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The Euro Med treatment of Cardueae (Compositae) — generic concepts and required new names

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Notulae ad floram euro-mediterraneam pertinentes No. 3

WERNER GREUTER

The Euro+Med treatment of *Cardueae (Compositae)* – generic concepts and required new names

Abstract

Greuter, W.: The Euro+Med treatment of *Cardueae (Compositae)* – generic concepts and required new names. – Willdenowia 33: 49-61. 2003. – ISSN 0511-9618.

A synonymic survey of *Cardueae* genera accepted for the purpose of the Euro+Med Project is presented. As a consequence of shifts in generic circumscription, or reassessment of accepted specific and subspecific taxa, combinations that are required in the genera *Amphoricarpos, Carduus, Carlina, Carthamus, Centaurea, Cyanus, Echinops, Jurinea, Klasea, Psephellus, Rhaponticoides, Rhaponticum* and *Volutaria,* but do not so far exist, are validated. Three names in *Centaurea,* two of them Linnaean, are typified.

Introduction

A concise characterisation of the Euro+Med PlantBase Project, its main purposes and planned "products", and of the rationale and prospects of the present Notulae series, can be found in the first instalment of the Notulae, elsewhere in this issue (Willdenowia 33: 37. 2003). Further information on the setup and structures of Euro+Med is displayed on the Internet (http://euromed.org.uk/).

When I undertook to edit the whole *Compositae* family for Euro+Med, I sought the advice of competent specialists of the various tribes, principally but not exclusively on questions of generic delimitation. For the *Cardueae,* I obtained it from Prof. Dr Gerhard Wagenitz, Goettingen, and in the case of *Leuzea* vs. *Rhaponticum* from Dr Manfred Dittrich, Confignon. Even though the ultimate responsibility for the decisions that had to be taken rests with myself, I owe a debt of sincere gratitude to them both for the expert advice they generously provided. I am furthermore indebted to Dr Mariam Aghababian, Fontainebleau, for contributing her data on *Rhaponticoides*. A discussion of the latter name, as well as *Rhaponticum,* will be included in a forthcoming paper (with Aghababian and Wagenitz) on Vaillant's generic nomenclature.

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Table 1. The Euro+Med genera of *Cardueae*. Accepted names appear in bold-face type, their synonyms in italics. "*Centaurea*" stands for a genus that excludes the proposed conserved type.

Acantholepis
Acroptilon
Amberboa
Amphoricarpos
Arctium
= *Lappa*
Arcyna
Atractylis
Berardia
Callicephalus
Cardopatium
= *Broteroa*
Carduus
Carlina
= *Chamaeleon*
= *Lyrolepis*
Carthamus
= *Carduncellus*
= *Durandoa*
= *Femeniasia*
= *Kentrophyllum*
= *Lamottea*
= *Onobroma*
= *Phonus*
Centaurea
= *Acosta*
= *Aegialophila*
= *Calcitrapa*
= *Calcitrapoides*
= *Chartolepis*
= *Cheirolepis*
= *Cnicus*
= *Colymbada*
= *Grossheimia*
= *Hyalea*
= *Jacea*
= *Melanoloma*
= *Phaeopappus*
=*Stephanochilus*
= *Stizolophus*
= *Tomanthea*
= *Wagenitzia*
Chardinia
Cheirolophus
= *Palaeocyanus*
= *Ptosimopappus*
Cirsium
Cousinia
Crupina
Cyanus
Cynara
=*Bourgaea*
Echinops
Galactites
= *Lupsia*
Hirtellina
Jurinea
= *Jurinella*
= *Microlonchoides*
Klasea
Lamyropsis
Mantisalca
= *Microlonchus*
Myopordon
= *Autrania*
Notobasis
Oligochaeta
Onopordum
Phalacrachena
Picnomon
Psephellus
= *Aetheopappus*
Ptilostemon
= *Chamaepeuce*
= *Lamyra*
Rhaponticum
= *Leuzea*
= *Stemmacantha*
Rhaponticoides
= *Bielzia*
= *"Centaurea"*
Saussurea
Serratula
Siebera
Silybum
= *Mariana*
Staehelina
Tyrimnus
Volutaria
= *Cyanopsis*
Xeranthemum
= *Xeroloma*
Zoegea

A generic survey of Euro+Med *Cardueae*

The accepted Euro+Med genera of *Cardueae,* with their relevant synonyms, are listed in Table 1. No complete synonymy is given, but generic names that were adopted in recent floristic literature for the area are all included.

Since 1976, when vol. 5 of Flora Europaea was published, *Cardueae* systematics have progressed considerably. As a result of in-depth studies of phenotype features and, more recently, DNA sequences, combined with reasonably strict adherence to the tenets of phylogenetic systematics (see Bremer, Asteraceae Clad. & Class.: 112-156. 1994), generic circumscriptions have changed in several instances. A survey of the main changes that are being accepted for Euro+Med purposes when compared to Flora Europaea and, for extra-European genera, Heller & Heyn (Consp. Fl. Orient. 8. 1993) follows. For convenience and because no satisfactory alternative exists (Garcia-Jacas & al. in Molec. Phylog. Evol. 22: 51-64. 2002), it uses the four traditional subtribes recognised in Bremer (l.c.), *Echinopinae, Carlininae, Centaureinae* and *Carduinae,* even though at least the last named is clearly paraphyletic (Häffner & Hellwig in Willdenowia 29: 27-39. 1999).

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A generic survey of the two smaller subtribes, *Echinopinae* and *Carlininae,* was published by Dittrich (in Boissiera 51. 1996). The two genera of the former, *Echinops* L. and *Acantholepis* Less., remained unchanged. In the *Carlininae,* two changes are of note. *Staehelina* L. was split into two halves by the segregation of *Hirtellina* (Cass.) Cass; and the group of species around *Atractylis gummifera* L. was separated from *Atractylis* L. as *Chamaeleon* Cass. Recent molecular data by Garcia-Jacas & al. (Molec. Phylog. Evol. 22: 51-64. 2002) confirm the separation of *Chamaeleon* from *Atractylis* but suggest that merging the former with *Carlina* L. is the better solution, and I shall follow that advice.

Häffner's reassessment of *Carduinae* phylogeny (in Englera 21. 2000), while not primarily aimed at redefining generic limits, failed to bring to light problems in this respect. A moderate shift in generic boundaries between *Arctium* L. and *Cousinia* Cass. (Duistermaat in Bocconea 5: 1-5. 1997) does not affect species of the Euro+Med area. The only relevant changes at generic level are the split-off of *Arcyna* Wiklund from *Cynara* L. (see the following paper) and the merger of *Jurinella* Jaub. & Spach with *Jurinea* Cass. (following Tamamšjan & Muradjan in Fl. Rastitel'nost' Ratstitel'nye Resursy Armjansk. SSR 10: 50-57. 1987).

In the *Centaureinae,* however, major changes had to be made. Numerous papers have been dealing with the morphology, anatomy and molecular taxonomy of this group (for details, see the survey papers by Wagenitz & Hellwig in Hind & Beentje, Compos. Syst. 1: 491-510. 1996; Garcia-Jacas & al. in Taxon 45: 39-42. 1996 and in Pl. Syst. Evol. 223: 185-199. 2000; Petit & al. in Bocconea 13: 41-53. 2001; and literature cited there). These studies have led to a far better understanding of the complex generic patterns and interrelationships than was previously possible; they also made it necessary to propose re-typification, through conservation, of the generic name *Centaurea* L. (Greuter & al. in Taxon 50: 1201-1205), a proposal that has since been unanimously recommended for adoption by the Committee for Spermatophyta (R. K. Brummitt, pers. comm.), so that for the purpose of the Euro+Med treatment I will assume that it shall be accepted.

Centaurea can no longer be maintained in the wide sense of Flora Europaea, nor can the excessive splitting of the genus by some authors be recommended. The Euro+Med treatment will follow a medium term. The previous *Centaurea* sect. *Centaurea,* but distantly related with the generic core, must now be named *Rhaponticoides* Vaill. (type: *Centaurea centaurium* L., here designated by M. Aghababian). Other genera that are being segregated are *Psephellus* Cass. (as revised by Wagenitz & Hellwig in Willdenowia 30: 29-44. 2000) and *Cyanus* Mill. Conversely, three genera recognised in Flora Europaea are being merged in *Centaurea*: *Chartolepis* Cass., *Cnicus* L., and *Wagenitzia* Dostál.

The only further instance in which a narrower genus concept is being adopted than in Flora Europaea, in this subtribe, is the separation of *Klasea* Cass. from *Serratula* L. This split is supported by cytological and palynological differences and is consistent with the molecular data so far available.

A major merge is that of *Carthamus* L. with *Carduncellus* Adans., under the former name, which in my view and in the present state of our knowledge is the preferable alternative to recognising a number of additional, minor segregate genera such as *Phonus* Hill and *Femeniasia* Susanna (created for the previously misplaced *Centaurea balearica* Rodr.). Of comparable consequence is the fusion of *Rhaponticum* Vaill. (type: *Centaurea rhaponticum* L., designated here; = *Stemmacantha* Cass.) with *Leuzea* DC., a fusion already accepted in Flora Europaea but under the latter name. Furthermore, *Palaeocyanus* Dostál is included in *Cheirolophus* Cass. (Susanna in Pl. Syst. Evol. 214: 157. 1999), and *Cyanopsis* Cass. in *Volutaria* Cass.

Amphoricarpos

Amphoricarpos neumayerianus (Vis.) Greuter, **comb. nova** ≡ *Jurinea neumayeriana* Vis., Fl. Dalm.: t. 10, f. 2. 1842 ≡ *Amphoricarpos neumayeri* Vis. in Giorn. Bot. Ital. 1: 196. 1844. – The illegitimacy of the name *Amphoricarpos neumayeri* is long known, having been pointed out e.g. in the Index Nominum Genericorum (Farr & al. in Regnum Veg. 100: 74. 1979) and NCU-3 (Greuter & al. in Regnum Veg. 129: 48. 1993).

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Carduus

Carduus hamulosus subsp. ***stenocephalus*** (Tamamsch.) Greuter, **comb. nova** ≡ *Carduus stenocephalus* Tamamsch. in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 16: 468. 1954.

Carduus nigrescens subsp. ***australis*** (Nyman) Greuter, **comb. nova** ≡ *Carduus vivariensis* subsp. *australis* Nyman, Consp.: 412. 1879 ≡ *Carduus australis* Jord. in Jard. Bot. Ville Grenoble, Cat. Graines 1849: 14 [App.: 1]. 1849 (non L. f. 1782).

Carduus nutans subsp. ***platypus*** (Lange) Greuter, **comb. nova** ≡ *Carduus platypus* Lange, Ind. Sem. Hort. Haun. 1857: 26. 1857.

Caduus nutans subsp. ***siculus*** (Franco) Greuter, **comb. nova** ≡ *Carduus macrocephalus* subsp. *siculus* Franco in Bot. J. Linn. Soc. 71: 48. 1975.

Carduus onopordioides subsp. ***atropatanicus*** (Grossh.) Greuter, **comb. nova** ≡ *Carduus atropatanicus* Grossh., Fl. Kavk. 4: 175. 1934.

Carduus onopordioides subsp. ***furiosus*** (Tamamsch.) Greuter, **comb. nova** ≡ *Carduus furiosus* Tamamsch. in Komarov, Fl. SSSR 28: 599. 1963.

Carduus onopordioides subsp. ***hajastanicus*** (Tamamsch.) Greuter, **comb. nova** ≡ *Carduus hajastanicus* Tamamsch. in Komarov, Fl. SSSR 28: 599. 1963.

Carduus personata subsp. ***albidus*** (Adamović) Kazmi in Mitt. Bot. Staatssamml. München 5: 376. 1964 ≡ *Carduus personata* var. *albidus* Adamović in Nastavnik 4, Pril. 7. 1893? [n.v.]. – When Kazmi proposed this combination he failed to cite the date of publication of the basionym, but as he fulfilled all conditions for the valid publication of a new taxon (Latin description, citation of type), the combination nevertheless stands as such (International Code of Botanical Nomenclature, Art. 33.2 and 33.6(d)). Lamentably, it has proved impossible to trace Adamović's protologue, in spite of Dr Olja Vasić's kind efforts in various Belgrade libraries. She found a contribution by Adamović titled "Novine za floru Kraljevine Srbije", paged 1-19, stated to correspond to Nastavnik 4, Prilog 6. 1893 – but there is no mention in it of *Carduus personata* var. *albidus*. No Prilog (contribution) No. 7 is known to exist for volume 4 (1893) of the journal. The above citation (the one also used by Kazmi) is from Hayek (in Repert. Spec. Nov. Regni Veg. 30(2): 707. 1931). The first ascertained validation of the basionym, by Adamović, is in Rad Jugosl. Akad. Znan. 185 (= Mat. Prir. Razz. 49): 241. 1911.

Carduus spachianus subsp. ***atlantis*** (Humb. & Maire) Greuter, **comb. nova** ≡ *Carduus atlantis* Humb. & Maire in Mém. Soc. Sci. Nat. Maroc 15: 43. 1926.

Carduus spachianus subsp. ***megalatlanticus*** (Maire) Greuter, **comb. nova** ≡ *Carduus megalatlanticus* Maire in Bull. Soc. Hist. Nat. Afrique N. 23: 192. 1932 ≡ *Carduus atlantis* subsp. *megalatlanticus* (Maire) Emb. in Jahandiez & Maire, Cat. Pl. Maroc: 797. 1934.

Carduus tmoleus subsp. ***baldaccii*** (Kazmi) Greuter, **comb. nova** ≡ *Carduus cronius* subsp. *baldaccii* Kazmi in Mitt. Bot. Staatssamml. München 5: 379. 1964.

Carduus tmoleus subsp. ***cronius*** (Boiss. & Heldr.) Greuter, **comb. nova** ≡ *Carduus cronius* Boiss. & Heldr. in Boissier, Diagn. Pl. Orient. 6: 105. 1846.

Carlina

Carlina comosa (Spreng.) Greuter, **comb. nova** ≡ *Acarna comosa* Spreng., Syst. Veg. 3: 380. 1826 ≡ *Atractylis comosa* (Spreng.) DC., Prodr. 6: 550. 1838 ≡ *Chamaeleon comosus* (Spreng.) Greuter in OPTIMA Newslett. 31: (4). 1997.

Carlina sicula subsp. ***mareotica*** (Asch. & Schweinf.) Greuter, **comb. nova** ≡ *Carlina involucrata* var. *mareotica* Asch. & Schweinf. in Mém. Inst. Egypt. 2: 93. 1887.

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Carthamus

Carthamus atractyloides (Pomel) Greuter, **comb. nova** ≡ *Carduncellus atractyloides* Pomel, Nouv. Mat. Fl. Atl.: 278. 1875.

Carthamus balearicus (Rodr.) Greuter, **comb. nova** ≡ *Centaurea balearica* Rodr. in Bull. Soc. Bot. France 16: 237. 1869 ≡ *Femeniasia balearica* (Rodr.) Susanna in Collect. Bot. (Barcelona) 17: 84. 1988.

Carthamus catrouxii (Maire) Greuter, **comb. nova** ≡ *Carduncellus catrouxii* Maire in Bull. Soc. Hist. Nat. Afrique N. 23: 197. 1932.

Carthamus cespitosus (Batt.) Greuter, **comb. nova** ≡ *Carduncellus cespitosus* Batt. in Bull. Soc. Bot. France 35: 390. 1889.

Carthamus chouletteanus (Pomel) Greuter, **comb. nova** ≡ *Lamottea chouletteana* Pomel, Mat. Fl. Atl.: 3. 1860 ≡ *Onobroma chouletteana* (Pomel) Pomel in Bull. Soc. Sci. Phys. Algérie 11: 24. 1874 ≡ *Carduncellus chouletteanus* (Pomel) Batt. in Battandier & Trabut, Fl. Algérie, Dicot.: 515. 1889.

Carthamus eriocephalus (Boiss.) Greuter, **comb. nova** ≡ *Carduncellus eriocephalus* Boiss., Diagn. Pl. Orient. 10: 100. 1849.

Carthamus hispanicus subsp. ***araneosus*** (Boiss. & Reut.) Greuter, **comb. nova** ≡ *Carduncellus araneosus* Boiss. & Reut. in Biblioth. Universelle Genève 38: 210. 1842 ≡ *Carthamus araneosus* (Boiss. & Reut.) Sch. Bip. in Webb & Berthelot, Hist. Nat. Iles Canaries 3(2,2): 363. 1846 ≡ *Carduncellus hispanicus* subsp. *araneosus* (Boiss. & Reut.) G. López in Anales Jard. Bot. Madrid 38: 531. 1982.

Carthamus hispanicus subsp. ***macrocephalus*** (Cuatrec.) Greuter, **comb. nova** ≡ *Carduncellus araneosus* var. *macrocephalus* Cuatrec. in Trab. Mus. Ci. Nat. Barcelona 12: 471. 1929 ≡ *Carduncellus araneosus* subsp. *macrocephalus* (Cuatrec.) Rivas Goday & Rivas Mart. in Anales Inst. Bot. Cavanilles 25: 195. 1967 ≡ *Carduncellus cuatrecasasii* G. López in Anales Jard. Bot. Madrid 38: 531. 1982 ≡ *Carduncellus hispanicus* subsp. *macrocephalus* (Cuatrec.) Rivas Mart. & al. in Rivasgodaya 6: 21. 1991.

Carthamus hispanicus subsp. ***pseudomitissimus*** (Rivas Goday & Rivas Mart.) Greuter, **comb. nova** ≡ *Carduncellus araneosus* subsp. *pseudomitissimus* Rivas Goday & Rivas Mart. in Anales Inst. Bot. Cavanilles 25: 197. 1967 ≡ *Carduncellus hispanicus* subsp. *pseudomitissimus* (Rivas Goday & Rivas Mart.) Rivas Mart. & al. in Rivasgodaya 6: 20. 1991.

Carthamus ilicifolius (Pomel) Greuter, **comb. nova** ≡ *Carduncellus ilicifolius* Pomel, Nouv. Mat. Fl. Atl.: 277. 1875.

Carthamus lucens (Ball) Greuter, **comb. nova** ≡ *Carduncellus lucens* Ball in J. Bot. 11: 370. 1873 ≡ *Carduncellus pinnatus* subsp. *lucens* (Ball) Ball in J. Linn. Soc., Bot. 16: 532. 1878.

Carthamus matritensis (Pau) Greuter, **comb. nova** ≡ *Carduncellus matritensis* Pau in Bol. Soc. Aragonesa Ci. Nat. 3: 291. 1904 ≡ *Carduncellus pinnatus* subsp. *matritensis* (Pau) Rivas Goday & Rivas Mart. in Anales Inst. Bot. Cavanilles 25: 192. 1967.

Carthamus plumosus (Pomel) Greuter, **comb. nova** ≡ *Carduncellus plumosus* Pomel, Nouv. Mat. Fl. Atl.: 277. 1875.

Carthamus rhaponticoides (Pomel) Greuter, **comb. nova** ≡ *Carduncellus rhaponticoides* Pomel, Nouv. Mat. Fl. Atl.: 278. 1875.

Centaurea

Centaurea acarnanica (Matthäs) Greuter, **stat. nov.** ≡ *Centaurea subciliaris* subsp. *acarnanica* Matthäs in Bot. Jahrb. Syst. 95: 430. 1976.

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Centaurea affinis subsp. ***denudata*** (Halácsy) Greuter, **comb. in stat. nov.** ≡ *Centaurea affinis* var. *denudata* Halácsy in Bull. Herb. Boissier 6: 593. 1898 ≡ *Centaurea pallidior* subsp. *denudata* (Halácsy) Dostál in Bot. J. Linn. Soc. 71: 197. 1976.

Centaurea argentea subsp. ***chionantha*** (Turland & L. Chilton) Greuter, **stat. nov.** ≡ *Centaurea argentea* var. *chionantha* Turland & L. Chilton in Bot. Chron. 13: 77. 2000.

Centaurea boissieri subsp. ***calvescens*** (Maire) Greuter, **comb. in stat. nov.** ≡ *Centaurea boissieri* var. *calvescens* Maire in Bull. Soc. Hist. Nat. Afrique N. 23: 192. 1932 ≡ *Centaurea atlantica* subsp. *calvescens* (Maire) Figuerola & al. in Feddes Repert. 102: 2. 1991.

Centaurea brulla Greuter, **nom. nov.** ≡ *Centaurea apula* Bianco & Brullo in Braun-Blanquetia 2: 32. 1988 (non Lam. 1785).

Centaurea chartolepis Greuter, **nom. nov.** ≡ *Chartolepis intermedia* Boiss., Diagn. Pl. Orient., ser. 2, 3: 64. 1856 (non *Centaurea intermedia* Mutel in Rev. Bot. Recueil Mens. 1: 400. 1846). – This is the taxon referred to as *"Chartolepis glastifolia"* in Flora Europaea, but not *Centaurea glastifolia* L. as typified by Wagenitz (in Taxon 47: 357. 1999), a Caucasian and Irano-Turanian species. In Russian Floras it is referred to as *Chartolepis intermedia,* but the epithet *intermedia* is unavailable in *Centaurea*.

Centaurea daralagoezica (Fomin) Greuter, **comb. nova** ≡ *Phaeopappus daralagoezicus* Fomin in Izv. Kavkazsk. Muz. 3: 282. 1908.

Centaurea djebel-amouri Greuter, **nom. nov.** ≡ *Centaurea alba* var. *mauritanica* Batt. in Battandier & Trabut, Fl. Algérie, Dicot.: 494. 1889 (non *Centaurea mauritanica* (Font Quer) Pau 1930).

Centaurea drabifolia subsp. ***floccosa*** (Boiss.) Wagenitz & Greuter, **comb. nova** ≡ *Phaeopappus floccosus* Boiss., Fl. Orient. 3: 595. 1875 ≡ *Phaeopappus floccosus* Boiss. subsp. *floccosus* [per Bornm. in Repert. Spec. Nov. Regni Veg. Beih. 89: 370. 1944]. – This taxon, which includes the types of both *Phaeopappus floccosus* and *Phaeopappus floccosus* subsp. *detonsus* Bornm. (in Repert. Spec. Nov. Regni Veg. Beih. 89: 370. 1944), was named *Centaurea drabifolia* subsp. *detonsa* (Bornm.) Wagenitz (in Bot. Jahrb. Syst. 82: 163. 1963), in conformity with the then current nomenclatural Code. Owing to changes of the autonym rules adopted by the Sydney Congress in 1981, the epithet *floccosus* now takes precedence (International Code of Botanical Nomenclature, Art. 11.6).

Centaurea finazzeri subsp. ***kozanii*** (Routsi & T. Georgiadis) Greuter, **comb. nova** ≡ *Centaurea rupestris* subsp. *kozanii* Routsi & T. Georgiadis in Routsi, Biosust. Meletê sect. Acrocentron Ellada: 131. 1993. – The basionym was published a second time, independently but based on the same type, in Candollea 49: 366. 1994.

Centaurea friderici subsp. ***jabukensis*** (Ginzb. & Teyber) [Dostál in Bot. J. Linn. Soc. 71: 196. 1976, comb. inval., ex] Greuter, **comb. & stat. nov.** ≡ *Centaurea jabukensis* Ginzb. & Teyber in Verh. Zool.-Bot. Ges. Wien 70: (30). 1920. – Dostál's earlier combination is invalid under Art. 33.5 of the International Code of Botanical Nomenclature: Dostál does not cite the place of valid publication of the intended basionym, but a later publication (in Österr. Bot. Z. 70: 31. 1921). Art. 33.6(a) cannot be used to condone the error, because in the 1921 paper there is an explicit reference (by a footnote, referring to the full reference list at the end) to the 1920 publication; nor does Art. 33.6(d) offer an escape, as Ginzberger in 1921 provides a Latin diagnosis but does not indicate a type specimen.

Centaurea gabrieljanae Greuter, **nom. nov.** ≡ *Chartolepis biebersteinii* Jaub. & Spach, Ill. Pl. Orient. 3: 10. 1847 ≡ *Centaurea biebersteinii* (Jaub. & Spach) Walp. in Ann. Bot. Syst. 1: 448. 1849 (non DC., Prodr. 6: 583. 1838).

Centaurea jacea subsp. ***forojulensis*** (Poldini) Greuter, **comb. & stat. nov.** ≡ *Centaurea forojulensis* Poldini in Giorn. Bot. Ital. 111: 303. 1977.

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Centaurea jacea subsp. ***julica*** (Hayek) Greuter, **comb. nova** ≡ *Centaurea haynaldii* var. *julica* Hayek in Verh. K.K. Zool.-Bot. Ges. Wien 68: 204. 1918 ≡ *Centaurea julica* (Hayek) Van Soest in Nederl. Kruidk. Arch. 54: 81. 1947 ≡ *Centaurea haynaldii* subsp. *julica* (Hayek) E. Mayer in Anon., Ann. Horti Bot. Labac. CL: 39. 1960.

Centaurea jacea subsp. ***weldeniana*** (Rchb.) Greuter, **comb. in stat. nov.** ≡ *Centaurea weldeniana* Rchb., Fl. Germ. Excurs.: 213. 1831 ≡ *Centaurea jacea* var. *weldeniana* (Rchb.) Briq., Monogr. Centaurées Alpes Marit.: 69. 1902 ≡ *Centaurea amara* subsp. *weldeniana* (Rchb.) Kušan in Prir. Istraž. Kral. Jugoslavije 20: 29. 1936.

Centaurea kartschiana subsp. ***lubenicensis*** (Trinajstić & Zi. Pavletić) Greuter, **comb. nova** ≡ *Centaurea dalmatica* subsp. *lubenicensis* Trinajstić & Zi. Pavletić in Nat. Croat. 8: 58. 1999.

Centaurea kotschyi subsp. ***floccosa*** (Boiss.) Greuter, **stat. nov.** ≡ *Phaeopappus kotschyi* var. *floccosus* Boiss., Fl. Orient. 3: 595. 1875 ≡ *Centaurea kotschyi* var. *floccosa* (Boiss.) Wagenitz in Bot. Jahrb. Syst. 82: 170. 1963.

Centaurea kotschyi subsp. ***persica*** (Boiss.) Greuter, **stat. nov.** ≡ *Cheirolepis persica* Boiss., Diagn. Pl. Orient. 10: 108. 1849 ≡ *Centaurea kotschyi* var. *persica* (Boiss.) Wagenitz in Bot. Jahrb. Syst. 82: 169. 1963.

Centaurea micevskii Greuter, **nom. nov.** ≡ *Centaurea wagenitzii* Micevski in Prilozi Makedonska Akad. Nauk. Umetn., Oddel. Biol. Med. Nauki 8(1-2): 49. 1990 (non Hub.-Mor. 1967).

Centaurea papposa (Coss.) Greuter, **comb. & stat. nov.** ≡ *Centaurea gymnocarpa* var. *papposa* Coss., Notes Pl. Crit.: 136. 1851.

Centaurea phrygia subsp. ***alutacea*** (Dobrocz.) Greuter, **comb. nova** ≡ *Centaurea alutacea* Dobrocz. in Bot. Žurn. (Kiev) 6(2): 74. 1949 ≡ *Centaurea pseudophrygia* subsp. *alutacea* (Dobrocz.) Mikheev in Bot. Žurn. 84(9): 106. 1999.

Centaurea phrygia subsp. ***razgradensis*** (Velen.) Greuter, **comb. nova** ≡ *Centaurea razgradensis* Velen. in Abh. Königl. Böhm. Ges. Wiss., ser. 7, 1(8): 25. 1886 ≡ *Centaurea jacea* subsp. *razgradensis* (Velen.) Stoj. & Acht., Stud. Centaur. Bulg.: 69. 1935 [*Centaurea stenolepis* subsp. *razgradensis* (Velen.) Dostál in Tutin & al., Fl. Eur. 4: 295. 1976, comb. inval].

Centaurea raphanina subsp. ***saxatilis*** (K. Koch) Greuter, **comb. & stat. nov.** ≡ *Centaurium saxatile* K. Koch in Linnaea 24: 419. 1851 ≡ *Phaeopappus saxatilis* (K. Koch) Boiss., Fl. Orient. 3: 602. 1875 ≡ *Centaurea saxatilis* (K. Koch) B. D. Jacks., Index Kew. 1: 476. 1893. – Koch's "mystery species" (see, e.g., Halácsy, Consp. Fl. Graec. 2: 128. 1902; Dostál in Tutin & al., Fl. Eur. 4: 297. 1976) was based on a specimen in the Gundelsheimer herbarium (now probably lost) collected on Tournefort's Oriental expedition and named *"Jacea Cretica, saxatilis, Glasti folio, flore purpurascente"* (Tournefort, Inst. Rei Herb., Corollarium: 31. 1703). A duplicate in Paris (P-TRF 3913; IDC microfiche 189: A6!) turns out to be a perfect match of the hitherto unnamed rock crevice ecotype of *Centaurea raphanina,* characterised by lanceolate, entire to subpinnate, glabrous leaves and cuneate-based capitula borne on short, scapiform stems. So far I have only collected it in E Crete (districts of Ierapetra-Sitia, *Greuter 3615;* Pedias, *Greuter 7771*) where it grades into the strikingly different, acaulescent and pinnately leaved, widespread phrygana ecotype.

Centaurea resupinata subsp. ***dufourii*** (Dostál) Greuter, **comb. nova** ≡ *Centaurea tenuifolia* Dufour in Ann. Gén. Sci. Phys. 7: 303. 1820 (non Salisb. 1796) ≡ *Centaurea boissieri* subsp. *dufourii* Dostál in Bot. J. Linn. Soc. 71: 201. 1976 ≡ *Centaurea dufourii* (Dostál) Blanca in Lagascalia 10: 154. 1981. – Breitwieser & Podlech (in Mitt. Bot. Staatssamml. München 22: 82. 1986) adopt the name *"Centaurea resupinata* subsp. *spachii"* for this taxon; however, the holotype of *Centaurea spachii* Willk., an incomplete specimen, was collected near Balazote (Albacete Province), in the domain of *Centaurea lagascae* Nyman (see Blanca in Lagascalia 10: 162. 1981). The consequence is an unfortunate switch of names: the taxon previously known as *Centaurea resu-*

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pinata subsp. *lagascae* (Nyman) Fern. Casas & Susanna must be called *Centaurea resupinata* subsp. *spachii* (Willk.) Fern. Casas & Susanna, and the taxon previously so named becomes *Centaurea resupinata* subsp. *dufourii*.

Centaurea resupinata subsp. ***prostrata*** (Coss.) Greuter, **comb. in stat. nov.** ≡ *Centaurea resupinata* var. *prostrata* (Coss.) Amo, Fl. Fan. Penins. Ibérica 4: 344. 1872 ≡ *Centaurea prostrata* Coss., Notes Pl. Crit.: 115. 1851 ≡ *Centaurea boissieri* subsp. *prostrata* (Coss.) Dostál in Bot. J. Linn. Soc. 71: 201. 1976 ≡ *Centaurea spachii* subsp. *prostrata* (Cosson) Figuerola & al. in Feddes Repert. 102: 3. 1991.

Centaurea scabiosa subsp. ***cephalariifolia*** (Willk.) Greuter, **stat. nov.** ≡ *Centaurea cephalariifolia* Willk. in Flora 34: 762. 1851 ≡ *Centaurea scabiosa* var. *cephalariifolia* (Willk.) O. Bolòs & Vigo in Collect. Bot. (Barcelona) 17: 92. 1987.

Centaurea scabiosa subsp. ***integra*** Greuter, **nom. nov.** ≡ *Centaurea integrifolia* Tausch in Flora 11: 485. 1828 (non *Centaurea scabiosa* var. *integrifolia* Gaudin, Fl. Helv. 5: 404. 1829).

Centaurea seridis subsp. ***sonchifolia*** (L.) Greuter, **stat. nov.** ≡ *Centaurea sonchifolia* L., Sp. Pl.: 915. 1753 ≡ *Centaurea seridis* subsp. *sonchifolia* (L.) Briq., Centaurées Alpes Marit.: 173, 176. 1902. – Good reasons for including *Centaurea sonchifolia* in *Centaurea seridis* are given by Briquet & Cavillier (in Burnat, Fl. Alpes Marit. 7: 213-124. 1931). The NW African plants usually referred to *Centaurea seridis* probably belong to the present subspecies, but pending further revision will be left unplaced at subspecies rank.

Centaurea splendens L., Sp. Pl.: 914. 1753. – Lectotype (designated here): Herb. Linn. No. 1030.39 (LINN). – The identity of *Centaurea splendens* L. has been discussed in great detail by Lacaita (in Nuovo Giorn. Bot. Ital., ser. 2, 30: 202-211. 1923). The sheet here chosen as type is the only one that Linnaeus, in his herbarium, annotated with the epithet splendens and the Species Plantarum number. No. 1030.40 is an obvious duplicate, bearing the provenance on the back in Linnaeus's handwriting, but not the epithet. The plants were collected by Gerber in S Russia (Tanai region; referred to by Linnaeus as "Siberia") and correspond to *Centaurea margaritacea* Ten., an Ukrainian endemic when taken in a narrow sense. Fortunately, Art. 57 of the International Code of Botanical Nomenclature clearly prohibits the use of the Linnaean name in the sense of its type (nor can it be used, of course, in any other sense).

Centaurea stoebe L., Sp. Pl.: 914. 1753. – Neotype (here designated): "*Centaurea Rhenana* Bor., Niederösterreich. Felsen in der Mödlinger Klause", 13.07.1908, *Korb* (W, acq. No. 5875). – As noted by Ochsmann (in Diss. Bot. 324: 65. 2000) *Centaurea stoebe* is without original material. No specimen used by Linnaeus is known to exist, nor is there a reference to an illustration in the protologue. It is urgent to fix the application of the name, which has been in some dispute. Linnaeus primarily based his species on a comment, by Clusius, on a plant from the hills near Vienna, which has guided my choice. I am indebtet to Dr Wallnöfer (W) for sending digital images of the neotype.

Centaurea stoebe subsp. ***australis*** (A. Kern.) Greuter, **comb. nova** ≡ *Centaurea australis* A. Kern. in Österr. Bot. Z. 22: 118. 1872 ≡ *Centaurea sublanata* subsp. *australis* (A. Kern.) Nyman, Consp. Fl. Eur.: 426. 1879 ≡ *Centaurea biebersteinii* subsp. *australis* (A. Kern.) Dostál in Bot. J. Linn. Soc. 71: 200. 1976. – The junior synonym *Centaurea stoebe* subsp. *micranthos* (Griseb.) Hayek (in Stojanov & Stefanov, Fl. Bulg.: 1187. 1925) has been adopted for this taxon in Ochsmann's recent revision of the *Centaurea stoebe* group (in Diss. Bot. 324: 69. 2000); contrary to Ochsmann I treat *Centaurea maculosa* subsp. *biebersteinii* (DC.) Nyman (Consp. Fl. Eur.: 427. 1879), with equal priority, as a further synonym.

Centaurea thasia Hayek in Repert. Spec. Nov. Regni Veg. Beih. 30(2): 762. 1931. – Neotype (here designated): Greece, "insula Thasos: in vertice montis Ipsario", 100 m, 6.7.1973, *Greuter 11431* (G; iso- ATH, C, ERE, herb. Dittrich, herb. Greuter). – As pointed out by Georgiadis (in

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Bot. Chron. 1: 14-17. 1981) there can be no reasonable doubt, in view of the respective descriptions and provenance, that *Centaurea thasia* and the subsequently described *Centaurea ipsaria* Stoj. & Kitan. (in Izv. Bulg. Bot. Druž. 9: 102. 1943) are one and the same species. Unfortunately even a repeated, thorough search failed to locate type material of the senior name. Rather that procrastinating its acceptance I prefer to fix its application beyond doubt by designating an appropriate neotype.

Cirsium

Cirsium alsophilum (Pollini) Greuter, **comb. nova** ≡ *Cnicus alsophilus* Pollini, Fl. Veron. 2: 620. 1822. – This combination has been ascribed to "Soldano [1994]" in Kerguélen's online version of his Index Synonymique de la Flore de France (http://www.inra.fr/flore-france/), but I was unable to find a corresponding validation. It is needed because *Cirsium montanum* (Willd.) Spreng. (Syst. Veg. 3: 376. 1826), under which name the species is generally known, is a later homonym of *Cirsium montanum* Hill (Herb. Brit. 1: 80. 1769).

Cyanus

Cyanus albofimbriatus (Stef. & T. Georgiev) Greuter, **comb. nova** ≡ *Centaurea albofimbriata* Stef. & T. Georgiev in Spis. Bulg. Akad. Nauk. 44: 167. 1931.

Cyanus bourgaei (Boiss.) Wagenitz & Greuter, **comb. nova** ≡ *Centaurea bourgaei* Boiss., Fl. Orient. 3: 637. 1875.

Cyanus cyanoides (Wahlenb.) Wagenitz & Greuter, **comb. nova** ≡ *Centaurea cyanoides* Wahlenb. in Berggren, Resor Eur. Österland 2, Bihang: 65. 1826. – See Wagenitz (in Tuexenia 3: 540. 1983) for the correct citation of the place of valid publication of the basionym.

Cyanus elbrusensis (Boiss. & Buhse) Wagenitz & Greuter, **comb. nova** ≡ *Centaurea elbrusensis* Boiss. & Buhse in Nouv. Mém. Soc. Imp. Naturalistes Moscou 12: 131. 1860 ≡ *Centaurea lanigera* subsp. *elbrusensis* (Boiss. & Buhse) Dostál in Preslia 10: 68. 1931.

Cyanus fuscomarginatus (K. Koch) Greuter, **comb. nova** ≡ *Centaurea axillaris* var. *fuscomarginata* K. Koch in Linnaea 24: 426. 1851 ≡ *Centaurea fuscomarginata* (K. Koch) Juz. in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 14: 41. 1951.

Cyanus matthiolifolius (Boiss.) Wagenitz & Greuter, **comb. nova** ≡ *Centaurea matthiolifolia* Boiss., Diagn. Pl. Orient. 4: 19. 1844.

Cyanus novakii (Dostál) Greuter, **comb. nova** ≡ *Centaurea novakii* Dostál in Preslia 10: 61. 1931 ≡ *Centaurea triumfettii* subsp. *novakii* (Dostál) Dostál in Bot. J. Linn. Soc. 71: 209. 1976.

Cyanus pichleri subsp. ***extrarosularis*** (Hayek & Siehe) Wagenitz & Greuter, **comb. nova** ≡ *Centaurea extrarosularis* Hayek & Siehe in Ann. K.K. Naturhist. Hofmus. 28: 170. 1914 ≡ *Centaurea pichleri* subsp. *extrarosularis* (Hayek & Siehe) Wagenitz in Notes Roy. Bot. Gard. Edinburgh 33: 231. 1974.

Cyanus pinnatifidus subsp. ***sooanus*** (Borhidi) Greuter, **comb. nova** ≡ *Centaurea achtarovii* subsp. *sooana* Borhidi in Ann. Hist.-Nat. Mus. Natl. Hung., ser. 2, 8: 219. 1957 ≡ *Centaurea pinnatifida* subsp. *sooana* (Borhidi) Soó in Feddes Repert. 83: 149. 1972.

Cyanus tchihatcheffii (Fisch. & C. A. Mey.) Wagenitz & Greuter, **comb. nova** ≡ *Centaurea tchihatcheffii* Fisch. & C. A. Mey. in Ann. Sci. Nat., Bot., ser. 4, 1: 31. 1854.

Cyanus velenovskyi (Adamović) Wagenitz & Greuter, **comb. nova** ≡ *Centaurea velenovskyi* Adamović in Österr. Bot. Z. 43: 172. 1893 ≡ *Centaurea nyssana* subsp. *velenovskyi* (Adamović)

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Hayek in Stojanov & Stefanov, Fl. Bulg. 2: 1181. 1925 ≡ *Centaurea napulifera* subsp. *velenovskyi* (Adamović) Wagenitz & E. Gamal-Eldin in Strid & Tan, Mount. Fl. Greece 2: 523. 1991.

Echinops

Echinops ritro subsp. ***siculus*** (Strobl) Greuter, **comb. nova** ≡ *Echinops siculus* Strobl in Flora 65: 505. 1882.

Echinops spinosissimus subsp. ***bithynicus*** (Boiss.) Greuter, **comb. nova** ≡ *Echinops bithynicus* Boiss., Diagn. Pl. Orient. 6: 100. 1846 ≡ *Echinops viscosus* subsp. *bithynicus* (Boiss.) Rech. f. in Akad. Wiss. Wien, Math.-Naturwiss. Kl., Denkschr. 105(1): 641. 1944. – The combination was first proposed by Kožuharov (in Bot. J. Linn. Soc. 71: 41. 1975), but invalidly so, since the basionym was not cited.

Echinops spinosissimus subsp. ***bovei*** (Boiss.) Greuter, **comb. nova** ≡ *Echinops bovei* Boiss., Diagn. Pl. Orient. 6: 99. 1846 ≡ *Echinops spinosus* subsp. *bovei* (Boiss.) Murb. in Acta Univ. Lund., ser. 2, sect. 2, 19(1): 59. 1923.

Echinops spinosissimus subsp. ***fontqueri*** (Pau) Greuter, **comb. nova** ≡ *Echinops fontqueri* Pau in sched. Font Quer, Iter Marocc. 1928: No. 409. 1929 ≡ *Echinops spinosus* subsp. *fontqueri* (Pau) Valdés in Lagascalia 18: 306. 1996.

Echinops spinosissimus subsp. ***macrolepis*** (Boiss.) Greuter, **comb. nova** ≡ *Echinops viscosus* var. *macrolepis* Boiss., Fl. Orient., Suppl.: 304. 1888 ≡ *Echinops viscosus* subsp. *macrolepis* (Boiss.) Feinbrun in Notes Roy. Bot. Gard. Edinburgh 35: 244. 1977.

Echinops spinosissimus subsp. ***spinosus*** Greuter, **subsp. nova** – Holotype: [Egypt], "Aegyptus", Jan.-Mar. 1846, *Boissier* (G-BOIS [photo!]). – Validating description: the Latin description of *"Echinops spinosus"* in Boissier, Fl. Orient. 3: 429. 1875. – This taxon corresponds to *"Echinops spinosus"* of most authors, but not to *Echinops spinosus* L. (Mant. Pl.: 119. 1767; Syst. Nat., ed. 12, 2: 581. 1767), which is an illegitimate renaming of *Echinops spinosissimus* Turra (Farsetia: 13. 1765). – Thanks are due to Dr F. Jacquemoud, Genève, who helped selecting the type specimen and sent a photograph of it at short notice.

Jurinea

Jurinea moschus subsp. ***pinnatisecta*** (Boiss.) Greuter, **comb. nova** ≡ *Jurinea depressa* var. *pinnatisecta* Boiss., Fl. Orient. 3: 583. 1875 ≡ *Jurinella moschus* subsp. *pinnatisecta* (Boiss.) Danin & P. H. Davis in Notes Roy. Bot. Gard. Edinburgh 33: 432. 1975.

Jurinea neicevii (Kožuharov) Greuter, **comb. nova** ≡ *Jurinea consanguinea* subsp. *neicevii* Kožuharov in Izv. Bot. Inst. (Sofija) 18: 71. 1968.

Klasea

Klasea aznavouriana (Bornm.) Greuter & Wagenitz, **comb. nova** ≡ *Serratula aznavouriana* Bornm. in Bull. Herb. Boissier, ser. 2, 6: 233. 1906.

Klasea bornmuelleri (Azn.) Greuter & Wagenitz, **comb. nova** ≡ *Serratula bornmuelleri* Azn. in Repert. Spec. Nov. Regni Veg. 11: 397. 1912.

Klasea cerinthifolia (Sm.) Greuter & Wagenitz, **comb. nova** ≡ *Centaurea cerinthifolia* Sm., Fl. Graec. Prodr. 2: 197. 1813 ≡ *Serratula cerinthifolia* (Sm.) Boiss., Fl. Orient. 3: 585. 1875.

Klasea erucifolia (L.) Greuter & Wagenitz, **comb. nova** ≡ *Xeranthemum erucifolium* L., Sp. Pl.: 858. 1753 ≡ *Serratula erucifolia* (L.) Druce in Bot. Exch. Club Soc. Brit. Isles 3: 424. 1914.

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Klasea flavescens subsp. ***cichoracea*** (L.) Greuter & Wagenitz, **comb. nova** ≡ *Centaurea cichoracea* L., Syst. Nat., ed. 10: 1231. 1759 ≡ *Klasea cichoracea* (L.) Webb, Iter Hispan.: 34. 1838 ≡ *Serratula cichoracea* (L.) DC., Prodr. 6: 670. 1838.

Klasea flavescens subsp. ***cretica*** (Turrill) Greuter & Wagenitz, **comb. nova** ≡ *Serratula cichoracea* subsp. *cretica* Turrill in Kew Bull. 12: 391. 1958 ≡ *Klasea cretica* (Turrill) Holub in Folia Geobot. Phytotax. 12: 305. 1977.

Klasea flavescens subsp. ***neglecta*** (Iljin) Greuter & Wagenitz, **comb. nova** ≡ *Serratula neglecta* Iljin in Repert. Spec. Nov. Regni Veg. 35: 353. 1934.

Klasea grandifolia (P. H. Davis) Greuter & Wagenitz, **comb. nova** ≡ *Serratula grandifolia* P. H. Davis in Notes Roy. Bot. Gard. Edinburgh 33: 293. 1974.

Klasea hakkiarica (P. H. Davis) Greuter & Wagenitz, **comb. nova** ≡ *Serratula hakkiarica* P. H. Davis, Fl. Turkey 10: 235. 1988.

Klasea kotschyi (Boiss.) Greuter & Wagenitz, **comb. nova** ≡ *Serratula kotschyi* Boiss., Fl. Orient. 3: 590. 1875.

Klasea kurdica (Post) Greuter & Wagenitz, **comb. nova** ≡ *Serratula kurdica* Post, Pl. Post. 4: 8. 1892.

Klasea lasiocephala (Bornm.) Greuter & Wagenitz, **comb. nova** ≡ *Serratula lasiocephala* Bornm. in Repert. Spec. Nov. Regni Veg. 5: 167. 1908.

Klasea monardii subsp. ***algarbiensis*** (Cantó) Greuter & Wagenitz, **comb. nova** ≡ *Serratula monardii* var. *algarbiensis* Cantó in Lazaroa 6: 60. 1984.

Klasea mouterdei (Arènes) Greuter & Wagenitz, **comb. nova** ≡ ×*Centauserratula mouterdei* Arènes in Notul. Syst. (Paris) 14: 188. 1951 ≡ *Serratula mouterdei* (Arènes) Dittrich in Candollea 36: 359. 1981.

Klasea oligocephala (DC.) Greuter & Wagenitz, **comb. nova** ≡ *Serratula oligocephala* DC., Prodr. 6: 669. 1838.

Klasea pusilla (Labill.) Greuter & Wagenitz, **comb. nova** ≡ *Cynara pusilla* Labill., Icon. Pl. Syr. 3: 11. 1809 ≡ *Rhaponticum pusillum* (Labill.) Boiss., Fl. Orient. 3: 592. 1875 ≡ *Serratula pusilla* (Labill.) Dittrich in Candollea 36: 350. 1981.

Klasea quinquefolia (Willd.) Greuter & Wagenitz, **comb. nova** ≡ *Serratula quinquefolia* Willd., Sp. Pl. 3: 1639. 1803.

Klasea radiata subsp. ***cetinjensis*** (Rohlena) Greuter & Wagenitz, **comb. nova** ≡ *Serratula radiata* var. *cetinjensis* Rohlena in Magyar Bot. Lapok 3: 321. 1905 ≡ *Serratula cetinjensis* (Rohlena) Rohlena in Österr. Bot. Z. 62: 64. 1912 ≡ *Serratula radiata* subsp. *cetinjensis* (Rohlena) Hayek in Repert. Spec. Nov. Regni Veg. Beih. 30(2): 734. 1931.

Klasea serratuloides (DC.) Greuter & Wagenitz, **comb. nova** ≡ *Leuzea serratuloides* DC., Prodr. 6: 666. 1838 ≡ *Serratula serratuloides* (DC.) Takht. in Tahtadžjan & Fedorov, Fl. Erevana: 323. 1945.

Psephellus

Psephellus araxinus (Gabrieljan) Greuter, **comb. nova** ≡ *Centaurea araxina* Gabrieljan in Novosti Sist. Vysš. Rast. 25: 169. 1988.

Psephellus atropatanus (Grossh.) Greuter, **comb. nova** ≡ *Amblyopogon atropatanus* Grossh. in Trudy Prikl. Bot., Ser. 1, Sist. Rast. Obščie Vopr. Rasteniev 2: 245. 1937 ≡ *Centaurea atropatana* (Grossh.) Tzvelev in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 19: 419. 1959.

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Psephellus carbonatus (Klokov) Greuter, **comb. nova** ≡ *Centaurea carbonata* Klokov in Nauk. Zap. Kyïvs'k. Deržavn. Univ. Ševčenka, Sect. 7, 6: 77, 82. 1948.

Psephellus erivanensis subsp. ***holargyreus*** (Bornm. & Woronow) Greuter, **comb. nova** ≡ *Psephellus holargyreus* Bornm. & Woronow in Vestn. Tiflissk. Bot. Sada 32: 7. 1914 ≡ *Centaurea erivanensis* subsp. *holargyrea* (Bornm. & Woronow) Gabrieljan in Novosti Sist. Vysš. Rast. 25: 163. 1988.

Psephellus fajvuschii (Gabrieljan) Greuter, **comb. nova** ≡ *Centaurea fajvuschii* Gabrieljan in Novosti Sist. Vysš. Rast. 25: 164. 1988.

Psephellus sumensis (Kalen.) Greuter, **comb. nova** ≡ *Centaurea sumensis* Kalen. in Bull. Soc. Imp. Naturalistes Moscou 18(1): 238. 1845.

Psephellus xanthocephalus subsp. ***xanthocephaloides*** (Tzvelev) Greuter, **comb. nova** ≡ *Centaurea xanthocephaloides* Tzvelev in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 20: 25. 1960 ≡ *Centaurea xanthocephala* subsp. *xanthocephaloides* (Tzvelev) Gabrieljan in Novosti Sist. Vysš. Rast. 25: 168. 1988.

Rhaponticoides

Rhaponticoides africana (Lam.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea africana* Lam., Encycl. 1: 664. 1785.

Rhaponticoides alpina (L.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea alpina* L., Sp. Pl.: 910. 1753.

Rhaponticoides amasiensis (Bornm.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea amasiensis* Bornm. in Repert. Spec. Nov. Regni Veg. 3: 54. 1906.

Rhaponticoides amplifolia (Boiss. & Heldr.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea amplifolia* Boiss. & Heldr. in Boissier, Diagn. Pl. Orient., ser. 2, 3: 68. 1856.

Rhaponticoides carrissoi (Rothm.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea carrissoi* Rothm. in Bol. Soc. Brot., ser. 2, 13: 281 1939.

Rhaponticoides centaurium (L.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea centaurium* L., Sp. Pl.: 910. 1753.

Rhaponticoides eriosiphon (Emb. & Maire) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea eriosiphon* Emb. & Maire, Pl. Marocc. Nov: 4. 1929.

Rhaponticoides fraylensis (Nyman) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea fraylensis* Nyman, Consp. Fl. Eur.: 420. 1879.

Rhaponticoides hajastana (Tzvelev) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea hajastana* Tzvelev in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 19: 411. 1959.

Rhaponticoides iconiensis (Hub.-Mor.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea iconiensis* Hub.-Mor. in Bauhinia 7: 77. 1981.

Rhaponticoides kasakorum (Iljin) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea kasakorum* Iljin in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 7: 66. 1937.

Rhaponticoides linaresii (Lázaro Ibiza) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea linaresii* Lázaro Ibiza in Anales Soc. Esp. Hist. Nat. 29: 152. 1900.

Rhaponticoides mykalea (Hub.-Mor.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea mykalea* Hub.-Mor. in Bauhinia 6: 370. 1979.

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Rhaponticoides pythiae (Azn. & Bornm.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea pythiae* Azn. & Bornm. in Mitth. Thüring. Bot. Vereins 37: 48. 1927.

Rhaponticoides ruthenica (Lam.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea ruthenica* Lam., Encycl. 1: 663. 1785.

Rhaponticoides taliewii (Kleopow) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea taliewii* Kleopow in Izv. Kievsk. Bot. Sada 5-6: 87. 1927.

Rhaponticoides tamanianae (M. V. Agab.) M. V. Agab. & Greuter, **comb. nova** ≡ *Centaurea tamanianae* M. V. Agab. in Biol. Žurn. Armenii 42: 186. 1989.

Rhaponticum

Rhaponticum coniferum (L.) Greuter, **comb. nova** ≡ *Centaurea conifera* L., Sp. Pl.: 915. 1753 ≡ *Leuzea conifera* (L.) DC. in Lamarck & Candolle, Fl. Franç., ed. 3, 4: 109. 1805.

Rhaponticum coniferum subsp. ***berardioides*** (Battand.) Greuter, **comb. nova** ≡ *Leuzea berardioides* Batt., Contr. Fl. Atl.: 55. 1919.

Rhaponticum cossonianum (Ball) Greuter, **comb. nova** ≡ *Centaurea cossoniana* Ball in J. Bot. 11: 369. 1873. – Contrary to general belief, *Centaurea cossoniana* Ball takes priority both against its synonym *Rhaponticum caulescens* Coss. & Balansa (in Bull. Soc. Bot. France 20: 251. 1874 [see Leussink in Taxon 34: 599. 1985] ≡ *Leuzea caulescens* (Coss. & Balansa) Holub in Folia Geobot. Phytotax. 8: 391. 1973 ≡ *Stemmacantha caulescens* (Coss. & Balansa) Soldano in Compositae Newslett. 32: 19. 1998) and its homonym *Centaurea cossoniana* Batt. & Trabut (in Bull. Soc. Bot. France 35: 341. 1888).

Rhaponticum exaltatum (Willk.) Greuter, **comb. nova** ≡ *Leuzea exaltata* Willk. in Linnaea 30: 117. Aug. 1859 ≡ *Stemmacantha exaltata* (Willk.) Dittrich in Candollea 39: 47. 1984. – The priority of *Leuzea exaltata* over *Leuzea rhaponticoides* Graells (in Mem. Real Acad. Ci. Madrid 2: 468. Oct. 1859) was established by Dittrich (l.c.).

Rhaponticum heleniifolium subsp. ***bicknellii*** (Briq.) Greuter, **comb. nova** ≡ *Centaurea rhapontica* var. *bicknellii* Briq., Monogr. Centaurées Alpes Marit.: 56. 1902 ≡ *Leuzea rhapontica* subsp. *bicknellii* (Briq.) Holub in Folia Geobot. Phytotax. 8: 392. 1973 ≡ *Stemmacantha heleniifolia* subsp. *bicknellii* (Briq.) Dittrich in Candollea 39: 47. 1984.

Rhaponticum longifolium subsp. ***ericeticola*** (Font Quer) Greuter, **comb. nova** ≡ *Leuzea longifolia* var. *ericeticola* Font Quer, Iter Marocc. 1930: [in sched.] No. 704. 1932.

Rhaponticum scariosum subsp. ***lamarckii*** (Dittrich) Greuter, **comb. nova** ≡ *Stemmacantha rhapontica* subsp. *lamarckii* Dittrich in Candollea 45: 491. 1990.

Volutaria

Volutaria saharae (L. Chevall.) Wagenitz, **comb. nova** ≡ *Amberboa saharae* L. Chevall. in Bull. Herb. Boissier, ser. 2, 5: 442. 1905. – This combination was originally but invalidly proposed by Wagenitz (in Candollea 46: 409. 1991, where by an oversight the intended basionym was omitted from the printed text). Prof. Wagenitz kindly accepted to validate the combination here.

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