

**ARIZONA GAME AND FISH DEPARTMENT  
HERITAGE DATA MANAGEMENT SYSTEM**

**Plant Abstract**

**Element Code:** PDBIX01010

**Data Sensitivity:** No

**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE**

**NAME:** *Amoreuxia gonzalezii*

**COMMON NAME:** Saiya (Zaiya), Temaqui, Santa Rita mountain yellowshow

**SYNONYMS:**

**FAMILY:** Bixaceae

**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 by Susannah Fulton.

**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).  
Color photo (L. Pritchett-Kozak, CPC #4459 accessed 6/18/2003 from [http://ridgwaydb.mobot.org/cpcweb/CPC\\_ProfileImage.asp?FN=4459a](http://ridgwaydb.mobot.org/cpcweb/CPC_ProfileImage.asp?FN=4459a))

**TOTAL RANGE:** Southern Arizona (Pima and Santa Cruz cos.) south to Sonora, Mexico, and probably Baja California. Total distribution is not known.

**RANGE WITHIN ARIZONA:** Baboquivari and Santa Rita Mountains, Pima and Santa Cruz 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)  
[Salvage Restricted, ARS, ANPL 1993]

**OTHER STATUS:** Forest Service Sensitive (USDA, FS Region 3 1999)  
[Forest Service Sensitive USDA, FS Region 3 1990]

**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. buffelgrass [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; Private.

## **SOURCES OF FURTHER INFORMATION**

### **REFERENCES:**

Arizona Revised Statutes Chapter 7. 1993. Arizona Native Plant Law. Appendix A:8.

- Arizona Revised Statutes Chapter 7. 1999. Arizona Native Plant Law. Appendix A. Center for Plant Conservation (CPC) – National Collection of Endangered Plants. Plant Profile *Amoreuxia gonzalezii*. Accessed 6/18/2003 from [http://ridgwaydb.mobot.org/cpcweb/CPC\\_ViewProfile.asp?CPCNum=4459](http://ridgwaydb.mobot.org/cpcweb/CPC_ViewProfile.asp?CPCNum=4459).
- Desert Botanical Garden (DBG). 1999. *Amoreuxia gonzalezii* Saiya. Web abstract accessed 6/18/2003 from [http://www.dbg.org/Collections/amoureauxia\\_gonzalesii.html](http://www.dbg.org/Collections/amoureauxia_gonzalesii.html).
- Falk, M., P. Jenkins, et al; Arizona Rare Plant Committee. 2001. Arizona Rare Plant Guide. Published by a collaboration of agencies and organizations. U.S. Government Printing Office. Pages unnumbered.
- Hodgson, W.C. 1986. Line drawings of plant with ovary, fruit and seed. Desert Botanical Garden. Phoenix, Arizona.
- Hodgson, W.C. 1987. Letter to Fish and Wildlife Service, Albuquerque, New Mexico. January 19, 1987.
- Hodgson, W.C. 1989. A tale of two saiyas: conserving plant lore and gene pools. *Agave* 3(3).
- Hodgson, W.C. 1989. *Amoreuxia gonzalezii* Sprague and Riley Annual Report. Prepared for Coronado National Forest. 7 pp.
- Hodgson, W.C. 1994. Bureau of Land Management Safford District Rare Plant Workshop. November 14-16. Tucson, Arizona.
- Hodgson, W.C. 1994. *Amoreuxia gonzalezii* Sprague and Riley Status Report for U.S. Fish and Wildlife Service, Phoenix, Arizona.
- Integrated Taxonomic Information System (ITIS). Retrieved 6/18/2003 from ITIS, <http://www.itis.usda.gov>.
- Kearney, T.H., R.H. Peebles with collaborators. 1951. Arizona flora. Second edition with supplement by J.T. Howell, E. McClintock and collaborators. 1960. University of California Press, Berkeley. p. 558.
- Martin, P.S., et al., eds. 1998. Gentry's Río Mayo Plants, The tropical deciduous forest & environs of Northwest Mexico. The Southwest Center Series, The University of Arizona Press, Tucson, Arizona. P. 292.
- Missouri Botanical Garden – TROPICOS, Nomenclatural Data Base. *Amoreuxia gonzalezii* Sprague & H.P. Riley. [http://mobot.mobot.org/cgi-bin/search\\_vast](http://mobot.mobot.org/cgi-bin/search_vast). Accessed: 6/18/2003.
- Poppendieck, H. 1981. Cochlospermaceae. *Flora Neotropica Monograph* No. 27. New York Botanical Garden, New York. pp. 18-24.
- Shreve, F. and I.L. Wiggins. 1964. *Vegetation and Flora of the Sonoran Desert*. Stanford University Press, Stanford, California. II:935.
- USDA, Forest Service Region 3. 1990. Regional Forester's Sensitive Species List.
- USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.
- USDA, NRCS. 2002. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- USDI, Fish and Wildlife Service. 1993. Plant Taxa for Listing as Endangered or Threatened Species; Notice of Review. *Federal Register* 58(188):51147.
- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants: Review of Plant Taxa that are Candidates for Listing as Endangered or Threatened Species; Notice of Review. Proposed Rule. *Federal Register* 61(40):7595-7613.

U.S. National Herbarium Type Specimen Register (US). Department of Systematic Biology – Botany, Smithsonian Institution. Accessed: 6/18/2003 from <http://rathbun.si.edu/botany/types/fullRecords.cfm?myFamily>.

**MAJOR KNOWLEDGEABLE INDIVIDUALS:**

Richard Felger - Tucson, Arizona.

Wendy Hodgson - Desert Botanical Garden, Phoenix, Arizona.

Tom Van Devender, Tucson, Arizona

**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.

<b>Revised:</b>	1990-12-26 (SR)
	1991-10-19 (BKP)
	1991-12-04 (SR)
	1995-02-28 (WCH)
	2003-06-26 (SMS)
	2011-06-16 (WCH)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX (= **year of last revision as indicated at end of abstract**). X...X (= **taxon of animal or plant**). Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.