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TAXONOMIC SUMMARY OF *ERICAMERIA* (ASTERACEAE: ASTEREAE), WITH THE INCLUSION OF *HAPLOPAPPUS* SECTS. *MACRONEMA* AND *ASIRIS*

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ABSTRACT

Ericameria sensu stricto (12 species) is broadened to include the species of sect. *Stenotopsis* (1 species), sect. **Macronema** (Nutt.) Nesom (9 species) and sect. **Asiris** (H.M. Hall) Nesom (5 species). The nomenclature for the 27 species of *Ericameria* as so defined is summarized and criteria for the distinction of the sections are presented in a key. New specific combinations are proposed for **E. compacta, E. crispa, E. discoidea, E. gilmanii, E. greenei, E. obovata, E. ophitidis, E. suffruticosa, E. watsonii** and **E. zionis**. One new varietal combination is proposed, **Ericameria discoidea** var. **linearis**.

KEY WORDS: *Ericameria, Haplopappus*, Asteraceae, Astereae.

Ericameria has been understood to include a group of subshrubby species with narrow, entire, punctate-resinous leaves, small heads commonly in corymboid capitulescences and a base chromosome number of $x=9$. The genus has not been generally accepted by floristicians since Hall's treatment of it as *Haplopappus* sect. *Ericameria* (Hall 1928), although recent studies (primarily Johnston 1970 and Urbatsch, 1975; 1976; 1978; 1979) have recognized it as distinct.

Nesom, *et al.* (submitted) have sharpened the definition of *Ericameria* by removing from it as a separate genus, seven species (see Excluded Species, below) closely related to *Euthamia*, but distantly related to species traditionally recognized as *Haplopappus*. Plants of the new genus can be distinguished morphologically by characteristics of their involucral bracts, which have a white indurated, enervate basal portion and a glandular herbaceous patch on the upper portion, and their disc corollas, which are zygomorphic, the lobes strongly uneven in length. In contrast, plants of *Ericameria* have involucral bracts without an apical glandular patch, but with a clear midvein from base to tip and their disc corollas are regular with lobes of even length.

Although Hall (1928) segregated the species of *Haplopappus* sect. *Asiris* within his broad concept of *Haplopappus*, some were originally included in *Ericameria* by Nuttall, and some were again included in that genus by Urbatsch in his contribution to a checklist of North American plants (Kartesz & Kartesz 1980). One of the six species originally recognized by Hall in sect. *Asiris*, *H. purpusii*, is included in the new genus being described by Nesom, *et al.* (submitted). A connection between *Macronema* (*Haplopappus* sect. *Macronema*) and *Ericameria* has not been generally recognized, although Macbride (1918, see comments below) transferred *Haplopappus bloomeri* to *Ericameria*. A close similarity between sect. *Macronema* and sect. *Asiris*, however, has been acknowledged as they are treated together in keys (*e.g.*, Ferris 1960; Cronquist 1973). *Ericameria linearifolia*, one of the two species of *Stenotopsis* (*Haplopappus* sect. *Stenotopsis*), has been transferred to *Ericameria* by Urbatsch & Wussow (1979). The other species, *E. parrasana*, is part of the new genus.

An overview of the taxonomy of *Ericameria* has not been published since Hall's treatment of *Haplopappus*. In the course of studying the generic boundaries of *Ericameria* for a floristic treatment of the Mexican species as well as for the separation of a new genus, I have arrived at a broadened view of the former, which is presented below.

There are two primary areas of difficulty in formulating a clear definition of *Ericameria*, the first involving sect. *Stenotopsis*, the second involving sects. *Macronema* and *Asiris*.

Section *Stenotopsis*

The first problem involves the relationship of typical *Ericameria* with *E. linearifolia*, which was segregated as the genus *Stenotopsis* Rydb. and included as one of the two species of *Haplopappus* sect. *Stenotopsis* (Rydb.) H.M. Hall. Extensive and well documented natural hybridization (Urbatsch & Wussow 1979; Cody & Thompson 1986) exists between *E. linearifolia*, which has long, merely bracteate peduncles with large, solitary heads with long, prominent ray flowers and 3 veined, stipitate glandular phyllaries, and *E. cooperi*, which is morphologically more typical of *Ericameria*. These two species have similarly colored pappus bristles and similarly shaped style appendages, and because of this, they are considered by Urbatsch & Wussow to be closely related and both placed in *Ericameria* sect. *Stenotopsis*. Considering the large differences between these two species, however, the small morphological similarities used by these workers to unite them are likely to be fortuitous. If the main criterion for associating the two species is ease of hybridization, attempts of artificial crosses between *E. linearifolia* and other species of *Ericameria* should be considered in the formulation of more meaningful hypotheses of close relationship. This is particularly true in view of the natural hybrids known between *Haplopappus macronema* and *Chrysothamnus nauseosus* (Anderson & Reveal 1966), which also are extremely divergent in morphology.

Although *Ericameria linearifolia* falls outside the boundaries of typical *Ericameria* in some features, it produces somewhat flattened, 6-8 nerved achenes and punctate leaves, which are characteristic of the genus. Its large, solitary heads and long ray flowers are more similar to those of species of sect. *Macronema*. *Ericameria cooperi* is much more similar to typical *Ericameria* in its small, discoid, apically clustered heads, but its turbinate-subcylindric achenes with 10-12 thin nerves are atypical.

Sections *Macronema* and *Asiris*

The second problem in defining *Ericameria* involves its distinction from *Haplopappus* sects. *Macronema* and *Asiris*. The following key provides contrasts that, with the caveats discussed below, separate these groups from *Ericameria* and *Stenotopsis*.

1. Leaves flat and obovate to terete and linear, sometimes in axillary fascicles, usually resinous from punctate glands; involucral bracts with a thick to thin, prominent, orange resinous midvein often expanded at the very apex, the bract apices rounded to acute but apiculate or appendaged in 2 species; collecting appendages of the disc style branches most narrowly triangular and equal or shorter in length than the stigmatic portions, rarely linear and longer; achenes narrowly oblong, most commonly compressed or flattened, with (4-)6-8(-12) nerves, sometimes subterete 2

    2. Heads mostly in panicles or corymboid capitulescences, solitary in one species; phyllaries 1 nerved, papillate glandular in one species but not stipitate glandular; ray flowers absent or with short, inconspicuous ligules ..... sect. *Ericameria*

    2' Heads solitary; phyllaries 3 nerved, stipitate glandular; ray flowers with long, prominent ligules ..... sect. *Stenotopsis*

1' Leaves narrow and mostly flat, not in axillary fascicles, resinous but apparently eglandular or with stipitate glands; midvein of the involucral bracts orange resinous to greenish yellow, the bract apices rounded to acute, with a pronounced, herbaceous apiculum or appendage; collecting appendages of the disc style branches linear to linear lanceolate, longer than the stigmatic portions; achenes narrowly cylindric to flattened, 3-5 nerved 3

    3. Heads relatively large, solitary to clustered, immediately subtended by leaf like bracts; involucral bracts apically apiculate to appendaged, with a definite, orange resinous midvein, not keeled; achenes cylindric to slightly compressed, 5 nerved ..... sect. *Macronema*

3' Heads relatively small, clustered, without definite leaf like bracts; involucral bracts apically apiculate, with a thin, greenish yellow midvein, often slightly keeled; achenes distinctly flattened, 3-4 nerved ..... sect. *Asiris*

Ericameria, Macronema and *Asiris* each comprise species with variably shaped leaves and solitary to clustered heads variable in size. The heads in both may be eradiate or radiate with ray corollas variable in size. The distinction between them appears to lie in the nature of the leaf glandularity, the shape and nervation of the achenes and the shape of the style branch collecting appendages and their length relative to the stigmatic portion. The species of sect. *Asiris* and those of sect. *Macronema* are more closely similar between themselves, as evidenced by their apiculate involucral bracts, long linear style appendages and few nerved achenes. The species of sect. *Asiris* are divergent from the species of *Macronema* in their narrower heads with more thinly herbaceous involucral bracts and their peduncles that are not so strongly leafy.

The definition, however, between *Ericameria* and *Macronema* loses significant clarity because of overlapping variation in both groups. This is particularly true in *Ericameria*, where *E. pinifolia* is strongly similar to *Macronema* in its apiculate to appendaged involucral bracts, linear style branches longer than the stigmatic portions and narrowly cylindrical achenes. Further, the leaves of some plants of this species are not at all punctate. The generic affinity of *E. pinifolia* has never been questioned and it belongs firmly in *Ericameria*, where it is closely related to the type species of the genus, *E. ericoides*, which also shows some of the same *Macronema* like features. The differences between the groups in achene shape and nervation are not constant, because *E. palmeri* has achenes typical of *Macronema*, terete with (4-)5(-7) nerves. The achenes of *E. cooperi* are terete to slightly compressed, and along with those of several other species, *E. parishii* and *E. pinifolia*, may produce up to 12 nerves.

Finally, some plants of *Haplopappus* (sect. *Macronema*) *bloomeri* produce leaves that clearly are punctate resinous. Macbride's (1918) transferral of this species to *Ericameria* was made without specific comment, but perhaps reflected his reliance upon this criterion to distinguish *Ericameria*. *Haplopappus bloomeri* is highly variable in a number of other characteristics, as evidenced by the number of infraspecific taxa that have been named within it (see Hall 1928). *Ericameria pinifolia* is equally as variable, and because the variability in each species includes forms that are morphologically "shifted" toward the other, an investigation of these species for the possibility of hybridization should be interesting.

Parallel variation in *Chrysothamnus*

Chrysothamnus appears to be very closely related to *Ericameria* and *Macronema*, particularly the latter (Anderson 1970), but it is generally accepted as a

distinct genus (Hall & Clements 1923; Blake 1926; Anderson 1984). It is more homogenous than either *Ericameria* or *Macronema* in its densely arranged, narrow, strictly eradiate heads and its involucral bracts in vertical files. Substantial variation occurs within *Chrysothamnus*, however, in the same characters that separate *Ericameria* from *Macronema* (Anderson 1970). The leaves of most species are resinous but non punctate, yet they are punctate in others. The achenes are variable in shape (terete to flattened) and in number of nerves, and the style branch collecting appendages vary from shorter to longer than the stigmatic portions. The species have been arranged into sections by Anderson (1984) to account for aspects of this variability.

Other $x=9$ groups of *Haplopappus: Hesperodoria, Petradoria, Stenotus, Tonestus* and *Oreochrysum*

Hesperodoria E. Greene (*Haplopappus* sect. *Hesperodoria* [E. Greene] H.M. Hall), with slightly resinous punctate leaves, may be related to the group of genera around *Ericameria*, but its scabrous margined leaves and strongly turbinate heads are unlike any species there. In its general habit, it is more like *Petradoria*, whose composition and systematic position has been somewhat ambiguous, although it appears to be closely related to *Chrysothamnus* (Anderson 1963; 1983; 1984).

Stenotus Nutt. (*Haplopappus* sect. *Stenotus* [Nutt.] A. Gray) appears to be situated outside of the closely related elements of the *Ericameria* group, contrary to an earlier hypothesis (Nesom 1989). In contrast to *Ericameria* and *Macronema*, as well as *Chrysothamnus* (excluding *Petradoria*), plants of *Stenotus* are uniformly low, caespitose and monocephalous herbs. They are perennials, but on the basis of morphology, *Stenotus* clearly does not belong in the *Ericameria-Asiris-Macronema* lineage as a "woody shrub" as indicated by Clark, *et al.* (1980), although it is similar in flavonoids to those taxa.

Plants of *Tonestus* A. Nels. (*Haplopappus* sect. *Tonestus* [A. Nels.] H.M. Hall) are also herbaceous and they are further characterized by thick caudex branches or rhizomes, plants mostly single stemmed from the base, leaves with a strong tendency to produce spinulose toothed margins and thin herbaceous bracts that nearly enclose the heads. Some of the species of *Stenotus* have been confused with *Tonestus* but the latter is clearly not a member of the *Ericameria-Macronema* alliance (Nesom & Morgan, submitted). Plants of the monotypic *Oreochrysum* Rydb. (*Haplopappus* sect. *Oreochrysum* [Rydb.] H.M. Hall) are rhizomatous, non resinous herbs with broad, relatively thin, clasping leaves and herbaceous, reflexing involucral bracts and could only be distantly related to *Ericameria*. Anderson & Creech (1975) included it within *Solidago*. Apart from *Ericameria* and its close relatives as recognized in the present paper, and from *Hesperodoria* and *Petradoria*, the species of *Stenotus, Tonestus* and *Oreochrysum* are the others of *Haplopappus* (sensu Hall 1928) with a base chromosome number of $x=9$.

In summary, the species of *Ericameria* (12), *Stenotopsis* (1), *Macronema* (9) and sect. *Asiris* (5) constitute four apparently closely related lineages that are overlapping in morphology. Natural hybridization occurs between *Ericameria* and *Stenotopsis*. On morphological grounds, *Chrysothamnus* is also closely related to these groups and natural hybrids are known between *Macronema* and *Chrysothamnus*, but *Chrysothamnus* is generally accepted as a distinct genus. To provide a taxonomic framework for these four sections of *Haplopappus* sensu Hall that are closely related to *Chrysothamnus*, there are several options. First, *Ericameria, Stenotopsis, Macronema* and *Asiris* might each be recognized as a separate genus, or *Ericameria* (with *Stenotopsis*) and *Macronema* (with *Asiris*) could be recognized, but in either case, there would be no morphological features to consistently separate the generic units. Alternatively, *Ericameria* could be expanded to bring the species of all four sections into a single taxon of coordinate rank with *Chrysothamnus*, resulting in the recognition of two closely related genera with similar patterns of variation among their respective species.

If, as hypothesized by Clark, *et al.* (1980) on the basis of flavonoid profiles, *Ericameria* proves to be closest to the ancestral form in this group, with *Macronema* and perhaps *Asiris* as derivatives, and if the closest relative of *Macronema* proves to be *Chrysothamnus*, strict adherence to principles of cladistic classification would necessitate the merger of *Chrysothamnus* with all the rest. This would be extremely difficult to justify on a pragmatic basis, however, in view of the careful and detailed morphological and anatomical investigations of *Chrysothamnus* by Loran Anderson, which have not suggested that it is congeneric with *Macronema*.

In order to clarify the boundaries of *Ericameria*, seven species have been removed as a separate, distantly related genus (Nesom, *et al.* submitted). In a correlated step, I propose to enlarge *Ericameria*, recognizing it as closely related to *Chrysothamnus*, and leaving as *Haplopappus* and its close relatives a group of species of South America (and North America if *Hazardia* is included) with the base chromosome number of $x=5$ (Brown & Clark 1982).

Taxonomic Summary of *Ericameria*

Ericameria Nutt., Trans. Amer. Philos. Soc., ser. 2 7:318. 1841. TYPE SPECIES: *Ericameria microphylla* Nutt., *nom. nov. illeg.* (= *E. ericoides*).

As pointed out by Hall (1928), Nuttall arbitrarily adopted a new epithet ("*microphylla*") when he transferred the type species to the new genus *Ericameria*. He cited "*Haplopappus ericoides* (Less.) DC." as the name his new one would replace, but that combination was first made by Hooker & Arnott.

The following species are included, with partial synonymy.

A. *Ericameria* sect. *Ericameria*

1. *Ericameria arborescens* (A. Gray) E. Greene, *Man. Bot. S.F. Bay Reg.* 175. 1894. *Bigelovia arborescens* A. Gray, Proc. Amer. Acad. Arts 8:640. 1873. *Haplopappus arborescens* (A. Gray) H.M. Hall, Univ. California Publ. Bot. 7:273. 1919.

2. *Ericameria brachylepis* (A. Gray) H.M. Hall, Univ. California Publ. Bot. 3:56. 1907. *Bigelovia brachylepis* A. Gray, *Bot. California* 1:614. 1876. *Haplopappus brachylepis* (A. Gray) H.M. Hall, Univ. California Publ. Bot. 7:273. 1919; *non* Phil. *Haplopappus propinquus* S.F. Blake, *nom. nov.*, Contr. U.S. Natl. Herb. 23:1490. 1926.

3a. *Ericameria cooperi* (A. Gray) H.M. Hall, Univ. California Publ. Bot. 3:56. 1907. *Bigelovia cooperi* A. Gray, Proc. Amer. Acad. Arts 8:640. 1873. *Haplopappus cooperi* (A. Gray) H.M. Hall, Carnegie Inst. Washington, Publ. 389:275. 1928.

Ericameria monactis (A. Gray) McClatchie, Erythea 2:124. 1894. *Haplopappus monactis* A. Gray, Proc. Amer. Acad. Arts 19:1. 1883.

3b. *Ericameria cooperi* var. *bajacalifornica* (Urbatsch & Wussow) Urbatsch, Phytologia 67:109. 1989. *Ericameria cooperi* subsp. *bajacalifornica* Urbatsch & Wussow, Brittonia 31:274. 1979.

4a. *Ericameria cuneata* (A. Gray) McClatchie, Erythea 2:124. 1894. *Haplopappus cuneatus* A. Gray, Proc. Amer. Acad. Arts 8:635. 1873.

4b. *Ericameria cuneata* var. *macrocephala* Urbatsch, Madroño 23:344. 1976.

4c. *Ericameria cuneata* car. *spathulata* (A. Gray) H.M. Hall, Univ. California Publ. Bot. 3:52. 1907. *Bigelovia spathulata* A. Gray, Proc. Amer. Acad. Arts 11:74. 1876. *Haplopappus cuneatus* var. *spathulatus* (A. Gray) S.F. Blake, Contr. U.S. Natl. Herb. 23:1849. 1926.

5. *Ericameria ericoides* (Less.) Jepson, *Fl. W. Mid. Calif.* 559. 1901. *Diplopappus ericoides* Less., Linnaea 6:117. 1831. *Haplopappus ericoides* (Less.) Hook. & Arn., *Bot. Beechey Voy.* 146. 1833; *non* DC., *Prodr.* 5:346. 1836. *Ericameria microphylla* Nutt., *nom. illeg.*, Trans. Amer. Philos. Soc., ser. 2 7:319. 1841.

6. *Ericameria fasciculata* (Eastw.) Macbr., Contr. Gray Herb. 56:36. 1918. *Chrysoma fasciculata* Eastw., Bull. Torrey Bot. Club 32:215. 1905. *Haplopappus eastwoodae* H.M. Hall, *nom. nov.*, Carnegie Inst. Washington, Publ. 389:258. 1928.

7. *Ericameria juarezensis* (R. Moran) Urbatsch, Phytologia 67:109. 1989. *Haplopappus juarezensis* R. Moran, Trans. San Diego Soc. Nat. Hist. 15:154-155. 1969.

8. *Ericameria laricifolia* (A. Gray) Shinners, Field & Lab. 18:27. 1950. *Haplopappus laricifolius* A. Gray, *Pl. Wright.* 2:80. 1853.

Ericameria nelsonii (Fernald) S.F. Blake, Contr. Gray Herb. 52:26. 1917. *Bigelovia nelsonii* Fernald, Proc. Amer. Acad. Arts 36:505. 1901.

9. *Ericameria martirensis* Wiggins, Contr. Dudley Herb. 1:177. 1933. *Aplopappus martirensis* (Wiggins) S.F. Blake, Proc. Biol. Soc. Washington 48:173. 1935.

10a. *Ericameria palmeri* (A. Gray) H.M. Hall, Univ. California Publ. Bot. 3:53. 1907. *Haplopappus palmeri* A. Gray, Proc. Amer. Acad. Arts 11:74. 1876.

10b. *Ericameria palmeri* var. *pachylepis* (H.M. Hall) Nesom, Phytologia 67:104. 1989. *Haplopappus palmeri* subsp. *pachylepis* H.M. Hall, Carnegie Inst. Washington, Publ. 389:267. 1928.

11a. *Ericameria parishii* (E. Greene) H.M. Hall, Univ. California Publ. Bot. 3:55. 1907. *Bigelovia parishii* E. Greene, Bull. Torrey Bot. Club 9:62. 1882. *Haplopappus parishii* (E. Greene) S.F. Blake, Contr. U.S. Natl. Herb. 23:1491. 1926.

11b. *Ericameria parishii* var. *peninsularis* (R. Moran) Nesom, Phytologia 67:104. 1989. *Haplopappus arborescens* subsp. *peninsularis* R. Moran, Trans. San Diego Soc. Nat. Hist. 15:152. 1969.

12. *Ericameria pinifolia* (A. Gray) H.M. Hall, Univ. California Publ. Bot. 3:54. 1907. *Haplopappus pinifolius* A. Gray, Proc. Amer. Acad. Arts 8:636. 1873.

B. *Ericameria* sect. *Stenotopsis* (Rydb.) Urbatsch & Wussow, Brittonia 31:273. 1979. *Stenotopsis* Rydb., Bull. Torrey Bot. Club 23:617. 1900. TYPE SPECIES: *Haplopappus linearifolius* DC. (= *Ericameria linearifolia* [DC.] Urbatsch & Wussow). *Haplopappus* sect. *Stenotopsis* (Rydb.) H.M. Hall, Carnegie Inst. Washington, Publ. 389:156. 1928, in part.

1. *Ericameria linearifolia* (DC.) Urbatsch & Wussow, Brittonia 31:273. 1979. *Haplopappus linearifolius* DC., *Prodr.* 5:347. 1836. *Stenotus linearifolius* (DC.) Torrey & A. Gray, *Fl. N. Amer.* 2:238. 1842. *Stenotopsis linearifolius* (DC.) Rydb., Bull. Torrey Bot. Club 27:617. 1900.

Haplopappus interior Coville, Proc. Biol. Soc. Washington 7:65. 1892. *Haplopappus linearifolius* var. *interior* (Coville) Jones, Proc. California Acad., ser. 2 5:697. 1895.

C. **Ericameria** sect. **Asiris** (H.M. Hall) Nesom, *comb. nov.* BASIONYM: *Haplopappus* sect. *Asiris* H.M. Hall, Carnegie Inst. Washington, Yearb. 25:342. 1926. TYPE SPECIES: *Ericameria nana* Nutt.

1. *Ericameria cervina* (S. Wats.) Rydb., *Fl. Rocky Mts.* 853. 1917. *Haplopappus cervinus* S. Wats., Amer. Naturalist 7:301. 1873.

2. *Ericameria nana* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:319. 1841. *Haplopappus nanus* (Nutt.) D.C. Eaton, *Bot. King's Expl.* 159. 1871. *Chrysothamnus nanus* (Nutt.) J.T. Howell, *Fl. N.W. Amer.* 302. 1900.

3. **Ericameria obovata** (Rydb.) Nesom, *comb. nov.* BASIONYM: *Macronema obovatum* Rydb., Bull. Torrey Bot. Club 27:618. 1900. *Haplopappus rydbergii* S.F. Blake, *nom. nov.*, Contr. U.S. Natl. Herb. 25:545. 1925; not *Haplopappus obovatus* Phil. *Haplopappus watsonii* var. *rydbergii* (S.F. Blake) S.L. Welsh, Great Basin Nat. 43:295. 1983. I have not been able to evaluate Welsh's taxonomic judgment.

4. *Ericameria resinosa* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:319. 1841. *Haplopappus resinosus* (Nutt.) A. Gray, *Bot. Calif.* 1:313. 1876. *Chrysothamnus resinosus* (Nutt.) J.T. Howell, *Fl. N.W. Amer.* 303. 1900.

5. **Ericameria watsonii** (A. Gray) Nesom, *comb. nov.* BASIONYM: *Haplopappus watsonii* A. Gray, Proc. Amer. Acad. Arts 16:79. 1881. *Macronema watsonii* (A. Gray) E. Greene, Erythea 2:74. 1894.

D. **Ericameria** sect. **Macronema** (Nutt.) Nesom, *comb. nov.* BASIONYM: *Macronema* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:322. 1841. *Haplopappus* sect. *Macronema* (Nutt.) A. Gray, Proc. Amer. Acad. Arts 6:542. 1865. TYPE SPECIES: *Ericameria suffruticosa* (Nutt.) Nesom.

1. *Ericameria bloomeri* (A. Gray) Macbr., Contr. Gray Herb. 56:36. 1918. *Haplopappus bloomeri* A. Gray, Proc. Amer. Acad. Arts 6:541. 1865. *Chrysothamnus bloomeri* (A. Gray) E. Greene, Erythea 3:115. 1895.

2. **Ericameria compacta** (H.M. Hall) Nesom, *comb. nov.* BASIONYM: *Haplopappus bloomeri* A. Gray subsp. *compactus* H.M. Hall, Carnegie Inst. Washington, Publ. 389:199. 1928. *Haplopappus compactus* (H.M. Hall) L.C. Anderson, Great Basin Nat. 43:358. 1983.

3. **Ericameria crispa** (L.C. Anderson) Nesom, *comb. nov.* BASIONYM: *Haplopappus crispus* L.C. Anderson, Great Basin Nat. 43:359. 1983.

4a. **Ericameria discoidea** (Nutt.) Nesom, *comb. nov.* BASIONYM: *Macronema discoidea* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:322. 1841. *Haplopappus macronema* (Nutt.) A. Gray, *nom. nov.*, Proc. Amer. Acad. Arts 6:542. 1865.

4b. **Ericameria discoidea** var. **linearis** (Rydb.) Nesom *comb. nov.* BASIONYM: *Macronema linearis* Rydb., Mem. New York Bot. Gard. 1:384. 1900. *Haplopappus macronema* (Nutt.) A. Gray var. *linearis* (Rydb.) Dorn, *Vascular Plants of Wyoming* 295. 1988.

5. **Ericameria gilmanii** (S.F. Blake) Nesom, *comb. nov.* BASIONYM: *Haplopappus gilmanii* S.F. Blake, Proc. Biol. Soc. Washington 52:97. 1939.

6. **Ericameria greenei** (A. Gray) Nesom, *comb. nov.* BASIONYM: *Haplopappus greenei* A. Gray, Proc. Amer. Acad. Arts 16:80. 1880. *Macronema greenei* (A. Gray) E. Greene, Erythea 2:73. 1894.

7. **Ericameria ophitidis** (J.T. Howell) Nesom, *comb. nov.* BASIONYM: *Haplopappus bloomeri* var. *ophitidis* J.T. Howell, Leaflets West. Bot. 6:85. 1950. *Haplopappus ophitidis* (J.T. Howell) Keck, Aliso 4:103. 1958.

8. **Ericameria suffruticosa** (Nutt.) Nesom, *comb. nov.* BASIONYM: *Macronema suffruticosa* Nutt., Trans. Amer. Philos. Soc., ser. 2 7:322. 1841. *Haplopappus suffruticosus* (Nutt.) A. Gray, Proc. Amer. Acad. Arts 6:542. 1865.

9. **Ericameria zionis** (L.C. Anderson) Nesom, *comb. nov.* BASIONYM: *Haplopappus zionis* L.C. Anderson, Great Basin Nat. 43:360. 1983.

Species Excluded

The following species will be treated as a separate genus (Nesom, *et al.* submitted).

Ericameria austrotexana M.C. Johnston

Ericameria diffusa Benth.

Ericameria parrasana S.F. Blake

Ericameria pseudobaccharis (S.F. Blake) Urbatsch

Ericameria purpusii Brandegee

Ericameria riskindii Turner & Langford

Ericameria triantha (S.F. Blake) Shinners

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