

depends on a more thorough knowledge of *M. foliosa* and related species which inhabit the islands off the coast of California and Baja California, and which may have participated in the allopolyploid origin of the populations we have named *M. similis*. Measurements of the pollen of different collections of the *M. foliosa* complex suggest that it contains both diploids and tetraploids.

**Malacothrix sonorae** sp. nov. (fig. 1, 2d). Herba annua; foliis ad radices lanceolatis vel oblanceolatis, inaequaliter pinnatifidis; capitulis campanulatis, 6–9 mm. longis, 4–6.6 mm. latis, floribus 30–61; corollis flavis; achaeniis columnaris 1.7–2.00 mm. longis ad basim attenuatis, subflexuosis, praesertim fuscis nunc stramineis, subtiliter aequaliterque 15-costatis, in sectione transversa rotundis, parte superiore dilata, achaenii parte superiore ad 0.2–0.3 mm. nullomodo costata, ab annula setarum 16–18 scabrosarum circumdata; setis perstatis 2, per occasionem 1, raro 3 vel 4.

Annual herb 10–35 cm. tall, usually unbranched at the base but occasionally with up to 9 stems; basal leaves lanceolate to oblanceolate, irregularly and doubly dentate, the rachis broadest near the apex, narrowed below; heads campanulate, 5–109 (median, 10), 6–9 mm. high, 4–6.6 mm. broad, 30–61-flowered; ligules yellow; pollen grains 20–29  $\mu$  in diameter (mean=25  $\mu$ ); achenes cylindrical (1.6–) 1.7–2.0 mm. long, attenuate toward the base, slightly curved, grey-brown to straw-colored, finely 15-ribbed, all the ribs equal, the achene round in transverse section, the apex slightly expanded, the upper 0.2–0.3 mm. of the achene not ribbed, bordered by a ring of 16–18 white-scarious teeth, of which the basal portions do not extend above the achene lip, the teeth pectinate, straight, acicular, the persistent setae 2, occasionally 1, rarely 3 or 4.

Type. Tucson Mountains, altitude 2600 feet, Pima County, Arizona, 24 April 1903, *Thornber 362* (ARIZ 59,491; istotypes, DS, POM, UC).

Specimens examined. ARIZONA. Pima County: north base of Silver Bell Mountains, *Benson 10716*; Rosemont, *Thornber* in 1907; Sabino Canyon, Santa Catalina Mountains, *Thornber* in 1903; Tucson Mountains, *Thornber 428*, in 1903. Pinal County: between Oracle and Mammoth, *Gentry 6081*. SONORA, MEXICO. Distrito de Altar: Passo San Emeterio, *Keck 4135A*; 4 miles west of Caborca, *Keck 4040*.

The size and number of apertures of its pollen suggest that this distinctive and rather local species may be diploid ( $n=7$ ), but we have not yet been able to obtain living material from which to make chromosome counts. In achene shape (fig. 1d, a, f) it is intermediate between *M. clevelandii* and *M. fendleri* A. Gray (fig. 2), the latter a diploid<sup>3</sup> species with long-exserted ligules that occurs east of the range of the *Malacothrix clevelandii* complex. The range of *M. sonorae* likewise lies between that of the other two diploids.

<sup>3</sup> We have made two new gametic chromosome counts of *M. fendleri*,  $n=7$ , from the following collections: 1.9 miles north of Chambers, Apache County, Arizona, *Raven 13026*; 5 miles northeast of Bates Well, Pima County, Arizona, *Raven 11699*. Stebbins *et al.* (*op. cit.*) reported the same number for a collection from New Mexico.

We have derived the specific epithet, "sonorae," from the Sonoran Desert in which the range of this taxon lies.

**Malacothrix stebbinsii** sp. nov. (fig. 1, 2e). Herba annua; foliis ad radices lanceolatis vel oblanceolatis, dentatis, raro pinnatifidis; capitulis campanulatis, 7–10 mm. longis, 3.5–8 mm. latis, floribus 19–70; corollis flavis, raro albis; achaeniis fusiformo-columnaris, 1.7–2.3 mm. longis, ad basim subattenuatis, raro flexuosis, nunc cinereo-fuscis nunc stramineis, subtiliter aequaliterque 15-costatis, in sectione transversa rotundis, parte superiore subdilata, achaenii parte superiore ad 0.14–0.20 mm. non costata, ab annulo setarum 14–17 scabriusarum circumdata; setis perstatis 1, per occasionem 2.

Annual herb 6–60 cm. tall, usually unbranched at the base but occasionally with up to 9 stems; basal leaves lanceolate to oblanceolate, dentate, more rarely pinnatifid, the rachis often narrowed near the base; heads campanulate, 5–66 (median, 20), 7–10 mm. high, 3.5–8 mm. broad, 19–70-flowered; ligules yellow, rarely white; pollen grains 24–36  $\mu$  in diameter (mean=30  $\mu$ ); achenes narrowly fusiform-columnar, tapering slightly to the base, 1.7–2.3 mm. long, 0.3–0.45 mm. wide, rarely curved, grey-brown to straw-colored, finely 15-ribbed, all the ribs equal, the achene round in transverse section, the apex slightly flared, the upper 0.14–0.20 mm. of the achene not ribbed, bordered by a ring of 14–17 white-scarious teeth, of which the basal portions rarely extend above the achene lip, the teeth rarely and irregularly cleft, straight, lance-linear; the persistent setae 1, rarely 2.

Type. Abundant in shade of a large rock, moist soil, Mendoza Canyon, Coyote Mountains, Pima County, Arizona, altitude 3,800 feet, 22 April 1945, *K. F. Parker 5815* (ARIZ 32,709; isotype, UC).

Representative specimens. NEVADA. Washoe County: hills west of Reno, *Hillman* in 1893. Clark County: Nelson, *Jones* in 1907. CALIFORNIA. Inyo County: Titus Canyon, *Eastwood & Howell 7786*; 4 miles east of Aberdeen, *Kerr 630*; 2 miles east of Bradbury Wells, *Howell* in 1928; Slate Range, *Alexander & Kellogg 1135*. San Bernardino County: Turtle Mountains, *Munz & Harwood 3505*; Quail Springs, Little San Bernardino Mountains, *Munz & Johnson 5227*; south base of Old Dad-Granite Mountain Range, *Wolf 10092*; Kingston Mountains, *Wolf 10456*. Riverside County: Murray Canyon, *Peirson 2715*; 12 miles southwest of Twentynine Palms, *Alexander & Kellogg 2129*. San Diego County, Palm Canyon, Borrego Valley, *Wolf 8451*; San Felipe Hill, *Jones* in 1906. ARIZONA. Mohave County: Yucca, *Jones* in 1884; Chemehuevis, *Jones* in 1903; Diamond Creek Canyon, *Wilson* in 1893. Yavapai County: Burro Creek, *Crooks & Darrow* in 1938; Skull Valley, *Jones* in 1903. Gila County: Pine Creek, near Roosevelt, *Peebles et al. 5227*; Mazatzal Mountains, *Eastwood* in 1929, *17163*. Pinal County: near Oracle, *Peebles 6844*; between Superior and Miami, *A. & R. A. Nelson 1900*; Galuro Mountains, 12 miles above Mammoth, *Gentry 6051*. Pima County: Baboquivari Peak, *Goodding 4649*; Florita Canyon, *Knipe* in 1938; Oracle Camp, Santa Catalina Mountains, *Simon 224*; Sabino Canyon, Santa Catalina Mountains, *Thornber* in 1905, in 1913. Santa Cruz County: Stone Cabin Canyon, Santa Rita Mountains, *Thornber 5543*. SONORA, MEXICO. 4 miles south of Imuris, *Abrams 13202*.

Pollen of this species is consistently larger than in *M. clevelandii* and *M. sonorae*, both of which are diploids, and, like that of the tetraploid

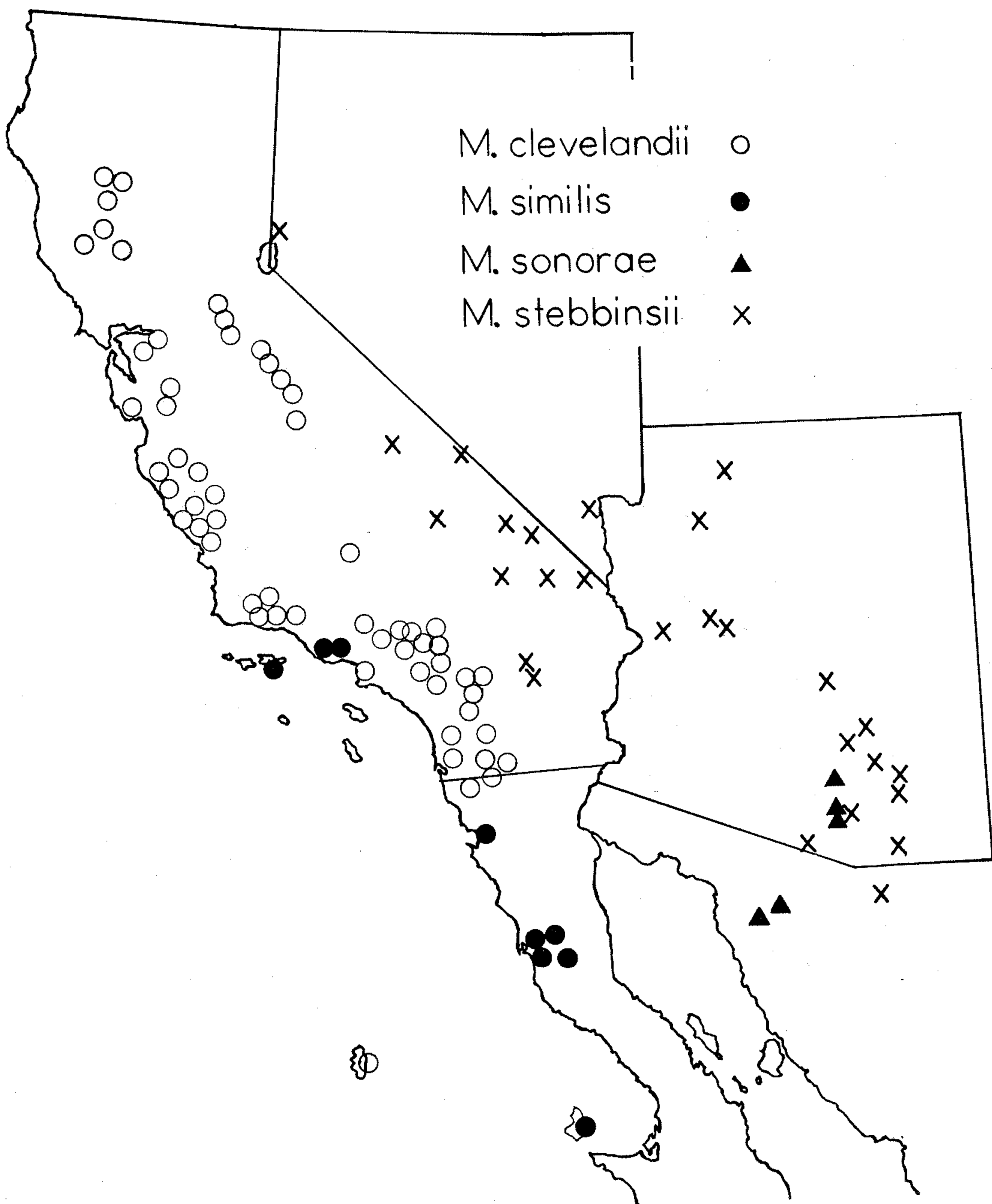


FIG. 1. Distribution of *Malacothrix clevelandii* and allied species in the southwestern United States and northwestern Mexico.

Drytown, *Hansen 401*. BAJA CALIFORNIA, MEXICO. Guadalupe Island, *Palmer 51*; 13 miles southeast of Tecate, *Munz 9520*.

As shown by the specimens cited above and by figure 1, this species occurs on the coastward slopes of the mountains of California and northernmost Baja California. Its occurrence on Guadalupe Island should be confirmed by additional material and by determination of chromosome number. In addition to the report of Stebbins *et al.* of a chromosome number of  $2n=14$  from the Sharsmith collection cited above from Santa Clara County, we have obtained this number in a collection from the Santa Monica Mountains, Los Angeles County, California (*Raven &*

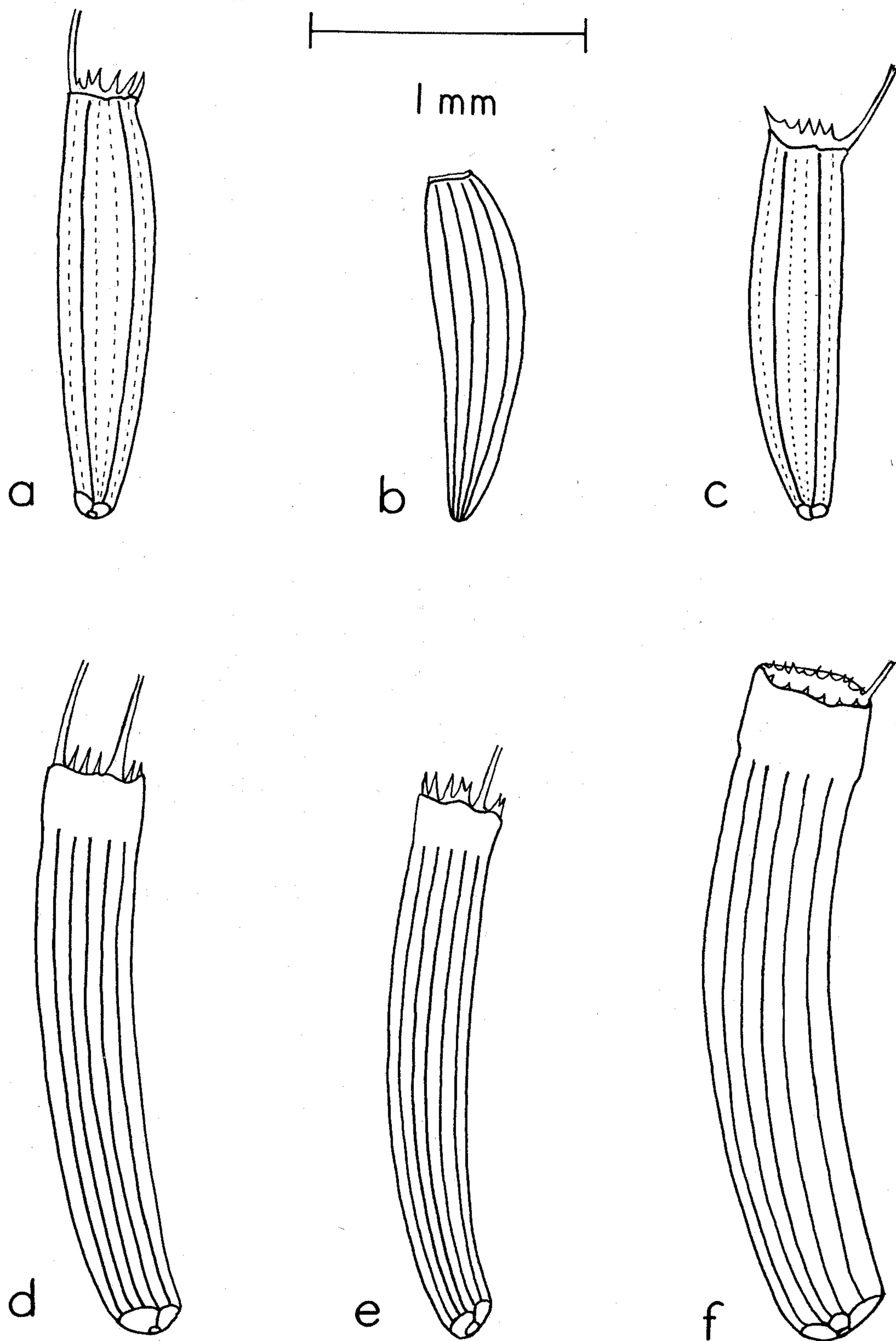


FIG. 2. Mature achenes of species of *Malacothrix*: a. *M. clevelandii*; b. *M. foliosa*; c. *M. similis*; d. *M. sonorae*; e. *M. stebbinsii*; f. *M. fendleri*.

other California station, are much to be desired. In both cases the pollen measurements are consistent with the range of size expected for the tetraploid. We suggest that an understanding of relationships in the complex