

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

Plant Abstract

Element Code: PDCAC05030

Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Echinocactus polycephalus*

COMMON NAME: Cotton-top cactus, Cottontop cactus, Cottontop barrel cactus, Woolly-headed barrel, Cottontop echinocactus, Clustered barrel cactus, Many-headed barrel, Biznaga-tonel amacollada [Spanish]

SYNONYMS:

FAMILY: Cactaceae

AUTHOR, PLACE OF PUBLICATION: Engelm. & Bigelow J.M., Proc. Amer. Acad. Arts and Sci. 3: 276. 1856.

TYPE LOCALITY: LT: USA, California, Mohave Valley (MO).

TYPE SPECIMEN: LT: MO. J.M. Bigelow s.n., 8 Mar 1854. LT designated by Chamberland, Syst. Bot. 22: 311 (1997).

TAXONOMIC UNIQUENESS: *E. polycephalus* is 1 of 3 species in the genus *Echinocactus*, and 1 of 2 in Arizona. Two varieties of *E. polycephalus* occur in Arizona including, *E.p.* var. *polycephalus* and *E.p.* var. *xeranthemoides*.

DESCRIPTION: This is the only barrel in Arizona that branches under normal conditions. Plants branch from the base, with 8-inch (20 cm) diameter heads occurring in clusters of up to 200, forming mounds to 3 feet (1 m) across and somewhat less high. FNA (1993+) reports mounds of 2-50(-130) branches. Stems are gray-green to yellow-green, with 11-25 ribs usually vertical, or somewhat curving around the stem. The dense, stout spines obscure the plant bodies and restrict the small yellow flowers from opening fully. The brown spines appear bright red when wet from rain. (Arizona-Sonora Desert Museum, 2000; FNA 1993+).

Technical: Stems branching in clumps of 5-30 (10-20 per NatureServe 2005; 2-50(-130) per FNA 1993+), up to 0.6 m (2 ft) high and 1.2 m (4 ft) diameter. Larger stems gray-green, spheroidal to cylindroid, 30-60 cm (12-23.6 in) long, to 10-20 cm (4-7.8 in) diameter; ribs 13-21. Tubercles almost completely coalescent; areole elliptic, typically 12 mm apart. Spines dense, obscuring stem; central spines red or yellow with ashy surface layer, in the common variety with a dense, felty canescence, which may peel off in sheets as spine ages. The lowest (principal) spine curves slightly downward, other nearly straight, strongly cross-ribbed, the longer 6-7.5 cm (2.3-3 in) long. Radial spines similar to centrals but smaller, 6-8 per areole, spreading irregularly or slightly curving in low arcs, the longer 3-4.5 cm (1.18-1.7 in) long. Flower up to 5 cm (2 in) in

diameter and long; sepals with pink midribs and yellowish margins, largest subulate, each forming a spine (20-25 mm long). Petals yellow or midribs tinged with pink, largest oblanceolate. Filaments, anthers, and style yellow. Fruit dry at maturity, densely encased in matted woolly hairs 12-20 mm long, the ovary 20-25 mm long. Seeds black, irregularly obovoid but sharply irregularly angled from compression, 2-2.5 mm long. (Benson, 1982; FNA 1993+).

AIDS TO IDENTIFICATION: Differences in the varieties include: *E.p. var. polycephalus* is found at 30-750 m in altitude in the Mojavean and Sonoran deserts; has stems in clumps of 10-30, the longest in the middle; spines are densely canescent, the felt peeling away in sheets; seeds are irregularly obovoid-oblong, markedly papillate-reticulate, not shiny. *E.p. var. xeranthemoides* is found at 1080-1500 m in altitude in the Navajoan Desert; stems in clumps of 5-12 or solitary, the longest on the margin; spines are glabrous or glabrate with hairs falling away separately; seeds are obovoid, papillate-reticulate but the pattern not prominent, shiny. (Benson, 1982).

ILLUSTRATIONS: Color photo (<http://www.calflora.net/>)
Color photo of plant in habitat (CA Acad. Sci. 1999, in CalPhotos
<http://elib.cs.berkeley.edu/>)
Color photo (<http://www.desert-tropicals.com>)
Color photo (<http://www3.nau.edu/cline/>)
B&W drawing (Arizona-Sonora Desert Museum, 2000)
Color photos (Benson, 1982: fig. 750-754)
Color photos (Gary A. Monroe, in USDA, NRCS 2004 at
<http://plants.usda.gov/intellect.html>)

TOTAL RANGE: Arizona (Coconino, Mohave, and Yuma Co.), California (Inyo, San Bernardino, Riverside and Imperial Co.), Nevada (Lincoln and Clark Co.), and historically in Utah.

RANGE WITHIN ARIZONA: Occurs in the driest parts of the Sonoran and Mohave deserts in Mohave and Yuma counties, and in Coconino County on the Grand Canyon NP, and the Navajo Reservation.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial stem succulent shrub/subshrub.

PHENOLOGY: Blooms March to June, with the flowers set into the spines of the plant preventing the flower from fully opening.

BIOLOGY: This cactus is slow growing and probably very long-lived. For example, plants grown from seed at the Desert Museum are just beginning to branch at nearly 20 years of age. The flowers are pollinated by bees. Though the fruits seem to be imprisoned within the

spiny armor, birds and packrats can get to them and disperse the seeds. Bighorn sheep and javelina eat the whole plants and probably function as occasional long-distance seed dispersers. (Arizona-Sonora Desert Museum, 2000).

HABITAT: Variety *polycephalus* is found in rocky and gravelly slopes in the driest parts of the Sonoran and Mohave deserts. Often found in creosote bush scrub. Variety *xeranthemoides* is found in rocky, south-facing ledges of canyons and hills in the Navajoan Desert and the edge of the Juniper-Pinyon Woodland.

ELEVATION: The following elevation ranges are based off of herbarium collections housed in SEINet (assessed 2005). Coconino County: 3,760 – 6,483 ft (1146-1976 m). Mohave County: 1803 – 4,921 ft (550-1500 m). Yuma County: 230 – 1,120 ft (70-342 m).

EXPOSURE:

SUBSTRATE: Rocky or gravelly soils of dry slopes, and sometimes clay soils of valley deserts.

PLANT COMMUNITY: Sonoran, Mohave, and Navajoan deserts, and the edge of the juniper-pinyon woodland. In Coconino County, associated species include: *Acacia* sp., *Agave utahensis utahensis* (Utah Agave), *Artemisia* sp. (sagebrush), *Cirsium* sp. (thistle), *Coleogyne ramosissima* (blackbush), *Echinocereus engelmannii* var. *variegatus* (a hedgehog cactus), *Ephedra torreyana* (Torrey's Mormon-tea), *Fallugia paradoxa* (Apache-plume), *Gutierrezia sarothrae* (broom snakeweed, on drier sites), *Juniperus osteosperma* (Utah juniper), *Nolina* (bear-grass), *Opuntia erinacea* (old-man prickly-pear), *Perityle congesta* (compacted rockdaisy), *Pinus edulis* (two-needle pinyon pine), *Purshia mexicana* (Mexican cliff-rose), *Shepherdia rotundifolia* (roundleaf buffaloberry), and *Stipa* (needlegrass). (SEINet, accessed 2005)

In Mohave County, associated species include: *Agave* sp., *Ambrosia* (bursage), *Aristida* (three-awn grass), *Artemisia tridentata* (big sagebrush), *Atriplex* (saltbush), *Ceratoides* (= *Krascheninnikovia*, winter-fat), *Coleogyne ramosissima*, *Coryphantha* sp. (pincushion cactus), *Cryptantha* (cat's-eye), *Dalea* (prairie-clover), *Echinocereus* sp. (hedgehog cactus), *E. coccineus*, *E. triglochidiatus* (mound hedgehog cactus), *Echinomastus* (= *Sclerocactus*) *johnsonii*, *Ephedra* (Mormon-tea), *Eriogonum* (wild buckwheat), *Fallugia paradoxa*, *Ferocactus cylindraceus* (California barrel cactus), *F. cylindraceus* var. *lecontei* (Leconte's barrel cactus), *Forsellesia* (= *Glossopetalon*, greasebush), *Juniperus* (juniper), *Krameria* (Ratany), *Larrea tridentata* (creosote bush), *Lycium* (desert-thorn), *Opuntia arbuscula* (pencil cholla), *O. basilaris* (beavertail prickly-pear), *O. bigelovii* (teddy-bear cactus), *O. echinocarpa* (straw-top cholla), *O. erinacea* (old-man prickly-pear), *O. versicolor* (staghorn cholla), *Pinus edulis*, *Poa* (bluegrass), *Purshia* (cliff-rose), *Quercus* (oak), *Thamnosma*, *Yucca baccata* (fleshy-fruit yucca), *Y. brevifolia* (Joshua tree), and grama grasses. (SEINet, accessed 2005)

In Yuma County, associated species include: *Ambrosia dumosa* (white bursage), *Carnegiea gigantea* (Saguaro cactus), *Cercidium* sp. (= *Parkinsonia*, paloverde), *Encelia farinosa* (white brittlebush), *Fouquieria splendens* (ocotillo), *Larrea tridentata*, *Olneya tesota* (Ironwood tree), and *Opuntia basilaris*. (SEINet, accessed 2005).

POPULATION HISTORY AND TRENDS: This species is geographically stable; its range has not changed for at least the past 30,000 years despite the dramatic climatic swing from ice age to a warm interglacial period (Arizona-Sonora Desert Museum, 2000).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None
STATE STATUS: Salvage Restricted (ARS, ANPL 1999)
OTHER STATUS: Protected (Nevada)

MANAGEMENT FACTORS: Like most cacti, subject to horticultural collecting.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP: BIA – Navajo Nation; BLM – Arizona Strip Field Office; NPS – Grand Canyon National Park and Lake Mead National Recreation Area. Possibly USFS – Kaibab National Forest.

SOURCES OF FURTHER INFORMATION

REFERENCES:

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MAJOR KNOWLEDGEABLE INDIVIDUALS:**ADDITIONAL INFORMATION:**

Spanish name: biznaga de chilitos (little chile barrel).

The name “cotton-top” refers to the generous tufts of cottony hairs enveloping the flower base and fruits. This woolliness of the fruits is natural and not due to injury by rodents. (Jaeger, 1969).

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