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MIMULUS GEMMIPARUS SP. NOV. FROM COLORADO

WILLIAM A. WEBER

University of Colorado Museum, Boulder 80302

Minulus gemmiparus W. A. Weber, sp. nov., Sect. *Simiolus*. Herba annua erecta, tota glabra, 1—10 cm alta, simplex, debilis, plus minusve succulenta. Folia internodiis breviora, ovata, petiolata, usque ad 10 mm longa et 7 mm lata, obscure triplinervia, apicibus obtusis vel rotundatis, basibus truncatis; petioli 2—3 mm longi, latero-compressi, profunde saccati, fere omnes propagulum lenticularem continentes. Flores solitarii, axillarii vel terminalii, brevipedicellati, bilabiati; calyx 3—4 mm longus, plicato-carinatus, subcampanulatus, emaculatus, laciniis subaequalibus, incurvatis; corolla calyce paullo longiora, 4—5 mm longa, cylindrica vel infundibuliformia, glabra, lutea, emaculata; faux brevis, aperta, intus parvicristata, non palatum formans; lobi subaequales, erecto-patentes, obtusi vel rotundati; stamina glabra, inclusa; lobi stigmatici rotundati. Capsula et semina ignota.

Annual herb; foliage and stem totally glabrous; stem 1—10 cm tall, simple, weak, somewhat succulent. Leaves shorter than the internodes, ovate, petiolate, up to 10 mm long and 7 mm wide, obscurely 3-nerved, the apices obtuse to rounded, the bases broad, truncate, the margins entire or remotely denticulate; petioles 2—3 mm long, laterally compressed, deeply saccate, almost every one containing a lenticular propagulum. Flowers solitary, axillary or terminal, short-pedicellate, bilabiate; calyx 3—4 mm long, plicate-keeled, subcampanulate, not spotted, the teeth subequal, incurved; corolla not much longer than the calyx, 4—5 mm long, cylindrical to funnel-form, glabrous, yellow, not spotted; throat short, open, with two low parallel ridges within, not forming a prominent palate; lobes subequal, erect-spreading, obtuse or rounded; stamens glabrous, included; stigmatic lobes rounded. Capsule and seeds unknown. Chromosome number, $n = 16$ (teste R. K. Vickery in litt.). (Fig. 1.)

Holotype. U. S. A. Colorado. Rocky Mountain National Park; Old Fall River Road, east side of Continental Divide (Larimer County), 10,000 ft. alt.; on gently sloping seeping granite slopes, forming colonies in the protection of the overhanging rounded surfaces of erratic boulders, subalpine, open sites in *Picea-Abies-Populus tremuloides* association, 9,500—10,500 ft. alt.; associated with *Mimulus rubellus* A. Gray and *M. guttatus* DC. (*M. hallii* Greene), 8 July 1970, W. A. Weber 10,462 (COLO).

Mimulus gemmiparus is characterized by a mode of vegetative reproduction unique in the genus (Grant, 1924) and perhaps unique in the Holarctic flora—the consistent production of saccate petioles that envelop a fleshy pair of rudimentary leaves, a rudimentary axis, and sometimes even the beginning of an adventitious root. The cotyledon-like leaves are laterally-oriented within the petiole, the entire structure

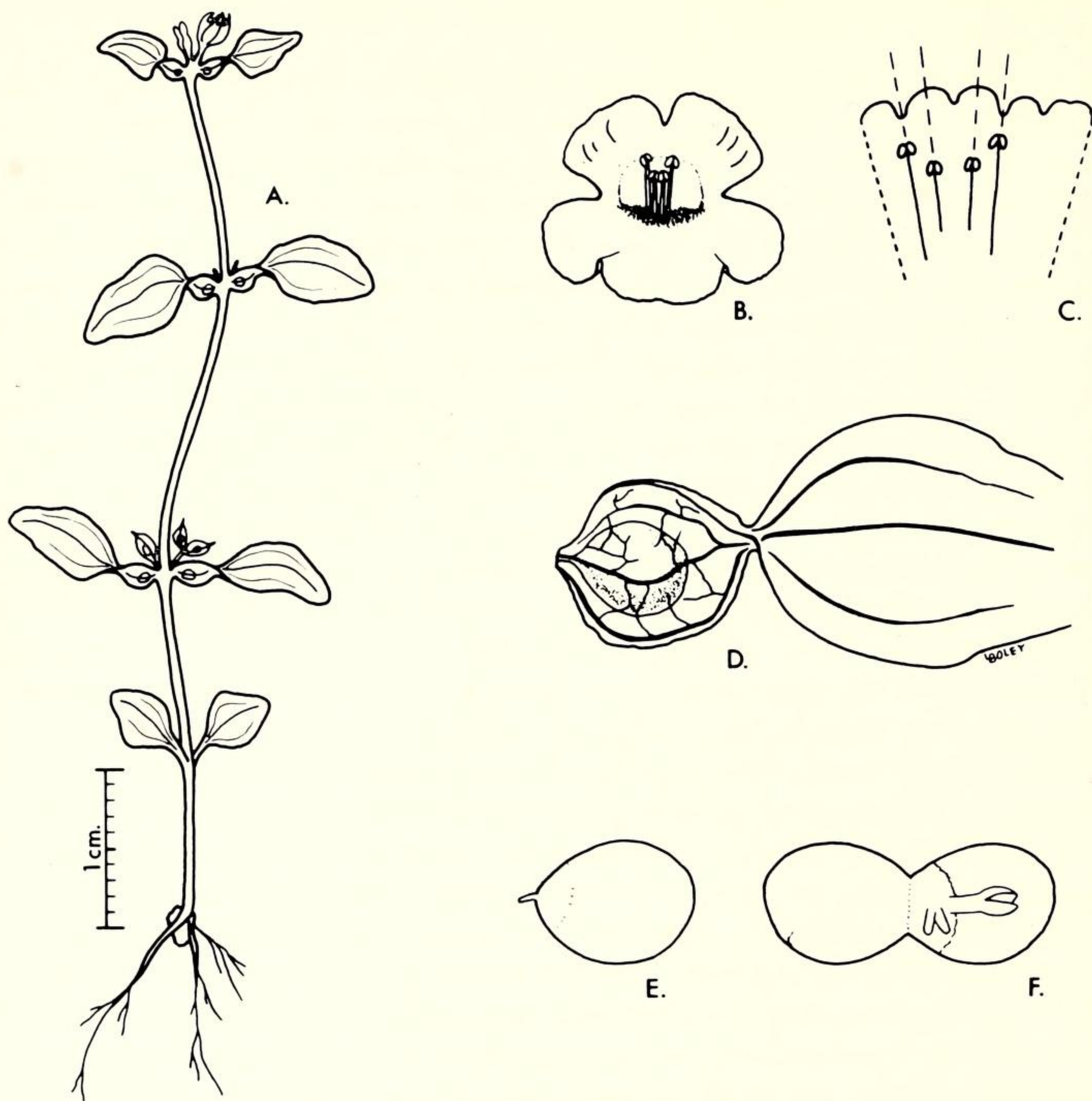


FIG. 1. *Mimulus gemmiparus* W. A. Weber: A, habit; B, face view of corolla; C, corolla, opened view showing staminal insertions; D, detail of saccate petiole with enclosed propagulum; E, F, propagulum, complete and dissected. Drawing by Linda Boley, Staff Artist, Univ. of Colorado Museum.

bearing an analogy to a small, one-seeded legume pod with the ventral suture open. The combined elements are released as a unit. When the plant reaches maturity, within a few weeks time, the leaf-lamina withers and falls away, and the propagulum dissociates from the drying stem. The flat, lenticular propagula, resembling large *Marchantia* gemmae, float down-slope in seepage water and tend to collect in drifts in sites suitable for germination.

A graded series of stages leading to the production of typical propagula may be observed on a single plant. The lowermost leaf pair is usually unmodified, with normal petioles and blades. Modification increases upward, with the leaves closest to the inflorescence bearing the

largest and plumpest propagula and most reduced leaf-blades. Even the abortive lateral shoots from the leaf-axils may bear minute leaves and saccate gemmiparous petioles.

Superposed buds evidently are produced at the nodes, for the production of a vegetative shoot in a leaf axil does not result in an empty petiolar sac. In almost all instances when a vegetative shoot diverges from a leaf axil, another, situated slightly below, grows into the petiolar sac, filling it with a propagular shoot.

R. K. Vickery (in litt.) feels that the relationships of the new species are with *M. guttatus* DC. although the shape of the corolla, with its very weakly-developed palate, more closely resembles that of *M. glaberratus* H.B.K.

Mimulus gemmiparus has been known in the field and herbarium for over twenty years. It was first discovered by Ruth Ashton Nelson on the North Inlet Trail on the west side of the Continental Divide (Grand County). She experimented with the propagula and was able to germinate them. Some years later, Mrs. Margaret Douglass became interested in the plant during her surveys of the vegetation of the Park. She forwarded living material to R. K. Vickery, who analyzed it cytologically. Although a great deal of field work has been done in the mountains of Colorado, this unique species has not yet been found outside Rocky Mountain National Park.

Flowers are very infrequently produced in *Mimulus gemmiparus* and the calyces that have been found lack mature capsules. Reproduction seems to be almost exclusively the function of the vegetative propagulum.

LITERATURE CITED

- GRANT, A. L. 1924. A monograph of the genus *Mimulus*. *Annals Missouri Bot. Garden* 11: 99-388.

NOTES AND NEWS

AVAILABILITY OF SMILEY'S BOREAL FLORA OF THE SIERRA NEVADA.—A limited number of "A report upon the boreal flora of the Sierra Nevada of California" (Frank Jason Smiley, 1921. *Univ. Calif. Publ. Bot.* 9:1-423.) were recently uncovered from storage at Occidental College. Individuals interested in obtaining a copy for their institutional or herbarium library should address their request to Dieter Wilkin, Department of Biology, Occidental College, Los Angeles, California 90041.

NEW PUBLICATIONS

Systematics of the Onocleoid ferns. By ROBERT M. LLOYD. *Univ. Calif. Publ. Bot.* 61:1-86. 1971. A monographic study of *Onoclea*, *Matteucia*, and the monotypic Mexican-Guatemalan *Onocleopsis hintonii*.

A biosystematic study of the genus *Brodiaea* (Amaryllidaceae). By THEODORE F. NIEHAUS. *Univ. Calif. Publ. Bot.* 60:1-66. 1971. A comprehensive study of *brodiaea*, sensu stricto.

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