ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDPAS01073
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Passiflora arizonica* (Killip) D.H. Goldman
COMMON NAME: Arizona passionflower, White passionflower, Corona de Cristo
SYNONYMS: *Passiflora foetida* var. *arizona* Killip
FAMILY: Passifloraceae

AUTHOR, PLACE OF PUBLICATION: *Passiflora arizonica* D.H. Goldman, Madroño, Vol. 50, No. 4, pp. 243-264, 2003. (*P. f.* var. *arizonica*: E.P. Killip, Publ. Field Mus. Nat. Hist., Bot. Ser. 19: 490. 1938.).

TYPE LOCALITY: Fresnal Canyon, Baboquivari Mountains, Pima County, Arizona, USA.

TYPE SPECIMEN: HT: US-1365002. G.J. Harrison 4774, 26 Sep 1927. IT: ARIZ-101387.

TAXONOMIC UNIQUENESS: The tropical genus *Passiflora* contains 13 species in North America (Killip 1938, although Venning 1984 reports 14), but worldwide contains close to 500 species (Vanderplank 2000, in Goldman 2003), with many species in cultivation. Three native species of *Passiflora* occur in Arizona and include *P. arizonica* (Killip) D.H. Goldman, *P. bryonioides* HBK., and *P. mexicana* Juss. *P. arizonica* was formerly recognized as the only variety of *P. foetida* to occur in Arizona, but was recently elevated by Goldman (2003) to full species level, based on its particular distinctiveness in floral morphology and phenology. *P. arizona* differs from the various varieties of *P. foetida* in having leaves that are deeply lobed, with the central lobe often narrowed near its base, the lateral lobes themselves lobed, and the margins erose serrate. (MacDougal 2001). According to Goldman (2003), a relatively recent naturalized species, *P. arida*, has avoided detection in Arizona because it was typically identified as *P. arizonica*. It avoided detection until the last two years (MacDougal 2001) and the rapidity of its spread suggests that it has the potential to become a problematic weed.

DESCRIPTION: A perennial vine that is occasionally a climbing, spreading, low shrub with numerous short, leafy branches, stems terete, pubescent with short erect, white to gray trichomes. Plants are about 0.5-3.0 m (1.6-9.8 ft) long, with leaves malodorous (having a bad odor; foul) when bruised. Leaves are densely pubescent, villous, with erect, white to rarely red-brown trichomes and numerous elongate capitate glandular trichomes that are abundant along both leaf surfaces, petioles and particularly the leaf margins. The leaves are ovate in outline, basally cordate, 1.5-5.0 cm long by 1.0-7.0 cm wide, with 3-5 lanceolate, acuminate lobes, the sinus between the main central lobe and the first adjacent lobe is 0.2-2.5 cm deep,

the sinus between the first and second adjacent lobes is 0.0-0.6 cm deep, 0.2-4.0 cm long. Stipules are glandular-viscid, semi-annular, pinnatifid, 0.1-0.8 cm long, with several narrow, erect segments; tendrils pubescent, frequently functional, to 16.0 cm long, but often small and non-functional. The peduncle is 1.7-6.5 cm long, frequently elongating a centimeter or more in fruit. The floral bracts are green to red, 1.5-3.5 cm long and 1.0-2.8 cm wide, lightly pilose, deeply bipinnatifid, very glandular-viscid with numerous capitate glandular trichomes. Flowers are 4.0-6.5 cm (1.6-2.6 in) wide, strongly fragrant, usually solitary at the nodes; sepals subequal to or slightly shorter than the petals, ovate-lanceolate, abaxial surface pale green but white at the margins, adaxial surface white and glabrous, 1.7-3.8 cm long by 0.6-0.9 cm wide; petals are white, obovate-lanceolate to ovate-lanceolate, entire, 1.6-3.0 cm long by 0.6-1.2 cm wide. Corona consists of 5-6 series of filaments, lilac in color; the outer two series of coronal filaments are pale purple in the apical half, particularly along the bottom surface, and white in the basal half, more so to the top. The ovary is globose, densely pubescent, 0.3-0.5 cm long. The fruit is a berry, ovoid to basally and/or apically truncate, triangular to round in cross-section, pubescent, green to yellow-green, 2.0-3.5 cm long by 1.8-3.0 cm wide; red at maturity. Seeds are flattened, reticulate (pitted), narrowed basally and with three apical teeth, 5.0-7.0 mm long by 2.5-4.0 mm wide, enclosed in a nearly opaque whitened, fragrant, bittersweet to sour aril. (MacDougal 2001; Goldman 2003).

AIDS TO IDENTIFICATION: *Passiflora arizonica* is the only *Passiflora* found in Arizona with a lilac-colored corona and pinnatifid stipules. It is easy to distinguish from a commonly confused naturalized (and invasive) species of *Passiflora* in Arizona, *P. arida*. *P. arida* lacks the obvious glandular trichomes that are so abundant in *P. arizonica*, and generally has more numerous, longer and narrower leaf lobes than *P. arizonica*. The leaves of *P. arizonica* resemble those of many species of *Acer*, whereas the leaves of *P. arida* do not. The petioles of *P. arida* are also usually much shorter than those on *P. arizonica*. Sepals and petals tend to be smaller in *P. arida* than *P. arizonica* and the outer two series of coronal filaments tend to be shorter as well. The color pattern on these coronal filaments is distinct; in *P. arida* the basal 1/5th purple to magenta, the apical half pale pink above and below, and the medial portion white. The outer two series of coronal filaments of *P. arizonica* are pale purple in the apical half, particularly along the bottom surface, and white in the basal half, more so to the top. The two species are isolated reproductively as *P. arida* flowers early in the morning with relatively little floral fragrance and *P. arizonica* flowers in the evening with a strong fragrance. Additionally, the seed of *P. arida* tends to germinate rapidly, whereas seed of *P. arizonica* express strong dormancy, which seem to have to go through several cycles of heat, moisture and dryness before germination occurs. (Goldman 2003). For complete comparison between *P. arizonica* and *P. arida*, and other *Passiflora* species and varieties, see the discussion in Goldman (2003).

ILLUSTRATIONS: Color photo (Rickett 1970)
Color photo (Spellenberg 2003: p. 108)
Line drawing (Puente, *in* MacDougal 2001: Fig. 2, P. 44)
Color photo type (Killip, *in* MGB http://mobot.mobot.org/cgi-bin/search_vast)

Color photo of Holotype (US-1365002, USNH http://ravenel.si.edu/botany/types/fullRecords.cfm?myFamily=)
Line drawing (Eric Hsu 2002, *in* Goldman 2003: fig. 3, p. 250)
Color photo of *Passiflora foetida* var. *arizonica* (http://www.hewo.nl/passiflora%20species/foedita_arizonica.jpg)
Color photo of *P. foetida* var. *arizonica* (Foto di Maurizio Vecchia 2004, http://www.passiflora.it/foetidaariz.htm)
Color photo of *P. foetida* var. *arizonica* (Foto di Maurizio Vecchia, http://www.exot.nutz.zier.de/images/prod_images/Passiflora_foetida_var_arizonica.jpg)
Color photos of *P. foetida* var. *arizonica* (http://passiflora.li/meine_sammlung/arizonica/arizonica.htm)

TOTAL RANGE: Southern Arizona and Sonora, Mexico.

RANGE WITHIN ARIZONA: From the southern part of state including the Baboquivari, Las Guijas, and Pozo Verde mountains, and Arivaca in Pima County, and Bartlett Mountain and California Gulch, in Santa Cruz County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous perennial vine, often referred as Liana (= a woody climbing usually tropical plant).

PHENOLOGY: Flowers primarily from May through December, although most flowering occurs in August and September during monsoon season (Goldman 2003). MacDougal (2001) reports the flowering period as June-October with fruiting occurring from August-October.

BIOLOGY: *P. arizona* flowers in the evening, typically opening around 4-5 p.m. and closing around midnight. "This feature, plus the light color of the flowers, the pleasant fragrance noticeable from some distance, and the relatively deep floral tube suggest moths as pollinators." (Goldman 2003).

HABITAT: Inhabits rocky desert hillsides, limestone outcrops, canyons cliffs, and arroyos, in the Lower Sonoran Zone, where it is primarily just beyond the typically defined boundaries of the Sonoran Desert.

ELEVATION: Throughout its range, *P. arizonica* can be found growing from elevations near sea level to 5,906 ft (1800 m), typically from 3,281-5,906 ft (1000-1800 m) in Arizona. (Goldman 2003). In Arizona, it has been collected between 3,500-5,600 ft (1067-1707 m) (SEINet accessed 2006).

EXPOSURE: South to west-facing.

SUBSTRATE: Granite or related igneous rock. Where collected in the southern portion of Coronado National forest (2109), in the vicinity was granite, diorite, Mesozoic andesite or rhyolite and possibly Cretaceous-tertiary porphyry and granite. Soils were of the steep Lampshire-Chiricahua association….. In southern Pima County (Buenos Aires National Wildlife Refuge; 2120) the bedrock was Cretaceous-tertiary granite, with the associated soil type as Lampshire-Romero-rock out-crop complex….” (Goldman 2003).

PLANT COMMUNITY: Desert grasslands in the Lower Sonoran Zone. In the Coronado National Forest (Santa Cruz Co.), Goldman (2003) found *P. arizonica* growing with *Carnegiea gigantean* (rare), *Celtis pallida, Chenopodium watsoni, Dodonaea viscose, Eriogonum wrightii, Erythrina flabelliformis, Eupatorium solidaginifolium, Eyesenhardtia polystachya, Fouquieria splendens, Gomphrena sonorae, Jatropha cardiophylla, Mimosa dysocarpa, Plumbago scandens, Quercus emoryi,* and *Waltheria americana*. In Buenos Aires National Wildlife Refuge (southern Pima Co.), Goldman (2003) found this species growing with *Artemesia* sp., *Astrolepis sinuate, Bouteloua repens, Boerhaavia purpurascens, Cheilanthes wootoni, C. wrightii, Dalea* sp., *Dasylirion wheeleri, Eragrostis lehmanniana, Eriogonum* sp., *Eyesenhardtia polystacha, Fouquieria splendens, Heteropogon contortus, Iva xanthifolia, Janusia gracilis, Manihot angustiloba, Mimosa dysocarpa, Notholoaena grayi, Prosopis velutina, Quercus oblongifolia, Stipa* sp. and *Talinum paniculatum.*

P. arizonica has also reported to have been collected with *Agave schottii, Aristida, Calliandra, Ericameria laricifolia, Garrya wrightii,* and *Gutierrezia*. (SEINet accessed 9/20/2006)

POPULATION TRENDS: Unknown. But populations of *P. arizonica* could be affected in the future by increasing range expansion of the potentially invasive naturalized *P. arida*.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None
STATE STATUS: None
OTHER STATUS: Sensitive under *P. foetida* var. *arizona* (USDA, FS Region 3 1999).

MANAGEMENT FACTORS: Commonly confused with the recently naturalized and invasive species *P. arida,* although currently these two species occupy different habitats in Arizona. This may change as *P. arida* continues to increase its range. (Goldman 2003).

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Surveys to determine full distribution of both *P. arizonica* and the naturalized invasive *P. arida*, to better manage and protect the native populations of *P. arizonica*.

LAND MANAGEMENT/OWNERSHIP: BIA - Tohono O'Odham Nation; BLM - Tucson Field Office; USFS - Coronado National Forest; USFWS - Buenos Aires National Wildlife Refuge; State Land Department; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

According to Spellenberg (2003), "Spanish Catholic missionaries in South America used the flowers to refer to Christ's passion: 3 stigmas symbolize nails of Crucifixion; 5 stamens, his wounds; corona, the crown of thorns; 5 sepals and 5 petals, the apostles, minus Peter and Judas; lobed leaves and tendrils the hands and whips of Christ's tormentors."

The genus *Passiflora* is from L. passio passion (fr. Pati, passus, to suffer) + flors, floris, flower. The species *arizonica*, refers to the U.S. state of Arizona.

Passiflora arida has the potential to be quite invasive, and could affect the slower growing native *P. arizonica*, as its range expands. It spreads much faster by seed than *P. arizonica*, which suggests that it has the potential to become a problematic weed. "….caution should be exercised by horticulturists and plant enthusiasts because of the international distribution of seed. Further evaluation of the invasive potential of this species is necessary." (Goldman 2003).

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