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**The Euro+Med treatment of *Senecioneae* and the minor *Compositae* tribes – generic concepts and required new names, with an addendum to *Cardueae***

**Abstract**

Greuter, W.: The Euro+Med treatment *Senecioneae* and the minor *Compositae* tribes – generic concepts and required new names, with an addendum to *Cardueae*. – Willdenowia 33: 245-250. – ISSN 0511-9618; © 2003 BGBM Berlin-Dahlem.

A synonymic survey of genera in the *Senecioneae* accepted for the purposes of the Euro+Med Project is presented, and new combinations that are required in the genera *Adenostyles*, *Doronicum*, *Senecio* and *Tephrosieris* (including a new subspecies), as well as *Xanthium* in the *Heliantheae*, are validated. Five validations concerning *Cardueae* taxa, three in *Centaurea*, one in *Psephellus*, and one in *Rhaponticum*, are appended. A synopsis of accepted genera (including many exotic aliens) in nine minor tribes (*Arctoteae*, *Calenduleae*, *Eupatorieae*, *Gundelieae*, *Helenieae*, *Heliantheae*, *Mutisieae*, *Plucheeae*, *Vernonieae*) completes the generic survey of European and Mediterranean *Compositae*.

**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 (Willdenowia 33: 37. 2003). Further information on the setup and structures of Euro+Med is displayed on the Internet (<http://www.euromed.org.uk/>).

This paper concludes a series of similar notes dealing with the various *Compositae* tribes (No. 1-3 and 6-8 of these Notulae). Taken together, they present a generic survey of the Euro-Mediterranean representatives of this large family, which I boldly undertook to edit for the Euro+Med Checklist. They point out the main changes in generic concepts that occurred since 1976 when vol. 4 of *Flora Europaea* was published, and that I found to be appropriate based on a literature survey and the competent advice of specialists. Bertil Nordenstam, Stockholm, was my adviser for the principal remaining tribe, *Senecioneae*, and also for the *Calenduleae* (but my provisionally placing the problem genus *Dipterocome* in this tribe is none of his fault). I gratefully acknowledge his assistance, and I also thank H. Manitz, Jena, for his help in verifying specimens and labels in the Haussknecht Herbarium.

When discussing shifts in generic circumscription in *Senecioneae* since 1976, I should start by pointing out that one genus, *Arnica*, has left the tribe to find a better home in *Helenieae*, but that its name and contents remain unaffected. Most of the changes of note affect the mega-genus *Senecio*, the dismemberment of which has not yet reached completion. Four of the sections recognised in Flora Europaea have meanwhile become accepted genera. Two of them are naturalised aliens: *Senecio petasitis* is now a *Roldana* and *S. mikanioides* a *Delairea*. The other two are native plants, one restricted to the Azores (*S. malvifolius*, a member of the Macaronesian genus *Pericallis*), the other widespread and comprising several species in Europe: *S.* sect. *Tephroseris*, now the genus *Tephroseris*. To complete the picture, add *S. farfarifolius*, given as doubtfully present in Greece, that is now a member of *Iranecio*, as well as the recently described *Caucasalia*, which reaches the Med-Checklist area but does not extend to Europe. The last remaining

Table 1. The Euro+Med genera of *Senecioneae* and nine minor *Compositae* tribes. Accepted names appear in bold-face type, their synonyms in regular italics. Bracketed names are of xenophytic (non-native) genera, quotation marks denote names applied in a sense that excludes their type.

<b>Arctoteae</b>	[ <i>Coreopsis</i> ]	<b><i>Pseudoconyza</i></b>
[ <i>Arctotheca</i> ]	[= <i>Calliopsis</i> ]	<b><i>Pluchea</i></b>
[= <i>Cryptostemma</i> ]	[ <i>Cosmos</i> ]	<b><i>Sphaeranthus</i></b>
[ <i>Arctotis</i> ]	[ <i>Dahlia</i> ]	<b><i>Senecioneae</i></b>
[ <i>Gazania</i> ]	[ <i>Echinacea</i> ]	<b><i>Adenostyles</i></b>
<b>Calenduleae</b>	[ <i>Eclipta</i> ]	= <i>Cacalia</i>
<b><i>Calendula</i></b>	[ <i>Eleutheranthera</i> ]	<b><i>Caucasalia</i></b>
[ <i>Chrysanthemoides</i> ]	[ <i>Galinsoga</i> ]	[ <i>Crassocephalum</i> ]
<b><i>Dipterocome</i></b>	[ <i>Guizotia</i> ]	[ <i>Delairea</i> ]
<b><i>Tripteris</i></b>	[ <i>Helianthus</i> ]	<b><i>Doronicum</i></b>
<b>Eupatorieae</b>	[ <i>Heliopsis</i> ]	= <i>Aronicum</i>
[ <i>Ageratina</i> ]	[ <i>Iva</i> ]	[ <i>Emilia</i> ]
[ <i>Ageratum</i> ]	[= <i>Cyclachaena</i> ]	[ <i>Erechtites</i> ]
<b><i>Eupatorium</i></b>	[ <i>Montanoa</i> ]	[ <i>Farfugium</i> ]
<b><i>Gundelieae</i></b>	[= <i>Lepachys</i> ]	<b><i>Hertia</i></b>
<b><i>Gundelia</i></b>	[ <i>Rudbeckia</i> ]	<b><i>Homogyne</i></b>
<b><i>Warionia</i></b>	[ <i>Sigesbeckia</i> ]	<b><i>Iranecio</i></b>
<b>Helenieae</b>	[ <i>Silphium</i> ]	<b><i>Kleinia</i></b>
<b><i>Arnica</i></b>	[ <i>Tithonia</i> ]	<b><i>Ligularia</i></b>
[ <i>Flaveria</i> ]	[ <i>Verbesina</i> ]	= <i>Senecillis</i>
[ <i>Gaillardia</i> ]	<b><i>Xanthium</i></b>	<b><i>Parasenecio</i></b>
[ <i>Helenium</i> ]	[ <i>Zinnia</i> ]	= " <i>Cacalia</i> "
[ <i>Madia</i> ]	<b><i>Mutisieae</i></b>	<b><i>Pericallis</i></b>
[ <i>Schkuhria</i> ]	<b><i>Dicoma</i></b>	<b><i>Petasites</i></b>
[ <i>Tagetes</i> ]	= <i>Hochstetteria</i>	[ <b><i>Roldana</i></b> ]
<b>Heliantheae</b>	= <i>Tibestina</i>	<b><i>Senecio</i></b>
<b><i>Ambrosia</i></b>	<b><i>Uechtrizia</i></b>	= " <i>Cineraria</i> "
<b><i>Bidens</i></b>	<b><i>Plucheeae</i></b>	<b><i>Tephroseris</i></b>
= <i>Kerneria</i>	<b><i>Doellia</i></b>	<b><i>Tussilago</i></b>
<b><i>Blainvillea</i></b>	= " <i>Blumea</i> "	<b><i>Vernonieae</i></b>
	<b><i>Karelinia</i></b>	[ <b><i>Centratherum</i></b> ]
	<b><i>Laggera</i></b>	<b><i>Ethulia</i></b>
	= " <i>Blumea</i> "	

change to be mentioned is nomenclatural, not taxonomic: The genus named *Cacalia* (now a rejected name) in Flora Europaea must be known as *Parasenecio*.

Little is to be said for the nine remaining, “minor” tribes (where the qualification as “minor” is quite Eurocentric). Three of them (*Gundelieae*, *Mutisieae*, *Vernonieae*) do not reach Europe at all but occur in North Africa and/or SW Asia. The *Plucheeae* do not appear in Flora Europaea, where their only European representative, *Karelinia*, is placed in the *Inuleae*. Many of the remaining tribes consist for the most part or exclusively (*Arctoteae*) of exotic aliens (xenophytes). The single case of generic change in the whole lot is indeed an alien: the former *Eupatorium adenophorum*, now placed in *Ageratina*.

#### *Adenostyles*

*Adenostyles alpina* subsp. *australis* (Ten.) Greuter, **comb. in stat. novo** ≡ *Cacalia alpina* var. *australis* Ten., Syll. Pl. Fl. Neapol., App. 5: 40. 1842 ≡ *Adenostyles viridis* subsp. *australis* (Ten.) Nyman, Consp. Fl. Eur.: 396. 1879. – [= *Adenostyles nebrodensis* Strobl in Flora 65: 196. 1882 ≡ *Adenostyles glabra* subsp. *nebrodensis* (Strobl) Wagenitz & I. Müll. in Phytion (Horn) 23: 149. 1983].

#### *Doronicum*

*Doronicum plantagineum* subsp. *atlanticum* (Rouy) Greuter, **comb. & stat. novi** ≡ *Doronicum atlanticum* Rouy in Bull. Soc. Bot. France 40: 187. 1893.

#### *Senecio*

*Senecio ambiguus* subsp. *taygeteus* (Boiss. & Heldr.) Greuter, **comb. nova** ≡ *Senecio taygeteus* Boiss. & Heldr. in Boissier, Diagn. Pl. Orient. 6: 95. 1846 ≡ *Cineraria nebrodensis* subsp. *taygetea* (Boiss.) Nyman, Consp. Fl. Eur.: 350. 1879.

*Senecio hercynicus* subsp. *dacicus* (Hodálová & Marhold) Greuter, **comb. & stat. novi** ≡ *Senecio dacicus* Hodálová & Marhold in Bot. J. Linn. Soc. 128: 288. 1998.

*Senecio hercynicus* subsp. *dalmaticus* (Griseb.) Greuter, **comb. nova** ≡ *Senecio nemorensis* var. *dalmaticus* Griseb. in Verh. Vereins Natur- Heilkunde Presburg 11: 43. 1874 ≡ *Senecio nemorensis* subsp. *dalmaticus* (Griseb.) Nyman, Consp. Fl. Eur., Suppl.: 163. 1889.

*Senecio hercynicus* subsp. *ucranicus* (Hodálová) Greuter, **comb. & stat. novi** ≡ *Senecio ucranicus* Hodálová in Folia Geobot. 34: 334. 1999.

*Senecio leucanthemifolius* subsp. *cyrenaicus* (E. A. Durand & Barratte) Greuter, **stat. nov.** ≡ *Senecio leucanthemifolius* var. *cyrenaicus* E. A. Durand & Barratte, Fl. Libyc. Prodr.: 135. 1910 ≡ *Senecio cyrenaicus* (E. A. Durand & Barratte) Pamp. in Boll. Soc. Bot. Ital. 1918: 16. 1918.

*Senecio leucanthemifolius* subsp. *mauritanicus* (Pomel) Greuter, **comb. nova** ≡ *Senecio mauritanicus* Pomel in Bull. Soc. Sci. Phys. Algérie 11: 62. 1874 ≡ *Senecio gallicus* subsp. *mauritanicus* (Pomel) Maire in Mém. Soc. Sci. Nat. Maroc 17: 54. 1927. – [= *Senecio fradinii* Pomel in Bull. Soc. Sci. Phys. Algérie 11: 61. 1874].

*Senecio leucanthemifolius* subsp. *vernalis* (Waldst. & Kit.) Greuter, **comb. & stat. novi** ≡ *Senecio vernalis* Waldst. & Kit., Descr. Icon. Pl. Hung. 1: 23. 1800.

*Senecio nemorensis* subsp. *apuanus* (Tausch) Greuter, **comb. & stat. novi** ≡ *Senecio apuanus* Tausch in Syll. Pl. Nov. 2: 252. 1828.

*Senecio nemorensis* subsp. *bulgaricus* (Velen.) [Ko žiharov & N. Andreev in Andreev & al., Opred. Visš. Rast. Bălgarija: 786. 1992, comb. inval. (Art. 33.5), ex] Greuter, **comb. nova** ≡

*Senecio bulgaricus* Velen. in Sitzungsber. Königl. Böhm. Ges. Wiss., Math.-Naturwiss. Cl. 1888: 44. 1889 ≡ *Senecio fuchsii* subsp. *bulgaricus* (Velen.) Nyman, Consp. Fl. Eur., Suppl.: 163. 1789.

*Senecio nevadensis* subsp. *malacitanus* (Huter) Greuter, **comb. & stat. novi** ≡ *Senecio malacitanus* Huter in Österr. Bot. Z. 55: 402. 1905. – [= *Solidago linifolia* L., Sp. Pl.: 881. 1753 ≡ *Senecio linifolius* (L.) L., Sp. Pl., ed. 2: 1220. 1763 (non L. 1759) ≡ *Senecio lythroides* Wjinands, Bot. Commelins: 83. 1983 ≡ *Senecio linifoliaster* G. López in Anales Jard. Bot. Madrid 42: 323. 1986, nom. illeg.].

*Senecio ovatus* subsp. *stebianus* (Lacaita) Greuter, **comb. nova** ≡ *Senecio stebianus* Lacaita in Bull. Orto Bot. Napoli 3: 282. 1913 ≡ *Senecio nemorensis* subsp. *stebianus* (Lacaita) Pignatti in Giorn. Bot. Ital. 111: 57. 1977.

*Senecio samnitum* (Nyman) Greuter, **comb. & stat. novi** ≡ *Cineraria cordifolia* var. *samnitum* Nyman, Consp. Fl. Eur.: 352. 1879 ≡ *Senecio alpinus* var. *samnitum* (Nyman) Fiori in Fiori & Paoletti, Fl. Italia 3: 219. 1903. – [*Senecio samnitum* E. Huet & A. Huet, Pl. Neapol.: [in sched.] No. 361. 1856, nom. nud.; *Senecio samniticus* Pignatti, Fl. Italia 3: 123. 1982, nom. inval.].

*Senecio scopoli* subsp. *floccosus* (Bertol.) Greuter, **comb. nova** ≡ *Arnica floccosa* Bertol., Lucubr. Re Herb.: 36. 1822 (non *Senecio floccosus* Schur 1866) ≡ *Senecio lanatus* subsp. *floccosus* (Bertol.) Arcang., Comp. Fl. Ital.: 346. 1882. – [= *Arnica lanigera* Ten., Fl. Napol. 1: il. 1811 (non *Senecio lanigerus* Burm. f. 1768) ≡ *Senecio tenorei* Pignatti in Giorn. Bot. Ital. 111: 56. 1977].

*Senecio squalidus* subsp. *aethnensis* (DC.) Greuter, **comb. & stat. novi** ≡ *Senecio aethnensis* DC., Prodr. 6: 345. 1838.

*Senecio squalidus* subsp. *chrysanthemifolius* (Poir.) Greuter, **comb. & stat. novi** ≡ *Senecio chrysanthemifolius* Poir. in Lamarck, Encycl. 7: 96. 1806.

### *Tephroseris*

*Tephroseris integrifolia* subsp. *caucasigena* (Schischk.) Greuter, **comb. & stat. novi** ≡ *Senecio caucasigena* Schischk. in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 16: 427. 1954 ≡ *Tephroseris caucasigena* (Schischk.) Czerep., Vasc. Pl. Russia Adj. States: 107. 1995.

*Tephroseris integrifolia* subsp. *jailicola* (Juz.) Greuter, **comb. & stat. novi** ≡ *Senecio jailicola* Juz. in Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 15: 399. 1953 ≡ *Tephroseris jailicola* (Juz.) Konechn. in Bot. Žurn. 66: 838. 1981.

*Tephroseris longifolia* subsp. *brachychaeta* Greuter, **subsp. nova** – Typus: “*Cineraria longifolia*”, [in alpebus Apuanis in valle Catino sub vertice] “Sagro”, misit *Bertoloni* anno 1808 (G-DC [IDC microfiche No. 1114-B5, dext.] sub *Senecio brachychaetus*). – Descr. lat.: Cufodontis in Repert. Spec. Nov. Regni Veg. Beih. 70: 101. 1933, sub voce “*Senecio brachychaetus*”. – Note: *Senecio brachychaetus* DC. (Prodr. 6: 362. 1838) was published as an avowed substitute for *Cineraria longifolia* Jacq. (Fl. Austriac. 2: 49. 1774), the epithet of which was unavailable for transfer to *Senecio* due to the existence of *S. longifolius* L. 1763. Cufodontis (l.c.) used the name *S. brachychaetus* in a restricted sense, for a taxon endemic to the Central Apennines, and excluded the Jacquin element, which he (l.c.: 141) treated as a variety of *S. helenitis*. He thereby arguably established a later homonym of *S. brachychaetus* DC. (Code, Art. 48.1). However, since none of the names involved had been formally typified at that time, this interpretation is open to challenge. For safety, I prefer to publish the required combination as the name of a new taxon rather than as a nomen novum, noting that its authorship and date will be the same either way.

*Tephrosieris longifolia* subsp. *pseudocrispa* (Fiori) Greuter, **comb. nova**  $\equiv$  *Senecio alpestris* var. *pseudocrispa* Fiori in Fiori & Paoletti, Fl. Italia 3: 220. 1903  $\equiv$  *Senecio pseudocrispa* (Fiori) E. Mayer in Dela Inst. Biol. Slov. Akad. Znan. 3: 317. 1952  $\equiv$  *Senecio rivularis* subsp. *pseudocrispa* (Fiori) E. Mayer, Annum Horti Bot. Labac. cl: 40. 1960  $\equiv$  *Tephrosieris pseudocrispa* (Fiori) Holub in Folia Geobot. Phytotax. 9: 272. 1974  $\equiv$  *Tephrosieris rivularis* subsp. *pseudocrispa* (Fiori) B. Nord. in Opera Bot. 44: 45. 1978.

#### *Xanthium* (*Heliantheae*)

*Xanthium orientale* subsp. *californicum* (Greene) Greuter, **comb. & stat. novi**  $\equiv$  *Xanthium californicum* Greene in Pittonia 4: 62. 1899.

*Xanthium orientale* subsp. *italicum* (Moretti) Greuter, **comb. nova**  $\equiv$  *Xanthium italicum* Moretti in Giorn. Fis., ser. 2, 5: 326. 1822  $\equiv$  *Xanthium italicum* Moretti subsp. *italicum* [per Čelak., Prodr. Fl. Böhmen: 186. 1871]  $\equiv$  *Xanthium saccharatum* subsp. *italicum* (Moretti) Hayek in Repert. Spec. Nov. Regni Veg. Beih. 30(2): 613. 1931  $\equiv$  *Xanthium strumarium* subsp. *italicum* (Moretti) D. Löve in Bot. J. Linn. Soc. 71: 271. 1976  $\equiv$  *Xanthium echinatum* subsp. *italicum* (Moretti) O. Bolòs & Vigo in Collect. Bot. (Barcelona) 17: 90. 1988. – [= *Xanthium saccharatum* Wallr., Beitr. Bot.: 238. 1844; = *Xanthium cavanillesii* Schouw in Ann. Sci. Nat., Bot., ser. 3, 12: 357. 1849; & Ind. Sem. Hort. Acad. Haun. 1849: 14. 1849-1850  $\equiv$  *Xanthium strumarium* subsp. *cavanillesii* (Schouw) D. Löve & Dans. in Canad. J. Bot. 37: 205. 1959].

*Xanthium orientale* subsp. *riparium* (Čelak.) Greuter, **comb. nova**  $\equiv$  *Xanthium riparium* Lasch in Bot. Zeitung (Berlin) 14: 412. 1856 (non Itzigs. & Hertsch 1854)  $\equiv$  *Xanthium italicum* subsp. *riparium* Čelak., Prodr. Fl. Böhmen: 186. 1871  $\equiv$  *Xanthium albinum* subsp. *riparium* (Čelak.) Widder & Wagenitz in Hegi, Ill. Fl. Mitt.-Eur., ed. 2, 6(3): 275. 1968  $\equiv$  *Xanthium ripicola* Holub in Folia Geobot. Phytotax. 11: 83. 1976  $\equiv$  *Xanthium albinum* subsp. *ripicola* (Holub) Dostál in Folia Mus. Rerum Nat. Bohemiae Occid., Bot. 21: 12. 1984.

*Xanthium strumarium* subsp. *sibiricum* (Widder) Greuter, **comb. & stat. novi**  $\equiv$  *Xanthium sibiricum* Widder in Repert. Spec. Nov. Regni Veg. Beih. 20: 32. 1923.

#### *Cardueae*

*Centaurea aplolepa* subsp. *bertolonii* (Arrigoni) Greuter, **comb. nova**  $\equiv$  *Centaurea bertolonii* Hausskn. in Mitth. Thüring. Bot. Vereins 6: 34. 1894, nom. illeg.  $\equiv$  *Centaurea paniculata* subsp. *bertolonii* Arrigoni in Parlatorea 6: 60. 2003. – Note: *Centaurea bertolonii* Hausskn. was illegitimate when published, because Haussknecht included in it the earlier, legitimate *C. aplolepa* Moretti (as var. *haplolepis*). Nevertheless, *C. bertolonii* is not automatically typified by the type of *C. aplolepa*, under Art. 7.5 of the Code, because Haussknecht stated that the plant he was describing was the “typical form”, distinct from var. *haplolepis*, thereby definitely indicating a different type. That type has not so far been explicitly designated. Arrigoni (l.c.) erroneously assumed a Bertoloni specimen (anyway missing) to be the holotype and foreshadowed designation of a neotype. At my suggestion, H. Manitz kindly looked in the Haussknecht Herbarium for original material, and found the following (which I here designate as the lectotype): “*Centaurea Bertolonii* m.”, [Liguria], “Genua in glareos. vallis Bisogna” [recte: Bisagno], 26.8.1892, Haussknecht (JE). This will also serve as the type of Arrigoni’s *C. paniculata* subsp. *bertolonii*, a legitimate nomen novum for the illegitimate *C. bertolonii* (Code, Art. 58).

*Centaurea aplolepa* subsp. *levantina* (Arrigoni) Greuter, **comb. nova**  $\equiv$  *Centaurea paniculata* subsp. *levantina* Arrigoni in Parlatorea 6: 62. 2003.

*Centaurea arrigonii* Greuter, **nom. nov.**  $\equiv$  *Centaurea maculosa* f. *intermedia* Micheletti in Nuovo Giorn. Bot. Ital. 23: 315, 322. 1891  $\equiv$  *Centaurea intermedia* (Micheletti) Arrigoni in Parlatorea 6: 76. 2003 (non Mutel 1846).

*Psephellus yildizii* (Civelek & al.) Greuter, **comb. nova**  $\equiv$  *Centaurea yildizii* Civelek & al. in Bot. J. Linn. Soc. 143: 207. 2003.

*Rhaponticum longifolium* subsp. *ericeticola* (Font Quer) Greuter, **comb. & stat. novi**  $\equiv$  *Centaurea ericeticola* Font Quer in Cavanillesia 3: 62. 1930. – This combination was not validly published when first proposed (in Willdenowia 33: 61. 2003) due to my failure to cite the correct basionym. I am grateful to Ms K. Challis, Kew, for pointing this out to me.

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