

STUDIES IN THE BORAGINACEAE, XIII
NEW OR OTHERWISE NOTEWORTHY SPECIES,
CHIEFLY FROM WESTERN UNITED STATES

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***Heliotropium molle* (Torr.), comb. nov.**

Helioophytum molle Torr. U. S. & Mex. Bound. Bot. 138 (1859).

Tournefortia mollis Gray, Proc. Am. Acad. 10: 50 (1875); not Muell. (1858).

Tournefortia monclovana Wats. Proc. Am. Acad. 18: 120 (1883).

TEXAS: plains south of Santiago Peak, 1883, *Havard* 46½ (G).
COAHUILA: mountains 24 mi. north of Monclova, Sept. 1880, *Palmer* 887 (TYPE of *T. monclovana*, G); Movano, July 1910, *Purpus* 4555 (G); 19 mi. south of Laguna del Rey, a colony on silty floor of a broad valley, with *H. Greggii*, fl. white, leaves thickish, gray, crisped, Sept. 20, 1938, *Johnston* 7803 (G).

The type of *H. molle* was collected by Bigelow near Presidio del Norte (i.e. near Ojinaga), northern Chihuahua. The collection made by Palmer (no. 887) north of Monclova, Coahuila, the type of *T. monclovana*, is unquestionably conspecific. During my travels in Coahuila and Chihuahua, last year, I observed this species at only three localities. In each, it formed large though restricted colonies on dry silty valley-floors or dry sandy stream-ways. The plant spreads underground by rhizomes. The herbaceous stems, 2-3 dm. tall, were numerous at each station but may have come from the rhizomes of a relatively small number of individual plants. I noted the species (1) south of Laguna del Rey near Mohovano (specimen cited above), (2) near the Coahuila-Chihuahua boundary near Guimbalete, and (3) in northern Chihuahua in the type-region between Mula and Ojinaga. The species has a dry velvety fruit which breaks into two-seeded halves at maturity. The halves of the fruit contain two well-developed fertile cells and no infertile cavities. The plant unquestionably belongs to *Heliotropium* and can not possibly be kept in *Tournefortia*.

***Heliotropium assurgens*, nom. nov.**

Heliotropium phyllostachyum var. *erectum* Macbride, Proc. Am. Acad. 51: 542 (1916); not *H. erectum* Lam. (1778).

Anchusa incana Sesse & Mociño, Fl. Mex. 33 (1893) and ed. 2, 30 (1894); not Ledeb. (1847), nor *H. incanum* R. & P. (1799).

Plagiobothrys californicus Greene, var. **fulvescens** Johnston, Contr. Gray Herb. 68: 74 (1923).

Plagiobothrys micranthus Nelson, Am. Jour. Bot. 25: 115 (1938).

ARIZONA: moist creek bank, Prescott, April 28, 1925, *Nelson 10232* (TYPE of *P. micranthus*, Laramie); White House Canyon, below recreation area, Santa Rita Mts., fl. white, about 4500 ft., April 14, 1928, *Graham 3538* (G); Soldiers Canyon trail below Vails Corral, Santa Catalina Mts., fl. white, April 12, 1928, *Graham 3462* (G).

I have had the privilege of examining the type of *P. micranthus* Nels. and find it conspecific with the two above cited collections made by Graham. All three collections are thoroughly typical of *P. californicus* var. *fulvescens*, a form characteristic of the western borders of the Colorado and Mohave deserts and heretofore unreported from Arizona. In gross aspect *P. californicus* var. *fulvescens* is very similar to the relatively common Arizonan *P. Pringlei* Greene. It differs from this latter species in its unstalked, distinct nutlets and in its slightly less elongate calyx. I suspect that *P. californicus* var. *fulvescens* may be more common in Arizona than the few collections at hand seem to indicate. Perhaps collectors, mistaking it for *P. Pringlei*, have failed to collect it.

Plagiobothrys infectivus, sp. nov.

Herba annua e radice gracili palari purpureo-tincta oriens; caulibus saltem basim versus purpureo-tinctis erectis vel ascendentibus solitariis vel pluribus 1-3.5 dm. longis ramos ascendentis saepe 1-2 gerentibus cum pilis gracilibus subappressis et pilis rigidioribus erectis villosulo-hispidis; foliis infimis plus minusve congestis sed vix rosulatis sub anthesi sub-deciduis; foliis caulinis oblongis vel oblongo-linearibus sessilibus 4-10 mm. latis 1.5-6 cm. longis, apice obtusis vel subrotundis, basi obtusis vel attenuatis, supra villosis, subtus pallidioribus pilis sparsioribus aliquantum rigidioribus ornatis, margine et costa purpureo-tinctis; inflorescentia conspicue foliaceo-bracteata saepe solitaria elongata saepe 1-2 dm. longa; floribus extra-axillaribus; corolla alba 4-4.5 mm. longa, limbo ca. 2.5 mm. diametro, lobis ovatis ca. 0.8 mm. latis ascendentibus; calyce sub anthesi extus brunneo-hispidulo, intus albedo-villoso, fere ad basim lobato, lobis lineari-lanceolatis; calyce fructifero ca. 4 mm. crasso 1-2 mm. longe pedicellato, lobis lanceolatis 4-5 mm. longis suberectis; nuculis 4 late compresseque ovoideis 2.5-3.5 mm. longis nuculis *P. julvi* similibus.

CALIFORNIA: "San Luis Obispo and Monterey counties," 1899, *Jared 28* (G); Lower Hospital Canyon, San Joaquin Co., April 1938, *Hoover 3067* (TYPE, Gray Herb.); lower end of Corral Hollow, San Joaquin Co.,

April 1937, *Hoover 1744* (G); 2 mi. east of Midway, San Joaquin Co., March 1932, *Mason 6829* (G); near Madison, Yolo Co., April 1902, *Heller & Brown* (G); Colusa County, May 1884, *Curran* (G).

This plant has the calyx, corolla, and fruit of *P. fulvus* var. *campestris*, and the type of inflorescence and growth-habit of *P. canescens*. The base of the stem, the root, the midrib and margins of the leaves, and commonly even the calyx-margins, are charged with abundant purple dye. In *P. fulvus* of Chile, and in the coarser but otherwise similar Californian var. *campestris*, the stems spring from a rather well developed and persistent basal leaf-rosette and produce, usually forked, definite scorpioid cymes which are devoid of bracts or rarely produce only one or two near their base. The basal rosette in *P. infectivus* is poorly developed and short lived. The inflorescence is not well differentiated from the leafy stem, as is the case in *P. fulvus*. The flowers are produced along elongate branches with numerous interspersed leafy bracts and accordingly seem to be scattered along leafy stems. This type of inflorescence is exactly that of *P. canescens*. The gross habit of *P. infectivus* and *P. canescens* is very similar. The deeply lobed calyx and the nutlet with an annulate scar, however, quickly distinguish *P. infectivus* from that species.

Plagiobothrys myosotoides (Lehm.) Brand, Pflanzenr. [Heft 97] IV. 252: 108 (1931).

Lithospermum myosotoides Lehm. Asperif. 319 (1818).

Lithospermum tinctorium R. & P. Fl. Peruv. 4, tab. 114 (1799); not Linn. (1753).

Plagiobothrys tinctorius Gray, Proc. Am. Acad. 20: 283 (1885); Johnston, Contr. Gray Herb. 78: 80 (1927).

CALIFORNIA: ridge between Isabel Valley and Arroyo Bayo, Mt. Hamilton Range, Santa Clara Co., in loose shale under dense chaparral, 2500 ft., April 28, 1935, *C. W. & H. K. Sharsmith 1893* (G); Big Sandy Valley, east base of Black Mt., Fresno Co., May 17, 1938, *R. F. Hoover 3465* (G).

The two Californian collections above cited have been compared with a large series of *P. myosotoides* from South America and agree so closely with the austral material, in all technical details and intangibles of habit, etc., that I am confident that they must represent that species, heretofore unreported from North America. In South America typical *P. myosotoides* ranges in Chile from the prov. of Bio Bio north to Coquimbo (lat. 30°-38°), usually well below 5000 ft. alt. It reappears further north, and naturally at higher altitudes (10-15000 ft.) in middle-western and southern Peru and adjacent Bolivia (lat. 11°-17°). The two Cali-

formian stations, one in the South Coast Ranges about 8 miles east of Mt. Hamilton Observatory, and the other in the Sierran foothills, 20-25 miles northeast of Fresno, are in areas which have been given a careful botanical exploration only recently. Neither are areas in which a recently introduced plant from Chile might be expected to appear. I am forced to the opinion that *P. myosotoides* is a native of California, but rare, local and only recently detected. It is another addition to the list of Californian borages which have an immediate close relative in Chile and Argentina or which divide their range between California and in these South American countries; e.g., *Coldenia Nuttallii*, *Cryptantha circumscissa*, *Plag. fulvus* var. *campestris* (var. *typica* in Chile), *Plag. acanthocarpus* (*P. gracilis* in Chile), *Plag. californicus* (*P. collinus* in Chile), *Pectocarya pusilla*, *Pectocarya linearis* var. *jerocula*, *Amsinckia tessellata*, etc.

Among the Californian species *P. myosotoides* is most closely related to *P. Torreyi* Gray. It is a more slender and erect plant with slightly smaller fruit and much more roughened nutlets. The nutlets of *P. Torreyi* have the back marked by broad smooth low-convex transverse ridges which are usually separated by parallel lineate grooves. In *P. myosotoides* the back of the nutlet is usually roughened by narrow crests and papillae, and the ridges are more irregular and usually separated by broad irregular interspaces. Both species have the herbage charged with a purple dye. *Plagiobothrys Torreyi* is a montane plant, of the Yellow Pine Belt. *Plagiobothrys myosotoides*, in California, comes from much lower altitudes in the chaparral. The two species are certainly closely related. Typical *P. myosotoides* differs from *P. Torreyi* in habit, but *P. verrucosus* of Patagonia (which perhaps may be no more than a variety of *P. myosotoides*) has exactly the habit of *P. Torreyi* and its var. *dij-fusus*, and has less roughened nutlets than *P. myosotoides* though these never become as smooth and as regularly marked as in the Californian *P. Torreyi*. In this group of species exact definition of species has become difficult.

The group connects with *P. tenellus* (Nutt) Gray through *P. shastensis* Greene. The basal constriction of the nutlet, producing the characteristic cruciform nutlets of *P. tenellus*, is usually present in *P. shastensis*, but it is usually less pronounced and may rarely be almost absent. The herbage varies in the amount of purple dye present. It is one of the dye-stained forms of *P. shastensis*, having weakly constricted nutlets, which was described as *P. Torreyi* var. *perplexans* Johnston. This latter variety had best go into the synonymy of *P. shastensis*.

Mention should be made of an unnamed plant immediately related to

P. myosotoides, which was recently collected by John Thomas Howell at The Pinacles, San Benito Co., 1937, no. 12905, and at Santa Lucia Camp, Santa Lucia Mts., Monterey Co., 1936, no. 2416. These are plants having the dye-stained herbage, the slender branching habit, and the nutlets of *P. myosotoides*. In fact they differ only by having the calyx armed with uncinatè bristles. The collections came from opposite sides of the Salinas Valley. The uncinatè hairs are not developed in the South American forms of *P. myosotoides* and, furthermore, are probably unique in the genus. Consequently this plant, otherwise similar to *P. myosotoides*, can not be an introduction from South America, and if it is native to California I can not see why the collections of *P. myosotoides* from Santa Clara and Fresno counties can not be accepted as native also.

***Cryptantha dissita*, sp. nov.**

Herba annua erecta 5-25 cm. alta; caulibus simplicibus vel non raro medium versus ramulos ascendentes breves 1-2 gerentibus, villosio-hispidis, pilis gracilibus haud pungentibus 0.5-1 mm. longis erectis et appressis; foliis oblongis ligulatis vel lineari-oblongis 6-20 mm. longis 2-3 mm. latis utrinque villosio-hispidis, supremis paullo reductis, infimis subcongestis, reliquis 3-15 mm. distantibus; pilis folii 1-1.5 mm. longis gracilibus saepe curvatis griseis haud abundantibus erectis vel ascendentibus e basi subbulbosa orientibus; cymis ternatis ebracteatis pedunculum nudum 1-6 cm. longum terminantibus 3-10 cm. longis; floribus numerosis, maturitate 5-15 mm. distantibus; corolla alba, limbo 4-6 mm. diametro, tubo (in sicco brunneo) ca. 2 mm. longo, lobis calycis floriferi aequilongo; calycibus fructiferis 5-6 mm. longis basim versus 2-2.5 mm. crassis, lobis supra nuculis conniventibus deinde erectis vel ascendentibus, costa incrassata pilis 1-2.5 mm. longis rigidis pungentibus 5-10 e basi bulbosa orientibus armata, alibi praesertim marginem versus loborum villosis (pilis 0.5-1 mm. longis adpressis); ovulis 4; nuculis 1-4 (saepe 2-4), abaxialari semper maturante, 2-2.5 mm. longis laevibus nitidis maculatis 2.5-plo longioribus quam latis, dorso convexis, latere rotundis, ventre subplanis vel late obtusis, sulco omnino clauso imam ad basim late furcato; gynobasi ca. 1 mm. longo; stylo apicem nuculi distincte attingente vel breviter sed distincte superante.

CALIFORNIA (Lake County): hills about Scotts Valley, 6 mi. northwest of Lakeport, May 30, 1902, *J. P. Tracy 1744* (G); near foot of grade west of Lakeport, May 1, 1938, *M. S. Baker 8956* (TYPE, Gray Herb.); on Hopland highway a few miles west of Lakeport, May 5, 1934, *M. S. Baker 7648* (G); near Lakeport, May 1, 1930, *M. S. Baker 4939* (G).