

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

Plant Abstract

Element Code: PDRUT02022

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Choisya mollis* Standley

COMMON NAME: Santa Cruz Star Leaf; Sycamore Canyon Star Leaf; Zorillo; Star-leaf; A Mexican-Orange

SYNONYMS: *Choisya dumosa* (Torrey) A. Gray var. *mollis* (Standley) L. Benson

FAMILY: Rutaceae

AUTHOR, PLACE OF PUBLICATION: Standley, P.C. 1914. Proc. Biol. Soc. Wash. 27:223.

TYPE LOCALITY: Arizona: Santa Cruz County: "Sierra del Pajarito".

TYPE SPECIMEN: U. S. National Herbarium 15062. A. Schott (Mexican Boundary Survey #146). 1854.

TAXONOMIC UNIQUENESS: There are only 7 described species of *Choisya*. These are found in North America and Mexico, with 2 species currently known from southern Arizona (*C. mollis* and *C. arizonica*) (Toolin 2014). Previously, these taxa had been treated as varieties of *Choisya dumosa*, but the upcoming treatment in Flora of North America will treat them as species (T. Daniel, personal communication, February 23, 2021). The Arizona species are in the subgenus *Astrophyllum* (Harvard University Herbaria 1999, Lehr 1978, Toolin 1982).

DESCRIPTION: Non-technical: Perennial shrub to about 2.0 m (6.6 ft.) tall, (usually 60.0 cm to 1.0 m [2.0-3.3 ft.] tall) with evergreen palmately compound leaves. Three to 5 leaflets have soft hairs, dull green above, paler below, and are about 2.0-6.0 mm (0.08-0.12 in.) wide, 25.0-50.0 mm (1.0-2.0 in.) long. Flowers have white petals, 8.0-12.0 mm (0.32-0.48 in.) long. Fruits spotted, each with 5 lobes that have short, outward-pointed tip. Crushed leaves have very strong resinous odor. Leaflet and petiole trichomes long, multicellular hairs, giving leaflets a velvety texture (Toolin 1986, Benson and Darrow 1981).

Technical: A rhizomatous, strongly aromatic perennial shrub with woody stems, to 1.8 m tall. Twigs with papillose glands spreading-hirsute to pilose; new growth conspicuously yellowish-green. Evergreen leaves palmately divided into 3 - 5 (6) leaflets, these copiously pilose, (2) 2.5 - 4.5 (5) mm wide & (16) 18 - 48 mm long, larger leaflets found on plants in deeper shade. Leaflets are more or less oblong, tapering at both ends, the margins revolute and bearing glands, the apex obtuse or slightly emarginate; upper and lower surfaces pilose with pustulate-based, multi-cellular hairs, most of which bear dendritic-stellate branches at the base. Petioles densely hirsute, often with some pilose hairs present, distinctly papillose-

glandular, variable in length, 5 - 22 mm long. Average (N=72) petiole: leaflet length is 1:3. Flowers solitary in the axils of the upper leaves, crowded so as to appear clustered, on hirsute-ciliate & glandular-punctate. Petals 5, white, 7-10 (11) mm long. Stamens yellow. Pistils globose, 5-lobed. Fruit of 5 carpels, hirsute, glandular-punctate, each approximately 6 mm long, with a short dorsal projection at the apex. Seeds brown, more or less ovate, 3.2 - 3.9 mm long and 2.0 - 2.4 mm wide (Toolin 1986, Benson and Darrow 1981).

AIDS TO IDENTIFICATION: *Choisya mollis* is unique in its geographic range in being the only shrub in the region with evergreen, palmately-lobed, aromatic leaves, white flowers, and gland-dotted 5-lobed fruits. Although the range of *C. mollis* and *C. arizonica* are not known to overlap, it is important to know how to separate these two similar species. *C. mollis* is most reliably separated from *C. arizonica* by the trichomes. The trichomes of *C. mollis* are long and multicellular, while the trichomes of *C. arizonica* are unicellular, short, stubby, appressed, silvery, and dense on petioles but scattered on leaflets. Leaf surfaces of *C. mollis* are pilose (hairy), while the leaf surfaces of *C. arizonica* are glossy, dark green. To see the crosswalls of the multicellular trichomes, one must look at them with a microscope at 20x or 40x magnification (Fletcher 1981, Kearney and Peebles 1960, Toolin 1982, Toolin 1986).

ILLUSTRATIONS: Line drawing (Muller 1940:742).
Line drawing of seed (Fletcher 1981).
Line drawing (USFWS).

TOTAL RANGE: Endemic to southern Arizona.

RANGE WITHIN ARIZONA: Santa Cruz County: Atascosa Mountains, Pajarito Mountains, Tumacacori Mountains; Cochise County: Dragoon Mountains (this locality, known from a single collection, has yet to be verified).

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Woody perennial shrub

PHENOLOGY: Normally blooms in May to early June. In 1986, following a warm winter and sufficient spring rains, the bloom occurred in early April. All plants in all populations bloom at the same time, over a period of about two weeks (Toolin 1986).

BIOLOGY: Toolin (1986) has never observed a seedling. Toolin (1986) states that seed viability may be low, although testing was limited (0% germination of about 3 dozen seeds tested in 1986). About 90% of the stems produce fruits in a given year. Reproduction appears to be mostly asexual (rhizomatous cloning). Smaller clones consist of a few-to-several stems; the largest clones observed are up to 10 meters wide and nearly 20 meters long, with an average stem density of about 40 stems/meter. *C. mollis* appears to be a poor migrator, but some dispersal may occur through foraging of birds.

HABITAT: Canyon bottoms and slopes, usually in the shade of oaks and other trees, or rock outcrops. This species is found within madrean evergreen woodland communities, as defined by Brown (1994). All populations of *C. mollis* occur in essentially identical habitats and soils on slopes of <5 -50% (Toolin 1986).

ELEVATION: Approximately 3,500 - 5,000 ft. (1,067 - 1,524 m).

EXPOSURE: North and east.

SUBSTRATE: Sandy, gravelly/sandy, gravelly, and cobbly loams of rhyolitic (and other?) parent materials. Soil associations include Lampshire-Graham-Chiricahua; Rock-outcrop-Lithic Haplustolls (Toolin 1986). Substrate does not appear to be a limiting factor for this species, as herbarium collections indicate several geologic substrates: limestone, granite, and rhyolite (SEINet 2021).

PLANT COMMUNITY: Madrean evergreen woodland communities, as defined by Brown (1994). Associated tree species include *Juniperus deppeana*, *Quercus arizonica*, *Quercus emoryi*, *Quercus rugosa*, *Quercus grisea*, *Platanus wrightii*, and *Juglans major*. Associated species include *Fendlera rupicola*, *Ptelea trifoliata* and (in Sycamore Canyon) *Dalea tentaculoides*, *Desmanthus bicornutus*, *Coryphantha recurvata*, *Anoda abutiloides*, *Agave parviflora* ssp. *parviflora*, *Graptopetalum bartramii*, *Fraxinus goodingii*, and *Ipomoea tenuiloba* var. *lemmonii*, and *Salix* sp. (Toolin 1986).

POPULATION TRENDS: Population trends are unknown. Existing populations are likely relics, and represent the remnants of a previously wider and more continuous distribution (Toolin 1986).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
 [Category 2 USDI, FWS 1993]
 [Category 2 USDI, FWS 1990]
 [Category 2 USDI, FWS 1985]
 [Category 2 USDI, FWS 1980]
 [PTN-T USDI, FWS 1975]

STATE STATUS: None

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1980, 1990, 1999, 2013).

MANAGEMENT FACTORS: This species typically occurs in rugged and remote mountainous areas where human activity is very low, other than some livestock grazing. *C. mollis* does not appear to be browsed by cattle or native herbivores, including insects. Despite these facts, *C. mollis* is relatively rare, has a restricted range, and is only found within specific habitats (Toolin 1986).

CONSERVATION MEASURES TAKEN: Some populations of this species occur in the Goodding Research Natural Area and the Pajarita Wilderness Area, two areas of limited use within the Coronado National Forest.

SUGGESTED PROJECTS: Toolin (1986) suggested that the populations of this species should be monitored occasionally to determine trends. The Coronado National Forest should consider the limited range and relative rarity of this species in their management plans.

LAND MANAGEMENT/OWNERSHIP: USFS Coronado National Forest (Nogales Ranger District).

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Several botanists familiar with northern Sonora (R. Felger, L. Toolin, F. Reichenbacher, R.M. Turner, P.S. Martin) apparently have never seen the plant there, though its occurrence there is possible (Toolin 1987). Searches for *Choisya mollis* specimens on SEINet and iNaturalist in 2021 indicate that this species has still not been collected or observed there, indicating that it is a narrow endemic.

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