastern elements, pp. 68–70 (Trondheim 2013) (with var. *alpinus*, var. *arcticus* and their intermediates in Norway, but subspecies status supported for the races).

Diploid and tetraploid. 2n=16 (No): A.W. Johnson & J.G. Packer, Bot. Not. 121: 405(map) (1968) (also for material from S.W. Canada); T. Engelskjøn, Opera Bot. 52: 26 (1979). The same number reported by, e.g., V.A. Belaeva & V.N. Siplivinsky, Bot. Zhurn. (Moscow & Leningrad) 61: 877 (1976), for material from the Baikal area, T.S. Rostovtseva, Bot. Zhurn. (Moscow & Leningrad) 62: 1037 (1976), for material from S. Siberia, N.N. Gurzenkov & N.S. Pavlova, Bot. Zhurn. (Moscow & Leningrad) 69: 1569 (1983), for material from Russian Far East, and E.A. Andriyanova et al., Taxon 63: 1148 (2014), for material from Russian Far East. – 2n=32 reported by K. Holmen, Bot. Not. 115: 87–89 (1962), for material from Alaska, O. Hedberg, Ark. Bot. 6: 322 (1966), for material from arctic Canada and Alaska, G.A. Mulligan & A,E. Porsild, Canad. J. Bot. 47: 659 (1969), for material from N.W. Canada, P.G. Zhukova et al., Bot. Zhurn. (Moscow & Leningrad) 58: 1335 (1976), for material from Russian Far East, A.W. Johnson & J.G. Packer, Bot. Not. 121: 405(map), 429 (1968), for material from Russian Far East, Alaska and Arctic Canada, and E.A. Andriyanova et al., Taxon 63: 1148 (2014), for material from Russian Far East.

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.).

Total range. Circumpolar-alpine. – Hultén Alaska 1968: 649, 650 (as *Astragalus alpinus* subsp. *alpinus* and "subsp. *arcticus*"); Hultén CP 1971: map 42 (with "subsp. *arcticus*" and three North American infraspecific taxa); Hultén & Fries 1986: map 1190 (as *A. alpinus* subsp. *alpinus* and "subsp. *arcticus*" and three North American infraspecific taxa.)

Data wanted: Au, Br, Fe, Ga, Ge, He, Hs, It, No, Po, Rm, Rus (C, N), Sk, Sl, Su

A. alpinus subsp. **alpinus** – Map 0000.

Astragalina alpestris Bubani, nom. illeg.; Astragalus phacinus E.H.L. Krause, nom. illeg.; Atelophragma alpina (L.) Rydb.; Phaca alpina (L.) Rydb., nom. illeg.; P. minima All.; Tium alpinum (L.) Rydb.; Tragacantha alpina (L.) Kuntze

Diploid with 2n=16 (Ga, He, Hs, It, Sk): C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 72: 18, 20, 21 (1949) (as *Phaca alpina*), 88: 24, 60 (1965) (as *Astragalus alpinus*); C. Favarger & P. Küpfer, Collect. Bot. 7: 354 (1968) (as *A. alpinus*); P. Küpfer, Boissiera 23: 3–322 (1974); J. Kochjarová, Acta Fac. Rerum Nat. Univ. Comen., Bot. 38: 90 (1991) (as *A, alpinus*); A. Murín, Acta Fac. Rerum Nat. Univ. Comen., Bot. 39: 45–51 (1992) (as *A. alpinus*); J. Májovský et al., Oecol. Mont. 5: 87–92 (1996) (as *A. alpinus*); Marhold et al. 2007 (118) (as *A. alpinus*). Thes same diploid number reported by R. Spellenberg, Taxon 25: 466 (1976), for material from Colorado, U.S.A. (as *A. alpinus* var. *alpinus*), and P.G. Zhukova & V.V. Petrovsky, Bot. Zhurn. (Moscow & Leningrad) 61: 967 (1976), for material from Russian Far East. – Tetraploid chromosome number 2n=32 reported by P.G. Zhukova & V.V. Petrovsky, Bot. Zhurn. (Moscow & Leningrad) 65: 654 (1980), B.A. Yurtsev & P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 67: 781 (1982), and P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 68: 927 (1983), for material from numerous localities in N.E. Asia.

Total range. According to Panarctic Flora (http://nhm2.uio.no/paf/; accessed April 2017), confirmed from C. and W. Europe, N.E. Asia, and throughout northern North America and the western Cordilleras, and with "probably a connection through European Russia and Siberia but we have not had material available for inspection".

Data wanted: Au, Br, Ga, Ge, He, Hs, It, No, Po, Rm, Sk, Sl, Su

A. alpinus subsp. **arcticus** (Sondén) Lindm. – Map 0000.

Astragalus alpinus f. arcticus Sondén
A. alpinus subsp. borealis Kozhevn.
A. arcticus Bunge 1869 non Willd. 1814 nec (R. Br.) Spreng. 1827
Phaca lapponica DC. 1825 non Wahlenb. 1813 (Astragalus lapponicus Schischk. 1933 non Burnat 1912; A. subpolaris Boriss. & Schischk.)

Nomenclature. Author citation corrected ((Sondén) Lindm. instead of Lindm.).

Diploid with 2n=16 (Fe, Rus (N)): A.P. Sokolovskaya, Vestn. Leningr. Univ. (Biol.) 17: 111 (1970) (as *Astragalus subpolaris*); Uotila & Pellinen 1985: 17 (as *A. alpinus*); A.N. Lavrenko et al., Bot. Zhurn. (Moscow & Leningrad) 75: 1624 (1990) (as *A. subpolaris*). Tetraploid chromosome number 2n=32 reported by P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 68: 927 (1983), for material from Wrangel Island (as *A. alpinus* subsp. *arcticus*).

Total range. According to Panarctic Flora (http://nhm2.uio.no/paf/; accessed April 2017), confirmed from northern and eastern Fennoscandia, northern European Russia, northern Siberia and Russian Far East, and northern Alaska.

Data wanted: Fe, No, Rus (C, N), Su

Astragalus sect. **Hypoglottidei** DC.

Astragaloides Moench
Cystium Steven
Sect. Ciceroidei DC.
Sect. Glycyrrhizi W.D.J. Koch
Sect. Hypoglottis Bunge

Astragalus bourgaeanus Cosson – Map 0000.

Tragacantha bourgaeana (Cosson) Kuntze

Taxonomy and nomenclature. Fl. Iber. 1999: 316–319; Podlech & Zarre 2013: 945–946.

Total range. Outside Europe, present in Morocco and Algeria. [In Fl. Eur. indicated as endemic to Europe.]

Data wanted: Hs

Astragalus cicer L. – Map 0000.

Astragaloides cicera (L.) Moench; Astragalus cicerinus St.-Lag., nom. illeg.; A. vesicarius Lam., nom. illeg.; Cystium cicer (L.) Steven; Glaux astragaloides Medik., nom. illeg.; Tragacantha cicer (L.) Kuntze
Astragalus canescens Kit. 1864 non DC. 1802
A. microphyllus L.
A. mucronatus DC. (Tragacantha mucronata (DC.) Kuntze)
A. pseudocicer Opiz (Cystium pseudocicer (Opiz) Opiz)

Phylogenetics. R.L. Latterell & C.E. Townsend, Int, J. Plant Sci. 154: 450–457 (1993) (meiotic analysis of octoploids), 155: 475–480 (1994) (meiotic analysis of polyhaploids); A. Adiguzel et al., Biochem. Syst. Ecol. 34: 424–432 (2006) (fatty acid and RAPD profiles in revealing genetic relationships); A. Dizkirici Tekpinar et al., Turkish J. Bot. 40: 250–263 (2016) (phylogenetic relationships between *Oxytropis* and *Astragalus* species native to an Old World diversity center [Turkey]).

Taxonomy and nomenclature. M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 281–282 (1957) (with five formae); F. Dvořák et al., Folia Geobot. Phytotax. 12: 347–350 (1977) (karyotype); D. Podlech, Sendtnera 1: 271 (1993) (*Astragalus microphyllus*); E.S. Nemirova & N.V. Martynov, Bull. Moscow Reg. State Univ, Nat. Sci. 2009(4): 149–154 (2009) (pollen morphology); Podlech & Zarre 2013: 949–951.

Octoploid with 2n=64 (Bu, By, Cs, Ge, Po, Sk): J. Májovský et al., Acta Fac. Rerum Nat. Univ. Comen., Bot. 16: 5 (1970); F. Dvořák et al., Folia Geobot. Phytotax. 12: 348, 349 (1977); E. Pogan et al., Acta Biol. Cracov. Ser. Bot. 25: 57–77 (1983); K.P. Buttler, Hess. Florist. Briefe 34: 37–42 (1985); L.V. Semerenko & I.V. Shvets in Tesizy II Symp. Plant Karyology, pp. 66–68 (Novosibirsk 1989); D.K. Pavlova & S.I. Kozhuharov, Fitologija 44: 75 (1993); Marhold et al. 2007: 119; Z. Münzbergová, Bot, J. Linn. Soc. 160: 292 (2009) (as ploidy level 8 based on flow cytometry). The same octoploid number reported by Magulaev, Bot. Zhurn. (Moscow & Leningrad) 65: 837 (1980), for material from Caucasia. – "Hyper- and hypoaneuploids with 2n=65 and 2n=63 are not uncommon in the breeding populations of Colorado" (R.L. Latterell & C.E. Townsend, Int. J. Plant Sci. 154: 450–457 (1993)).

Notes. [Br, Fe, Su] added (not given in Fl. Eur.). Not native and possible not even extant in Hs (in Fl. Eur. given as native and extant). – For details concerning Cs, see Z. Kaplan et al., Preslia 88: 236–239 (2016). For the breeding, physiology, culture, and utilization of the species, see C.E. Townsend, Adv. Agron. 49: 253–308 (1993).

Total range. According to Podlech & Zarre 2013: 950, "Originally Mediterranean and from East Europe" but "Today introduced in many places of the world and naturalized".

Data wanted: Au, *Be (B), Be (L), BH, [Br], Bu, By, Cg, Cm, Cs, Ct, [Fe], Ga, Ge, He, [×Hs], Hu, It, Kaz, Ko, [La], Mk, Mo, Po, Rm, Rus (C, E), Se, Sk, Sl, [Su], Uk

Astragalus danicus Retz. – Map 0000.

Hypoglottis polysperma Torr. & A. Gray
Oxytropis montana Spreng. 1832 non DC. 1802

Taxonomy and nomenclature. F. Dvořák & B. Dadácová, Biologia (Bratislava) 35: 69–73 (1989) (karyotype); E.S. Nemirova & N.V. Martynov, Bull. Moscow Reg. State Univ, Nat. Sci. 2009(1): 75–80 (2009) (morphology and anatomy of seeds), 2009(4): 149–154 (2009) (pollen morphology); Podlech & Zarre 2013: 952–954.

Diploid with 2n=16 (By, Cs, Ga, Ge, Po, Sk): M. Guinochet & A. Logeois, Rev. Cytol. Biol. Vég. 25: 471 (1962); G. Dersch, Philippia 2: 77 (1974); F. Dvořák & B. Dadáková, Taxon 27: 223 (1978); M. Hindáková & T. Schwarzová, Taxon 27: 380 (1978); F. Dvořák & B. Dadáková, Biologia (Bratislava) 35: 69 (1980); E. Pogan et al., Acta Biol. Cracov. Ser. Bot. 24: 159–189 (1982); L.V. Semerenko, Bot. Zhurn. (Moscow & Leningrad) 74: 1671 (1989); Marhold et al. 2007: 119. The same number reported by T.V. An'kova & D.N. Shaulo, Taxon 61: 1336 (2012), for material from Asiatic Kazakhstan. – F. Dvořák & B. Dadáková, Biologia (Bratislava) 35: 69 (1980), observed mixoploidy (diploid cells ansd tetraploid ones) in the meristem of root tips of seeds.

Notes. [Fe] and Hs added (not given in Fl. Eur.). – For details concerning Cs, see Z. Kaplan et al., Preslia 88: 238–240 (2016). For details concerning Su, see Y. Nordhag, Svensk Bot. Tidskr. 83: 175–176 (1989), 85: 201–205 (1991), and K. Emanuelsson & H. Alexandersson, Svensk Bot. Tidskr. 104: 293–296 (2010).

Total range. From Europe to Russian Far East and China: MJW 1965: map 243c [the North American range shown belongs to *Astragalus agrestis* Douglas ex G. Don (*A. dasyglottis* Fisch. ex DC. 1825 non Pall. 1802; *A. danicus* var. *dasyglottis* (Fisch. ex DC.) B. Boivin)]; Hultén Alaska

1968: 652; Hultén & Fries 1986: map 1186 [the North American range shown belongs to *Astragalus agrestis*].

Data wanted: Au, Br, By, Cs, Da, Es, [Fe], Ga, Ge, Hb, Hs, It, Kaz, La, Lt, Po, Rus (C, E, Ka, N), Sk, Su, Uk

Astragalus glaux L. – Map 0000.

Astragaloides glaux (L.) Moench; Astragalus capitatus Lam., nom. illeg.; A. clusii Bubani, nom. illeg.; Hypoglottis glaux (L.) Fourr.; Tragacantha glaux (L.) Kuntze
Astragalus glauciformis Pomel
A. granatensis Lange 1865 non Lam. 1783 (A. granadinus Pau, nom. illeg.)
A. procumbens Mill.

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology); Fl. Iber. 1999: 316, 317; Podlech & Zarre 2013: 956–958; Fl. Gallica 2014: 714.

Diploid with 2n=16 (Hs, Lu): A. Fernandes & M.F. Santos, Bol. Soc. Brot., ser. 2, 45: 181–182 (1971); Á. Löve & E. Kjellqvist, Lagascalia 4: 157 (1974); A. Pretel Martínez, Taxon 23: 804 (1974); Fernandes & Quieros 1978: 141; A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978); A. Pretel Martínez, Ci. Biol. Ecol. Sist. 6/7: 31–34 (1980); J.A. Elena Rosselló et al., Stud. Bot. Univ. Salamanca 4: 111 (1987).

Total range. Outside Europe, present in Algeria, Morocco and Tunisia.

Data wanted: Ga, Hs, Lu

Astragalus hypoglottis L. – Map 0000.

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus purpureus* (incl. *A. gremlii*) without subspecies. – Fl. Iber. 1999: 319, 320; Podlech & Zarre 2013: 961–964 (with subsp. *hypoglottis* and subsp. *gremlii*).

Endemic to Europe (in Fl. Eur. not indicated as such).

A. hypoglottis subsp. **hypoglottis** – Map 0000.

Astragalus onobrychis L. subsp. hypoglottis (L.) Bonnier & Layens; Phaca hypoglottis (L.) MacMill.; Solenotus hypoglottis (L.) Steven; Tragacantha hypoglottis (L.) Kuntze
A. phacaceus Arv.-Touv.
A. purpureus Lam. (A. hypoglottis subsp. purpureus (Lam.) Rivas Goday & Borja, nom. inval.; A. onobrychis subsp. purpureus (Lam.) Bonnier & Layens; A. pulchellus Salisb., nom. illeg.; Hypoglottis purpurea (Lam.) Fourr.; Solenotus purpureus (Lam.) Steven; Tragacantha purpurea (Lam.) Kuntze)

Diploid with 2n=16 (Ga): D. Cartier, Taxon 25: 493 (1976); Z. Afzal-Rafii et al., Rev. Cytol. Biol. Veg. Bot. 8: 33–62 (1985) (in both as *Astragalus purpureus*).

Notes. Ga, Hs (subspecies not recognized in Fl. Eur.).

Data wanted: Ga, Hs

A. hypoglottis subsp. **gremlii** (Burnat) Greuter & Burdet – Map 0000.

Astragalus gremlii Burnat (A. purpureus Lam. subsp. gremlii (Burnat) Asch. & Graebn.)

Diploid with 2n=16 (It): C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 92: 17 (1969), Taxon 18: 434 (1969) (in both as *Astragalus gremlii*).

Notes. Al, BH, Cg, Ct, Ga, It, Mk (the taxon not recognized in Fl. Eur.). – Given from many localties of the French Alps in Podlech & Zarre 2013: 962–963, but according to Fl. Gallica 2014: 715, “ce taxon est à exclure de la flore française”.

Data wanted: Al, BH, Cg, Ct, Ga, It, Mk, Sl

Astragalus maniaticus Kit Tan & Strid 1997 – Map 0000.

Taxonomy and nomenclature. K. Tan & A. Strid, Pl. Syst. Evol. 206: 47–50 (1997); Podlech & Zarre 2013: 964–965; K. Kougioumoutzis et al., Pl. Biosyst. 151: 108–116 (2017) ("*Astragalus maniaticus* cannot be distinguished from *A. suberosus* subsp. *haarbachii* on morphological grounds. Therefore, it is transferred to sect. *Platyglottis* and regarded a heterotypic synonym of *A. suberosus* subsp. *haarbachii*.").

Notes. Gr (taxonomic novelty).

Endemic to Europe (Greece: Peloponnisos).

Data wanted: Gr

Astragalus pseudopurpureus Guşul. – Map 0000.

Taxonomy and nomenclature. M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 282–285 (1957); Podlech & Zarre 2013: 971.

Endemic to Europe (Romania: E. Carpathians).

Data wanted: Rm

Astragalus sect. **Stereothrix** Bunge
Sect. Koelziana Širj. & Rech. f.

Taxonomy and nomenclature. M. Ranjbar et al., Biol. Diversity Conserv. 6: 114–133.

Notes. For the phytogeography of the section, see M. Mahmoodi et al., Willdenowia 43: 263–270 (2013).

Astragalus setosulus Gontsch. – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 996–997.

Endemic to Europe (S. Crimea).

Data wanted: Cm

Astragalus sect. **Tapinodes** Bunge

Astragalus depressus L. – Map 0000.
Craccina depressa (L.) Steven; Tragacantha depressa (L.) Kuntze
Astragalus bonannii J. Presl & C. Presl (A. depressus subsp. bonannii (J. Presl & C. Presl) Arcang.)
A. helminthocarpos Vill.
A. leucophaeus Sm.
A. tachdirtensis Andr.

Taxonomy and nomenclature. "One of the most variable species, particularly in size of parts; no useful subdivision has yet been made" (Fl. Eur.). – Podlech & Zarre 2013: 1030–1033.

Diploid with 2n=16 (Bu, Ga, Gr, He, It): C. Favarger & K.L. Huynh, Taxon 13: 205 (1964); C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 88: 24, 60 (1965); D. Cartier, Taxon 25: 493 (1976), Rev. Cytol. Biol. Vég., Bot. 2: 169–181 (1979); N. Andreev, Taxon 31: 576 (1982); R. Franzén & L.-Å. Gustavsson. Willdenowia 13: 104 (1983); M. Baltisberger, Newslett. Int. Organ. Pl. Biosyst.

(Pruhonice) 31: 11–12 (1999); D. Pavlova & A. Tosheva, Fl. Medit. 12: 452, 453 (2002); D. Pavlova & A. Bani, Taxon 64: 1347 (2015). The same number reported by D. Cartier, Taxon 25: 493 (1976), for material from Anatolia, and N. Galland, Trav. Inst. Sci. Univ. Mohammed V, Sér. Bot. 35: 144 (1988), for material from Morocco.

Notes. For details concerning Rm, see A. Bartók et al., Anelele Stiint. Univ. Al. I. Cuza Iaşi, Biol. Veg. 60: 79–86 (2014).

Total range. Outside Europe, present in Morocco, Algeria and Anatolia.

Data wanted: Al, BH, Bu, Cg, Cr, Ct, Ga, Gr, He, Hs, It, Ko, Mk, Rm, Se, Si (S)

Astragalus sect. **Malacothrix** Bunge

Sect. Bornmuelleriana Širj.
Sect. Heterozyx Bunge

Astragalus austroaegeus Rech. f. – Map 0000.

Astragalus tauricola Boiss. subsp. austroaegeus (Rech. f.) Ponert
A. insulae-karpathi Eig

Taxonomy and nomenclature. Orthography of the specific epithet corrected (*austroaegeus* instead of *austraegeus*). – Podlech & Zarre 2013: 1061–1062.

Total range. Outside Europe, present on Rodhos.

Data wanted: Cr

Astragalus turolensis Pau – Map 0000.

Astragalus arragonensis Freyn, nom. illeg. (A. turolensis subsp. arragonensis (Freyn) Maire)
A. domitus Bubani
A. pilosus Asso 1779 non L. 1753

Taxonomy and nomenclature. Fl. Iber. 1999: 321–323; K. Sutorý, Anales Jard. Bot. Madrid 67: 98 (2010) (lectotype designated for *Astragalus arragonensis*); Podlech & Zarre 2013: 1147–1148.

Notes. For ecology of the species, see J.A. Lázaro-Bello, Anales Biol. 31: 19–32 (2009).

Endemic to Europe (in Fl. Eur. not indicated as such, evidently due to the inclusion of the Moroccan *Astragalus exsul* Maire (*A. turolensis* subsp. *exsul* (Maire) Maire)).

Data wanted: Hs

Astragalus sect. **Poterion** Bunge

Astragalus clusianus Soldano – Map 0000.

Astragalus clusii Boiss. 1849 non Pollini 1816

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus clusii* Boiss. 1849 [non Pollini 1816]. – A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; as *A. clusii* ("clussii")); A. Soldano, Thaiszia 4: 120 (1994); Fl. Iber. 1999: 323–325; Podlech & Zarre 2013: 1191–1192.

Diploid with 2n=16 (Hs): A. Pretel Martínez, Taxon 23: 804 (1974); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978) (in both as *Astragalus clusii*).

Endemic to Europe (Spain: E. parts).

Data wanted: Hs

Astragalus sect. **Adiaspastus** Bunge

Sect. Acidodes Bunge
Sect. Brachycalyx Bunge
Sect. Hystrix Bunge
Sect. Tragacanthae W.D.J. Koch, nom. illeg.

Astragalus nevadensis Boiss. – Map 0000.

Incl. Astragalus giennensis Heywood

Taxonomy and nomenclature. In Fl. Eur. treated as *Astragalus sempervirens* subsp. *nevadensis* and subsp. *muticus* "(Pau) Rivas Goday & Borja" and as *A. giennensis*. – A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; as *A. sempervirens* subsp. *nevadensis*); Fl. Iber. 1999: 309–311; Podlech & Zarre 2013: 1362–1364 (in the two last as *A. nevadensis* with subsp. *nevadensis* (incl. *A. giennensis*) and subsp. *muticus*).

Endemic to Europe (Spain: E. parts).

A. nevadensis subsp. **nevadensis** – Map 0000.

Astragalus sempervirens Lam. subsp. nevadensis (Boiss.) P. Monts.; Tragacantha nevadensis (Boiss.) Kuntze
A. giennensis Heywood (A. sempervirens subsp. giennensis (Heywood) Malag.)
A. nevadensis subsp. granatensis Braun-Blanq., nom. illeg.

Diploid with 2n=16 (Hs): A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978) (as *A. sempervirens* subsp. *nevadensis*).

Data wanted: Hs

A. nevadensis subsp. **andresmolinae** (Díez-Garretas & Asensi) Mota & F.J. Pérez-García 2012 – Map 0000.

Astragalus sempervirens Lam. subsp. andresmolinae Díez-Garretas & Asensi

Taxonomy and nomenclature. F.J. Pérez-García et al., Ann. Bot. Fenn. 49: 54 (2012).

Notes. Hs (Málaga: Sierra de las Nieves) (taxonomic novelty).

Data wanted: Hs

A. nevadensis subsp. **muticus** (Pau) Zarre & Podlech – Map 0000.

Astragalus muticus Pau (A. sempervirens Lam. subsp. muticus (Pau) M. Lainz)

Diploid with 2n=16 (Hs): P. Küpfer, Boissiera 23: 3–322 (1974); M. Boscaiu et al., Anales Jard. Bot. Madrid 56: 120 (1998) (in both as *Astragalus sempervirens* subsp. *muticus*).

Data wanted: Hs

Astragalus sempervirens Lam. – Map 0000.

Astragalus aristatus L'Her. (Phaca aristata (L'Hér.) Clairv.)
A. cephalonicus C. Presl (A. sempervirens subsp. cephalonicus (C. Presl) Asch. & Graebn.; Tragacantha cephalonica (C. Presl) Kuntze)
A. nevadensis Boiss. subsp. catalaunicus Braun-Blanq. (A. sempervirens subsp. catalaunicus (Braun-Blanq.) M. Lainz)
A. sempervirens subsp. alpinus Pignatti
A. sempervirens subsp. gussonei Pignatti
Phaca tragacantha All.

Excl. Astragalus nevadensis Boiss. (A. sempervirens subsp. nevadensis (Boiss.) P. Monts and A. sempervirens subsp. muticus (Pau) M. Lainz)

Taxonomy and nomenclature. In Fl. Eur. four subspecies are recognized, of which two (subsp. *nevadensis* and subsp. *muticus*) are here treated as subspecies of *Astragalus nevadensis* and the two others (subsp. *sempervirens* and subsp. *cephalonicus*) are not recognized here. Our treatment follows that of Podlech & Zarre 2013: 1372–1374. – Fl. Iber. 1999: 307–309; D. Gargano & L. Peruzzi, Allionia 39: 111–117 (2003) (Calabrian populations as subsp. *gussonei*); Fl. Gallica 2014: 712 (with subsp. *sempervirens* and subsp. *catalaunicus*).

Diploid with 2n=16 (Gr, It): J. Damboldt, Taxon 20: 787 (1971) (as *Astragalus sempervirens* subsp. *cephalonicus*); P. Küpfer, Boissiera 23: 3–322 (1974); D. Cartier, Taxon 25: 493 (1976) (as *A, sempervirens* subsp. *cephalonicus*); D. Gargano & L. Peruzzi, Allionia 39: 113, 114 (2003) (as *A. sempervirens* subsp. *gussonei*).

Endemic to Europe (in Fl. Eur. not indicated as such).

Data wanted: Ga, Gr, He, Hs, It,

Astragalus sect. **Pterophorus** Bunge

Astragalus parnassi Boiss. – Map 0000.

Excl. Astragalus cylleneus Boiss. & Heldr. ex Fisch. (A. parnassi subsp. cylleneus (Boiss. & Heldr. ex Fisch.) Hayek)

Taxonomy and nomenclature. K. Micevski & E. Mayer, Acta Bot. Croat. 43: 307–311 (1984); Podlech & Zarre 2013: 1403–1405.

Notes. Tu omitted (given in Fl. Eur.). – For details concerning Mk, see K. Micevski & E. Mayer, loc. cit. (1984).

Endemic to Europe (in Fl. Eur. not indicated as such).

A. parnassi subsp. **parnassi** – Map 0000.

Astracantha parnassi (Boiss.) Podlech; A. thracica (Griseb.) Podlech subsp. parnassi (Boiss.) Greuter; Astragalus thracicus Griseb. subsp. parnassi (Boiss.) Strid; Tragacantha parnassi (Boiss.) Kuntze
Astragalus jankae Degen & Bornm. (Astracantha jankae (Degen & Bornm.) Podlech; A. thracica subsp. jankae (Degen & Bornm.) Greuter; Astragalus thracicus subsp. jankae (Degen & Bornm.) Vălev)

Taxonomy and nomenclature. In Fl. Eur. *Astragalus jankae* is mentioned in a note under *A. thracicus* as a taxonomically obscure plant appearing intermediate between *A. parnassi* and *A. trojanus* [= *A. thracicus*]. – W. Greuter, Willdenowia 15: 426 (1986) (as *Astracantha thracica* subsp. *jankae* and subsp. *parnassi*).

Diploid with 2n=16 (Mk): M. Šopova & Ž. Sekovski, Ann. Fac. Biol. Univ. Skopje. 34: 65–76 (1981) (as *Astragalus parnassi*).

Notes. Al, Bu, Gr, Ko, Mk. "From N.W. Macedonia and Thrace to S.C. Greece" (Fl. Eur.).

Data wanted: Al, Bu, Gr, Ko, Mk

A. parnassi subsp. **calabricus** (Fisch.) Maassoumi – Map 0000.

Astracantha parnassi (Boiss.) Podlech subsp. calabra Podlech, nom. illeg.; Astragalus calabricus Fisch. (Astracantha parnassi subsp. calabrica (Fisch.) Podlech; A. thracica (Boiss.) Podlech subsp. calabrica (Fisch.) Podlech; Astragalus siculus Raf. subsp. calabricus (Fisch.) Arcang.); A. calabrus Fiori, nom. illeg.; A. parnassi subsp. calabrus Chater, nom. illeg.

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus parnassi* subsp. *calabrus* "(Fiori) Chater". – W. Greuter, Willdenowia 15: 426 (1986) (as *Astracantha thracica* subsp. *calabrica*); D. Podlech, Sendtnera 1: 270 (1993). **The *calabrus* nomenclature and its legitimacy are still in need

of revision.**

Diploid with 2n=16 (It): O. Pellegrini, Delpinoa 5: 3–8 (1963), S. Brullo et al., Inform. Bot. Ital. 9: 57–71 (1977) (in both as *Astragalus calabrus*).

Notes. It. "Calabria" (Fl. Eur.).

Data wanted: It

Astragalus thracicus Griseb. – Map 0000.

Incl. Astragalus trojanus Steven ex Fisch.

Taxonomy and nomenclature. In Fl. Eur. subsp. *thracicus* is treated as *Astragalus thracicus* and *A. trojanus*, and subsp. *monochorum* is mentioned in a note under *A. thracicus* as a taxonomically obscure plant appearing intermediate between *A. parnassi* subsp. *parnassi* and *A. thracicus*. – J. Ponert, Feddes Repert. 83: 628 (1973) (as *A. thracicus* with three subspecies and as *A.* × *pseudoparnassi*, which regarded as *A. parnassi* × *A. thracicus*); Fl. Turkey 1970: 164–165 ("Doubtfully distinct from *A. trojanus.*"); K. Micevski & E. Mayer, Acta Bot. Croat. 43: 307–311 (1984); I. Uysal, Erc. Ünv. Fen Bil. Derg. 13(1–2): 54–66 (1997) (as *A. trojanus*); Podlech & Zarre 2013: 1407–1409.

A. thracicus subsp. **thracicus** – Map 0000.

Astracantha thracica (Griseb.) Podlech; Tragacantha thracica (Griseb.) Kuntze
Astragalus mitchellianus Boiss. (Astracantha mitchelliana (Boiss.) Podlech; Tragacantha mitchelliana (Boiss.) Kuntze)
A. parnassi Boiss. var. samothracicus Širj.
A. × pseudoparnassi Ponert
A. ptilodes Boiss. subsp. paraptilodes Ponert
A. thracicus subsp. baytopianus Ponert
A. trojanus Steven ex Fisch. (A. thracicus subsp. trojanus (Steven ex Fisch.) Ponert; Astracantha trojana (Steven ex Fisch.) Podlech)
A. warburgii Bornm. (Astracantha warburgii (Bornm.) Podlech)

Tetraploid with 2n=32 (Bu): B.A. Kuzmanov, Taxon 23: 808 (1974) (as *Astragalus thracicus*).

Notes. For details concerning Mk and Tu, see K. Micevski & E. Mayer, Acta Bot. Croat. 43: 307–311 (1984), and I. Uysal, Erc. Ünv. Fen Bil. Derg. 13(1–2): 54–66 (1997) (as *Astragalus trojanus*), respectively.

Total range. Outside Europe, present in W. Anatolia.

Data wanted: Bu, Gr, Mk, Tu

A. thracicus subsp. **monachorum** (Širj.) Strid – Map 0000.

Astragalus monachorum Širj. (Astracantha monochorum (Širj.) Podlech; A. thracica subsp. monachorum (Širj.) Greuter)

Endemic to Europe (Greece: Áthos).

Data wanted: Gr

Astragalus sect. **Rhacophorus** Bunge – Map 0000.

Sect. Macrothrix Širj.
Sect. Microthrix Širj.
Sect. Platonychium Bunge
Sect. Stenonychium Bunge

Astragalus arnacantha M. Bieb. – Map 0000.
Astracantha arnacantha (M. Bieb.) Podlech; Tragacantha arnacantha (M. Bieb.) Kuntze
Astragalus criacanthus Fisch.

Taxonomy and nomenclature. Podlech & Zarre 2013: 1431–1432.

Notes. Bu omitted (given in Fl. Eur.), the material being referable to *Astragalus microcephalus*.

Endemic to Europe (S. Crimea).

Data wanted: Cm

Astragalus creticus Lam. – Map 0000.

Excl. Astragalus rumelicus Bunge (A. creticus subsp. rumelicus (Bunge) Maire & Petitm.)

Taxonomy and nomenclature. S. Brullo & G. Giusso del Galdo, Nord. J. Bot. 21: 475–480 (2001), Israel J. Pl. Sci. 51: 307–316 (2003); Podlech & Zarre 2013: 1444–1445.

Diploid with 2n=16 (**): D. Cartier, Rev. Cytol. Biol. Vég., Bot. 2: 169–181 (1979).

Notes. Al, ?Ju and Gr omitted (given in Fl. Eur.), due to the recognition of *Astragalus rumelicus* as a distinct species.

Endemic to Crete.

A. creticus subsp. **creticus** – Map 0000.
Astracantha cretica (Lam.) Podlech; Astragalus cretensis Pall., nom. illeg.; Tragacantha cretica (Lam.) Kuntze

Diploid with 2n=16 (Cr): B. de Montmollin, Bot. Helv. 94: 262 (1984).

Notes. Cr (subspecies not recognized in Fl. Eur.).

Data wanted: Cr

A. creticus subsp. **minoicus** Brullo & Giusso 2003 – Map 0000.

Notes. Cr (taxonomic novelty).

Data wanted: Cr

Astragalus cylleneus Boiss. & Heldr. ex Fisch. – Map 0000.
Astracantha parnassi (Boiss.) Podlech subsp. cylleneus (Boiss. & Heldr. ex Fisch.) Podlech; A. thracica (Griseb.) Podlech subsp. cyllenea (Boiss. & Heldr. ex Fisch.) Greuter; Astragalus parnassi Boiss. subsp. cylleneus (Boiss. & Heldr. ex Fisch.) Hayek; A. thracicus Griseb. subsp. cylleneus (Boiss. & Heldr. ex Fisch.) Strid
Astragalus calavrytensis Beauverd & Topali

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus parnassi* subsp. *cylleneus.* – W. Greuter, Willdenowia 15: 426 (1986) (as *Astracantha thracica* subsp. *cyllenea*); Podlech & Zarre 2013: 1446–1447.

Endemic to Europe (Greece: N. Peloponnisos).

Data wanted: Gr

Astragalus dolinicola (Brullo & Giusso) Brullo & Giusso 2003 – Map 0000.
Astracantha dolinicola Brullo & Giusso

Taxonomy and nomenclature. S. Brullo & G. Giusso del Galdo, Nord. J. Bot. 21: 475–480 (2001) (as *Astracantha dolinicola*), Israel J. Pl. Sci. 51: 307–316 (2003); F. Ghahremaninejad, Nord. J. Bot. 23: 711–712 (2006), Ann. Naturhist. Mus. Wien, B 115: 237 (2013); Podlech & Zarre 2013:

1453.

Notes. Cr (taxonomic novelty).

Endemic to Crete (Psiloritis).

Data wanted: Cr

Astragalus granatensis Lam. – Map 0000.

Astracantha granatensis (Lam.) Podlech; Astragalus creticus Lam. subsp. granatensis (Lam.) Rivas Goday & Borja; A. poterium Vahl, nom. illeg.; Tragacantha granatensis (Lam.) Kuntze
Astragalus boissieri Fisch. (A. creticus subsp. boissieri (Fisch.) Rivas Goday & Borja, nom. inval.; Tragacantha boissieri (Fisch.) Kuntze)
A. boissieri subsp. maroccanus Font Quer (A. meuselii Romo)

Excl. Astragalus nebrodensis (Guss.) Strobl and A. siculus Biv. (A. granatensis subsp. siculus (Biv.) Franco & P.C. Silva)

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; as *Astragalus granatensis* subsp. *granatensis*); Fl. Iber. 1999: 310–312; Podlech & Zarre 2013: 1469–1471.

Diploid with 2n=16 (Bl, Hs): M. Guinochet & M. Lefranc, Taxon 21: 497 (1972) (as *Astragalus poterium*); A. Pretel Martínez, Taxon 23: 804 (1974) (as *A. granatensis* subsp. *granatensis*); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978) (as *A. granatensis* subsp. *granatensis*).

Notes. Bl added (not given in Fl. Eur.). Si omitted (given in Fl. Eur.), due to the exclusion of *Astragalus nebrodensis* and *A. siculus*. – For details of the distribution and ecology in N. Spain, see A. Molina & J. Izco, Trab. Dept. Bot. Univ. Complut. Madrid 13: 83–97 (1986), and J.V. Ferrández Palacio, Lucas Mallada 8: 73–88 (1996).

Total range. Outside Europe, present in Morocco.

Data wanted: Bl, Hs

Astragalus laconicus Iatrou & Kit Tan 1999 – Map 0000.

Taxonomy and nomenclature. K. Tan & G. Iaotrou, Willdenowia 29: 56–58 (1999); Podlech & Zarre 2013: 1476–1477.

Notes. Gr (taxonomic novelty).

Endemic to Europe (Greece: Laconia).

Data wanted: Gr

Astragalus microcephalus Willd. – Map 0000.

Astracantha microcephala (Willd.) Podlech; Tragacantha microcephala (Willd.) Kuntze
Astragalus adustus Bunge (Astracantha adusta (Bunge) Podlech; Tragacantha adusta (Bunge) Kuntze)
A. aitosensis Ivan. (Astracantha aitosensis (Ivan.) Podlech; A. arnacantha (M. Bieb.) Podlech subsp. aitosensis (Ivan.) Reer & Podlech)
A. atenicus Ivan.
A. bibracteolatus Širj. & Rech. f.
A. bienertii Bunge (Astracantha bienertii (Bunge) Podlech; Tragacantha bienertii (Bunge) Kuntze)
A. brantii Eig
A. erinaceus Fisch. 1853 non C. Presl 1845 (Astracantha erinacea (Fisch.) Podlech; Tragacantha erinacea (Fisch.) Kuntze)
A. fissilis Freyn & Sint.
A. fissilis subsp. neglectus Freyn
A. gerruensis Bornm. & Širj.

A. getschesarensis Širj. & Bornm.
A. ghilanicus Fisch. (Astracantha ghilanica (Fisch.) Podlech; Tragacantha ghilanica (Fisch.) Kuntze)
A. glaucopsiformis Maassoumi
A. gudrathi Al. Fed., Fed. & Rzazade (Astracantha gudrathi (Al. Fed., Fed. & Rzazade) Podlech)
A. pirimukurunicus Eig
A. pycnocladus Boiss. & Hausskn. (A. microcephalus subsp. pycnocladus (Boiss. & Hausskn.) Širj.)
A. pycnophyllus Steven
A. senganensis Bunge (Tragacantha senganensis (Bunge) Kuntze)
A. terekensis Al. Fed., Fed. & Rzazade

Phylogenetics. M. Mehrnia et al., Biochem. Syst. Ecol. 33: 149–158 (2005) (intra- and inter-specific relationships within the *Astragalus microcephalus* complex using RAPD; *A. microcephalus* as "one of the most problematic species" of the section *Rhacophorus*).

Taxonomy and nomenclature. In Fl. Eur. evidently included in *Astragalus arnacantha* as its Bulgarian population. – Fl. Turkey 1970: 132–133; A. Pirani et al., Flora 201: 240–247 (2006) (spine anatomy and its systematic application in *Astragalus* sect. *Rhacophorus*); Podlech & Zarre 2013: 1486–1491.

Diploid and tetraploid. 2n=16 reported by D. Cartier, Rev. Cytol. Biol. Vég., Bot. 2: 169–181 (1979), for material from **. – 2n=32 reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1520 (1989), for material from Caucasia, and M. Sheidai et al., Caryologia 62: 31–32 (2009), for material from Iran.

Notes. Bu (floristic novelty). – For details of the distribution and ecology, see V. Velchev & I. Bondev in Anon. (ed.), V čest na Akademik Daki Jordanov, pp. 121–159 (Sofija 1975), and I. Apostolova & M. Dimitrova, Phytol. Balcan. 8: 341–346 (2002) (in both as *Astragalus aitosensis*).

Total range. Main range in Caucasia, Anatolia, N.E. Iraq and Iran.

Data wanted: Bu

Astragalus nebrodensis (Guss.) Strobl – Map 0000.

Astracantha nebrodensis (Guss.) Greuter; Astragalus siculus Biv. var. nebrodensis Guss.

Taxonomy and nomenclature. In Fl. Eur. (Index) included in *Astragalus granatensis* subsp. *granatensis* [= *A. granatensis*]. – W. De Leonardis et al., Boll. Acc. Gioenia Sci. Nat. 19: 143–167 (1986) (palynology); W. De Leonardis & A. Zizza, Acta Bot. Malac. 19: 217–229 (1994) (palynology; pollen grains of *A. nebrodensis* and *A. siculus* differing from each other); Podlech & Zarre 2013: 1496–1497.

Diploid with 2n=16 (Si (S)): S. Brullo et al., Inform. Bot. Ital. 9: 57–71 (1977).

Notes. Si (S) (the species not recognized in Fl. Eur.).

Endemic to Sicily (Madonie Mts. and Nebrodi Mts.).

Data wanted: Si (S)

Astragalus rumelicus Bunge – Map 0000.

Astracantha cretica (Lam.) Podlech subsp. rumelica (Bunge) Podlech; A. rumelica (Bunge) Reer & Podlech; Astragalus creticus Lam. subsp. rumelicus (Bunge) Maire & Petitm.; A. veluchensis Boiss., nom. illeg.; Tragacantha rumelica (Bunge) Kuntze
Astracantha rumelica subsp. taygetica (Širj.) Reer & Podlech
Astragalus albanicus Širj.

Taxonomy and nomenclature. In Fl. Eur. treated as *Astragalus creticus* subsp. *rumelicus*. – Podlech & Zarre 2013: 1515–1517.

Notes. Ju not confirmed (?Ju given in Fl. Eur.).

Endemic to Europe.

Data wanted: Al, Gr

Astragalus siculus Biv. – Map 0000.

Astracantha granatensis (Lam.) Podlech subsp. sicula (Biv.) Podlech; Astracantha sicula (Biv.) Greuter; Astragalus granatensis Lam. subsp. siculus (Biv.) Franco & P.C. Silva

Taxonomy and nomenclature. In Fl. Eur. treated as *Astragalus granatensis* subsp. *siculus*. – W. De Leonardis et al., Boll. Acc. Gioenia Sci. Nat. 19: 143–167 (1986) (palynology); W. De Leonardis & A. Zizza, Acta Bot. Malac. 19: 217–229 (1994) (palynology; pollen grains of *A. nebrodensis* and *A. siculus* differing from each other); Podlech & Zarre 2013: 1518.

Tetraploid with 2n=32 (Si (S)): S. Brullo et al., Inform. Bot. Ital. 9: 57–71 (1977); J.A. Devesa et al., Taxon 37: 920 (1988).

Notes. For the ecology of the species, see G. Eberle, Jahrb. Nassau. Verh. Naturkunde 101: 97–104 (1971).

Endemic to Sicily (Madonie Mts. and Etna).

Data wanted: Si (S)

Astragalus sect. **Uliginosi** A. Gray

Sect. Euodmus Bunge

Taxonomy. C. Vural et al., Pl. Syst. Evol. 274: 255–263 (2008) (seed morphology and its systematic implications; *Astragalus falcatus* and *A. odoratus* having different seed types corroborating the earlier hypothesis that *A. falcatus* is not closely related to other members of the Old World section *Uliginosi*).

Astragalus falcatus Lam. – Map 0000.

Craccina falcata (Lam.) Steven; Tragacantha falcata (Lam.) Kuntze
Astragalus virescens Aiton

Taxonomy and nomenclature. Podlech & Zarre 2013: 1542–1543.

Diploid chromosome number 2n=16 reported by E. Kreuter, Planta 11: 26 (1930), for cultivated material, and A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 65: 837 (1980), for material from Caucasia.

Notes. "[*Rm]" omitted (given in Fl. Eur.).

Total range. Outside Europe, present in Anatolia, Caucasia and S.W. Siberia.

Data wanted: Rus (C, E)

Astragalus odoratus Lam. – Map 0000.

Solenotus odoratus (Lam.) Steven; Tragacantha odorata (Lam.) Kuntze
Astragalus videus Parsa

Taxonomy and nomenclature. Podlech & Zarre 2013: 1543–1545.

Notes. [Br, It] added (not given in Fl. Eur., though "… perhaps naturalized in C. Italy" given in a note under the species): Pignatti Fl. 1982: 660; F. Conti, Bocconea 10: 80 (1998) (as "Adv. casual" in It).

Total range. Outside Europe, present in Anatolia, Syria, Iran, Caucasia and Asiatic Kazakhstan.

Data wanted: [Br], ?Gr, [It], Mk

Astragalus sect. **Picrophace** Bunge

Astragalus amarus Pall. – Map 0000.

Tragacantha amara (Pall.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1552–1553.

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.).

Total range. Outside Europe, present in Asiatic Kazakhstan, Turkmenistan and Uzbekistan.

Data wanted: Kaz, Rus (C, E)

Astragalus sect. **Onobrychoidei** DC.

Macrosema Steven
Sect. Asciocalyx Bunge
Sect. Onobrychides A. Gray
Sect. Onobrychiopsis Golosk.
Sect. Onobrychium Bunge, nom. illeg.
Sect. Xerophilus Bunge

Phylogenetics. N. Ghorbani Nohooji et al., Iran. J. Bot. 18: 239–248 (2012).

Taxonomy. C. Vural et al., Pl. Syst. Evol. 274: 255–263 (2008) (seed morphology and its systematic implications; species from the sections *Onobrychoidei* and *Ornithopodium* were placed in separate groups according to seed types and different seed types included species from both sections, i.e. the sections appeared so closely related that the species from them were intermixed).

Astragalus leontinus Wulfen – Map 0000.

Astragalus tauricus Pall., nom. illeg.; Glandula leontina (Wulfen) Medik., nom. illeg.; Solenotus leontinus (Wulfen) Steven; Tragacantha leontina (Wulfen) Kuntze
A. murrii Huter

Taxonomy and nomenclature. Podlech & Zarre 2013: 1602–1603.

Tetraploid with 2n=32 (He): C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 82: 270–271, 273 (1959).

Endemic to Europe.

Data wanted: Au, ?Ct, Ga, He, It, ?Sl

Astragalus onobrychis L. – Map 0000.

Macrosema onobrychis (L.) Steven; Tragacantha onobrychis (L.) Kuntze
Astragalus atrocarpus Chamberlain & V.A. Matthews
A. banaticus Heuff.
A. borysthenicus Klokov
A. chaldiranicus Kit Tan & Sorger
A. chlorocarpus Griseb. (A. onobrychis subsp. chlorocarpus (Griseb.) Kožuharov & D.K. Pavlova)
A. dacicus Heuff.
A. goktschaicus Grossh. (A. onobrychis subsp. goktschaicus (Grossh.) Ponert)
A. jelenevskyi Sytin
A. kitianus Sorger
A. kosmaljanicus Rzazade
A. linearifolius Pers. (A. onobrychis subsp. linearifolius (Pers.) Kožuharov & D.K. Pavlova)
A. moldavicus (DC.) Steud.
A. pancicii Heuff.

A. parvifolius Formánek 1898 non Nutt. ex A. Gray 1864
A. pseudohirsutus Nyár.
A. pseudonobrychis Andrz.
A. rasmontii Podlech
A. rochelianus Heuff. ex Griseb. & Schenk
A. skorpilii Velen. (A. onobrychis subsp. skorpilii (Velen.) Kožuharov & D.K. Pavlova)
A. sofianus Velen.
A. trichocarpus Scheele
A. troitzkii Grossh.
A. varnensis Davidov

Phylogenetics. N. Ghorbani Nohooji et al., Iran. J. Bot. 18: 239–248 (2012) (phylogeny of sect. *Onobrychoidei*).

Taxonomy and nomenclature. "Extremely variable throughout almost the whole of its range" (Fl. Eur.). – O.D. Visjulina in Fl. RSS Ucr. 6: 472–473 (1954) (as *Astragalus onobrychis* with three varieties and *A. borysthenicus*); M. Guşuleac & E.I. Nyárády in Săvul., Fl. Rep. Pop. Romîne 5: 293–295 (1957) (as *A. onobrychis* with three varieties and numerous formae and *A. pseudohirsutus*); Fl. Turkey 1970: 211; F. Dvořák et al., Folia Geobot. Phytotax. 12: 347–350 (1977) (karyotype); A. Sytin, Novosti Sist. Vyssh. Rast. 33: 132–134 (2001) (*A. jelenevskyi*); M. Pinar et al., Turkish J. Bot. 33: 291–303 (2009) (pollen morphology); Podlech & Zarre 2013: 1593–1594 (*A. jelenevskyi*), 1610–1617 (*A. onobrychis*).

Diploid and (or to) **octoploid**. 2n=16 (BH, Cm): A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1520 (1989); S. Pustahija et al., Plant Soil 373: 431 (2013) (as estimated genome size using cytometry). The same number reported by A.A. Ramak Maassoumi, Iran. J. Bot. 3: 119 (1987), for material from Iran, and A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1519–1521 (1989), for material from Caucasia. – 2n=64 (Cs, Ga, It, Po, Sk): J. Májovský et al., Acta Fac. Rerum Nat. Univ. Comen., Bot. 16: 5 (1970); D. Cartier, Taxon 25: 493 (1976), Rev. Cytol. Biol. Vég., Bot. 2: 169–181 (1979); F. Dvořák et al., Folia Geobot. Phytotax. 12: 349–350 (1977) (also 2n=64+1B); E. Pogan et al., Acta Biol. Cracov. Ser. Bot. 25: 57–77 (1983); Marhold et al. 2007: 120. The same number reported by D. Cartier, Taxon 25: 493 (1976), for material from Anatolia, A.K. Sytin, Bot. Zhurn. (Moscow & Leningrad) 69: 680 (1984), for material from Caucasia (as *Astragalus goktschaicus*), and A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1520 (1989), for material from Caucasia. – The tetraploid number 2n=32 reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1520, 1521 (1989), for material from Caucasia (as *A. onobrychis* and *A. troitzkii*). – The pentaploid number 2n=40 reported by A.K. Sytin, Bot. Zhurn. (Moscow & Leningrad) 69: 680 (1984), for material from Caucasia (as *A. goktschaicus*).

Notes. Not native (as extinct) in Ge (†Ge given in Fl. Eur.). Hs omitted (given in Fl. Eur.): Fl. Iber. 1999: 280. – Z. Kaplan et al., Preslia 88: 242–243 (2016)

Total range. Outside Europe, present from Caucasia and Anatolia to S.W. Siberia and Mongolia.

Data wanted: Al, Au, BH, Bu, Cg, Cm, Cs, Ct, Ga, [†Ge], Gr, He, Hu, It, Kaz, Ko, Mk, Mo, Po, Rm, Rus (C, E), Se, Sk, Sl, Tu, Uk

Astragalus roemeri Simonk. – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 1622–1623.

Tetraploid with 2n=32 (Rm): O. Sz.-Borsos, Acta Bot. Acad. Sci. Hung. 17: 41 (1971).

Notes. For details of the distribution and ecology of the species, see L. Bartha & A. Bartók, Contr. Bot. Grăd. Bot. "Alexandru Borza" Cluj-Napoca 48: 23–26 (2013).

Endemic to Europe (Romanian Carpathians: Munții Apuseni and Munții Bistriței).

Data wanted: Rm

Astragalus sect. **Hololeuce** Bunge
Sect. Chlorosphaerus Bunge

Astragalus agraniotii Orph. ex Boiss. – Map 0000.
Tragacantha agraniotii (Orph. ex Boiss.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1644–1645.

Endemic to Europe (Greece: Parnon (Malevo)).

Data wanted: Gr

Astragalus fialae Degen – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 1656–1657.

Endemic to Europe.

Data wanted: Al, BH, Cg, Ko

Astragalus idaeus Bunge – Map 0000.
Tragacantha idaea (Bunge) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1666.

Notes. For details of the distribution and ecology, see D. Vassiliades, Bot. Chron. (Patras) 16: 13–17 (2003).

Endemic to Crete (not indicated as such in Fl. Eur.).

Data wanted: Cr

Astragalus sect. **Baldaccia** Sytin & Podlech

Astragalus autranii Bald. – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 1677–1678; K. Tan et al., Phytotaxa 234: 83–89 (2015) (complete and amended description provided; "... placement in *A.* sect. *Hololeuce* would also be appropriate").

Notes. For details of the distribution and ecology, see K. Tan et al., loc. cit.

Endemic to Europe (Albania: Mount Tomorr (Baba Tomorri)).

Data wanted: Al

Astragalus sect. **Ammodendron** Bunge

Phylogenetics. A. Dastpak et al., Biochem. Syst. Ecol. 50: 459–466 (2013) (phylogenetic analysis of the section; well supported *Ammodendron* s. str. clade found, but resolution within it "is very poor due to the low rate of evolutionary change in nucleotides").

Astragalus ammodendron Bunge – Map 0000.

Tragacantha ammodendron (Bunge) Kuntze
Astragalus transcaspicus Freyn & Bornm. (A. ammodendron subsp. transcaspicus (Freyn & Bornm.) Basil.)

Taxonomy and nomenclature. A.K. Sytin & A.P. Laktionov, Bot. Zhurn. (Moscow & Leningrad) 92: 905–912 (2007); Podlech & Zarre 2013: 1698–1699.

Diploid to octoploid. 2n=16 reported by R.O Zakirova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 14: 59–61 (1985), for material from **, Bot. Mater. Gerb. Inst. Bot. Akad. Nauk Uzbeksk. SSR 2: 46–50 (1989), for material from ** (as *Astragalus transcaspicus*), and R.O. Zakirova & I.I. Nafanailova, Bot. Zhurn. (Moscow & Leningrad) 73: 1493 (1988), for material from Asiatic Kazakhstan (as *A. transcaspicus*). – 2n=48, c. 64 reported by R.O Zakirova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 14: 59–61 (1985), for material from **.

Notes. Kaz, Rus (E) (floristic novelty): A.P. Laktionov, Izv. Samarsk. Naucn. Chenm. Ross. Akad. Naukch. 10: 358-359 (2008).

Total range. Outside Europe, present in Asiatic Kazakhstan, Turkmenistan and Uzbekistan.

Data wanted: Kaz, Rus (E)

Astragalus baeri Sytin & Laktionov 2007 – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 1701.

Notes. Rus (E) (taxonomic novelty).

Endemic to Europe (Russia: Astrakhan Province).

Data wanted: Rus (E)

Astragalus sect. **Ornithopodium** Bunge

Taxonomy. C. Vural et al., Pl. Syst. Evol. 274: 255–263 (2008) (seed morphology and its systematic implications; species from the sections *Onobrychoidei* and *Ornithopodium* were placed in separate groups according to seed types and different seed types included species from both sections, i.e. the sections appeared so closely related that the species from them were intermixed).

Astragalus algerianus E. Sheld. – Map 0000.

Astragalus tenuifoliolosus Maire, nom. illeg.; A. tenuifolius Desf. 1799 non L. 1763 (Tragacantha tenuifolia (Desf.) Kuntze)
A. stenophyllus Rouy

Taxonomy and nomenclature. In Fl. Eur. given as "*Astragalus tenuifoliosus*". – Fl. Iber. 1999: 327, 328; Podlech & Zarre 2013: 1763–1764.

Notes. Extinct in Hs (in Fl. Eur. given as extant).

Total range. Outside Europe, present in N.W. Africa (Morocco, Algeria, Tunisia).

Data wanted: †Hs

Astragalus mesopterus Griseb. – Map 0000.

Tragacantha mesoptera (Griseb.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1774–1775.

Endemic to Europe.

Data wanted: Bu, Gr, ?Tu

Astragalus mugosaricus Bunge – Map 0000.

Tragacantha mugosarica (Bunge) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1794–1795.

Notes. Rus (C) (floristic novelty): Z.N. Ryabinina et al., Vestnik OGY 12(131): 136 (2011).

Total range. Outside Europe, present in Asiatic Kazakhstan.

Data wanted: Rus (C)

Astragalus sect. **Craccina** (Steven) Bunge – Map 0000.

Craccina Steven

Astragalus arenarius L. – Map 0000.

Kirschneria arenaria (L.) Opiz; Philammos arenarius (L.) Steven; Tragacantha arenaria (L.) Kuntze

Taxonomy and nomenclature. E.S. Nemirova & N.V. Martynov, Bull. Moscow Reg. State Univ, Nat. Sci. 2009(1): 75–80 (2009) (morphology and anatomy of seeds), 2009(4): 149–154 (2009) (pollen morphology); Podlech & Zarre 2013: 1799–1801.

Diploid with 2n=16 (By): L.V. Semerenko, Bot. Zhurn. (Moscow & Leningrad) 74: 1671 (1989).

Notes. In Fe extinct as an established alien (in Fl. Eur. given as an extant neophyte). Native in Ge (both Ge and [Ge] given in Fl. Eur.). Rm added (Rm not given in Fl. Eur.). – For details of the distribution in Cs, see R. Prausová, Východočeský sborník přírodovědný Práce a Studie 12: 109–111 (2005), and Z. Kaplan et al., Preslia 88: 234, 236 (2016). For the reproduction and genetic diversity of the fragmented populations of Es and La, see T. Kull & V. Jaaska, Ann. Bot. Fenn. 51: 90–100 (2014).

Endemic to Europe.

Data wanted: By, Cs, Es, Ge, La, Lt, Po, Rm, Rus (C, E, Ka, N), Sk, Su, Uk

Astragalus austriacus Jacq. – Map 0000.

Astragalus dichopterus Pall., nom. illeg. (Oxytropis dichoptera (Pall.) DC.; A. sulcatus Lam. 1779 non L. 1753; Craccina austriaca (Jacq.) Steven; Phaca austriaca (Jacq.) Medik.; Tragacantha austriaca (Jacq.) Kuntze
A. olopterus DC.

Incl. A. tenuifolius L.

Excl. Astragalus scopaeformis Ledeb.

Taxonomy and nomenclature. In Fl. Eur. treated as *Astragalus austriacus* and *A. tenuifolius*, the latter with *A. scopaeformis* ("scopiformis") as a synonym. – F. Dvořák et al., Folia Geobot. Phytotax. 12: 347–350 (1977) (karyotype); D. Podlech, Sendtnera 1: 271 (1993) (*A. tenuifolius*); Podlech & Zarre 2013: 1801–1804.

Diploid with 2n=16 (Cs, Sk): F. Dvořák et al., Folia Geobot. Phytotax. 12: 347 (1977); Mardold et al. 2007: 119. The same number reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 65: 837 (1980), for material from Caucasia.

Notes. [†Tu] added (not given in Fl. Eur.): Fl. Turkey 1970: 195 ("This species has not been collected again in Turkey and is possibly alien."). – For details concerning Cs, see Z. Kaplan et al., Preslia 88: 237, 239 (2016).

Total range. Outside Europe, present in Caucasia, Asiatic Kazakhstan and S.W. Siberia. – MJW

1965: map 244a.

Data wanted: Au, Bu, Cm, Cs, Ct, Ga, Hs, Hu, It, Kaz, Mo, Rm, Rus (C, E), Se, Sk, [†Tu], Uk

Astragalus baionensis Loisel. – Map 0000.

Solenotus baionensis (Loisel.) Steven; Tragacantha baionensis (Loisel.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1804.

Notes. Extinct in Hs (in Fl. Eur. given as extant).

Endemic to Europe.

Data wanted: Ga, †Hs

Astragalus clerceanus Iljin & Krasch. – Map 0000.

Astragalus clerceanus subsp. graniticus Knjaz.

Taxonomy and nomenclature. N.V. Kulikov et al., Endemichnye rasteniya Urala vo flore Sverdlovskoi oblasti, pp. 205–211 (Ekaterinburg 2013) (with subsp. *graniticus*); Podlech & Zarre 2013: 1805–1806.

Notes. Rus (C) added (Rs (C) not given in Fl.Eur.).

Total range. Outside Europe, present in Siberia N.E. of Yekaterinburg (in Fl. Eur. indicated as endemic to Europe).

Data wanted: Rus (C, E)

Astragalus filiformis (DC.) Poir. – Map 0000.

Oxytropis filiformis DC.
Astragalus tauricus auct.
Craccina taurica Steven

Taxonomy and nomenclature. In Fl. Eur. probably included in *Astragalus tenuifolius* [= *A. austriacus*] by giving "*A. tauricus* Pallas pro parte" as its synonym. – Podlech & Zarre 2013: 1808–1809.

Notes. Cm (the species not recognized in Fl. Eur.)

Endemic to Europe (S. Crimea).

Data wanted: Cm

Astragalus scopaeformis Ledeb. – Map 0000.

Astragalus tauricus Pall. subsp. scopaeformis (Ledeb.) L.I. Vassiljeva; Craccina scopaeformis (Ledeb.) Steven
A. tenuifolius auct.

Taxonomy and nomenclature. In Fl. Eur. included in *Astragalus tenuifolius* [= *A. austriacus*]. – Podlech & Zarre 2013: 1814.

Notes. Kaz, Rus (C, E) (the species not recognized in Fl. Eur.)

Total range. Outside Europe, present in Asiatic Kazakhstan and S.W. Siberia.

Data wanted: Kaz, Rus (C, E)

Astragalus silvisteppaceus Knjaz. 2007 – Map 0000.
Astragalus austriacus auct.

Taxonomy and nomenclature. N.V. Kulikov et al., Endemichnye rasteniya Urala vo flore Sverdlovskoi oblasti, pp. 211–215 (Ekaterinburg 2013); Podlech & Zarre 2013: 1814–1815.

Notes. Rus (C) (taxonomic novelty).

Endemic to Europe (Russia: C. Ural).

Data wanted: Rus (C)

Astragalus sulcatus L. – Map 0000.
Astragalus leptostachys Pall., nom. illeg. (Craccina leptostachys (Pall.) Steven); Craccina sulcata (L.) Steven; Tium sulcatum (L.) Medik.; Tragacantha sulcata (L.) Kuntze
A. holopterus Bunge 1868 non A. olopterus DC. 1825

Taxonomy and nomenclature. Podlech & Zarre 2013: 1815–1816.

Diploid with 2n=16 (Au): C. Dobeš et al., Verh. Zool.-Bot. Ges. Wien 133: 308 (1996). The same number reported by A.A. Krasnikov & D.N. Schaulo, Bot. Zhurn. (Moscow & Leningrad) 75: 119 (1990), for material from S. Siberia.

Notes. Cm added (Rs (K) not given in Fl. Eur.). Cz omitted (given in Fl. Eur.).

Total range. Outside Europe, present in S.W. Siberia, Asiatic Kazakhstan, Mongolia and N. China.

Data wanted: Au, Cm, Hu, Kaz, Mo, Rus (C, E), Uk

Astragalus sect. **Dissitiflori** DC. – Map 0000.
Pedina Steven
Sect. Cystodes Bunge
Sect. Pedina (Steven) Bunge
Sect. Tricholobos Freyn, nom. illeg.
Sect. Xiphidium Bunge

Phylogenetics. L. Bartha et al., Botany 91: 702–714 (2013) (molecular evidence for reticulate speciation and allopolyploidy); R. Sheikh Akbari Mehr et al., Iran. J. Bot. 18: 1–9 (2012).

Astragalus albicaulis DC. – Map 0000.
Solenotus albicaulis (DC.) Steven; Tragacantha albicaulis (DC.) Kuntze
Astragalus dealbatus Pall., nom. illeg.

Incl. Astragalus glaucus M. Bieb.

Taxonomy and nomenclature. In Fl. Eur. *Astragalus glaucus* is recognized as a distinct species. – M. Guşuleac & E.I. Nyárády in Săvul., Fl. Rep. Pop. Romîne 5: 308, 309, 311 (1957) (as *A. glaucus* with three varieties and *A. albicaulis*); A.S. Bădărău et al., Stud. Univ. Babeş-Bolyai, Geogr. 45: 125–127 (2000); L. Bartha et al., Contr. Bot. Grad. Bot. "Alexandru Borza" Cluj-Napoca 47: 59–66 (2012) (multivariate morphometrics), Botany 91: 702–714 (2013); Podlech & Zarre 2013: 1850–1851.

Octoploid with 2n=64 (Bu): D.K. Pavlova & S.I. Kozhuharov, Fitologija 44: 75 (1993) (as *Astragalus glaucus*).

Notes. Bu, Mo and Uk added (Bu and Rs (W) not given in Fl. Eur.). Cm and Rm added (Rm and Rs (K) not given in Fl. Eur.), due to the inclusion of *Astragalus glaucus*.

Total range. Outside Europe, present in Caucasia. – MJW 1965: map 244c [excludes *Astragalus*

glaucus].

Data wanted: Bu, Cm, Mo, Rm, Rus (C, E), Uk

Astragalus apollineus Boiss. & Heldr. – Map 0000.
Tragacantha apollinea (Boiss. & Heldr.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1856.

Diploid with 2n=16 (Gr): G.-H. Leute, Taxon 26: 451 (1977).

Endemic to Europe (Greece: Parnassos).

Data wanted: Gr

Astragalus aquilanus Anzal. 1970 – Map 0000.

Taxonomy and nomenclature. B. Anzalone, Webbia 24: 723–734 (1970); Podlech & Zarre 2013: 1857.

Diploid with 2n=16 (It): M. Pogliani, Inform. Bot. Ital. 3: 155–157 (1971).

Notes. It (taxonomic novelty). – For details of the distribution and ecology, see L. Veri, Lav. Soc. Ital. Biogeogr. N.S. 2: 81–87 (1971).

Endemic to Europe (Italy: Abruzzo, ?Calabria).

Data wanted: It

Astragalus asper Jacq. – Map 0000.
Astragalus chloranthus Pall., nom. illeg.; Pedina aspera (Jacq.) Steven; Phaca aspera (Jacq.) Medik.; Solenotus asper (Jacq.) Steven; Tragacantha aspera (Jacq.) Kuntze

Taxonomy and nomenclature. M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 286–289 (1957); L. Bartha et al., Botany 91: 702–714 (2013); Podlech & Zarre 2013: 1861–1863.

Hexaploid with 2n=48 (Sk): Marhold et al. 2007: 118. The same number reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 65: 837 (1980), 74: 1519 (1989), for material from Caucasia.

Notes. Se added (Ju not given in Fl. Eur.). – For details concerning Rm and Cs, see A.S. Bădărău et al., Stud. Univ. Babeş-Bolyai, Geogr. 45: 129–130 (2000), and Z. Kaplan et al., Preslia 88: 234–239 (2016), respectively.

Total range. Outside Europe, present in Caucasia. – MJW 1965: map 243d; Hultén & Fries 1986: map 1193.

Data wanted: Au, Bu, Cm, †Cs, Hu, Mo, Rm, Rus (C, E), Se, Sk, Uk

Astragalus astrachanicus Sytin & Laktionov 2007 – Map 0000.

Taxonomy and nomenclature. A.K. Sytin & A.P. Laktionov, Bot. Zhurn. (Moscow & Leningrad) 92: 905–912 (2007); M.S. Knyasev & P.V. Kulikov, Bot. Zhurn. (Moscow & Leningrad) 96: 1357–1369 (2011); Podlech & Zarre 2013: 1863.

Notes. Rus (E) (taxonomic novelty).

Endemic to Europe (Russia: Kalmykia).

Data wanted: Rus (E)

Astragalus brachylobus DC. – Map 0000.

Tragacantha brachyloba (DC.) Kuntze

Taxonomy and nomenclature. A.K. Sytin, Bot. Zhurn. (Moscow & Leningrad) 84(12): 117–124 (1999); Podlech & Zarre 2013: 1871–1872.

Chromosome number. 2n=c. 90 reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1519 (1989), for material from Caucasia.

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.). Cm omitted (Rs (K) given in Fl. Eur.).

Total range. Outside Europe, present in Caucasia, Asiatic Kazakhstan and S.W. Siberia.

Data wanted: Kaz, Rus (C, E)

Astragalus corniculatus M. Bieb. – Map 0000.

Philammos corniculatus (M. Bieb.) Steven; Tragacantha corniculata (M. Bieb.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1876–1877.

Notes. Bu added (not given in Fl. Eur.). – For details concerning Rm, see A. Bartók et al., Analele Stiint. Univ. Al. I. Cuza Iaşi, Biol. Veg. 60: 87–94 (2014).

Total range. Probably endemic to Europe (in Fl. Eur. indicated as such), but doubtfully recorded from Caucasia.

Data wanted: Bu, Cm, Mo, Rm, Uk

Astragalus cornutus Pall. – Map 0000.

Astragalus vimineus Pall., nom. illeg.; Tragacantha cornuta (Pall.) Kuntze
A. cretophilus Klokov
A. lussiae Rzazade
A. nyaradyanus Prodan
A. odessanus Besser

Phylogenetics. A. Dizkirici Tekpinar et al., Turkish J. Bot. 40: 250–263 (2016) (phylogenetic relationships between *Oxytropis* and *Astragalus* species native to an Old World diversity center [Turkey]).

Taxonomy and nomenclature. M. Klokov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 15: 153–154 (1953) (as *Astragalus odessanus*); M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 300–303, 307 (1957) (as *A. cornutus* and *A. nyaradyanus*); Podlech & Zarre 2013: 1877–1878.

Total range. Outside Europe, present in E. Anatolia, Caucasia, Asiatic Kazakhstan and S.W. Siberia.

Data wanted: Bu, Kaz, Rm, Rus (C, E), Uk

Astragalus gladiatus Boiss. – Map 0000.

Tragacantha gladiata (Boiss.) Kuntze
Astragalus pugionifer Fisch. ex Bunge

Phylogenetics. A. Dizkirici Tekpinar et al., Turkish J. Bot. 40: 250–263 (2016) (phylogenetic relationships between *Oxytropis* and *Astragalus* species native to an Old World diversity center

[Turkey]).

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus pugionifer*. – Podlech & Zarre 2013: 1886–1887.

Diploid with 2n=16 (Bu): D.K. Pavlova & S.I. Kozhuharov, Fitologija 44: 75 (1993).

Notes. Gr added (not given in Fl. Eur.): A. Strid & K. Tan, Willdenowia 29: 58 (1999). Tu omitted (given in Fl. Eur.).

Total range. Outside Europe, present in W. Anatolia. [In Fl. Eur. *Astragalus pugionifer* is indicated as endemic to Europe.]

Data wanted: Bu, Gr, Mk

Astragalus hispanicus Coss. ex Bunge – Map 0000.

Astragalus hegelmaieri Willk.
Tragacantha alicantensis Kuntze

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology); Fl. Iber. 1999: 336, 337; Podlech & Zarre 2013: 1889–1890.

Diploid with 2n=16 (Hs): A. Pretel Martínez, Taxon 23: 804 (1974); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978).

Endemic to Europe (S.E. Spain).

Data wanted: Hs

Astragalus igoschinae Kamelin & Jurtzev 1982 – Map 0000.

Taxonomy and nomenclature. Fl. Arct. URSS 1986: 59, 61; Podlech & Zarre 2013: 1890–1891.

Notes. Rus (N) (taxonomic novelty).

Endemic to Europe (Russia: N. Ural).

Data wanted: Rus (N)

Astragalus karelinianus Popov – Map 0000.

Taxonomy and nomenclature. N.V. Kulikov et al., Endemichnye rasteniya Urala vo flore Sverdlovskoi oblasti, pp. 448–450 (Ekaterinburg 2013); Podlech & Zarre 2013: 1899.

Notes. Rus (E) added (Rs (E) not given in Fl. Eur.).

Total range. Outside Europe, present in Asiatic Kazakhstan and S.W. Siberia. [In Fl. Eur. indicated as endemic to Europe.]

Data wanted: Rus (C, E)

Astragalus macropus Bunge – Map 0000.

Tragacantha macropus (Bunge) Kuntze
Astragalus olgianus Krits'ka
A. pseudomacropus Knjaz. & Kulikov

Taxonomy and nomenclature. Podlech & Zarre 2013: 1907–1908.

Notes. Uk added (Rs (W) not given in Fl. Eur.).

Total range. Outside Europe, present in Asiatic Kazakhstan and S.W. Siberia.

Data wanted: Kaz, Rus (C, E), Uk

Astragalus muelleri Steud. & Hochst. – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 1916–1917; L. Peruzzi et al., Fl. Medit. 24: 233–238 (2014) (morphological variation; the Italian populations recognized as subsp. *etruscus*).

Endemic to Europe.

A. muelleri subsp. **muelleri** – Map 0000.
Astragalus vegliensis Asch. & Graebn., nom. illeg.; Tragacantha muelleri (Steud. & Hochst.) Kuntze
A. argenteus Vis.

Notes. Cg, Ct (subspecies not recognized in Fl. Eur.).

Data wanted: Cg, Ct

A. muelleri subsp. **etruscus** Peruzzi, Gestri & Pierini 2014 – Map 0000.

Taxonomy. F. Selvi & G. Fiorini, Atti Soc. Tosc. Sci. Nat. Pisa. Mem., ser. B, 101: 153–155 (1995) (karyology; as *Astragalus muelleri*).

Diploid with 2n=16 (It): F. Selvi & G. Fiorini, Atti Soc. Tosc. Sci. Nat. Pisa. Mem., ser. B, 101: 154, 155 (1995) (as *Astragalus muelleri*).

Notes. It (taxonomic novelty).

Data wanted: It

Astragalus neokarelinianus Knjaz. 2009 – Map 0000.
Astragalus karelinianus auct.

Taxonomy and nomenclature. Podlech & Zarre 2013: 1917.

Notes. Rus (C) (taxonomic novelty).

Total range. Outside Europe, present in S.W. Siberia (Asiatic part of Chelyabinsk Province).

Data wanted: Rus (C)

Astragalus oropolitanus Knjaz. & Kulikov 2002 – Map 0000.

Taxonomy and nomenclature. M.S. Knyazev & P.V. Kulikov, Bot. Zhurn. (Moscow & Leningrad) 87(2): 136-140 (2002); Podlech & Zarre 2013: 1923.

Hexaploid with 2n=48 (Rus (C)): M.S. Knyazev & P.V. Kulikov, Bot. Zhurn. (Moscow & Leningrad) 87(2): 138 (2002).

Notes. Rus (C) (taxonomic novelty).

Total range. Outside Europe, present in the Orenburg Province of Russia S. the River Ural, as well as in Altai.

Data wanted: Rus (C, E)

Astragalus pallescens group

Astragalus pallescens + A. peterfii + A. pseudoglaucus + A. tarchankuticus

Phylogenetics. L. Bartha et al., Botany 91: 702–714 (2013) (molecular evidence for reticulate speciation and allopolyploidy; two distantly related ribotype groups found to be shared by the closely related polyploids *Astragalus pallescens*, *A. peterfii* and *A. pseudoglaucus* suggesting ancient hybridization followed by incomplete lineage sorting (i.e. shared ancestral polymorphism) in nrDNA ITS; reticulation also invoked as an underlying evolutionary process behind the incongruent placement of *A. pseudoglaucus* in nuclear versus plastid phylogenies; species status of all the four taxa corroborated).

Astragalus pallescens M. Bieb. – Map 0000.

Solenotus pallescens (M. Bieb.) Steven; Tragacantha pallescens (M. Bieb.) Kuntze
Astragalus hypanicus Krits'ka

Taxonomy and nomenclature. L. Bartha et al., Contr. Bot. Grad. Bot. "Alexandru Borza" Cluj-Napoca 47: 59–66 (2012) (multivariate morphometrics); Podlech & Zarre 2013: 1925–1926.

Notes. Cm and Rus (C) added (Rs (C, K) not given in Fl. Eur.).

Endemic to Europe.

Data wanted: Cm, Mo, Rus (C, E), Uk

Astragalus peterfii Jáv. – Map 0000.

Phylogenetics. T. Borza et al., Contrib. Bot. 33: 197–201 (1996) (low allozyme polymorphism found).

Taxonomy and nomenclature. A.S. Bădărău et al., Stud. Univ. Babeş-Bolyai, Geogr. 45: 125–127 (2000); P. Pânzaru, Boll. Mus. Regionale. Sci. Nat. Torino 23: 721–727 (2006) (*Astragalus peterfii* synonymized with *A. vesicarius* subsp. *pastellianus*); L. Bartha et al., Contr. Bot. Grad. Bot. "Alexandru Borza" Cluj-Napoca 47: 59–66 (2012) (multivariate morphometrics; "a close morphological relationship" between the octoploid *Astragalus peterfii* and the tetraploid *A. pallescens* detected); Podlech & Zarre 2013: 1927.

Octoploid with 2n=64 (Rm): I. Lungeanu, Taxon 24: 503 (1975).

Notes. For details of the distribution, see A.S. Bădărău et al., Stud. Univ. Babeş-Bolyai, Geogr. 45: 128–129 (2000). For details of the distribution, ecology and conservation of the species, see A. Şuteu et al., Acta Horti Bot. Bucurest. 28: 255–261 (1999) (possibility of *ex situ* concervation), Bocconea 16: 455–464 (2003) (reproductive and distribution patterns).

Endemic to Europe (Romania: Transylvanian Basin).

Data wanted: Rm

Astragalus pseudoglaucus Klokov – Map 0000.

Taxonomy. In Fl. Eur. mentioned in a note under *Astragalus vesicarius* subsp. *pastellianus* as possibly to be included in that taxon. – M. Klokov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 15: 150–152 (1953); A.S. Bădărău et al., Stud. Univ. Babeş-Bolyai, Geogr. 45: 125–127 (2000) (as *A. vesicarius* "ssp. *pseudoglaucus* (Klokov) Ciocârlan"); L. Bartha et al., Contr. Bot. Grad. Bot. "Alexandru Borza" Cluj-Napoca 47: 59–66 (2012) (multivariate morphometrics; *A. pseudoglaucus* and *A. vesicarius* s. l. showing "a substantial morphological overlap"); Podlech & Zarre 2013: 1965–1966 (included in *A. vesicarius* subsp. *vesicarius*).

Notes. Mo, Rm, Uk (the species not recognized in Fl. Eur.).

Endemic to Europe.

Data wanted: Mo, Rm, Uk

Astragalus tarchankuticus Boriss. – Map 0000.

Notes. In Fl. Eur. mentioned in a note under *Astragalus vesicarius* subsp. *pastellianus* as possibly to be included in that taxon. – A. Borissova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 14: 222–225 (1951); A.S. Bădărău et al., Stud. Univ. Babeș-Bolyai, Geogr. 45: 125–127 (2000) (as. *A. vesicarius* "ssp. *tarchankuticus* (Boriss.) comb. nova"); Podlech & Zarre 2013: 1850 (included in *A. albicaulis*).

Notes. Cm (the species not recognized in Fl. Eur.).

Endemic to Europe (Crimea: Tarkhan Peninsula).

Data wanted: Cm

Astragalus pseudotataricus Boriss. – Map 0000.

Astragalus tartaricus (DC.) Popov & Klokov 1946 non A. tataricus Franch. 1884
A. abruptus Krits'ka

Taxonomy and nomenclature. In Fl. Eur. included in *Astragalus subuliformis*. – Podlech & Zarre 2013: 1931.

Hexaploid chromosome number 2n=48 reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1521 (1989), for material from Caucasia

Notes. Cm, Kaz, Rm, Rus (C, E), ?Tu, Uk (the species not recognized in Fl. Eur.).

Total range. Outside Europe, present in Caucasia.

Data wanted: Cm, Kaz, Rm, Rus (C, E), ?Tu, Uk

Astragalus sericophyllus Griseb. – Map 0000.

Tragacantha sericophylla (Griseb.) Kuntze
Astragalus mariovoensis Micevski
A. mayeri Micevski

Taxonomy and nomenclature. Podlech & Zarre 2013: 1939–1940.

Endemic to Europe.

Data wanted: Al, Gr, Mk

Astragalus stenoceras C.A. Mey. – Map 0000.

Philammos stenoceras (C.A. Mey.) Steven; Tragacantha stenoceras (C.A. Mey.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1946–1947.

Notes. Rus (E) (floristic novelty): M.A. Berezutsky et al., Byull. Bot. Sada Saratovsk. Gosuniv. 12: 11–13 (2014).

Total range. Outside Europe, present in S.W. Siberia, Asiatic Kazakhstan, Tadzhikistan, Mongolia and N.W. China.

Data wanted: Rus (E)

Astragalus storozhevae Knjaz. 2002 – Map 0000.
Astragalus albicaulis auct.
A. pallescens auct.

Taxonomy and nomenclature. M.S. Knjazev, Bot. Zhurn. (Moscow & Leningrad) 87(4): 148–152 (2002); Podlech & Zarre 2013: 1948.

Notes. Rus (C, E) (taxonomic novelty).

Total range. Outside Europe, present in Orenburg Province of Russia south of the River Ural and in N.W. Asiatic Kazakhstan.

Data wanted: Rus (C, E)

Astragalus subuliformis DC. – Map 0000.
Astragalus subulatus Pall., 1800 non Desf. 1799; Philammos subulatus (Pall.) Steven; Tragacantha subulata (Pall.) Kuntze

Excl. Astragalus pseudotataricus Boriss. and A. ucrainicus Popov & Klokov

Taxonomy and nomenclature. Podlech & Zarre 2013: 1950–1951.

Notes. Ju, Kaz, Rm, Rus (C, E), Tu and Uk omitted (Ju, Rm, Rs (C, W. E), Tu given in Fl. Eur.), principally due to the exclusion of *Astragalus pseudotataricus* and *A. ucrainicus*.

Endemic to Europe (not indicated as such in Fl. Eur., where the species has a wider circumscription) (Crimea: near Sudak).

Data wanted: Cm

Astragalus temirensis Popov – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 1956–1957.

Notes. Rus (E) (floristic novelty).

Total range. Outside Europe, present in Asiatic Kazakhstan.

Data wanted: Rus (E)

Astragalus ucrainicus Popov & Klokov – Map 0000.

Taxonomy and nomenclature. In Fl. Eur. included in *Astragalus subuliformis*. – L. Bartha et al., Contr. Bot. Grad. Bot. "Alexandru Borza" Cluj-Napoca 47: 59–66 (2012) (multivariate morphometrics), Botany 91: 702–714 (2013); Podlech & Zarre 2013: 1959.

Notes. Cm, Rus (C, E), Uk (the species not recognized in Fl. Eur.).

Total range. Outside Europe, present in Caucasia.

Data wanted: Cm, Rus (C, E), Uk

Astragalus varius S.G. Gmel. – Map 0000.

Taxonomy and nomenclature. A.K. Sytin, Bot. Zhurn. (Moscow & Leningrad) 84(12): 117–124 (1999) (with subsp. *eupatoricus*); L. Bartha et al., Botany 91: 702–714 (2013); Podlech & Zarre 2013: 1962–1964.

Notes. Cm and †Se added (†Ju and Rs (K) not given in Fl. Eur.).

Total range. Outside Europe, present in Caucasia, Asiatic Kazakhstan and S.W. Siberia.

A. varius subsp. **varius** – Map 0000.

Astragalus virgatus Pall., nom. illeg. (Solenotus virgatus (Pall.) Steven)
A. ammophilus M. Bieb. ex Besser
A. novus Winterl

Taxonomy. M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 299–300 (1957) (as *Astragalus virgatus*); M.F. Kozak & I.A. Skvortsova, Estestvennye nauki: Zhurnal fundamental′nykh i prikladnykh issledovanii, Izdatel′skii dom, "Astrakhanskii universitet" 4(41): 58–66 (2012) (karyology).

Diploid with 2n=16 (Bu, Rus (E)): D.K. Pavlova & S.I. Kozhuharov, Fitologija 44: 75 (1993); M.F. Kozak & I.A. Skvortsova, Estestvennye nauki: Zhurnal fundamental′nykh i prikladnykh issledovanii, Izdatel′skii dom, "Astrakhanskii universitet" 4(41): 58–66 (2012) (in both as *Astragalus varius*).

Notes. Bu, Cm, Hu, Kaz, Mo, Rm, Rus (C, E), †Se, Uk (subspecies not recognized in Fl. Eur.).

Data wanted: Bu, Cm, Hu, Kaz, Mo, Rm, Rus (C, E), †Se, Uk

A. varius subsp. **eupatoricus** Sytin 1999 – Map 0000.

Notes. Cm (taxonomic novelty).

Endemic to Europe (W. Crimea).

Data wanted: Cm

Astragalus vesicarius L. – Map 0000.

Phylogenetics. L. Bartha et al., Botany 91: 702–714 (2013) (molecular evidence for reticulate speciation and allopolyploidy in Sect. *Dissitiflori*; reticulation also invoked as an underlying evolutionary process behind the incongruent placement of *Astragalus vesicarius* subsp. *pastellianus* in nuclear versus plastid phylogenies).

Taxonomy and nomenclature. A. Borissova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 14: 222–225 (1951) (as *Astragalus vesicarius* and *A. dealbatus*); M. Guşuleac & E.I. Nyárády in Săvul., Fl. Rep. Pop. Romîne 5: 304–307 (1957); A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology of subsp. *vesicarius*); A.S. Bădărău et al., Stud. Univ. Babeş-Bolyai, Geogr. 45: 125–127 (2000); P. Pânzaru, Boll. Mus. Regionale. Sci. Nat. Torino 23: 721–727 (2006) (subsp. *pastellianus*); E. Zippel & T. Wilhalm, Gredleriana 9: 119–134 (2009) (populations of the southern border of the Alps found distinctly genetically separated, including the western and eastern populations of subsp. *pastellianus*); L. Bartha et al., Contr. Bot. Grad. Bot. "Alexandru Borza" Cluj-Napoca 47: 59–66 (2012) (multivariate morphometrics; *A. pseudoglaucus* and *A. vesicarius* s. l. showing "a substantial morphological overlap"); Podlech & Zarre 2013: 1965–1968 (with three subspecies, which are "only weakly separated"; subsp. *carniolicus* and subsp. *pastellianus* "are only different by petals colour"; transitions between subsp. *carniolicus* and subsp. *vesicarius* "can be found in the western Balkans"); Fl. Gallica 2014: 713 (with subsp. *vesicarius* and subsp. *pastellianus*).

Notes. Rus (E) added (Rs (E)) not given in Fl. Eur.). Rus (C) not confirmed (Rs (?C) given in Fl. Eur.). – For details of the distribution in Rm, see A.S. Bădărău et al., Stud. Univ. Babeş-Bolyai, Geogr. 45: 127–128 (2000).

Endemic to Europe (not indicated as such in Fl. Eur.).

Data wanted: Al, Au, BH, Bu, Cg, Cm, Ct, Ga, Gr, Hs, Hu, It, Mk, Mo, Rm, Rus (E), Se, Sk, Sl, Uk

A. vesicarius subsp. **vesicarius** – Map 0000.
Astragalus dealbatus Pall., nom. illeg. (Solenotus dealbatus (Pall.) Steven); Solenotus vesicarius (L.) Steven; Tragacantha vesicaria (L.) Kuntze
A. albidus Waldst. & Kit. (A. vesicarius subsp. albidus (Waldst. & Kit.) Kožuharov & D.K. Pavlova)
A. cuatrecasasii Font Quer
A. mixtus M. Bieb.

Diploid and tetraploid. 2n=16 (Bu, Ga, Hs, Sk): M. Guinochet & A. Logeois, Rev. Cytol. Biol. Vég. 25: 471 (1962) (as *Astragalus vesicarius* var. *typicus*); S.I. Kožuharov et al., Taxon 22: 288 (1973) (as *A. vesicarius*); P. Küpfer, Boissiera 23: 3–322 (1974); A. Pretel Martínez, Taxon 23: 805 (1974); A. Murín & J. Májovský, Taxon 25: 488 (1976) (as *A, vesicarius* subsp. *albidus*); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978); Marhold et al. 2007: 120. – 2n=32 (Bu): D.K. Pavlova & S.I. Kozhuharov, Fitologija 44: 75 (1993).

Notes. Al, Au, BH, Bu, Cg, Cm, Ct, Ga, Gr, Hs, Hu, It, Mk, Mo, Rm, Rus (E), Se, Sk, Uk. "Throughout the range of the species except most of the Balkan peninsula" (Fl. Eur.).

Data wanted: Al, Au, BH, Bu, Cg, Cm, Ct, Ga, Gr, Hs, Hu, It, Mk, Mo, Rm, Rus (E), Se, Sk, Uk

A. vesicarius subsp. **carniolicus** (A. Kern.) Chater – Map 0000.
Astragalus carniolicus A. Kern.
A. tymphaeus Quezel & Contandr.

Diploid and tetraploid. 2n=16 (Ct): S. Siljak-Yakovlev et al., Adv. Sci. Lett. 3: 196, 207 (2010). – 2n=32 (?Bu, Gr): P. Quezel & J. Contandriopoulos, Candollea 67 (1965) (as *Astragalus tymphaeus*); D.K. Pavlova & S.I. Kozhuharov, Fitologija 44: 75 (1993) [identification of the material should be checked].

Notes. Al, BH, Ct, Gr, It, Sl. "W. part of the Balkan peninsula, extending to Trieste" (Fl. Eur.).

Data wanted: Al, BH, Ct, Gr, It, Sl

A. vesicarius subsp. **pastellianus** (Pollini) Arcang. – Map 0000.
Astragalus pastellianus Pollini
A. leucanthus Dalla Torre & Sarnth. 1909 non Pall. 1800
A. venostanus Fritsch

Notes. Ga, It. "E. Italian Alps; ?Bulgaria" (Fl. Eur.). – For details of the distribution, see C. Favarger, Ber. Bayer. Bot. Ges. 42: 201–202 (1970), and E. Zippel & T. Wilhalm, Gredleriana 9: 119–124 (2009).

Data wanted: Ga, It

Astragalus zingeri Korsh. – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 1972–1973.

Tetraploid with 2n=32 (Rus (C)): N.A. Spasskaya & T.I. Plaksina, Bot. Zhurn. (Moscow & Leningrad) 80(10): 100 (1990).

Notes. Uk added (Rs (W) not given in Fl. Eur.).

Total range. Outside Europe, present in Asiatic Kazakhstan. – MJW 1965: map 244c.

Data wanted: ?Kaz, Rus (C, E), Uk

Astragalus sect. **Erioceras** Bunge

Sect. Acantherioceras Rech. f.
Sect. Pseuderioceras N. Ulziykh.
Sect. Tamias Bunge

Astragalus arcuatus Kar. & Kir. – Map 0000.

Philammos arcuatus (Kar. & Kir.) Steven; Tragacantha arcuata (Kar. & Kir.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 1984–1985.

Diploid chromosome number 2n=16 reported by N.A. Chuksanova, Bot. Zhurn. (Moscow & Leningrad) 52: 1125 (1967), for material from [Asiatic?] Kazakhstan.

Notes. Rus (C) confirmed (?Rs (C) given in Fl. Eur.).

Total range. Outside Europe, present in Asiatic Kazakhstan and N.W. China.

Data wanted: Kaz, Rus (C, E)

Astragalus reduncus Pall. – Map 0000.

Euilus reduncus (Pall.) Steven; Proselias reduncus (Pall.) Steven; Tragacantha redunca (Pall.) Kuntze
Astragalus concavus Boriss.
A. similis Boriss.

Taxonomy and nomenclature. A. Borissova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 14: 216–220 (1951) (as *Astragalus similis, A. concavus* and *A. reduncus*); O.D. Visjulina in Fl. RSS Ucr. 6: 473–475 (1954) (as *A. concavus*); Podlech & Zarre 2013: 2004–2005.

Diploid chromosome number 2n=16 reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 74: 1521 (1989), for material from Caucasia.

Total range. Outside Europe, present in Caucasia

Data wanted: Cm, Rus (E), Uk

Astragalus subarcuatus Popov – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 2006–2007.

Notes. Rus (C) (floristic novelty).

Total range. Outside Europe, present in southernmost Orenburg Territory of Russia, as well as in Asiatic Kazakhstan and E. Uzbekistan.

Data wanted: Rus (C)

Astragalus sect. **Helmia** Bunge

Sect. Chomutoviana B. Fedtsch.

Taxonomy and nomenclature. M.S. Knyasev et al., M.S. Knyasev, Bot. Zhurn. (Moscow & Leningrad) 91: 278–290 (2006).

Astragalus depauperatus Ledeb. – Map 0000.

Tragacantha depauperata (Ledeb.) Kuntze
Astragalus chakassiensis Polozhij

A. eriolobus Bunge (Philammos eriolobus (Bunge) Steven)

Taxonomy and nomenclature. Podlech & Zarre 2013: 2031–2032.

Tetraploid and hexaploid. 2n=32 M.S. Knyasev, Bot. Zhurn. (Moscow & Leningrad) 91: 86 (2006), for material from South Ural just outside Europe. – 2n=48 reported by T.V. An'kova & D.N. Shaulo, Taxon 61: 1336 (2012), for material from Altai.

Notes. Rus (C) (floristic novelty).

Total range. Outside Europe, present in Orenburg Province south of the River Ural, as well as in Asiatic Kazakhstan, S. Siberia, Mongolia and N.W. China.

Data wanted: Rus (C)

Astragalus helmii Fisch. ex DC. – Map 0000.

Philammos helmii (Fisch. ex DC.) Steven; Tragacantha helmii (Fisch. ex DC.) Kuntze

Taxonomy and nomenclature. M.S. Knyasev, Bot. Zhurn. (Moscow & Leningrad) 91: 282 (2006); Podlech & Zarre 2013: 2034–2035.

Diploid with 2n=16 (Rus (C)) M.S. Knyasev, Bot. Zhurn. (Moscow & Leningrad) 91: 278–290 (2006).

Total range. Outside Europe, present in Orenburg Province south of the River Ural, as well as in Asiatic Kazakhstan, S.W. Siberia and Mongolia.

Data wanted: Rus (C, E)

Astragalus permiensis C.A. Mey. – Map 0000.

Taxonomy and nomenclature. M.S. Knyasev, Bot. Zhurn. (Moscow & Leningrad) 91: 278–290 (2006); N.V. Kulikov et al., Endemichnye rasteniya Urala vo flore Sverdlovskoi oblasti, pp. 201–205 (Ekaterinburg 2013); Podlech & Zarre 2013: 2041.

Octoploid chromosome number 2n=64 reported by M.S. Knyasev, Bot. Zhurn. (Moscow & Leningrad) 91: 288 (2006), for material from Asiatic side of Sverdlovsk Province of Russia.

Notes. Rus (C) (floristic novelty).

Total range. Outside Europe, present in Asiatic side of the Sverdlovsk Province of Russia.

Data wanted: Rus (C)

Astragalus sect. **Trachycercis** Bunge – Map 0000.

Ailuroschia Steven
Sect. Borodiniana B. Fedtsch.
Sect. Deserta S.B. Ho
Sect. Popovianthe Gontsch.
Sect. Wettsteiniana Širj. & Rech. f.

Astragalus baldaccii Degen – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 2054.

Decaploid with 2n=80 (Gr); G.-H. Leute, Taxon 26: 451 (1977).

Notes. Doubtfully present in Gr (given as certain in Fl. Eur., where the circumscription of the species against *Astragalus lacteus* is evidently different than here). Mk added (Ju not given in Fl.

Eur.).

Endemic to Europe.

Data wanted: Al, ?Gr, Mk

Astragalus dolichophyllus Pall. – Map 0000.

Ailuroschia diffusa (Willd.) Steven; Astragalus diffusus Willd., nom. illeg.; Myobroma diffusa (Willd.) Steven; Tragacantha dolichophylla (Pall.) Kuntze

Taxonomy and nomenclature. Podlech & Zarre 2013: 2059–2060.

Total range. Outside Europe, present in Caucasia and Asiatic Kazakhstan.

Data wanted: Cm, Kaz, Rm, Rus (C, E), Uk

Astragalus gracaninii Micevski 1971 – Map 0000.

Taxonomy and nomenclature. K. Micevski, Godisen Zborn. Prir.-Mat. Fak. Univ. Skopje, Biol. 23: 121–130 (1971); Podlech & Zarre 2013: 2065.

Notes. Mk (taxonomic novelty).

Endemic to Europe (FYR Macedonia: Kumanovo and Ohrid Municipalities).

Data wanted: Mk

Astragalus lacteus Heldr. & Sartori – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 2072–2073.

Decaploid with 2n=80 (Gr): R. Franzén & L.-Å. Gustavsson. Willdenowia 13: 104 (1983).

Notes. In Fl. Eur., where the circumscription of the species against *Astragalus baldaccii* is evidently different than here, given only from "S. Greece (Parnon Oros)".

Endemic to Europe.

Data wanted: Al, Gr

Astragalus rupifragus Pall. – Map 0000.

Ailuroschia rupifraga (Pall.) Steven; Myobroma rupifraga (Pall.) Steven; Tragacantha rupifraga (Pall.) Kuntze
Astragalus sareptanus A.K. Becker

Taxonomy and nomenclature. Podlech & Zarre 2013: 2086.

Total range. Outside Europe, present in Asiatic Kazakhstan and S.W. Siberia.

Data wanted: Cm, Kaz, Rus (C, E)

Astragalus testiculatus Pall., nom. cons. – Map 0000.

Ailuroschia testiculata (Pall.) Steven; Myobroma testiculata (Pall.) Steven; Tragacantha testiculata (Pall.) Kuntze
Astragalus amygdaliger Less.
A. lactiflorus Ledeb.
A. longiflorus Pall. (Myobroma longiflora (Pall.) Steven; Tragacantha longiflora (Pall.) Kuntze); A. tragacanthoides L., nom. rej.
A. poliotes Bunge

Taxonomy and nomenclature. L.I. Prilunko & K.Yu. Abachev, Byull. Glavn. Bot. Sada 97: 68–76

(1976) (morphogenesis); K.Yu. Abachev & M.G. Agaev, Vestn. Leningradsk. Univ., Ser. Biol. 1978(4): 48–56 (1978) (intrapopulation dimorphism in seed characters; as *Astragalus longiflorus*); D. Podlech, Sendtnera 1: 271 (1993) (*A. tragacanthoides*); Podlech & Zarre 2013: 2093–2095.

Notes. Uk added (Rs (W) not given in Fl. Eur.).

Total range. Outside Europe, present from Caucasia and N.E. Iran to S.W. Siberia and N.W. China.

Data wanted: Cm, Rus (C, E), Uk

Astragalus wilmottianus Stoj. – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 2098–2099.

Diploid with 2n=16 (Bu): R.M. Krusheva, Taxon 35: 613 (1986).

Notes. Mk and Se added (Ju not given in Fl. Eur.). – For details of the distribution and ecology, see V. Randelović et al., 7th Symposium on Flora of Southeastern Serbia and Neighbouring Regions, Proceeding 1–4 (Dimitrovgrad 2002).

Endemic to Europe.

Data wanted: Bu, Mk, Se

Astragalus sect. **Cystium** Bunge
Xerophysa Steven

Astragalus physodes L. – Map 0000.
Cystium physodes (L.) Steven; Tragacantha physodes (L.) Kuntze; Xerophysa physodes (L.) Steven
Astragalus suprapilosus Gontsch.

Taxonomy and nomenclature. C.E. Jarvis et al., Taxon 50: 1129–1133 (2001) (lectotype designated); Podlech & Zarre 2013: 2116–2117.

Total range. Outside Europe, present in C. Anatolia (as subsp. *acirikensis* Ekim) and Asiatic Kazakhstan, and possibly in Caucasia.

Data wanted: Cm, Kaz, Rus (E)

Astragalus sect. **Paracystium** Gontsch.

Astragalus pallasii Spreng. – Map 0000.
Cystium pallasii (Spreng.) Steven
Astragalus inderiensis Claus
A. pallasii DC., 1825 non Spreng. 1807 (Tragacantha pallasii (DC.) Kuntze)
A. lasiophyllus Ledeb.

Taxonomy and nomenclature. Podlech & Zarre 2013: 2119–2120.

Tetraploid chromosome number 2n=32 reported by T.V. An'kova et al., Taxon 63: 1148 (2014), for material from Asiatic Kazakhstan (as *Astragalus lasiophyllus*).

Notes. Kaz, Rus (E) (floristic novelty).

Total range. Outside Europe, present in C. Asiatic Kazakhstan, Uzbekistan, Mongolia and N.W. China.

Data wanted: Kaz, Rus (E)

Astragalus sect. **Leucophysa** Bunge

Astragalus ergenensis Kamelin & Sytin 2003 – Map 0000.

Taxonomy and nomenclature. R.V. Kamelin et al., Bot. Zhurn. (Moscow & Leningrad) 88(6): 114–119 (2003); Podlech & Zarre 2013: 2150–2151.

Notes. Rus (E) (taxonomic novelty).

Endemic to Europe (Russia: Rostov Province and W. Kalmykia).

Data wanted: Rus (E)

Astragalus sect. **Incani** DC.

Chondrocarpus Steven
Sect. Apatellobium Pomel
Sect. Podochreati W.D.J. Koch
Sect. Proselius Bunge

Astragalus incanus L. – Map 0000.

Taxonomy and nomenclature. A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; as *Astragalus incanus* subsp. *incanus* and subsp. *macrorhizus*); A.R. Mehrabian et al., Iranian J. Bot. 13: 138–145 (2007) (petiole anatomy); Fl. Iber. 1999: 327–331; Podlech & Zarre 2013: 2238–2241.

Notes. Lu added (not given in Fl. Eur.).

Total range. Outside Europe, present (as both subspecies) in Morocco and Algeria. [In Fl. Eur. subsp. *incanus* has a narrower circumscription and is indicated as endemic to Europe.]

A. incanus subsp. **incanus** – Map 0000.

Astragalus barrelieri Dufour, nom. illeg.; Podochrea incana (L.) Fourr.; Proselias incanus (L.) Steven; Tragacantha incana (L.) Kuntze
A. antiatlanticus Emb. & Maire
A. hybridus Pau 1904 non S.G. Gmel. 1770
A. nivelleanus Braun-Blanq.
A. queralti Sennen
Medyphylla rotundifolia Opiz

Incl. Astragalus incurvus Desf. (Astragalus incanus subsp. incurvus (Desf.) Rivas Goday & Borja; A. monspessulanus L. subsp. incurvus (Desf.) Arcang.; Tragacantha incurva (Desf.) Kuntze)

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus incanus* subsp. *incanus* and subsp. *incurvus*.

Diploid with 2n=16 (Hs): A. Pretel Martínez, Taxon 23: 804 (1974); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978); T. Luque & Z. Díaz Lifante, Bocconea 1: 353 (1991) (as *Astragalus incanus* subsp. *incurvus*).

Data wanted: Ga, Hs

A. incanus subsp. **nummularioides** (Desf.) Maire – Map 0000.

Astragalus nummularioides Desf. (Tragacantha nummularioides (Desf.) Kuntze); A. nummularius Desf. 1799 non Lam. 1783; A. rotundifolius Willd., nom. illeg.
A. fontianus Maire

Incl. A. macrorhizus Cav. (A. incanus subsp. macrorhizus (Cav.) Laínz; Tragacantha macrorhiza (Cav.) Kuntze)

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus incanus* subsp. *nummularioides* and subsp. *macrorhizus* "(Cav.) Chater".

Diploid with 2n=16 (Hs, Lu): A. Pretel Martínez, Taxon 23: 804 (1974); A. Fernandes et al., Bol. Soc. Brot., ser. 2, 51: 137–186 (1977); Fernandes & Quieros 1978: 141; A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978) (in all four as *A. incanus* subsp. *macrorhizus*).

Data wanted: Hs, Lu

Astragalus monspessulanus L. – Map 0000.

Taxonomy and nomenclature. M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 296–299 (1957) (with two varieties); Fl. Iber. 1999: 331–333; Podlech & Zarre 2013: 2258–2264 (subsp. *illyricus* as "a weakly defined subspecies").

Diploid with 2n=16 (Bu, Gr): S.I. Kozuharov et al., Taxon 21: 336 (1972); D. Cartier, Taxon 26: 451 (1977; A. Strid & R. Franxén, Taxon 30: 835 (1981); T. Luque & Z. Díaz Lifante, Bocconea 1: 353 (1991). The same number reported by E. Kreuter, Planta 11: 26 (1930), for cultivated material.

Notes. Tu not confirmed (?Tu given in Fl. Eur.).

A. monspessulanus subsp. **monspessulanus** – Map 0000.

Astragalus declinatus Salisb., nom. illeg.; A. polygala Pall., nom. illeg.; Podochrea monspessulana (L.) Fourr.; Proselias monspessulanus (L.) Steven; Tragacantha monspessulana (L.) Kuntze
A. atticus Hausskn.
A. chaubardii Bunge (Tragacantha chaubardii (Bunge) Kuntze)
A. kindlii Formánek
A. macedonicus Heldr. & Nadji
A. praecox Baumg.
A. vandasii Velen.

Diploid with 2n=16 (Bu, Ga, Si (S)): M. Guinochet & A. Logeois, Rev. Cytol. Biol. Vég. 25: 471 (1962) (as *Astragalus monspessulanus*); C. Favarger & K.L. Huynh, Taxon 13: 205 (1964) (as *A. monspessulanus*); N. Andreev, Taxon 31: 576 (1982) (as *A, monspessulanus* var. *vandasii*); P. Colombo et al., Anales Jard. Bot. Madrid 39: 199, 200 (1982).

Notes. Al, BH, Bu, Ct, Ga, Gr, He, Hs, It, Mk, Mo, Rm, Si (S), Uk. "Throughout the range of the species" (Fl. Eur.).

Total range. Outside Europe, present in Algeria and Tunisia.

Data wanted: Al, BH, Bu, Ct, Ga, Gr, He, Hs, It, Mk, Mo, Rm, Si (S), Uk

A. monspessulanus subsp. **gypsophilus** Rouy – Map 0000.

Astragalus chlorocyaneus Boiss. & Reut. (A. monspessulanus subsp. chlorocyaneus (Boiss. & Reut.) Malag.; Tragacantha chlorocyanea (Boiss. & Reut.) Kuntze)
A. cossonii Bunge (Tragacantha cossonii (Bunge) Kuntze)
A. monspessulanus var. canescens Boiss. (A. monspessulanus subsp. canescens (Boiss.) O. Bolòs, Vigo, Masalles & Ninot)
A. saxatilis Cav.
A. teresianus Sennen & Elias (A. monspessulanus subsp. teresianus (Sennen & Elias) Amich)

Notes. Hs (the taxon not recognized in Fl. Eur., where *Astragalus teresianus* is mentioned in a note under *A. monspessulanus* subsp. *monspessulanus* as "probably not more than varietally distinct" from it).

Total range. Outside Europe, present in Morocco and Algeria.

Data wanted: Hs

A. monspessulanus subsp. **illyricus** (Bernh.) Chater – Map 0000.
Astragalus illyricus Bernh.
A. soyeri Buching. ex Bunge (Tragacantha soyeri (Buching. ex Bunge) Kuntze)
A. wulfenii W.D.J. Koch (Tragacantha wulfenii (W.D.J. Koch) Kuntze)

Notes. BH, Bu, Cg, Ct, It, Se, Sl. "Balkan peninsula, extending to Trieste" (Fl. Eur.).

Diploid with 2n=16 (**): B. Druskovic & M. Lovka, Int. Organ. Pl. Biosyst. Newslett. (Zürich) 24: 15–19 (1995) (as *Astragalus illyricus*).

Endemic to Europe (not indicated as such in Fl. Eur.).

Data wanted: BH, Bu, Cg, Ct, It, Se, Sl

Do the plants of Se and Bu really belong here?

Astragalus glacialis Lovrić 1972 – Map 0000.
Astragalus glacialis subsp. uraganicus Lovrić

Taxonomy. Perhaps not specifically distinct from *Astragalus monspessulanus*. – A.Ž. Lovrić, Oesterr. Bot. Z. 119: 567–568 (1972; "1971") (with two subspecies); Podlech & Zarre 2013: 2262 ("The *A. glacialis*… and its subsp. *uraganicus* … are perhaps not more than vigorous ecotypes of *A. monspessulanus*.").

Notes. Ct (taxonomic novelty).

Endemic to Europe (Croatia: Prvić Island).

Data wanted: Ct

Astragalus spruneri Boiss. – Map 0000.
Tragacantha spruneri (Boiss.) Kuntze
Astragalus tempskyanus Freyn
A. tempskyanus subsp. crassicarpus Freyn
A. tempskyanus subsp. unguiculatus Freyn
A. thessalus Boiss. (Tragacantha thessala (Boiss.) Kuntze)

Phylogenetics. A. Dizkirici Tekpinar et al., Turkish J. Bot. 40: 250–263 (2016) (phylogenetic relationships between *Oxytropis* and *Astragalus* species native to an Old World diversity center [Turkey]).

Taxonomy and nomenclature. Podlech & Zarre 2013: 2299–2301.

Diploid and tetraploid. 2n=16 (Gr): H. Runemark, Fl. Medit. 16: 410 (2006). – 2n=32 (Bu): B.A. Kuzmanov, Taxon 24: 504 (1975).

Total range. Outside Europe, present in Anatolia.

Data wanted: Al, Bu, Cg, Gr, Mk, Rm, Tu

Astragalus sect. **Laguropsis** Bunge
Oedicephalus Nevski
Sect. Holargyreus Vved.
Sect. Phaerocystis Bunge

Astragalus calycinus M. Bieb. – Map 0000.
Tragacantha calycina (M. Bieb.) Kuntze
Astragalus iljinii Rzazade

Taxonomy and nomenclature. Podlech & Zarre 2013: 2322–2323.

Diploid chromosome number 2n=16 reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 65: 837 (1980), for material from Caucasia.

Notes. Rus (E), Uk (floristic novelty). – For details concerning Uk (U), see Yu.S. Peregrim et al., Ukrayins'k. Bot. Zhurn. 70: 642–645 (2013).

Total range. Outside Europe, present in Caucasia.

Data wanted: Rus (E), Uk

Astragalus sect. **Tragacantha** DC. – Map. 0000.

Sect. Melanocercis Bunge

Phylogenetics. L. Hardon et al., Molec. Phylogen. Evol. 97: 187–195 (2016) (the section having roots dating back to the Pliocene; data indicating an eastern-western split giving rise to the five main lineages that exist today and supporting an old east-west pattern of vicariance that completely rules out the possibility of a recent eastern origin for western taxa; range fragmentation as the likely main driver of diversification).

Astragalus angustifolius Lam. – Map 0000.

Tragacantha angustifolia (Lam.) Kuntze
Astragalus leucophyllys Willd., nom. illeg.
A. retusus Willd.

Phylogenetics. F. Abdel Samad et al., Pl. Syst. Evol. 300: 819–830 (2014) (genome size and phylogeny).

Taxonomy and nomenclature. In Fl. Eur., two subspecies are recognized, viz. subsp. *angustifolius* "throughout the range of the species" and subsp. *pungens* (Willd.) Hayek present in "N. Greece" in Europe, and a note is given that "There is also clinal variation in certain characters, particularly in the length of the calyx teeth, which decreases towards the south". We tentatively follow the classification adopted by S. Brullo et al., Bocconea 24: 19–52 (2012) (with seven subspecies, of which four in Europe; *Astragalus pungens*, *A. valdeviolaceus* Brullo, Giusso & Musarella (*A. angustifolius* var. *violaceus* Boiss.), *A. hubermorathii* Brullo, Giusso & Musarella (*A. angustifolius* subsp. *longidens* Hub.-Mor. & V.A. Matthews) and *A. taygeteus* as distinct species). – Fl. Turkey 1970: 247–248 (with subsp. *angustifolius* (incl. *A. echinoides*, *A. retusus*, *A. leucophyllus* and *A. olympicus*, as well as *A. hermoneus* [here included in the *A. sirinicus* group]), subsp. *longidens* and subsp. *pungens* (incl. *A. heideri* [here included in the *A. sirinicus* group]); J. Persson & A. Strid, Willdenowia 12: 207–209 (1982) (differences between *A. angustifolius* [subsp. *erinaceus*] and *A. taygeteus*); A. Alegro et al., Ann. Bot. Fenn. 46: 569–573 (2009); Podlech & Zarre 2013: 2358–2362 (with subsp. *angustifolius* in Europe and S.W. Asia, subsp. *longidens* in S. Anatolia and subsp. *pungens* (Willd.) Hayek in Anatolia; *A. angustifolius* var. *violaceus*, *A. echinoides*, *A.erinaceus* and *A. taygeteus* included in subsp. *angustifolius*).

Diploid chromosome number 2n=16 reported by D. Cartier, Taxon 25: 493 (1976), for material from Anatolia (as *Astragalus angustiofolius* subsp. *angustifolius* and subsp. *pungens*).

Total range. Outside Europe, present in East Aegean Islands, Anatolia, Armenia, Lebanon, Syria and Israel.

Data wanted: Al, BH, Bu, Cg, Cr, Gr, Mk, Se

A. angustifolius subsp. **balcanicus** Brullo, Giusso & Musarella 2012 – Map 0000.
Astragalus angustifolius subsp. pungens auct.
?A. olympicus Pall.

Diploid and tetraploid. 2n=16 (Bu): S.I. Kozuharov et al., Taxon 21: 336 (1972) (as *Astragalus angustifolius*); R.M. Krusheva, Taxon 24: 677 (1975) (as *A. angustifolius*); D.K. Pavlova & S.I. Kozhuharov, Fitologija 44: 75 (1993) (as *A, angustifolius* subsp. *angustifolius*). – 2n=32 (Gr): K. Papanicolaou, Taxon 33: 131 (1984) (as *A. angustifolius*).

Notes. Al, BH, Bu, Cg, Gr, Mk, Se (taxonomic novelty).

Endemic to Europe.

Data wanted: Al, BH, Bu, Cg, Gr, Mk, Se

A. angustifolius subsp. **echinoides** (L'Her.) Brullo, Giusso & Musarella – Map 0000.
Astragalus echioides Willd.; A. echinoides L'Her.
A. creticus Willd. 1794 non Lam. 1783

Notes. Cr (the taxon not recognized in Fl. Eur.).

Endemic to Crete.

Data wanted: Cr

A. angustifolius subsp. **erinaceus** (C. Presl) Brullo, Giusso & Musarella – Map 0000.
Astragalus erinaceus C. Presl

Notes. Gr (the taxon not recognized in Fl. Eur.).

Endemic to Europe (S. Greece).

Data wanted: Gr

A. angustifolius subsp. **odonianus** Brullo, Giusso & Musarella 2012 – Map 0000.

Notes. Gr (taxonomic novelty).

Endemic to Thasos.

Data wanted: Gr

Astragalus sirinicus group – Map 0000.

Astragalus croaticus + A. genargenteus + A. gennarii + A. greuteri + A. sirinicus + A. taygeteus + A. tymphresteus

Taxonomy and nomenclature. G. Bacchetta & S. Brullo, Willdenowia 36(Special Issue): 157–167 (2006) (taxonomic revision of the *Astragalus genargenteus* complex [*A. genargenteus*, *A. gennarii*, *A. greuteri*]; *A. sirinicus*); G. Bacchetta et al., Flora, Morphol. Distrib. Funct. Ecol. Pl.203: 669–682 (2008) (morpho-colorimetric characterization by image analysis to identify seeds; *A. genargenteus* and *A. greuteri*); S. Brullo et al., Bocconea 24: 19–52 (2012) (taxonomic revision of *Astragalus angustifolius* group [incl. *A. sirinicus* group]).

Total range. Outside Europe, present in S. Anatolia (as *Astragalus heideri* Wettst.) and in Lebanon, Syria and Israel (as *A. hermoneus* Boiss.).

Astragalus croaticus Alegro, Bogadanović, Brullo & Giusso 2009 – Map 0000.

Astragalus angustifolius Lam. subsp. biokovensis Kušan, nom. inval.

Taxonomy and nomenclature. F. Kušan, Acta Mus. Maced. Sci. Nat. 4: 43–67 (1956) (as *Astragalus angustifolius* subsp. *biokovensis*); A. Alegro et al., Ann. Bot. Fenn. 46: 569–573 (2009);

Podlech & Zarre 2013: 2363.

Diploid with 2n=16 (Ct): S. Siljak-Yakovlev et al., Adv. Sci. Lett. 3: 196, 207 (2010) (as *Astragalus angustifolius* subsp. *biokovensis* ("biokoënsis")).

Notes. Cg, Ct (taxonomic novelty).

Endemic to Europe.

Data wanted: Cg, Ct

Astragalus genargenteus Moris – Map 0000.

Astragalus sirinicus subsp. genargenteus (Moris) Arcang.

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus sirinicus* subsp. *genargenteus*. – D. Gargano & L. Peruzzi, Allionia 39: 111–117 (2003) (preferred to be treated as *A. sirinicus* subsp. *genargenteus*); Podlech & Zarre 2013: 2364–2365.

Diploid with 2n=16 (Sa): R. Villa, Inform. Bot. Ital. 10: 241–248 (1979).

Notes. Co omitted ("Corse, Sardegna" given in Fl. Eur.), the material being referable to *Astragalus greuteri*. – For details of the distribution, ecology and vulnerability of the species, see B. Corrias, Boll. Soc. Sarda Sci. Nat. 28: 297–302 (1979; "1978") (as southern populations of *Astragalus genargenteus* [the northern are referable to *A. gennarii*]), and S. Sau et al., Inform. Bot. Ital. 46: 289–291 (2014).

Endemic to Sardinia (Gennargentu massif).

Data wanted: Sa

Astragalus gennarii Bacch. & Brullo 2006 – Map 0000.

Astragalus genargenteus Moris subsp. gennarii (Bacch. & Brullo) Arrigoni

Taxonomy and nomenclature. Podlech & Zarre 2013: 2365.

Notes. Sa (taxonomic novelty). – For details of the distribution, ecology and vulnerability of the species, see B. Corrias, Boll. Soc. Sarda Sci. Nat. 28: 297–302 (1979; "1978") (as northern populations of *Astragalus genargenteus* [the southern are referable to *A. genargenteus* as here delimited]), and D. Cogoni et al., Inform. Bot. Ital. 46: 103–105 (2014).

Endemic to Sardinia (Monte Albo massif).

Data wanted: Sa

Astragalus greuteri Bacch. & Brullo 2006 – Map 0000.

Taxonomy and nomenclature. Podlech & Zarre 2013: 2365–2366; Fl. Gallica 2014: 712.

Diploid with 2n=16 (Co): J. Contandriopoulos, Ann. Fac. Sci. Marseille 32: 1–354 (1962) (as *Astragalus genargenteus*).

Notes. Co (taxonomic novelty).

Endemic to Corsica.

Data wanted: Co

Astragalus sirinicus Ten. – Map 0000.
Tragacantha sirinica (Ten.) Kuntze

Excl. Astragalus genargenteus Moris and A. tymphresteus Boiss. & Spruner

Taxonomy and nomenclature. D. Gargano & L. Peruzzi, Allionia 39: 111–117 (2003) (as *Astragalus sirinicus* subsp. *sirinicus*); A. Alegro et al., Ann. Bot. Fenn. 46: 569–573 (2009); Podlech & Zarre 2013: 2368–2369 (*A. tymphresteus* included).

Diploid with 2n=16 (It): O. Pellegrini, Delpinoa, ser. 2, 5: 3–8 (1963); D. Gargano & L. Peruzzi, Allionia 39: 113 (2003).

Notes. Al, Co, Ga, Gr, Ju and Sa omitted (given in Fl. Eur.), the matetrial being referable to other species of the *Astragalus sirinicus* group, viz. *A. tymphresteus*, *A. genargenteus*, *A. gennarii* and *A. greuteri*. – For details of the distribution and ecology, see G. Caputo, Delpinoa 10–11: 39–48 (1970), and D. Gargano & L. Peruzzi, loc. cit.

Endemic to Europe (Italy).

Data wanted: It

Astragalus taygeteus Jim. Perss. & Strid 1982 – Map 0000.

Taxonomy and nomenclature. J. Persson & A. Strid, Willdenowia 12: 207–209 (1982); Podlech & Zarre 2013: 2359 (included in *Astragalus angustifolius* subsp. *angustifolius*).

Diploid with 2n=16 (Gr): J. Persson & A. Strid, Willdenowia 12: 207–209 (1982).

Notes. Gr (taxonomic novelty).

Endemic to Europe (Greece: Taýgetos).

Data wanted: Gr

Astragalus tymphresteus Boiss. & Spruner – Map 0000.
Astragalus angustifolius Lam. subsp. tymphresteus (Boiss. & Spruner) Hayek; Tragacantha tymphrestea (Boiss. & Spruner) Kuntze

Taxonomy and nomenclature. In Fl. Eur. included in *Astragalus sirinicus* subsp. *sirinicus* [= *A. sirinicus*]. – Podlech & Zarre 2013: 2368 (included in *A. sirinicus*).

Diploid with 2n=16 (Gr): R. Franzén & L.-Å. Gustavsson. Willdenowia 13: 104 (1983) (as *Astragalus sirinicus*).

Notes. Al, Bu, Cg, Gr, Mk (the species not reecognised in Fl. Eur.).

Endemic to Europe.

Data wanted: Al, Bu, Cg, Gr, Mk

Astragalus tragacantha group – Map 0000.
Astragalus balearicus + A. tegulensis + A. terracianoi + A. thermensis + A. tragacantha

Taxonomy. G. Bacchetta et al., Flora, Morphol. Distrib. Funct. Ecol. Pl.203: 669–682 (2008) (morpho-colorimetric characterization by image analysis to identify seeds; *Astragalus terracianoi* and *A. thermensis*), Ann. Bot. Fenn. 48: 449–454 (2011) (seed morphometric and colorimetric features of *A. terracianoi*, *A. tegulensis* and *A. thermensis*); O. Grillo et al., Compt. Rend. Biol. 336: 102–108 (2013) (geographic isolation affecting inter- and intrapopulation seed variability, as assessed by morpho-colorimetric analysis including all the five species).

Astragalus balearicus Chater – Map 0000.

Tragacantha balearica (Chater) Romo
Astragalus poterium auct.

Taxonomy and nomenclature. Fl. Iber. 1999: 333–335; Podlech & Zarre 2013: 2362–2363.

Diploid with 2n=16 (Bl): M.A. Cardona, Colloquis Soc. Catal. Biol. Genet. 10–11: 51–67 (1977); M. Castro & J.A. Rossello, Folia Geobot. 41: 442–443 (2006).

Endemic to the Balearic Islands.

Data wanted: Bl

Astragalus tegulensis Bacch. & Brullo 2010 – Map 0000.

Taxonomy and nomenclature. G. Bacchetta & S. Brullo, Candollea 65: 5–14 (2010).

Notes. Sa (taxonomic novelty). – For details of the distribution, ecology and vulnerability of the species, see G. Bacchetta & S. Brullo, loc. cit., and G. Fenu et al., Inform. Bot. Ital. 44: 207–209 (2012).

Endemic to Sardinia (Capo Teulada).

Data wanted: Sa

Astragalus terracianoi Vals. 1994 – Map 0000.

Astragalus tragacantha L. subsp. terraccianoi (Vals.) Jeanm.

Taxonomy and nomenclature. F. Valsecchi, Webbia 49: 31–41 (1994); D. Jeanmonod, Candollea 61: 120 (2006) (as *Astragalus tragacantha* subsp. *terracianoi*); G. Bacchetta & S. Brullo, Candollea 65: 5–14 (2010); L. Hardion et al., Ecol. Medit. 36: 99–106 (2010) (phylogenetic relationships and infrageneric classification of *A. tragacantha* based on molecular data; "Corsican samples" [= *A. terracianoi*] forming a well supported subclade of a monophyletic clade); Podlech & Zarre 2013: 2369–2370.

Notes. Co, Sa (taxonomic novelty)

Endemic to Corsica (Capo Pertusato) and Sardinia (N.W. coast and Asinara Island).

Data wanted: Co, Sa

Astragalus thermensis Vals. 1994 – Map 0000.

Taxonomy and nomenclature. F. Valsecchi, Webbia 49: 31–41 (1994); Podlech & Zarre 2013: 2370.

Notes. Sa (taxonomic novelty)

Endemic to Sardinia (N.W. coast).

Data wanted: Sa

Astragalus tragacantha L. – Map 0000.

Tragacantha vera Medik.
Astragalus tragacantha subsp. vicentinus (Samp.) Rivas Mart., T.E. Díaz & Fern.Gonz.
A. tragacanthus Lam.
Tragacantha massiliensis Mill. (Astragalus massiliensis (Mill.) Lam.)

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus massiliensis*. – G. Bacchetta & S. Brullo, Candollea 65: 5–14 (2010); L. Hardion et al., Ecol. Medit. 36: 99–106 (2010) (phylogenetic relationships and infrageneric classification of *Astragalus tragacantha* based on molecular data); Podlech & Zarre 2013: 2370–2371.

Diploid with 2n=16 (Lu): A. Fernandes & M.F. Santos, Bol. Soc. Brot., ser. 2, 49: 176, 177 (1975); Fernandes & Quieros 1978: 141 (in both as *Astragalus massiliensis*).

Notes. Co and Sa omitted, the material being referable to *Astragalus tegulensis*, *A. terracianoi* and *A. thermensis*. It and Si not confirmed (?It and ?Si given in Fl. Eur.).

Endemic to Europe.

Data wanted: Ga, Hs, Lu

Oxytropis DC. – Map 0000.

Aragallus Neck. ex Greene, nom. illeg.
Spiesia Neck. ex Kuntze, nom. illeg.

Generic delimitation and phylogenetics. R.C. Barneby, Proc. Calif. Acad. Sci. 4: 180–182 (1952); I.T. Vassilczenko, Bot. Zhurn. (Moscow & Leningrad) 50: 313–333 (1965) ("… considerations concerning the genesis of the genus *Oxytropis*"); M.F. Wojciechowski, Brittonia 57: 382–396 (2005) ("A molecular phylogenetic perspective"; distinctness of *Oxytropis* from *Astragalus* strongly corroborated); L.I. Malyshev, Contemporary Problems Ecol. 1: 440–444 (2008) (phenetics of subgenera and sections bearing on ecology and phylogeny); J. Gao et al., Acta Agr. Boreal.-Sin. 6: 168–173 (2009) (molecular phylogeny); A. Archambault & M.V. Strömvik, Botany 90: 770–779 (2012) (evolutionary relationships as estimated from ITS sequences; *Oxytropis* found monophyletic; sequences pointing to multiple expansions into the Arctic); A. Dizkirici Tekpinar et al., Turkish J. Bot. 40: 250–263 (2016) (phylogenetic relationships between *Oxytropis* and *Astragalus* species native to an Old World diversity center [Turkey]; monophyly of the genus confirmed; species of the genus not showing high genetic diversity); A.B. Kholina et al., Russian J. Genetics 52: 780–793 (2016) (phylogenetic relationships of species from Asian Russia [with numerous species reaching Europe]).

Notes. The map includes extant native and possibly native occurrences with certain identification and locality, thus principally showing the present, confirmed native range of the genus.

Total range. I.T. Vassilczenko, Bot. Zhurn. (Moscow & Leningrad) 50: 314 (1965).

Oxytropis lapponica (Wahlenb.) J. Gay – Map 0000.

Phaca lapponica Wahlenb. (Astragalus lapponicus (Wahlenb.) Burnat; Oxytropis montana (L.) DC. subsp. lapponica (Wahlenb.) Bonnier & Layens; Spiesia lapponica (Wahlenb.) Kuntze)
Oxytropis amoena Kar. & Kir.
Phaca montana Wahlenb. 1812 non (L.) All. 1785
Spiesia glacialis Kuntze

Taxonomy and nomenclature. N. Hylander, Uppsala Univ. Årsskr. 1945(7): 229 (1945) (Scandinavian population differing from the Central European one in seed colour); Gutermann & Merxmüller 1961: 270–272; B. Boivin, Svensk Bot. Tidskr. 56: 496–500 (1962) (*Oxytropis deflexa* with five variaties, including var. *lapponica* [= *O. lapponica*]); Fl. Iber. 1999: 340, 341; L.I. Malyshev, Turczaninowia 11(4): 126–127 (2008); D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology).

Diploid with 2n=16 (Ga, No): T. Engelskjøn, Opera Bot. 52: 26 (1979); C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 120: 28 (1997). The same number reported by P.G. Zhukova, Bot. Zhurn.

(Moscow & Leningrad) 68: 930 (1983), for material from many localities in N.E. Asia, M. Ashraf & R.N. Gohil, Taxon 35: 408 (1986), for material from India, B. Jahan et al., Ann. Missori Bot. Gard. 81: 795 (1994), for material from Pakistan, and S.M. Jeelani et al., Pl. Syst. Evol. 300: 1181 (2014), for material from the Kashmir Himalaya.

Notes. For details of the distribution and ecology in Norway, see R. Nordhagen, Svensk Bot. Tidskr. 58: 129–135, 160–161 (1964).

Total range. Outside Europe, present in Caucasia and C. and S.E. Asian mountains: Hultén & Fries 1986: map 1194.

Data wanted: Al, Au, Fe, Ga, He, Hs, It, Ju, No, Su

Oxytropis deflexa (Pall.) DC. subsp. **norvegica** Nordh. – Map 0000.

Phylogenetics (of the species). A. Archambault & M.V. Strömvik, Botany 90: 770–779 (2012) (evolutionary relationships as estimated from ITS sequences; *Oxytropis deflexa* and *O. amethystea* belonging to the same informal group, which is basal in the phylogenetic tree but at one tip of the sequence network); A.B. Kholina et al., Russian J. Genetics 52: 780–793 (2016) (*O. deflexa* in a clade with high support value together with *O. pallasii*, *O. pilosa*, *O. floribunda* and *O. glabra*).

Taxonomy. Altogether up to four subspecies or varieties are recognized in *Oxytropis deflexa*, of which only subsp. *norvegica* is present in Europe. **–** R.C. Barneby, Proc. Calif. Acad. Sci. 4: 193–201 (1952); B. Boivin, Svensk Bot. Tidskr. 56: 496–500 (1962) (with five variaties, including var. *lapponica* [= *O. lapponica*]); R. Nordhagen, Svensk Bot. Tidskr. 58: 135–151 (1964); Fl. Arct. URSS 1986: 76–80; K. Høiland & M.M. Laane, Canad. J. Bot. 67: 218–224 (1989) (flower substances and their phytogeographical implications; Norwegian specimens found chemotaxonomically isolated from American and Asian populations); L.I. Malyshev, Turczaninowia 11(4): 123–124 (2008).

Diploid with 2n=16 (No): T. Engelskjøn, Opera Bot. 52: 26 (1979). – Also in its main range the species is diploid with 2n=16 (e.g. J. Měsíček & J. Soják, Folia Geobot. Phytotax. 4: 56 (1969), for material from Mongolia , T.S. Rostovtseva, Bot. Zhurn. (Moscow & Leningrad) 62: 1037 (1976), for material from S. Siberia, M. Kovanda, Rhodora 80: 433 (1978), for material from Colorado, the United States, P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 68: 928 (1983), for material from N.E. Asia (as *Astragalus deflexa* subsp. *deflexa* and subsp. *dezhnevii* Jurtz.), and S.Z. Zhang et al., Acta Sci. Nat. Univ. Nei Menggu 25: 64–72 (1994), for material from N.E. China).

Notes. For details of the distribution, possible history and ecology of the taxon, see C.T. Mörner, Svensk Bot. Tidskr. 20: 344–351 (1926), R. Nordhagen, Svensk Bot. Tidskr. 58: 135–163 (1964), O. Skifte, Blyttia 40: 237–242 (1982), A. Elvebakk, Tromura Naturvitensk. 42: 1–69 (1984), M.M. Laane & K. Høiland, Svensk Bot. Tidskr. 88: 199–212 (1994), K.B. Westergaard et al., Ecofact rapport 97, 21 pp. (Tromsø & Sandnes 2011) (also genetic analysis), and R. Elven in R. Elven et al. (ed.), Distribution maps of Norwegian vascular plants, IV The eastern and northeastern elements, pp. 273–275 (Trondheim 2013).

Endemic to Europe (Norway: Kautokeino in S.W. Finnmark). – The main range of the species extends disjunctly from Altai to N.W. Canada and eastern U.S.A: Hultén & Fries 1986: map 1195. The northern Norwegian populations are isolated by c. 7 500 km and c. 9 000 km from the nearest populations in Asia and (across the Atlantic) in North America, respectively.

Data wanted: No

Oxytropis montana (L.) DC. – Map 0000.

Astragalus montanus L. (Aragallus montanus (L.) Greene; Phaca montana (L.) All.; Spiesia montana (DC.) Kuntze)
Oxytropis jacquinii Bunge (Astragalus jacquinii (Bunge) A.W. Hill; Oxytropis montana subsp. jacquinii (Bunge) Nyman)

Taxonomy and nomenclature. In Fl. Eur. given as *Oxytropis jacquinii*. – Gutermann & Merxmüller 1961: 202–232, 234–237, 262–267 (as *Oxytropis jacquinii*; *Astragalus montanus* L. as nomen ambiguum; also *O. jacquinii* × *pyrenaica* [= *O. montana* × *neglecta*]); W. Guterman, Phyton (Horn) 49: 77–92 (2009) (*A. montanus* L. lectotypified with a Burser specimen; "accordingly *Oxytropis montana* (L.) DC. (s. str.) is the correct name of what is usually known as *O. jacquinii* Bunge since 1961; Fl. Gallica 2014: 748 (plants appearing intermediate between *O. jacquinii* [= *O. montana*) and *O. amethystea* are present in the central Prealps of France).

Diploid with 2n=16 (He): C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 76: 139–140, 147 (1953).

Endemic to Europe.

Data wanted: Au, Ga, Ge, He, It

Oxytropis carpatica R. Uechtr. – Map 0000.

Oxytropis montana (L.) DC. subsp. carpatica (R. Uechtr.) Soó

Taxonomy and nomenclature. Gutermann & Merxmüller 1961: 202–230, 238–239.

Diploid with 2n=16 (Sk): A. Murín & J. Májovský, Acta Fac. Rerum Nat. Univ. Comen., Bot. 30: 9 (1983); A. Uhríková & Z. Dúbravcová, Oecol. Mont. 6: 1–3 (1997).

Endemic to Europe.

Data wanted: Po, Rm, Sk, Uk

Oxytropis helvetica Scheele – Map 0000.

Oxytropis gaudinii Bunge (Spiesia gaudinii (Bunge) Kuntze)
O. neglecta Bertol. 1851 non Ten. 1831 (Oxytropis lapponica (Wahlenb.) J. Gay subsp. neglecta (Bertol.) Nyman)
O. parvopassuae Parl. (Astragalus parvopassuae (Parl.) Burnat, nom. illeg.)

Taxonomy and nomenclature. In Fl. Eur. givens as *Oxytropis gaudinii*. – Gutermann & Merxmüller 1961: 202–230 (in the first and last as *O. gaudinii*).

Diploid with 2n=16 (Ga, It): C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 92: 17 (1969), 120: 28 (1997), Taxon 18: 434 (1969) (as *Oxytropis gaudinii*).

Notes. For details of the distribution in the S.W. Alps, see W. Lippert, Mitt. Bot. Staatssamml. München 19: 435–439 (1983).

Endemic to Europe.

Data wanted: Ga, He, It

Oxytropis amethystea Arv.-Touv. – Map 0000.

Oxytropis amethystina Arv.-Touv, nom. illeg.
O. montana (L.) DC. subsp. occidentalis (Asch. & Graebn.) Braun-Blanq.; O. neglecta Ten. subsp. occidentalis (Asch. & Graebn.) O. Bolòs, Vigo, Masalles & Ninot

Phylogenetics. A. Archambault & M.V. Strömvik, Botany 90: 770–779 (2012) (evolutionary relationships as estimated from ITS sequences; *Oxytropis deflexa* and *O. amethystea* belonging to the same informal group, which is basal in the phylogenetic tree but at one tip of the sequence network).

Taxonomy and nomenclature. "Hybrid swarms with 3 [= *Oxytropis gaudinii*, here given as *O. montana*] occur in the Alps" (Fl. Eur.). – Gutermann & Merxmüller 1961: 202–230, 243–246; Fl. Iber. 1999: 340–342; Fl. Gallica 2014: 748 (plants appearing intermediate between *O. jacquinii* [= *O. montana*) and *O. amethystea* are present in the central French Prealps).

Notes. It not confirmed (?It given in Fl. Eur.). – For details of the distribution in the S.W. Alps, see W. Lippert, Mitt. Bot. Staatssamml. München 19: 435–439 (1983).

Endemic to Europe.

Data wanted: Ga, Hs

Oxytropis neglecta Ten. – Map 0000.

Oxytropis carniolica Vierh.
O. gaudinii subsp. samnitica Arcang. (O. montana subsp. samnitica (Arcang.) Hayek; O. samnitica (Arcang.) Vierh.)
O. generosa Brügger (O. pyrenaica Godr. & Gren. subsp. generosa (Brügger) Nyman)
O. huteri Rchb. f.
O. montana (L.) DC. subsp. retezatensis Pawł.
O. pyrenaica Godr. & Gren. (Astragalus pyrenaicus (Godr. & Gren.) Rouy; O. gaudinii Bunge subsp. pyrenaica (Godr. & Gren.) Bonnier & Layens; O. montana subsp. pyrenaica (Godr. & Gren.) O. Bolòs & Vigo, nom. inval.; O. neglecta subsp. pyrenaica (Godr. & Gren.) O. Bolòs, Vigo, Masalles & Ninot; Spiesia pyrenaica (Godr. & Gren.) Kuntze)

Taxonomy and nomenclature. In Fl. Eur. given as *Oxytropis pyrenaica*. "Plants of hybrid origin intermediate between 3 [= *Oxytropis gaudinii*, here given as *O. montana*] and 7 [= *O. pyrenaica*, here given as *O. neglecta*] are frequently found" (Fl. Eur.). – M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 309, 313 (1957) (as *O. montana* subsp. *retezatensis*); Gutermann & Merxmüller 1961: 202–230, 232–233, 246–268 (as *O. pyrenaica* with seven variants ("Varianten"); *O. neglecta* Ten. as nomen ambiguum; also *O. jacquinii* × *pyrenaica* [= *O. montana* × *neglecta*]); Fl. Iber. 1999: 341, 342–343; D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology); Fl. Gallica 2014: 748.

Diploid with 2n=16 (Ga, Hs, It, Sl): C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 82: 271–273 (1959); C. Favarger & P. Küpfer, Collect. Bot. 7: 354 (1968) (as *Oxytropis pyrenaica*); M. Lovka et al., Taxon 20: 790 (1971) (as *O. pyrenaica*); P. Küpfer, Boissiera 23: 3–322 (1974) (as *O. pyrenaica*); E. Puente García et al., Taxon 62: 1082 (2013).

Notes. Al and Gr not confirmed (?Al and ?Gr given in Fl. Eur.). – For details of the distribution in the S.W. Alps, see W. Lippert, Mitt. Bot. Staatssamml. München 19: 435–439 (1983) (as *Oxytropis pyrenaica*).

Endemic to Europe.

Data wanted: Au, Ct, Ga, He, Hs, It, Rm, Sl

Oxytropis triflora Hoppe – Map 0000.

Astragalus triflorus (Hoppe) Gams; Spiesia triflora (Hoppe) Kuntze

Taxonomy. Gutermann & Merxmüller 1961: 202–230, 268–269.

Notes. It confirmed (?It given in Fl. Eur.).

Endemic to Europe.

Data wanted: Au, It

Oxytropis mertensiana Turcz. – Map 0000.

Aragallus mertensianus (Turcz.) Greene; Spiesia mertensiana (Turcz.) Kuntze

Taxonomy. R.C. Barneby, Proc. Calif. Acad. Sci. 4: 201–202 (1952); Fl. Arct. URSS 1986: 92–96; L.I. Malyshev, Turczaninowia 11(4): 13–14 (2008).

Diploid chromosome number reported by K. Holmen, Bot. Not. 115: 89, 90 (1962), and A.W. Johnson & J.G. Packer, Bot. Not. 121: 430 (1968), for material from Alaska, as well as by P.G. Zhukova & A.D. Tikhonova, Bot. Zhurn. (Moscow & Leningrad) 56: 872 (1971), P.G. Zhukova et al., Bot. Zhurn. (Moscow & Leningrad) 58: 1335 (1976), P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 68: 925–932 (1983), and N.S. Probatova et al., Taxon 61: 1341 (2012), for material from Russian Far East.

Total range. From Polar Ural to N.W. Canada (Yukon): Fl. Arct. URSS 1986: 92 (Eurasian part).

Data wanted: Rus (N)

Oxytropis hippolyti Boriss. – Map 0000.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(2): 79–97 (2001) (with two varieties); I.R. Arslanova & N.A. Kalashnik, Naucn. Vedomosti, Ser. Estestv. nauki. 9(104): 157–164 (2011) (morphometric parameters of chromosomes), Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012) (karyotype).

Hexaploid with 2n=48 (Rus (E)): E.G. Filippov et al., Bot. Zhurn. (Moscow & Leningrad) 83: 138 (1998); I.R. Arslanova & N.A. Kalashnik, Naucn. Vedomosti, Ser. Estestv. nauki. 9(104): 159, 163 (2011), Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012).

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.): A.E. Mitroshenkova, Nauchnyy Dialog No. 2(38): 133 (2015).

Endemic to Europe.

Data wanted: Rus (C, E)

Oxytropis campestris (L.) DC. – Map 0000.

Taxonomy. J. Jalas, Ann. Bot. Soc. Zool.-Bot. Fenn. "Vanamo" 24(1): 57–64, 283–291 (1950) (with "subsp. *typica"*, subsp. *scotica* and subsp. *sordida*); P. Leins & H. Merxmüller, Mitt. Bot. Staatssamml. München 6: 19–31 (1966) (with subsp. *campestris* (incl. subsp. *scotica*), subsp. *tyroliensis* ("tiroliensis") and subsp. *sordida*); J. Chrtek & A. Chrtková, Folia Geobot. Phytotax. 18: 309–320 (1983) (comparisons with Balkan species); E. Kozuharova et al., Phytol. Balcan. 13: 335–346 (2012), in W. Garza (ed.), Fabaceae: Classification, Nutrient Composition and Health Benefits, pp. 61–109 (Hauppauge 2015) (in both publications comparisons of Balkan species of *Oxytropis* using morphological characters and molecular techniques; *O. campestris* possibly evolved as an allohexaploid derivative of the diploid *Oxytropis urumovii* and a tetraploid from the Balkans, such as *O. kozhuharovii*); M.X. Li et al., Rec. Nat. Prod. 6: 1–20 (2012) (phytochemistry); D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology; *O. campestris* and *O. halleri* subsp. *korabensis* showing "high similarity" and standing "closer to *O. kozhuharovii* compared to *O. urumovii* and *O. dinarica*"); R. Elven & T. Alm in R. Elven et al. (ed.), Distribution maps of Norwegian vascular plants, IV The eastern and northeastern elements, pp. 270–273 (Trondheim 2013) (with subsp. *campestris*, subsp. *sordida* and subsp. *scotica*).

Notes. Al added (not given in Fl. Eur.).

Total range. Outside Europe, present (as subsp. *sordida*) in N.W. Siberia and perhaps further east

to Russian Far East. In North America, there are plants that are often treated as races of *Oxytropis campestris* (e.g. R.C. Barneby, Proc. Calif. Acad. Sci. 4: 248–269 (1952)) but, according to R. Elven & T. Alm, loc. cit., probably are several species not very closely related to the Eurasian plant. – MJW 1965: map 245c; Hultén & Fries 1986: map 1196 (with ranges of subsp. *campestris* and subsp. *sordida* outlined) [in both the Siberian – Far Eastern range possibly exaggerated (see the note above)].

O. campestris subsp. **campestris** – Map 0000.
Astragalus campestris L. (Aragallus campestris (L.) Greene; Spiesia campestris (L.) Kuntze)
Oxytropis alpina Ten. (Astragalus campestris subsp. alpinus (Ten.) P. Fourn.; O. campestris subsp. alpina (Ten.) Wettst.)
O. campestris subsp. azurea Carrillo & Ninot
O. campestris subsp. linnaeana Hyl.
O. campestris subsp. oblongifolia Hazsl. ex Jáv.
O. nuriae Sennen
O. tatrae Borbás

Taxonomy. In Fl. Eur. *Oxytropis nuriae* is mentioned in a note under *O. campestris* as possibly representing its further subspecies. – M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 317–318 (1957) (as *O. campestris* subsp. *oblongifolia*); Fl. Iber. 1999: 343, 345; Fl. Gallica 2014: 747.

Tetraploid to high polyploid, but mostly hexaploid. 2n=32 (Po): E. Pogan et al., Acta Biol. Cracov. Ser. Bot. 22: 37–69 (1980) (as *Oxytropis campestris*). – 2n=48 (Au, Bu, Ga, Hs, It, Sk): C. Favarger & P. Küpfer, Collect. Bot. 7: 354 (1968) (as *O. campestris*); J. Májovský et al., Acta Fac. Rerum Nat. Univ. Comen., Bot. 23: 14 (1974) (as *O. campestris*); P. Küpfer, Boissiera 23: 3–322 (1974) (as *O. campestris*); D. Pavlova, Fl. Medit. 6: 325, 326 (1996); Dobeš & Vitek 2000: 123 (as *O. campestris*); N.S. Probatova et al., Taxon 57: 1272 (2008) (as *O. campestris*). – 2n=98 (It): G. Chichiricc`o & F. Tammaro, Inform. Bot. Ital. 14: 264–267 (1982) [possibly hyperdodecaploid].

Notes. For details of the ecology, phenology and distribution in Bu, see E. Kozuharova, Ann. Univ. Sofia, Fac. Biol., Bot. 91: 49–61 (2000) (reproductive biology), and E. Kozuharova et al., Phytol. Balcan. 18: 25–35 (2012), in W. Garza (ed.), Fabaceae: Classification, Nutrient Composition and Health Benefits, pp. 61–109 (Hauppauge 2015) (in all as *Oxytropis campestris*). – For the breeding system of the subspecies in Bu, see E. Kozuharova & A.J. Richards, Compt. Rend. Acad. Bulg. Sci., Sci. Math. Nat. 69: 1571–1580 (2016) (as *O. campestris*).

Endemic to Europe (not indicated as such in Fl. Eur.).

Data wanted: Al, Au, BH, Br, Bu, Es, Ga, He, Hs, It, Mk, Po, Rm, Rus (C, N), Sk, Su, Uk

O. campestris subsp. **scotica** Jalas – Map 0000.

Taxonomy. In Fl. Eur. (Index) included in subsp. *campestris*.

Notes. For details concerning No, see K.A. Lye & O.G. Lima, Blyttia 32: 169–180 (1974), and A. Lundberg, Blyttia 72: 123–135 (2014).

Endemic to Europe.

Data wanted: Br, No

O. campestris subsp. **tyroliensis** (Sieber ex Fritsch) Leins & Merxm. – Map 0000.
Oxytropis tyroliensis Sieber ex Fritsch
Astragalus tyroliensis Steud.

Taxonomy. P. Schönswetter et al., Pl. Syst. Evol. 244: 245–255 (2004) (Amplified Fragment

Length Polymorphism revealing no genetic divergence of subsp. *tyroliensis* and subsp. *campestris*, and "Neither do the morphological characters in the literature discriminate between them").

Nomenclature. Orthography of the specific epithet corrected (*tyroliensis* instead of *tiroliensis*).

Endemic to Europe.

Data wanted: Au, He, It

Should apparently be included in subsp. campestris.

O. campestris subsp. **sordida** (Willd.) C. Hartm. – Map 0000.
Astragalus sordidus Willd. (Oxytropis sordida (Willd.) Pers.; Spiesia sordida (Willd.) Kuntze)

Taxonomy. N. Hylander, Uppsala Univ. Årsskr. 1945(7): 229 (1945) (subsp. *sordida* not recognized due to the wide variation of the species); O.I. Kuzeneva in Pojark., Fl. Murmansk. 4: 139–142 (1959) (as *Oxytropis sordida*); Fl. Arct. URSS 1986: 109–115 (as *O. sordida* with three subspecies); M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(2): 79–97 (2001) (as *O. sordida*); L.I. Malyshev, Turczaninowia 11(4): 64–65 (2008) (as *O. sordida* with two subspecies); I.R. Arslanova & N.A. Kalashnik, Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012) (karyotype; as *O. sordida*).

Hexaploid with 2n=48 (Fe, No, Rus (C, N)): A.P. Sokolovskaya, Vestn. Leningr. Univ. (Biol.) 17: 111 (1970) (c. 48; as *Oxytropis sordida*); T. Engelskjøn, Opera Bot. 52: 26 (1979); Uotila & Pellinen 1985: 18 (2n=36 given in the literature for material from Finland stated to be an error); A.N. Lavrenko et al., Bot. Zhurn. (Moscow & Leningrad) 74: 1060 (1989), 75: 1624 (in both as *O. sordida*); I.R. Arslanova & N.A. Kalashnik, Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012) (as *O. sordida*). – Dodecaploid chromosome number 2n=96 reported by P.G. Zhukova, Bot. Zhurn. (Moscow & Leningrad) 68: 930 (1983), for material from Wrangel Island (as *Oxytropis sordida* subsp. *schamurinii* Jurtz.

Total range. From Fennoscandia to Siberia (at least to Taimyr).

Data wanted: Fe, No, Rus (C, N)

Oxytropis approximata Less. – Map 0000.
Oxytropis campestris auct.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(2): 79–97 (2001); I.R. Arslanova & N.A. Kalashnik, Vestn. Orenburg State Univ. 6/2009: 43–45 (2009), Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012) (in both karyotype); N.V. Kulikov et al., Endemichnye rasteniya Urala vo flore Sverdlovskoi oblasti, pp. 451–452 (Ekaterinburg 2013).

Hexaploid with 2n=48 (Rus (C)): I.R. Arslanova & N.A. Kalashnik, Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012). The same number reported by E.G. Filippov et al., Bot. Zhurn. (Moscow & Leningrad) 83: 138 (1998), for material from the Asian side of the Chelyabinsk Province of Russia.

Notes. Rus (C) (floristic novelty).

Total range. Outside Europe, present on the eastern side of the S. Urals.

Data wanted: Rus (C)

Oxytropis gmelinii Fisch. ex Boriss. – Map 0000.
Oxytropis campestris auct.

Taxonomy. In Fl. Eur. mentioned in a note under *Oxytropis campestris* as "probably not a distinct species". – M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(2): 79–97 (2001) (with two varieties); I.R. Arslanova & N.A. Kalashnik, Vestn. Orenburg State Univ. 6/2009: 43–45 (2009) (karyotype), Naucn. Vedomosti, Ser. Estestv. nauki. 9(104): 157–164 (2011) (morphometric parameters of chromosomes), Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012) (in both karyotype).

Hexaploid with 2n=48 (Rus (C)): E.G. Filippov et al., Bot. Zhurn. (Moscow & Leningrad) 83: 138 (1998) (also for material from the Asian side of the S. Urals); I.R. Arslanova & N.A. Kalashnik, Naucn. Vedomosti, Ser. Estestv. nauki. 9(104): 158–162 (2011), Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012).

Notes. Rus (C) (the species not recognized in Fl. Eur.). – For details of the distribution and ecology, see A.A. Muldashe et al., Proc. Samara Sci. Center RAS 13: 78–81 (2011).

Total range. Outside Europe, present on eastern slopes of the S. Urals.

Data wanted: Rus (C)

Oxytropis lessingiana Knjaz. 2001 – Map 0000.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(2): 79–97 (2001) (as *Oxytropis* × *lessingiana* (*O. approximata* × *O. gmelinii*)).

Notes. Rus (C) (taxonomic novelty).

Total range. The range extends from Rus (C) just to the east of the River Ural.

Data wanted: Rus (C)

Oxytropis sibajensis Knjaz. 2001 – Map 0000.
Oxytropis gmelinii auct.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(2): 79–97 (2001).

Notes. Rus (C) (taxonomic novelty).

Total range. The range extends from Rus (C) just to the east of the River Ural.

Data wanted: Rus (C)

Oxytropis prenja (Beck) Beck – Map 0000.
Oxytropis halleri W.D.J. Koch var. prenja Beck

Taxonomy. P. Leins & H. Merxmüller, Mitt. Bot. Staatssamml. München 6: 19–31 (1966); D. Pavlova et al., Willdenowia 29: 69–75 (1999); D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology; *Oxytropis prenja* separated "very clearly" from other Balkan species by its largest pollen grains).

Notes. Gr added (not given in Fl. Eur.): Mountain Fl. Greece 1986: 478.

Endemic to Europe.

Data wanted: Al, Cg, Ct, BH, Gr

Oxytropis kozhuharovii D.K. Pavlova, D. Dimitrov & M. Nikolova 1999 – Map 0000.

Taxonomy. D. Pavlova et al., Willdenowia 29: 69–75 (1999) ("*Oxytropis kozhuharovii* combines morphological features of the *Oxytropis campestris* group … and of *O. halleri* subsp. *korabensis*…"); E. Kozuharova et al., Phytol. Balcan. 13: 335–346 (2007), Compt. Rend. Acad. Bulg. Sci., Bot. 65: 457–462 (2012) (chromatographic studies), in W. Garza (ed.), Fabaceae: Classification, Nutrient Composition and Health Benefits, pp. 61–109 (Hauppauge 2015) (in both publications comparisons of Balkan species of *Oxytropis* using morphological characters and molecular techniques; *O. kozhuharovii* as most closely related to *O. prenja* and as possibly evolved as an allotetraploid derivative of *O. urumovii* and *O. halleri*); D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology).

Tetraploid with 2n=32 (Bu): D. Pavlova et al., Willdenowia 29: 71 (1999).

Notes. Bu (taxonomic novelty). – For details of the ecology, phenology and distribution of the species, see E. Kozuharova & A.J. Richards, Compt. Rend. Acad. Bulg. Sci. 62: 831–838 (2009), and E. Kozuharova et al., Phytol. Balcan. 18: 25–35 (2012), loc. cit. (2015). – For the breeding system of the species, see E. Kozuharova & A.J. Richards, Compt. Rend. Acad. Bulg. Sci., Sci. Math. Nat. 69: 1571–1580 (2016).

Endemic to Europe (Bulgaria: Pirin Mts.).

Data wanted: Bu

Oxytropis urumovii Ják. – Map 0000.

Excl. Oxytropis dinarica (Murb.) Wettst.

Taxonomy. P. Leins & H. Merxmüller, Mitt. Bot. Staatssamml. München 6: 19–31 (1966) (*Oxytropis campestris* subsp. *dinarica* [= *O. dinarica*] included); J. Chrtek & A. Chrtková, Folia Geobot. Phytoatax. 18: 309–320 (1983); E. Kozuharova et al., Phytol. Balcan. 13: 335–346 (2007), Compt. Rend. Acad. Bulg. Sci., Bot. 65: 457–462 (2012) (chromatographic studies), in W. Garza (ed.), Fabaceae: Classification, Nutrient Composition and Health Benefits, pp. 61–109 (Hauppauge 2015) (in both publications comparisons of Balkan species of *Oxytropis* using morphological characters and molecular techniques; *O. urumovii* as "a very distinct diploid species which might be ancestral to this group [= *O. urumovii*, *O. kozhuharovii*, *O. campestris*, *O. halleri* and *O. dinarica*]"); D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology; "*Oxytropis urumovii* and *O. dinarica* are clustered together showing a high degree of similarity and separated from *O. campestris*").

Diploid and hexaploid. 2n=16 (Bu): R.M. Krusheva, Taxon 35: 613 (1986); D. Pavlova, Fl. Medit. 6: 324, 325 (1996). – 2n=48 (Bu): N. Andreev, Taxon 30: 74 (1981) (according to E. Kozuharova & A.J. Richards, Compt. Rend. Acad. Bulg. Sci., Sci. Math. Nat. 69: 1573 (2016), this is a case of endopolyploidy).

Notes. Al and Ju omitted (given in Fl. Eur.), the material being referable to *Oxytropis dinarica*. – For the reproductive biology of the species, see E.K. Kozuharova, God. Sofiisk. Univ. "Kliment Ohridski", Biol. Fak., 2 Bot., 91: 49–61 (2000). For details of the ecology, phenology and distribution, see E. Kozuharova, Ann. Univ. Sofia, Fac. Biol., Bot. 91: 49–61 (2000) (reproductive biology), see E. Kozuharova & A.J. Richards, Compt. Rend. Acad. Bulg. Sci. 62: 831–838 (2009), and E. Kozuharova et al., Phytol. Balcan. 18: 25–35 (2012), loc. cit. (2015). – For the breeding system of the species, see E. Kozuharova & A.J. Richards, Compt. Rend. Acad. Bulg. Sci., Sci. Math. Nat. 69: 1571–1580 (2016).

Endemic to Europe (Bulgaria: Pirin Mts.).

Data wanted: Bu

Oxytropis dinarica (Murb.) Wettst. – Map 0000.

Taxonomy. In Fl. Eur. included in *Oxytropis urumovii* by citing *O. campestris* subsp. *dinarica* as its synonym. – P. Leins & H. Merxmüller, Mitt. Bot. Staatssamml. München 6: 19–31 (1966) (included in *O. urumovii*); J. Chrtek & A. Chrtková, Folia Geobot. Phytoatax. 18: 309–320 (1983) (with three subspecies, of which subsp. *dinarica* with three varieties); D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology; "*Oxytropis urumovii* and *O. dinarica* are clustered together showing a high degree of similarity and separated from *O. campestris*").

Endemic to Europe.

Notes. Al, BH, Cg, Ct, Ko. Mk, Se (the species not recognized in Fl. Eur.)

O. dinarica subsp. **dinarica** – Map 0000.

Oxytropis campestris (L.) DC. subsp. dinarica Murb.
O. sulphurea Pant. 1874 non Ledeb. 1831

Notes. Al, BH, Cg, Ko. Mk, Se.

Data wanted: Al, BH, Cg, Ko. Mk, Se

O. dinarica subsp. **velebitica** Chrtek & Chrtková 1983 – Map 0000.

Notes. Ct.

Data wanted: Ct

O. dinarica subsp. **weberi** Chrtek & Chrtková 1983 – Map 0000.

Diploid with 2n=16 (Mk): E. Kozuharova et al., Phytol. Balcan. 13: 337, 339 (2007).

Notes. Al, Mk.

Data wanted: Al, Mk

Oxytropis foucaudii Gillot – Map 0000.

Astragalus foucaudii (Gillot) A.W. Hill
A. lazicus auct.
Oxytropis lazica auct. gall.

Taxonomy. P. Leins & H. Merxmüller, Mitt. Bot. Staatssamml. München 6: 19–31 (1966); Fl. Iber. 1999: 343–345.

Diploid and tetraploid. 2n=16 (Hs): P. Küpfer, Boissiera 23: 3–322 (1974); E. Puente García et al., Taxon 62: 1082 (2013). – 2n=32 (Ga): C. Favarger & K.L. Huynh, Taxon 13: 205 (1964); C. Favarger & P. Küpfer, Collect. Bot. 7: 354 (1968).

Endemic to Europe.

Data wanted: Ga, Hs

Oxytropis jabalambrensis (Pau) Podlech – Map 0000.

Astragalus jabalambrensis Pau

Taxonomy. D. Podlech, Sendtnera 3: 147–148 (1996); C. Aedo et al., Anales Jard. Bot. Madrid 56: 408–409 (1998); Fl. Iber. 1999: 344–347.

Diploid with 2n=16 (Hs): C. Aedo et al., Anales Jard. Bot. Madrid 56: 408–409 (1998).

Notes. Hs (the species not recognized in Fl. Eur.). – For details of the distribution, ecology and conservation of the species, see Gobierno de Aragón, Departamento de Medio Ambiente (ed.), Catálogo de Especies Amenazadas en Aragón, flora, pp. 48–51 (Huesca 2007), and J.L. Lozano Terrazas & G. Mateo Sanz, Flora Montiber. 46: 109–112 (2010).

Endemic to Europe (Spain: Sierra de Javalambre and Sierra de Gúdar).

Data wanted: Hs

Oxytropis spicata (Pall.) O. Fedtsch. & B. Fedtsch. – Map 0000.

Astragalus spicatus Pall.
Oxytropis caudata DC. (Spiesia caudata (DC.) Kuntze)

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(4): 141–144 (2001); L.I. Malyshev, Turczaninowia 11(4): 65–66 (2008); I.R. Arslanova & N.A. Kalashnik, Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012) (karyotype); N.V. Kulikov et al., Endemichnye rasteniya Urala vo flore Sverdlovskoi oblasti, pp. 215–220 (Ekaterinburg 2013).

Diploid and tetraploid with 2n=16, 32 (Rus (C)): E.G. Filippov et al., Bot. Zhurn. (Moscow & Leningrad) 83: 138–139 (1998) (2n=16 also for material from the Asian side of the Urals); I.R. Arslanova & N.A. Kalashnik, Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012).

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.). – For details concerning the Samara Province of Rus (E), see V.N. Ilina, Izv. Samarsk. Naucn. Tsentra Ross. Akad. Nauk 17(4): 98–104 (2015).

Total range. Outside Europe, present in S.W. Siberia just E. of the Urals.

Data wanted: Rus (C, E)

Oxytropis songorica (Pall.) DC. – Map 0000.

Astragalus songoricus Pall. (Spiesia songorica (Pall.) Kuntze)

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(4): 141–143 (2001); L.I. Malyshev, Turczaninowia 11(4): 63–64 (2008).

Diploid chromosome number 2n=16 reported by T.V. An'kova & D.N. Shaulo, Taxon 61: 1336 (2012), for material from Asiatic Kazakhstan.

Notes. Probably extinct in Rus (E) (in Fl. Eur. given as extant in Rs (E)).

Total range. Outside Europe, present in Asiatic Kazakhstan, S.W. Siberia, Mongolia and N.W. China.

Data wanted: ×Rus (E)

Oxytropis kasakorum Knjaz. 2001 – Map 0000.

Oxytropis spicata auct.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(4): 143–146 (2001).

Tetraploid with 2n=32 (Rus (C)): E.G. Filippov et al., Bot. Zhurn. (Moscow & Leningrad) 83: 138–139 (1998) (as *Oxytropis spicata*).

Notes. Rus (C) (taxonomic novelty).

Total range. The range extends from Rus (C) just to the south and east of the River Ural.

Data wanted: Rus (C)

Oxytropis knjazevii Vasjukov 2014 – Map 0000.

Oxytropis tatarica Knjaz. 2001 non Bunge 1874
O. spicata auct.

Taxonomy and nomenclature. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(4): 145–148 (2001) (as *Oxytropis tatarica*); V.M. Vasjukov, Turczaninowia 17: 5 (2014).

Notes. Rus (C, E) (taxonomic novelty).

Endemic to Europe.

Data wanted: Rus (C, E)

Oxytropis ambigua (Pall.) DC. – Map 0000.

Astragalus ambiguus Pall. (Spiesia ambigua (Pall.) Kuntze)

Taxonomy. L.I. Malyshev, Turczaninowia 11(4): 35 (2008); I.R. Arslanova & N.A. Kalashnik, Naucn. Vedomosti, Ser. Estestv. nauki. 9(104): 157–164 (2011) (morphometric parameters of chromosomes), Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012) (karyotype).

Diploid and tetraploid. 2n=16 (Rus (C)): I.R. Arslanova & N.A. Kalashnik, Naucn. Vedomosti, Ser. Estestv. nauki. 9(104): 158 (2011). – 2n=32 (Rus (C)): I.R. Arslanova & N.A. Kalashnik, Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012).

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.).

Total range. Outside Europe, present in Asiatic Kazakhstan, S.W. (? and N.) Siberia, Mongolia and N.W. China.

Data wanted: Rus (C, E)

Oxytropis baschkiriensis Knjaz. 2001 – Map 0000.

Oxytropis baschkiriensis subsp. skvortsovii Knjaz. (O. baschkiriensis var. skvortsovii (Knjaz.) Knjaz.)
O. ambigua auct.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(1): 126–130 (2001) (with subsp. *baschkiriensis* ("baschkirensis") and subsp. *skvortsovii*), 90: 415–416 (2005) (var. *skvortsovii*); M.N. Vladimirova et al., Nauch. Zhurn. KunGAU 66(02): 1–9 (2011) (characteristics of age stages); A.A. Muldashev et al., Izv. Samarsk. Naucn. Tsentra Ross. Akad. Nauk 15(3): 1394–1397 (2015) (morphological variability of flowers).

Tetraploid with 2n=32 (Rus (E)): E.G. Filippov et al., Bot. Zhurn. (Moscow & Leningrad) 83: 138 (1998) (as *Oxytropis ambigua*).

Notes. Rus (C, E) (taxonomic novelty).

Total range. Outside Europe, present on E. slopes of the S. Urals.

Data wanted: Rus (C, E)

Oxytropis campanulata Vassilcz. – Map 0000.

Oxytropis uralensis auct.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 84(9): 113–122 (1999); L.I. Malyshev, Turczaninowia 11(4): 41–42 (2008).

Diploid and tetrapoid. 2n=16 reported by L.A. Malakhova, Bjull. Glavn. Bot. Sada 155: 60–66 (1990), for material from C. Siberia. – 2n=32 reported by N.V. Stepanov, Bot. Zhurn. (Moscow & Leningrad) 72: 137 (1994), for material from S. Siberia.

Notes. Rus (C, E) (floristic novelty).

Total range. Outside Europe, present in S. Siberia and Mongolia.

Data wanted: Rus (C, E)

Oxytropis ponomarjevii Knjaz. 2001 – Map 0000.

Oxytropis uralensis auct.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 86(1): 129–133 (2001).

Tetraploid chromosome number 2n=32 reported by E.G. Filippov et al., Bot. Zhurn. (Moscow & Leningrad) 83: 139 (1998), for material from E. slopes of S. Urals (as *Oxytropis uralensis*).

Notes. Rus (C) (taxonomic novelty).

Total range. Outside Europe, present on E. slopes of the S. Urals.

Data wanted: Rus (C)

Oxytropis halleri Bunge ex W.D.J. Koch – Map 0000.

Astragalus variabilis Rouy 1899 non Bunge 1877
A. velutinus Sieber

Excl. Oxytropis xerophila Gutermann (O. halleri subsp. velutina O. Schwartz)

Taxonomy. D. Pavlova et al., Willdenowia 29: 69–75 (1999).

Endemic to Europe.

O. halleri subsp. **halleri** – Map 0000.

Spiesia halleri (Bunge ex W.D.J. Koch) Kuntze
Oxytropis halleri subsp. sericea (Lam.) O. Schwarz
O. intermedia Brügger ** non Bunge 1839
O. intricans Dulac, nom. illeg.
O. sericea (DC.) Simonk.

Taxonomy. M. Guşuleac in Săvul., Fl. Rep. Pop. Romîne 5: 318–319 (1957) (as *Oxytropis sericea* with two varieties); Fl. Iber. 1999: 344 ("podria ser alopoliploide" [2n=32 given]), 345.

Tetraploid with 2n=32 (Br, He, Hs, Sk): C. Favarger & K.L. Huynh, Taxon 13: 205 (1964) (as *Oxytropis halleri*); C. Favarger, Bull. Soc. Neuchâteloise Sci. Nat. 88: 26-27 (1965) (as *O. halleri*); A.J. Richards, Taxon 18: 560 (1969) (as *O. halleri*); P. Küpfer, Boissiera 23: 3–322 (1974); M. Laínz, Collect. Bot. (Barcelona) 10: 201–204 (1976); A. Uhríková & Z. Dúbravcová, Oecol. Mont. 6: 1–3 (1997) (as *O. halleri*); Marhold et al. 2007: 425–426 (2n=16 reported for material from Sk regarded as possibly erroneous); E. Puente García et al., Taxon 62: 1082 (2013). – Diploid counts 2n=16 for material from Ga, He and It by C. Favarger, Bull. Soc. Neuchâteloise Sci. Nat. 88: 26–27 (1965) (as *Oxytropis halleri*), are probably referable to *O, xerophila*.

Notes. Au, Br, Ga, He, Hs, It, Po, Rm, Sk. "Pyrenees, Alps, Carpathians; Scotland" (Fl. Eur.).

Data wanted: Au, Br, Ga, He, Hs, It, Po, Rm, Sk

O. halleri subsp. **korabensis** (Kümmerle & Jáv.) Chrtek & Chrtková – Map 0000.

Oxytropis sericea (DC.) Simonk. subsp. korabensis Kümmerle & Jáv.

Taxonomy. In Fl. Eur. *Oxytropis sericea* subsp. *korabensis* is mentioned in a note under *O. halleri* as requiring further investigation "as these plants may not be correctly placed in this species". – J.

Chrtek & A. Chrtková, Folia Geobot. Phytoatax. 18: 318–319 (1983); D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology; *O. campestris* and *O. halleri* subsp. *korabensis* showing "high similarity" and standing "closer to *O. kozhuharovii* compared to *O. urumovii* and *O. dinarica*").

Notes. Al, Mk (the taxon not recognized in Fl.Eur.).

Data wanted: Al, Mk

Oxytropis xerophila Gutermann 2006 – Map 0000.

Oxytropis halleri Bunge ex W.D.J. Koch subsp. velutina O. Schwartz

Taxonomy and nomenclature, In Fl. Eur. given as *Oxytropis halleri* subsp. *velutina* "(Sieber) O. Schwarz". – Fl. Iber. 1999: 344 (as *O. halleri* subsp. *velutina* with 2n=16); W. Gutermann, Phyton (Horn) 46: 76–78 (2006) (as distinct from *O. halleri* both morphologically and cytologically); Fl. Gallica 2014: 747.

Diploid with 2n=16 (It): P. Küpfer, Boissiera 23: 3–322 (1974) (as *Oxytropis halleri* subsp. *velutina*). – The diploid counts 2n=16 for material from Ga, He and It by C. Favarger, Bull. Soc. Neuchâteloise Sci. Nat. 88: 26–27 (1965) (as *Oxytropis halleri*), are probably referable to this species.

Notes. Au, Ga, He, It. "C. Alps" (Fl. Eur., for *Oxytropis halleri* subsp. *velutina*).

Data wanted: Au, Ga, He, It

Oxytropis uralensis (L.) DC. – Map 0000.

Astragalus uralensis L. (Aragallus uralensis (DC.) Greene; Spiesia uralensis (L.) Kuntze)

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 90: 416–418 (2005); L.I. Malyshev, Turczaninowia 11(4): 72–73 (2008); I.R. Arslanova & N.A. Kalashnik, Naucn. Vedomosti, Ser. Estestv. nauki. 9(104): 157–164 (2011) (morphometric parameters of chromosomes), Byull. Bot. Sada Saratovsk. Gosuniv. 10: 171–176 (2012) (karyotype); I.R. Arslanova & N.V. Maslova, Byull. Bot. Sada Saratovsk. Gosuniv. 10: 32–37 (2012) (fruit and seed morphology).

Tetraploid with 2n=32 (Rus (N)): A.N. Lavrenko et al., Bot. Zhurn. (Moscow & Leningrad) 75: 1624 (1990). The same number reported by V.A. Belaeva & V.N. Siplivinsky, Bot. Zhurn. (Moscow & Leningrad) 61: 877 (1976), for material from the Baikal area.

Total range. Outside Europe, present in S.W. Siberia.

Data wanted: Rus (C, ?N)

Oxytropis kungurensis Knjaz. 1999 – Map 0000.

Oxytropis demidovii Knjaz. (O. kungurensis subsp. demidovii (Knjaz.) Knjaz.)
O. uralensis auct.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 84(9): 113–122 (1999) (as *Oxytropis kungurensis* and *O. demidovii*), 90: 415 (2005) (subsp. *demidovii*); N.V. Kulikov et al., Endemichnye rasteniya Urala vo flore Sverdlovskoi oblasti, pp. 220–223 (Ekaterinburg 2013).

Notes. Rus (C) (taxonomic novelty).

Total range. Outside Europe, present on E. slopes of the S. Urals.

Data wanted: Rus (C)

Oxytropis wologdensis Knjaz. 2005 – Map 0000.
Oxytropis uralensis auct.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 90: 418–422 (2005).

Notes. Rus (N) (taxonomic novelty).

Endemic to Europe (Russia: Vologda Province).

Data wanted: Rus (N)

Oxytropis ivdelensis Knjaz. 1999 – Map 0000.

Taxonomy. M.S. Knjasev, Bot. Zhurn. (Moscow & Leningrad) 84(9): 113–122 (1999) (with two varieties); L.I. Malyshev, Turczaninowia 11(4): 72–73 (2008) (included in *Oxytropis uralensis*); N.V. Kulikov et al., Endemichnye rasteniya Urala vo flore Sverdlovskoi oblasti, pp. 224–228 (Ekaterinburg 2013).

Notes. Rus (N) (taxonomic novelty).

Total range. Main range on the E. slopes of the C. and N. Urals.

Data wanted: Rus (N)

Oxytropis pilosa (L.) DC. – Map 0000.

Phylogenetics. M. Schlee et al., Nova Acta Leop. NF 87(328): 379–387 (2003) (molecular and phytosociological analyses of C. European relic populations), in J.C. Habel & T. Assmann (eds.), Relict species – Phylogeography and conservation biology, pp. 105-117 (Heidelberg 2010) (genetic variability of populations; "In fact, single populations of *O. pilosa* are as divergent as or even considerably more divergent than some *Astragalus* species. As a consequence, they deserve the same conservation efforts as the latter."); A. Archambault & M.V. Strömvik, Botany 90: 770–779 (2012) (evolutionary relationships as estimated from ITS sequences; *Oxytropis pilosa* and *O. glabra* belonging to the same informal group); A. Dizkirici Tekpinar et al., Turkish J. Bot. 40: 250–263 (2016) (phylogenetic relationships between *Oxytropis* and *Astragalus* species native to an Old World diversity center [Turkey]); A.B. Kholina et al., Russian J. Genetics 52: 780–793 (2016) (*O. pilosa* in a clade with high support value together with *O. pallasii*, *O. floribunda*, *O. glabra* and *O. deflexa*).

Taxonomy. Fl. Turkey 1970: 256; L.I. Malyshev, Turczaninowia 11(4): 17 (2008); T. Ceter et al., Bangladesh J. Bot. 42: 167–174 (2013) (pollen morphology); D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology; "a very high degree of similarity" found between *Oxytropis pilosa* and *O. purpurea*); S.K. Erkul et al., Pl. Biosyst. 149: 875–883 (2015) (seed morphology); E. Martin et al., Caryologia 68: 357–362 (2015) (karyology).

Notes. Al and Gr added (not given in Fl. Eur.): Mountain Fl. Greece 1986: 479; Z. Barina et al., Willdenowia 39: 297 (2009). – For details of the ecology in C. Europe, see M. Schlee et al., Nova Acta Leop. NF 87(328): 379–387.

Total range. Outside Europe, present in E. Anatolia, N. Iran, Caucasia, Asiatic Kazakhstan, temperate Siberia and N.W. China: MJW 1965: map 245a; Hultén & Fries 1986: map 1197.

O. pilosa subsp. **pilosa** – Map 0000.
Astragalus pilosus L. (Spiesia pilosa (L.) Kuntze)

Diploid with 2n=16 (Bu, Cs, Po, Rm, Sk): L. Baksay, Ann. Hist.-Nat. Mus. Natl. Hung., Nov. ser. 9: 121 (1958); J. Májovský et al., Acta Fac. Rerum Nat. Univ. Comen., Bot. 18: 56 (1970); F.

Dvořák & B. Dadáková, Taxon 25: 497 (1976); F. Dvořák et al., Taxon 30: 844 (1981); E. Pogan et al., Acta Biol. Cracov. Ser. Bot. 24: 159–189 (1982); F. Starlinger et al. in Naturwissenschaftliche Forschungen über Siebenbürgen V: Beiträge zur Flora, Vegetation und Fauna von Siebenbürgen, pp. 181–194 (Köln 1994); D. Pavlova, Fl. Medit. 6: 323, 324 (1996) (in all as *Oxytropis pilosa*). The same diploid number reported by A.J. Magulaev, Bot. Zhurn. (Moscow & Leningrad) 65: 840 (1980), for material from Caucasia, L.A. Malakhova, Bjull. Glavn. Bot. Sada 155: 60–66 (1990), for material from C. Siberia, T.V. An'kova & D.N. Shaulo, Taxon 61: 1336 (2012), for material from Asiatic Kazakhstan, T.V. An'kova et al., Taxon 63: 1148 (2014), for material from S. Siberia, and E. Martin et al., Caryologia 68: 358–359 (2015), for material from Anatolia (in all as *O. pilosa*).

Notes. Al, Au, BH, Bu, By, Cg, Cm, Cs, Ct, Es, Ga, Ge, Gr, He, Hu, It, Ko, La, Lt, Mo, Po, Rm, Rus (Ka, C, E), Se, Sk, Sl, Su, Uk (subspecies not recognized in Fl. Eur.).

Data wanted: Al, Au, BH, Bu, By, Cg, Cm, Cs, Ct, Es, Ga, Ge, Gr, He, Hu, It, Ko, La, Lt, Mo, Po, Rm, Rus (Ka, C, E), Se, Sk, Sl, Su, Uk

O. pilosa subsp. **caputoi** (Moraldo & La Valva) Brilli-Catt., Di Massimo & Gubellini 2001– Map 0000.
Oxytropis caputoi Moraldo & La Valva

Taxonomy. B. Moraldo & V. La Valva, Webbia 34: 627–636 (1980) (as *Oxytropis caputoi*); A.J.B. Brilli-Cattarini et al., Inform. Bot. Ital. 33: 38–39 (2001).

Diploid with 2n=16 (It): B. Moraldo & V. La Valva, Webbia 34: 630, 632 (1980 (as *Oxytropis caputoi*).

Notes. It (taxonomic novelty). – For details of the distribution and ecology, see B. Moraldo & V. La Valva, loc. cit., and A.J.B. Brilli-Cattarini et al., loc. cit.

Endemic to Europe (Italy: S. and C. Appennines).

Data wanted: It

Oxytropis glabra DC. – Map 0000.
Astragalus glaber (DC.) Lam.
Oxytropis salina Vassilcz.
O. sorkhenensis Ranjbar

Phylogenetics. J. Gao et al., Acta Agr. Boreal.-Sin. 6: 168–173 (2009) (molecular phylogeny); A. Archambault & M.V. Strömvik, Botany 90: 770–779 (2012) (evolutionary relationships as estimated from ITS sequences; *Oxytropis pilosa* and *O. glabra* belonging to the same informal group); A.B. Kholina et al., Russian J. Genetics 52: 780–793 (2016) (*O. glabra* in a clade with high support value together with *O. pallasii*, *O. pilosa*, *O. floribunda* and *O. deflexa*).

Taxonomy. L.I. Malyshev, Turczaninowia 11(4): 125–126 (2008); M.X. Li et al., Rec. Nat. Prod. 6: 1–20 (2012) (phytochemistry); A.A. Maassoumi, Iran. J. Bot. 19: 11 (2013).

Diploid chromosome number 2n=16 reported by S.Z. Zhang et al., Acta Sci. Nat. Univ. Nei Menggu 25: 64–72 (1994), for material from N.E. China.

Notes. Rus (C, E) (floristic novelty).

Total range. Main range in Siberia, N. Iran, C. Asia and Mongolia.

Data wanted: Rus (C, E)

Oxytropis pallasii Pers. – Map 0000.

Spiesia pallasii (Pers.) Kuntze

Phylogenetics. A. Dizkirici Tekpinar et al., Turkish J. Bot. 40: 250–263 (2016) (phylogenetic relationships between *Oxytropis* and *Astragalus* species native to an Old World diversity center [Turkey]); A.B. Kholina et al., Russian J. Genetics 52: 780–793 (2016) (*O. pallasii* in a clade with high support value together with *O. pilosa, O. floribunda, O. glabra* and *O. deflexa*).

Taxonomy. Fl. Turkey 1970: 256; T. Ceter et al., Bangladesh J. Bot. 42: 167–174 (2013) (pollen morphology); S.K. Erkul et al., Pl. Biosyst. 149: 875–883 (2015) (seed morphology); E. Martin et al., Caryologia 68: 357–362 (2015) (karyology).

Diploid chromosome number 2n=16 reported by E. Martin et al., Caryologia 68: 358–359 (2015), for material from Anatolia.

Notes. Uk not confirmed (?Rs (W) given in Fl. Eur.).

Total range. Outside Europe, present in N. Anatolia and Caucasia. – MJW 1965: map 245a.

Data wanted: Cm

Oxytropis cretacea N. Basil. – Map 0000.

Taxonomy. "The legumes are unknown so the relationships are unknown" (Fl. Eur. in a note under *Oxytropis floribunda*).

Notes. Kaz (the species not recognized in Fl. Eur.).

Total range. Endemic to Europe (Kazakhstan: N. West Kazakhstan).

Data wanted: Kaz

Oxytropis floribunda (Pall.) DC. – Map 0000.

Astragalus floribundus Pall. (Spiesia floribunda (Pall.) Kuntze)

Phylogenetics. A.B. Kholina et al., Russian J. Genetics 52: 780–793 (2016) (*Oxytropis floribunda* in a clade with high support value together with *O. pallasii, O. pilosa, O. glabra* and *O. deflexa*).

Taxonomy. L.I. Malyshev, Turczaninowia 11(4): 76–77 (2008).

Diploid with 2n=16 (Rus (C)): E.G. Filippov et al., Bot. Zhurn. (Moscow & Leningrad) 83: 138 (1998). The same number reported by T.V. An'kova & D.N. Shaulo, Taxon 61: 1336 (2012), for material from Altai.

Notes. Rus (C) added (Rs (C) not given in Fl. Eur.). – For details of the distribution and dynamics of the populations in the Samara Region, see I.V. Nikolaevna, Fitorazn. Vost. Evropy 9: 156–170 (2015).

Total range. Outside Europe, present in Asiatic Kazakhstan. – MJW 1965: map 245a.

Data wanted: Kaz, Rus (C, E)

Oxytropis teres (Lam.) DC. – Map 0000.

Astragalus teres Lam.
Oxytropis vaginata Fisch.

Notes. Rus (C) (floristic novelty).

Total range. Outside Europe, present in S. Siberia (Altai) and Asiatic Kazakhstan.

Data wanted: Rus (C)

Oxytropis purpurea (Bald.) Margraf – Map 0000.

Oxytropis pilosa (L.) DC. var. purpurea Bald.
O. olympica Turrill
O. thessala Turrill

Taxonomy. D. Pavlova, Genet. Pl. Physiol. 3: 42–54 (2013) (pollen morphology; "a very high degree of similarity" found between *Oxytropis pilosa* and *O. purpurea*).

Diploid with 2n=16 (Gr): D. Cartier, Taxon 25: 494 (1976); A. Strid & R. Franxén, Taxon 30: 835 (1981).

Notes. Mk added (Ju not given in Fl. Eur.)

Endemic to Europe.

Data wanted: Al, Gr, Mk

Oxytropis fetida (Vill.) DC. – Map 0000.

Astragalus fetidus Vill. (Aragallus fetidus (Vill.) Greene; Spiesia fetida (Vill.) Kuntze)
A. viscosus Vill. (O. fetida subsp. viscosa (Vill.) Kerguélen; O. viscosa (Vill.) Pers.)
Phaca viscosa Clairv.

Taxonomy. Fl. Gallica 2014: 747 (subsp. *viscosa* not accepted).

Diploid with 2n=16 (Ga, He): C. Favarger, Bull. Soc. Neuchateloise Sci. Nat. 82: 271, 273 (1959), 120: 28 (1997), Candollea 24: 183–184 (1969).

Endemic to Europe.

Data wanted: Ga, He, It

Erophaca baetica (L.) Boiss. – Map 0000.

Phylogenetics and generic delimitation. S. Talavera, Anal. Jard. Bot. Madrid 57: 220 (1999) (subtribus Erophacinae of the tribus Astragaleae proposed for the genus); F. Abdel Samad et al., Pl. Syst. Evol. 300: 819–830 (2014) (genome size and phylogeny); R. Casimiro-Soriguer et al., Molec. Phylogen. Evol. 56: 441–450 (2010) (the monotypic genus found monophyletic, old (Miocene) and sister to the Astragalean clade; European plants are clearly derived from North-African populations, and the Eastern and Western subspecies are genetically distinct), Pl. Biol. (Stuttgart) 15: 353–359 (2013) (*Erophaca* as the first example of an andromonoecious Papilionoid in the Old World).

Taxonomy and nomenclature. In Fl. Eur. given as *Astragalus lusitanicus*. – A. Pretel & A. Sañudo, Lagascalia 8: 25–38 (1978) (caryology and palynology; as *A. lusitanicus* subsp. *lusitanicus*); D. Podlech, Sendtnera 1: 267–269 (1993); Fl. Iber. 1999: 347–350.

E. baetica subsp. **baetica** – Map 0000.

Astragalus dorycnioides Scop.; A. lusitanicus Lam.; Phaca baetica L. (Colutea baetica (L.) Poir.)

Diploid with 2n=16 (Hs, Lu): A. Fernandes & M.F. Santos, Bol. Soc. Brot., ser. 2, 45: 177 (1971) (as *Astragalus lusitanicus*); A. Pretel Martínez, Taxon 23: 804 (1974) (as *A. lusitanicus* subsp. *lusitanicus*); A. Fernandes & M.F. Santos, Bol. Soc. Brot., ser. 2, 49: 173–196 (1975) (as *A. lusitanicus*); Fernandes & Quieros 1978: 141 (as *A. lusitanicus* subsp. *lusitanicus*); A. Pretel & A. Sanudo, Lagascalia 8: 35 (1978) (as *A. lusitanicus* subsp. *lusitanicus*); J.A. Elena-Rosselló et al., Lazaroa 8: 92 (1985) (as *A. lusitanicus*).

Notes. Hs, Lu. "Portugal and S.W. Spain" (Fl. Eur.)

Total range. Outside Europe, present in Morocco and Algeria.

Data wanted: Hs, Lu

E. baetica subsp. **orientalis** (Chater & Meikle) Podlech – Map 0000.
Astragalus lusitanicus Lam. subsp. orientalis Chater & Meikle

Diploid with 2n=16 (Gr): T. Constantinidis & G. Kamari, Bot. Chron. (Patras) 13: 118 (2000) (as *Astragalus lusitanicus* subsp. *orientalis*).

Notes. Gr. "Peloponnisos" (Fl. Eur.)

Total range. Outside Europe, present in S.W. Anatolia, Syria, Cyprus and Lebanon.

Data wanted: Gr

Abbreviations for frequently quoted literature

For the abbreviations of titles of books prior to 1968, see also Fl. Eur. Appendix 2.

Dobeš & Vitek 2000 = C. Dobeš & E. Vitek, Documented Chromosome Number Checklist of Austrian Vascular Plants. – 642 pp. Wien 2000.

Eur. Garden Fl. 1995 = J. Cullen et al. (eds.), The European Garden Flora 4 (Dicotyledons (part 2)). – xvii + 602 pp. Cambridge 1995. [Leguminosae pp. 463–550 (Astragalus by J. Cullen pp. 506–509)]

Fernandes & Queirós 1978 = A. Fernandes & M. Queirós, Contribution à la connaissance cytotaxinomique de Spermatophyta de Portugal. IV. Leguminosae (suppl. 3). — Mem. Soc. Brot. 52: 79–164 (1978).

Gutermann & Merxmüller 1961 = W. Gutermann & H. Merxmüller, Die europäischen Sippen von Oxytropis Sectio Oxytropis. – Mitt. Bot. Staatssamml. München 4: 199–275 (1961).

Fl. Arct. URSS 1986 = B.A. Jurtzev (ed.), Flora Arctica URSS. 9(2). Leguminosae. – 188 pp. Leninopoli 1986. [Astragalus and Oxytropis pp. 20–146, 178–182 by B.A. Jurtzev]

Fl. Gallica 2014 = J.-M. Tison & B. de Foucault (coords), Flora Gallica. Flore de France. – xx + 1196 pp. Mèze 2014. [Astragalus and Biserrula pp. 712–716, Oxytropis pp. 747–749].

Fl. Iber. 1999 = S. Castroviejo et al. (eds.), Flora Iberica. Plantas vasculares de la Península Ibérica e Islas Baleares 7(1). Leguminosae (partim). – xlv + 578 pp. Madrid 1999. [Astragalus and Erophaca by D. Podlech pp. 279–338, 347–350; Oxytropis by M. Laínz pp. 338–347]

Fl. Turkey 1970 = Davis, P.H. (ed.) 1970: Flora of Turkey and the East Aegean Islands. 5. – xvii + 628 pp. Edinburgh 1970. [Leguminosae pp. 1–600 (Astragalus pp. 49–254 by D.F. Chamberlain & V.A. Matthews); Oxytropis pp. 254–260 by I.C. Hedge & J.M. Lamond)]

Hultén Alaska 1968 = E. Hultén, Flora of Alaska and neighboring territories. – 1008 pp. Stanford 1968.

Hultén CP 1971 = E. Hultén, The Circumpolar Plants. II. Dicotyledons. – Kungl. Svenska Vet.-Akad. Handl., Ser. 4, 13(1): 1–463. 1971.

Hultén & Fries 1986 = E. Hultén & M. Fries, Atlas of North European vascular plants north of the tropic of Cancer. II. Maps 997–1936. – xi + 470 pp. Königstein 1986.

Marhold et al. 2007 = K. Marhold, P. Mártonfi, P. Mered'a jun. & P. Mráz (ed.), Chromosome number survey of the ferns and flowering plants of Slovakia. – 650 pp. Bratislava 2007.

Měsíček & Jarolímová 1992 = J. Měsíček & V. Javůrková-Jarolímová, List of chromosome numbers of the Czech vascular plants. – 144 pp. Praha 1992.

MJW 1965 = H. Meusel, E.J. Jäger & E. Weinert, Vergleichende Chorologie der zentraleuropäischen Flora. – Text 583 pp., Karten 258 pp. Jena 1965.

Mountain Fl. Greece 1986 = A. Strid (ed.), Mountain Flora of Greece. 1. – xxx + 822 pp. Cambridge 1986. [Fabaceae pp. 443–443 (Astragalus and Oxytropis pp. 460–480 by A. Strid)]

Pignatti Fl. 1982 = S. Pignatti (ed.), Flora d'Italia. 1. – 790 pp. Bologna 1982. [Leguminosae pp. 619–766]

Podlech & Zarre 2013 = D. Podlech & S.H. Zarre (with collaboration of M. Ekici, A.A. Maassoumi & A. Sytin), A taxonomic revision of the genus Astragalus L. (Leguminosae) in the Old World. I–III. – 2439 pp. Bad Vöslau 2013.

Uotila & Pellinen 1985 = P. Uotila & K. Pellinen, Chromosome numbers in vascular plants from Finland. – Acta Bot. Fenn. 130: 1–37. 1985.

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