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KEY TO THE PINWEEDS (*LECHEA*, CISTACEAE) OF ALABAMA AND ADJACENT STATES

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ABSTRACT

Lechea (Cistaceae) is a genus of eighteen species primarily centered in eastern North America, with a few taxa extending southward to Central America. Eleven pinweeds are known from the five-state region of Alabama (7 spp.) and adjacent states Mississippi (6 spp.), Tennessee (5 spp.), Georgia (8 spp.), and Florida (10 spp.). One species, *Lechea deckertii*, is found only in Georgia and Florida and three species are endemic to Florida: *Lechea cernua*, *Lechea divaricata*, which are globally rare to imperiled (G2/G3), and *Lechea lakelae*, which is presumed to be extinct. Keys, illustrations, photographs, and commentary are provided for all Southeastern taxa except *Lechea lakelae*.

KEY WORDS: *Lechea*, pinweed, Alabama

Pinweeds (*Lechea* spp.) are semi-woody (suffruticose) or herbaceous perennials in the Cistaceae (Rock-rose family). Most species are low growing herbs with narrow leaves and numerous small flowers (averaging 2 mm long), which often resemble tiny pinheads (Fig. 1). According to Britton (1894), each plant blooms once in the bright morning sunshine and soon after the three reddish petals wither away (Fig. 2). The calyx on each flower is composed of five sepals in two distinct series. The two outer, bract-like sepals are slender and can be either longer or shorter than the three broader inner sepals. Rafinesque (1836) was the first to note that the length of the inner and outer sepals was a useful character in delineating species.

Figure 1. *Lechea sessiliflora*, Wickham Park, Brevard Co., Florida, 22 Jul 2011. (a) Plant in sandy habitat. (b) Close-up of flowering branch. (c) Immature fruits and mature flowers. Photos by Wayne Matchett.

Figure 2. *Lechea mucronata* in flower, Carter Co., Missouri, 5 Jul 2004. <www.missouriplants.com>. Photo by Dan Tenaglia

In 1751, Peter Kalm named the genus *Lechea* to honor his fellow Swedish botanist John Leche and subsequently Linnaeus (1753) published the genus in his first edition of *Species Plantarum* (Britton 1894). *Lechea* is strictly a New World genus and is composed of eighteen species that are centered in eastern North America, extending southward into Mexico, Central America, and the West Indies (Brizicky 1964). The genus is well-represented in the southeastern USA with a total of eleven species, five of them being endemic to the region (Wilbur & Daoud 1961; Wilbur 1974).

Pinweeds are a distinct and easily recognized genus, but keying them out to species has long puzzled many botanists. Wilbur and Daoud (1961) said that "*Lechea* has usually been considered a difficult genus due to the rather minute technical characters upon which the species distinctions rest." Plants in flower are much more difficult to identify, so it is better to collect material with mature fruit. Leggett (1878) stated that "a good specimen of *Lechea* should have the mature capsule, the sterile stems, i.e., the prostrate or assurgent shoots which spring from the base of the stem when the fruit is about mature, and stem leaves if possible." An immature specimen can also be misleading because the sepal length often changes. In most species of *Lechea* the slender exterior sepals are longer when plants are in bud, but as the flowers mature the inner broad sepals may end up surpassing the outer slender ones.

The keys that follow were constructed after examining specimens from various herbaria in the South (ALNHS, AMAL, AUA, BRIT, JSU, UNA, USF, VDB). Many North American treatments of the genera were utilized to assist in creating keys and determining distributions. Publications used as references include the following: A revision of the genus *Lechea* (Britton 1894); Guide to the Vascular Plants of the Florida Panhandle (Clewell 1985); A taxonomic study of *Lechea* (Hodgdon 1938); Floristic Synthesis of North America (Kartesz 2013); Alabama Plant Atlas (Kral et al. 2013); Manual of the Vascular Flora of the Carolinas (Radford et al. 1968); Manual of the Southeastern Flora (Small 1933); Flora of the Southern and Mid-Atlantic States (Weakley 2013); The genus *Lechea* (Cistaceae) in the southeastern United States (Wilbur & Daoud 1961); and Guide to the Vascular Plants of Florida (Wunderlin & Hansen 2003).

Information on taxa is generally set up in the following format: **Number. Name** author(s) {derivation of specific and infraspecific epithets}. VERNACULAR NAME. Habitat; relative abundance in Alabama; flowering dates. Comments. [*Synonyms*].

KEY TO PINWEEDS OF ALABAMA AND ADJACENT STATES

1. Flowers and fruits mostly borne in clusters of 2's and 3's (occasionally solitary), usually on bent, reflexed pedicels; leaves pubescent on both surfaces; cauline stems usually with appressed pubescence (basal shoots are villous); outer slender sepals shorter than the broad inner sepals; plants endemic to peninsular Florida ..... **10. Lechea cernua**
1. Flowers and fruits borne singly (separate, not fascicled), usually on straight pedicels; leaves pubescent on both surfaces or glabrous; cauline stems glabrous, villous or with appressed pubescence; outer slender sepals shorter or longer than the broad inner sepals; plants of Florida or other states.

    2. Stems with spreading pubescence (villous).

        3. Sepals sparsely pubescent to glabrous; main stem leaves usually more than 1.5 cm long; inner broad sepals distinctly bowed (U or V-shaped in cross-section); capsule subglobose, splitting to 3 valves at maturity and about equal to the calyx in length or slightly exserted; fruit usually with 2−4 seeds; common throughout the Southeast ..... **1. Lechea mucronata**
        3. Sepals uniformly pubescent; main stem leaves all less than 1 cm long; inner broad sepals not bowed or only slightly so; capsule ellipsoid, indehiscent and distinctly exserted from calyx (obviously longer than the sepals); fruit usually 1-seeded; endemic to Florida ..... **2. Lechea divaricata**

    2. Stems with mostly appressed pubescence or glabrous.

        4. Base of calyx of older flowers and/or fruits clearly differentiated into a hardened, shiny, yellowish base, contrasting in color and texture with the rest of the calyx (basal portion, when mature, is mostly glabrous, though immature flowers are sparsely pubescent); fruit narrowly ellipsoid or pyriforme, about twice as long as broad; pedicels averaging about 2 mm long (1.5─3.5 mm); mature capsules exserted from calyx; the two slender outer sepals equaling or shorter than the three broad inner sepals (sometimes the inner sepals are slightly longer in immature flowers); plants chiefly found in Appalachian highland and Piedmont provinces in the Southeast ..... **7. Lechea racemulosa**
        4. Plants without the above combination of characters; plants of the coastal plain or Appalachian highlands and Piedmont.

5. Outer slender sepals equaling or longer than the broad inner sepals. (Note: *Lechea sessiliflora* is keyed both here and under alternative couplet #5.)

    6. Mature capsule subglobose and enclosed by sepals; main stem leaves linear, averaging 1.0 mm wide (or less); calyx densely and evenly pubescent ..... **3. Lechea tenuifolia**
    6. Mature capsule ellipsoid and exserted above sepals; main stem leaves linear-lanceolate, lanceolate or elliptic, 1.5 mm or more wide; calyx not densely pubescent (hairs are spread out, not close together).

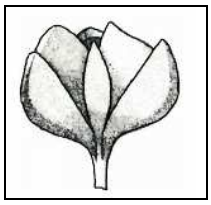
        7. Outer slender sepals (on mature flowers) only a little longer or equaling the inner broad sepals and shorter than mature capsule; main stem leaves (when present) alternate and narrow, rarely wider than 1.5 mm; mature capsule usually straw-colored (the reddish brown stigmas are easily seen capping the fruit because they contrast with the lighter capsule) ..... **5. Lechea sessiliflora**
        7. Outer slender sepals distinctly longer than the inner broad sepals and often equaling mature capsule (slender sepals sometimes a little shorter or a little longer than fruit); main stem leaves (when present) often opposite or whorled and typically more than 1.5 mm; mature capsule brownish (remnants of the stigmas on top are not as distinct because of the darker capsule) ..... **4. Lechea minor**

5. Outer slender sepals shorter than the broad inner sepals.

    8. Calyx very sparingly short-pubescent to glabrous; sepals spreading when in fruit; capsule globose and strongly exserted (1/3–1/2 of length); stems clearly woody at base with many wiry, woody branches; plants restricted to Florida and southern Georgia ..... **6. Lechea deckertii**
    8. Calyx sparsely to densely pubescent; sepals not spreading in fruit or only slightly so; mature capsule either ellipsoid and strongly exserted **or** oval to globose and included to slightly exserted; stems herbaceous (but can appear woody), dying to the base each year; plants occurring from North Carolina to Mississippi.

        9. Mature capsules ellipsoid and conspicuously exserted (capsule about 2 times as long as wide and capped by reddish brown fimbriate stigmas, which contrasts with the lighter capsule); outer slender sepals almost as long as inner broad sepals ..... **5. Lechea sessiliflora**
        9. Mature capsules oval or globose and slightly exserted or enclosed by sepals (about 1.5 times as long as wide and remnants of the stigmas often present, but not as noticeable because capsule is darker); outer slender sepals distinctly shorter than inner broad sepals.

            10. Mature capsules slightly exserted above sepals; leaves abruptly tapering into a hardened, shiny, conical callous tip; calyx appearing brownish (sepals are uniformly strigose-pubescent but their undersurface is easily seen); fruit usually with 2 seeds ..... **8. Lechea pulchella**
            10. Mature capsules not longer than the sepals (though a persistent mound of stigmas on the capsule often protrudes above the sepals); leaves merely acute and lacking a callous tip; calyx often appearing whitish (sepals are typically densely cinereous-pubescent and their undersurface is only slightly exposed); fruit with 3−6 seeds ..... **9. Lechea torreyi**

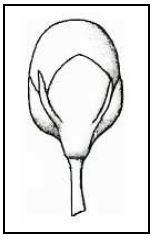


1. Lechea mucronata Rafinesque {sharp point} — HAIRY PINWEED; LARGE PINWEED (Fig. 2 & 3). Sandy woods, pinelands, roadsides, sandhills, and other open dry, sandy habitats; common throughout Alabama; June-October. The spreading pubescence on the stem and the boat-shaped inner sepals are diagnostic. Hairy Pinweed also has the largest primary stem leaves of any *Lechea*. The distribution of this taxon is throughout the eastern half of the USA (BONAP 2013) and it is one of the most common pinweeds in the Southeast. This species has long been known as *Lechea villosa* Elliott (Britton 1894), but Wilbur (1966) stated that there "actually seems to be nothing other than prejudice why we should not take up Rafinesque's name for this species since it has two years priority over Elliott's *L. villosa*." Hodgdon (1938) had a different opinion: "Without type-material to show exactly what the author had, it is futile to guess; and only confusion can result by overthrowing a well characterized and clearly typified name, such as *L. villosa*, by taking up for it a vague name which must always be open to doubt." Most modern authors now use *L. mucronata* (e.g., Weakley 2013; Wunderlin & Hansen 2003). [*Lechea villosa* Elliott var. *macrotheca* Hodgdon; *Lechea villosa* var. *schaffneri* Hodgdon; *Lechea villosa* Elliott var. *villosa*] Illustration: mature fruit of *Lechea mucronata* by Hazim S. Daoud (Wilbur & Daoud 1961).

(a) Mature fruit

(b) Inflorescence (c) Stem (d) Cauline leaves (e) Basal shoots (f) Whole plant

Figure 3. *Lechea mucronata.* (a & b) AMAL, *Barger & Holt SP-737*, Baldwin Co., Alabama, 25 Jul 2012. (c & d) AMAL, *Barger & Holt OC-304*, Dallas Co., Alabama, 7 Jul 2010. (e) USF, *Holst 7257*, Manatee Co., Florida, 7 Dec 1999. (f) AMAL, *Barger & Holt RH-296*, Monroe Co., Alabama, 6 Jul 2012. Photos by John R. Gwaltney.

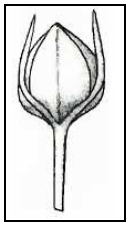


2. Lechea divaricata Shuttleworth ex Britton {spreading} — SPREADING PINWEED; DRYSAND PINWEED (Fig. 4). This species is endemic to peninsular Florida in sandy scrub and scrubby flatwoods habitats; flowering/fruiting typically in May-October (Coile 2000). Florida Natural Areas Inventory (2010) ranks this taxon as endangered in Florida and globally imperiled (G3). *Lechea divaricata* was reported by Charles Mohr (1901) for Mobile County, Alabama, but the specimen was misidentified and annotated by the author to *Lechea mucronata*. When the main stem leaves are not present, the conspicuously hairy calyx is the easiest way to separate *Lechea divaricata* from *L. mucronata*. Hodgdon (1938) thought *L. divaricata* to be a "very distinct species of *Lechea*" and stated that "the capsule, which exceeds the calyx, is extermely hard and indehiscent, the valves having quite coalesced … the leaves are always very small, never reaching 1 cm long." Illustration: mature fruit of *Lechea divaricata* by Hazim S. Daoud (Wilbur & Daoud 1961).

(a) Mature fruit (b) Inflorescence

(c) Cauline stem (d) Cauline leaves (e) Basal shoots (f) Whole plant

Figure 4. *Lechea divaricata.* (a) USF, *Lakela 25174*, Hillsborough Co., Florida, 12 Jul 1962. (b) USF, *Becker WCO0442*, Manatee Co., Florida, 6 Jul 1998. (c) USF, *Schmalzer & Foster 04-658*, Brevard Co., Florida, 19 Nov 2004. (d) USF, *Ray 9996*, Pinellas Co., Florida, 12 Aug 1960. (e) USF, *Bishop OS0049*, Sarasota Co., Florida, 5 Mar 2003. (f) JSU, *Whetstone 14373*, Citrus Co., Florida, 4 Jul 1984. Photos by John R. Gwaltney.



3. Lechea tenuifolia Michaux {narrow leaf} — NARROWLEAF PINWEED (Fig. 5). Open woods, clear-cuts, rocky outcrops (glades), dry roadsides, and other open disturbed places; infrequent throughout Alabama; June-October. This species is widespread in the eastern half of the USA but the center of its distribution is in the Midwest, where it is very common (BONAP 2013). In eastern states, it rare to infrequent and is found mostly in the Piedmont province (pers. comm. Bruce Sorrie). *Lechea tenuifolia* resembles *L. minor* because both taxa have slender sepals that exceed the broader inner ones, but *Lechea tenuifolia* has linear leaves and globose capsules that are enclosed by the sepals. *Lechea minor* has ellipsoid capsules that are distinctly exserted and leaves that are much wider (lanceolate or elliptic). Immature specimens of *Lechea tenuifolia* can be separated from *L. minor* by its very narrow leaves. *Lechea sessiliflora* is also mistaken for *Lechea tenuifolia* when immature, but the calyx of *L. sessiliflora* is sparsely pubescent and *L. tenuifolia* has a calyx that is more densely pubescent (especially when immature). Wilbur and Daoud (1961) stated that *Lechea tenuifolia* is "a widespread species easily recognized by its very narrowly linear leaves (usually 1.5 mm or less wide), globose capsules and enveloping calyx, and its external sepals that are equal to or more commonly exceed the inner." [*Lechea virgata* Rafinesque] Illustration: mature fruit of *Lechea tenuifolia* by Hazim S. Daoud (Wilbur & Daoud 1961).

(a) Fruit with dehiscing capsules

(b) Mature fruit

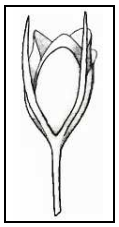
(c) Inflorescence

(d) Cauline stem and leaf

(e) Cauline leaves

(f) Whole plant

Figure 5. *Lechea tenuifolia*. (a) AMAL, *Spaulding 12011*, Fayette Co., Alabama, 3 Aug 2003. (b-e) AMAL, *Haynes 10488*, Claiborne Parish, Louisiana, 12 Jun 2004. (f) VDB, *Kral 12011*, Lamar Co., Alabama, 27 Jun 1970. Photos by John R. Gwaltney.

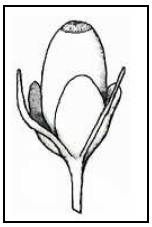


4. Lechea minor Linnaeus {smaller} — THYME-LEAF PINWEED (Fig. 6). Open pinelands, sandhills, pine-oak woodlands, sandy disturbed sites; frequent throughout Alabama; June-October. This pinweed is often confused with *Lechea racemulosa*, but *L. minor* has outer slender sepals that conspicuously exceed the inner broad ones (and appear almost twice as long in immature flowers) and typically has shorter pedicels (1—2 mm long). *Lechea tenuifolia* is also similar because both taxa have very long outer sepals, but *L. minor* has much wider (often whorled) leaves and its capsules are distinctly exserted. *Lechea tenuifolia* has linear leaves and capsules that are enclosed by the sepals. The relatively broad, often whorled leaves help to identify *L. minor* even when sterile. Thyme-leaf Pinweed is common in the eastern USA east of the Mississippi River (BONAP 2013) and is found most physiographic provinces. *Lechea minor* has been designated as the type species of the genus. The only other species named by Linnaeus, *Lechea major*, turned out to be in a different genus in the family (Britton 1894). [*Lechea brevifolia* Rafinesque; *Lechea revoluta* Rafinesque; *Lechea stellata* Rafinesque; *Lechea thymifolia* Michaux] Illustration: mature fruit of *Lechea minor* by Hazim S. Daoud (Wilbur & Daoud 1961).

(a) Fruit with dehiscing capsules (b) Mature fruit

c) Inflorescence (d) Cauline stem and leaf (e) Leaves (f) Whole plant

Figure 6. *Lechea minor*. (a) AMAL, *Barger & Holt Perd-560*, Baldwin Co., Alabama, 13 Aug 2008. (b-d) AMAL, *Spaulding 11620*, Cleburne Co., Alabama, 15 Sep 2002. (e & f) AMAL, *Barger & Holt Perd-596*, Baldwin Co., Alabama, 23 Apr 2009. Photos by John R. Gwaltney.



5. Lechea sessiliflora Rafinesque {stalkless flower} — PINELAND PINWEED (Figs. 1 & 7). Sandhills, dry pine flatwoods, sandy roadsides, coastal scrub and dunes; frequent on Coastal Plain, rare on the Interior Low Plateau; July-October. The distinguishing character of this species (when mature) is the conspicuously exserted, ellipsoid capsules that are capped by reddish-brown fimbriate stigmas (seen on capsules that have not opened). Pineland Pinweed is chiefly found on the Coastal Plain, but there is a specimen from Franklin County, Alabama (Interior Low Plateau), collected from a limestone glade. *Lechea sessiliflora* can be confused with *L. deckertii* because both species have prominently exserted straw-colored capsules with persistent stigmas. The easiest way to distinguish the two species is by length of the outer slender sepals and the shape of the capsule. *Lechea deckertii* has globose capsules and very short outer sepals. *Lechea sessiliflora* has ellipsoid capsules and the narrow outer sepals are almost equaling or a little longer than the broad inner sepals. *Lechea pulchella* is also similar to *L. sessiliflora* but can be identified by its very short outer sepals and distinct callus-tipped leaves. Immature specimens of *Lechea sessiliflora* are sometimes misidentified as *Lechea minor*, but *L. sessiliflora* differs by its narrower, alternate leaves (*L. minor* has wider leaves that are often in pairs or whorls). Since the late 1800's, this species went by the name *Lechea patula* Leggett, until Wilbur (1966) resurrected Rafinesque's *Lechea sessiliflora.* Leggett (1878) said that "*L. sessiflora* [sic], may possibly be *L. patula*, nob., but no species known to me has the mature flowers sessile." Wilbur (1966) remarked that "since no *Lechea* is actually sessile, it would perhaps be only reasonable to interpret Rafinesque's description as "subsessile" and consider short-pedicelled species as possibilities." [*Lechea exserta* Small; *Lechea patula* Leggett; *Lechea prismatica* Small] Illustration: mature fruit of *Lechea sessiliflora* by Hazim S. Daoud (Wilbur & Daoud 1961).

(a) Mature fruit

(b) Inflorescence

(c) Maturing fruit

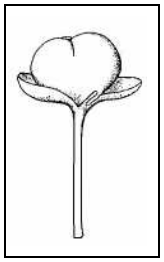
(d) Branch

(e) Cauline stem

(f) Cauline leaves

(g) Whole plant

Figure 7. *Lechea sessiliflora.* (a & b) AMAL, *Horne 1865*, Mobile Co., Alabama, 27 Aug 2012. (c-g) AMAL, *Kral 60836*, Houston Co., Alabama, 21 Aug 1977. Photos by John R. Gwaltney.



6. Lechea deckertii Small {for Florida naturalist, Richard F. Deckert who collected a specimen in 1926} — DECKERT'S PINWEED (Fig. 8). This species occurs throughout Florida (including the eastern Panhandle) and southern Georgia in xeric, sandy habitats such as scrubby flatwoods, sandhills, and Florida-Rosemary (*Ceratiola*) scrub. Since it is found in the Florida Panhandle, it should be searched for along Alabama's coast. The diagnostic features of *Lechea deckertii* are its woody base with numerous wiry, woody branches; sparsely pubescent to glabrous calyx; very short outer sepals; and strongly exserted thin-walled, globose capsules with spreading sepals. Deckert's Pinweed lacks sterile basal shoots that appear late in the season in other species of southeastern *Lechea* (Hodgdon 1938). Small (1933) named another taxon, *Lechea myriophylla*, which differs by its glabrous sepals and other minor characteristics, but Hodgdon (1938) concluded that it "represents merely a phase of *L. deckertii*." [*Lechea myriophylla* Small] Illustration: mature fruit of *Lechea deckertii* by Hazim S. Daoud (Wilbur & Daoud 1961).

(a) Mature fruit with sparsely pubescent sepals

(b) Mature fruit with glabrous sepals

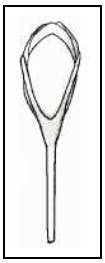
(c) Inflorescence

(d) Cauline stem

(e) Cauline leaves

(f) Whole plant

Figure 8. *Lechea deckertii*. (a) AMAL, *Kral 64146*, Tattnall Co., Georgia, 4 Aug 1979. (b-e) AMAL, *Kral 64128*, Highlands Co., Florida, 3 Aug 1979. (f) VDB, *Godfrey 83927*, Franklin Co., Florida, 29 Jul 1990. Photos by John R. Gwaltney.

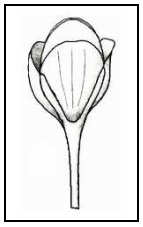


7. Lechea racemulosa Michaux {with small racemes} — RACEMOSE PINWEED; OBLONG-FRUIT PINWEED (Fig. 9). Open woods, sandstone outcrops; sandy pinelands, dry roadsides, forest edges, and old fields; common in the Cumberland Plateau, Valley & Ridge and Piedmont of Alabama, rare on the Coastal Plain; June-October. Only one specimen of *Lechea racemulosa* was observed by the author from the Coastal Plain. Wilbur and Daoud (1961) stated that the "Appalachian distribution pattern of this species has been modified by a migration onto the Coastal Plain from upper North Carolina to Long Island (but scarcely at all further south)." The hardened shiny yellowish base of the calyx is distinct and easily seen in mature specimens. Immature plants may look like *Lechea minor*, but the 2 slender sepals of *L. minor* greatly exceed the inner sepals, but in *L. racemulosa* they are about the same length or only a little longer. For some reason, another common name for this *Lechea* is Illinois Pinweed, yet according to BONAP (2013) it does not even occur in that state. [*Lechea surculosa* Rafinesque; *Lechea ternifolia* Rafinesque] Illustration: mature fruit of *Lechea racemulosa* by Hazim S. Daoud (Wilbur & Daoud 1961).

(a) Mature fruit (b) Inflorescence close-up

(c) Cauline stem and leaf (d) Inflorescence (e) Cauline leaves (f) Whole plants

Figure 9. *Lechea racemulosa.* (a-c) AMAL, *Dickson 768b*, DeKalb Co., Alabama, 5 Oct 1987. (d) AMAL, *Spaulding 13282*, Winston Co., Alabama, 2 Oct 2010. (e & f) AMAL, *Kral 65982*, Sussex Co., Virginia, 17 Jul 1980. Photos by John R. Gwaltney.



8. Lechea pulchella Rafinesque {pretty} — LEGGETT'S PINWEED (Fig. 10). Open woodlands, savannas, flatwoods, roadside ditches, and low areas in sandhills; frequent on the Coastal Plain and rare on the outer Piedmont; June-October. The species is common in well burned longleaf pinelands (pers. comm. Bruce Sorrie). Immature specimens of *Lechea pulchella* can often look like *L. sessiliflora* and *L. torreyi*, but only *Lechea pulchella* has leaves abruptly tapering to a conical, shiny callus tip (about 0.25 mm long). *Lechea pulchella* has also been confused with *L. racemulosa* because the base of the fruiting calyx is sometimes shiny and hardened, but *L. pulchella* has an oval to globose calyx (that is typically pubescent at base) and has callus tipped leaves. Sorrie and Weakley (2007) recognized two varieties of *Lechea pulchella.* The northern taxon, var. *pulchella,* is found from Maryland northward and can be identified by its crowded flowers/fruits that are clustered at branch tips; the southern entity, var. *ramosissima* (Hodgdon) Sorrie & Weakley, occurs from North Carolina southward and has flowers/fruits that are more loosely arranged than the nominate variety. Nathaniel L. Britton (1894) had named this species *Lechea leggettii* in honor of his good friend and *Lechea* expert, William H. Leggett. Both men worked on this genus and Britton (1894) said "we had together pored over Rafinesque's monograph, endeavoring to determine which of his names belonged to the forms we could recognize as distinct, and had come to the conclusion that, unless the type specimens could be found, there could be no certainty in using any of them." But Wilbur (1966) said that "the evidence seems sufficiently convincing that I do not hesitate to take up Rafinesque's binomial for the species most recently known as *L. leggettii*." [*Lechea laxiflora* Rafinesque; *Lechea leggettii* Britton & Hollick var. *leggettii*; *Lechea leggettii* Britton & Hollick var. *ramosissima* Hodgdon; *Lechea recurvata* Rafinesque] Illustration: mature fruit of *Lechea pulchella* by Hazim S. Daoud (Wilbur & Daoud 1961).

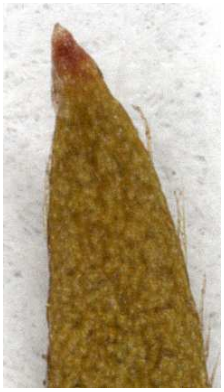
(a) Fruit with dehiscing capsules

(b) Mature fruit

(c) Inflorescence

(d) Cauline leaves

(e) Cauline stem



(f) Callus leaf tip

(g) Whole plant

Figure 10. *Lechea pulchella*. (a) AMAL, *MacDonald 7806b*, Houston Co., Alabama, 26 Sep 1994. (b) AMAL, *Kral 64171*, Alachua Co., Florida, 4 Aug 1979. (c) AMAL, *Kral 64190*, Glascock Co., Georgia, 5 Aug 1979. (d-f) AMAL, *Diamond 17796*, Butler Co., Alabama, 13 Jul 2007. (g) VDB, *Kral 86393*, Baldwin Co., Alabama, 4 Aug 1996. Photos by John R. Gwaltney.

9. Lechea torreyi Leggett ex Britton {in honor of John Torrey, American Botanist, 1796-1873} — SANDHILL PINWEED (Fig. 11). Sandy pine flatwoods and sandhills; lower Coastal Plain, rare in Alabama; July-October. The range of this taxon is from the outer Coastal Plain of Virginia south along the coast to Mississippi. The species is on rare lists in all states except Florida and it either has always been scarce or has become so since European colonization (pers. comm. Bruce Sorrie). The only valid collection known in Alabama occurs in Gulf Shores (Baldwin County) from a sandy area of slash pine-sand pine habitat. One of the common names for this *Lechea* is "Piedmont Pinweed," which is a misnomer since it is a coastal plain endemic (pers. comm. Alan Weakley). What seems to be a distinctive character of the *Lechea torreyi* is the whitish appearance of the plants. This is due to the dense cinereous pubescence on each calyx. Hodgdon (1938) recognized two varieties. The nominate variety appears to be restricted to Florida and the inflorescence is open and loose. *Lechea torreyi* var. *congesta* Hodgdon is more widespread and has congested panicles with more numerous flowers (this is the variety found in Alabama). Wilbur and Daoud (1961) didn't recognize varieties and stated that "the morphological differences are certainly not striking or clear-cut," but according to Weakley (2013) they "present little evidence for or against their recognition." Wilbur (1974) named another species from southern Florida, *Lechea lakelae* Wilbur, Lakela's Pinweed, which is similar to *L. torreyi* but differs by its glabrous calyx, stems, and leaves. It is only known from Collier County, growing along the coastal strand in scrub habitat and may possibly be extinct (FNAI 2010). Illustration: mature fruit of *Lechea torreyi* by Hazim S. Daoud (Wilbur & Daoud 1961).

(a) Mature fruit

(b) Inflorescence

(c) Inflorescence close-up

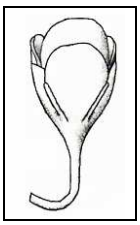
(d) Cauline leaves

(e) Close-up of leaves

(f) Cauline stem

(g) Whole plant

Figure 11. *Lechea torreyi*. (a & b) AMAL, *Kral 66205*, Highlands Co., Florida, 20 Aug 1980. (c-f) VDB, *Kral 64103*, Hendry Co., Florida, 30 Jul 1979. (g) ALNHS, *Barger & Holt SP-601*, Baldwin Co., Alabama, 12 Jul 2012. Photos by John R. Gwaltney.



10. Lechea cernua Small {nodding} — NODDING PINWEED; SCRUB PINWEED (Fig. 12). This species is endemic to peninsular Florida and flowers July-January (Coile 2000). Nodding Pinweed occurs sporadically throughout the Lake Wales Ridge and scrub areas (Christman & Judd 1990) and is restricted predominantly to large white-sand gaps in Florida-Rosemary, *Ceratiola*, scrub (Maliakal-Witt et al. 2005). Florida Natural Areas Inventory (2010) has ranked this taxon as globally rare (G3) and has it state listed as threatened in Florida. Wilbur and Daoud (1961) noted that this "species is so unlike any other within the genus that it is strange that it was overlooked until Small described it in 1924. The flowers and fruits are borne in clusters of 2-4 on stiff, often reflexed pedicels and the leaves are at least minutely pubescent upon both surfaces." Hodgdon (1938) had this comment about the species: "With its broad leaves densely hairy both on the upper and on the lower surface, its shrubby habit and its peculiarly disposed fruits, having indurated capsules with valves considerably grown together, *L. cernua* is very greatly specialized." Illustration: mature fruit of *Lechea cernua* by Hazim S. Daoud (Wilbur & Daoud 1961).

(a) Mature fruit

(b) Inflorescence

(c) Cauline stem

(d) Basal shoots

(e) Cauline leaves

(f) Whole plant

Figure 12. *Lechea cernua*. (a & b) USF, *Daubenmire s.n.*, Lake Co., Florida, 27 Sep 1981. (c) USF, *Lakela 29257*, Lee Co., Florida, 7 Oct 1965. (d) USF, *Orzell & Bridges 19053*, Lee Co., Florida, 11 Nov 1991. (e-f) USF, *Hansen & Richardson 6109*, Highlands Co., Florida, 26 Jul 1979. Photos by John R. Gwaltney.

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