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A NEW PENSTEMON (SCROPHULARIACEAE) AND GRINDELIA (ASTERACEAE)

FROM SOUTHERN NYE COUNTY, NEVADA

James L. Reveal¹

Department of Botany, University of Maryland

College Park, Maryland 20742

Janice C. Beatley

Laboratory of Nuclear Medicine and Radiation Biology, University of California,
Los Angeles, California 20742

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Reveal, J. L. (Dept. Bot., Univ. Maryland, College Park) and J. C. Beatley (Lab. Nuc. Med. Rad. Biol., Univ. California, Los Angeles). A new Penstemon (Scrophulariaceae) and Grindelia (Asteraceae) from southern Nye County, Nevada. Bull. Torrey Bot. Club 99: 000-000. 1972. -- A new Penstemon, P. pudicus is described from the Kawich Range, Nye Co., Nevada. A member of section Saccanthera, the entity may be distinguished by its long flowers, bearded staminode, glabrous leaves and anthers, and spreading habit. A new Grindelia, G. fraxino-pratensis is described from the Ash Meadows

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area of Nye Co., Nevada (extending into adjacent Inyo Co., California). It may be distinguished by erect or curved phyllaries, mostly entire to slightly dentate leaves (only at the apex), short ray lamina and resinous-punctate herbage.

Two additional species of vascular plants from southern Nye County, Nevada, are here described: Penstemon pudicus (Scrophulariaceae) from the high elevations of the Kawich Range southwest of Warm Springs; and Grindelia fraxino-pratensis (Asteraceae) from Ash Meadows, east of Death Valley, in extreme southern Nye County.

Penstemon pudicus Reveal & Beatley, spec. nov.

A P. gracilentus A. Gray corollis 25-35 mm longis et glabris ventralibus et a P. caesius A. Gray corollis non 17-23 mm longis et staminodiis non glabris differt; a P. kingii S. Wats. similaribus sed staminodiis barbatis, corollis longioribus (non 14-20 mm longis), labiis + brevioribus (non 4-7 mm longis), et antheris parum longioribus sed non tenus divisis, plantis glabris basi et not incanis atque P. kingii et P. cusickii A. Gray; a P. papillatus J. T. Howell et P. scapoides Keck foliis glabris differt, et a P. neoterico Keck antheris glabris et staminodiis barbatis differt.

Spreading herbaceous perennials 2-4.5 (5) dm high, lignescent at the base with few to several erect or ascending stems arising from a central crown; herbage green and decidedly glaucous, glandular within the inflorescence, the stems glabrous or infrequently glandular below, the foliage glabrous; basal central crown woody, mostly subterranean, spreading, the stems 2-6 (8) mm in diameter, with tannish-brown bark; flowering stems herbaceous, slender, light green except for a purplish hue near the base in some; leaves basal and cauline, the basal leaves crowded, the leaf-blade oblanceolate to spatulate, 1.5-5 cm long, 0.5-1.5 (2) cm wide, narrowed to a distinct petiole, the apex mostly acute or infrequently rounded, green above, glabrous and bluish-green

below, the petiole slender, 1-3 cm long, with an expanded, triangular, purplish-red petiole-base 1-3 mm wide, the margins often with fine hairs, the cauline leaves in pairs, the leaf-blade linear-oblongate, up to 5 (rarely 6) cm long and 1 cm wide, becoming reduced in size above and ultimately bract-like in the inflorescence, sessile except at the first node in some, otherwise similar to the basal leaves; inflorescences open panicles, 5-15 (20) cm long with 3-6 clusters of flowers, minutely glandular throughout with non-capitate hairs except for some capitate ones on the pedicel, calyx and on the outer surface of the corolla; pedicels bearing one (very rarely two) flowers, usually less than 2 cm long, erect and closely appressed to the main stem; calyx green, 6-8 (10) mm long, the sepals narrowly lanceolate, entire, acuminate, herbaceous; corolla violet-blue to azure-blue with a whitish tube, the lobes persistently colored, the tube and throat fading on drying and less intense blue when fresh, 25-35 mm long, 5-10 mm wide at the summit of throat, slightly glandular-pubescent without, especially so along the lips, glabrous within, slightly ampliate, the throat less than or just as long as the tube, the lips subequal, the upper ones 3.5-4 (4.5) mm long, the lower lips 5-6 (7) mm long, all moderately spreading, the lateral cleft slightly greater than the length of the lip; stamens essentially of equal length, equalling the length of the throat, the filament glabrous, the staminode (sterile filament) bearded with long golden-yellow hairs for 4-5 mm along the slightly dilated apex, slightly longer than the fertile stamens, the anther yellowish-white to white, 1.8-2 mm long, dehiscent about half the length at the apex, slightly gapping with minute teeth on the line of dehiscence less than 0.1 mm long, the body of the anther glabrous throughout; capsule dark brown, ovate, 8-11 mm long including the 2.5-3 mm long beak, the style long-persistent, 2.8-3.4 cm long, slightly curved toward the apex, the seeds several, irregularly shaped, yellowish-black or grayish, 1.2-1.5 (1.8) mm long.

Type: NEVADA: Nye Co.: Kawich Range, east side of range, area of Eden Creek Mining Camp southeast of Kawich Peak, 10.5 km west of Reveille Valley Road from a point 23.5 km south of Nevada Highway 25, about 28 airline km south of Warm Springs, on steep mountain slopes and along washes and lower slopes associated with Artemisia tridentata, Cercocarpus ledifolius, Pinus monophylla and Juniperus osteosperma, at (2320-) 2380 (-2750) m elevation, T. 1 N., R. 50 E., secs. 7 (SE1/4) and 18, 5 July 1971, Beatley 12950. Holotype, US! Isotypes, 40 sheets to be distributed by US.

Additional Collections Seen: All from Nye Co., Nevada: Steep eastern exposure adjacent to saddle east of the upper meadows above Longstreet Ranch, west of Kawich Peak, west slope of Kawich Range, at 2440 m, 7 June 1970, Beatley & Reveal 11070 (NTS); from the type area: 15 June 1970, Beatley & Reveal 11219 (NTS); 17 July 1970, Beatley et al. 11511 (NTS, US); 31 July 1970, Beatley 11578 (NTS); 26 June 1971, Beatley 12900 (NTS, NY, US); 26 June 1971, Holmgren et al. 5227 (NY, US).

The Bashful Beardtongue, Penstemon pudicus, is a woodland-border species, growing primarily in partial shade in Pinyon-Juniper woodland, and around the margins of Cercocarpus thickets of the adjacent steep Artemisia slopes, which characterize the high elevations of the Kawich Peak area of the Kawich Range. In the type locality it is a common species in the communities with which it is associated.

This lovely addition to the large and complex genus Penstemon is a member of section Saccanthera, subsection Saccanthera (=Heterophylli), a group which is likely an unnatural assemblage of plants whose origins are from scattered places in the genus but which are held together by a single "key character", the saccate anther (Keck, 1932; Pennell, 1935; Crosswhite, 1965). While it may be possible to assign members of the section Saccanthera to other groups within the genus, this does not discredit any attempt to place new entities within it as long as the section remains so defined. Thus, while the present

species, P. pudicus, is perhaps a relative of section Graciles, it is more closely and clearly related to those species placed in Saccanthera whose origins might have been Graciles, but are currently separated on the basis of their distinct anther.

Penstemon pudicus (from pudicus L., modest or bashful, as to its remote occurrence in the Kawich Range) is most closely related to P. gracilentus A. Gray of the northern Sierra Nevada of eastern California and adjacent Nevada. The two are readily distinguished by flower size. In the immediated area, P. kingii S. Wats. may be found, but its glabrous staminode, small purple-blue flowers and short compact habit make distinction easy. Of those species of Saccanthera that have bearded staminodes, P. pudicus may be distinguished as follows:

A. Leaves and lower stems glabrous, not canescent.

B. Corolla 13-16 mm long; flowers fasciculate..... P. gracilentus

BB. Corolla 25-35 mm long; flowers not fasciculate..... P. pudicus

AA. Leaves canescent.

B. Sepals linear-lanceolate; corolla glabrous within.. P. papillatus

BB. Sepals broadly ovate; corolla villous within..... P. scapoides

Grindelia fraxino-pratensis Reveal & Beatley, spec. nov.

A G. hallii Steyermark plantis (5) 7-10 (12) dm altis (nec 3-6 dm altis), foliis integris vel dentatis apicem versus (nec serratis ubique), inflorescentiis paniculatis nec corymbosis, capitulis brevioribus, radiis pro parte maxima 13 (nec 13-21), laminis 3-4.5 (7) mm longis differt.

Erect biennial or more commonly perennial herbs (5) 7-10 (12) dm high, with 1-3 (5) herbaceous stems arising from a subligneous, compact caudex atop a stout, woody taproot, the bark reddish-brown to brown; stems erect, glabrous, tan to reddish, simple about half their length, then openly branched, leafy throughout; leaves subcoriaceous, mostly dark green, conspicuously resinous-punctate throughout, mostly entire to dentate toward the apex with acute,

infrequently mucronate, tips, the basal (and usually overwintering) leaves narrowly oblanceolate, the blade 4-7 cm long, (7) 9-12 (15) mm wide, tapering gradually to a 1-3 cm long petiole, the thin membranaceous petiole-base up to 7 mm long and 5 mm wide, glabrous, the cauline leaves oblanceolate to oblong, the blade 1.5-5 (7) cm long, (3) 5-10 (12) mm wide, mostly sessile and amplexicaul, those at the lower nodes occasionally short-petioled, otherwise similar to the basal leaves; inflorescences open, paniculately branched with floriferous branchlets spreading to erect, glabrous and tannish, the branches and branchlets becoming reduced in length above; heads radiate, 8-10 (14) mm across; involucres cylindrical, 7-9 mm high, 5-10 mm wide, 4-7 seriate with narrowly lanceolate, thickish, resinous-punctate phyllaries 3-7 mm long, 0.8-1.2 mm wide, the upper tip usually green, erect to spreading or curved outward, the outer ones more curved than those above, not looping back to form a ring; ray-florets mostly 13, the lamina golden-yellow to lemon-yellow, 3-4.5 (7) mm long, 1-1.6 mm wide, the tube 4-4.5 (5) mm long, brownish-yellow in most, both the lamina and tube frequently resinous; disk-florets golden-yellow, 4-5 (5.5) mm long, the stigma linear, hispidulous; achenes oblong, 2.5-3.5 (4) mm long, tan to light brown, striated, truncate and smooth at the apex; awns 2 per floret, stoutish, entire, 3-4 mm long.

Type: NEVADA: Nye Co.: Amargosa Desert, Ash Meadows, in meadows along the Ash Meadows Road between Devils Hole and Ash Meadows Lodge, 1.5 airline km northwest of the Lodge, associated with Distichlis, at 660 m, T. 18 S., R. 50 E., sec. 23 (SE1/4), 21 August 1968, Reveal & Holmgren 1887. Holotype, US! Isotypes, 35 sheets will be distributed by US.

Additional Collections Seen: CALIFORNIA: Inyo Co.: Ash Meadows, Carson Slough, T. 26 N., R. 6 E., sec. 30, 5 May 1971, Reveal 2295 (NTS, US). NEVADA: Nye Co.: All Ash Meadows: 22 July 1965, Beatley 3310 (DS, NTS, RSA, US); 20 October 1968, Beatley 7224 (NTS, US); 17 June 1969, Beatley 9005 (NTS, US); 14 July 1969, Beatley 9322 (NTS); 11 October 1969, Beatley 9771 (NTS, US);

8 October 1970, Beatley 11820 (NTS); Beatley 11897 (NTS, US); 1 September 1971, Beatley 13154 (NTS, US); 21 September 1971, Beatley 13242 (NTS, US); 30 June 1968, Reveal 1431 (NTS, US); 4 July 1968, Reveal 1490 (NTS, US); 13 July 1968, Reveal 1536 (NTS, US); 15 September 1968, Reveal 2107 (NTS, US).

The Ash Meadows *Grindelia*, *Grindelia fraxino-pratensis*, is associated with *Atriplex confertifolia*, *Haplopappus acradenius*, *Distichlis*, and *Fraxinus-Baccharis* communities, in open meadows and woodland borders. It is rather widely distributed over Ash Meadows as usually small local populations and sometimes occurs as a weed species of disturbed sites; it is most frequent in the northern and eastern parts of the area. The species is associated with clay soils of both the uplands and lowlands, but exhibits its best development in size and numbers of plants in soils which are water-saturated much of the year.

The new species is seemingly most closely related to *Grindelia hallii* Steyermark of southern California. The two differ in size of plant, the entire leaves of the Ash Meadows species, the paniculate inflorescence as opposed to the corymbose inflorescence of *G. hallii*, and the lower number of ray-florets in *G. fraxino-pratensis*. In Kearney and Peebles (1951), the new species keys to *G. arizonica* A. Gray, but the two are only remotely associated and easily distinguishable by the size the ray lamina length along, with those of *G. arizona* being nearly twice to three times the length of those of *G. fraxino-pratensis*.

The authors are grateful to Peter H. Raven for his critical review of the original 1965 collection of the *Grindelia* and suggestion that this was likely a new species, and to Arthur Cronquist and Max P. Dunford for their subsequent help and interest in the disposition of this taxon.

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