

STEPHANOMERIA MALHEURENSIS (COMPOSITAE),  
A NEW SPECIES FROM OREGON

L. D. GOTTLIEB

Department of Genetics, University of California, Davis 95616

Evidence has been amassed that supports the hypothesis that the diploid annual plant informally referred to as "Malheurensis" in a series of publications (Gottlieb, 1973, 1974, 1977, 1978) has evolved from the population of *Stephanomeria exigua* ssp. *coronaria* (Greene) Gottlieb with which it is still biotically sympatric. The two taxa are morphologically extremely similar; however, they can be reliably distinguished by differences in achene length and weight. Reproductive isolation between them in nature appears complete and is maintained by three factors: (1) pollen movement is restricted by differences in breeding system; (2) there is a crossability factor(s) that reduces seed set from interspecific cross-pollinations compared to conspecific ones by about 50%; and (3) several differences in chromosomal structural arrangement exist, including a reciprocal translocation, which reduce fertility of  $F_1$  hybrids to 25% (Gottlieb, 1973). Consequently, it is appropriate to validate the new taxon as a species. It appears to be one of the very few examples of the recent natural origin of a diploid plant species.

*Stephanomeria malheurensis* Gottlieb, sp. nov. Differt a *S. exigua* ssp. *coronaria* acheniis longioribus (plerumque 3.3–3.8 mm longis) et gravioribus (medie  $87.3 \pm 0.44$  mg per 100 achenia) pappi setis longioribus (plerumque 5–6 mm longis) et numerosioribus (9–12 vel –15).

TYPE: Oregon, Harney County, 27 mi S of Burns, between Mile Posts 25 and 26 on Highway 205, in parts of sections 11 and 12, T 27 S, R 30 E, Willamette Meridian, elevation 1524 m, 2 Jul 1975, Gottlieb 750, (Holotype, OSC; isotype, NY).

Distribution: Known only from the type locality, the top of a broad hill with soil derived from volcanic tuff in an area surrounded by basaltic soils. The locality has been designated a Scientific Study Site by the Bureau of Land Management, which has jurisdiction over the land, in order to preserve the species and to permit additional scientific research on it. The site, including approximately 160 acres, has been enclosed within a barbed-wire fence.

Plants annual; taproot with lateral branches often  $> 30$  cm long; the basal leaf rosette generally  $< 15$  cm in diameter at bolting; herbage glabrous; rosette leaves generally entire to pinnatifid, oblanceolate to spatulate; stem single, generally  $< 60$  cm long; branches averaging 23 in number; length of branch between adjacent heads averaging 1.9 cm; heads on short peduncles 5–15 mm long, often having shorter secondary peduncles also bearing heads; involucre cylindrical or oblong with a

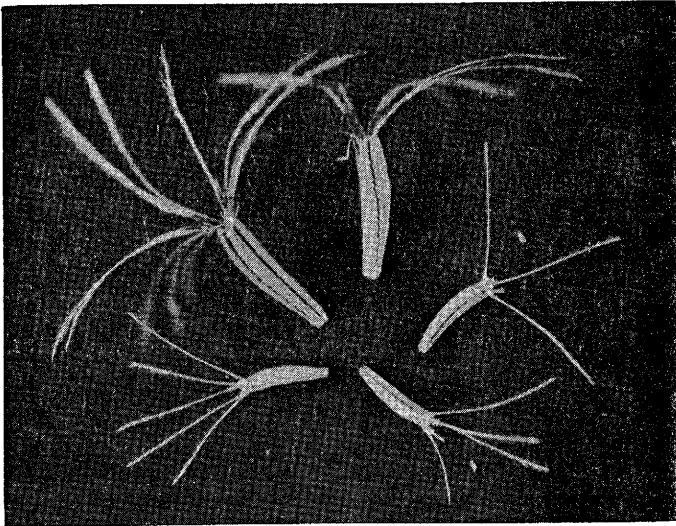


FIG. 1. Representative achenes of *Stephanomeria malheurensis* (large achenes) and *S. exigua* ssp. *coronaria* (small achenes).

series of equal-sized phyllaries averaging 8.0–9.5 mm long, equivalent in number to the number of florets, subtended by fewer appressed calyculate bractlets; florets 5–6 per head; ligules averaging 8.2–9.4 mm long and 3.2–3.6 mm wide, dark pink, pink, very light pink, white, or rarely orange-yellow; styles white or pink; anther apex most often dark pink, occasionally white; achenes tan or light brown, averaging 3.3–3.8 mm long, five-sided with a narrow longitudinal groove on each side, the surface generally rugose-tuberculate; pappus bristles generally 9–12(–15) in number, thickened and often connate in groups of 2–4 at their bases, averaging 5–6 mm long, plumose on their distal 50–60%. Chromosome number,  $n = 8$ .

In addition to the differences in their achene sizes, *S. malheurensis* can be distinguished from *S. exigua* ssp. *coronaria* in the uniform garden in a number of quantitative characters including cotyledon length, number of branches per stem, length of internodes along the branches between adjacent heads, number of florets per head, and ligule length/width ratio (Gottlieb, 1973, 1977). They also differ in breeding system: *S. exigua* ssp. *coronaria* has a sporophytic self-incompatibility system that prevents self-pollen from germinating on stigmas of the same plant, making it an obligate outcrosser. *Stephanomeria malheurensis* is predominantly self-pollinating. Comparative information regarding variation in the electrophoretic mobilities of a sample of their enzymes, cytogenetic behavior

and fertility of interspecific hybrids, growth rates under different experimental conditions, phenotypic variability, phenotypic plasticity, and requirements for seed germination have been described in the previously cited publications.

#### ACKNOWLEDGMENTS

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### TAXONOMY OF AXINIPHYLLUM (ASTERACEAE-HELIANTHEAE)

B. L. TURNER

The University of Texas, Austin 78712

*Axiniphyllum* is a small herbaceous genus of four poorly known species of south-central Mexico (states of Guerrero and Oaxaca). It was erected by Bentham in 1872 to accommodate two rayless species, *A. corymbosum* and *A. tomentosum*, the former serving as the type for the genus. The latter species, however, had been described earlier under the name *Polymnia scabrum*; hence *Axiniphyllum scabrum* is the correct binomial for this taxon, as noted by Blake (1930).

I became interested in the genus through my efforts to position what appeared to be an unidentified *Rumfordia*. While it seemed close to *Axiniphyllum*, it possessed well-developed rays. *Rumfordia*, with well-defined ray florets, appeared more remote, except for the relatively recently proposed *R. pinnatisecta* (Wilson, 1958). The latter, however, seemed exceptional in *Rumfordia*, and careful comparisons of the 10 or more species of the latter genus and the two original species proposed by Bentham for *Axiniphyllum* have convinced me that Wilson erred in placing *R. pinnatisecta* in *Rumfordia*. *Rumfordia pinnatisecta* is much closer to *Axiniphyllum* and I have therefore transferred it to what I believe is its correct phyletic position, alongside the newly proposed *A. sagittalobum*.