

EUPHORBIACEAE SPURGE FAMILY

Part 1. *Acalypha* and *Cnidocolus*

Geoffrey A. Levin
 Illinois Natural History Survey
 607 East Peabody Drive
 Champaign, IL 61820

Acalypha L. Three-seeded Mercury, Copperleaf

Annual or perennial herbs, shrubs, or rarely trees, monoecious or dioecious, without latex. LEAVES alternate, simple; stipules small. INFLORESCENCES axillary or terminal, spike-like, rarely panicles, staminate, pistillate, or mixed, then most commonly pistillate below and staminate above. STAMINATE FLOWERS very small, subsessile, several in the axil of a minute bract; calyx lobes 4; petals and disk 0; stamens 4-8, the anthers pendent, elongated, and twisted at maturity. TYPICAL PISTILLATE FLOWERS sessile, 1-3 in the axil of an often large foliaceous bract; calyx lobes 3(-5); petals and disk 0; pistil with (1-)3 carpels, the ovary (1-)3-locular, the style branches usually dissected into thread-like segments. ALLOMORPHIC PISTILLATE FLOWERS sometimes present, distal, differing from typical pistillate flowers by having the ovary strongly 1-3 lobed and the style subbasal, and often by being pedicelled and ebracteate. FRUITS capsules with (1-)3 locules, each segment splitting and falling from the persistent columella; fruits of allomorphic flowers deeply lobed schizocarps. SEED 1 per carpel, ovoid, usually carunculate, variously sculptured. --Ca. 400 spp. worldwide, chiefly of tropical and subtropical regions, a few cultivated as ornamentals. (Greek name for stinging nettle, some species resembling nettles, though not stinging). Levin, G. A. 1994. *Madroño* 41:254-265. Miller, L. W. 1964. A taxonomic treatment of the species of *Acalypha* in the United States. Ph.D. dissertation, Purdue University. Pax, F. and K. Hoffmann. 1924. Euphorbiaceae-Crotonoideae-Acalypheae-Acalyphinae. In: A. Engler (ed.). *Das Pflanzenreich*, IV, 147, XVI(Heft 85):1-231. Radcliffe-Smith, A. 1973. *Kew Bulletin* 28:525-529.

1. Plants perennial, shrubby or suffrutescent.
 2. Plants shrubby; leaves ovate-cordate, widest near the base; inflorescences both axillary and terminal, almost always unisexual, occasionally with one or a few pistillate flowers at the base of a staminate spike; bracts subtending pistillate flowers with 10-18 small obtuse teeth; young stems and leaves with stalked glands *A. californica*
 - 2' Plants herbaceous above the woody root; leaves (except sometime the lowermost) elliptic to obovate, widest near the middle; inflorescences mainly terminal, mostly with several to many pistillate flowers below and staminate flowers above, sometimes all pistillate; bracts subtending pistillate flowers with 5-7 large acute teeth; stems and leaves pubescent but not glandular *A. lindheimeri*
- 1' Plants annual, herbaceous.
 3. Bracts subtending pistillate flowers divided nearly to the base into 13-17 linear lobes; capsules sparsely short hispid and with fleshy glandular green outgrowths *A. ostryifolia*
 - 3' Bracts subtending pistillate flowers merely toothed; capsules hirsute or short pilose, but not with green outgrowths
 4. Bracts subtending pistillate flowers with the middle tooth much longer than the others; staminate flowers in separate spikes; allomorphic flowers sessile, the ovary bilobed and bumpy, not winged *A. neomexicana*
 - 4' Bracts subtending pistillate flowers evenly toothed all around, the middle tooth little if any larger than the others; staminate flowers above the pistillate flowers; allomorphic flowers pedicelled, the ovary obovoid and tipped with 2 fringed wings *A. indica*

Acalypha californica Benth. (of California). California Copperleaf. --Shrubs to 1 m tall; young stems

densely to sparsely hirsute and densely glandular with stalked glands; older stems glabrate and becoming reddish or grayish. LEAVES ovate to cordate, 1-5 cm long, 0.5-4 cm wide, hirsute and glandular; apex acute or obtuse; base truncate to rounded or cordate; margin crenate; petioles about half as long as the blade, with pubescence like the young stems. SPIKES in lower axils with only staminate flowers or with 1(-3) pistillate flowers near base, 1-4 cm long, terminal spikes and those in the upper axils with only pistillate flowers, fairly open, 1-2 cm long, often conspicuously red in flower because of the stigmas; bracts subtending pistillate flowers 1-3 mm long in flower and 3-5 mm long in fruit, with (8-)10-18 small rounded teeth, hispid and glandular. ALLOMORPHIC FLOWERS none. FRUITS ca. 2 mm long, ca. 3 mm wide, short hispid and glandular. SEEDS 1.5-2 mm long, dark brown, finely pitted. [*A. pringlei* S. Watson]. --Rocky slopes and along washes: w Pima Co.; 350-900 m (1100-3000 ft); Jan-Dec, especially Mar-Apr and Sep-Nov; s CA; Baja C., Son., Mex. Plants in Arizona and Sonora have been segregated as *A. pringlei* based on having long eglandular hairs mixed with shorter hairs on the stem. However, this trait appears throughout the range of *A. californica* and cannot be used to distinguish these species.

***Acalypha indica* L.** (of India). --Annuals to 50 cm tall; stems erect and little branched, with short recurved hairs at least near apex. LEAVES thin, ovate to elliptic, 2-6.5 cm long, 1.5-4 cm wide, glabrate; apex and base obtuse to rounded; margin serrate; petioles about as long as the blade, with pubescence like the stems. SPIKES axillary, solitary or paired, fairly open, 1-7 cm long, pistillate near the base and staminate above; bracts subtending pistillate flowers 2-6 per spike, almost round, to 1 cm long in fruit, with 13-18 small obtuse teeth, glabrous except for sparse hairs on the veins and margins; staminate portion 0.5-1 cm long, separated from the pistillate portion by a short peduncle, often abortive. ALLOMORPHIC FLOWERS pedicelled; ovary 1-celled, obovoid, hispid, with two fringed wings near the apex. FRUITS ca. 2 mm long, short pilose. SEEDS ca. 1.5 mm long, finely pitted. --Pine-oak woodland, Chiricahua Mts.: Cochise Co.; 1600 m (5300 ft); Sep; native to the Old World tropics (Afr., Asia), introduced to Mex., C. Amer. Collected near Paradise in 1907 but not since, suggesting that it did not become established.

***Acalypha lindheimeri* Muell. Arg.** (for F. J. Lindheimer, German-born Texas botanist). Lindheimer Copperleaf. --Perennial herbs to 50 cm tall; stems erect, branching above, densely covered with short recurved hairs and sparsely hirsute. LEAVES elliptic to obovate, or the lower almost round, 2-6 cm long, 1-3 cm wide, ciliate and sparsely to moderately hirsute on both surfaces; apex and base acute; margin serrate on the distal 2/3, entire below; petioles about 1-8 mm long, less than 0.2 as long as the blade, with pubescence like the stems. SPIKES mainly terminal, dense, 2.5-10 cm long, pistillate below and staminate above, often conspicuously red in flower because of the stigmas and the staminate bracts; bracts subtending pistillate flowers 5-12 mm long, with 5-7 lobes about 1/3 the length of the bract, sparsely hispid and ciliate and with a few yellowish stalked glands. ALLOMORPHIC FLOWERS infrequent, when present replacing staminate portion of spike, pedicelled; ovary bilobed, hispid. FRUIT ca. 2 mm long, ca. 2.7 mm wide, hispid mainly near the apex. SEEDS 1.5-2 mm long, brown or yellowish, very finely pitted. [*A. lindheimeri* var. *major* Pax & K. Hoffm.]. --Along creeks and in grasslands and oak woodlands: Cochise, Pima, and Santa Cruz cos.; 1300-1950 m (4200-6400 ft); Jun-Oct; NM, TX; n Mex. This species may not be distinct from *A. phleoides* Cav., which ranges through much of Mex.

***Acalypha neomexicana* Muell. Arg.** (of New Mexico). New Mexico Copperleaf. --Annuals to 35 cm tall; stems simple and erect or branched and ascending, with dense to sparse short recurved hairs. LEAVES ovate, 1.5-5 cm long, 0.75-2.5 cm wide, sparsely strigose and ciliate; apex acute; base rounded; margin serrate on the distal 4/5, entire below; petioles about 0.5 to as long as the blade, with pubescence like the stems. SPIKES of two kinds: staminate spikes axillary, 1-6 mm long on pedicels 1-3 mm long; pistillate spikes terminal (sometimes on short lateral branches and so appearing axillary), 2-5(-7) cm long, moderately compact, often appearing widest at the apex; bracts subtending pistillate flowers often purplish, 2-3 mm long in flower and 12-15 mm long in fruit, with 7-13 acute teeth of which the middle tooth is much longer than the others, hispid on the nerves, ciliate and glandular. ALLOMORPHIC FLOWERS sessile; ovary bilobed, covered with small bumps, hispid. FRUIT ca. 1.5 mm long, ca. 2 mm wide, hispid toward the apex.

SEEDS 1.2-1.5 mm long, gray or brown, often mottled, finely pitted. --Moist or shaded areas, foothills and mts. of e and c AZ: Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Navajo, Pima, Pinal, Santa Cruz, Yavapai cos.; 650-2450 m (2100-8000 ft); Aug-Oct; NM, TX; in Mex, s to Dgo. and S.L.P.

Acalypha ostryifolia Riddell (leaves like *Ostrya*, the Hop-hornbeam). Hop-hornbeam Copperleaf. -- Annuals to 70 cm tall; stems erect, branched, with short recurved hairs and stalked glands, especially toward the apex. LEAVES ovate, 3-8 cm long, 1.5-5 cm wide, sparsely pilose; apex acute to short attenuate; base cordate or rounded; margin serrate; almost as long as the blade, petioles with pubescence like the stems. SPIKES of two kinds: staminate spikes axillary, 5-35 mm long on pedicels 5-15 mm long; pistillate spikes terminal (sometimes on short lateral branches and so appearing axillary), 3-7 cm long, fairly open, especially in fruit; bracts subtending pistillate flowers 3-6 mm long, with (9-)13-17 narrow lobes about 2/3 the length of the bract, densely glandular with both sessile and stalked glands. ALLOMORPHIC FLOWERS sessile; ovary obovoid, pubescent, with two irregular flanges near the apex. FRUIT ca. 2 mm long, ca. 4 mm wide, sparsely short hispid and with fleshy green glandular outgrowths especially toward the apex. SEEDS 1.6-2 mm long, brown, with low bumpy ridges. --Moist areas, often weedy: Cochise, Graham, Pima, Santa Cruz cos.; 1000-1650 m (3200-5500 ft); Aug-Oct; VA to KS, s to FL and NM; to c Mex., W. Ind.

Cnidocolus Pohl Bull-nettle, Mala Mujer

Herbs, shrubs, or trees, monoecious, with milky latex, armed with stinging hairs. LEAVES alternate, simple, palmately veined and often palmately deeply lobed, stipulate; petioles glandular at the junction with the blade. INFLORESCENCES terminal cymes. STAMINATE FLOWERS toward the outside of the cyme; calyx 5-lobed, petal-like, white; petals 0; disk ring-shaped; stamens 8-10 in two whorls, the outer free and the inner connate or all connate; staminodes sometimes borne at the apex of the staminal column. PISTILLATE FLOWERS toward the center of the cyme; sepals 5, separate, petal-like, white, falling soon after flowering; petals 0; disk ring-shaped, sometimes with staminodes; pistil with 3 carpels, the ovary 3-locular, the styles branching dichotomously several times. FRUIT a capsule with 3 locules, each segment splitting and falling from the persistent columella. SEEDS 1 per carpel, carunculate. --Ca. 50 spp. of subtropical and tropical Amer. (Greek: *Cnide* = nettle + *skolos* = thorn, in reference to the stinging hairs).

Cnidocolus angustidens Torrey (narrow teeth). --Perennial herb 15 cm-1 m tall from a fleshy rhizome; stinging hairs on stems, leaves, and inflorescences, 4-8 mm long, transparent, each borne on a conspicuous, swollen, whitish base. LEAVES more or less round in outline, 8-15 cm in diameter, 3-5-lobed to about the middle, pubescent when young but soon glabrate between the stinging hairs; base broadly cordate; margin incised-dentate with aristate teeth 1-2.5 cm long, sparsely ciliate; petioles 2-10 cm long, with two large yellowish glands at apex; stipules 5-6 mm long, deeply lobed. STAMINATE FLOWERS numerous; calyx funnel-shaped, 9-14 mm long, armed with stinging hairs; stamens 10, all connate, with a ring of hairs at the base; staminodes 3, thread-like. PISTILLATE FLOWERS few; sepals oblanceolate to spatulate, 10-12 mm long, with a few stinging hairs; ovary pubescent but glabrate; styles twice-branched. FRUIT 10-12 mm long, the stinging hairs dense. SEEDS 9-11 mm long, 6-7 mm wide, 4-4.5 mm thick, rounded on the back, angled on the inner face, brown, sometimes mottled; caruncle whitish, fleshy, ca. 3 mm wide. --Dry plains and hillsides in grassland, desertscrub, and oak woodland: Cochise, Pima, Santa Cruz cos.; 1100-1600 m (3600-5200 ft); May-Sep; Baja C. Sur, Son., Sin., Mex.

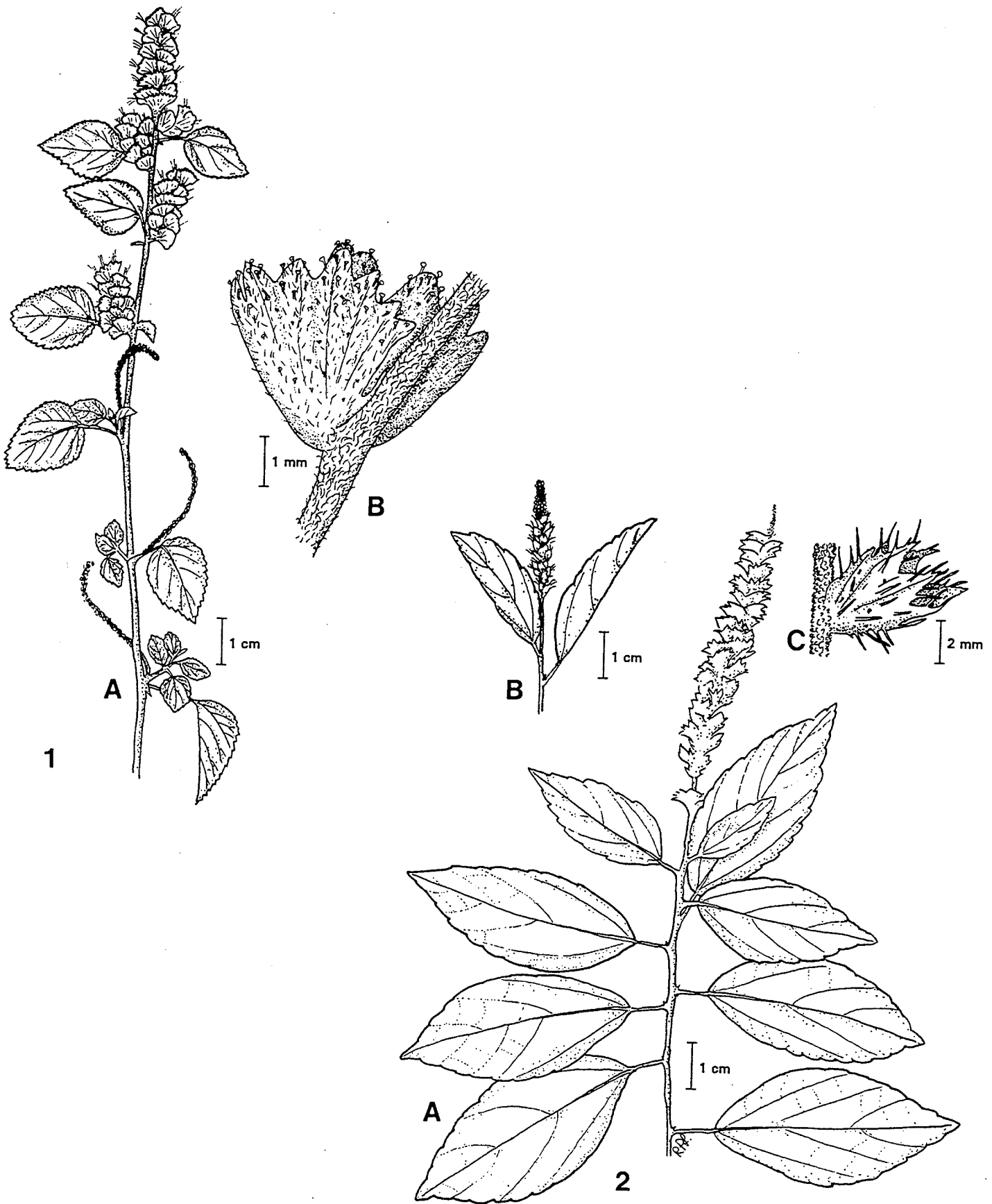


Figure 1. *Acalypha californica*. A, branch with staminate and pistillate spikes. B, bract subtending pistillate flower (both *Levin et al.* 2152).

Figure 2. *Acalypha lindheimeri*. A, branch with fruiting spike (*Reeves R1776*). B, flowering spike with pistillate flowers below and staminate flowers above (*Jandrey & Reeves R4143*). C, bract subtending pistillate flower (*Lehto 3927*).

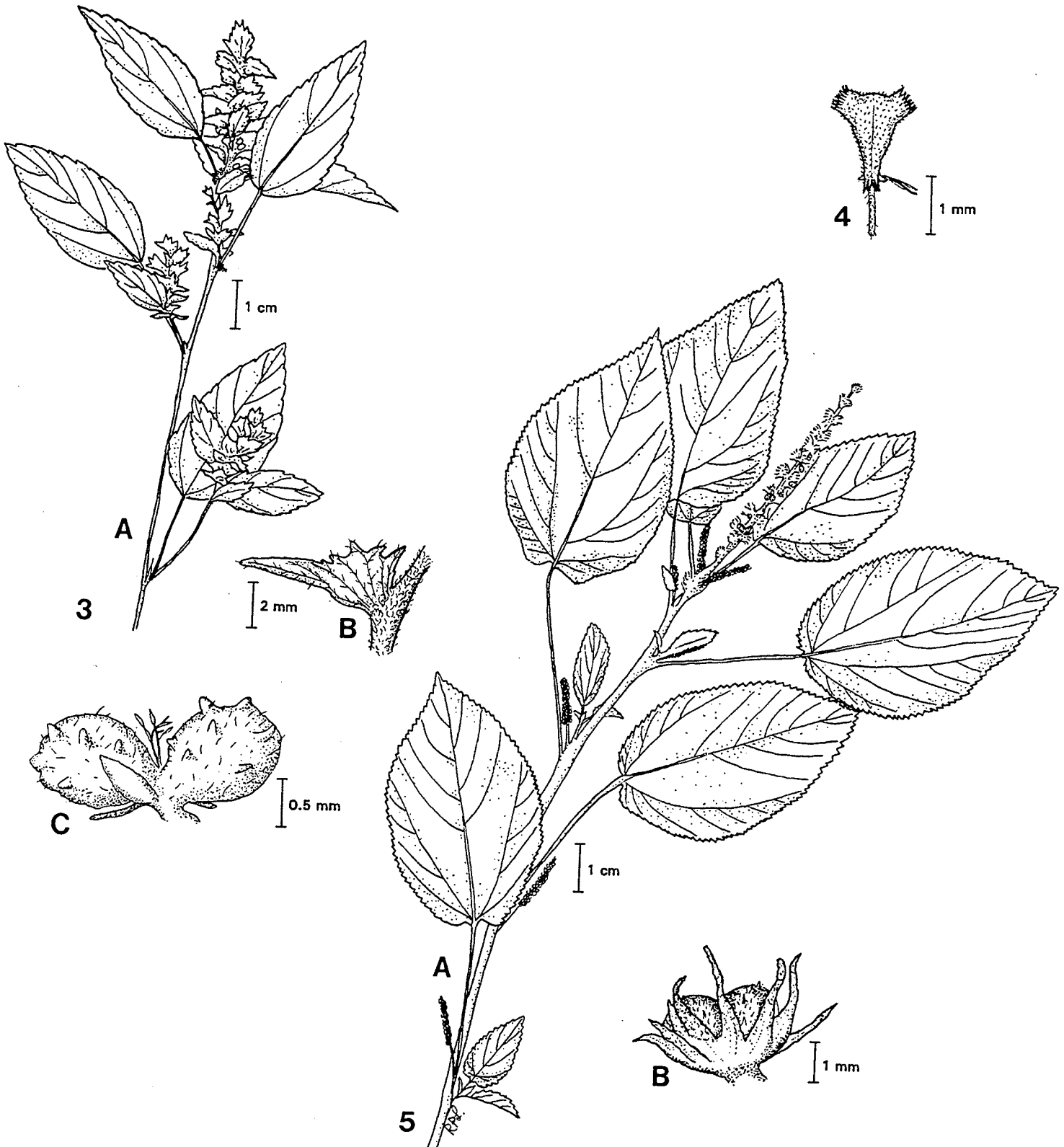


Figure 3. *Acalypha neomexicana*. A, branch with staminate and pistillate spikes (McLeod et al. 778). B, bract subtending pistillate flower (Reeves et al. R1589). C. Allomorphic fruit (Reeves R1225).

Figure 4. *Acalypha indica* allomorphic fruit (Faulkner 2758, after Radcliffe-Smith, 1973).

Figure 5. *Acalypha ostryifolia*. A, branch with staminate and pistillate spikes (Winship 814). B, bract subtending pistillate flower (Evers 63057).

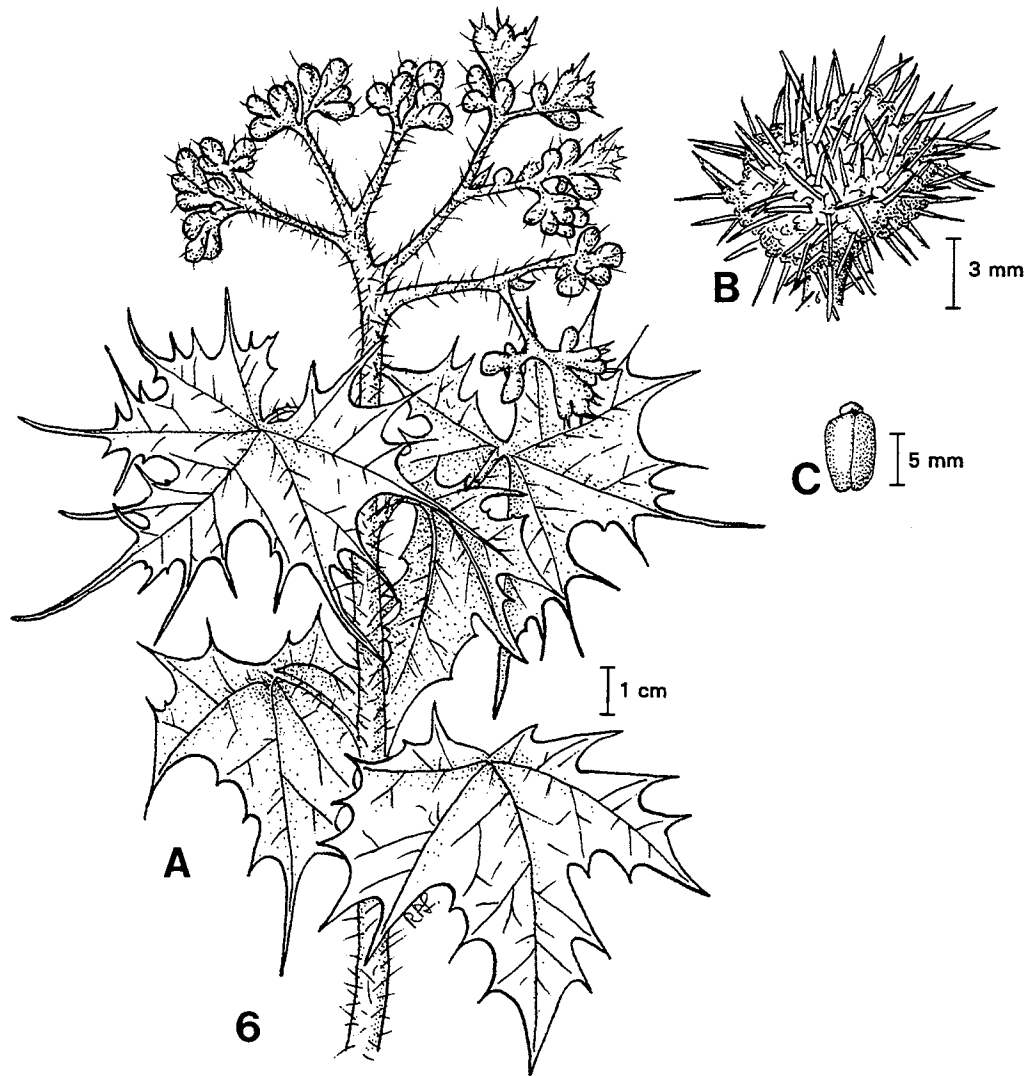


Figure 6. *Cridoscolus angustidens*. A, flowering branch (Mathews & Mathews 447 and Tate 9 July 1966). B, immature capsule (Tate 9 July 1966). C, seed showing large caruncle (Tate 502). Figures 1-6 drawn by Renée Papini Levin.

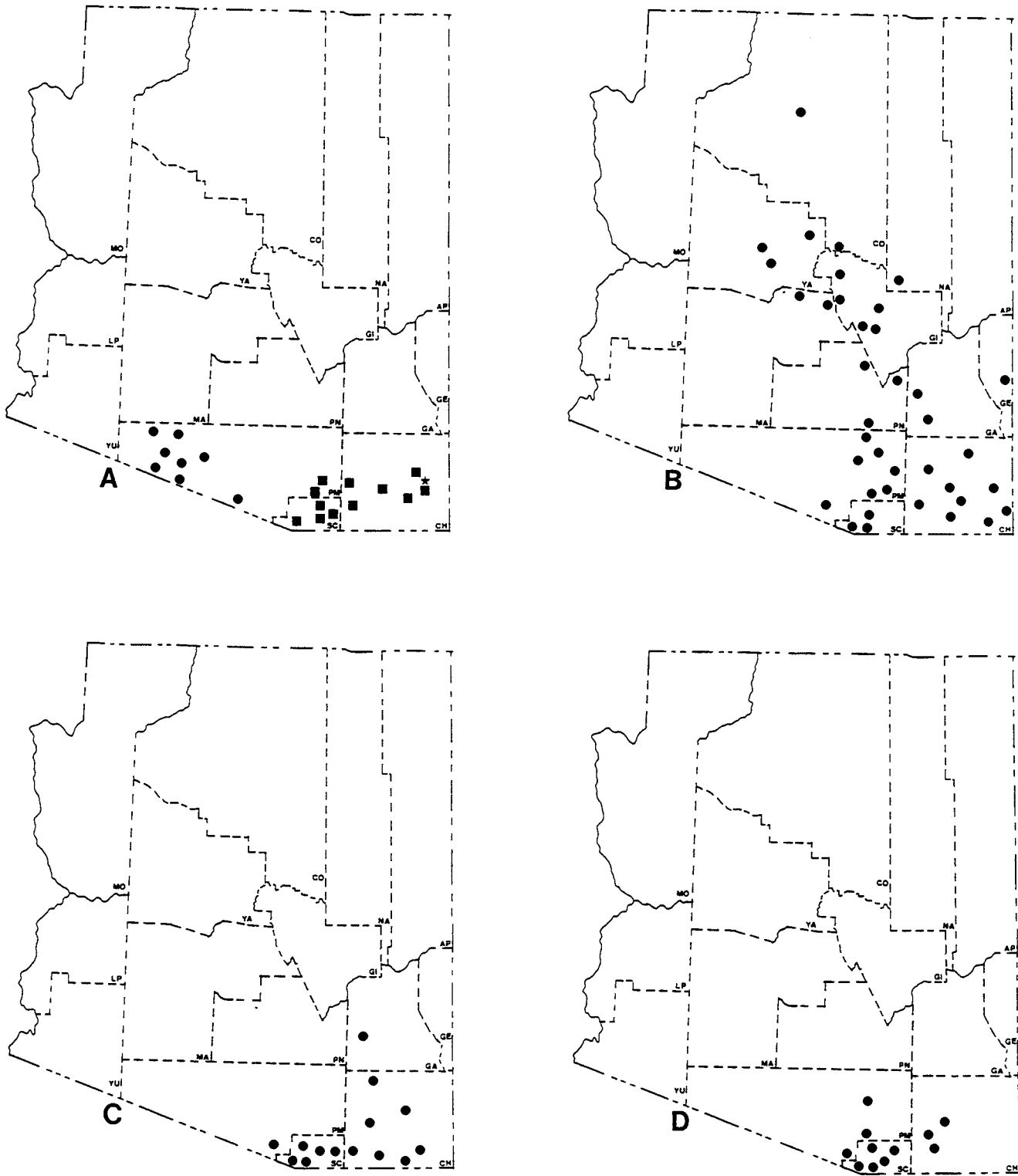


Figure 7. Distribution of: A, *Acalypha californica* (dots), *A. indica* (star), and *A. lindheimeri* (squares); B, *A. neomexicana*; C, *A. ostryifolia*; D, *Cnidoscolus angustidens*.