

TWO PENSTEMONS OF BAJA CALIFORNIA, MEXICO—ONE NEW, ONE USED  
(Scrophulariaceae)

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Among the fruits of many botanical trips in Baja California are various doubtful specimens, put aside for a time when there might be more time and then almost forgotten when there wasn't. Now the need for a name prompts me to take time for two neglected species.

Penstemon angelicus (I.M. Johnston) Moran, comb. & stat. nov.

P. clevelandii var. angelicus I.M. Johnston, Proc. Calif. Acad. Sci. iv. 12:1165. 1924.

P. clevelandii ssp. angelicus Keck, Amer. Midl. Naturalist 18:811. 1937.

Short-lived perennial, sometimes flowering first year, glabrous except for pedicels and flowers, the herbage somewhat grayish glaucous. Stems solitary or few from slightly woody base, virgate, 5-14 dm tall, to 2.5 cm thick at base, pale green, with ca. 15-35 nodes below inflorescence. Leaves all distinct, more crowded below, from irregularly dentate below to entire above: lower narrowly petiolate, 3-8 (-10) cm long, the blade ovate, acute to obtuse, 2-5 cm long, 1-3 cm wide, the petiole 1-3 cm long; few to several middle ones broadly petiolate, 4-8 (-12) cm long, 2-4 (-6) cm wide, elliptic to obovate, acute, narrowing gradually into petiole-like base 1-4 cm long and 2-12 mm wide; upper sessile, subcordate, triangular-ovate or narrowly so, acute, 4-7 (-8) cm long, 2-4 (-5) cm wide, the uppermost reduced and relatively narrower. Thyrses subracemose, 1-6 dm long, 3-5 cm wide, of ca. 5-25 nodes; peduncles erect or ascending, mostly 1-3 mm long, the lower in large inflorescences sometimes longer, in fruit even to 10 mm; cymes mostly 3-8 flowered; pedicels erect or ascending, glabrous to somewhat glandular-puberulent, 2-7 mm long in flower, to 12 (-18) mm long in fruit. Sepals purplish, ovate to mostly lanceolate or elliptic, acute, glabrous to glandular-puberulent, 3-6 mm long, 1.5-3 mm wide. Corolla scarlet, glandular-puberulent within and without, tubular-funnelform, bilabiate, 15-21 mm long, 5-8 mm wide at throat and 10-15 mm wide at apex (pressed), the tube slightly ascending, 3-5 mm long, 2-4 mm wide (pressed), the throat horizontal, rather abruptly ventricose anteriorly, straight posteriorly, in cross-section flat above and rounded below and ca. 4 mm high and 5 mm wide, the upper lip erect, 5-7 mm high, its segments rounded, 3-5 mm long, the lower lip deflexed, 6-9 mm long, its segments rounded, 4-6 mm long. Filaments

glabrous, the lower 10-12 mm long, adnate 2.5-3 mm, broadened at base, the upper 8-9 mm long, adnate 0.5-1 mm, with thickened ovate base ca. 1.5 mm wide; anther sacs explanate, ovate, glabrous, 1.5-1.9 mm long. Staminode 8-10 mm long, adnate 2-3 mm, glabrous, cuneately broadened to ca. 1 mm at apex. Ovary 2-3 mm long, the style 5-7 mm long. Capsules triangular-ovoid, brown, 7-12 mm long. Chromosomes:  $2n=16$ .

Type: Sheltered ledge of a basaltic cliff about 3 km from shore, in a short gorge-like constriction of Palm Canyon, Isla Angel de la Guarda, Baja California Norte, Mexico, 3 May 1921, Ivan M. Johnston 3413 (CAS 1304). To judge from Johnston's map, this is near 29°09'N, 113°13'W.

Distribution: Known only from Isla Angel de la Guarda, where it is occasional or locally common on slopes and especially in arroyo beds at 15 to 1080 m elevation in the northern to south-central part of the island. Collections: Hastings 71-12 (ARIZ, SD); Moran 7182, 7187, 8580, 12896, 12930, 23951 (SD and to go).

For one collection (M8580) Peter Raven got a chromosome count of  $2n=16$ , as reported also (by Keck and others) for most other counted diploid species of Penstemon, including P. clevelandii.

Until recently P. angelicus has been known only from the very incomplete type collection, with no flowers except a few dried ones found on the ground. Keck (1937) and Wiggins (1964), with no new material, followed Johnston in subordinating it to P. clevelandii. Later collections add several distinctive characters to those already known or suspected.

Penstemon angelicus is taller (5-14 dm) than P. clevelandii (3-7 dm). The transition from narrowly petiolate lower leaves to subcordate sessile upper ones is not abrupt but gradual on the taller stem of P. angelicus, with several broadly petiolate middle leaves. The inflorescence is sub-racemose, the peduncles greatly reduced as compared to those of P. clevelandii. The corolla is not crimson to purplish red but scarlet, with no trace of blue pigment. The corolla differs further in being a little shorter, relatively broader, and more markedly bilabiate; and the tube is much shorter and is more abruptly broadened to the throat. The staminode and stamens are much shorter and so do not closely approach the mouth of the corolla; and (in relation to the shorter tube) the staminode and lower stamens are inserted much closer to the corolla base. Thus P. angelicus differs rather sharply from P. clevelandii in several respects.

Because of its dentate leaves and ventricose corolla, P. angelicus seems best kept in subsection Spectabiles of section Peltanthera, where it becomes the only species with scarlet flowers. There is no other species to which it is obviously closest but perhaps none to which it seems closer than to P. clevelandii.

Penstemon vizcainensis Moran, spec. nov.

Herba biennis vel temporibus minus aridis saepe longius vivens, 1-2.5 m alta, praeter bracteolas ciliatas florasque glandulosas glabra. Folia viridia lanceolata usque 16 cm longa, inferioribus petiolatis denticulatis, superioribus sessilibus, supremis angustioribus integris. Thyrsus virgatus 4-15 dm altus 2-5 cm latus; sepala 4-5 mm longa sparse glanduloso-ciliata; corolla rosea infundibularis bilabiata sparsim glanduloso-puberulenta 18-22 mm longa; stamina glabra, antheris explanatis inclusis, staminodio glabro sparse barbato. Typus: Moran & Reveal 19938 (SD 92631). Species P. florida Brandegeae ut videtur proxima, quae autem 6-12 dm tantum alta est, foliis glaucis grossius denticulatis, inflorescentia glandulosa, corollae 22-30 mm longae.

Short-lived perennial, glabrous below inflorescence, the second year with single terminal flowering stem, in dry years often dying monocarpic, otherwise in next years with several stems from near base and then becoming bushy. Stems virgate, 1-2.5 m tall, to 2.5 cm thick at base, light green, after flowering dying mostly to lower fourth or below, with ca. 20-25 nodes below inflorescence, the lower crowded, the upper 6-10 cm long. Leaves bright green, lanceolate to oblong, to 16 cm long and 3.3 cm wide, the lower petiolate, acute to obtuse, cuneate at base, irregularly denticulate, with petioles to 3 cm, the middle sessile, acute, denticulate, the upper smaller and especially narrower, entire. Inflorescence a virgate thyrsus 4-15 dm high, 2-5 cm wide, of 12-30 internodes, the middle and lower 2-8 cm long, the upper shorter; peduncles closely ascending, 2-6 mm long; cymules of 1-3 (-10) flowers; bractlets narrowly lanceolate, acute, sparsely glandular-ciliate, ca. 5 mm long; pedicels ascending, 4-15 mm long. Sepals imbricate, lanceolate to ovate, acute to acuminate, 4-5 mm long, 1-3 mm wide, sparsely glandular-ciliate above. Corolla horizontal, deep pink to rose-purple, funnelform, bilabiate, 18-22 mm long, 8-10 mm wide at throat and to 17 mm wide at apex (pressed), sparsely glandular-puberulent without and in distal half within with trichomes mostly ca. 0.1 (-0.2) mm long, the tube ca. 3-4 mm long but indefinite, gradually ampliate into ventricose throat, the upper lip erect, ca. 5 mm long, the segments ca. 3 mm long, the lower lip ca. 6 mm long, the segments ovate, obtuse, 4-5 mm long and wide. Filaments glabrous, the lower 17-20 mm long, slightly broadened at base, adnate ca. 3 mm, the upper 15-18 mm long, with ovate basal thickening ca. 2 mm wide, nearly free;

anther sacs explanate, oval, ca. 2.4-2.7 mm wide, glabrous. Stamino-  
node 13-16 mm long, adnate less than 1 mm, thickened in lower 4 mm,  
slightly spatulate-broadened at apex, glabrous or sparsely bearded  
with to ca. 10 trichomes ca. 1 mm long within 3 mm of apex on pos-  
terior side. Ovary triangular-ovoid, very sparsely glandular,  
4-5 mm high, tapering into style 10-15 mm long. Capsule ovoid,  
brown, 8-10 mm long. Seeds black, angular, ca. 1.5 mm long.

Type: Steep north slope, bank of Arroyo Largo 16 km east of  
the mouth, Vizcaino Peninsula, Baja California Sur, Mexico (near  
27°37'N, 114°40'W), elevation ca. 340 m, 8 February 1973, Reid  
Moran and James L. Reveal 19938; holotype: SD 92631; isotypes  
to go (BM, CAS, MEXU, MO, NY, US).

Distribution: Known only from arroyos near the type locality.  
Other collections: bed of Arroyo Largo 4 km from mouth, 40 m,  
Moran 22769 (SD), 11 km from mouth, 150 m, Moran 28084 (SD), 14.5  
km from mouth, 270 m, Moran 28083 (SD and to go); gravelly arroyo  
bed [Arroyo de las Casitas] 12.4 km west of San José de Castro,  
300 m, Betty Mackintosh in 1969 (SD); arroyo bed 4.5 km west of  
San José de Castro, 350 m, Moran 28082 (SD).

The new species fits well in subsection Spectabiles of section  
Peltanthera (Keck 1937). It is remarkable for its height (1-2.5 m),  
equalled in the section only in P. eximius Keck (rarely to 2.8 m).  
It appears closest to P. floridus Brandegee, of east-central  
California and adjacent Nevada, and especially to the narrower-  
flowered southern subsp. austiniae (Eastw.) Keck. However, P.  
floridus is a shorter plant (6-12 dm), with glaucous and more  
coarsely dentate leaves, a glandular inflorescence, and longer  
corollas (22-30 mm); and the filaments of the shorter pair are  
somewhat viscid-puberulent at the base. The two members of this  
subsection closest geographically to P. vizcainensis are P. cleve-  
landii A. Gray, extending from southern California to Comodú,  
central Baja California, and P. eximius Keck, from the eastside  
canyons of the Sierra Juárez to Volcán las Tres Vírgenes, Baja  
California. Penstemon clevelandii is a much shorter plant (3-7  
dm), with relatively wider leaves and with a narrower, more nearly  
regular, crimson to purplish red corolla. Penstemon eximius has  
coarsely dentate leaves and a glandular inflorescence, and the  
corolla is white to pale pink with darker guidelines, is much  
larger (25-35 or even 45 mm long and 15-25 mm wide pressed), ex-  
pands more abruptly from a shorter tube, and has the lower lip  
bearded. Also close geographically is P. angelicus (I.M.Jtn.)  
Moran, fully described above.

The Vizcaino area has little rainfall and in some years none.  
A 12-year mean for Bahía Tortugas was 95.8 mm and a 10-year mean  
for Vizcaino 79.8 mm (Hastings & Humphrey 1969). No data are  
published for years since 1969.

In February 1969 Mrs. Mackintosh saw old stems of Penstemon several places but saw only one plant in flower. Her photograph shows this an old fruiting plant with stem still green, with some original leaves, and with two short flowering branches near the middle. Out of focus in the background are several seedlings and several old fruiting plants apparently dead in the upper half or more but with new axillary shoots below. At the type locality in February 1973, a season of moderate to high rainfall for the area, we found many seedlings and many old fruiting plants unbranched below the inflorescence and apparently dead and thus monocarpic. We found only one plant in flower, with several flowering branches from the base--perhaps a third-year plant, the only survivor of its generation. If so, we saw no plants that started the year before--suggesting that may have been a drought year. In December 1975, following more than a year of drought according to a local rancher, I found no seedlings but saw many old fruiting plants with new shoots near the base. In February 1980 I saw a few seedlings and only a dozen old plants the length of Arroyo Largo, all alive but none flowering.

These scattered observations suggest that drought years see few or no seedlings, so that a whole generation may have to wait; that plants flower the second year, then die nearly to the base; that many plants make further growth the third year even in drought years and will flower the third year and later if rainfall is adequate; but that many plants die after flowering once.

The many old stems seen in 1973, and likewise in 1975, told of very good flowering the year before. Only two plants were found flowering in the four years when collections were made, but possibly others flowered later in some of these years. Other years, such as 1979, appear to have had few plants flowering. Some plants grow on the bank and many in the bed of the arroyo. Even when not flowering, they are conspicuous by their height. It is noteworthy that they were found different places in different years.

#### References

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