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ASTER INTRICATUS (ASTERACEAE: ASTEREAE) TRANSFERRED TO *MACHAERANTHERA*

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ABSTRACT

Aster intricatus (*Leucosyris carnosa*) is transferred to *Machaeranthera* as **M. carnosa** (A. Gray) Nesom. On chromosomal and morphological grounds it is most closely related to *M. riparia* and another anomalous species, *Aster blepharophyllus* (in a separate paper, also being transferred to *Machaeranthera*).

KEY WORDS: *Machaeranthera, Aster, Leucosyris*, Asteraceae, Astereae.

The taxonomic position of *Linosyris carnosa* A. Gray (=*Leucosyris carnosa* =*Aster intricatus*) has perplexed students of the Astereae since the species was first recognized. Gray first included it in Cassini's genus *Linosyris*, which is typified by the Old World species *Aster linosyris* (L.) Bernh. (=*Linosyris vulgaris* DC.). He later renamed (heterotypically) the same species as *Bigelovia* before realizing that the two taxa were conspecific. Greene erected the monotypic *Leucosyris* to comprise the single species *Leucosyris carnosa.* He later included *Aster spinosus* Benth. in *Leucosyris*, but the latter species is now known to be most closely related to *Erigeron oxyphyllus* E. Greene (Nesom 1989).

Sundberg (1988) has studied *Aster intricatus* in relation to the group of species traditionally considered as *Aster* subgenus *Oxytripolium.* He concluded that the species does not belong in the genus *Aster*, and although he considered the possibility of relationships with *Machaeranthera* and *Hazardia*, he maintained it as the monotypic *Leucosyris.* After finishing his dissertation, however, Sundberg decided that it belonged with *Hazardia* and distributed specimens annotated as *H. carnosa* (A. Gray) ined. A more complete taxonomic study of this species, including details of typification and infraspecific variation, is forthcoming (Sundberg, in prep.).

Jones (1980) maintained *Aster intricatus* in *Aster*, most closely related to *A. spinosus*, although she later speculated (Jones & Young 1983) that *A. intricatus* might have been derived by hybridization between species of *Aster*

and *Machaeranthera* and omitted it from the cladistic analysis of *Aster*. In 1982, on annotations of specimens of the peculiar *A. blepharophyllus* A. Gray, Jones also observed and noted a similarity between it and *A. intricatus*. Ron Hartman (personal comm.) also has commented that the resemblance between those two species is suggestive of a close phyletic relationship.

Nesom, Vorobik & Hartman (in press) have transferred *A. blepharophyllus* to *Machaeranthera*, and molecular studies by David Morgan (in prep.) at the University of Texas support this placement. *Aster blepharophyllus* appears to be morphologically most similar to *M. riparia* (Kunth) A.G. Jones of the *Arida* group (*sensu* Hartman 1976). Including *A. intricatus*, these three species form a subgroup of essentially glabrous plants with mostly entire and succulent leaves among the other species of the *Arida* group, which are highly stipitate glandular with thinner, strongly toothed to pinnatifid leaves. A chromosome number of $n=5$ pairs is characteristic of all species of the *Arida* group, including *M. riparia* and the two "asters" under discussion (Hartman 1976; Sundberg 1986; Nesom, *et al.* in press) and is not found elsewhere in the genus. Achenes, such as those of *A. intricatus* and *A. blepharophyllus*, with numerous, thin, superficial nerves are also characteristic of the *Arida* group. *Aster intricatus* and *A. blepharophyllus* further resemble each other in their stiffly ascending stems, turbinate to narrowly campanulate heads, and particularly in their rhizomatous habit. Rhizomes apparently have been developed independently in two other species of *Machaeranthera*, one of the *Sideranthus* group (*sensu* Hartman, 1976), and one of sect. *Psilactes*. Finally, the hypothesis of relationship between *Aster intricatus* and the *Arida* group is reinforced by the geographic distribution of the former, which lies within that of the *Arida* group, all species of which are restricted to the southwestern United States and northwestern México.

Aster intricatus differs prominently from *A. blepharophyllus* in its much taller stems, lack of basal rosettes, lack of foliar marginal cilia, and rayless heads. The lack of ray flowers, however, is not unusual in *Machaeranthera*, because three other species (all of the *Blepharodon* group, see Hartman 1976) also are rayless.

Although the DNA of *Aster intricatus* has not yet been studied, molecular data perhaps will provide more precise hypotheses regarding the phyletic relationships of this species. Nevertheless, its similarity to *Machaeranthera* (through *A. blepharophyllus* and *M. riparia*) is clear, and in order to use the name in the forthcoming "Compositae of México" (Turner & Nesom in prep.), I propose the following combination.

Machaeranthera carnosa (A. Gray) Nesom, *comb. nov.* BASIONYM: *Linosyris carnosa* A. Gray, Pl. Wright. 2:80. 1853. *Leucosyris carnosa* (A. Gray) E. Greene, Fl. Francisc. 384. 1897. *Aster carnosus* (A. Gray) A. Gray *ex* Hemsl., Biol. Centr.-Amer. Bot. 2:120. 1881; non *Aster*

carnosus Gilib., 1781.

Bigelovia intricata A. Gray, Proc. Amer. Acad. Arts 17:208. 1882. *Aster intricatus* (A. Gray) S.F. Blake, J. Washington Acad. Sci. 27:378. 1937.

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