

# STUDIES IN THE EUPATORIEAE, (COMPOSITAE)

## I — III

R. M. KING

Since the death of Prof. B. L. Robinson over thirty years ago, the tribe Eupatorieae has not been critically studied. During this period great numbers of collections, much research, and many modern techniques have become available to botanists. The present study initiates an attempt to incorporate these new materials and methods in formulating a modern conspectus of the genera and species of the tribe. Grateful acknowledgement is extended to the directors of the following herbaria who generously loaned me this material: A, CAS, DS, G, GH, K, MICH, NY, P, PH, POM, RENO, RM, RSA, SMU, UC, US, USFS, and W.

### I. PLEUROCORONIS

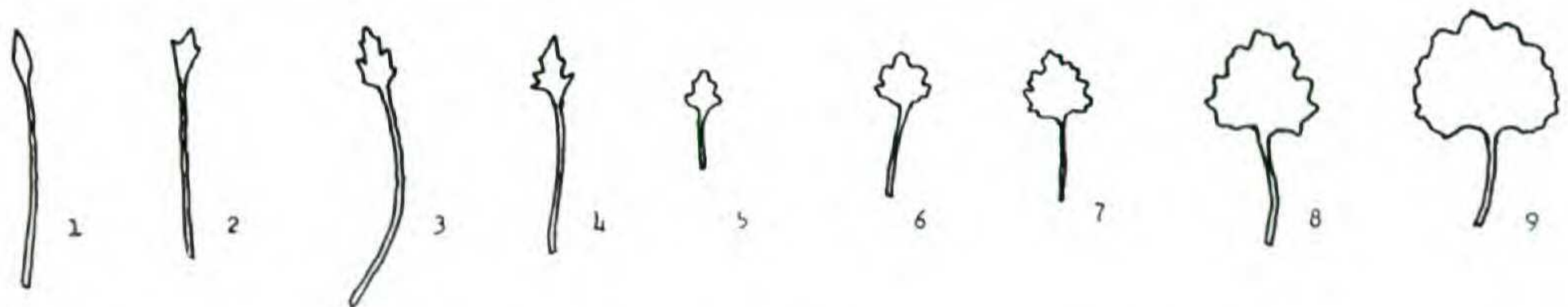
R. M. King and H. Robinson, *Phytologia* 12: 468-469. 1966. (Type species, *Hofmeisteria pluriseta* A. Gray.)

Woody sub-shrub. Leaves simple to compound, petiolate, serrate, opposite in lower portions of plant becoming alternate above. Peduncles not strongly differentiated, bearing alternate leaves. Inflorescence polycephalic. Heads turbinate or cylindrical, 25-30-flowered. Phyllaries in multiple series, outer one short, ovate, inner lanceolate. Corollas slender, regular, 5-lobed, white, tubular, glandular on the outer surface. Anthers elongate with large erect appendages, exothelial cells isodiametric or slightly wider than long. Pollen spherical, tricolpate, distinctly spinose. Style branches elongate, slightly enlarged at the tip, cells at the surface slightly bulging; basal node of style glabrous. Pappus of 3-16 long scabrate setae with intervening short erosely dentate squamae, sometimes bearing numerous additional setae in a distinct inner series. Achenes narrowly ellipsoid to obpyramidal, 4-5-ribbed, lateral surfaces densely pubescent, subcuticular cells without minute punctations except on the ribs; carpodium somewhat rounded, usually asymmetric, cells vertically elongate, basal foramen shallow, indistinct. Basic chromosome number, as determined from one species,  $X = 9$  pairs.

The species of *Pleurocoronis* can be distinguished by the following key

Leaves dissected ..... *P. gentryi*  
Leaves simple .....

- Petioles more than twice as long as leaf blades, leaves small, narrowly ovate with usually five or less teeth ..... *P. pluriseta*  
 Petioles always less than twice as long as leaf blades, leaf blades deltoid to reniform, usually with 15 or more marginal teeth .....  
 ..... *P. laphamioides*



Figs. 1-9, Leaves of *Pleurocoronis*. Figures 1-4, *P. pluriseta*. 1. Orcutt 1889 (US). 2. Woodcock 1889 (US). 3. Coville & Funston 207 (US). 4. Brandegee 1889 (US). Figures 5-9, *P. laphamioides*. 5. Mason 1975 (US). 6. Wiggins 17080 (US). 7. Wiggins 17080 (US). 8. Johnston 3630 (US). 9. Palmer 208 (US).

1. *Pleurocoronis gentryi* (Wiggins) R. M. King & H. Robinson *Phytologia* 12: 470. 1966.

*Hofmeisteria gentryi* Wiggins *Contr. Dudley Herb* 4: 25. 1950.

MEXICO: BAJA CALIFORNIA: Sierra Giganta above Puerto Escondido, April 21, 1938. *H. S. Gentry 3742* (Holotype DS! Isotype GH!).

Plants 4-6 dm tall. Stems few-branched, striate, gray-barked with dense glandular hairs on the younger portions; evanescent in older regions. Leaves thin. Petioles glandular, slender 12-15 mm long. Blade broadly ovate in outline 12-22 mm wide, 15-25 mm long, bipinnately or tripinnately divided; densely hispid on both surfaces. Heads turbinate, 10-12 mm tall (including style branches) *ca* 25-flowered. Phyllaries *ca* 25, mostly 3-nerved. 2-7 mm long, 0.5-1 mm broad. Florets 5-6 mm long. Stamens 5. Anthers (including appendages) *ca* 1.5 mm long *ca* 240  $\mu$  wide, appendage *ca* 385  $\mu$  long *ca* 220  $\mu$  wide. Filaments 2.5-3 mm long *ca* 50  $\mu$  wide. Style branches purplish, greatly exserted at maturity *ca* 2.5-3 mm long *ca* 225  $\mu$  wide. Setae 4-6, 5-6 mm long. Squamae 4-6, 1-1.5 mm long. Achenes narrowly prismatic, dark brown *ca* 3 mm long. Pollen *ca* 18  $\mu$  in diameter. Chromosome number not determined.

SPECIMENS EXAMINED: MEXICO: BAJA CALIFORNIA: 10 mi s of Mission Dolores, *Wiggins, Carter, & Ernst 300* (DS, MICH). Arroyo de San Matias near Rancho San Matias, *Carter & Sharsmith 4207* (UC). Arroyo Gabilan, *Carter & Ferris 4080* (UC). vicinity of Portezuelo, e of La Victoria, *Carter & Ferris 3910* (UC). Pilon de las Parras, w of Loreto, *Carter & Sharsmith 4236* (UC). Arroyo Tabar, w of Puerto Escondido, *Carter & Sharsmith 4247* (UC). Mesa de Alta Gracia, sw of La Cumbre de Alta Gracia, *Carter 4890* (UC).

2. *Pleurocoronis pluriseta* (A. Gray) R. M. King & H. Robinson.

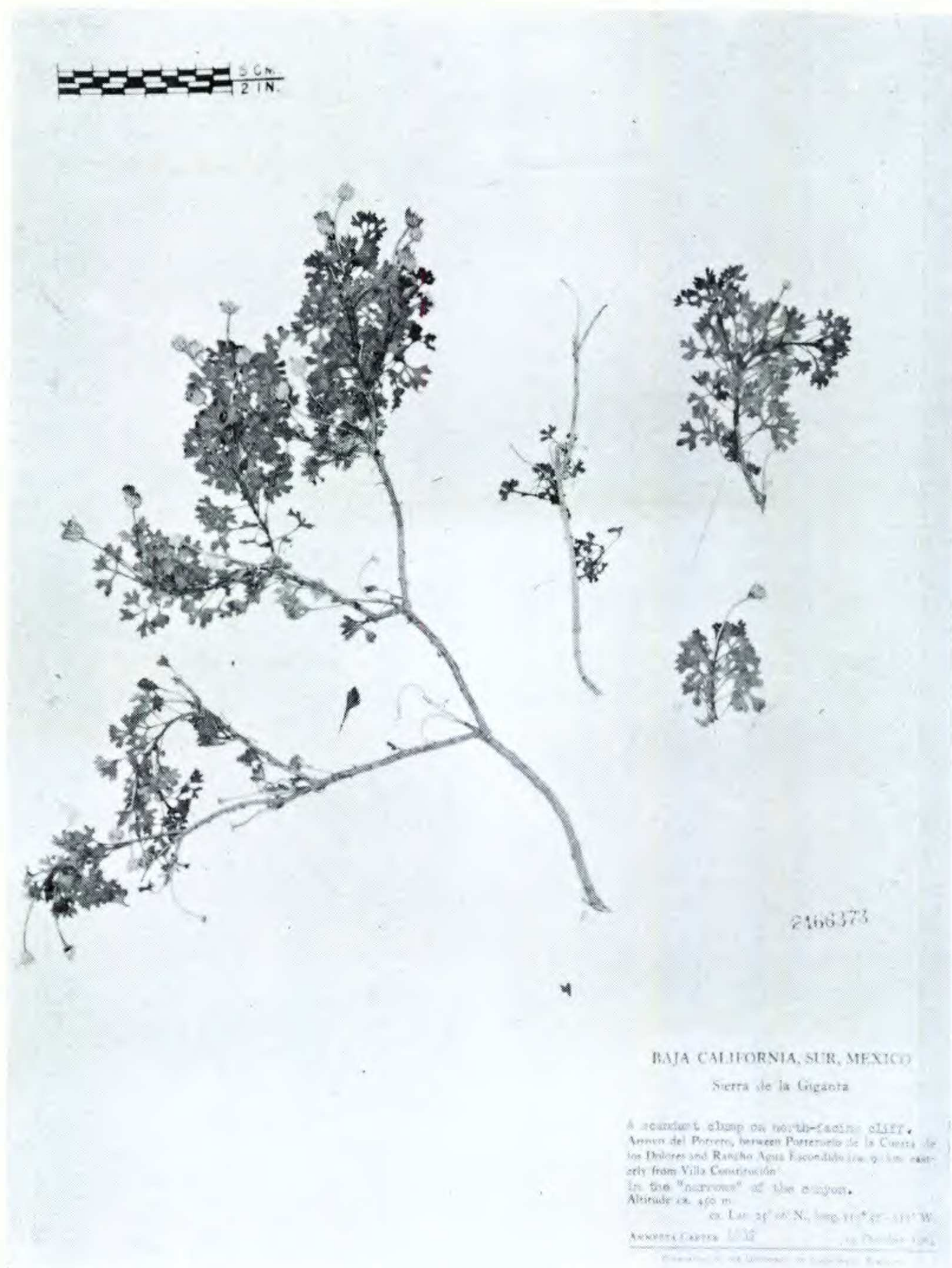


Plate 1338. *Pleurocoronis gentryi* Holotype (DS) Gentry 3742.

Phytologia 12: 469. 1966.

*Hofmeisteria pluriseta* A. Gray, Pacif. Rail. Rep. 4: 96, 1857.

UNITED STATES: ARIZONA: Bill Williams Fork, J. M. Bigelow in  
1853-54. (Holotype GH! isotypes; NY!; P!; PH!).

*Hofmeisteria viscosa* Nelson Bot. Gaz. 37: 263. 1904.

UNITED STATES: NEVADA: "The Pockets", April 30, 1902, Leslie N.

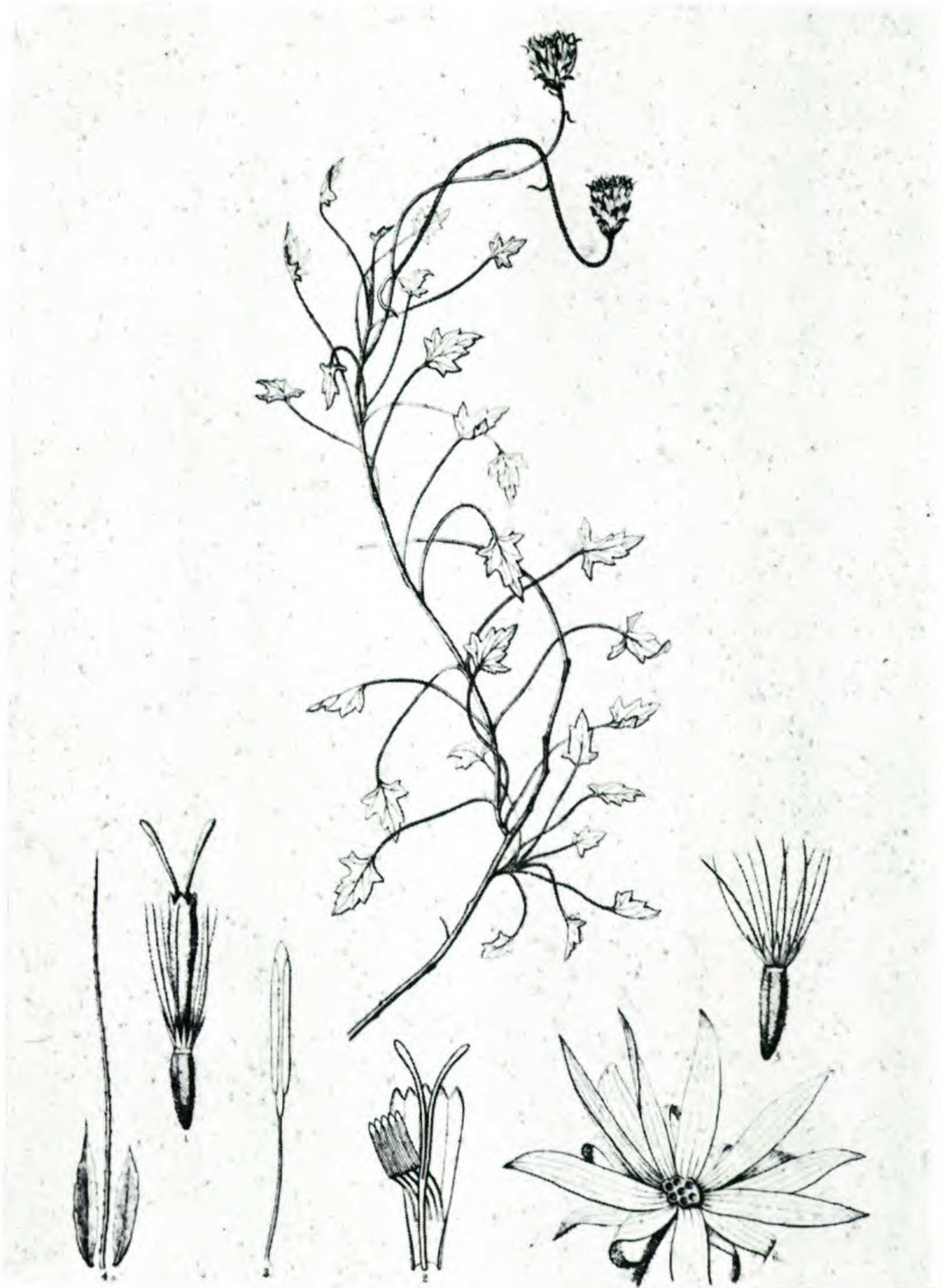


Fig. 10. *Pleurocoronis pluriseta* (From A. Gray, Pacific Rail. Rep. 4: 96, 1857).

*Goodding 671* (Holotype RM!).

Plants 2.5-5 dm tall. Stems few-branched, erect, striate, with evanescent puberulence. Leaves thin. Petioles with glandular hairs; narrow, 2-5 cm long. Blades glabrous or rarely with glandular hairs,

ovate to lanceolate, 1.5-5 mm wide, 3-10 mm long, entire or more frequently with 5 or less teeth. Petioles always twice as long as the blades. Inflorescence a loose corymb. Heads 6-11 mm tall (including style branches), *ca* 30-flowered. Phyllaries *ca* 25, outer surface glandular; striate, the apex acute, 0.5-1 mm broad, 2.5-6 mm long. Florets 4-5 mm long. Stamens 5. Anthers (including appendages) *ca* 1.5 mm long, *ca* 220  $\mu$  wide, appendage *ca* 220  $\mu$  wide, *ca* 330  $\mu$  long. Filaments *ca* 2 mm long *ca* 65  $\mu$  wide. Style branches, *ca* 1.5 mm long. Squamae 10-12, 1-2 mm long. Setae 10-12(16), 2.5-5 mm long. Achenes narrowly prismatic; dark brown to black, 3-4 mm long. Pollen *ca* 18  $\mu$  in diameter. Chromosome number  $N = 9 \text{ II}$  (Raven unpublished).

REPRESENTATIVE SPECIMENS EXAMINED: UNITED STATES: ARIZONA: COCONINO CO.: Havasupai Canyon, *Clover 6085* (MICH). Separation Canyon, *Clover 4219* (MICH). MOHAVE CO.: Grand Canyon National Monument, *W. P. Cottam*. May 5, 1952 (CAS). YUMA CO.: Tule Tank, *Shreve 5936* (DS); *Benson & Darrow 10804* (POM). Palm Canyon, *Benson & Darrow 10853* (POM). Sierra de la Gila, Gila Desert, *Monnet 1088* (CAS, P, US). CALIFORNIA: IMPERIAL CO.: Painted Gorge, Carisso Mts., *Ferris & Rossbach 9633* (DS, F, GH, RSA, UC). Between Coyote Wells and Jacumba, *MacFadden 14461* (CAS). 4.9 m n e of Mountain Springs, *Raven 11550* (SMU). Indian Picture Rocks, *F. M. Reed 5358* (P). INYO CO.: Pleasant Cañon, *Hall & Chandler 6917* (POM, UC). Surprise Canyon, *Ferris 7994* (A, DS, POM, UC). Titus Canyon, *Eastwood & Howell 7773* (CAS). Echo Canyon, *Coville & Gilman 146* (US). Death Valley, *Coville & Funston 207* (US). Inyo Mts., *Austin 461* (UC). East of Ophis Mine, Slate Mts., *Alexander & Kellogg 1133* (DS, UC). Darwin Springs, *C. L. Hitchcock 6208* (DS, NY, RSA, UC). Saline Canyon, *Train 671* (US). RIVERSIDE CO.: Andreas Cañon *Stark 4983* (RSA, TEX, UC). Painted Canyon, *Peirson 7173* (RSA); *Munz & Keck 9346* (GH, POM); *McGregor 735* (DS); *Ferris & Rossbach 9572* (DS, F, GH, MICH, RSA, UC). Tahquitz Canyon, *Peirson 1213* (RSA). 5 m s w of Palm Desert, *Breedlove 1887* (DS). Cottonwood Springs, *Stark 3751* (DS, RSA, UC, US). Palm Springs, *Parish 4122* (DS, GH, NY, PH, UC, US). Palm Canyon, *F. M. Reed 3866* (UC) *3870* (UC). Marshall Cañon, 11 km w of Coachella, *Hall 5795* (DS, F, G, GH, NY, PH, POM, UC). Near Indio, *Hall 5992* (DS, G, UC, US). Joshua Tree National Monument, *Hitchcock & Muhlick 23261* (UC). Eagle Cañon, 4 m east of Palm Springs, *E. C. Jaeger* March 18, 1922 (DS). Devil's Canyon, *Johansen & Ewan 7107* (DS, UC). SAN BERNARDINO CO.: 3.8 mi e of Hayden, *Wolf 10753* (DS, G, NY, RSA, TEX, UC). Carlyle Mine, Pinto Mts., east of 29 Palms, *Munz 15648* (DS, GH, POM, UC, US). Calico, *Parish 9813* (A, DS, G, GH, UC). Sheep Springs Canyon, *Hitchcock & Muhlick 23293* (DS, G, UC). Camp Cady, *Hall 6130* (DS, UC). 39 m from Needles, *Ferris 7230* (DS, GH, NY, POM). 1 m s of 29 Palms, *Alexander & Kellogg 952* (DS, UC, US). Whipple Mts., *Alexander & Kellogg 1226* (DS, UC). 10 m NW of Riggs, *Munz & Hitchcock 10957*

(POM). Painted Cañon, *Howell 3299* (CAS). 10 m e of Daggett, *Munz & Keck 7864* (NY, POM). 17 m from Vidal on old road to Needles, *Wolf 3190* (DS, RSA, UC, US). SAN DIEGO CO.: 15 mi e of Banner, *Gould 2270* (RSA, SMU, TEX). Palm Cañon, *Gander 5320* (SMU, UC); *Epling & Robison* April 8, 1932 (DS, RSA, UC, US). San Felipe Wash, *Eastwood 2279* (CAS, GH, POM, UC, US). The Narrows, *Gander 9212* (RSA). NEVADA: CLARK CO.: Valley of Fire, *Maguire, Maguire & Maguire 5011* (GH, UC); *5012* (GH, UC); *Clokey 5954* (DS, G, MICH, NY, PH, POM, RENO, SMU, TEX, UC, US, USFS, W); *Train 1885* (DS, F, RENO, UC); *Eastwood & Howell 9010* (CAS, NY, UC). Black Canyon, 5 m s of Hoover Dam, *Ferris 13384* (DS, NY). North of Cottonwood Peak, *Gullion 537* (UC). Petrified forest, Canyon w of Logan, *Heller 10460A* (A, DS, F, G, GH, NY, US). Hiko Wash, *Train 1370* (RENO, SMU, UC). Hemingway Wash., Lake Mead, *Maguire 17724* (POM, UC). Lake Mead, *Clover 8234* (MICH, SMU). LINCOLN CO.: Muddy Valley, *Kennedy & Gooding 54* (DS, NY, PH, UC, US). UTAH: "southern part of state" *Dr. Edward Palmer* in 1877 (NY, US).

MEXICO: BAJA CALIFORNIA: Cucopa Mts., *MacDougal 127* (NY). San Luis Gonzaga Bay, *I. M. Johnston 3326* (CAS, GH, NY, UC, US). El Cañon de los Osos, 4 m n of Gaskills Tanks, *Epling & Darsie* February 21, 1933 (UC). Santa Mariá, *T. S. Brandegees* May 15, 1889 (F, GH, PH, UC, US).  $\frac{3}{4}$  m s of Puertocito, *Wiggins & Wiggins 15867* (DS, MICH, TEX). SONORA: Cholla Bay, Punta, Penasco, *Raven 11665* (NY).

3a. *Fleurocoronis laphamioides* (Rose) R. M. King & H. Robinson var. *laphamioides* *Phytologia* 12: 470. 1966.

*Hofmeisteria laphamioides* Rose, *Contr. U. S. Nat. Herb.* 1:79, 1890. MEXICO: BAJA CALIFORNIA: San Pedro Martir Island, February 13, 1890, *Edward Palmer 148* (holotype US!; isotypes CAS!; F!; GH!; NY!).

*Hofmeisteria pluriseta* A. Gray var. *laphamioides* I. M. Johnston *Proc. Calif Acad* 4. 12: 1186. 1924.

Plants 0.5-1.5 m tall. Stems often branched, erect, striate, glabrous or rarely with glandular hairs. Leaves thin. Petioles glandular, narrow 1-2.5 cm long. Blades glandular, deltoid to reniform or orbicular, 4-28 mm wide and long, margin indented usually with 15 or more teeth. Petioles always less than twice as long as blades. Inflorescence in corymbs or cymes. Heads 8-12 mm tall (including style branches), *ca* 30-flowered. Phyllaries *ca* 25, striate, 0.5-1 mm broad, 2.5-6 mm long. Florets 4-5 mm long. Stamens 5. Anthers (including appendages) *ca* 1.5 mm long, *ca* 220  $\mu$  wide, appendage *ca* 220  $\mu$  wide, *ca* 330  $\mu$  long. Filaments *ca* 2-2.5 mm long *ca* 65  $\mu$  wide. Style branches *ca* 1.5 mm long, *ca* 250  $\mu$  wide. Squamae 10-12, 1-2 mm long. Setae 10-12, 2.5-5 mm long. Achenes narrowly ellipsoid; dark brown to black, 3-4 mm long. Pollen *ca* 18  $\mu$  in diameter. Chromosome number not determined.

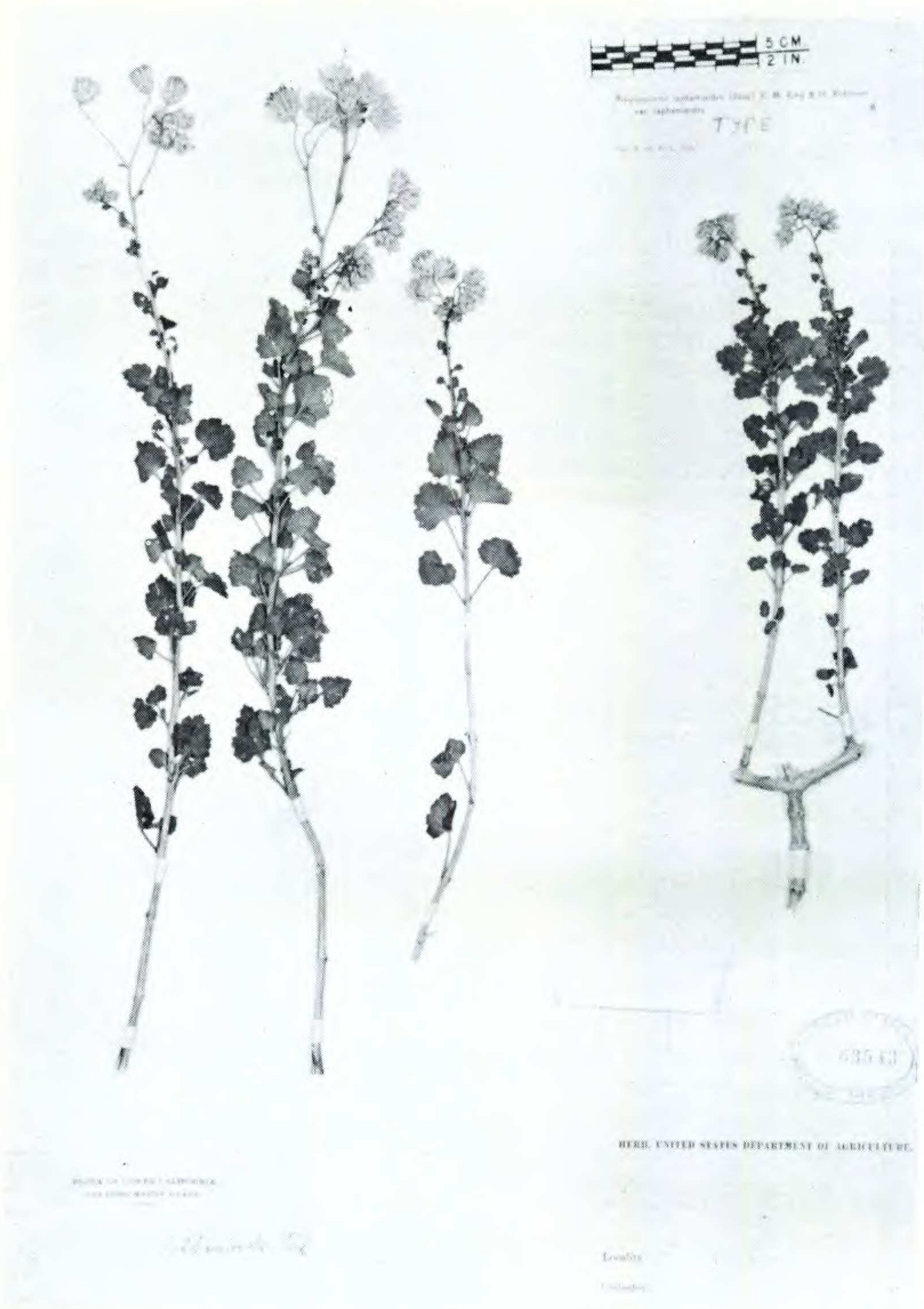


Plate 1339. *Pleurocoronis laphamioides* Holotype (US) Palmer 148.

SPECIMENS EXAMINED: MEXICO: BAJA CALIFORNIA: Salsipuedes Island, I. M. Johnston 3521 (CAS). San Marcos Island, I. M.

*Johnston 3630* (CAS, GH, NY, UC, US); *Moran 3955* (DS, UC). Angel de La Guarda Island, *I. M. Johnston 3376* (CAS). San Pedro Martir Island, *I. M. Johnston 3157* (CAS, F, GH, K, UC, US); *I. M. Johnston 3162* (CAS, DS, F, GH, NY, UC, US); *Dr. Edward Palmer 406* in 1887 (GH, US). San Bartolome Bay, *Rose 16213* (NY, US). Las Animas Bay, *I. M. Johnston 3516* (CAS, GH, NY, UC, US). San Francisquito Bay, *Rose 16755* (NY, P, US). Santa Rosalia, *Dr. Edward Palmer 208* in 1889 (GH, US). 10 m e of La Purisima, *Wiggins 11459* (GH). Bahia de los Angeles, *Wiggins & Wiggins 14889A* (DS). Bahia de los Angeles, *Wiggins & Wiggins 14820* (CAS, DS, MICH, TEX). Cerro Tordillo and vicinity, *Gentry 7452* (DS, MICH); *Gentry 7453* (DS, MICH). vicinity of Aguaje de San Andreas, *Gentry 7463* (DS, MICH). Rinconado de San Hipolito, *Gentry 7805* (DS). Las Tinajas, *Gentry 7545* (DS, MICH) 4 m s of Barrill, *Harbison 41602* (RSA). SONORA: Kino Point *Long 80a* (GH, US). Libertad, *Graham 3831* (DS). Punta Sargento, *Wiggins 17080* (US). San Pedro Nolasco Island, *Moran 4043* (DS).

**3b. *Pleurocoronis laphamioides* (Rose) R. M. King & H. Robinson var. *pauciseta* (I. M. Johnston) R. M. King, *comb. nov.***

*Hofmeisteria pluriseta* var. *pauciseta* I. M. Johnston, *Pro. Calif. Acad.* 4. 12: 1187. 1924.

MEXICO: SONORA: San Pedro Nolasco Island, April 17, 1921. *I. M. Johnston 3134* (Holotype CAS!; isotypes GH!; NY!; UC!; US!).

*Hofmeisteria laphamioides* Rose var. *pauciseta* (I. M. Johnston) Blake, *Contr. U. S. Nat. Herb.* 23: 1430. 1926.

The variety *pauciseta* differs from the variety *laphamioides* in having only 5 or 6 setae on the pappus instead of 7-16.

SPECIMENS EXAMINED: MEXICO: BAJA CALIFORNIA: Isla Carmen, *Wiggins 17512* (US). Espiritu Santo, *Rose 16868* (US). Purisima, *Brandegge in 1889* (NY). 10 m e of La Purisima, *Wiggins 11459* (DS). SONORA: San Pedro Nolasco Island, *Moran 4043* (UC).

The following collections may be regarded as intermediate between *P. pluriseta* and *P. laphamioides* and I have annotated the following specimens as *P. pluriseta*: UNITED STATES: ARIZONA: PIMA CO.; Dripping Wells, Puerto Blanco Mt., *Gould, Darrow & Haskell 3019* (CAS, GH). MEXICO: BAJA CALIFORNIA: Isla Angel de La Guarda, *Moran 7254* (DS). Turtle Bay, Revillagigedo Islands, *Mason 1975* (F, K) and I have annotated the following specimens as *P. laphamioides*. UNITED STATES: ARIZONA: PIMA CO.: Dripping Springs, *Darrow, Haskell, & Gould 2435* (CAS). *McClintock 52-80* (CAS). Dripping Wells, Puerto Blanco Mts., *Gould, Darrow & Haskell 3019* (UC). MEXICO: BAJA CALIFORNIA: Turtle Bay, Revillagigedo Islands, *Mason 1975* (CAS, US). SONORA: 7 m n w of Quitovac, *Wiggins 8328* (DS, MICH, US).



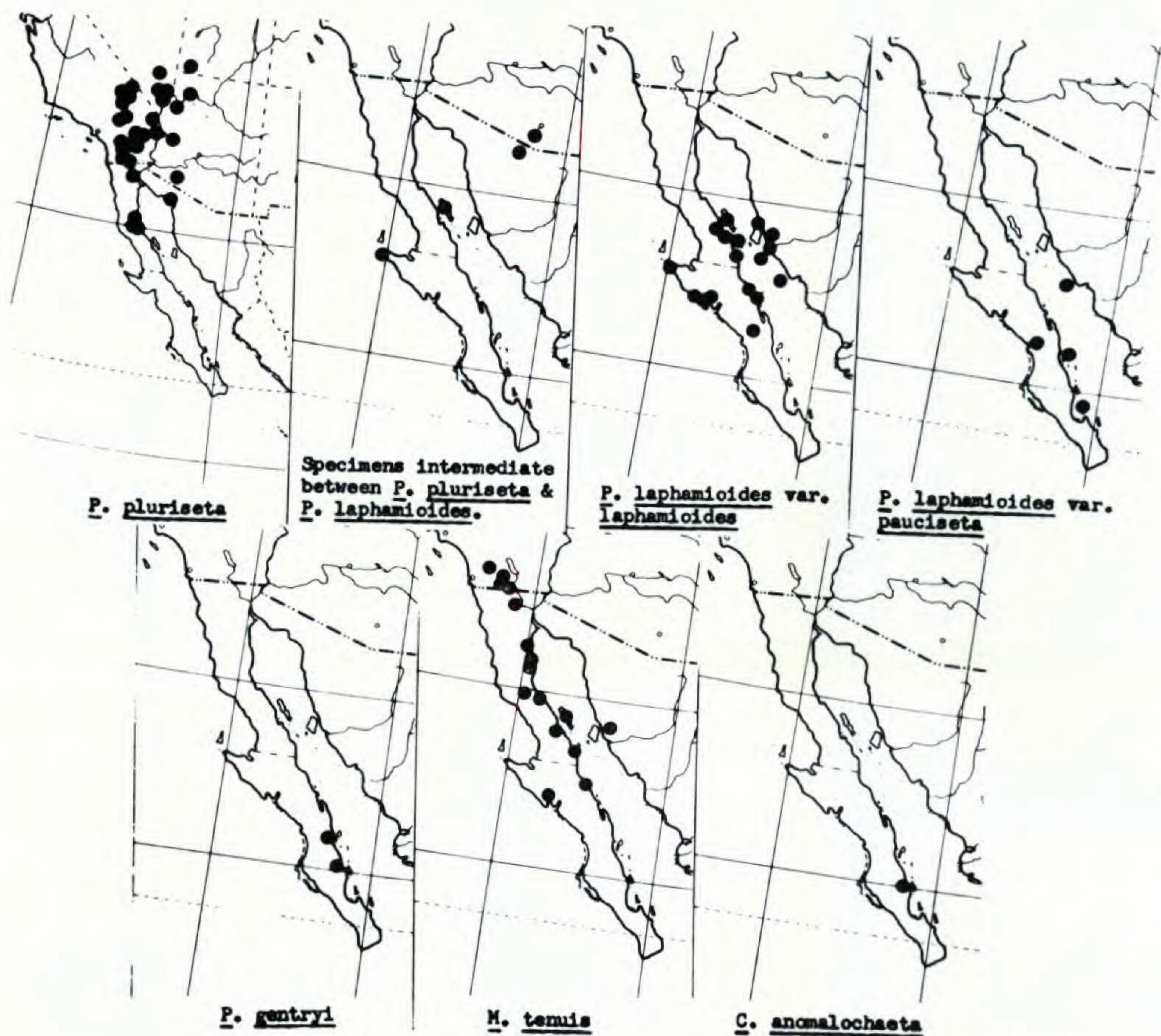


Fig. 11. Distribution of *Pleurocoronis*, *Malparia*, and *Carterothamnus*.

#### MALPARIA

S. Watson, Proc. Amer. Acad. 24: 54, 1889 (Type species, *Malparia tenuis* S. Watson).

Slender annual to slightly woody sub-shrub. Leaves simple, narrow, mainly sessile, sub-entire, opposite in lowermost nodes becoming alternate above. Peduncles not strongly differentiated. Inflorescence polyccephalic. Heads nearly cylindrical few, rather small, *ca* 30-flowered, in loose cymose panicles. Phyllaries in several series, lanceolate, the tips acute to acuminate. Receptacle flat, naked. Corolla slender, regular, tubular, 5-lobed, glandular on the outer surface. Anthers elongate with large erect appendages. Pollen spherical, distinctly spinose. Style branches filiform, thickened toward apex and exerted at maturity. Pappus in a single series, squamae overlapping setae. Achenes slender, prismatic, 5-ribbed. Carpodium with a very large foramen, often born laterally. Cells of carpodium quadrate. Chromosome number determined as  $X = 10$  pairs. (Raven unpublished)

1. *Malparia tenuis* S. Watson Proc. Am. Acad. 24: 54. 1889

MEXICO: BAJA CALIFORNIA: Near Los Angeles Bay, Dec. 1887  
*Dr. Edward Palmer 567* (Holotype, GH!; Isotypes NY!; US!).  
*Hofmeisteria tenuis* (Wats.) I. M. Johnston Proc. Cal. Acad. Sci. 4,  
12: 1188. 1924.

Plants 1-4 dm tall. Stems erect, striate, often reddish, sparingly branched to very branched in certain large individuals, finely puberulous to nearly glabrous. Leaves puberulous to nearly glabrous, up to 5.0 cm long, 0.3-3.0 mm wide. Heads 5-6 mm in diameter, 7.0

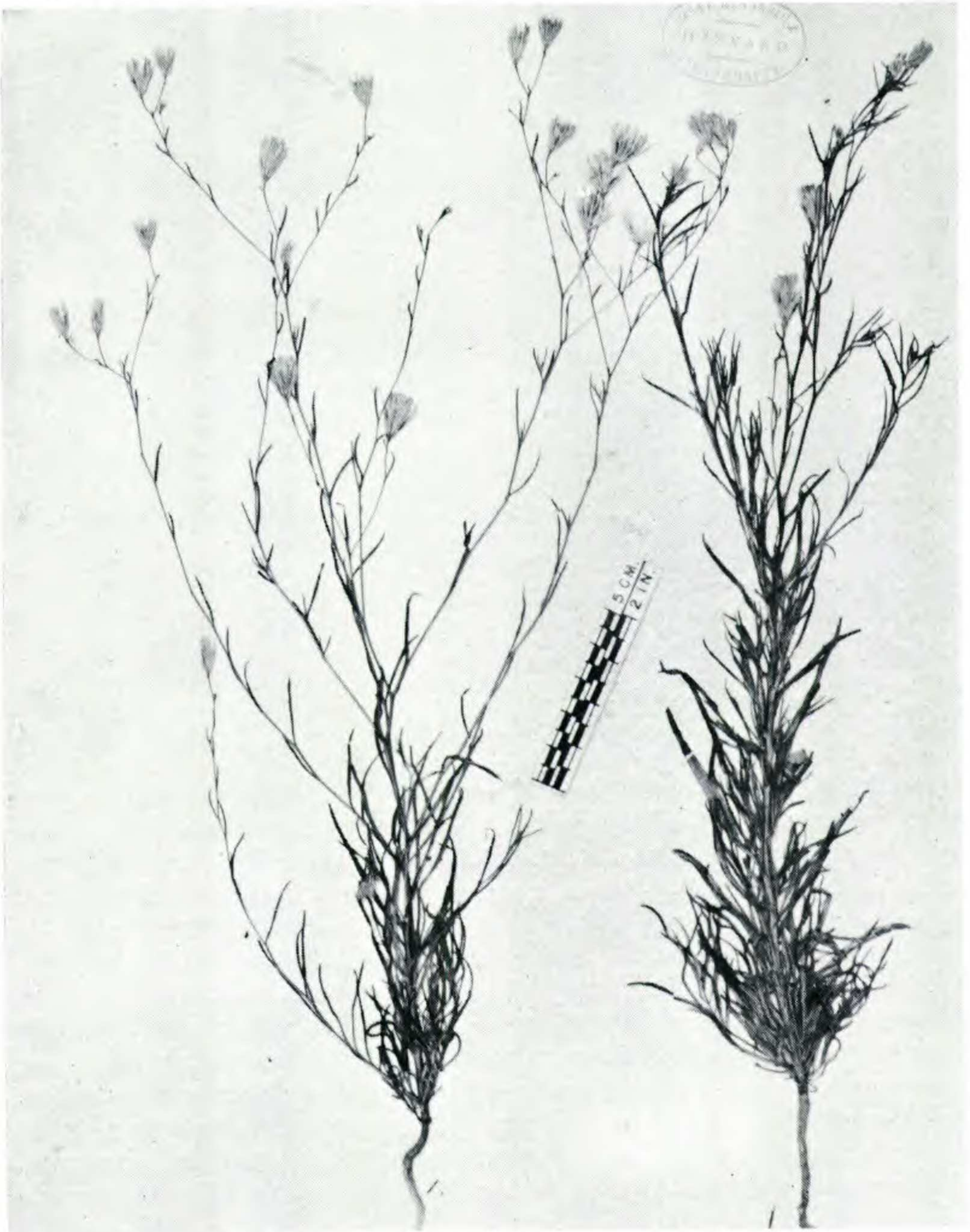


Plate 1340. *Malparia tenuis* Holotype (GH) *Palmer 567*.

mm to 1.4 cm tall (including the projecting florets). Phyllaries 20-25, puberulous, 12-15 mm wide, 0.4-1.2 cm long. Florets 20-30, ochroleucous or whitish; corolla narrow, tinged with pink, 5-6 mm long; stamens 5, anthers 2 mm long (including appendage) *ca* 0.25 long; wide, pappus setae 3, reddish brown, 5 mm long, pappus squamae 3, reddish brown, 0.5 mm long, pollen spherical, *ca* 18  $\mu$  diameter, achenes dark brown or black, 3 mm long. Chromosome number determined as  $n = 10$  pairs. (Raven unpublished)

REPRESENTATIVE SPECIMENS EXAMINED: UNITED STATES: CALIFORNIA: IMPERIAL CO.: upper end of Painted Gorge, Carisso Mts., *Ferris & Rossbach 9614* (DS). Fish Mt. *E. C. Jaeger* April 10, 1926 (POM). Split Mt. Canyon, Fish Creek Mts., *Ferris 9696* (DS). Split Mt., Colorado Desert, *T. S. Brandegee* April 1905 (DS, UC, US). Mt. Signal, *Abrams 3189* (DS, NY, POM); *E. M. Wilson* April 3, 1949 (DS). SAN DIEGO CO.: Yagin Pass, Borrego Valley, *Ripley & Barneby 10077* (CAS).

MEXICO: BAJA CALIFORNIA: Bahia de San Luis Gonzaga, *Wiggins & Wiggins 18166* (CAS, DS, MICH). 18 m s of San Felipe, *Wiggins & Wiggins 15815* (DS, MICH, TEX). 35 m n of San Felipe, *Wiggins & Wiggins 18161* (CAS, DS). 15 m n of San Felipe, *Wiggins & Wiggins 15785* (DS). 5 m w of Barril, *Wiggins 7830* (DS, F, GH, MICH, NY, UC, US). near Barrie, *Shreve 6991* (MICH, PH, UC). Puerto Refugio, Angel de la Guarda Island, *Copp 135* (DS). Angel de la Guarda Island, *I. M. Johnston 4205* (CAS). 2.5 m w of Agua Dulce, *Moran 10215* (DS). Las Tinajas, *Gentry 7609* (DS, MICH, UC). 65.5 m s of San Felipe on the road to Laguna Chapala, *Wiggins & Ernst 697* (DS, MICH) 3 m n of San Felipe, *Olmsted 1167* (RSA). 6 m s e of Tres Enriques, *Thorne & Henrickson 32579* (MICH, RSA). 10 m n of Santa Rosalia, *Reed 6261* (POM). 2.7 m n of San Felipe, *Raven 14764* (DS, RSA). Cucopa Mts., *MacDougal 175* (NY). Bahia de Los Angeles, *Cowan 2304* (US). San Francisquito Bay, *I. M. Johnston 3563* (CAS, GH, K, NY, UC). SONORA: Libertad Bay Inn, *Long 73* (US).

#### CARTEROTHAMNUS

R. M. King *gen. nov.* (Compositarum — Eupatorieae — Eupatoriinae) Suffrutex; Capitula homogama discoidea; flores omnes hermaphroditi, fertiles, regulares; antherae ad apicem appendiculatae; receptaculum paleaceum; achaenia 5 costata. Species typica: *Carterothamnus anomalochaeta* R. M. King

*Carterothamnus anomalochaeta* R. M. King sp. nov. Suffrutex; pauci-ramosus, erectus; folia alterna, lamina tenuis, orbicularis vel reniformis, profunde fissa, 1-5-2 cm lata, 1-1.25 cm longa, petiolus usque ad 1.5 cm longus; inflorescentia simplex; receptaculum paleis caducis inter flores instructum; involucri bracteeae 30-40, multi-seriatae, aequales, usque ad 2.5 mm longae, paleis *ca* 25, *ca* 4 mm longis; corolla glabra; pollen asperatum; achaenia 5 angulata, pris-

matica, 1-1.2 mm longa; pappus polysetaceus, seta unica elongata ceteris brevibus.

Scandent subshrub; stems few-branched, erect, terete, striate, glandular pubescent in younger portions; leaves alternate, blades thin, orbicular or reniform, 3-7 cleft two thirds or more in to base, lobes oblong, glandular pubescent on both surfaces, 1.5-2 cm wide, 1-1.25 cm long, petioles up to 1.5 cm long; inflorescence monocephalic; peduncles terete, striate, minutely glandular, up to 3 cm. long, rarely with setaceous bracts; heads discoid, campanulate, *ca* 7 mm high (including style branches), *ca* 7 mm wide, *ca* 50 flowered; receptacle convex with a slight depression in the center, paleaceous; phyllaries 30-40, in 3-4 series, thin, unequal, glandular on the outer surface, ovate-lanceolate, apex acute, margins erosely dentate, *ca* 1 mm wide, up to 2.5 mm long; pales *ca* 25, narrowly lanceolate, *ca* 4 mm long; florets perfect, glabrous fertile, regular, 5 lobed, white?, stamens 5; anthers appendaged, obtuse, *ca* 100  $\mu$  wide, *ca* .75 mm long; style branches 2, greatly exerted at maturity, club-shaped, 1.5-2 mm long; style tube *ca* 1.5 mm long; pollen tricolpate, spherical, distinctly spinose, *ca* 13  $\mu$  in diameter; achenes prismatic, 5-ribbed, ribs setose, 1-1.2 mm long, dark brown; carpodium symmetrical, basal foramen prominent with a clean margin, cells quadrate, rather thick-walled; pappus in one series, consisting of about 10-12 short setae 0.5-0.75 mm long and one long barbed seta *ca* 2.5 mm long; chromosome number not determined.

*Carterothamnus* possesses two characteristics that would indicate relationship with *Hofmeisteria*, its monocephalic inflorescence and glabrous corolla. *Carterothamnus* differs from *Hofmeisteria* in the shape of its carpodium, surface of its pollen, number of flowers in each head, shape of the phyllaries, and especially in the possession of a paleaceous receptacle. Paleaceous receptacles are rare in the tribe Eupatorieae, being found in only 3-4? other genera. The pappus of *C. anomalochaeta* seems unique in the Eupatorieae. It is approached only by certain species of *Stevia* which have one long seta and several short squamae.

The genus is named in honor of Annetta Carter, distinguished botanist of the University of California at Berkeley.

Holotype: *Annetta Carter 4812*. (US no. 2, 466, 373) Arroyo del Potrero, between Portezuelo de la Cuesta de los Dolores and Rancho Agua Escondido (*ca* 90 km easterly from Villa Constitución). Sierra de la Giganta, Baja California, Sur, Mexico, *ca.* Lat. 25° 06' N., Long. 110° 57' — 110° W. Altitude *ca* 450 meters. A scandent clump on north facing cliff. In the "narrows" of the canyon. 19 October

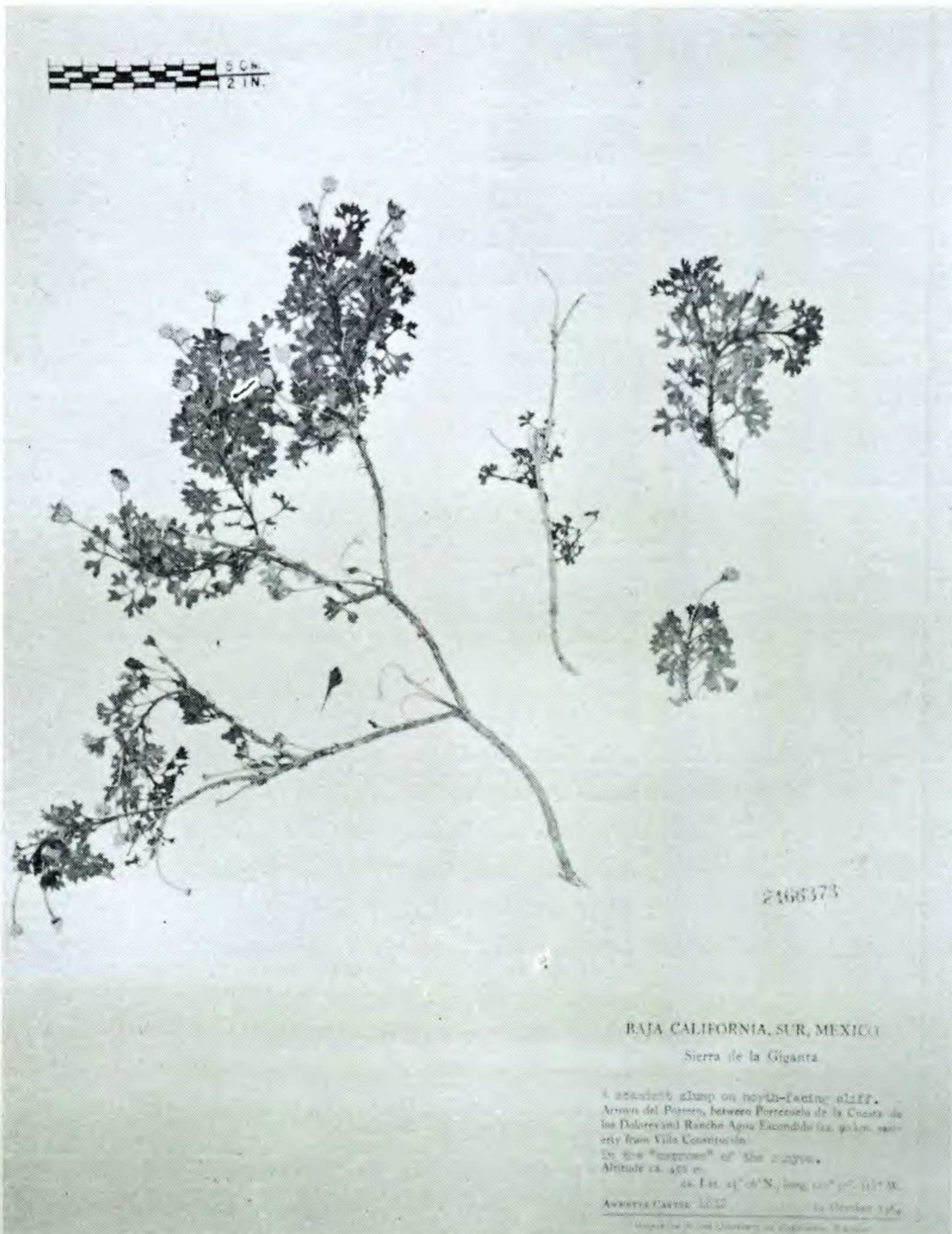


Plate 1341. *Carterothamnus anomalochaeta* Holotype (US) Carter 4812.

1964. Isotype at UC. Paratype: same locality Carter 5147 July 17-20 1966.

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