

Key to Prickly-pear Cacti (*Opuntia*, subgenus *Opuntia* in the strict sense)  
in and around Tucson, Arizona

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- 1a. Epidermis puberulent (a unicellular trichome protrudes about 0.2 mm. from each cell):
- 2a. Yellowish green; tepals yellow; intricately branched shrubs up to 1/2 meter tall [common in horticulture, and feral near habitation; native to east-central Mexico]:  
*Opuntia microdasys* (Bunny-ears Prickly-pear)
  - 2b. Blue-green or gray; tepals purple; branches mostly at ground level, plants usually reaching only one or two joints above ground [rare in horticulture; native to w. Arizona and California]:  
*O. basilaris* (Beavertail Prickly-pear)
- 1b. Epidermis smooth:
- 3a. Individual "pads" elongated and narrowed distally (owing to indeterminate growth), up to 1 meter long or larger; spines yellow, conspicuous; sprawling shrub 2 to 5 meters in diameter [grossly abundant in horticulture, and feral near habitation; native to San Antonio, Texas, where presumably extinct in the wild]:  
*O. lindheimeri*, mutant form "*linguiformis*" (Cow-tongue Cactus)
  - 3b. Individual pads round, oval, or rhomboid (owing to determinate growth, all "programmed" to stop growing at a species-specific size/shape); growth-habits various, but if "pads" up to 1 meter long (in one form of *O. ficus-indica*) then plants strictly erect and tree-like:
    - 4a. Stems uniformly purple or blue-grey:
      - 5a. Inner tepals uniformly yellow; pads relatively elliptical (bases broadly obtuse-angled to rounded); spines yellow, orange, or brown, rarely black-and-white; erect shrubs, identical in growth-habit to *Opuntia chlorotica* [native, cultivated, and feral populations; the domesticated type is almost spineless]:  
*O. santa-rita* (Purple Prickly-pear)
      - 5b. Inner tepals yellow with red bases, giving the flower a sharply defined red center; pads broadly obovate (bases varying from right-angled to broadly obtuse-angled); sprawling shrubs, intermediate with *Opuntia phaeacantha* in growth-habit:  
*O. macrocentra* (Black-spined Prickly-pear)  
[one taxonomic species containing two biological species; see couplet below]
    - 6a. Pads 2 to 6 inches long [in horticulture; native to Big Bend region of Texas]:  
diploid *O. macrocentra*
    - 6b. Pads 4 to 8 inches long; [native plants, seldom seen in horticulture]:  
tetraploid *O. macrocentra*
  - 4b. Stems basically green (sometimes purplish, but only under stress):

- 7a. Stems wrinkling transversely under stress, leaving permanent marks after the first winter; low-growing plants, less than a foot tall:
- 8a. Spines 0--2 (rarely 4) per areole, not hiding the stem surface; root system semi-succulent, the largest roots usually 1 cm. or more thick [native in woods and prairies above the desert]:  
*O. macrorhiza* (Tuberous-rooted Prickly-pear)
- 8b. Spines up to 10 per areole, nearly hiding the stem surface; roots all fibrous [native to Mohave Desert & Rocky Mountain region, rarely grown as an ornamental in Tucson]:  
*O. polyacantha* (Grizzly-bear Cactus, Plains Prickly-pear)
- 7b. Stems wrinkling irregularly, or remaining smooth, under stress; plants at maturity usually more than a foot tall:
- 9a. Areoles on flower/fruit 40--70; plants arborescent (2 to 5 meters) [south-central Mexican origin; abundant in horticulture, and even grown agriculturally; rarely feral near Tucson]:  
*O. ficus-indica* (Indian-fig Prickly-pear; Nopal)
- 9b. Areoles on flower/fruit 12--35; plants shrubby, not exceeding 2 meters tall:
- 10a. Pads long and narrow (2 to 4 times longer than wide) [grown in old yards in Phoenix and Tucson; wild origin unknown but not from USA]:  
*O. sp.* "Angel Wings"
- 10b. Pads round, rarely up to 1.5 times longer than wide:
- 11a. Glochids of all areoles large (spine/glochid transition-forms, up to 1 cm. long, forming a large, loose, star-like cluster, reddish brown or brown with yellow tips); normal spines absent, replaced by the extra-large glochids; inner tepals always bright red [native to s. Texas, uncommon in horticulture in Tucson]:  
*O. aciculata*
- 11b. Glochids all small (larger on the rims of the pads); normal spines present or not; spines and glochids variously colored; inner tepals mostly yellow:
- 12a. Completely spineless, even the glochids few and inconspicuous; leaves strongly decurved [strictly confined to dooryard horticulture, unknown in the wild]:  
*O. ellisiana* (South Texas Spineless Prickly-pear)
- 12b. Spines present in at least a few areoles of every plant; leaves straight, directed upward or outward; wild plants, also cultivated:

13a. Spines and glochids all pale yellow; spines all slender and bristle-like (none more than 0.5 mm. thick); largest spines on the flat faces of the pads tending to be directed downward instead of radiating evenly in all directions; pads often nearly round, their bases rounded or obtusely angled; erect shrubs (sometimes having a single six- or eight-inch-tall trunk); reproduction strictly from seed [uncommon native plants]:

*O. chlorotica* (Pancake Prickly-pear, Silver Dollar Prickly-pear)

13b. Largest spines mostly white and/or brown; glochids yellow or brown; largest spines rigid and needle-like (usually 0.5 to 1.0 mm. thick); largest spines all projecting straight out or else spreading indiscriminately in all directions; pads obovate or rhomboid, their bases cuneate (weakly obtuse- or broadly acute-angled); sprawling shrubs, rooting adventitiously and ultimately forming clonal thickets:

14a. Fruit pulp green or colorless; fruit rind brick-red to dull rose-pink; seeds greater than 4 mm. wide; inner tepals yellow with red bases; plants 0.1 to 0.5 meter tall; spines of seedlings normal (straight and sharp); glochids (on representative areoles--on faces of the stems, not on the rims) arranged in dense tufts (having a semicircular or crescent-shaped basal outline) in the upper halves of the areoles, with a cylindrical tuft near the center of each areole (after the first year), relatively small and uniform; seeds relatively large; stems often turning purplish red under stress; spines (at least the largest ones) reddish brown [abundant native plants, also in horticulture]:

*O. phaeacantha* (Brown-spined Prickly-pear)

14b. Fruit pulp beet-red; fruit rind dark beet-red to magenta; seeds less than 4 mm. wide; inner tepals unicolored (yellow, rarely changing to apricot-orange on second day); plants at maturity 0.5 to 2 meters tall; spines of seedlings (in the cylindroid stage, before flat "pads" are produced) hair-like and soft; glochids scattered throughout the areoles, relatively large (some of them transitional to normal spines); seeds relatively small; stems remaining green under stress; spines white or yellow [abundant native plants, also in horticulture]:

*O. engelmannii* (Engelmann's Prickly-pear; O'Odham names include Gook Eepai & Watik Eepai)

NOTE: This key omits *Opuntia quimilo*: Glossy green, glabrous, erect shrub, usually 1 to 2 m. tall, spineless except for a few of the uppermost areoles on well-developed pads; these contain a single spine (usually at least 4 cm. long) projecting straight out from the stem surface, gray or white; pads smooth and turgid; flowers are smallest of all Tucson p-pear species; inner tepals are bright orange (different from any other Tucson prickly-pear cactus); often male-sterile (anthers present, but lacking pollen) [native to n. Argentina or a nearby region; uncommon in horticulture in Tucson].

NOTE: This key also omits an unidentified *Opuntia*, probably *O. vulgaris*: Glossy green, glabrous, erect (but often flopping over, weak or wilted), usually 0.5 to 2 m. tall (often requiring physical support to exceed 1 meter in height); areoles few (about 35 or 40 per pad?); pads thin and often slightly tuberculate (having slightly elevated areoles); spines absent, or very few per plant [Flowers not seen on the Tucson plants, but those of *O. vulgaris* are supposed to be large and yellow.] [strictly in dooryard horticulture, where rare in Tucson, often in semi-shade in sheltered patio environments; *O. vulgaris* is native to Brazil, Argentina, Uruguay, and Paraguay]