ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDBIX01010
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Amoreuxia gonzalezii* Sprague & Riley
COMMON NAME: Saiya (Zaiya), Temaqui, Santa Rita Throwup Weed, Santa Rita Yellowshow, Zaya, Santa Rita Mountain Yellowshow, Saya
SYNONYMS:
FAMILY: Cochlospermaceae

AUTHOR, PLACE OF PUBLICATION: Sprague and H.P. Riley, 1922. Bull. Misc. Info. Kew 1922(3): 102. 1922.

TYPE LOCALITY: Mexico: Sinaloa: Choix, Cerro del Muerto, alt. 620m. September 27, 1919.

TYPE SPECIMEN: HT: K. González & Ortega 897, 27 Sep 1919, flowers, fruits. IT: US. USNM reports type fragment collected by M.N. Montes with A.E. Salazar 897, 27 Sep 1919.

TAXONOMIC UNIQUENESS: Four species recognized within genus of which two are found in Arizona; *A. gonzalezii* and *A. palmatifida* (Kearney et al. 1960). USDA PLANTS Database (2002), reports only three species in genus. Not closely related to *A. palmatifida* but more closely related to *A. wrightii* based on molecular study (Johnson-Fulton and Watson 2017).

Genetic analysis between members within Cochlospermaceae (some treatments place *Amoreuxia* in Cochlospermaceae rather than Bixaceae) and Bixaceae, Diegodendraceae, and Sphaerosepalaceae strongly suggests that *Amoreuxia* belongs within Cochlospermaceae (Johnson-Fulton 2014). Both *Amoreuxia* and *Cochlospermum* species share traits (such as yellow flowers, pollen released through apical pores) that the sister families do not. The genetic analysis provides further evidence that *A. gonzalezii* and *A. wrightii* are sister species (both have globose seed shapes); this seed shape appears to be a recent derivation, as a cochleate or reniform shape is shared amongst all other members of Cochlospermaceae. Additionally, the yellow flowers with red blotches that *Amoreuxia* species possess (versus solid yellow petals for *Cochlospermum* species) is a recently derived character, as is the floral bilateral symmetry.

DESCRIPTION: Herbaceous perennial up to 8.0 cm (3.2 in.) tall from a fusiform tuberous rootstock. Leaf blades alternate, long-petioled, 3.0-6.0 cm (1.2-2.4 in.) wide, **deeply 5-7 parted**, dark green above, and paler with scattered dark brown spots and lines beneath. Flowers are few on a single stem, bilaterally symmetric with five petals, 6-8 cm (2.4-3.2 in)

wide. Petals are 3.0 cm (1.2 in.) long, bright orange-yellow with 1 or 2 brownish carmine spots near the base (Shreve and Wiggins 1964). However, flowers are described as "pale salmon with the lowermost anthers cream-colored and the upper anthers purple" (Hodgson 1989, and Falk, Jenkins et al, 2001). "*A. palmatifida* are deep salmon-orange with anthers that are all purple" (Hodgson 1989). Flowers close in daytime, therefore harder to document species (Hodgson 1994). Ovary densely silky pubescent in *A. gonzalezii* but puberulent papillose in *A. palmatifida*. Fruits pendant, **ellipsoidal**, 4.5-8.0 cm (1.8-3.2 in.) long, longitudinally striate, and brownish. Brown seeds are **globose** and **aril is readily removed**.

AIDS TO IDENTIFICATION: The range of *A. gonzalezii* overlaps with the range of *A. palmatifida*. Fruits and flowers are needed to distinguish the two species with certainty. Fruits of *A. gonzalezii* are ellipsoid versus globose in *A. palmatifida,* 3.0-4.0 cm (1.2-1.6 in) long, weakly striate, and with scattered reddish glands intermingled with fine hairs. Leaf blades of *A. palmatifida* have 7-9 lobes and coarsely serrate, with kidney-shaped (not globose) seeds. Ovary of *A. gonzalezii* has whitish-silky hairs whereas *A. palmatifida* has very rough tiny hairs (minutely hairy). This seems to be stable characteristic. No evidence of hybridization between *A. gonzalezii* and *A. palmatifida* at the present time. Could be confused with *Manihot*.

ILLUSTRATIONS:

Black &white photos of plant in habitat (Hodgson 1989:12); Hodgson 2001).
Line drawings of plant with ovary, fruit and seed (Hodgson 1986, 1994).
Line drawing of plant with root, fruit and seed (Falk, Jenkins et al. 2001).
Color photo of flower (W. Hodgson, *in* Falk, Jenkins et al. 2001)
Color photos of plant & habitat (A. Segade, *in* Falk, Jenkins et al. 2001).

TOTAL RANGE: Southern Arizona (Pima, Santa Cruz, and Cochise cos.) south to Sonora, Mexico, and Baja California Sur (Sierra La Laguna) (Rebman et al. 2016, SEINet 2021). Total distribution is not known.

RANGE WITHIN ARIZONA: Baboquivari, Santa Rita, Rincon and Little Rincon Mountains, Pima, Santa Cruz and Cochise counties, respectively. Might expect to find it south of Tucson in Pima Co. into Cochise Co. (Hodgson 1994). A collection in Cochise County was misidentified, representing A. palmatifida (Falk, Jenkins et. al. 2001). The Desert Botanical Garden (DBG, 1999), reports in Arizona, this rare plant is only known from the Santa Catalina Mountains – this is an error.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous perennial.

PHENOLOGY: Dependent on mid-summer rains for flowering. Flowers from July to September, with flowers closing after mid-day. Pollen may be released by vibrations caused

by bees buzzing nearby. Fruit develops in late July to August, maturing September to mid-October (Hodgson 1994, Falk, Jenkins et. al. 2001).

BIOLOGY: Good production of flowers and fruits appears to be dependent on adequate summer rains.

HABITAT: In Santa Rita Mountains, this species grows on rocky limestone hillsides; unknown substrate in Baboquivari Mtns. In Sonora, it prefers decomposed granite on slopes.

ELEVATION: In Arizona, ranges from 4,200 - 4,600 feet (1281 - 1403 m); in Sonora, about 1,500 feet (458 m).

EXPOSURE: Open, full sun, south and southwest facing slopes.

SUBSTRATE: Limestone outcrops and fine granitic, low soil.

PLANT COMMUNITY: In Arizona, associated species include: *Eysenhardtia, Erythrina, Cercidium floridum, Tecoma, Agave schottii, Heteropogon, Fouquieria, Calliandra, Opuntia* ssp., *Krameria, Janusia gracilis, Agave palmeri* and *Hibiscus coulteri*.

POPULATION TRENDS: Santa Rita Mtns population four to five micro populations or one mega population of less than 65 plants, occur Arizona from a single limestone outcrop, but the trend is unknown; Thomas Canyon population size and trend unknown, possibly not seen since its collection in 1981 by Toolin 1705 and Turner (ARIZ), area of old Riggs Ranch in Thomas Canyon, east side of Baboquivari Mountains, woodland/grassland, at elevations of 4200-4500 ft., T19S, R7E. Sonoran populations trend and size unknown except for Mazocahui-Moctezuma population revisited a few months after first seen in 1988, much fewer plants seen and with few fruit.

SPECIES PROTECTION AND CONSERVATION

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

STATE STATUS: Highly Safeguarded (ARS, ANPL 1999, 2016)
[Salvage Restricted, ARS, ANPL 1993]

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1990, 1999, 2007, 2013)

MANAGEMENT FACTORS: Besides its limited occurrence, herbivory is the biggest management problem since this species is very palatable to cattle. Other threats include development, grazing (roots by Javelina), mining, habitat degradation, rarity, and competition

with introduced exotic grasses (e.g. buffelograss [for livestock forage], Lehman's lovegrass), and other aggressive exotic plants.

CONSERVATION MEASURES TAKEN:

SUGGESTED PROJECTS: Surveys for additional populations in the U.S. and Mexico are needed, along with potential habitat, and monitoring currently known populations for population trends, fruiting, seed development and recruitment.

LAND MANAGEMENT/OWNERSHIP: USDA - Coronado National Forest; NPS – Saguaro National Park (Rincon Mountain District); Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Virtually all parts of the plant were formerly used, including the roots, young fruits, and seeds. Used by Sonoran Pima as a food item, as all parts of the plant are edible. The fleshy roots of both *A. gonzalezii* and *A. palmatifida*, were eaten by the Seri, Pima, and Tohono O'odham people living in the area.

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