

Hill Lookout Rd. 1.6 mi S of Waldo, 15 Jun 1998, *Chambers* 6123 (OSC); junction of Waldo Hill spur road with road to Sanger Pk., 3 Jul 1965, *Chambers* 2364 (OSC).

Collections of *Microseris laciniata* subsp. *leptosepala* mapped in Figure 3. **U.S.A. CALIFORNIA. Del Norte Co.:** Gasquet Flat, alluvial flat in mixed evergreen woodland by the Smith R., T17N, R2E, S20, 24 Jun 1984, *Chambers* 5168 (OSC). **OREGON. Curry Co.:** 10 mi N of Carpenterville, 7 Jul 1939, *Peck* 20450 (WILLU); Brookings, 11 Jul 1919, *Peck* 8790 (WILLU); Rogue River 5 mi below Mule Ck., 21 Jun 1917, *Peck* 3502 (WILLU); Snow Camp Meadows, 3 Jul 1929, *Leach* 2244 (ORE); Mine Cabin, Collier Trail, 28 Jun 1929, *Leach* 2277 (ORE); near Agness, 25 Jun 1933, *Leach* 4428 (ORE); Waldeens, 29 Jun 1934, *Leach* 4700 (ORE); Pyramid Rock, 30 Jun 1934, *Leach* 4701 (ORE); Vulcan Peak, T39S, R11W, S15, 23 Jun 1980, *Hess* s.n. (OSC); Agness road, 2 mi W of Illinois R. junction with Rogue R., 18 Jun 1984, *Stansell* s.n. (OSC); Signal Buttes E of Gold Beach, 23 Jun 1982, *Stansell* s.n. (OSC); Pine Point Forest Camp, T37S, R13W, S18, 27 Jun 1974, *Hawk* s.n. (OSC); above Wren Cabin, T37S, R14W, S12, 28 Jun 1993, *Rittenhouse* 1480 (OSC); 10 km S of Gold Beach, T37S, R14W, S24, 16 Jun 1980, *Sundberg* 1098 (OSC); Fairview Meadow, T37S, R12W, S18, 11 Jul 1981, *Chambers* 4872 (OSC); Gold Beach to Agness road 1.6 mi W of Illinois R. bridge, 23 Jun 1984, *Chambers* 5162 (OSC). **Josephine Co.:** Eagle Gap, 11 mi W of Selma, 23 Jun 1930, *Leach* 2897 (ORE, WILLU); 7 mi W of O'Brien, T40S, R10W, S26, 14 Jun 1990, *Kagan* s.n. (OSC); Illinois R. road, T37S, R9W, S32, 31 May 1988, *Kagan* 5318801 (OSC); Illinois R. valley W of Selma, T37S, R9W, S23, 19 Jun 1969, *White/Lillico* 266 (OSC); old road to Buckskin Pk., T40S, R10W, S24, 11 Jul 1989, *Rolle* 256 (OSC); Bolt Mtn. 9 mi SW of Grants Pass near Applegate R., 9 Jul 1996, *Mazzu* s.n. (OSC).

***Microseris laciniata* (Hook.) Sch. Bip. subsp. *detlingii* K.L. Chambers, subsp. nov. (Figs. 2, 4, 5).** TYPE: U.S.A. OREGON. JACKSON CO.: Siskiyou Pass, S side on the old highway where it joins Hwy. 5, 2.1 mi N of Hilt exit, grassy openings in *Quercus breweri*/*Amelanchier pallida* brushland, in heavy clay soil on slope above road, 22 Jun 1967, K.L. *Chambers* 2868 (HOLOTYPE: OSC; ISOTYPES: BRIT-SMU, CAS, MO, NY, RSA, UC, US, WS, WTU).

Microseride laciniato subsp. *laciniato* similis a qua marginibus foliorum plerumque integris caule non ramoso radice longissimo segmentis pappi numeris 9–19 varians squamis 4–9 mm setis minute barbellatis differt; chromosomatum numerus $2n = 18$.

Perennial herbs with 1–2 much elongated fleshy biennial taproots; stem erect, to 55 cm high, usually simple, leafy near the base; leaves lanceolate or oblanceolate, acute to attenuate, tapering below to a clasping, winged petiole, glabrous, entire or rarely sparingly dentate or pinnatifid, margins often undulate; head single on a terminal, naked or bracteate peduncle, a second peduncle sometimes arising from the axil of a lower leaf; involucre 13–25 mm high, the inner series of phyllaries equal, lanceolate, often black-villous dorsally, the outer phyllaries imbricate in several series, broadly lanceolate to elliptic or round, cuspidate to acuminate, glabrous, sometimes purple-spotted, the outermost 3–7 mm wide; florets 18–85+, with yellow ligules 18–22 mm long, often purple-striped dorsally; cypselae 5–9 mm long, gray to brown, 10-ribbed, ribs smooth or hispid on outer fruits; pappi scales 9–19, 4–9 mm long, lanceolate, silvery (brownish on herbarium specimens), bristles minutely barbellate.

Distribution.—*Microseris laciniata* subsp. *detlingii* is endemic to a limited area east and south of Medford and Ashland, Jackson County, Oregon, extending north to near Butte Falls and south over Siskiyou Pass to the California state

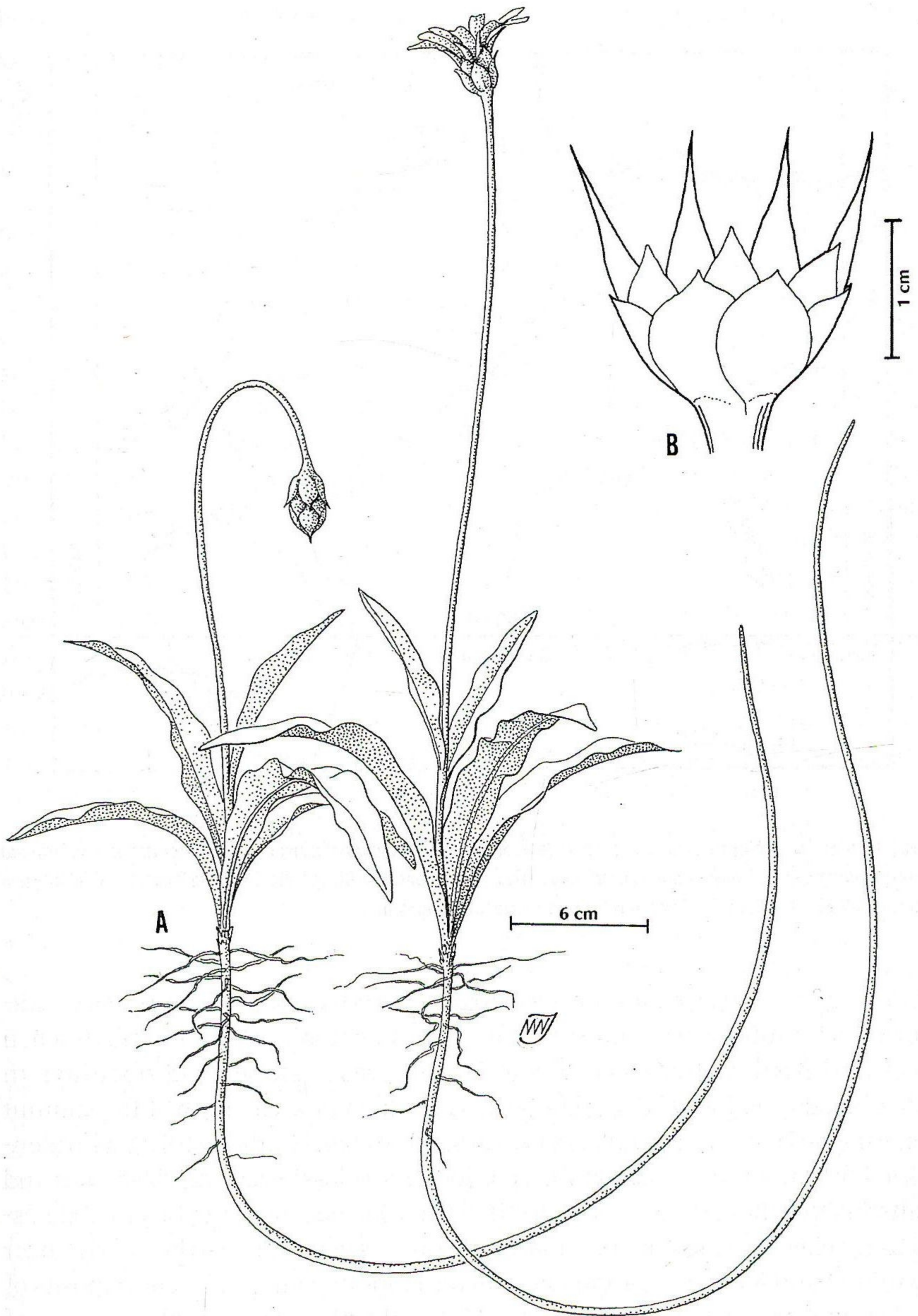


FIG. 4. *Microseris laciniata* subsp. *detlingii*. A. Habit of plant at anthesis. B. Pressed head showing phyllaries.

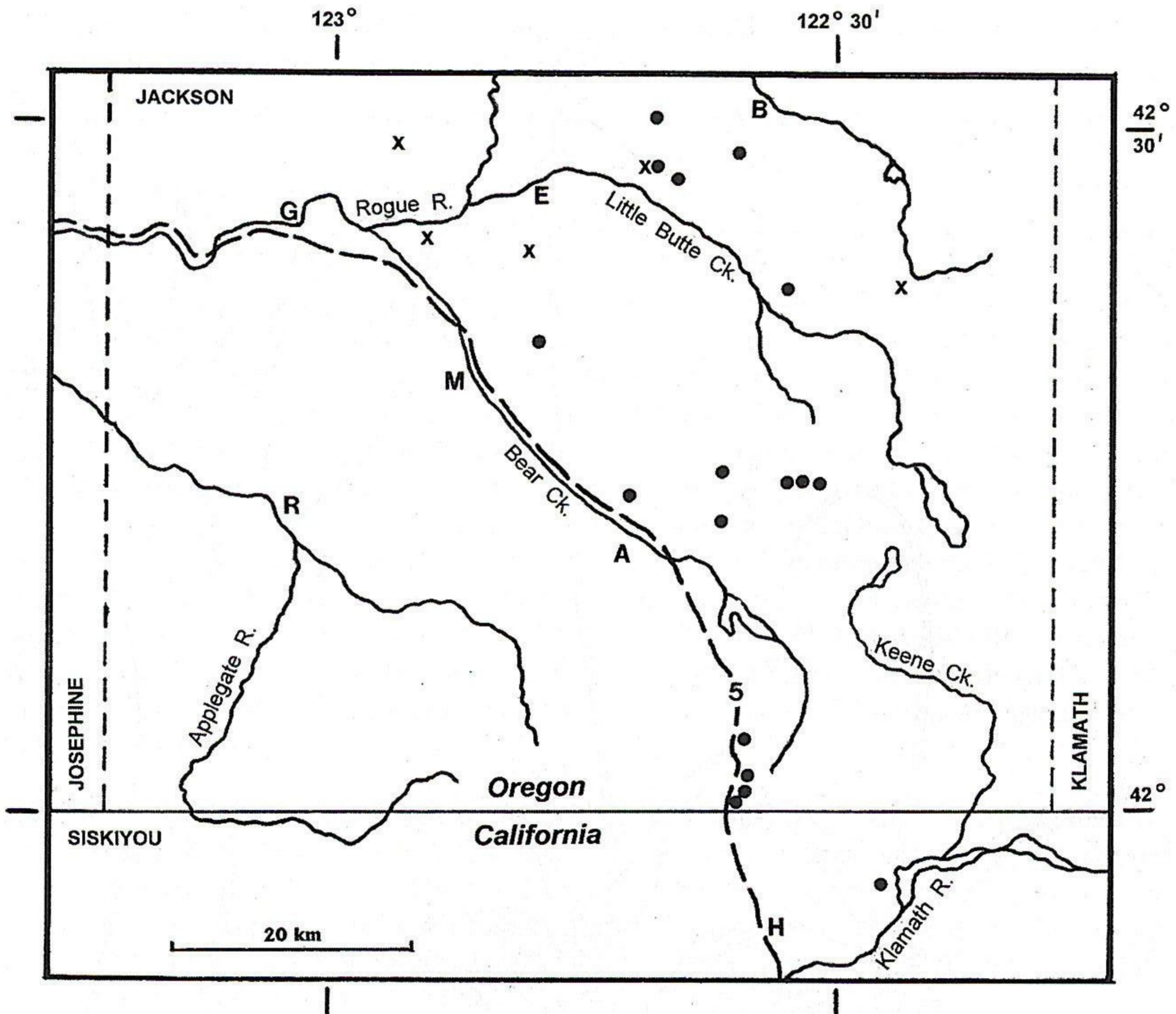


FIG. 5. Distribution of *Microseris* taxa in southern Jackson Co., OR and adjacent Siskiyou Co., CA. Black circles = *M. laciniata* subsp. *detlingii*; Xs = *M. laciniata* subsp. *laciniata*. Cities: A = Ashland; B = Butte Falls; E = Eagle Point; G = Gold Hill; H = Hornbrook; M = Medford; R = Ruch. Dashed line = Interstate Highway 5.

line (Fig. 5). One population has been found in adjacent Siskiyou County, California. The subspecies occurs only in montmorillonite clay soil, sticky when wet and hard and cracked when dry, on grassy slopes and openings in shrublands and forest edges. The geology of the type area, south of the summit of Siskiyou Pass, was included in the thesis of Richard Carlton (1972), who identified the underlying rocks at the type locality as fossil-bearing claystones and siltstones of the early Eocene Colestin Formation, lacustrine in origin and possessing clay minerals of the montmorillonite-mica type. Farther north, near Ashland and Medford, similar clay soil develops in younger Eocene deposits of volcanic-derived sedimentary rocks (McKnight 1971). The complex geology of this region also includes sandstones and volcanic lahar and ash-flow deposits. Adaptations of subsp. *detlingii* to this unusual substrate include an exceptionally deep, slender taproot (Fig. 4) and the ability to reproduce clonally by adventitious buds on the lateral rootlets. Colonies are often limited to patches of

loose soil turned up by gophers or squirrels. Associated species are *Pinus jeffreyi*, *Quercus breweri*, *Q. garryana*, *Amelanchier pallida*, *Ceanothus cuneatus*, *Arc-tostaphylos viscida*, *Toxicodendron diversifolium*, *Festuca idahoensis*, *Achnatherum lemmonii*. Elevations are 600–1450 m. Flowering occurs May–Jun.

Etymology.—The name is in honor of Prof. LeRoy Detling, longtime curator of the University of Oregon herbarium, whose 1950 collection first alerted the author to the peculiar features of this plant.

Figure 5 shows the limited distribution of subsp. *detlingii*, as well as the nearby occurrence of populations, marked by Xs, which the author places in subsp. *laciniata*. The latter specimens, listed below, occur on substrates other than the “heavy clay soil” or “rocky clay soil” consistently mentioned on the labels of subsp. *detlingii* specimens. North of Medford, subsp. *laciniata* is found on rocky alluvium, as at the Agate Desert (*Chambers* 3080), and differs from subsp. *detlingii* in having pinnate leaves, multiple arched-ascending stems from the base, consistently 10 pappi, and lacking an unusually elongate taproot. However, the pappi scales are up to 4 mm long, nearly twice the usual range of subsp. *laciniata*, and are barbellulate. On Kanutchan Creek just north of Little Butte Creek, collections by Greenleaf (1418, 1435) contain both subsp. *detlingii* and plants with highly pinnatifid leaves and basal branching like that of subsp. *laciniata* at Agate Desert. The habitat is described as *Quercus garryana*/*Pinus ponderosa*/*Arbutus menziesii* woodland. We expect that more intergradation will be found between the two subspecies in this area, depending on soil type and disturbance, for example by erosion and cattle grazing. A pappus member of subsp. *detlingii* is shown in Figure 2B, where it is compared with both subsp. *siskiyouensis* and with the common type in subspp. *leptosepala* and *laciniata*.

Collections of *Microseris laciniata* subsp. *detlingii* mapped in Figure 5. **U.S.A. CALIFORNIA. Siskiyou Co.:** Copco Rd. W of Iron Gate Reservoir, 1.2 mi N of Klamath R. bridge at Iron Gate Dam, 16 Jun 1998, *Chambers* 6132 (OSC, UC). **OREGON. Jackson Co.:** High hills opposite Ashland, Jun 1889, *Howell* s.n. (MIN, MSC, ORE, UC, US); slope of Grizzly Peak, 17 Jul 1913, *Peck* 7667 (WILLU); Klamath Hwy. 7 mi SE of Ashland, 19 Jun 1927, *Peck* 15000 (WILLU); S slope of Siskiyou Mtns. near California line, 12 Jun 1930, *Henderson* 13256 (ORE); Siskiyou Pass, T41S, R2E, S8, 11 Jun 1950, *Detling* 6635 (DS, ORE, UC, WTU); Dead Indian Memorial Rd. E of Ashland, T39S, R2E, S5, 23 May 1995, *Straw* 3274 (SOC); Round Top RNA, T35S, R1E, S15, 25 Jun 1997, *Wineteer* s.n. (SOC); Kanutchan Ck., T35S, R1E, S27, 31 May 1983, *Greenleaf* 1435 (OSC); Dead Indian Memorial Rd. E of Ashland, T38S, R2E, S24, 9 Jul 1982, *Kagan* s.n. (OSC); S of Butler Ck., hills N of Ashland, 9 May 1993, *Brock* 486 (OSC); W slope of Roxy Ann Pk. E of Medford, 30 May 1993, *Brock* 496 (OSC); Lick Ck., T36S, R1E, S1, *Brock* 797 (OSC); Heppsie Mtn., T37S, R2E, S2, *Brock* 807b (OSC); Lick Ck., T35S, R2E, S29, 14 Jun 2001, *Knapp* 614001 (OSC); Old Siskiyou Pass Rd., 3.5 mi S of summit at junction with Hwy. 5, 29 May 1965, *Chambers* 2348 (OSC); Old Siskiyou Pass Rd. 0.7 mi N of junction with Hwy. 5, 22 Jun 1967, *Chambers* 2869 (OSC); Old Siskiyou Pass Rd. 2.7 mi N of junction with Hwy. 5, 22 Jun 1967, *Chambers* 2870 (OSC); Siskiyou Pass summit on the old road, T40S, R2E, S32–33, 13 Jul 1978, *Chambers* 4524 (OSC); Siskiyou Pass, S side, on abandoned stretch of old road ca. 0.25 mi N of California state line, 16 Jun 1998, *Chambers* 6131 (OSC).

Collections of *Microseris laciniata* subsp. *laciniata* mapped in Figures 3 and 5. **U.S.A. OREGON. Jack-**

son Co.: Sam's Valley N of Medford, 4 May 1930, *Henderson* 12388, 13253 (ORE); 5 mi W of Fish Lake, T36S, R3E, S35, 27 Jul 1989, *Rolle* 280 (OSC); Kanutchan Ck. ca. 4 mi E of Eagle Point, 26 May 1983, *Greenleaf* 1418 (OSC); Sam's Valley, T35S, R2W, S32, 6 May 1961, *Chambers* 1601 (OSC); 2.5 mi E of Hwy. 62, White City N of Medford, 16 May 1971, *Chambers* 3044 (OSC); Agate Desert N of Medford, Kirtland Rd. 1 mi W of Table Rock Rd., 16 May 1971, *Chambers* 3080 (OSC). **Josephine Co.:** Fish Hatchery Rd. 0.7 mi W of New Hope Rd. S of Grants Pass, 14 Jun 1998, *Chambers* 6105 (OSC).

DISCUSSION

The Klamath Region, including the Siskiyou Mountains, has long been recognized as an area of high endemism and as a center of floristic diversity (Whittaker 1961). Factors favoring this diversity, mentioned by Whittaker, include a steep climatic gradient from the coast inland, high rainfall and moderate temperatures, much-dissected topography, and diversity of bedrock, and hence of soil types. The complex geological history and origin of the varying substrates are described by Coleman and Kruckeberg (1999). Types of endemism and an analysis of the endemic flora were presented by Smith and Sawyer (1988). These authors list the two taxa newly described here, whose names were available on herbarium annotations, and also *Microseris howellii*, a previously named endemic of serpentine barrens in the Illinois River valley of Josephine County, Oregon. This species, and the other *Microseris* taxa mentioned above, illustrate very well the importance of edaphic and climatic factors in keeping separate the parapatric members of this complex.

Proceeding from west to east, *Microseris laciniata* subsp. *leptosepala* occupies the more coastal region of Curry County and is found on serpentine barrens as well as non-serpentine meadows and forest edges. The peculiar vegetation and characteristic flora on serpentine barrens in the Siskiyou Mountains are discussed in Coleman and Kruckeberg (1999). Examples of serpentine sites among the specimens of subsp. *leptosepala* cited above are Pine Point (*Hawk* s.n.), Gold Beach to Agness road (*Chambers* 5162, *Stansell* s.n.), Signal Buttes (*Stansell* s.n.), S of Gold Beach (*Sundberg* 1098), Buckskin Peak (*Rolle* 256), and 7 miles W of O'Brien (*Kagan* s.n.). Endemic to serpentine barrens farther east in the Illinois River valley is *M. howellii*, a close relative of *M. laciniata*, having 5–10 pappi but differing in its pappi scales 3–5 mm long. Parapatric in Oregon with *M. howellii* is *M. laciniata* subsp. *siskiyouensis*, which avoids open, rocky serpentine barrens but occurs in adjacent forested sites in loam soil. No hybrid populations have been noted between these two taxa. To the east, *M. laciniata* subsp. *laciniata* is on alluvial and deeper loam soils in grasslands and mixed oak woodlands near the Rogue River. Finally, *M. laciniata* subsp. *detlingii* is endemic to montmorillonite clay soils from 600–1450 m elevation in the Medford-Siskiyou Pass area.

The differentiation of *Microseris* taxa in the Siskiyou Mountains, and their maintenance as genetically separate populations, has involved both an adaptation to different substrates and a geographical separation into different climatic zones.

This has led to an unusual richness of species and subspecies in this limited region of southwestern Oregon and adjacent California, which is in line with the frequently mentioned floristic diversity of the Klamath-Siskiyou Mountains in general.

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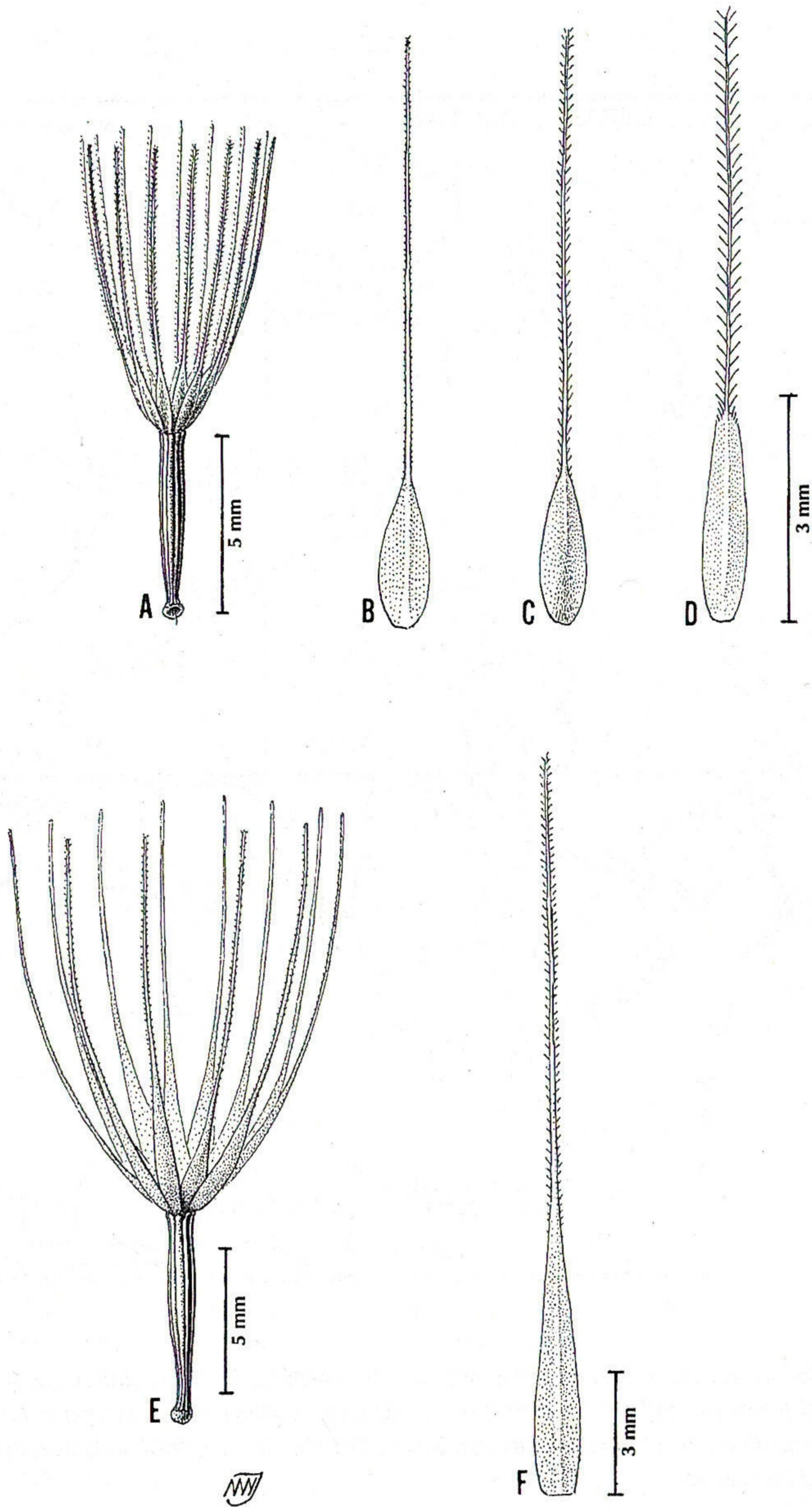


FIG. 2. Cypselae and pappi of various *Microseris* taxa. A. Cypselae of *M. laciniata* subsp. *siskiyouensis* bearing 15 pappus parts. B. Pappus part of *M. laciniata* subsp. *laciniata* or subsp. *leptosepala*, with scabrous bristle. C. Pappus part of *M. laciniata* subsp. *siskiyouensis*, with minutely barbellate bristle. D. Pappus part of *M. nutans*, with plumose bristle. E. Cypselae of *M. laciniata* subsp. *detlingii* bearing 12 pappus parts. F. Pappus part of *M. laciniata* subsp. *detlingii*, with minutely barbellate bristle.