NOTES ON SECTIONAL DELIMITATIONS IN *ERIGERON* (ASTERACEAE: ASTEREAE)

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ABSTRACT

Erigeron sect. *Linearifolii* is narrowed to a monotypic taxon, comprising only *Erigeron hyssopifolius* of northern North America. *Erigeron* sect. *Pycnophyllum* is restricted to the 14 species of the *E. foliosus* group, which are primarily Californian in distribution. The Mexican species *E. exilis* is transferred from sect. *Cincinnactis* to sect. *Lamprocaules*. *Erigeron rhizomatus* (New Mexico) and *E. lepidopodus* (Chihuahua and Durango, Mexico) are consolidated as *Erigeron* sect. *Geronpternix* Nesom & Noyes, sect. nov. The two species are distinct from other erigerons in their scaled-leaved, rhizomiform caudex branches, large, solitary heads, and long, narrowly oblong cypselas. Sect. *Geronpternix* is the most primitive phylogenetic element of *Erigeron* and of subtribe Conyzinae.

RESUMEN

Erigeron sect. *Linearifolii* se reduce a un taxon monotípico, que comprende sólo *Erigeron hyssopifolius* del norte de Norte América. *Erigeron* sect. *Pycnophyllum* se restringe a las 14 especies del grupo *E. foliosus*, que primariamente tienen una distribución Californiana. La especie mexicana *E. exilis* se transfiere de la sect. *Cincinnactis* a la sect. *Lamprocaules*. *Erigeron rhizomatus* (Nuevo México) y *E. lepidopodus* (Chihuahua y Durango, México) se consolidan como *Erigeron* sect. *Geronpternix* Nesom & Noyes, sect. nov. Las dos especies se distinguen de otros erigeron por sus ramas rizomiformes con hojas escamosas, capítulos grandes solitarios y cipselas largas estrechamente oblongas. La Sect. *Geronpternix* es el elemento filogenético más primitivo de *Erigeron* y de la subtribu Conyzinae.

Upon consideration of the morphology and systematics of North American *Erigeron* species, we observe that modifications in sectional alignments should be made. Changes discussed here deal primarily with species regarded as "peripheral to sect. *Linearifolii*" in the treatment by Nesom (1992).

1. The placement of *Erigeron hyssopifolius*

Cronquist (1947) included *Erigeron hyssopifolius* Michx. within the *E. foliosus*

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group (sect. *Pycnophyllum* sensu stricto; sect. *Linearifolii* sensu lato, including *E. hyssopifolius*) but noted (p. 277) that "it certainly is not approached by anything else in the section." Nesom (1989) maintained *E. hyssopifolius* within the group (as sect. *Linearifolii*) but later (1992) viewed it as peripheral to species of that group. With additional perspective on the genus, the disparity between *E. hyssopifolius* and the *E. foliosus* group suggests that it is more realistic to recognize the former at sectional rank, coordinate with the species of the *E. foliosus* group in its strict sense.

Erigeron hyssopifolius differs from *E. foliosus* and related species in several features, including cauline leaves abruptly reduced in size below the peduncles, short, axillary, leafy shoots often produced, heads solitary on bracteate peduncles 5–10 cm above the level of the leaves, phyllaries 3-nerved and all nearly equal in length, and lamina of the ray corollas not coiling. Further, sect. *Pycnophyllum* sensu stricto is almost completely restricted to areas along the Pacific coast of the U.S.A. and Baja California, while *E. hyssopifolius* ranges across northern North America (mostly Canada) from Newfoundland, Nova Scotia, and various New England states to Yukon and Alberta.

The nomenclature for the two sections concerned is now as follows.

Erigeron L. sect. **Linearifolii** (G. Don) Nesom, Phytologia 67:79. 1989. *Aster* L. sect. *Linearifolii* G. Don in Loudon, Hort. Brit. 346. 1830. LECTOTYPE (Sundberg & Jones 1987): *Aster graminifolius* Pursh [= *Erigeron hyssopifolius* Michx.]

Species included: *Erigeron hyssopifolius* Michx.

Erigeron L. sect. **Pycnophyllum** Cronq., Brittonia 6:141. 1947. TYPE: *Erigeron foliosus* Nutt.

Species included: the 14 species of the *E. foliosus* group (sensu Nesom 1992).

2. The placement of *Erigeron exilis*

Erigeron exilis, a species of the Mexican states of Jalisco and Nayarit, was previously included within sect. *Cincinnactis* Nesom (Nesom 1989), but its greater similarity to the species of sect. *Lamprocaules* (Nesom 1994a) has been recognized in recent study and review of Mexican *Erigeron*. The other species of sect. *Lamprocaules* (discussed as possible relatives of sect. *Linearifolii* by Nesom 1992) also are restricted to Mexico but occur in the northeastern states of Coahuila, Nuevo Leon, and Tamaulipas, compared to the more southwestern distribution of *E. exilis*.

The section, as newly amended, is as follows.

Erigeron L. sect. **Lamprocaules** Nesom, Phytologia 76:99. 1994. TYPE: *Erigeron scoparioides* Nesom

Species included: *E. chiangii* Nesom, *E. exilis* Gray ex S. Wats., *E. pattersonii* Nesom, and *E. scoparioides* Nesom.

These plants are perennials with stems simple or few-branched, slender

to wiry, shiny-textured, leaves all cauline, shiny-textured, narrow, and relatively even-sized, buds erect, and heads relatively small. The scale-leaved rhizomes of *E. exilis* are similar to those of *E. chiangii* and *E. scoparioides*; the thick, woody, non-rhizomatous base of the gypsum endemic, *E. pattersonii*, probably is specialized within the section. The stipitate-glandular stems and involucre of *E. exilis* are similar to those of *E. chiangii*.

The ray flowers with coiling lamina of *Erigeron exilis* are unusual in sect. *Lamprocaules*, because the rays in other three species apparently do not coil. Still, the overall similarity among *E. exilis* and other species suggests that they are closely related. Non-coiling (and non-reflexing) rays are uncommon in *Erigeron* and may represent a shared specialized state in the northeastern species of this group.

3. The status of *E. rhizomatus* and *E. lepidopodus*

Erigeron rhizomatus and *E. lepidopodus* were placed by Nesom (1989) as members of the *E. foliosus* group (*Erigeron* sect. *Linearifolii* sensu lato), where their relationship as sister species was noted. *Erigeron lepidopodus* occurs from central Chihuahua to northern Durango, Mexico; *E. rhizomatus* is endemic to Catron and McKinley counties, New Mexico, where it is considered rare and endangered (U.S. Fish and Wildlife Service 1988; Sivinski and Lightfoot 1995). In a detailed treatment of the *E. foliosus* group (Nesom 1992, p. 205), under the heading "Species peripheral to sect. *Linearifolii*," it again was observed that these two species are closely similar in geographic range and morphology and almost certainly related as sister species. Plants of both produce stems from rhizomelike caudex branches, usually without clustered basal leaves (similar to plants of the *E. foliosus* group), and both species produce large, solitary heads erect in bud, long, non-coiling ray corollas, and long cypselas, unlike plants of the *E. foliosus* group. Cronquist (1947, p. 275) observed that "Although clearly belonging to the small section *Wyomingia*, [*E. rhizomatus*] does not seem closely related to any other known species. Its subglabrous leaves and involucres separate it from anything else in the section, and its peculiar habit is unique in the genus." Indeed, of the characters noted by Cronquist to link *E. rhizomatus* to sect. *Wyomingia* (i.e., imbricate involucral bracts, 4–14-nerved cypselas), the cypsela morphology apparently was emphasized; they have little else in common. *Erigeron rhizomatus* and *E. lepidopodus* warrant formal taxonomic recognition as a distinct and discrete group.

Erigeron L. sect. **Geronpternix** Nesom & Noyes, sect. nov. TYPE SPECIES: *Erigeron rhizomatus* Cronq.

Ramis caudicis longis squamifoliatis rhizomiformibus, capitulis grandibus solitariis in alabastro erectis, ligulis non circinnatis, et acheniis longis anguste oblongis distinctus.

Perennial herbs arising from thick, fibrous roots and long, slender, de-

cumbent, often buried, rhizomiform, scale-leaved caudex branches. Stems erect, 6–45 cm tall, simple or with 1-3 short branches on the upper half, stipitate-glandular at least on the peduncles, otherwise sparsely pubescent with appressed to spreading or deflexed hairs, bearing ascending, linear to narrowly oblong leaves. Heads large, 12–20 mm wide; ray flowers 14-45, the lamina 6-14 mm long, white or blue-tinged with an abaxial lilac midstripe, apparently neither coiling nor reflexing at maturity. Cypselas narrowly oblong, 3.5–4.5 mm long, slightly compressed radially and 2- or 4-nerved (*E. lepidopodus*) or subterete and 5–6-nerved (*E. rhizomatus*), densely strigose to sericeous; pappus a single series of 25–50 bristles of unequal length, with a few outer setae. Flowering vernal. Base chromosome number, x = 9. For *E. lepidopodus*: chromosome number, 2n = 18 (Ward & Spellenberg 1988); illustration (Nesom 1981). For *E. rhizomatus*: chromosome number, 2n = 18 (Ward & Spellenberg 1986); photographs of habit, heads, and habitat (New Mexico Native Plants Protection Advisory Committee 1984; Heil 1995). The name is from Greek, *geron* (old) and *pternix* (stem of a plant), alluding to the name *Erigeron*, to the peculiar stems, and to the phylogenetically basal position (lower or "old stem") of this group.

Species included: *E. lepidopodus* (B. Rob. & Fern.) Nesom and *E. rhizomatus* Cronq.

Recent studies by Noyes (1999) show that *E. rhizomatus* and *E. lepidopodus* together apparently form the most basal phyletic element within *Erigeron* as well as within the entire subtribe Conyzinae. All of the species at more basal levels of the subtribe are *Erigeron*, as are most of the terminal species. Interpolated at various points in the subtribal topology, however, are other generic-level taxa, including *Conyza*, which apparently is biphyletic, and a group of South American genera (*Leptostelma*, *Apopyros*, *Neja*, and *Hysterionica*) recently recognized by Nesom (1994b), as well as the long-accepted and morphologically divergent genus *Aphanostephus*. The taxonomic implications of the Noyes analysis are complex, but morphological differences among various phyletically divergent infrageneric groups of species traditionally identified as *Erigeron* are in most cases so subtle that attempts to recognize segregate genera would be virtually impossible in actual practice. The two species of sect. *Geronpternix* are relatively easily distinguished as a group, and they are justifiably recognized at sectional rank.

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