NEW COMBINATIONS IN *PSEUDOGNAPHALIUM* (GNAPHALIEAE-ASTERACEAE) OF MEXICO

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Abstract: In a broad sense, *Gnaphalium* L. is a heterogeneous and polyphyletic genus. *Pseudognaphalium* Kirp. is one of the many segregated genera from *Gnaphalium* which have been proposed to obtain subgroups that are better defined and presumably monophyletic. Although most Mexican species of *Gnaphalium* s.l. have been transferred to *Pseudognaphalium*, the combinations so far proposed do not include a few Mexican taxa that truly belong in *Pseudognaphalium*. In this paper, the differences between *Gnaphalium* s.s. and *Pseudognaphalium* are briefly addressed, and the transfer of two Mexican species and three varieties from *Gnaphalium* to *Pseudognaphalium* are presented.

Key Words: generic segregate, *Gnaphalium*, Mexican composites, taxonomy.

Resumen: En sentido amplio, *Gnaphalium* L. es un género heterogéneo y polifilético. *Pseudognaphalium* Kirp. es uno de varios géneros segregados, a partir de *Gnaphalium*, que se han propuesto para obtener subgrupos mejor definidos y presumiblemente monofiléticos. La mayoría de las especies mexicanas de *Gnaphalium* s.l. han sido transferidas al género *Pseudognaphalium*; sin embargo, las combinaciones propuestas hasta el momento no cubren algunos taxones mexicanos que pertenecen a *Pseudognaphalium*. En este trabajo se explican brevemente las diferencias entre *Gnaphalium* s.s. y *Pseudognaphalium*, y se presentan las transferencias de dos especies y tres variedades mexicanas de *Gnaphalium* a *Pseudognaphalium*.

Palabras clave: compuestas mexicanas, *Gnaphalium*, segregados genéricos, taxonomía.

The tribe Gnaphalieae is one of the most diverse groups within the Asteraceae, comprising 180 genera and 2,000 species (Anderberg, 1994). Although Gnaphalieae are cosmopolitans, they are especially rich in South America, South Africa, and Australia (Anderberg, 1994; Ward *et al.*, 2009). Traditionally, the members of the Gnaphalieae were included in the tribe Inuleae, until it was shown that the latter tribe was not monophyletic (Anderberg, 1989). Therefore, in place of a single tribe that was recognized in the past, Anderberg (1989) proposed to recognize three tribes, Inuleae, Gnaphalieae, and Plucheeae. However, at present only the tribes Inuleae and Gnaphalieae are recognized, whereas the Plucheeae is included in the Inuleae again (Funk *et al.*, 2009).

The taxonomy of the tribe Gnaphalieae has been problematic (Anderberg, 1991). Among the major issues are: the definition and delimitation of diverse and heterogeneous genera, such as *Helichrysum* Mill. and *Gnaphalium* L. Anderberg (1991) concluded, based on a cladistic analysis, that both genera if they are considered in a broad sense, are

polyphyletic. Nevertheless, in many contributions to the Mexican flora (*e.g.* McVaugh, 1984; Espinosa, 2001), *Gnaphalium* has been considered in a broad sense (*Helichrysum* is not present in Mexico).

Pseudognaphalium Kirp. is a generic segregate from *Gnaphalium*. At first, *Pseudognaphalium* was proposed as a monotypic genus based on the Mexican species *G. oxyphyllum* DC. (Kirpicznikov and Kuprijanova, 1950). Afterwards, Hilliard and Burt (1981) transferred ten species from *Gnaphalium* to *Pseudognaphalium* (none of them was a Mexican species, although *P. luteoalbum* (L.) Hilliard & Burt. occurs in Mexico as an introduced species). In a systematic study of the tribe Gnaphalieae, Anderberg (1991) asserted that *Pseudognaphalium* is more closely related to *Achyrocline* DC. and *Helichrysum* than to *Gnaphalium* s.s. Consequently Anderberg (1991) transferred about 70 species more from *Gnaphalium* to *Pseudognaphalium*, including the majority of the Mexican species of *Gnaphalium* s.l. It is worth noting that the segregation of *Pseudognaphalium* from *Gnaphalium* (and other genera, *e.g.* *Gamochaeta*

ta Wedd.) has also been supported by recent phylogenetic analysis with molecular data (Ward *et al.*, 2009; Schilling and Floden, 2012).

In North America, the members of *Gnaphalium* s.s. are annual prostrate herbs, 3–30 cm high, woolly, with heads arranged in glomeruliform or spiciform clusters, and a pappus dimorphic (the bristles of the female florets have acute apical cells and the bristles of the hermaphroditic florets have clavate apical cells) of distinct and easily deciduous bristles (Nesom, 2006). On the other hand, *Pseudognaphalium* are annuals to perennials, ascending to commonly erect, herbs or subshrubs, 15–220 cm high, woolly to glandular-hirsute, with heads arranged in corymbiform clusters and a pappus monomorphic (the apical cells from the bristles of the two types of florets are all subclavate) also of distinct, (mostly) easily deciduous bristles. Furthermore, the stereome (the basal cartilaginous portion of the involucre bracts) is divided in *Gnaphalium*, whereas in *Pseudognaphalium* and related genera (i.e. *Achyrocline*, *Helichrysum*), the stereome is divided or fenestrated (Anderberg, 1991; Pruski, 2012). To observe the kind of stereome, it is often necessary to place the involucre bracts in some medium which makes the tissue transparent (Anderberg, 1991). This procedure is out of the scope of this work; however, the two types of stereomes are illustrated in Hilliard and Burt (1981). Otherwise, it has also been mentioned that *Gnaphalium* has the tip of the corolla purplish, whereas in *Pseudognaphalium* the tip of the corolla is yellowish. This is true in the majority of the cases; however, some taxa present in Mexico are an exception. For example, *G. polycephalum* Michx., a Mexican species retained in *Gnaphalium* s.s., has corollas with yellowish tips and *P. luteoalbum* has corollas with purplish tips. In addition, this character is difficult to observe in herbarium sheets, especially in old specimens.

Some Mexican species and varieties of *Gnaphalium* s.l., that have the characteristics of *Pseudognaphalium* mentioned above, were not examined by Anderberg (1991) and for this reason, the proper nomenclatural combinations were not carried out. Following the classification proposed by Anderberg (1991), we herewith transfer two species and three varieties of Mexican *Gnaphalium* s.l. to *Pseudognaphalium*.

***Pseudognaphalium attenuatum* (DC.) Anderb. var. *sylvicola* (McVaugh) Hinojosa & Villaseñor, comb. nov.** Basionym: *Gnaphalium attenuatum* DC. var. *sylvicola* McVaugh, Contr. Univ. Michigan Herb. 9: 465. 1972. TYPE: Mexico. Jalisco: Sierra de Cuale, SW of Talpa de Allende, altitude 1,800–2,250 m, 19–21 Nov 1952, *McVaugh 14283* (holotype: MICH digital image!, isotypes: BM digital image!, MEXU!, NY digital image!).

Distribution. Variety known from Guatemala and Mexico (Chis., D.F., Dgo., Gro., Jal., Mex., Mich., Mor., Nay., Oax., and Sin.).

Vegetation. In humid mountain forest, pine forest, pine-fir

forest, pine-oak forest, and at the transition between tropical deciduous forest and oak forest.

Altitude. 1,200–3,050 m.

Flowering. October–March.

***Pseudognaphalium ehrenbergianum* (Sch. Bip. ex Klatt) Hinojosa & Villaseñor, comb. nov.** Basionym: *Gnaphalium ehrenbergianum* Sch. Bip. ex Klatt, Linnaea 42: 127. 1878. TYPE: Mexico. Hidalgo. *Ehrenberg 24* (P fragment, digital image!).

Distribution. Species endemic to Mexico (Hgo., Pue., and Ver.).

Vegetation. In humid mountain forest, oak forest, pine forest, and pine-fir forest.

Altitude. 1,300–2,200 m.

Flowering. October–January.

***Pseudognaphalium hintoniorum* (G.L.Nesom) Hinojosa & Villaseñor, comb. nov.** Basionym: *Gnaphalium hintoniorum* G.L.Nesom, Phytologia. 68: 414. 1990. TYPE: Mexico. Nuevo Leon: Municipio Galeana, Cerro Potosi, pine forest, altitude 3,350 m, 15 Oct 1969, *Hinton 17263* (holotype: TEX digital image!, isotypes: HINTON digital image!, MICH digital image!).

= *Gnaphalium flavocephalum* G.L. Nesom, Phytologia 68: 413. 1990.

Distribution. Species endemic of Mexico (Coah., N.L., and Tams.).

Vegetation. Oak forest, pine forest, subalpine grassland, and matorral.

Altitude. 2,400–3,680 m.

Flowering. September–July.

Nesom (1990) published *Gnaphalium hintoniorum* and *G. flavocephalum* G.L. Nesom as different species, even though there are morphological and ecogeographical equivalences between the two entities. However, the holotype of *G. flavocephalum* (*Hinton 18902* TEX digital image!) was re-identified by Nesom, in 1999, as *G. hintoniorum* (as can be testified by the correction label of the author on the specimen). Therefore, *G. flavocephalum* is considered as synonym of *Pseudognaphalium hintoniorum*.

***Pseudognaphalium liebmannii* (Sch. Bip. ex Klatt) Anderb. var. *monticola* (McVaugh) Hinojosa & Villaseñor, comb. nov.** Basionym: *Gnaphalium vulcanicum* I.M. Johnston. var. *monticola* McVaugh, Contr. Univ. Michigan Herb. 9: 466. 1972. TYPE: Mexico. Jalisco: 25–30 km SE of Autlán, between El Chante and Cuizalapa, pine forest, altitude 2,750 m, 20–21 March 1965, *McVaugh 23126* (holotype: MICH digital image!, isotypes: CAS digital image!, ENCB!, NY digital image!).

= *Gnaphalium liebmannii* (Sch. Bip. ex Klatt) var. *monticola* (McVaugh) D.L. Nash, Fieldiana Bot. 36: 74. 1974.

Distribution. Variety known from Costa Rica, Guatemala

and Mexico (Chis., D.F., Dgo., Gro., Hgo., Mex., Mich., Mor., Oax., Pue., Tlax., and Ver.).

Vegetation. Fir forest, humid pine forest, pine forest, and pine-oak forest.

Altitude. 2,500-3,500 m.

Flowering. October-April.

***Pseudognaphalium oxyphyllum* (DC.) Kirp. var. *nataliae* (F.J.Espinosa) Hinojosa & Villaseñor, comb. nov.** Basionym: *Gnaphalium oxyphyllum* DC. var. *nataliae* F.J. Espinosa, Bol. Soc. Bot. México 45: 17. 1983. TYPE: México. Estado de México: Alrededores de San Pedro Nexcapa, Amecameca, bosque de *Pinus* y *Abies*, terreno perturbado, altitud 3,000 m, 21 de septiembre de 1979, *Espinosa* 766 (holotipo: MEXU!, isotipo: ENCB!).

Distribution: Variety endemic of Mexico (D.F., Hgo., Mex., Mor., Pue., and Ver.).

Vegetation: Fir-forest, oak forest, and pine forest.

Altitude: 2,500-3,900 m.

Flowering: October-April.

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