

\* **Portulaca grandiflora** Hooker, Rose-moss. In sandy soil or around granitic flatrocks; native of Argentina. Jul-Sep. [= C, FNA, G, K, Mo, Pa, RAB, S, WH3, Z]

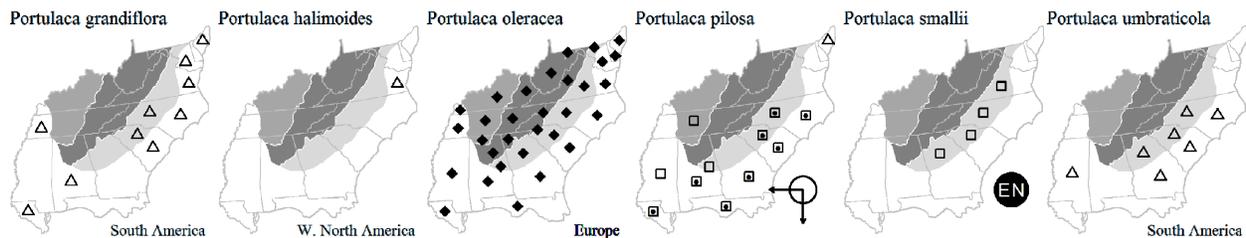
\* **Portulaca halimoides** Linnaeus. Waste area along railroad; probably only a waif, native of sw. North America. Reported by Reed (1964). [= FNA, K; > *P. parvula* A. Gray]

\*? **Portulaca oleracea** Linnaeus, Common Purslane, Garden Purslane, Pussley, Pursley. Gardens, disturbed areas, cracks in sidewalks; originally native (apparently) of at least Asia, but there is evidence of pre-European presence of this species (as here treated broadly) in North America. May-Nov. The various subspecies recognized may or may not be taxonomically significant; a decision awaits an analysis of variation worldwide, or, at least, in the native range of the species. In North America, *P. oleracea* is a widespread, sometimes noxious weed, probably representing numerous introductions of various genotypes, treated as multiple subspecies by some authors. In North America, these genotypes appear to have intermixed; in our area (at least), the recognition of infraspecific taxa has been considered unwarranted, difficult, and unmeaningful (see Matthews, Ketron, & Zane 1993); see Danin & Anderson (1986) for a contrasting opinion. During the Great Depression, *P. oleracea* was eaten extensively in the Valley of Virginia as a potherb. [= C, F, FNA, G, K, Mo, Pa, RAB, S, Va, W, WH3, WV, Z; > *P. oleracea* ssp. *granulostellata* (Poelln.) Danin & H.G. Baker; > *P. oleracea* ssp. *nicaraguensis* Danin & H.G. Baker; > *P. oleracea* ssp. *nitida* Danin & H.G. Baker; > *P. oleracea* ssp. *papillatostellulata* Danin & H.G. Baker]

**Portulaca pilosa** Linnaeus, Kiss-me-quick. Disturbed sandy soils. May-Oct. NC south to s. FL, west to NM, north in the interior to c. TN, AR, and OK, and in Central America; the native range perhaps obscure. See Matthews, Ketron, & Zane (1992a) for a further discussion of this species. [= FNA, K, Mo, RAB, S, WH3, Z; > *P. mundula* I.M. Johnston]

**Portulaca smallii** P. Wilson, Small's Portulaca. In thin soils on granitic and diabase flatrocks, sometimes locally spreading to adjacent fields, mowed areas, or other disturbed areas. (Jun-) Late Aug-Oct. Sc. VA south to c. GA. Generally considered an endemic limited to granitic flatrocks, *P. smallii* also occurs on a diabase flatrock, growing with an interesting mixture of granite flatrock and limestone cedar glade species (LeGrand 1987, Schafale & Weakley 1990). [= FNA, K, RAB, S, Va, Z]

\* **Portulaca umbraticola** Kunth, Chinese-hat, Wingpod Purslane. Disturbed areas, spreading weakly or persistent following cultivation; native of South America and the West Indies. See *P. coronata* for further discussion. [< *P. umbraticola* Kunth - Z; = *P. umbraticola* Kunth ssp. *umbraticola* - K]



316. CACTACEAE A.L. de Jussieu 1789 (Cactus Family) [in CARYOPHYLLALES]

A family of about 110-139 genera and about 1450-1800 species, perennial herbs, shrubs, vines, and trees, endemic to tropical, subtropical, and temperate America (a single species, *Rhipsalis baccifera*, occurring as well in Africa, Madagascar, and Sri Lanka, presumably as a result of long-distance dispersal from the Americas), with centers of diversity in sw. United States-n. Mexico, s. South America, and the West Indies. The base chromosome number for the family is  $n=11$ . References: Parfitt & Gibson in FNA (2003b); Barthlott & Hunt in Kubitzki, Rohwer, & Bittrich (1993); Hunt et al. (2006); Anderson (2001); Nyffeler & Eggli (2010).

*Opuntia* P. Miller 1754 (Prickly-pear Cactus)  
[contributed by Lucas C. Majure]

A genus of approximately 150-200 species, perennial herbs, shrubs, and trees, widespread in the Americas from s Canada to Patagonia, Argentina, which originated in southern South America and eventually spread to North American arid regions; subsequently occupied edaphically xeric regions of the eastern US (sandy soils, rock outcrops, saline soils, etc.). The genus represents the most widespread taxon in all of Cactaceae. Hybridization and polyploidization are common in this clade. Economically important, numerous species have been introduced worldwide as forage for livestock, as well as for ornamentals and agricultural products. *Opuntia ellisiana* Griffiths is commonly planted as an ornamental in North Florida but is not covered here, as no escaped populations are known. *Opuntia santa-rita* (Griffiths & Hare) Rose, purple prickly pear, is sometimes planted as an ornamental in the eastern US. *Opuntia* species are notoriously difficult to identify and are best-identified using live material with information regarding population morphological variation. Three-dimensional characters are most often lost in dried herbarium specimens, which make their identification using those materials more problematic. References: Britton & Rose (1920); Benson (1982)=Y; Anderson (2001); Pinkava in FNA (2003b); Majure et al. (2012a, 2012b, 2012c, 2013); Majure & Puente (2014); Majure (2014); Ward (2009e)=X; Doyle (1990)=Z; Barthlott & Hunt in Kubitzki, Rohwer, & Bittrich (1993).

- 1 Plants forming low, spreading shrubs.
  - 2 Tepals yellow with red or maroon bases adaxially.
    - 3 Erect-spreading shrubs, chains of cladodes radiating from center of plant, the flat surface generally held perpendicular to the ground surface; cladodes remaining turgid throughout the year; stigma usually green; fruit barrel-shaped (widest near the middle); [of c. TN] .... *O. phaeacantha*
    - 3 Spreading shrubs, plants clump forming or with chains of cladodes spreading from the central axis of the plant, the flat surface generally parallel to the ground surface; cladodes becoming cross-wrinkled during fall and winter months, fruit clavate (widest towards the tip); [collectively widespread in our area].
      - 4 Central spines mostly 0-2 (when 2, both spines generally in the same plain, i.e., both reflexed or both erect); spines monomorphic (central spines only produced); [widespread in eastern US, mostly west of the Appalachian Mts. and east of the MS River] ..... *O. cespitosa*
      - 4 Central spines mostly 0-3 per areole (when 2-3, the lower spines generally reflexed and the upper spine porrect on upper cladodes); spines monomorphic (central spines only) or dimorphic (with smaller hairlike radial spines and larger central spines); [mostly west of the Mississippi River, in our area as a rare disjunct in w. MS] ..... *O. macrorhiza*
  - 2 Tepals entirely yellow or greenish yellow.
    - 5 Cladodes spineless; cladodes never easily disarticulating; areoles typically 4-5 per diagonal row at the widest point of the cladode; [central Appalachian Mts. and n. Atlantic Coast, disjunct in nc. MS] ..... *O. humifusa*
    - 5 Cladodes generally with 1 or more spines per areole on at least some of the uppermost areoles; cladodes easily disarticulating or not; areoles typically 1-4 per diagonal row at the widest point of the cladode; [widespread in Atlantic and Gulf Coastal Plain and Atlantic Piedmont].
      - 6 Terminal cladodes easily disarticulating, 0.8-11.1 cm × 0.6-3.4 cm, often cylindrical or only moderately flattened; spines strongly retrorsely barbed; terminal cladodes with 1-2 areoles per diagonal row at the widest point of the cladode ..... *O. drummondii*
      - 6 Terminal cladodes disarticulating or not, 3.1-17.7 cm × 2-9 cm, strongly flattened; spines retrorsely barbed (to the touch) or not; cladodes with 3-4 areoles per diagonal row at the widest point of the cladode.
        - 7 Seeds with funicular envelope smooth, only moderate, if any, protrusion of the cotyledons and hypocotyl, cladodes typically scalloped-margined, elliptical or rotund in outline, spines delicate 0.7-0.9 mm in diameter; [restricted to the outer Gulf Coastal and Atlantic Coastal Plain] ..... *O. mesacantha ssp. lata*
        - 7 Seeds with funicular envelope bumpy, cotyledons and hypocotyl noticeably protruding, cladodes typically smooth-margined, obovate or rotund in outline, spines stout 0.95-1.3 mm in diameter; [of Atlantic Southern Piedmont, FL panhandle along the coast W to coastal MS and e. LA, otherwise mostly inner Gulf Coastal and Atlantic Coastal Plain] ..... *O. mesacantha ssp. mesacantha*
- 1 Plants forming erect or ascending shrubs or trees.
  - 8 Tepals red, pink, yellow with red midribs abaxially, or yellow with red or reddish maroon bases adaxially; stamens either thigmonastic (i.e., moving towards the stigma in response to manipulation of filaments) or not.
    - 9 Cladodes generally spineless; tepals red or pink, erect; stamens and style exerted past the corolla; filaments red or pink, the stamens not thigmonastic; [alien, rarely persistent or naturalizing in FL] ..... *O. cochenillifera*
    - 9 Cladodes generally spiny; tepals yellow and variously tinged red or maroon adaxially or abaxially; stamens and style included within the corolla; filaments yellow or yellow green, the stamens thigmonastic.
      - 10 Erect shrubs or small trees; spines chalky-white; cladodes dark, glossy green; tepals yellow with red abaxial midrib; stigmas white to cream; fruit clavate (widest towards the tip), often proliferous; [alien, known from FL only in our area] ..... *O. monacantha*
      - 10 Spreading or erect shrubs; spines pale white or white with maroon or brown bands; cladodes light, glaucous green, dull; tepals yellow basally tinged red or maroon adaxially; stigmas usually greenish; fruit barrel-shaped (widest near the midpoint), not proliferous; [of nc. TN] ..... *O. phaeacantha*
  - 8 Tepals yellow or greenish yellow; stamens thigmonastic.
    - 11 Spines white (at least on second year's growth), generally round at the base and thus round in cross section, strongly retrorsely barbed or not; glochids stramineous-colored; mature fruit red, greenish yellow or pink; [restricted to FL] ..... *O. austrina*
    - 11 Spines white or yellow (on second year's growth), often flattened at the base and thus lacunar or elliptical in cross section; glochids bright yellow; mature fruit usually dark purple or dark pink; [of coastal areas and also commonly cultivated].
      - 12 Glochid pattern generally of an adaxial crescent in the areole, i.e. glochids forming a dense fascicle in the upper portion of the areole, not widely separated throughout, exerted or not from the areole; spines yellow, sometimes with dark lateral banding; cladodes typically tuberculate with scalloped margins; [native, collectively widespread in coastal areas and also occasionally cultivated].
      - 13 Cladodes spiny throughout, the spines 0-11 per areole, generally curved and spreading from the areole margins, the marginal spines usually strongly flattened at the base, then with 1-4 central spines, which are dark yellow and commonly with dark brown or black bands towards to base and middle of the spine ..... *O. stricta var. dillenii*

- 13 Cladodes usually few-spined, spines mostly 0-3 per areole, generally straight, produced erect from the areole or only slightly spreading, usually rounded, slightly twisted, or only slightly flattened at base, yellow..... *O. stricta* var. *stricta*
- 12 Glochid pattern generally of a pin-cushion type, with the glochids widely separated and exerted from the areole; spines white with dark bases or yellow; cladodes not strongly tuberculate, the margins smooth not scalloped; [cultivated widely, and seemingly introduced in remote areas on barrier islands of SC, NC, and se. VA].
- 14 Spines white, with red-brown bases..... [*O. engelmannii* var. *engelmannii*]
- 14 Spines yellow, with or without dark bases.
- 15 Cladodes rotund, elliptical or obovate in outline, obviously determinate ..... *O. engelmannii* var. *lindheimeri*
- 15 Cladodes elongate, ovate or narrowly ovate (lanceolate) in outline, appearing indeterminate as a result of the lengthening and narrowing of the cladode apex ..... [*O. engelmannii* var. *linguiformis*]

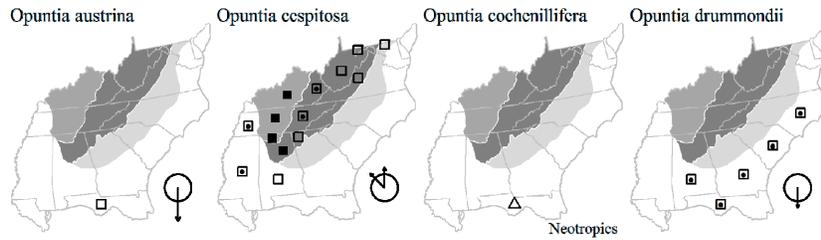
***Opuntia austrina*** Small, Southern Prickly Pear, Florida Prickly-pear. Scrub, sandhills, and transitional areas between scrub, sandhills and pine flatwoods, dunes, shell middens, in deep, sandy soils. Late Mar-May; Jul-Nov. Apparently endemic to FL occurring throughout most of the state but most common in the peninsula; mostly absent from the panhandle. *Opuntia austrina* is an erect shrub or treelet, and often semaphore-like with a primary central trunk and most of the branches towards the top of the plant, but growth form is highly variable in this species and some plants are “shrubbier” with lower branches than others; tuberous roots often present, as compared to *O. mesacantha*, which is a low, spreading species that has fibrous roots. Some plants of *O. austrina* can reach heights of up to 2 m. *Opuntia austrina* has frequently been confused with *O. stricta* var. *stricta* (e.g., see Y) due to its large size and the often straight, rounded (in cross-section) spines, which are similar to those of *O. stricta* var. *stricta*. Also, both species occur sympatrically along parts of the Atlantic Coast. This species has been heavily impacted in parts of its distribution by the cactus moth, *Cactoblastis cactorum* Berg. A diploid species ( $2n=22$ ). [ $> O. humifusa$  (Rafinesque) Rafinesque var. *ammophila* (Small) L.D. Benson – FNA, K1, Y, Z;  $<< O. humifusa$  var. *humifusa* – FNA;  $> O. ammophila$  Small – K2, S, X;  $> O. austrina$  Small – K2, S, X;  $> O. humifusa$  (Rafinesque) Rafinesque var. *austrina* (Small) Dress – K1, Y, Z;  $> O. cumulicola$  Small – S;  $> O. atropensis$  Small – S;  $> O. cumulicola$  Small – S;  $> O. nitens$  Small – S;  $> O. pisciformis$  Small – S;  $> O. polycarpa$  Small – S;  $> O. turgida$  Small – S;  $< O. humifusa$  – WH3; = *O. compressa* (Salisbury) J.F. Macbride var. *austrina* (Small) L.D. Benson;  $> O. compressa$  (Salisbury) J.F. Macbride var. *ammophila* (Small) L.D. Benson]

***Opuntia cespitosa*** Rafinesque, Common Eastern Prickly-pear. Limestone and chalk outcrops, dolomite outcrops, glades, sandy or blackland prairies, upland hardwood or mixed hardwood-pine forests in dry, clay soils. May-Jun; Aug-Dec (-Feb). This is the most common species (a tetraploid,  $2n = 44$ ) in the eastern United States but has traditionally been considered conspecific with *O. humifusa*. *O. cespitosa* is most common west of the Appalachian Mountains and is found throughout most of the Midwestern states, east of the MS river. *O. cespitosa* can be differentiated from *O. humifusa* by its yellow tepals that are basally tinged red, crimson or red-brown, as well as dark brown or red glochids and the presence of spines (note: populations in Bibb Co., AL tend to have lighter colored glochids as in *O. humifusa* or *O. mesacantha*). Vegetatively, it is most similar to *O. mesacantha* ssp. *mesacantha*, from which this allopolyploid may be partially derived, although floral features are quite different, and *O. cespitosa* does not have the strongly retrorsely-barbed spines common in *O. mesacantha*. This species also can be confused with certain forms of *O. macrorhiza*, another putative parent of *O. cespitosa*; both species have yellow inner tepals basally tinged red adaxially. [ $< O. humifusa$  (Rafinesque) Rafinesque var. *humifusa* – FNA, K1, Va, Y, Z;  $< O. humifusa$  var. *humifusa* – FNA;  $< O. compressa$  (Salisbury) J.F. Macbride var. *compressa* – G;  $< O. humifusa$  – K2;  $< O. compressa$  – RAB;  $< O. humifusa$  – C, F, Pa, W, WH3;  $> O. humifusa$  – X;  $> O. opuntia$  (Linnaeus) Korten – S;  $> O. compressa$  – WV;  $> O. rafinesquei$  Engelm var. *microsperma* Engelm;  $> O. mesacantha$  Rafinesque var. *microsperma* (Engelm) J.M. Coulter;  $> O. humifusa$  (Rafinesque) Rafinesque var. *microsperma* (Engelm) A. Heller;  $> O. compressa$  (Salisbury) MacBride var. *microsperma* (Engelm) L.D. Benson;  $> O. rafinesquei$  Engelm var. *minor* Engelm;  $> O. mesacantha$  Rafinesque var. *parva* J.M. Coulter;  $> O. humifusa$  (Raf.) Raf. var. *parva* (Coulter) A. Heller;  $> O. humifusa$  (Rafinesque) Rafinesque ssp. *minor* (Engelm) R. Crook & Mottram]

\* ***Opuntia cochenillifera*** (Linnaeus) P. Miller, Cochineal Nopal Cactus, Tunita. Disturbed areas, persistent and escaping from cultivation; native to central America and Mexico. Feb-Apr; May-Aug. A tall shrub or more commonly tree-forming, hummingbird-pollinated species. Occasionally growing as an escape in n. FL (and throughout FL peninsula), where it is commonly cultivated. The genus *Nopalea* is phylogenetically nested within *Opuntia*, and thus those taxa formerly treated in *Nopalea* should be referred to *Opuntia*. See Majure et al. (2012a) and Majure & Puente (2014) for further discussion. A diploid species ( $2n=22$ ). [= *Nopalea cochenillifera* (L.) Salm-Dyck – FNA]

***Opuntia drummondii*** Graham, Dune Prickly-pear, Sand-bur Prickly-pear, Little Prickly-pear, Creeping Cactus. Dunes on barrier islands, less commonly on river-associated sands and on granite outcrops. Apr-Jun; Aug-Oct. This species is found most commonly along coastal dune systems and gulf coast barrier islands but also along riverine sands, and rarely on granite outcrops (often associated with *O. mesacantha* subsp. *mesacantha*). As mentioned by Small (1933) and Radford, Ahles, & Bell (1968), this little coastal cactus is inconspicuous and often becomes attached by its retrorsely barbed-spines to the pants or shoes of people walking through the dunes. It can inflict painful wounds, the spines not easily removed from flesh or clothing because of the retrorse barbs. *O. drummondii* sometimes forms hybrid swarms with *O. mesacantha* on coastal dunes (see Y for additional discussion). *O. drummondii* is easily separated from other species in the eastern US by the production of very small cladodes with strongly retrorsely barbed spines; the cladodes easily disarticulate at the nodes and are often dispersed vegetatively forming clones of the parent plants. This species most often has fibrous root systems but sometimes produces small tubers as well. *O. drummondii* is most easily confused with *O. nemoralis* Griffiths of coastal w. LA, AR, MO, and TX. Intermediates between *O. drummondii* and *O. mesacantha* subsp. *mesacantha* have been found along the Atlantic and Gulf coasts and on granite in n. GA. Found throughout the Atlantic and Gulf coastal plain, but mostly absent from the FL peninsula, forming a disjunction between the Gulf and Atlantic coasts. A species with diploid, triploid, and tetraploid populations ( $2n=22, 33, 44$ ). [= RAB; = *O. pusilla* (Haworth) Haworth – FNA, K1, K2, WH3, X, Z, apparently misplid;  $> O. drummondii$  – S;  $> O. tracyi$  Britton – S;  $> O. pes-corvi$  LeConte ex Engelm;  $> O. frustulenta$  Gibbs]

\* ***Opuntia ellisiana*** Griffiths. Commonly cultivated as an ornamental in n. FL, and may persist. {neither keyed nor mapped}



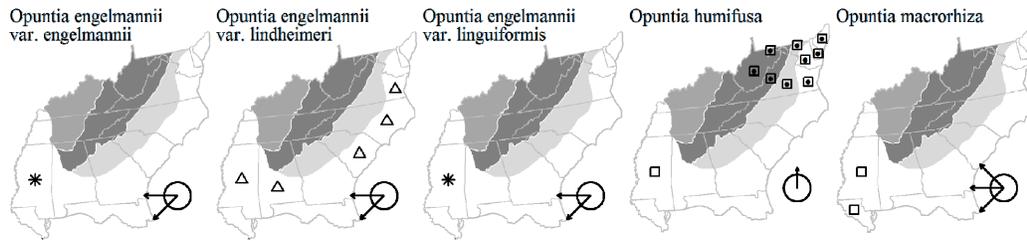
\* ***Opuntia engelmannii*** Salm-Dyck ex Engelm. var. ***engelmannii***, Engelm. Prickly-pear. Disturbed areas, planted as an ornamental and perhaps persisting or weakly spreading. *Opuntia engelmannii* is a large, shrubby hexaploid species ( $2n=66$ ) with a primary distribution in the western United States and Mexico. Numerous infraspecific taxa are recognized under this species in most current treatments (e.g., Pinkava in FNA 2003; followed here); some of these taxa have often been also regarded as species. Regardless, it is clear that they are closely related taxa (see Majure et al. 2012c). The typical var. *engelmannii* can be distinguished from the other two in our area by the production of white spines with dark, reddish-brown bases. It only occurs in our area as an ornamental, as far as is known. [= FNA, K2]

\* ***Opuntia engelmannii*** Salm-Dyck ex Engelm. var. ***lindheimeri*** (Engelmann) B.D. Parfitt & Pinkava, Texas Prickly-pear. Disturbed areas, where persistent or spreading from cultivation (Majure et al. 2011), but also apparently early introduced by native Americans or early settlers on coastal dunes and sand barrens on barrier islands; native of sc. United States south into Mexico. May-Jun; Aug-Nov (-Feb). Although found along the coast in NC (New Hanover Co., where it grows with *O. drummondii*), SC, and VA (Henrico and Isle of Wight cos.), the origin(s) of those populations is unknown. The native range of *O. engelmannii* var. *lindheimeri* is the western US (although occurring in coastal w LA) and Mexico, so it seems unlikely that the coastal Atlantic populations are native; however, certain populations along the SC coast can be found in quite isolated locations (P. McMillan, pers. comm.). Small (1933) reported *O. cantabrigiensis* Lynch from dunes near Beaufort, NC, based on a fragmentary 1930 collection accompanied by a photograph. Similar plants were apparently seen near Beaufort by Engelmann, prior to 1856. Benson (1982) refers the collection tentatively to *O. lindheimeri* Engelm. var. *cuija* (Griffiths & Hare) L.D. Benson, treated in K as *O. engelmannii* Salm-Dyck ex Engelm. var. *cuija* Griffiths & Hare, a native of Mexico. Benson (1982) also stated, however, that it could also be var. *lindheimeri* (primarily of TX and Mexico), or, indeed, *O. tuna* (Linnaeus) P. Miller (native to the West Indies). Benson (1982) failed to relocate the plant in the field in 1956, but stated there was "insufficient time for a thorough search." Unless relocated, the identity of the plant will probably remain a mystery, as well as whether it represents a native species, an established population from aboriginal use, or a more recent introduction or adventive. [= FNA; > *O. lindheimeri* Engelm. - S; > *O. cantabrigiensis* Lynch - S; = *Opuntia lindheimeri* Engelm.]

\* ***Opuntia engelmannii*** Salm-Dyck ex Engelm. var. ***linguiformis*** (Griffiths) B.D. Parfitt & Pinkava, Cow's-tongue Prickly-pear. Planted as an ornamental in our area (not known from wild populations in its putative region of origin), rarely persisting or perhaps spreading. [= FNA, K2; = *O. lindheimeri* Engelm. var. *linguiformis* (Griffiths) L.D. Benson; = *Opuntia linguiformis* Griffiths]

***Opuntia humifusa*** (Rafinesque) Rafinesque, Eastern Prickly Pear. Slate outcrops, sandy soils, upland hardwood forests or mixed pine-hardwood forests in dry, clay or silty soils. May-Jun; Aug-Dec. *O. humifusa* is restricted primarily to the Appalachian Mountains but also occurs in the inner coastal plain of central and n. central MS (Attala, Choctaw, Grenada, Webster cos.). More work may illuminate populations in n. AL, nw. GA, w. SC, w. NC, and ne. TN, however, at present populations are disjunct between the eastern states (DE, MD, NJ, VA, WV) and MS. *O. humifusa* is an allotetraploid ( $2n=44$ ), cryptic species that is most easily confused with *O. mesacantha* ssp. *mesacantha*, from which it can be separated by its lack of spines (although see *O. mesacantha*), and generally increased number of areoles per diagonal row across the cladode face at midstem (4-5 vs. 3-4 in *O. mesacantha*), generally inserted glochids (vs. exerted in *O. mesacantha*), and smaller seeds (4.0-4.6 mm long vs. 5.0-5.9 mm long in *O. mesacantha* ssp. *mesacantha*) with a smooth funicular envelop (instead of the upraised funicular envelope in *O. mesacantha* ssp. *mesacantha*). *Opuntia humifusa* also tends to have rotund or elliptic-oblong cladodes vs. *O. mesacantha* ssp. *mesacantha*, which more often has rotund to obovate cladodes, but cladode shape is highly variable. Populations of *O. humifusa* are typically located geographically between populations of *O. cespitosa* and *O. mesacantha* ssp. *mesacantha*. See Kalmbacher (1976) and Leuenberger (1993) for a discussion of the proper name for this taxon. [< *O. humifusa* - K2; < *O. humifusa* (Rafinesque) Rafinesque var. *humifusa* - K1, Va, Y, Z; < *O. humifusa* var. *humifusa* - FNA; < *O. compressa* (Salisbury) J.F. Macbride var. *compressa* - G; < *O. compressa* - RAB; < *O. humifusa* - C, F, Pa, W, WH3; > *O. humifusa* - X; > *O. impedita* Small - S; > *O. macarthuria* Gibbes - S; > *O. opuntia* (Linnaeus) Karten - S; > *O. compressa* - WV; > *O. calcicola* Wherry - WV; > *O. calcicola* Wherry; > *O. rafinesquei* Engelm., nomen nudum]

***Opuntia macrorhiza*** Engelm., Tuberos-rooted Prickly-pear, Plains Prickly-pear. Sandy or silty prairies, glades, limestone rock outcrops. May-Jun; Aug-Dec (-Feb). Mostly of the southwestern United States and northern Mexico, w. LA, AR, MO into the Midwestern states; in our range only occurring in w. MS in Yazoo, Holmes, and Bolivar counties. What is currently recognized as *Opuntia macrorhiza* s.l. is a group of closely related taxa (species complex), that is currently under revision (Majure, unpubl. data). Material that occurs in w. MS is of the *O. grandiflora* form (see Britton & Rose 1920), which is mostly spineless or may have 1-3 spines per areole. Those plants form large colonies and grow slightly ascending, produce inner tepals that are yellow with red bases adaxially and elongated fruit maturing dark purple to red (see Majure and Ervin 2008; treated as *O.* aff. *allairei*). This species often has tuberous roots. A species complex with diploid and tetraploid components ( $2n=22, 44$ ). [= FNA, K2; ? *O. allairei* Griffiths]



***Opuntia mesacantha* Rafinesque ssp. *lata*** (Small) Majure, Prickly-pear. Coastal dunes and scrub, sandhills, borders of pine flatwoods, scrub, coastal islands (FL, GA, SC), riverine sands. Apr-Jun; Jul-Nov. Ssp. *lata* is restricted to the outer Atlantic and Gulf Coastal Plains and the FL peninsula. Co-occurs with *O. austrina* in parts of the FL peninsula. A diploid taxon ( $2n = 22$ ). [ $< O. humifusa$  (Rafinesque) Rafinesque var. *humifusa* – FNA, K1, Va, Y, Z;  $< O. humifusa$  var. *humifusa* – FNA;  $< O. compressa$  (Salisbury) J.F. Macbride var. *compressa* – G;  $< O. humifusa$  – K2;  $< O. compressa$  – RAB;  $< O. humifusa$  – C, F, Pa, W, WH3;  $> O. impedita$  Small – S; orthographic variant;  $> O. eburnispina$  Small;  $> O. impedita$  Small;  $> O. lata$  Small;  $> O. macrarthra$  Gibbes]

***Opuntia mesacantha* Rafinesque ssp. *mesacantha***, Prickly-pear. Granite outcrops, coastal dunes and scrub, sandhills, pine forests in sandy soils, Gulf Coast barrier Islands (AL, FL panhandle, MS), riverine sands. Apr-Jun; Aug-Dec. Throughout the southern Piedmont, Atlantic and Gulf Coastal Plain, but absent from the FL peninsula forming a disjunction between the Gulf and Atlantic coasts, as in *O. drummondii*, with which this subspecies is often associated, at least along the coast and in certain Piedmont populations on granite. This is the most common species in the Atlantic and Gulf Coastal Plain and Atlantic Southern Piedmont. *O. mesacantha* is a low-spreading shrub with typically spiny cladodes with 1-2 spines per areole (although populations exist with individuals with up to 6 or more spines per areole, while other population may consist of nearly spineless plants), those spines generally, but not always, strongly retrorsely barbed. This species was mostly referred to as *O. humifusa* var. *austrina* or *O. humifusa* var. *humifusa* by Benson (1982). Vegetative propagules of this taxon have been found widely dispersed in coastal areas after hurricanes. This is a tetraploid taxon ( $2n=44$ ). [ $< O. humifusa$  (Rafinesque) Rafinesque var. *humifusa* – FNA, K1, Va, Y, Z;  $< O. humifusa$  var. *humifusa* – FNA;  $< O. compressa$  (Salisbury) J.F. Macbride var. *compressa* – G;  $< O. humifusa$  – K2;  $< O. compressa$  – RAB;  $< O. humifusa$  – C, F, Pa, W, WH3;  $> O. pollardii$  Britton & Rose – G, S, X;  $> O. humifusa$  – X; = *O. pollardii* Britton & Rose]

\* ***Opuntia monacantha* (Willdenow) Haworth**, Common Prickly-pear. Disturbed areas, sometimes persistent or escaping from horticultural use; native of South America (Argentina, Brazil, Paraguay). Although *O. monacantha* can form trees to several meters high, those found in FL typically are smaller, erect shrubs – maybe a result of environmental conditions. Reports of *O. monacantha* from numerous states are erroneous and based on the misinterpretation of the invalid name, *O. vulgaris*, which has been used for both *O. humifusa* and *O. monacantha* (see Leuenberger 1993). [= FNA, K1, K2; ? *O. vulgaris* P. Miller – RAB, X, Y; = *O. monacanthos* – WH3]

***Opuntia phaeacantha* Engelman**, Tulip Prickly-pear. Limestone glades. May-Jun; Aug-Oct. KS to CA south to TX and Mexico; disjunct in c. TN. Specimens from c. TN do not fit within the circumscription of *O. cespitosa*, the common species for that region, and are here tentatively treated as *O. phaeacantha*, but need additional study. These populations differ from *O. cespitosa* by their growth form, forming ascending shrubs, with chains of cladodes produced mostly parallel to the ground surface, and the cladodes that maintain turgidity throughout the year, instead of becoming cross-wrinkled during the winter, as in *O. cespitosa*. An additional assumption that these TN populations were merely an escape from cultivation (see Majure 2012c, under *O. phaeacantha*) has been altered by the discovery of additional populations of this taxon in central TN. At least one of the three populations is confined to cattle grazing areas and could have been introduced via cattle imported from the western US. However, more work will be necessary to determine where this taxon originated, as these populations are far out of the range of this western species. The material from central TN is smaller and not as spiny as typical *O. phaeacantha*, but at least one population from Wilson Co. has been recorded as hexaploid ( $2n=66$ ; Majure et al. 2012a), the same ploidal level as that of other *O. phaeacantha* populations. The other populations are currently being studied to more appropriately treat this taxon and determine its origin in the se. US. *Opuntia phaeacantha* s.l. is a species complex comprised of numerous morphotypes, which needs careful morphological, cytogenetic, and molecular-based study. [= FNA, K2]

***Opuntia stricta* (Haworth) Haworth var. *dillenii*** (Ker Gawler) L.D. Benson, Coastal Prickly Pear, Shell Midden Prickly-pear, Yaaxpakan. Coastal dunes and coastal scrub, occasionally in water-logged saline soils of mangroves. Apr-Jun; Aug-Dec (-Feb). Var. *dillenii* is most common in the Caribbean region but makes its way into the se. US along both the Atlantic (north to e. SC) and Gulf coasts (of the FL peninsula and panhandle and coastal AL). *O. stricta* var. *dillenii* is typically a larger, more robust plant than *O. stricta* var. *stricta*. A hexaploid taxon ( $2n=66$ ). [= *O. stricta* (Haworth) Haworth var. *dillenii* (Ker-Gawler) L.D. Benson – K1, X, Y, Z;  $< O. stricta$  – FNA, K2, S, WH3; = *Opuntia dillenii* (Ker Gawler) Haworth] AL, FL, GA, SC.  $2n=66$ .

***Opuntia stricta* (Haworth) Haworth var. *stricta***, Coastal Prickly Pear, Shell Midden Prickly-pear. Coastal dunes and coastal scrub, shell middens in salt marshes of the Gulf Coast, occasionally in water-logged saline soils of mangroves. Apr-Jun; Aug-Dec (-Feb). Se. NC (reports from VA are based on a misidentification) south to s. FL, west to e. LA. *O. stricta* is introduced throughout the world, in the Americas occurring throughout the Antilles, se. US, parts of coastal TX and eastern Mexico, northern South America, Ecuador, and Peru. Mostly restricted to coastal areas from SC to e. LA in our area, unless planted as an ornamental; coastal hammocks, shell middens, coastal dunes, barrier islands. Small (1933) recorded *O. stricta* (as *O. tunoidea*) from NC, but no specimens have been seen of this material. This species forms an erect or ascending shrub from 1-2 (-3) m tall, which are generally highly branching. The gray-green, dull color of the pads, yellow spines, and dark purple fruit can help distinguish this species from *O. austrina*, with which it is sometimes associated on the FL Atlantic Coast. The restricted distribution of this species in the se. US likely is the result of its lack of cold tolerance (Majure, pers. obs.). This species has long been used as a food source for native peoples; Small (1933) identifies it as the “the prickly-pears the early Spanish records tell us

the aborigines feasted on for three months of each year and also cured, like figs, for food when out of season". *O. stricta* has been heavily impacted by the non-native cactus moth, *Cactoblastis cactorum*. Two varieties of *O. stricta*, *O. stricta* var. *stricta* and *O. stricta* var. *dillenii*, are recognized in our area, which sometimes are elevated to species level. Although the distinction of *O. stricta* var. *dillenii* is mostly straightforward in the Antilles, intermediate morphotypes and overlapping populations of the two in the southeastern U.S. make differentiation into species very difficult. Both taxa can sometimes produce spineless cladodes, but *O. stricta* var. *dillenii* tends to have more tuberculate stems. More taxonomic and genetic work needs to be carried out on this species complex. *O. stricta* has been involved in numerous hybridization events throughout its range (see Majure et al. 2012c). Intermediates between *O. stricta* and *O. mesacantha* ssp. *mesacantha* have been found in coastal AL (Majure, pers. obs.). Var. *stricta* is apparently restricted to the se. US along the coast, although spineless material from the Caribbean is often attributed to it. Inland material in sw. MS (Adams Co.) may be the result of escaped individuals from ornamental plantings. Vegetative propagules of this taxon have been found widely dispersed in coastal areas after hurricanes (Majure, pers. obs.). This taxon is hexaploid ( $2n=66$ ). [= *O. stricta* (Haworth) Haworth var. *stricta* – K1, X, Y, Z; < *O. stricta* – FNA, K2, S, WH3]

