

## Taxonomic problems in *Erigeron* sect. *Trimorpha* (*Compositae*) in Eurasia

Taxonomická problematika sekce *Trimorpha* rodu *Erigeron* v Eurasii

Otakar Šída jun.

Department of Botany, Charles University, Benátská 2, CZ-128 01 Praha 2, Czech Republic

Šída O. jun. (1998): Taxonomic problems in *Erigeron* sect. *Trimorpha* (*Compositae*) in Eurasia. – Preslia, Praha, 70: 259–269.

A new subdivision of the section *Trimorpha* of the genus *Erigeron* in Eurasia is proposed. This section is divided into three series: ser. *Trimorpha*, ser. *Politae* and ser. *Macrophyllae*; the latter two are newly described. Two new names are published, *E. canariensis* Šída f. and *E. lalehzaricus* (Rech. f.) Šída f. Brief notes on the representatives of particular series are presented.

Keywords: *Erigeron*, *Erigeron* sect. *Trimorpha*, taxonomy, Eurasia

### Introduction

The genus *Erigeron* (*Compositae*) belongs to the taxonomically complicated tribe *Astereae*. Evolutionary relationships within the genus *Erigeron* and at the generic level in the whole tribe are rather unclear. The geographical range of the genus is bipolar, and occupies the whole of Holarctic region and most of Central and South America (not only the Andes but also the Galapagos, Cuba and the southeast of South America). The primary centre of the evolution of the genus is found in Mexico and western North America. In America, the genus can be divided in a number of, mostly endemic, sections (ca 21, see Nesom 1994: 221). A very different taxonomic pattern is found in the Old World where only two sections are recognized. In the mountain regions of Eurasia, less distinct centres of evolutionary radiation of *Erigeron* are situated. It should be emphasized that modes of differentiation in the genus are substantially different in North American and Eurasian groups. In America, the differentiation is characterized by polyploidy (polyploid complexes) and a shift to agamospermy in triploid taxa. In Eurasia, the representatives of the genus are almost exclusively diploid with  $2n = 18$ , the exceptions being a few tetraploid taxa – *E. humilis* distributed from eastern North America through Greenland, Iceland to Scandinavia, *E. flaccidus* (Siberia), *E. petiolaris* (the Altai) and *E. silenifolius* (the Eurasian Arctics). The latter two taxa comprise both diploid and tetraploid cytotypes. In Eurasia, the evolution took place predominantly at the diploid level through geographic speciation that might have been very rapid. The contrast between the variety of speciation processes (and a great number of supraspecific taxa) in America, and the relative uniformity of the genus in Eurasia suggest that the origin of the genus can be located in the New World.

### Diagnosis of the Eurasian representatives of *Erigeron*

Biennials or perennials, leaves in basal rosettes, stems more or less leafy, leaves entire, hairy at least on margins (ciliate). Stem with one or more capitula (sect. *Erigeron*), or inflorescence composed, capitula numerous arranged in racemose or paniculate composed synflorescence (sect. *Trimorpha*). Involucral bracts in several rows, linear-lanceolate, the inner equalling the outer ones or at most twice as long. Florets of two or three types: ray florets ligulate, female, in two or several circles, disc florets tubular, hermaphrodite (perfect), rarely some of them filiform and female. Achenes minutely pubescent, pappus sessile.

In the group of related genera around *Erigeron* – *Conyza*, it is possible to follow a developmental trend from *Aster* with long uniseriate ray florets, through *Erigeron* with ray florets in several rows, to *Conyza* with  $\pm$  non-ligulate, almost filiform-tubular female florets in several rows. Ligulate ray florets represent a diagnostic feature distinguishing groups of related genera, one of which includes *Erigeron*, the other with *Conyza*. Genera closely related to *Erigeron*, formerly often treated as members of a broad *Erigeron*, are *Chamaegeron* Schrenk, *Lachnophyllum* Bunge, *Brachyactis* Ledeb. and *Psychrogeton* Boiss. The latter two genera differ from *Erigeron* in having disc florets only (ray florets are missing), the former two genera differ from *Erigeron* by spirally twisted ligulate florets (cf. Grierson & Rechinger 1982, Bremer 1994).

The genus *Erigeron* is one of the largest genera in the tribe *Astereae*. It comprises about 400 species, almost 12 % of the species diversity of the whole tribe (Nesom 1994).

### The division of the genus in Eurasia

The presence of two or, alternatively, three types of florets in a capitulum has been considered as a feature of major importance by many authors. On the basis of this character, the genus usually was divided in two groups at various levels: at the level of genera *Erigeron* L. and *Trimorpha* Cass. (e. g. Vierhapper 1906, Nesom 1989), subgenera (Bochantsev 1959) or sections (e. g. De Candolle 1836, Tsvelev 1991). Thus, the genus (or, more generally, a taxon called) *Trimorpha* Cass. in this circumscription includes the *Erigeron acris* group on one hand, and, on the other hand, high alpine species of a very different general habit having three floret types (*E. alpinus*, *E. neglectus* and others). In some Central Asian members of the genus, this feature was found variable (Bochantsev 1959), and plasticity of this character was also pointed out by Utelli et al. (1995). With regard to the variable nature of this feature, I incline to follow Pawłowski (1970) who totally abandoned the above division criterion. Pawłowski recognizes a broad genus conception including genera *Conyza* Less. (*Erigeron* sect. *Caenotus* Nutt.) and *Phalacroloma* Cass. (syn. *Stenactis* auct. non Cass.). The representatives of the genus *Erigeron* sensu stricto are ranked here into the nominate section *Erigeron*, which is divided into two subsections on the basis of complex of traits such as, e. g. the length of ray flowers, and length of pappus. These two subsections are *Macroglossae* (Vierh.) Pawł. including high-mountain representatives of the genus, and *Brachyglossae* (Vierh.) Pawł. including aggregate group *Erigeron acris*. If this conception is followed and the taxa are classified at the level of the section, *Erigeron uniflorus* L. (the type of the genus) will be also included in the section *Macroglossae* Vierh. which must be therefore considered the nominate one and bear the name sect. *Erigeron*.

*Erigeron acris* L. represents the nomenclature type of the sect. *Trimorpha* (Cass.) DC.; De Candolle's combination is the oldest valid name of a taxon in the rank of a section involving this species. Due to the fact that the name *Trimorpha* Cass. is used also for mountain representatives with trimorphous flowers, it is necessary to emphasize that, within this classification approach, these taxa are excluded from sect. *Trimorpha* (Cass.) DC. and ranked into the nominate section.

### Taxonomic division of the section *Trimorpha* (Cass.) DC.

As a matter of fact, it is almost impossible to locate the diversification centre of the section *Trimorpha* (Cass.) DC. Its species diversity is almost evenly distributed throughout its geographical range, the ranges of individual species often are large frequently overlapping. Morphological radiation within the section is relatively considerable, the mosaic-like distribution of morphological characters is manifested here. The majority of the section can be divided in a relatively clean-cut groups of relatives (or at least, groups with a certain, higher degree of morphological homogeneity). A minor part of species do not show any more distinct relationships to the other members of the section. There are three alternatives how to solve this problem. First, it is possible to refrain from subdividing the section; this solution neglects the existence of the evident species groups. Another possibility is to accommodate each species of the smaller group to a separate monotypic series. Alternatively, it is possible to leave the isolated species for future studies; the latter approach has been adopted here.

Only Eurasian species are treated in the following account. However, the same system can be applied for the North American representatives of the section. Species marked with the question mark are not safely assigned to the respective series. There are some other taxa which I have not studied, in particular those from Central Asia (Grierson & Rechinger 1982); these are not listed but although undoubtedly belong to the section.

### sect. *Trimorpha* (Cass.) DC. Prodr. Syst. Natur. 5: 290 (1836)

Typus: *Trimorpha vulgaris* Cass., Dict. Sci. Natur. 55: 324 (1828), nom. illeg. (= *Erigeron acris* L.)

Syn: *Trimorpha* Cass., Bull. Sci. Soc. Philom. Paris, p. 137 (1817) (basionym)

*Erigeron* L. subgen. *Trimorpha* (Cass.) M. Pop., Tr. Bot. Inst. AN SSSR, ser. 1, 7: 10 (1948)

= *Trimorpha* Cass. sect. *Brachyglossae* Vierh., Beih. Bot. Centralbl. 19: 423 (1906)

= *Erigeron* L. subsect. *Brachyglossae* (Vierh.) Pawl., Fragm. Florist. Geobot. 16 (2): 256 (1970)

= *Erigeron* L. [unranked] *Acres* Rydb. Fl. Colorado, p. 359 (1906)

**D i a g n o s i s :** Biennial to shortly perennial herbs with basal leaf rosette (which may be decayed at anthesis) and leafy stem, synflorescence usually composed of more capitula; capitula small, up to 10 (–15) mm long, three types of flowers are present in each capitulum.

### ser. *Trimorpha* (Cass.) Šída f., comb. nova

Bas.: *Trimorpha* Cass., Bull. Sci. Soc. Philom. Paris, p. 137 (1817)

Typus: *Trimorpha vulgaris* Cass., Bull. Sci. Soc. Philom. Paris, p. 137 (1817)

**Diagnosis:** Stems, leaves and involucre usually  $\pm$  covered with simple hairs, in some cases a dense glandulose indumentum present in the synflorescence, cauline leaves 10–20 (–25).

**Distribution:** With the exception of *E. acris* whose geographical range extends to the Far East, species of this series occur from W Europe and NW Africa to Central Asia. In the southern part of the range of the section, stenoendemic species confined to the higher vegetation mountain belts are found.

*E. acris* L.

*E. serotinus* Weihe

*E. hispanicus* (Vierh.) Maire (mountains of NE Spain)

*E. granatensis* Lippert (S Spain, Sierra Nevada)

*E. mesatlanticus* Maire (Morocco, Mt. Atlas)

*E. lalehzaricus* (Rech. f.) Šída f.

### **ser. *Politae* Šída f., ser. nova**

Typus: *Erigeron politus* Fries, Bot. Notis. 1843: 142 (1843)

**Diagnosis:** Caules, folia et involucria tota glabra (pili involucrorum introgressum specierum ser. *Trimorpha* indicant), tantum involucria cum glandulis parvis sessilibus, numerus minor anthodiorum (usque ad 15), folia 10–15, partes superiores caulium et involucria significanter rubra.

**Diagnosis:** Stems, leaves and involucre totally glabrous (the hairiness of the involucre is a result of introgression of the species of ser. *Trimorpha*), only involucre with minute sessile glands, capitula few (up to 15), leaves 10–15, upper parts of stems and the involucre distinctly suffused with red.

**Distribution:** The geographical range of the series is of the Arcto-Alpine type; individual taxa are restricted to the alpine belt or to tundra vegetation.

*E. politus* Fries (the Arctics)

*E. angulosus* Gaud. (the Alps)

*E. pseudo-elongatus* Boch. (the Caucasus)

### **ser. *Macrophyllae* Šída f., ser. nova**

Typus: *E. macrophyllus* Herbich, Flora 42: 671 (1854)

**Diagnosis:** Plantae robustae, caules 30–100 cm alti, dense foliis tecti, cum (25–) 30–40 (–45) foliis, anthodia in inflorescentiis paniculatis variarum formarum, si pauperiores, racemosae.

**Diagnosis:** Plants robust, stems 30–100 cm high, densely leafy, cauline leaves (25–) 30–40 (–45), capitula in paniculate synflorescences of various shapes, if capitula few then synflorescences of a racemose type.

**Distribution:** The geographical range of the series extends from Central Europe to the Far East.

*E. macrophyllus* Herbich

*E. podolicus* Bess.

- E. baicalensis* Boch.  
? *E. elongatus* Ledeb.  
? *E. kamschaticus* DC.  
? *E. droebachiensis* O. F. Müll.

The position of the following species in the system of the section remains unclear:

- E. uralensis* Less.  
*E. canariensis* Šída f.

### Notes on some species

1. *Erigeron acris* L. Sp. Pl., p. 863 (1753).

The type species of the section occupies the largest geographical range extending from the westernmost Europe to the Far East. The species is characterized by lower stems and fewer cauline leaves (up to 12), conspicuous hairiness of the whole plant, and capitula arranged in a racemose synflorescence.

Geographical data from the protologue: "in Europae apricis, siccis".

**Distribution:** Al, Au, Be, Br, Bu, Cz, Da, Fe, Ga, Ge, Gr, He, Ho, Hs, Hu, It, Ju, No, Po, Rm, Rs, Su, Turkey, the Caucasus, Siberia, the Russian Far East, northern Mongolia, the Pamir, the Tchien-Shan.

**Specimina visa:** Numerous specimens from the herbaria BC, BCF, BP, BRA, BRNM, BRNU, CB, GM, HR, LE, LIM, LIT, MA, MAF, MJ, MW, OL, OLM, OP, PL, PR, PRC, Museum of Příbram, ROZ, SAV, Museum of Sokolov, ZMT.

2. *Erigeron serotinus* Weihe, Flora 13: 258 (1830)

This species name was validly published as early as 1830, in 19th century it was frequently listed in floras at the rank of species or variety. At the beginning of this century it was almost forgotten and frequently equated with *E. acris*. However, it can be supposed that it represents a clearly delimited taxon differing from *E. acris* in the flowering time, general habit, in the geographical distribution and, to a certain extent, also in its ecological amplitude. The species is characterized by canaliculate, at least in the lower half of stem recurved leaves with obtusely acute apex, by darker coloration of the plants and by the presence of linear obtuse bracts in the synflorescence.

Geographical data from the protologue: "... an bergigen, sonnigen Triften in kalkhaltigem Thonschiefer zum Herford".

**Distribution:** Au, Br, Cz, Ga, Ge, Hs, Hu, Ju, Po, Ru.

**Specimina visa:** Numerous specimens from the herbaria BC, BCF, BP, BRA, BRNM, BRNU, CB, GM, HR, LE, LIM, LIT, MA, MAF, MJ, OL, OLM, OP, PL, PR, PRC, Museum of Příbram, ROZ, SAV, ZMT.

3. *Erigeron hispanicus* (Vierh.) Maire, Bull. Soc. Hist. Natur. Afr. Nord 2: 85 (1924)

Bas.: *Trimorpha hispanica* Vierh., Beih. Bot. Centralbl. 19(2): 423 (1906)

The species was described on the basis of the exsiccate series of Reverchon, Plantes d'Espagne, no. 796, from Sierra de Valacloche, 1500 m, and Sierra de Camarena, 1600 m, in the province of Teruel. The plants are distinct in having rather larger capitula on longer peduncles, and conspicuously developed glandulose indumentum. Most probably, it represents a species endemic to the mountains of eastern Spain.

Geographical data from the protologue: "Provinz Teruel, Sierra de Valacloche. Calc. 1500 m (E. Reverchon Pl. Esp. No 796), Sierra de Camarrena. Calc. 1600 m (E. Reverchon Pl. Esp. No 796)".

**Distribution:** Hs.

**Specimina visa:** Only the type material deposited in PRC.

4. *Erigeron granatensis* W. Lippert, Mitt. Bot. Staatssamml. München 20: 465 (1981).

Syn.: *Trimorpha nevadensis* Vierh., Beih. Bot. Centralbl. 19(2): 457 (1906) non *Erigeron nevadensis* Weddell, Chlor. And. 1: 194 (1857) nec *E. nevadensis* A. Gray, Proc. Am. Acad. 8: 649 (1873); *E. mairei* Braun-Blanquet, Bull. Soc. Hist. Natur. Afr. Nord 14: 25 (1923) non *E. mairei* Lévillé, Feddes Repert. 9: 307 (1912)

Plants with several stems of 10–30 cm in height, hairy, stem leaves 8–15, smaller than rosette leaves, linear-lanceolate, 2–5 cm long, max. 4 mm wide, hairy, number of capitula less than 5 (–8), arranged in a poor raceme; involucre covered with long, simple hairs; small, short glandular hairs are also present.

Geographical data from the protologue: "Iberische Halbinsel. Sierra Nevada. In summis pratis 8000' (Boissier), In summis calcareis 7000' (Boissier 1837, Alioth 1853), Picacho de Veleta (M. Winkler, Reise südl. Span. 1873), Mulahacen, 3200–3300 m (Huter, Porta et Rigo, It. III. Hisp. No 564)".

The range of this species is restricted to the alpine belt of the Sierra Nevada in S Spain.

**Distribution:** Hs.

**Specimina visa:** PR (1), PRC (1), BC (1), BCF (1).

5. *Erigeron mesatlanticus* Maire, Bull. Soc. Hist. Natur. Afr. Nord 15: 84 (1924).

Stems 30–70 cm tall, covered with adpressed non-glandular hairs; leaves linear-lanceolate, hairy, number of leaves 15–20; capitula arranged in racemoso-paniculate inflorescences, in outline opposite triangular, involucre are adpressed hairy.

Geographical data from the protologue: "In cedretis supra opp. Azrou, solo basaltico; in pascuis ad ripas lacus Sidi-Ali-ou-Mohand, solo calcareo et basaltico etc. – Typus in Univers. Algeriensis et in Herb. Inst. Imper. Scient. Rabatensis".

**Distribution:** Morocco.

**Specimina visa:** MA (1).

**6. *Erigeron canariensis* Šída f., nom. nov.**

Nomen substitutum: *Erigeron cabreræ* M. Dittrich, Candollea 36: 243 (1981), nom. illeg., non Solbrig, Bol. Soc. Argent. Bot. 6: 21 (1955).

Stems are shorter, max. 25 cm tall, covered with glandular hairs only (otherwise completely hairless); leaves are linear-lanceolate, hairless on surface, covered with numerous cilia on margin; involucre covered with numerous, small, sessile glandular hairs, otherwise hairless; involucral leaves dark-green coloured along medium rib, light green on margins.

Distribution: Tenerif

Specimina visa: MA (1)

**7. *Erigeron lalehzaricus* (Rech. f.) Šída f., comb. nova**

Bas.: *Erigeron acris* L. subsp. *lalehzaricus* Rech. f. in Grierson et Rechinger f. Flora Iranica Vol. 154. *Compositae* V – *Astereae*, p. 21, (1982).

Plants with only a few stems, 20–30 cm tall, ascendent or straight, branched from a lower half, hairy; stem leaves not exceeding 5; inflorescence racemose, composed of 5–15 (–20) capitula.

Holotypus: "Bornmüller 3979, W"

Distribution: Iran (prov. Kerman)

Specimina visa: BRNU (1), PR (1)

**8. *Erigeron politus* Fries, Bot. Notis. 1843: 142, 1843.**

*Erigeron politus* is characterized by a low number of capitula on long peduncles, stems with a few leaves with obtuse to rounded apices. The whole plant is conspicuously glabrous, with a dark purple coloration of the upper part of stem, peduncles and involucre. Numerous herbarium specimens come from Scandinavia, further scattered records are from the whole of the Arctic (e. g., Gerb. Fl. USSR, no. 6050, Chukotka); chromosome number records under this name are reported from Alaska, as well (Dawe & Murray in Löve 1979, Chinnappa & Chmielewski 1987).

Geographical data from the protologue: non vidi

Distribution: Fe, No, Rs (N), Su, Arctic Siberia, Arctic North America (?)

Specimina visa: BP (4), BRNU (11), BRNM (3), PRC (18), PR (19)

**9. *Erigeron angulosus* Gaud. Fl. Helv. 5: 265 (1829)**

A species of limestones scree, preferably in the alpine and subalpine belts of the Alps; it is also found in lower sites, for instance on gravelly sediments along mountain rivers. It is a biennial to shortly perennial herb, with a low stem and a racemose synflorescence, cauline leaves are relatively few (up to 15), leaves lanceolate to linear-lanceolate, the whole plant

is glabrous, with the exception of sessile glands on involucre; upper part of stems and the involucre are suffused with purple.

Geographical data from the protologue: “Hab. ni fallor, in Alpihus, supra Bagnes”

Distribution: Au, Cz, Ga, Ge, He, It

Specimina visa: BRA (2), BRNM (2), BRNU (10), OLM (2), OP (1), PRC (11), PR (10)

10. *Erigeron pseudo-elongatus* Boch. in Shishkin, Fl. SSSR 25, Addenda 24: 587. 1959

This species is a Caucasian analogy of *Erigeron angulosus*. Its geographical range covers central and eastern Caucasus and the adjacent part of Transcaucasia. It differs from *E. angulosus* in having ascending stems and rather obtuse and rounded leaves.

Holotypus: “Provincia Terskaja. Flumen Czegem superior. In morenis glaciei Schartau (Tchtingi) 2100–2400 m s. m. 6. VIII. 1911, fl. E. et N. Busch. In Herb. Inst. Acad. URSS (Leningrad) conservatur.”

Distribution: Caucasus

Specimina visa: Only the type material deposited in LE

11. *Erigeron macrophyllus* Herbich, Flora 42: 671 (1854)

Stems of this species are glabrous or sparsely hairy below, tall, densely leafy, the leaf surface is glabrous, margins of upper leaves often ciliate; involucre with minute sessile glands, otherwise glabrous or sparsely ciliate. Leaves in the lower half of stem are up to 10 cm long and 1.3 cm wide, capitula are arranged in a paniculate synflorescence (rhombic in outline). Until recently, the species has been reported to occur in the Carpathians, the Sudetes and the eastern Alps (Pawłowski 1969, Gutermann 1974). However, its real distribution range is much more extensive: in the Balkans, it reaches the Croatian Velebit, in the east it occupies the whole of the southern part of the European Russia (reaching the Moscow region in the north), northern part of Ukraine, and it is known from the Caucasus (cf. Tsvelev, 1993). There is an unsolved problem of its relationships to the South Scandinavian *E. droebachiensis*; it is possible that the two taxa are conspecific; in such case, the latter name should be given priority.

Geographical data from the protologue: “Auf Glimmerschiefer-Felsen im Bistritz-Thale bei Kirlibaba und Pareu Androni mit *Sempervivum montanum* und *Scopolia atropoides*.”

Distribution: Au, Cz, Ge, Hu, Ju, Po, Rs (W), Rs (E), Rs (C), Ru, the Caucasus

Specimina visa: Numerous specimens from the herbaria BP, BRA, BRNM, BRNU, CB, GM, HR, LE, LIM, LIT, MW, OLM, OL, OP, PRC, SAV, ZMT, Museum of Píbram, Museum of Sokolov



12. *Erigeron droebachiensis* O. F. Muell. Flora Danica 15: 4 (1782)

Despite this name being in various floras frequently attributed to a taxon distributed from southern Fennoscandia and northern Germany through Poland to the European part of Russia, its identity is doubtful. The traits listed in the floras (e. g. Tsvelev 1994, Pawłowski 1970) do not agree with the original description of this taxon which is, however, rather brief. There is an obvious difference between racemose inflorescence mentioned by present authors and paniculate inflorescence cited in the protologue. Since the original herbarium material has been probably lost, it appears necessary to set up the existing illustration as the type and to solve the interpretation of this name by selection of an epitype. At least part of herbaria specimens studied, which bear this name and are deposited e. g. in LE, belong to *Erigeron macrophyllus* Herbich. The identity of both taxa is not doubted by their original diagnoses of *E. droebachiensis* O. F. Muell. either. Plants fitting the description of *E. droebachiensis* O. F. Muell. (sensu Tsvelev 1994, Pawłowski 1970) might be also encountered within the population of *E. macrophyllus* Herbich, because they are usually smaller due to unfavourable conditions. The question of the identity of this name as well as its relationship to *E. macrophyllus* Herbich thus remains open.

Geographical data from the protologue: "An der felsigen Ufern des Dröbacker Meerbusens"

13. *Erigeron podolicus* Bess. Enum. Pl. Volh., p. 76 (1822)

Robust, densely hairy plants with a densely leafy stem, capitula arranged in a paniculate synflorescence (triangular in outline). The geographical range of *E. podolicus* extends from the steppe and woodland-steppe zone of Russia and Ukraine to the Caucasus in the south, and to the Pannonian Basin, i. e., Romania, Hungary, S Slovakia, S Moravia and E Austria in the west.

Geographical data from the protologue: "In Podolia australi"

Distribution: Au, Bu, Cz, Ju, Hu, Rs (E), Rs (W), Ru, Caucasus, western Kazakhstan?

Specimina visa: Numerous specimens from the herbaria BP, BRA, BRNM, BRNU, GM, HR, LE, OLM, OL, OP, PRC, PR, SAV, ZMT

14. *Erigeron elongatus* Ledeb. Icon. Pl. Fl. Ross. Impr. Alt. 1: 9, tab. 31 (1829) nom. illeg., non Moench Suppl. Meth. Plant., p. 247 (1802)

This species has recently been equated with the Arctic *E. politus*. The character of the Ledebour's original material (LE) is in contrary with the latter conception. The original plants are robust, with large paniculate synflorescences; they share with *E. politus* only the very sparse indumentum of the whole plants, and probably also the reddish coloration of the upper part of stem. It is probable that this species should better be classified as a member of the ser. *Macrophyllae* but any safer conclusion may be reached only after a revision of a rich material from the Altai, and perhaps from the Tchien-Shan where similar forms occur. The question of the correct name for this taxon remains unanswered, as well.

Geographical data from the protologue: non vidi

Distribution: Altai, Tchien-Shan

Specimina visa: BP (1), BRNU (1), the type material deposited in LE

15. *Erigeron baicalensis* Boch. in Shishkin, Fl. SSSR 25, Addenda 24: 584, 1959

A species with a dense indumentum of the whole plant; leaves are large, less numerous than in *E. podolicus* (10–15), also capitula are less numerous and of larger size than those in *E. podolicus*. There is a tendency towards a reddish coloration of the involucre and peduncles, ligulate florets are more intensively coloured than those of *E. podolicus*.

Holotypus: "Provincia Zabaikalskaja, montes Nerczinsk, prope opp. Kluczevskoje, Bolschoi Kadaluj, in pratis. 6. VIII. 1911, No. 4989, fl. V. Smirnov. In herb. Inst. Acad. URSS (Leningrad) conservatur."

Distribution: Transbaikalia

Specimina visa: Only the type material deposited in LE

16. *Erigeron kamtschaticus* DC. Prodr. Syst. Natur. 5: 290 (1836)

Stems about 70 cm tall, hairless; leaves less numerous than in *E. macrophyllus* Herbich (10–15); inflorescence racemose or racemose-paniculate, sparse, capitula arranged on relatively long peduncles, involucre hairless.

Geographical data from the protologue: "In Kamtschatka"

Distribution: It represents a Far East analogy of *E. macrophyllus*. *E. kamtschaticus* is reported (Meusel & Jäger 1992) to occur in the Russian Far East, Japan, Korea and NE China.

Specimina visa: BRNU (1)

Species excludendae:

*Erigeron orientalis* Boiss.

*Erigeron alpinus* L.

*Erigeron borealis* (Vierh.) Simmons

*Erigeron rhodopaeus* (Vierh.) Hayek

*Erigeron hungaricus* (Vierh.) Pawł.

*Erigeron epiroticus* (Vierh.) Halácsy

*Erigeron neglectus* Kern.

*Erigeron atticus* Vill.

*Erigeron gaudinii* Brügger

## Acknowledgements

I am grateful to Dr. J. Holub, Dr. J. Kirschner, Dr. J. Štěpánek and anonymous referees for valuable comments on the paper and to Dr. J. Kirschner and Mgr. P. Dostál for the translation of the paper into English.

## Souhrn

Rod *Erigeron* se v Eurasii člení do dvou sekcí: sekce *Erigeron*, zahrnující vysokohorské zástupce rodu a sekce *Trimorpha*, zahrnující agregátní komplex kolem druhu *E. acris*. *Erigeron* sect. *Trimorpha* se dále člení do tří serií, ser. *Trimorpha*, ser. *Politae* a ser. *Macrophyllae*.

Do ser. *Trimorpha* jsou začleněny druhy vynikající přítomností nezláznatého nebo v některých případech žláznatého odění s nevysokým počtem lodyžních listů (10–20). Areál sekce sahá od západní Evropy po Dálný Východ. V jižních částech areálu se vyskytují stenoendemitní druhy vázané na vyšší vegetační stupně hor (např. Tenerife, Atlas, Sierra Nevada, Kuh-e Laleh Zar).

Do ser. *Politae* patří druhy vázané svým rozšířením na arko-alpínskou tundru. Vyznačují se absencí odění, pouze v květenství jsou přítomny drobné přisedlé žlázy. Horní části lodyh jsou často červeně zbarvené. Lodyžních listů a úborů je menší počet. Areál je výrazně disjunktivní, zahrnuje eurasijskou (i americkou?) Arktidu, Alpy, Kavkaz a patrně některé středoaasijské hory.

Do ser. *Macrophyllae* patří robustní rostliny až 1 m vysoké, s hustě olistěnou lodyhou a s bohatými latnatými květenstvími. Listů je zpravidla 30–40. Areál sahá od střední Evropy až po Dálný Východ.

U každé serie je uveden přehled jejich zástupců, u jednotlivých druhů jsou dále uvedeny krátký popis, rozšíření a instituce, v jejich herbariovém materiálu byly tyto druhy revidovány.

## References

- Bochantsev V. P. (1959): Rod 1477. Melkolepestnik – *Erigeron*. – In: Shishkin B.K. (ed.), Flora SSSR 25: 191–288, Izdatelstvo AN SSSR, Moskva & Leningrad.
- Bremer K. (1994): *Asteraceae*: Cladistic and classification. – Timber Press, Inc. Portland, Oregon, USA.
- De Candolle A. P. (1836): *Prodromus Systematis Naturalis Regni Vegetabilis*. Vol. 5. – Paris.
- Chinnappa C. C. & Chmielewski J. G. (1987): Documented plant chromosome numbers 1987: 1. Miscellaneous counts from western North America. – *Sida*, Dallas, 12: 409–417.
- Grierson A. J. C. & Rechinger K. H. fil. (1982): Flora Iranica 154. *Compositae* V – *Astereae*. – Akademische Druck- und Verlagsanstalt, Graz.
- Gutermann W. (1974): *Erigeron acris* subsp. *macrophyllus*, eine verkannte Sippe des Alpen-Ostrandes. – *Phyton* (Austria) 16: 75–79.
- Lippert W. (1984): *Erigeron granatensis* – ein neuer Name für eine altbekannte spanische Art. – *Mitt. Bot. Staatssamml., München*, 20: 465–466.
- Löve Á. (ed.) (1979): IOPB chromosome number reports LXIII. – *Taxon*, Utrecht, 28: 265–268.
- Meusel H. & Jäger E. J. (eds.) (1992): *Vergleichende Chorologie der zentraleuropäischen Flora*. Vol. III. – Gustav Fischer Verlag, Jena etc.
- Nesom G. L. (1989): The separation of *Trimorpha* (*Compositae*: *Astereae*) from *Erigeron*. – *Phytologia*, Huntsville, 67: 61–66.
- Nesom G. L. (1994): Subtribal classification of the *Astereae* (*Asteraceae*). – *Phytologia*, Huntsville, 76: 193–274.
- Pawlowski B. (1970): De speciebus polonicis et carpaticis generis *Erigeron* L. – *Fragm. Flor. Geobot., Kraków*, 16: 255–293.
- Tsvelev N. N. (1991): Zametki o rodach *Erigeron* L. s. l. i *Cirsium* Mill. (*Asteraceae*) v evropejskoj časti SSSR. – *Nov. Sist. Vysš. Rast., Leningrad*, 28: 147–152.
- Tsvelev N. N. (1993): Zametki o nekotorych složnocvetnyh (*Asteraceae*) i aronnikovych (*Araceae*) Kavkaza. – *Bjull. Mosk. Obšč. Ispyt. Prir., Otd. Biol., Moskva*, 98 (6): 99–108.
- Tsvelev N. N. (1994): Rod 86. Melkolepestnik – *Erigeron* L. – In: Tsvelev N. N. (ed.), *Flora Evropejskoj časti SSSR* 7: 196–203, Sankt-Peterburg.
- Utelli A.-B., Huber W. & Zopfi H.-J. (1995): Phenotypic plasticity in alpine *Erigeron* species (*Asteraceae*). – *Nord. J. Bot., Copenhagen*, 15: 483–492.
- Vierhapper F. (1906): Monographie der alpinen *Erigeron*-Arten Europas und Vorderasiens. – *Bchh. Bot. Centralbl., Leipzig*, 19: 385–560.

Received 20 March 1997

Accepted 20 April 1998