

ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract

Element Code: PDFAB330L0
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Macroptilium supinum* (Wiggins & Rollins) A. Delgado & L. Torres
COMMON NAME: Supine Bean
SYNONYMS: *Phaseolus supinus* Wiggins & Rollins
FAMILY: Fabaceae

AUTHOR, PLACE OF PUBLICATION: *Phaseolus supinus* I. L. Wiggins and R. C. Rollins, Contr. Dudley Herb. 30: 266-284. 1943. *Macroptilium supinum* (Wiggins & Rollins) A. Delgado & L. Torres, Anales Inst. Biol. Univ. Nac. Auton. Mexico, Bot. 66: 189. 1995.

TYPE LOCALITY: Mexico: Sonora: 19 miles north of La Colorada.

TYPE SPECIMEN: Dudley Herbarium #285,564. I. Wiggins and R. Rollins #354. 7 Sept. 1941.

TAXONOMIC UNIQUENESS: There are 3 species of *Macroptilium* in Arizona (Lehr 1978, Lehr and Pinkava 1980, Lehr and Pinkava 1982).

DESCRIPTION: Non-technical: Perennial herb with prostrate stems from a tuberous root. Leaves parted into three leaflets, these narrowly lance-shaped. Flowers small, salmon-colored, 2-8 per flower stalk, borne both above ground and tucked into bases of grass clumps. Fruit in the form of small seed pods, to about 1 inch long, covered with short hairs. Seeds 1/8 inch wide and up to 1/4 inch long (Toolin 1982, Toolin 1987).

Technical: A perennial herb with prostrate, creeping stems arising from an elliptical tuber that is 3-14 cm long. Leaves are opposite with 3 lanceolate leaflets that taper from the base to the tip. These leaflets are 0.6-1.2 cm wide and 3-8 cm long. Above-ground flowers are salmon-colored with keeled petals up to 11 mm long. These flowers (2-8) are borne on an erect, unbranched inflorescence that originates at the base of the leaf petioles. The species also has underground, cleistogamous (self fertilizing) flowers, 5-6 mm long that are mostly yellow with salmon. These flowers are borne on axillary, branched inflorescences (each branch with 0-5 flowers) that grow under the leaf litter or under rocks. Pods on both above- and below- ground inflorescences are small (8-15 mm), oblong to slightly elliptic, and usually contain a single seed. Seeds are buff-colored, mottled with purple, and are 2 mm wide and 4 mm long (Gori et al. 1990).

AIDS TO IDENTIFICATION: This is the only *Macroptilium/Phaseolus* in the area with a tuberous root, subterranean inflorescences, and unlobed, narrowly-lanceolate leaflets (Gori et al. 1990).

ILLUSTRATIONS: Line drawing, USFWS.
Line drawings of plant and flowers (Wiggins and Rollins 1943).

TOTAL RANGE: Santa Cruz County, Arizona, south into Mexico, including the states of Sonora and Nayarit.

RANGE WITHIN ARIZONA: Santa Cruz County: Atascosa-Pajarito Mountains, San Luis Mountains, Patagonia Mountains, and the southern portion of the Santa Cruz River drainage.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous perennial.

PHENOLOGY: Flowers and sets fruit after the onset of summer rains in July and may continue into early October, depending on the amount of moisture available.

BIOLOGY: Most seed production occurs through self-fertilization of cleistogamous underground flowers. Seeds produced in this way are "preplanted" for following season. Vegetative growth and reproduction are closely tied to summer rainfall; seasonal growth is initiated only after early summer rains have begun (July). Plants return to dormancy during periods of drought or low rainfall. This dormancy may continue even after normal rainfall has resumed and plants may fail to reproduce during that growing season (Toolin 1982, Toolin 1987).

HABITAT: Ridge tops and gentle slopes of rolling hills in semi-desert grassland or grassy openings in oak-juniper woodland.

ELEVATION: 3,600 - 4,900 feet (1080-1470 m).

EXPOSURE: Various.

SUBSTRATE: Sandy loams, derived from rhyolite and other substrates.

PLANT COMMUNITY: This species is found in semi-desert grassland and madrean evergreen woodland communities, as defined by Brown (1994). Associated species include (all species not present at every site) *Calliandra eriophylla*, *Quercus emoryi*, *Q. oblongifolia*, *Juniperus deppeana*, *Fouquieria splendens*, *Prosopis* spp., *Yucca baccata*, *Mimosa biuncifera*, *M. dysocarpa*, *Opuntia macrorhiza*, *Nolina* sp., *Bouteloua curtipendula*, *B. gracilis*, *B. chondrosioides*, *B. hirsuta*, *Aristida hamulosa*, *Eragrostis intermedia*, *Muhlenbergia arizonica*, *Trachypogon secundus*, *Hilaria berlandieri*.

POPULATION TRENDS: There are currently an estimated 12 populations of this species in Arizona. Population sizes range from small (around 20) to relatively large (around 3,500). A monitoring plot was established within one population in the Atascosa Mountains and was monitored from 1989 to 1993. Over this time period, a 43% decline in the number of plants was observed in the monitoring plot. This decline was apparently due to low reproductive output and poor recruitment, although the reasons for these are unknown (Gori 1999).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
 [C2 under *Phaseolus supinus*, USDI, FWS, 1993]
 [C1, under *P. supinus* USDI, FWS 1990]
 [3C, under *P. supinus* USDI, FWS 1985]
 [C1, under *P. supinus* USDI, FWS 1980]

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]

MANAGEMENT FACTORS: There are a small number of populations (approximately 12) in the U.S., with a relatively small acreage of occupied habitat.

Possible threats include degradation of habitat due to livestock grazing, off-road vehicle activity, recreation (camping and hiking), Border Patrol activities, utility corridor and road construction and maintenance, home building, etc. This species is apparently browsed by rodents and grazed by livestock (Toolin 1987).

PROTECTIVE MEASURES: One population in Arizona, occurs in the Goodding Research Natural Area. This species has been listed as "Forest Service Sensitive" since 1990.

SUGGESTED PROJECTS: Monitoring of known populations should continue to some extent. Areas of suitable habitat need to be searched for this species.

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

SOURCES OF FURTHER INFORMATION

LITERATURE CITATIONS:

Brown, D. E. ed. 1994. Biotic communities: southwestern United States and northwestern Mexico. University of Utah Press. Salt Lake City. 342 pp.

- Buhrow, R. 1983. The Wild Beans of Southwestern North America. *Desert Plants* 5(2):67-71.
- Gori, D. 1999. Unpublished abstract prepared for the as yet unpublished Arizona Rare Plant Field Guide. 1 pp.
- Gori, D. F, P. L. Warren, and L. S. Anderson. 1990. Population Studies of Sensitive Plants of the Huachuca, Patagonia and Atascosa Mountains, Arizona. Report for the Coronado National Forest, Tucson, Arizona.
- Lehr, J. H. 1978. A catalogue of the flora of Arizona. Desert Botanical Garden, Phoenix, AZ.
- Lehr, J. H. and D. J. Pinkava. 1980. A catalogue of the flora of Arizona. Supplement I. *Journal of the Arizona-Nevada Academy of Science* 15:17-32.
- Lehr, J. H. and D. J. Pinkava. 1982. A catalogue of the flora of Arizona. Supplement I. *Journal of the Arizona-Nevada Academy of Science* 17:19-26.
- Toolin, L. J. 1982. Status Report for *Phaseolus supinus*. Prepared for U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- Toolin, L. J. 1987. Status Report for *Phaseolus supinus*. Prepared for U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- USDA, Forest Service Region 3. 1990. Regional Forester's Sensitive Species List.
- USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.
- USDI, Fish and Wildlife Service. 1980. Endangered and Threatened Wildlife and Plants; Review of Plant Taxa for Listing as Endangered or Threatened Species. *Federal Register* 45(242):82506.
- USDI, Fish and Wildlife Service. 1985. Endangered and Threatened Wildlife and Plants; Review of Plant Taxa for Listing as Endangered or Threatened Species. Notice of Review. *Federal Register* 50(188):00021.
- USDI, Fish and Wildlife Service. 1990. Endangered and Threatened Wildlife and Plants; Review of Plant Taxa for Listing as Endangered or Threatened Species; Notice of Review. *Federal Register* 55(35):6202.
- USDI, Fish and Wildlife Service. 1993. Plant Taxa for Listing as Endangered or Threatened Species; Notice of Review. *Federal Register* 58(188):51163.
- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species; Notice of Review; Proposed Rule. *Federal Register* 61(40):7604.
- Wiggins, I. L. and R. C. Rollins. 1943. New and noteworthy plants from Sonora, Mexico. *Contrib. Dudley Herb.* 30:266-284.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

- Dave Gori - The Nature Conservancy, Tucson, Arizona.
- Gary Nabhan - Arizona-Sonora Desert Museum, Arizona.
- Frank Reichenbacher - Southwest Field Biologists, Tucson, Arizona.
- Larry Toolin - University of Arizona.
- Peter Warren - The Arizona Nature Conservancy, Tucson, Arizona.

ADDITIONAL INFORMATION:

Several populations were located in the Pajarito Mountains a few miles south of the U.S./Mexico border in 1990.

Horticultural experiments have taken place with this species, often showing favorable results.

Revised: 1990-12-14 (SR)
1991-10-20 (BKP)
1998-01-09 (SSS)
1999-11-30(DJG)

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. 19XX (= **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