

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

Plant Abstract

Element Code: PDPOR080N0

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Phemeranthus marginatus* (Greene) Kiger
COMMON NAME: Tepic Flame Flower, Tepic fameflower, Huachuca Green Fingers
SYNONYMS: *Talinum marginatum* Greene, *Talinum marginatus*
FAMILY: Portulacaceae

AUTHOR, PLACE OF PUBLICATION: E.L. Greene, Leaf. Bot. Obs. and Crit. 2(12): 270-271. 1912.

TYPE LOCALITY: Mexico: Nayarit: Tepic: Sierra Madre, near Santa Teresa.

TYPE SPECIMEN: HT: US-301135. J.N. Rose 2221, 12 August 1897.

TAXONOMIC UNIQUENESS: Price (2012) recognizes ca. 25 species of *Phemeranthus*. Six species of *Phemeranthus* occur in Arizona. Kiger (2001) confirmed transfer of 13 species from *Talinum* to *Phemeranthus* due to differences in leaf, pollen, fruit, and seed structure.

DESCRIPTION: A low perennial herb with a cluster of cylindrical succulent leaves, rarely exceeding 10 cm (4 in) in height, arising from a globose tuber. The main roots are cone or top-shaped, fleshy, occasionally forked, and turberate, with the stem then being very short. The main stems are usually simple, erect, and short; they are rarely branched. Occasionally stems may be elongated to 10 cm when soil has been deposited around the plant. Leaves originate from the short above ground portion of the stalk, giving the appearance of a tuft or rosette. They are succulent and terete with obvious petioles (sometimes tinged red), 1-10 cm long and 2-4 cm wide. The cymose inflorescence is taller than the leaves. Sepals are ovate, obtuse, about 3 mm long, and deciduous as the ovary matures. The yellow 5-petaled flowers are elliptic to obovate, about 4 mm long; stamens usually 5-8 and stigma subcapitate. Seed capsules are about 4 mm long, typically ellipsoid to subglobose, sometimes triquetrous (triangular). The black seeds are ringed with concentric ridges and are about 1 mm long. (Neal 1987).

AIDS TO IDENTIFICATION: The yellow flowers of *Phemeranthus marginatus* distinguish it from all other members of the genus in the area except *P. humile* and *P. aurantiacum*. *P. humile* is very similar in flower color, morphology, and general appearance except that it has no apparent petiole, while *P. marginatus* has distinctly long-petiolate leaves. The inflorescence of *P. humile* does not generally overtop or exceed the length of the leaves.

The inflorescence of *P. marginatus* in contrast is usually longer than the leaves and stands above the level of the leaves. *P. aurantiacum* may also have yellow flowers, but they are inserted singly or occasionally in 2- or 3- flowered cymules rather than in pedunculate cymes as in *P. marginatus* (Neal 1987).

ILLUSTRATIONS: Line drawing (P. Warren/TNC, in Falk, Jenkins et al. 2001)
Color photos of plant and habitat (P. Warren/TNC, in Falk, Jenkins et al. 2001)
Color photo of type collection (USNM, Accessed 5/5/2004
<http://ravenel.si.edu/botany/types/fullRecords.cfm?myFamily=>)
Color photo (R.L. Bellsey, in Accessed 5/5/2004
http://www.desertmuseum.org/programs/yecora_gallerynewplants.htm)

TOTAL RANGE: Currently known from a few isolated populations in southeastern Arizona and in the Sierra Madre Occidental of Mexico, in the states of Nayarit, Durango, Chihuahua, and Sonora. Historically collected (in 1897) near Tepic, Mexico, almost 1000 km farther south.

RANGE WITHIN ARIZONA: Cochise County: Ramsey, Bear and Brown Canyons in the Huachuca Mountains; Santa Cruz County: Carr Canyon and The Reef, Canelo Hills.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Dwarf succulent perennial.

PHENOLOGY: Initiated growth and leaves become visible in late June or early July. Flowers from about mid-July to mid-August, although it may flower throughout the warm season in response to rain. Senescence occurs in mid- or late- August. Flowers only open on bright sunny days. Anthesis begins about noon and the flowers are closed about 3 - 4 hours later (Neal 1987).

BIOLOGY: Species appears to be a poor competitor, growing only in areas relatively devoid of other plants. This species is apparently insect pollinated, as bees (family Bombyliidae) were observed visiting the flowers. Self-pollination may also occur. Neal (1987) stated that many flowers receive no visitation by potential pollinators and many flowers do not set fruit. Species only blooms on sunny days after noon, for 3 to 4 hours. This short blooming period limits duration for pollination activity (AZNPS 2008).

HABITAT: In Arizona, this species occurs in higher (7,000 ft) mountainous areas with pine-oak woodland and areas of low (5,000 ft) rolling hills dissected with narrow, steep-walled canyons at the transition zone between Madrean evergreen woodland communities and semi-desert grassland communities, as defined by Brown (1994). This species only occurs in openings in these types of habitats, which are generally without other perennial plants, on thin

gravelly soils. Occupied habitat is unshaded (Neal 1987). Per Martin et al. (1998), occupied habitat consists of thin soils, volcanic ash bedrocks, rocks and boulders in pine-oak forests.

ELEVATION: Approximately 5,000 - 7,025 ft. (1525-2143 m) in Arizona. In Mexico, found at elevation from 4,590-8,853 ft. (1400-2700 m).

EXPOSURE: Various aspects, but apparently always in open situations. Known to occur on south and east-facing slopes.

SUBSTRATE: Very shallow (generally only 3-10 cm deep) sandy soil on exposed bedrock ledges and outcrops. This soil is usually within shallow pockets and depressions in the bedrock (Warren et al. 1989, Corral-Diaz 1990).

PLANT COMMUNITY: In Arizona, this species grows in open patches of bare soil which are generally without other perennial plants. It is found in both forested areas (Madrean evergreen woodland) and in areas with primarily grass (semi-desert grassland), but also with shrubs mixed in among widely spaced trees (Neal 1987). It is probably the open areas that are significant, rather than the vegetation physiognomy and community structure. Thus, associated indicator plant species are probably of little use locating this species. According to Corral-Diaz (1990), in Mexico the plants grow in pure stands or in populations mixed with other herbaceous perennials with fleshy root systems in openings within Madrean evergreen woodland communities, as defined by Brown (1994). In Arizona, found associated with: *Bouteloua* sp. (grama), *Cassia leptadenia* (= *Chamaecrista nictitans* var. *leptadenia*, partridge pea), *Crotalaria sagittalis* (arrow-headed rattle-box), *Cuphea wrightii* (Wright's waxweed), *Dalea exigua* (Chihuahua prairie-clover), *Eragrostis* sp. (lovegrass), *Ipomoea* sp. (morning-glory), *Leucospora* (= *Schistophragma*) *intermedia*, *Macroptilium gibbosum* (variable bushbean), *Melampodium longicorne* (Arizona blackfoot), *Salvia* sp. (sage), *Tagetes micrantha* (licorice marigold), and *Tradescantia pinetorum* (pinewoods spiderwort). In Mexico, they have been observed with *Begonia* sp., *Cyperus* sp. (flatsedge), *Irida* sp., and *Quercus* sp. (oak).

POPULATION TRENDS: Apparently, only the Ramsey Canyon population has been monitored to any extent. This population occurs in 3 subpopulations that were estimated to contain a total of 3,075, 1,879, and 2,928 plants in 1994 (Gori 1995). The population was estimated to contain between 8,000 and 10,000 plants in 1986 (Neal 1987). The number of plants and reproductive output declined in the monitoring plots of the Ramsey Canyon population from 1986 to 1994. It was decided that this population should be monitored less often, in order to not impact the population through monitoring, and at the entire population level, so that a better picture of the population as a whole can be achieved (Falk and Warren 1994). The Reef population in the Huachuca Mountains was estimated to contain 300 - 400 individuals in 1982 (Johnson and Reichenbacher 1982). Corral-Diaz (1990) stated that *P. marginatus* was abundant at each of the locations where it was observed and collected in Mexico.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2, USDI, FWS 1990]

STATE STATUS: Salvage Restricted (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]
[Forest Service Sensitive USDA, FS Region
3 1985]

MANAGEMENT FACTORS: The limited distribution, narrow habitat requirements, and small amount of habitat this species occupies, makes it a species of concern at the present time. Large amount of unsearched potential habitat on Forest Service, BLM, and private lands in the U.S. and in Mexico. Road building, mining, trampling by cattle and people, and soil erosion are possible threats (AZNPS 2000). “Threats from grazing are enormous” according to Elizabeth Makings (Laurenzi and Spence, 2012).

CONSERVATION MEASURES TAKEN: This species has been listed as “Forest Service Sensitive” since 1985. The Ramsey Canyon population was mapped in 1986. Annual monitoring of that population occurred until 1994 by The Nature Conservancy. The population at La Michilia, Mexico (Durango) is located within private property and managed by the federally funded Instituto de Ecologia. Basaseachic is a National Park in western Chihuahua, managed by SEDUE, but heavily used by cattle. El Tecuan (Durango, Mexico) is a recreation center with increasing visitation.

SUGGESTED PROJECTS: Potential habitat should be surveyed, especially in areas adjacent to known populations. Existing populations should be monitored to some extent, if possible. Protect known populations of *P. marginatus* from grazing and all forms of soil disturbance, and any activities which may cause erosion or alter soil deposition at the site.

LAND MANAGEMENT/OWNERSHIP: USFS - Coronado National Forest (Sierra Vista Ranger District); TNC - Ramsey Canyon Preserve; and private.

SOURCES OF FURTHER INFORMATION**REFERENCES:**

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

D. F. Gori - The Nature Conservancy, Tucson, AZ.

R.W. Kiger - Hunt Inst. Bot. Documentation, Carnegie-Mellon Univ., Pittsburgh, PA.

P. Neal - State University of New York, Stony Brook.

F.R. Reichenbacher - Southwest Field Biologists, Tucson, AZ.

L. J. Toolin - University of Arizona, Tucson.

ADDITIONAL INFORMATION:

Toolin: added to flora of United States in 1980 with discovery of Ramsey Canyon population; published 1986.

Apparently Greene (1910) described the leaves in error--as flat with scarious margins rather than terete because he only saw dried, pressed specimens.

There is apparently a large amount of unsearched potential habitat.

Warren et al. (1989) note that all populations (known to them in 1989) occupy less than one acre of habitat.

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