**Fuchsia pachyrhiza** (Onagraceae), a Tuberous New Species and Section of *Fuchsia* from Western Peru

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**ABSTRACT.** *Fuchsia pachyrhiza* is described and is the type of the new section *Pachyrhiza*. The species is known from only two localities along the western slope of the Peruvian Andes. Distinguishing sectional characters are the presence of a whorl of reflexed stamens, tuberous roots, alternate leaves, pollen with smooth viscin threads, and small flowers with a distinctively ridged nectary. The tuberous roots appear to be adapted for water as well as starch storage, and are most likely related to the strongly seasonal habitat and deciduous habit of the species. Chromosome number is *n* = 11, the normal diploid condition for the genus, and only bivalents are present at meiosis. No clear affinities with other sections of *Fuchsia* can be discerned based on the characters examined.

A very distinctive *Fuchsia* was collected along the Pacific slope of the northern Peruvian Andes by the second author during the rainy season of 1985. Upon examination, this plant proved to be an undescribed species that possesses a suite of characters not found in any currently recognized section of the genus (Berry 1982). The area was revisited in 1987 to make more detailed field observations on the species, and to obtain additional material for cytological, anatomical, and morphological analysis, as well as live material for cultivation and for macromolecular analysis (Sytsma, in prep.). In this paper we formally describe the new species and section, and present information on its morphology, palynology, and cytology. Because of the unusual tuberous roots and deciduous habit, a detailed investigation of the root and wood anatomy was also undertaken.

**TAXONOMIC TREATMENT**

**Fuchsia** Section *Pachyrhiza* P. Berry & B. A. Stein, sect. nov.—**TYPE: Fuchsia pachyrhiza** P. Berry & B. A. Stein.

Frutex radicibus valde tuberosis. Folia pleurnque alterna. Flores axillares, biseuales, sepalis petalis duplo longioribus, parum basi connatis, nectario disco annulari styli basin cingenti atque 4-porcatro inter tubum stylumque, petalis subconvolutis; staminibus filamentis antepetalis erectis, antipetalis in tubum reflexis inclusisse; bacca seminibus multis, 120–150.

Shrubs with thick, tuberous roots. Leaves mostly alternate, deciduous. Flowers hermaphroditic, solitary, axillary, and pendant. Floral tube suburceolate, 4-lobed, the nectary forming a ring around the base of the style, with 4 conspicuous ridges extending out to the floral tube.
and tapering upwards towards the rim. Sepals longer than the floral tube, shortly connate at base. Petals erect and subconvolute, ca. ½ the length of the sepals. Stamens in two series, filaments of the antepetalous stamens erect, those of the antipetalous stamens reflexed and included within the floral tube. Pollen mostly 2-, rarely 3-apaturate, with smooth viscin threads and elongate sculpture elements in the ectexine. Stigma capitale, slightly 4-lobed. Berries oblong with 120–150 seeds per fruit. n = 11.

**Fuchsia pachyrhiza** P. Berry & B. A. Stein, sp. nov. (fig. 1).—**Type:** Peru, Cajamarca, 11–15 km from Contumazá on road to Cascas, 94–101 km above Casa Grande (Panamerican Hwy.), 7°25'S, 78°50'W, 2450–2550 m, 8 Feb 1987, Stein et al. 4066 (holotype: MO; isotypes: AAU, B, CAS, F, HUT, K, NY, U, USM).

Frutex 1–2 metralis, radicibus tuberosis. Folia anguste elliptica, plerumque alternata, decidua. Flores pendentes, secundi, tubo florali suburceolato, 6.5–7.5 mm longo, rubro-aurantiaco, parum ovario longiore, petalis suborbiculari-bus, erectis subconvolutisque, marroninis; staminibus filamentos 1–1.5 mm longis, antipetalis in tubum reflexis. Numerum chromosomicus n = 11.

Erect to scandent shrubs 1–2 m high. Branches arching to divergent with reddish-brown, exfoliating bark; young stems pilose with hairs 0.3–0.5 mm long. Roots tuberous with large clusters present at base of stem, individual segments irregularly ovoid to clavate, to 16 cm long and 5.5 cm in diam. Leaves deciduous in the dry season, mostly alternate, occasionally opposite or ternate, membranaceous, narrowly elliptic, 5–13 cm long, 1.5–2.5 cm wide, glabrous above with impressed veins, subglabrous to pilose below, margins serrulate; secondary veins 9–15 on either side of the midvein. Petioles pilose, 5–21 mm long, often leaving a subspinose protrusion on the stem after leaf abscission. Stipules dark, triangular with subulate tips, 0.8–1.1 mm long, persistent. Flowers solitary in upper leaf axils, pendant and secund. Pedicels 19–44 mm long. Ovary oblong, pilose, light red, 5–7 mm long, 1.5–3 mm long in diam. Floral tube suburceolata, 6.5–7.5 mm long from top of ovary to point of petal and stamen insertion, 4–5 mm in diam. and 4-lobed at the base, narrowed to 3.5 mm in diam. in the middle, ca. 4.5 mm in diam. at the rim, sparsely pilose outside, glabrous within; nectary a ring ca. 1 mm high, surrounding and tightly appressed to the base of the style, with 4 stout ridges extending up along the floral tube and tapering towards the rim. Sepals triangular, spreading at anthesis, 9–11 mm long, connate at base for 2–3 mm, 3 mm wide at the base of the lobes. Tube and sepals red to orange-red. Petals maroon, suborbicular, erect, slightly convolute, 5–6.5 mm long, 4.5–5.5 mm wide. Stamens in two series, the antepetalous stamens erect and exserted above the floral tube, with filaments 1–1.5 mm long, the antipetalous stamens reflexed and included within the tube, with filaments 1 mm long; anthers oblong, 2–3.5 mm long, 1–2 mm wide, with a small, mucronate tip, dorsifixum, the exserted anthers slightly larger; pollen 2- (rarely 3-) aperturate, longest dimensions 84–96 μm (based on 10 grains), the exkine with elongate sculpture elements and smooth viscin threads attached near the proximal pole. Style glabrous, 12–14 mm long, pink; stigma capitale, shortly 4-lobed, 2 mm long, 1.5–2 mm in diam., pink. Berry oblong, 15–20 mm long, 10–12 mm in diam., deep maroon; seeds laterally compressed, 1.2–1.6 mm long, ca. 1 mm wide, 120–150 per fruit. n = 11.

**Distribution** (fig. 2). Known only from two localities on the western slopes of the Peruvian Andes, near Contumazá in Cajamarca Department and near Cochabamba in Ancash Department, at elevations of 2450–2900 m.

**Additional specimens examined.** **Peru.** **Cajamarca:** 12 km S of Contumazá on road to Cascas, 2530 m, fl. & fr., 2 Feb 1985, Stein & Todzia 2047 (K, MO, USM). **Ancash:** Prov. Huaraz, 10 km by road from Cochabamba, 9°27'S, 77°51'W, 2870 m, fl. 6–8 Jun 1985, Smith & Buddensiek 10912 (MO).

**Ecology**

*Fuchsia pachyrhiza* grows on the Pacific slope of the Andes in an area characterized by a long dry season. The short rainy season generally occurs between December and April. Individuals of this species are apparently deciduous during the dry season, producing flushes of leaves and flowering shoots after the onset of the rains. The vegetation at the type locality is a mixture of xeric elements characteristic of the