ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDSOL03030
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Browallia eludens* R.K. Van Devender and P.D. Jenkins
COMMON NAME: Elusive browallia, Bush-violet
SYNONYMS:
FAMILY: Solanaceae

AUTHOR, PLACE OF PUBLICATION: Van Devender, Rebecca K. and Philip D. Jenkins, Madroño 40(4): 214-223, f. 1-4. 1993.

TYPE LOCALITY: Arizona: Santa Cruz County: West Canyon, Canelo Hills, Coronado National Forest, 1 mi N of Canelo Pass, 5300 feet elevation.

TYPE SPECIMEN: HT: ARIZ. R.K. Van Devender and T.R. Van Devender 90-421, 25 August 1990. (IT: GH, MO, UC, US).

TAXONOMIC UNIQUENESS: This species from southern Arizona is the first report for an indigenous species of the genus *Browallia* from the United States. The genus is neotropical and the species' nearest taxonomic relatives (four species) are native to southern Mexico, Central and South America, and the tropics of the New and Old World. According to Jenkins (date unknown), "Morphological evidence, analyzed phylogenetically and using multivariate techniques, implies that there are five species of *Browallia*. The species recognized are *Browallia acutiloba* Segástegui & Díos, *B. americana* Linnaeus, *B. eludens* R.K. Van Devender & P. Jenkins, *B. jamesonii* Bentham, and *B. speciosa* Hooker. Four *Browallia* have limited distributions: three in the South American Andes and one disjunct in southwestern North America. The fifth, *Browallia americana*, is widespread and introduced throughout the tropics of the New and Old Worlds. It exhibits variable characters in the Andes of Peru, but less so elsewhere, especially where it is likely introduced." The species *eludens* is 1 of 2 in the genus *Browallia* in North America, and the genus is 1 of 40 in the Family Solanaceae (USDA, NRCS 2002).

DESCRIPTION: A sort-lived erect summer annual, 2-30 cm (0.8-12 in.) tall, with typically unbranched stems. Leaves are alternate, entire, up to 4 cm (1.6 in.) long, and 1.0 cm (0.4 in.) wide, rhombic-lanceolate. Irregular flowers are solitary in the axils. The calyx is 8-15 mm long, 5 lobed, and strongly picate. The zygomorphic corolla is cream colored, the limb 6-12 mm across, 5-lobed with the tips reflexed, the upper lobe the largest; corolla tube is 10-17 mm long. The stamens are four and didynamous; the upper pair with short flat filaments bearing a mass of white trichomes, closing the mouth of the corolla. The fruit is a capsule (dry, not juicy) included in the accrescent calyx. Seeds are 1.1-1.5 mm long, numerous, and dark brown when maturity.

AIDS TO IDENTIFICATION: *Browallia eludens* has no close relatives in the region. Unlike most other Solanaceae, *Browallia* has a zygomorphic corolla and four didynamous stamens. The anthers of the upper pair each bear one abortive and one fertile theca. In this genus alone, the upper anthers curve downward, elevating the flattened, densely ciliate filaments that effectively close the very small mouth of the corolla (D'Arcy 1978, *in* Van Devender & Jenkins 1993). *Browallia eludens* differ from other species in the genus in a number of morphological characters. It is typically unbranched with consistently narrow, subsessile leaves. The other species are usually much branched with primarily ovate, petiolate leaves. *Browallia eludens* has whitish flowers turning pale yellow with age and the corolla tube is scarcely exserted from the comparatively oversized calyx. The others, especially *B. americana*, are noted for variable flower colors, typically some shade of blue, but ranging from white to purple. A white or yellow eye is often apparent in the throat. The corolla tube is well exserted in these species, due to the relatively smaller calyx. (Van Devender & Jenkins 1993).

ILLUSTRATIONS: B&W drawing of plant and parts (Van Devender and Jenkins, 1993).
Line drawing (Phil Jenkins 1992, *in* Falk & Jenkins et al. 2001)
Color photos of plant and habitat (Phil Jenkins, *in* Falk & Jenkins et al. 2001)

TOTAL RANGE: Known from disjunct populations in southern Arizona, west-central Chihuahua, and southeastern Sonora, Mexico.

RANGE WITHIN ARIZONA: Santa Cruz County: Canelo Hills. Despite being described over 30 years ago, the known range within Arizona is confined to a small area in the Canelo Hills, suggesting this taxon has specific habitat requirements.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous annual.

PHENOLOGY: Flowers in late summer from August – September, after onset of summer rains. Falk and Jenkins et al. (2001), report flowering occurs in July and early August. This species has only been collected in the month of August.

BIOLOGY: Readily self pollinating or pollinated by beeflies. The seeds of this short-lived species require warm, wet soils to germinate, and will remain dormant for long periods in the absence of adequate summer moisture (Van Devender and Jenkins 1993).

HABITAT: Confined to a relatively narrow range of temperate, moist-summer habitats, which are found in and around the boundaries of Madrean Evergreen Woodland. This woodland is centered in the Sierra Madre Occidental, where the species undoubtedly occurs more frequently and is more widespread there than at the northern limits of the woodland in the United States. Prefers moist damp soils adjacent to streams (usually temporary) or growing in mud adjacent to, or above, streams. (NatureServe 2003). Habitat requirements are similar to *Coursetia grabella.* Despite being described over 30 years ago, the known range within Arizona

is confined to a small area in the Canelo Hills, suggesting this taxon has specific habitat requirements.

ELEVATION: In Arizona, elevation ranges from 5,065 to 5,250 ft (1545-1600 m) based on unpublished record from Arizona Game & Fish Departs HDMS (accessed 2003). Throughout its range, this species is found from 4,590 – 6,885 m (1400–2100 ft) (Van Devender & Jenkins 1993).

EXPOSURE:

SUBSTRATE: Rather fine deposition soil derived from rhyolitic or andesitic volcanic rocks.

PLANT COMMUNITY: Madrean Evergreen Woodland. Oak woodland dominated by Emory oak (*Quercus emoryi*) with scattered alligator bark juniper (*Juniperus deppeana*). Associated species include: *Pinus discolor, Quercus toumeyi* (Toumey oak), *Lycurus setosus*, *Ipomoea* sp. (morningglory), *Setaria* (bristlegrass), *Agrostis* (benygrass), *Elymus* (wildrye), *Gutierrezia wrightii*, *Muhlenbergia* (muhly), *Erigeron* (fleabane), *Drymaria molluginea, D. leptophylla*, *Cuphea wrightii*, *Crotalaria* (rattlebox), *Tagetes micrantha* (little marigold), and *Crusea*.

POPULATION TRENDS: Hundreds of plants in both populations. According to NatureServe (2003), "The species is easily overlooked for several reasons, including its short life cycle and sporadic occurrence only in years with adequate moisture. For these reasons, its abundance and distribution, especially in the Sierra Madre, could be far greater than the current number of collections would indicate."

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[Category 2 USDI, FWS 1993]

STATE STATUS: None

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999, 2013)

MANAGEMENT FACTORS: Fuel wood cutting, military operations, floods, cattle, and hiking on the Arizona Trail.

CONSERVATION MEASURES TAKEN:

SUGGESTED PROJECTS: 1) Survey for additional populations. 2) Monitor known population to determine population trends and ecological needs. 3) Identify threats.

LAND MANAGEMENT/OWNERSHIP: USFS - Coronado National Forest.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

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Becky Van Devender - University of Arizona Herbarium, Tucson
Tom Van Devender - Arizona-Sonora Desert Museum, Tucson

ADDITIONAL INFORMATION:

Collected in west-central Chihuahua, Mexico in 1946 and in Arizona in 1990. Never been described. A few collections have been made in the past in Sonora and Chihuahua, but had never been identified (including the original collection). Remained unidentified until 1994 when collections were recognized as distinct and as *Browallia*. Plant's unusual appearance means it should not have been frequently overlooked by collectors.

Discoverers of U.S. population could not find any plants one year later (in 1991).

U.S. populations discovered in Western Canyon near Forest Service road, near Flower Tanks.

Because plant is annual "may appear in different spots from year to year, or not at all. Moreover population size may fluctuate annually, depending on precipitation or other factors; under some conditions the species can be locally abundant. Thus plot sampling and extrapolation are unlikely to provide a useful measure of status or growth. Complete surveys and counts in the suitable wash terrace habitats constitute the best approach, looking each year for evidence of colonization (Falk and Warren 1994)."

Revised: 1991-10-30 (PLW)
1991-11-13 (SR)
1991-11-22 (SR)
1995-06-20 (DBI)
1998-01-06 (SSS)
2003-09-11 (SMS)
2021-12-04 (TME)