

light fires may be beneficial to the species in woodland vegetation (cf. Griffin, 1976); and (5) the ecological behavior of coulter pine appears different in differing parts of its ecological range, presumably because of variations in environmental conditions and associated species.

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NOTEWORTHY COLLECTIONS

POLYGONUM HYDROPIPEROIDES Michx. (POLYGONACEAE).—Ecuador, Galápagos Ids., Indefatigable (Santa Cruz) I., S slope, 300 m, moist places, 7 Apr 1930, *Svenson 98* (BKL). Seen through courtesy of the Director, Brooklyn Botanical Garden.

Previous knowledge. Reported under this name by Svenson (*Amer. J. Bot.* 22:228. 1935): "South slope of the mountain, scattered in a moist ravine at 1000 ft." Erroneously ascribed to Isla Isabela in Wiggins and Porter (*Fl. Galápagos Ids.* 1971). Not otherwise known from the archipelago.

Diagnostic characters. Pl andromonoecious; lvs broad- to linear-lanceolate, ± glabrous except marginally; fls pink to rose; fr perianth oval, completely enclosing achene at maturity.

Significance. Abaxial surfaces of lvs of *Svenson 98* are covered with silvery pustules ("plate glands") typical of *P. opelousanum* Ridd. ex Small (Mitchell, *Bull. N. Y. St. Mus.* 431:53. 1978). Plate glands do not occur on *P. hydropiperoides*. *P. opelousanum*, more tropical in distribution than *P. hydropiperoides*, has been collected a number of

times on Isla Santa Cruz in the general area where Svenson gathered his specimen. This is a single small plant with immature achenes that have not yet enlarged enough to become exerted from the perianth, as is typical for *P. opelousanum*. This character is generally used in keys to distinguish the two species. Thus, *P. hydropiperoides* should be deleted from the list of plants known to occur in the archipelago.—DUNCAN M. PORTER, Department of Biology, Virginia Polytechnic Institute & State University, Blacksburg 24061. (Accepted 28 Apr 1978.)

The following records are from the Arizona Strip, that portion of Arizona lying north and west of the Colorado River. Collections were made as part of a Bureau of Land Management inventory. Special acknowledgment is due Ralph K. Gierisch, BLM, who has generously provided many collections and field assistance.

For all taxa reported herein, herbaria consulted are ASU, ARIZ, ASC, and MNA; published sources are the following: Abrams, *Illus. flora Pacific States*. 1940–1960; Barneby, *Mem. New York Bot. Gard.* 13:1–1188. 1964; Beatley, *Vasc. pls. Nevada Test Site*. 1976; Benson, *The cacti of Arizona*, ed. 3. 1969; Cronquist et al., *Intermountain flora*. 1977; Davis et al., *Flora of Idaho*. 1952; Federal Register 40(127):27824–27924. 1975; Federal Register 41(117):24524–24572. 1976; Gillett, *Canad. J. Bot.* 50:1975–2007. 1972; Harrington, *Man. pls. Colorado*, ed. 2. 1964; Hitchcock and Chase, *Man. grasses U. S.* 1950; Hitchcock et al., *Vasc. pls. Pacific Northwest*. 1955–1969; Kearney et al., *Arizona flora*. 1960; Lehr, *J. Ariz. Nev. Acad. Sci.* 14:18. 1979; McDougall, *Seed pls. Northern Arizona*. 1973; McDougall and Stockert, *Plateau* 39:102–103. 1966; Muenscher, *Poisonous pls. U. S.*, ed. 2. 1975; Munz, *A flora of southern California*. 1974; Munz, *A California flora*. 1959; Parker, *An illus. guide to Arizona weeds*. 1972; Porter, *A flora of Wyoming*. 1962–1972; Raven, *Contr. U. S. Natl. Herb.* 37:161–396. 1969; Reveal, *Phytologia* 34:409–484. 1976; Shreve and Wiggins, *Vegetation and flora of the Sonoran Desert*. 1964; Tutin et al., *Flora Europea*. 1964; Welsh, *Great Basin Naturalist* 38:225–367. 1978; Welsh and Moore, *Utah Plants, Tracheophyta*. 1973; Welsh et al., *Great Basin Naturalist* 38:125–179. 1978.

BALSAMORHIZA HOOKERI Nutt. (ASTERACEAE).—Mohave Co.: Virgin Mts, E side Black Rock Mt, ca. 4 km W of Maple Spring, T39N R14W S13, basalt with *Juniperus*, *Pinus*, and *Artemisia tridentata*, 1900 m, 21 May 1978, *Brown 803 and Parfitt* (ASU).

Previous knowledge. NW WA to SW WY, S UT (Hitchcock), N CA (Munz). Absent from OR (Hitchcock).

Significance. First state record, representing a range extension from SW UT. *B. sagittata* (Pursh) Nutt. was recently reported from NE AZ (McDougall).

SOLIDAGO SPECTABILIS (D. C. Eaton) A. Gray. (ASTERACEAE).—Mohave Co.: near Littlefield, T40N R15W S4, along stream through desert shrub zone, 580 m, 21 Nov 1978, *Gierisch 4601* (ASU).

Previous knowledge. SE OR to UT, E-central CA (Munz).

Significance. First state record, representing a range extension from S UT.

STENOTUS ACAULIS (Nutt.) Nutt. (ASTERACEAE).—Coconino Co.: N end House Rock Valley, mouth of Burro Canyon, T39N R3W S4 NW¼, limestone, 1800–1950 m, 13 May 1978, *Brown 519 and Parfitt* (ASU); Buckskin Mts, T41N R2E S16 and 21, steep rocky limestone slope and ledges with *Cowania*, *Fallugia*, and *Artemisia*, 1990 m, 9 May 1978, *Gierisch 4285* (ASU).

Previous knowledge. Central OR (Abrams) to SASK (Davis), N-central CO (Harrington), N AZ (Kearney), Baja Calif. (Munz, 1974). Report from AZ based upon “doubtful evidence” (Kearney). Synonym: *Haplopappus acaulis* (Nutt.) A. Gray.

Significance. First definite state record, representing a range extension from adjacent UT.

HUTCHINSIA PROCUMBENS (L.) Desv. (BRASSICACEAE).—Mohave Co.: Buckhorn Spring ca. 8 km N of Lake Mead, T34N R16W S26, silty soil with *Larrea* and *Krameria*, 510 m, 19 Apr 1978, *F. Smith 934* (ASU). Cochise Co.: Croton Springs, Willcox Playa, 28 Mar 1962, *P. S. Martin s.n.* (ARIZ).

Previous knowledge. Brit. Columbia to WY, to W CO (Harrington), UT (Welsh and Moore), S CA (Munz), central Baja Calif. (Shreve), N AZ (Kearney); also Labrador to Newfoundland, in Europe, Asia, and Australia (Abrams).

Significance. Second and third state records; Croton Springs apparently the SE-most site in N.A. Last AZ collection from late nineteenth century at Pearce (Pierce) Spring, Mohave Co. (Kearney). We were unable to locate Pearce Spring on any maps.

OPUNTIA WHIPPLEI Engelm. & Bigelow var. *MULTIGENICULATA* (Clokey) L. Benson. (CACTACEAE).—Mohave Co.: above Hurricane Rim, Navajo Trail, T39N R9W S8, rocky loam—limestone with *Cowania*, *Artemisia*, and *Chamaebatiaria*, 1615 m, 13 Sep 1978, *Gierisch 4509* (ASU).

Previous knowledge. Species from S NV to SW CO, to NW and W NM, N and central AZ (Benson). Variety from S NV to SW UT, NW AZ (Benson).

Diagnostic characters. Shrub with densely compact branching; joints up to 2 cm in diameter, usually shorter than 8 cm; spines 10 or more per areole, obscuring the stem; spine sheaths tan or yellowish-pink; fruit yellow, spineless; flowers greenish-yellow.

Significance. Second record of the variety in AZ. The previously reported locality is 116 km to the S. Proposed for threatened status throughout its range (Fed. Reg. 40).

HALOGETON GLOMERATUS (Bieb) Mey. (CHENOPODIACEAE).—Mohave Co.: E of Hurricane Rim near Antelope Springs, T41N R9W S23, desert scrub with *Atriplex*, *Chrysothamnus*, *Gutierrezia*, *Tetradymia*, and *Suaeda*, 22 Aug 1978, *Gierisch 4464* (ASU).

Previous knowledge. S ID to central WY (Porter), W-central CO (Harrington), UT, NV (Muenscher), S CA (Munz, 1974). Native to Eurasia (Porter).

Significance. First state record, representing a range extension from adjacent UT, and indicative of the continuing spread of this poisonous weed.

ASTRAGALUS ACUTIROSTRIS S. Wats. (FABACEAE).—Mohave Co.: 2.3 km SE of NV state line along road from Mesquite, NV to Lime Kiln Canyon, T38N R16W S9 NW¼, N-facing slope, sandy-rocky soil with *Larrea*, *Opuntia*, and *Yucca*, 790 m, 28 Apr 1978, *Brown 250 and Parfitt* (ASU). Identified by R. C. Barneby.

Previous knowledge. S and E CA to S NV, to Baja Calif. (Barneby), W-central AZ (Lehr).

Significance. Second record for the state and first record for Mohave Co. The Yavapai Co. locality (Lehr) is ca. 310 km SSE.

TRIFOLIUM KINGII S. Wats. ssp. *MACILENTUM* (Greene) Gillett. (FABACEAE).—Mohave Co.: Virgin Mts, Black Rock Mt, SE of Quaking Asp Spring, T39N R14W S10, 2060 m, 21 May 1978, *Brown 800 and Parfitt* (ASU). Identified by J. M. Gillett.

Previous knowledge. Species from S ID (Davis) to UT, E NV (Gillett), N AZ (Davis), W CO (Harrington). Subspecies from SW UT (Gillett, Welsh), E NV (Welsh). Because neither Gillett nor Welsh considered *T. kingii* ssp. *macilentum* to occur in CO or AZ, Harrington and Davis may have been working with misidentified specimens.

Diagnostic characters. Perennial to 35 cm tall with few leaves; leaflets thin, not fleshy, setose to dentate; heads conspicuously longer than broad; calyx sparsely pubescent, the lobes shorter than the tube.

Significance. First definite record for AZ, representing a range extension from adjacent SW UT.

PHACELIA CURVIPES Torr. (HYDROPHYLLACEAE).—Mohave Co.: Virgin Mts, Lime Kiln Canyon, T38N R16W S33 SE¼, E- and W-facing limestone slopes with *Juniperus*, *Pinus*, *Cowania*, and *Agave*, 1270 m, 28 Apr 1978, *Brown 265 and Parfitt* (ASU); Lime Kiln Canyon, T37N R16W S4, rocky and sandy SW slope with pinyon, juniper, *Quercus turbinella*, *Arctostaphylos*, and *Coleogyne*, 1430 m, 28 Apr 1978, *Gierisch 4232* (ASU).

Previous knowledge. S CA (Munz) to NV, SW UT (Welsh and Moore).

Significance. First state record, representing a range extension from SW UT and S NV. Its occurrence in AZ was anticipated by Kearney.

NAMA PUSILLUM Lemmon. (HYDROPHYLLACEAE).—Mohave Co.: Burro Study Area (Bureau of Land Management) ca. 8 km N of Lake Mead, T34N R16W S27, desert pavement with *Larrea*, *Ambrosia*, and *Opuntia*, 500 m, 27 Apr 1978, *F. Smith 983* (ASU).

Previous knowledge. SE CA (Munz) to S NV, W AZ (Kearney).

Significance. Second state record, representing a NNE disjunction of 162 km from the previously reported AZ locality at Fort Mohave, Mohave Co. Apparently the last AZ collection was made in 1884 (the type collection).

CAMISSONIA PARVULA (Nutt. ex T. & G.) Raven. (ONAGRACEAE).—Coconino Co.: W edge Paria Plateau, Corral Valley, along Corral Valley Road, T40N R4E S18 SE¼, deep sand with *Artemisia tridentata*, *Artemisia filifolia*, and *Juniperus*, 1860 m, 15 May 1978, *Brown 597 with Parfitt and Gierisch* (ASU). Identified by P. H. Raven.

Previous knowledge. S and central WA to W WY, to NW CO, UT, NV, E-central CA (Raven). Synonym: *Oenothera contorta* (Dougl.) Kearney var. *flexuosa* (A. Nels.) Munz, *pro parte*.

Diagnostic characters. Herbaceous annual to ca. 20 cm tall with one or more wiry stems, strigose to subglabrous, few glandular trichomes in inflorescence; leaves linear, definite basal rosette lacking; sepals reflexed singly, not in pairs.

Significance. First state record, representing a range extension from UT.

EREMOPYRUM TRITICEUM (Gaertn.) Nevski. (POACEAE).—Coconino Co.: ca. 1.6 km N of Fredonia on hwy 89A, T41N R2W S8 SE¼, hard gray clay with *Sarcobatus* and *Lycium*, 1430 m, 17 May 1978, *Brown 652 and Parfitt, Gierisch 4324* (ASU). Verified by F. W. Gould; N of Sedona, 1370 m, 1 Jun 1967, *Soil Conservation Service s.n.* (MNA).

Previous knowledge. E OR (Cronquist) to MT (Davis), to central CO (Harrington), W and central UT, N, NV (Cronquist). Native to Russia (Cronquist). Synonym: *Agropyron triticeum* Gaertn.

Significance. First state records, representing range extensions from W and central UT. Apparently continuing to spread.

POA NEVADENSIS Vasey ex Scribn. (POACEAE).—Mohave Co.: Virgin Mts, Lime Kiln Canyon, T38N R16W S33 SE¼, limestone with *Juniperus*, *Pinus*, *Cowania*, and *Agave*, 1270 m, 28 Apr 1978, *Brown 269b and Parfitt* (ASU). Verified by F. W. Gould.

Previous knowledge. AK (Cronquist) to MT (Hitchcock), to CO (Harrington), N AZ (McDougall), E-central CA (Munz).

Significance. Second definite locality for AZ and first record for Mohave Co., representing a disjunction of 280 km to the NW of the previously known AZ locality (Fort Valley Park, Coconino Co.).

SCHISMUS ARABICUS Nees. (POACEAE).—Mohave Co.: SW of St. George, flat SE of Black Knolls, with *Larrea*, *Lycium*, and *Krameria*, T41N R12W S18, 980 m, 20 May 1978, *Brown 757 and Parfitt* (ASU). Verified by F. W. Gould.

Previous knowledge. S CA (Munz, 1974) to S NV (Beatley), to S AZ (Kearney); also N AZ (Welsh et al.), SW UT (Cronquist), Chile (Hitchcock and Chase). Native to SW Asia (Munz) or Africa (Hitchcock and Chase).

Significance. Second record for N AZ, representing a disjunction of 185 km W of the site of the first N AZ record. These records, and a report of the species in extreme SW UT, add to the documentation of the continuing spread of *S. arabicus* throughout the range of *S. barbatus* as suggested by Parker.

ERIOGONUM DARROVII Kearney. (POLYGONACEAE).—Mohave Co.: near Ide Valley Spring, T39N R13W S31, rocky clay loam with *Pinus*, *Juniperus*, *Rhus*, and *Gutierrezia*, 19 Jul 1978, *Coombs and Bundy 2631* (ASU); near Ide Valley Spring, T38N R13W S6, gravelly loam in woodland with pinyon, juniper, and *Rhus*, 18 Aug 1978, *Gierisch 4453 and Bundy* (ASU); verified by J. L. Reveal; vicinity of Mt Trumbull, gravelly loam with *Juniperus*, *Cowania*, and *Artemisia*, 2 Jun 1978, *Gierisch 4375* (ASU); Parashont Wash, T34N R12W S10, rocky loam along roadside with *Juniperus* and *Artemisia*, 1740 m, 24 Aug 1978, *Coombs, Gierisch and Bundy 2695* (ASU); 0.8 km S of Pigeon Tank, T33N R12W S6, gravelly loam in road, 1740 m, 7 Sep 1978, *Coombs and Bundy 2753* (ASU). Verified by J. L. Reveal.

Previous knowledge. White Pine Co., NV and Kaibab Plateau, Coconino Co., AZ (Reveal).

Diagnostic characters. Low, spreading annual, leafy throughout; outer tepals fan-shaped and hooded.

Significance. First records for Mohave Co., representing disjunctions of 80–130 km W of previously reported localities. Proposed for endangered species status (Fed. Reg. 41). However, these collections show the species is rather widespread on the Strip.

RANUNCULUS TESTICULATUS Crantz. (RANUNCULACEAE).—Coconino Co.: ca. 1.6 km N of Fredonia along hwy 89A, T41N R2W S8 SE¼, hard gray clay with *Lycium*, 1430 m, 17 May 1978, *Brown 654 and Parfitt* (ASU); Coconino Co.: Oak Creek Canyon, May 1973, *Theroux 495* (MNA); Apache Co.: Canyon de Chelly National Monument, *Halse 756, 776, 791, 803, 843* (ARIZ); 6.4 km NW of Ganado along hwy 63 and 264, picnic area, 20 Apr 1979, *K. Rill 5018* (OSH, ASU).

Previous knowledge. E WA (Abrams) to NE WY (Porter), to W CO (Harrington), UT, N AZ (McDougall), NV, OR (Hitchcock). Native to SE and E-central Europe (Tutin). Synonym: *Ceratocephalus testiculatus* (Crantz) Roth.

Significance. Second, third, fourth, and fifth state records, representing the spread of the species throughout much of N AZ. May be expected to invade Mohave Co. which is ca. 1 km W of the Fredonia site. First report was from Grand Canyon Village, 110 km SSE of Fredonia (McDougall and Stockert).

GALIUM BIFOLIUM S. Wats. (RUBIACEAE).—Mohave Co.: E side Virgin Mts, Maple Spring in Maple Canyon, T39N R13W S17 and 20, steep N-facing slope, limestone with *Acer* and *Quercus*, 1680 m, 21 May 1978, *Brown 784 and Parfitt* (ASU).

Previous knowledge. S Brit. Columbia (Hitchcock) to MT, to W-central CO (Harrington), N AZ (Kearney), S CA (Munz, 1974).

Significance. Second state record and first Mohave Co. record, representing a disjunction of 170 km NW of the previously reported locality (Greenland Lake on N rim of Grand Canyon).—BRUCE D. PARFITT, GREGORY K. BROWN, and ELINOR LEHTO, Department of Botany and Microbiology, Arizona State University, Tempe 85281. (Accepted 30 Apr 1979).



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