

NEW COMBINATIONS IN *XANTHISMA* (ASTERACEAE: ASTEREAE)

Guy L. Nesom

Botanical Research Institute of Texas
509 Pecan Street
Fort Worth, TX 76102-4060, U.S.A.

ABSTRACT

Xanthisma incisifolium (I.M. Johnston) Nesom, comb. nov. (*Machaeranthera pinnatifida* var. *incisifolia* = *Machaeranthera incisifolia*), and ***Xanthisma glaberrimum*** (Rydb.) Nesom & O'Kennon, comb. nov. (*Machaeranthera pinnatifida* var. *glaberrima*), are transferred at specific rank to the genus *Xanthisma*, newly expanded by Morgan and Hartman to include species segregated from *Machaeranthera* sensu stricto.

RESUMEN

Xanthisma incisifolium (I.M. Johnston) Nesom, comb. nov. (*Machaeranthera pinnatifida* var. *incisifolia* = *Machaeranthera incisifolia*), y ***Xanthisma glaberrimum*** (Rydb.) Nesom & O'Kennon, comb. nov. (*Machaeranthera pinnatifida* var. *glaberrima*), se transfieren con rango específico al género *Xanthisma*, ampliado de nuevo por Morgan y Hartman para incluir especies segregadas de *Machaeranthera* sensu stricto.

Molecular evidence (Morgan 2003) indicates *Machaeranthera* Nutt. sensu lato (Hartman 1990) is not monophyletic if the genera *Oonopsis* Nutt., *Pyrrocoma* Hook., and *Xanthisma* DC. (sensu Semple 1974) are excluded from it. In consequence, Morgan and Hartman (2003) have restricted *Machaeranthera* to two species and assigned the remaining species to three other genera, including *Xanthisma*. The latter is enlarged by Morgan and Hartman from a monospecific taxon to one including 17 species, and two additional taxa at specific rank are formally recognized here. Each of those added here is a member of the *Xanthisma spinulosum* (Pursh) Morgan & Hartman complex (= *Machaeranthera pinnatifida* sensu lato) and has been treated at varietal rank by Turner and Hartman (1976), Hartman (1990), and Morgan and Hartman (2003).

Xanthisma incisifolium (I.M. Johnston) Nesom, comb. nov. BASIONYM: *Haplopappus arenarius* Bentham var. *incisifolius* I.M. Johnston, Proc. Calif. Acad. Sci., ser. 4, 12:1190. 1924. *Machaeranthera pinnatifida* (Hook. f.) Shinnars var. *incisifolia* (I.M. Johnston) Turner & Hartman, Wrightia 5:315. 1976. *Machaeranthera incisifolia* (I.M. Johnston) Nesom, Phytologia 69:112. 1990. *Xanthisma spinulosum* (Pursh) Morgan & Hartman var. *incisifolium* (I.M. Johnston) Morgan & Hartman, Sida 20:1409. 2003.

This Mexican taxon was earlier treated at specific rank (Nesom 1990), where it was noted that it is morphologically non-intergrading with other ‘phases’ of the *Machaeranthera pinnatifida* complex. It is restricted to San Lorenzo Island of Baja California Norte and the islands of San Esteban and Tiburón of Sonora.

Xanthisma glaberrimum (Rydb.) Nesom & O’Kennon, comb. nov. BASIONYM: *Sideranthus glaberrimus* Rydb., Bull. Torrey Bot. Club 27:621. 1900. *Machaeranthera pinnatifida* (Hook. f.) Shinnery var. *glaberrima* (Rydb.) Turner & Hartman, Wrightia 5:311. 1976. *Xanthisma spinulosum* (Pursh) Morgan & Hartman var. *glaberrimum* (Rydb.) Morgan & Hartman, Sida 20:1408. 2003.

Xanthisma glaberrimum is an entity of the Great Plains, occurring from the Texas panhandle region northward into southeastern South Dakota and extreme west-central Minnesota. *Xanthisma spinulosum* (var. *spinulosum*) borders the distribution of *X. glaberrimum* on the south, west, and north. Turner and Hartman (1976, p. 311) observed that “Populations of [*X. glaberrimum*] seem fairly well-marked throughout most of Kansas and Nebraska and southern South Dakota, but to the western periphery of these regions they intergrade over a broad area into [*X. spinulosum*], especially in Oklahoma and the panhandle region of Texas.” The somewhat contrasting observation is made here that reproductive isolation in this area of sympatry is at least as significant as intergradation, and in view of its morphological distinction and apparent isolation, a balance of evidence indicates that recognition at specific rank is appropriate for *Xanthisma glaberrimum*.

In recent floristic studies centered in Hutchinson, Moore, and Potter counties of the Texas panhandle (Nesom and O’Kennon in prep.), we have observed many sites where populations of *Xanthisma glaberrimum* and *X. spinulosum* grow in close proximity without intermediacy. A large array of herbarium collections also indicates that two morphological ‘nodes’ exist in this region (see contrasts in key below) and confirms the field experience. Evidence of introgression is seen, but even in such instances, *X. spinulosum* that shows characteristics of *X. glaberrimum* remains distinct from the latter at a population level, indicating the existence of reproductive isolation. For example, from Hutchinson County, Nesom & O’Kennon 164 and 165 (BRIT) represent populations of *X. glaberrimum* (in typical form) and *X. spinulosum* (with strict, few-branched stems, similar to *X. glaberrimum* in habit but glandular and densely tomentose) that were growing at the same site—the two entities were distinct, with no intermediates observed in the field. Without the apparent introgression, the distinction is even more obvious. The direction of introgression appears to be primarily toward *X. spinulosum*—this species shows greater inter-population variability, especially when it occurs in close proximity to *X. glaberrimum*, while the latter maintains a more stable morphology. In our field work, we have referred to these as the “gray thang” (= *X. spinulosum*) and “green thang” (= *X.*

glaberrimum) and rarely find it necessary to get closer than 5 meters to make an identification.

Collections at BRIT indicate that both taxa coexist in at least 10 of the 20 counties in the upper Texas panhandle region—this is considerably more of a mix than shown by the map in Turner et al. (2003). Herbarium material at BRIT indicates that a broad area of sympatry also occurs in adjacent Oklahoma. The area of sympatry was not indicated by the map in Turner & Hartman (1976, Fig. 42), and the Atlas of the Flora of the Great Plains (Great Plains Flora Association 1976) made no distinction between *Machaeranthera pinnatifida* var. *pinnatifida* and var. *glaberrima*.

Turner and Hartman (1976, p. 311) noted that “In eastern Wyoming, eastern Colorado, eastern New Mexico and the panhandle of Texas, the more typical, mostly pubescent, populations [of *Machaeranthera pinnatifida* var. *pinnatifida*] pass into the var. *glaberrima*, the two varieties often occurring near one another, but it is believed that this has resulted primarily from migration along road shoulders in relatively recent time, of var. *pinnatifida* into the regions of var. *glaberrima*, and perhaps vice versa.” In contrast, however, Nesom and O’Kennon observe that the two taxa grow both with and without the other at many sites that appear to be relatively undisturbed and that are relatively distant from highway sides. The kind of morphological intergradation seemingly implied by the phrase “pass into” would be the impression from study of herbarium collections and reflect the recognition of gene flow (as also postulated above). Only the repeated field experience led us to interpret this intergradation with further perspective, and it is significant that Turner and Hartman’s observation that the two occur “near one another” agrees with our own.

1. Stems usually unbranched until the upper third, the heads usually distinctly clustered; leaves strictly ascending, narrowly oblong in outline, 1-pinnatifid, midportion 1–2(–2.5) mm wide, lobes oblong-lanceolate to lanceolate or triangular, sometimes shallowly toothed, glabrous or less commonly lightly tomentose, eglandular or less commonly glandular; involucre cupulate. _____ **Xanthisma glaberrimum**
1. Stems branched from midstem or below to the upper third, the heads diffusely arranged; leaves loosely ascending to spreading, oblong to obovate in outline, especially the basal and lower cauline, 1–2-pinnatifid, midportion 0.5–1(–1.5) mm wide, lobes linear to lanceolate, usually shallowly toothed, usually glandular to varying degrees, slightly to densely tomentose, rarely without eglandular hairs; involucre shallowly hemispheric. _____ **Xanthisma spinulosum** var. **spinulosum**

Plants of *Xanthisma glaberrimum* with light tomentum were annotated in 1971 by R.C. Jackson as “var. *glaberrima* > subsp. *wootonii* (Greene) Jackson” (the combination by Jackson never published), but the type of *Eriocarpum wootonii* Greene was collected in the White Mountains of Lincoln Co., New Mexico, and is part of *X. spinulosum*. Its similarity in vestiture to some plants of *X. glaberrimum* is interpreted here as parallel. It seems likely that relatively un-

common plants of *X. glaberrimum* showing glandularity reflect gene flow from *X. spinulosum*, although their close relationship also suggests that parallelism is a possibility. Differences in pappus morphology noted by Turner and Hartman (1976) between *X. glaberrimum* and *X. spinulosum* have not been confirmed in the present study.

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