ERIGERON PEREGRINUS AND ERIGERON GLACIALIS
(ASTERACEAE: ASTEREEAE)

Guy L. Nesom
Botanical Research Institute of Texas
509 Pecan Street
Fort Worth, Texas 76102-4060, U.S.A.
gnesom@brit.org

ABSTRACT

Erigeron glacialis (Nutt.) A. Nels. (= E. callianthemus Greene) is recognized as a species separate from E. peregrinus (Banks ex Pursh) Greene. It has most recently been treated as E. peregrinus subsp. callianthemus. Intermediates between E. glacialis and E. peregrinus do occur but the two species are mostly distinct even where in close contact in Washington and British Columbia; intermediates are uncommon or absent as E. glacialis at the western edge of its range is contiguous or perhaps intermittently sympatric with E. peregrinus northward into Alaska. Erigeron glacialis var. hirsutus (Cronq.) Nesom, comb. nov., is proposed in order to complete the alternate taxonomy. If Cronquist's recognition of two subspecies within E. peregrinus is to be followed, the name E. peregrinus subsp. callianthemus (1943) is incorrect, the precedent for a name at that rank set by E. salsuginosus subsp. angustifolius (1906).

RESUMEN

Erigeron glacialis (Nutt.) A. Nels. (= E. callianthemus Greene) se reconoce como una especie diferente de E. peregrinus (Banks ex Pursh) Greene. Ha sido tratada recientemente como E. peregrinus subsp. callianthemus. Se encuentran intermedios entre E. glacialis y E. peregrinus pero las dos especies son muy distintas incluso cuando están en contacto en Washington y en Columbia Británica; los intermedios son raros o ausentes ya que E. glacialis en el límite Oeste de su área vive contiguo o quizás intermitentemente simpátrico con E. peregrinus hacia el Norte hasta Alaska. Se propone Erigeron glacialis var. hirsutus (Cronq.) Nesom, comb. nov., para completar la taxonomía alternativa. Si se sigue el reconocimiento de Cronquist de dos subspecies en E. peregrinus, el nombre E. peregrinus subsp. callianthemus (1943) es incorrecto, el precedente para un nombre en ese rango está establecido por E. salsuginosus subsp. angustifolius (1906).

A taxon previously known as Erigeron salsuginosus (Richards. ex R. Br.) A. Gray was united by Cronquist (1943) at subspecific rank with E. peregrinus (Banks ex Pursh) Greene. Cronquist observed that Erigeron (Aster) glacialis (Nutt.) A. Nels. is the oldest name at specific rank to replace the misapplied E. salsuginosus but that the type of E. callianthemus Greene is more representative of the taxon, thus he used the latter for the name at subspecific rank (see nomenclatural summary below). He later (1947) recognized several varieties within each subspecies.

Erigeron peregrinus subsp. callianthemus is widely distributed in the mountains of the western U.S.A. and southwestern Canada, while E. peregrinus subsp. peregrinus occurs in coastal and near coastal habitats from southern Alaska to the northwestern conterminous U.S.A. Their ranges are largely dis-
tinct (Fig. 1) but the occurrence of intermediates in Washington and British Columbia suggested to Cronquist (1947) that the two taxa were best treated within a single species, a taxonomic arrangement that has since been followed in accounts of North American *Erigeron*. Douglas et al. (1998, p. 252) also noted that the subspecies “intergrade” where ranges overlap. My observation, in contrast, is that intermediates do occur but that even where they overlap or are in close contact in Washington and British Columbia, populations of ‘good’ subsp. *peregrinus* (without signs of intermediacy) and ‘good’ subsp. *callianthemus* are more common.

The distribution of subsp. *peregrinus* runs from the Kamchatka area of the Russian Far East (Commander Islands: Botschantzev 1959; Czerepanov 1995) across the Aleutian Islands, southern-central Alaska, southwestern Yukon, and southward along the Alaskan-British Columbian archipelago into western Washington and northwest Oregon (Fig. 1; more detailed maps in Hultén 1950, 1968; Cody 2000). From the Yukon region, it trails southward in a relatively thin line along the Pacific; as noted by Douglas et al. (1998), it is “common in and west of the Coast-Cascade Mountains, rare east of the Coast-Cascade Mountains.” Calder and Taylor (1968, p. 533) observed that in the Queen Charlotte Islands “a few collections [of subsp. *peregrinus* sensu stricto] show a tendency towards ssp. *callianthemus* as the involucral bracts are not conspicuously vil-lous and tend to be slightly glandular.”

Subspecies *callianthemus* is widely distributed and relatively abundant in montane regions throughout the western U.S.A. as well as in southwestern Alberta and British Columbia. At the western edge of its range from British Columbia northward into Alaska, it is contiguous and perhaps intermittently sympatric with subsp. *peregrinus*. Subsp. *callianthemus* is absent from the Queen Charlotte Islands (Calder & Taylor 1968) and absent or rare in other insular portions of the Alaskan-British Columbian archipelago. It is rare in southwestern Yukon and southeastern Alaska, apparently growing within the range of subsp. *peregrinus*. Scoggan (1979) recorded subsp. *peregrinus* for Alberta, but this probably is based on plants such as *Breitung 16978* (BRIT) from Waterton Lakes National Park, which have phyllaries stipitate-glandular and also sparsely villosulous on the proximal half, “determined by A. Cronquist” as *E. peregrinus* subsp. *callianthemus* var. *scaposus*. Typical subsp. *callianthemus* is the common form in the same region.

Fig. 1. Summary distribution of *Erigeron peregrinus* and *E. glacialis*. The distribution of *E. peregrinus* continues westward along the Aleutian Islands and into the Kamchatka region.
In the view here, subsp. *peregrinus* and subsp. *callianthemus* are reasonably treated as separate species, *E. peregrinus* and *E. glacialis*, apparently occasionally hybridizing but not intergrading in a sense that would imply the existence of a zone of intermediacy reflecting continuous gene exchange. The two species can be identified by the following morphological contrasts.

Phyllaries eglandular or sparsely sessile-glandular at the apices, rarely sparsely glandular over the surface, sparsely to moderately villous-hirsute on surfaces, margins usually ciliate

Erigeron *peregrinus*

Phyllaries densely and evenly stipitate-glandular, without other hairs or rarely sparsely villous on surfaces and margins of outer phyllaries

Erigeron *glacialis*

Cronquist (1955) noted other distinctions of *E. peregrinus* (vs. *E. glacialis*): leaves often toothed (vs. usually entire), often soft-pubescent (vs. usually glabrous), peduncular hairs rather loose (vs. close), but these are less diagnostic.

Choice of specific over infraspecific rank in this case emphasizes three factors:

1. Reproductive isolation, although incomplete, apparently exists between *E. glacialis* and *E. peregrinus*, as noted above.

2. The distinction between *E. glacialis* and *E. peregrinus* is analogous to that between other closely related species of *Erigeron*, where relatively small but consistent and conspicuous differences in vestiture are significant (e.g., *E. compactus*—*E. consimilis*; *E. ursinus*—*E. gracilis*; *E. caespitosus*—*E. abajoensis*; *E. tracyi*—*E. colomexicanus*; *E. flagellaris*; *E. engelmannii*—*E. pumilus*; and *E. flettii*—*E. algidus*—*E. simplex/grandiflorus*).

3. *Erigeron glacialis* may be as closely related to *E. howellii* (A. Gray) A. Gray as to *E. peregrinus*. These three species form a morphological unit and apparently are more closely related among themselves than to any other species. *Erigeron howellii*, which is essentially endemic to an area along the Columbia River in Oregon and Washington, differs from *E. glacialis* in its distally strigillose but otherwise glabrous stems (vs. stems strigillose, more densely so distally), more consistently spatulate basal and lower cauline leaves (vs. leaves linear-oblanceolate to broadly lanceolate or spatulate), consistently white rays (vs. rays blue to rose-purple or pink, less commonly white to pale blue), and habitats mostly at lower elevation. *Erigeron howellii* and *E. glacialis* are nearly identical in involucral vestiture, and a reasonable hypothesis is that the narrow endemic and *E. glacialis* are sister species. This is not intended as a “cladistic argument” for recognition of *E. glacialis* at specific rank, and it is clear that *E. glacialis* is more strongly differentiated from *E. howellii* than from *E. peregrinus*, but it adds a line of evidence for consideration in this admittedly subjective decision concerning choice of rank.

Erigeron *peregrinus* (Banks ex Pursh) Greene, Pittonia 3:166. 1897. *Aster peregrinus*

Phyllaries moderately to densely hirsute to villous-hirsute on the surfaces, margins ciliate; ray corollas purplish to pink or white; upland habitats _________ Erigeron peregrinus var. peregrinus

Phyllaries very sparsely villous-hirsute to glabrous on the surfaces, margins ciliate; ray corollas white; sphagnum bogs ________________ Erigeron peregrinus var. thompsonii

Erigeron peregrinus (Banks ex Pursh) Greene var. peregrinus
   Erigeron unalaschensis Less., Linnaea 6:122. 1831.
   Erigeron peregrinus (Banks ex Pursh) Greene var. dawsonii Greene, Pittonia 3:166. 1897.

Erigeron peregrinus var. dawsonii was described from the Queen Charlotte Islands, where var. peregrinus is abundant. Calder and Taylor (1968) did not recognize var. dawsonii, noting that populational variants include plants of both varieties and numerous intermediates.

Cronquist (1955, p. 188) noted that “A phase of ssp. peregrinus, resembling var. peregrinus but perhaps properly to be segregated, occurs on Saddle Mt. in Clatsop Co., Oreg.” Chambers (pers. comm.) observes that these plants “combine the genetic traits of glacialis and peregrinus,” with villous hairs most abundant on the outer phyllaries, dense glandular indument on the inner phyllaries. They are perhaps “best interpreted as derived from a history of gene exchange between E. peregrinus and E. glacialis, along with segregation and recombination of the genes affecting the principal morphological differences in pubescence. ‘Good’ peregrinus has not yet been found in this part of the state, but ‘good’ glacialis is present nearby.”

Erigeron peregrinus (Banks ex Pursh) Greene var. thompsonii (Blake ex J.W. Thompson) Cronquist, Brittonia 6:144. 1947. Erigeron thompsonii Blake ex J.W. Thompson, Rhodora 34:238. 1932. TYPE: U.S.A. WASHINGTON. GRAYS HARBOR CO.: open bog near Lake Quinault, 10 Jul 1931, J.W. Thompson 7336 (HOLOTYPE: US!; ISOTYPES: GH!, K, MO!, UC). From details and wording of the protologue and description, it seems clear that Blake wrote both; he was not credited by Thompson, however, other than being cited as sole author of the name and the authorship must be attributed to Thompson as “ex” rather than “in.”

Cronquist (1947, p. 148) observed that var. thompsonii “is in a sense intermediate between [E. glacialis and E. peregrinus] and intergrades both ways.” The taxonomic status and evolutionary relationships of this taxon, which is endemic to a small area of the Olympic peninsula in western Washington, need to be investigated in more detail.

Erigeron glacialis (Nutt.) A. Nels., Bot. Gaz. 37:270. 1904. Aster glacialis Nutt., Trans. Amer. Philos. Soc. n. ser. 7:291. 1840. Erigeron salsuginosus (Richards. ex R. Br.) A. Gray var. glacialis (Nutt.) A. Gray, Synopt. Fl. N. Amer. 1, pt. 2:209. 1884. TYPE: U.S.A. Nuttall’s protologue observed that the habitat of A. glacialis was “with the preceding” species, Aster andinus Nutt. [=Symphyotrichum spathulatum (Lindl.) Nesom], which was noted to have been collected “on the highest summits of the Rocky Mountains, near the line of perpetual snow, in 42º. About ten thousand feet above the level of the sea. Near summit of Thornberg’s Ridge, where we made an ineffectual attempt to cross the Northern Andes, in August, still deeply buried in snow.” Gray saw the specimen—“Nutt.!” as indicated in Torrey and Gray (1841, p. 155) and later
As earlier observed (Nesom 1992, p. 190), within Erigeron peregrinus subsp. callianthemus, var. scaposus and var. angustifolius can be recognized apart from var. callianthemus “only as arbitrarily distinguished and intergrading populations.” Douglas et al. (1998) also noted that the varieties “often grow together and show a continuous variation.” Cronquist (1947, p.148) regarded var. scaposus as a “reduced alpine phase” with the dwarfing “probably genetically controlled,” but he observed that it “intergrades profusely with var. ecallianthemus ... and both are often present in the same collection.” Var. angustifolius, also, was seen by Cronquist to be strongly intergrading with other expressions of the species.

If Erigeron glacialis is maintained at infraspecific rank within E. peregrinus, the taxon E. peregrinus subsp. callianthemus (sensu Cronquist) includes all varietal taxa, but if the widespread entity identified by Cronquist as E. peregrinus var. callianthemus is interpreted to include either var. scaposus or var. angustifolius or both, it should be recognized that both latter names at varietal rank have precedence over var. callianthemus (var. scaposus the oldest). If any of these varieties are to be recognized within E. glacialis, the type of E. glacialis represents the alpine form treated as var. scaposus. In the taxonomic alternative proposed here, all three of these taxa are included within Erigeron glacialis var. glacialis.
Further complicating the nomenclature is the observation that the earliest name at subspecific rank in this whole complex is *Erigeron salsuginosus* subsp. *angustifolius* (A. Gray) Piper, from 1915, rendering Cronquist’s combination in 1943 based on *E. callianthemus* incorrect (superfluous, because it included the type of “subsp. *angustifolius*”). Thus, if one desires to follow Cronquist’s concept of recognizing two subspecies within *E. peregrinus*, the one he treated as “subsp. *callianthemus*” requires a new combination, based on Gray’s original *Aster salsuginosus* var. *angustifolius*.


Variety *hirsutus* is restricted to the seven southernmost counties in the range of the species in California (Fresno, Inyo, Madera, Mariposa, Mono, Tulare, and Tuolumne cos.) and in Mineral Co., Nevada. I also have seen plants of typical *E. glacialis* and intergrades toward var. *hirsutus* from Mono, Tulare, Fresno, and Inyo cos., but they apparently are less common than those identified as typical var. *hirsutus*.

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I thank Bob Kiger for pointing out that *Erigeron peregrinus* var. *callianthus* is not the correct name when it includes var. *scaposus* and var. *angustifolius* (as I have used it in the past). His comments precipitated the presentation of this taxonomic alternative, which I have anticipated for more than a decade. Ken Chambers further pointed out that the name *E. peregrinus* subsp. *callianthemus* is incorrect, as it was preceded at that rank by “subsp. *angustifolius*.” Ron Hartman gave advice on geography of the *E. glacialis* type collection, Kanchi Gandhi reviewed aspects of the nomenclature, James Macklin provided information on the type collection at PH, and Ken Chambers reviewed the whole manuscript and arranged a loan of pertinent specimens from OSU. Review comments by David Murray also were very helpful.

REFERENCES


