

brate at maturity, gynophores recurved, exserted 1–3 mm from involucre, glabrous. Seeds white to brown, 2–3 mm long, smooth to shallowly rugose. Occasional in wet forest, 150–900 m, Kaua'i.—*Plate 81*.

Chamaesyce remyi is a variable species with a wide distribution on Kaua'i; it is unique in having caducous stipules that leave a clear scar on the stem. The species can be divided into 3 varieties: var. *hanalei* with solitary cyathia and villous capsules well exserted beyond the top of the cyathia (known only from the type locality at Hanalei); var. *kauaiensis* with many-branched cymose inflorescences and glabrous capsules scarcely exserted beyond the top of the cyathia (Kahōluamanu); and var. *remyi* [incl. *Euphorbia remyi* var. *kahiliana*, *E. r.* var. *lydgatei*, *E. r.* var. *olokelenensis*, *E. r.* var. *pteropoda*, *E. r.* var. *wahiwana*, *E. r.* var. *waimeana*] with solitary cyathia and glabrous capsules well exserted beyond the top of the cyathia (throughout Kaua'i above 400 m). The many varieties that Sherff accepted are geographical variants that form a continuous range of variation and do not appear to merit taxonomic recognition. Hybrids between *Chamaesyce remyi* and *C. sparsiflora* have been found near the margins of Wahiawa Bog, Kaua'i (e.g., *Wagner et al.* 4982, BISH).

19. *Chamaesyce rockii* (C. Forbes) Croizat & Degener

[*Euphorbia rockii* C. Forbes]

(end, E*) 'Akoko, koko, 'ekoko, kōkō-mālei

Usually compact shrubs or sometimes small trees 0.5–2 m tall, in protected sites up to 4 m tall, glabrous throughout. Leaves distichous, coriaceous, narrowly oblong to narrowly oblong-elliptic or occasionally narrowly elliptic, (6–)8–14(–17) cm long, (1.5–)2–3.5(–4) cm wide, margins entire, apex obtuse to rounded, sometimes minutely emarginate, base obliquely subcordate, petioles 0–1(–2) mm long, stipules deltate, 2–3 mm long, weakly erose. Cyathia 3–10(–12) in branched, open to sometimes condensed, cymose inflorescences usually 2–6(–7) cm long, peduncles 3–10(–12) mm long, sparsely to moderately puberulent; involucre broadly campanulate, 1.5–2.2

mm high, 3.5–4.5 mm wide, puberulent, sometimes very sparsely so, the glands 5–6, greenish yellow, green, or red, upper surface glabrous, lower surface puberulent, occasionally with a white appendage. Capsules brilliant red, sometimes pink tinged red (and then perhaps not fully ripe), globose, 14–25 mm long and nearly so in diameter, glabrous, usually noticeably exserted from involucre, gynophores red, erect, exserted 1–4 mm from involucre, puberulent. Seeds brown to grayish brown, globose or broadly obovoid, 3.5–4 mm long, testa slightly wrinkled. Scattered in wet forest, 600–830 m, primarily along cloudswep summit ridges, sometimes along streams, along upper crest and upper windward side of the Ko'olau Mountains, O'ahu.—*Plate 82*.

The large red capsules of *Chamaesyce rockii* are unique in the genus. The feature of capsules scarcely exserted from the top of the cyathia is shared only with *C. celastroides* and *C. herbstii*.

20. *Chamaesyce skottsbergii* (Sherff) Croizat & Degener

[*Euphorbia skottsbergii* Sherff; *Chamaesyce multiformis* (Hook. & Arnott) Croizat & Degener var. *haleakalana* (Sherff) Degener & I. Degener; *C. m.* var. *kapuleiensis* (Degener & Sherff) Degener & I. Degener; *C. skottsbergii* var. *audens* (Sherff) Degener & I. Degener; *C. s.* var. *kalaeloana* (Sherff) Degener & I. Degener; *C. s.* var. *vaccinioides* (Sherff) Koutnik; *Euphorbia multiformis* Hook. & Arnott var. *haleakalana* Sherff; *E. m.* var. *kapuleiensis* Degener & Sherff; *E. m.* var. *k. f. pekelonis* Degener, I. Degener & Sherff; *E. skottsbergii* var. *audens* Sherff; *E. s.* var. *kalaeloana* Sherff; *E. s.* var. *vaccinioides* Sherff]

(end [1 var. V; 1 var. E*]) 'Akoko, koko, 'ekoko, kōkō-mālei

Subshrubs; stems erect or ascending to prostrate, 0.2–1(–2) m long, pilose to villous, glabrate, flowering branches occasionally nodose, 0.5–2 mm in diameter. Leaves distichous, sometimes repand, ovate-elliptic to obovate or elliptic to oblanceolate, (5–)12–25(–32) mm long, 3–12 mm wide, upper surface glabrous, lower surface pilose to villous, at least on midvein and at basal margin, margins serrate or entire, apex acute to rounded, retuse or mucronulate, base cuneate to rounded, oblique, petioles (1–)1.5–4 mm long, pilose to villous, stipules rounded-triangular, 0.5–

1 mm long, glabrous to villous, ciliate, erose. Cyathia solitary in the leaf axils, peduncles 0.5–1(–1.5) mm long, pilose to villous; involucre campanulate, 1–2 mm high, 1–2 mm wide, glabrous to pilose, glands 4(5), yellowish green to red, glabrous or pilose below; styles green to white or red, bifid ca. ½ their length, 0.5–1 mm long, glabrous to sparsely villous; stigma thickened. Capsules green, 1.5–2 mm long, glabrous or sparsely tomentose, gynophores recurved, becoming erect just prior to dehiscence, exserted 1–2 mm from involucre, villous. Seeds gray to brown, 1–1.3 mm long, rugose. Uncommon in coastal vegetation and dry shrubland, apparently restricted to calcareous substrates, 5–200 m, on O'ahu, Moloka'i, Maui, and Kaho'olawe.—*Plate 83*.

Chamaesyce skottsbergii shows considerable variation throughout its range. It is divided into 2 varieties: var. *skottsbergii* [incl. *Euphorbia multiformis* var. *kapuleiensis* f. *pekelonis*, *E. skottsbergii* var. *audens*, *E. s.* var. *kalaeloana*], which has leaves usually less than 2 cm long, ovate or obovate, and margins often serrate, especially when young (southwestern O'ahu and northwestern Moloka'i); and var. *vaccinioides* [incl. *E. multiformis* var. *haleakalana*, *E. m.* var. *kapuleiensis*], which is a larger, more robust plant with leaves usually more than 2 cm long, elliptic or oblanceolate, and margins entire (Moloka'i, 2 collections from Kaho'olawe, and a single collection (*Forbes 2010.M*, BISH, F) from southern Maui). Variety *vaccinioides* is presently vulnerable, and var. *skottsbergii* was federally listed as endangered under the name *Euphorbia skottsbergii* var. *kalaeloana* in 1982 (Fay, 1980, 1982).

21. *Chamaesyce sparsiflora* (A. Heller) Koutnik

[*Euphorbia sparsiflora* A. Heller; *Chamaesyce multiformis* (Hook. & Arnott) Croizat & Degener var. *sparsiflora* (A. Heller) Degener & I. Degener; *Euphorbia multiformis* Hook. & Arnott var. *sparsiflora* (A. Heller) Sherff]

(end, R) 'Akoko, koko, 'ekoko, kōkō-mālei

Subshrubs, bark gray to pale brown; stems ascending, 0.2–0.6 m long, glabrous,

flowering branches 1–1.5 mm in diameter. Leaves decussate, glaucous, elliptic to obovate or oblanceolate, rarely spatulate, 10–30 mm long, 5–15 mm wide, glabrous, margins entire, apex rounded to obtuse, rarely acute, mucronulate or retuse, base cuneate, oblique, petioles 0.5–2.5 mm long, glabrous, stipules rounded-triangular, 0.5–1 mm long, glabrous, ciliate, erose, occasionally bifid. Cyathia solitary in the leaf axils, peduncles 1–4 mm long, glabrous; involucre campanulate, 1.5–2 mm high, 2–3 mm wide, glabrous or rarely sparsely pubescent beneath the glands, glands 4–5, purple, rarely with a narrow white appendage, glabrous; styles red, shortly bifid up to ¼ their length, 0.5–1 mm long; stigma not thickened. Capsules green to red, 3-angled, 2–3 mm long, glabrous, gynophores recurved, exserted 1.5–3 mm from involucre, glabrous. Seeds reddish brown to gray, 1.5–1.8 mm long, smooth to faintly rugose. Rare in Wahiawa Bog, 600–800 m, Kaua'i.

Chamaesyce sparsiflora is vegetatively very similar to *C. multiformis*, of which it was considered a variety by Sherff (1936b). The 2 species are distinguished by the consistent decussate leaf arrangement and the short, nearly undivided styles of *C. sparsiflora*. *Chamaesyce multiformis* normally has a distichous leaf arrangement and styles divided at least ½ their length.

22. *Chamaesyce thymifolia* (L.) Millsp.

[*Euphorbia thymifolia* L.]

(nat)

Annual herbs; stems prostrate, 1–3 dm long, crisp-pubescent above, glabrous below. Leaves ovate to oblong, 3–9 mm long, 1.5–5 mm wide, glabrous or with a few scattered hairs, margins coarsely serrate, apex rounded or obtuse, base obtuse, rounded, or subcordate, petioles 0.5–1 mm long, stipules distinct, 0.5–1 mm long, lacinate. Cyathia 1 to few at nodes of short, congested, leafy, lateral shoots; involucre 0.6–1 mm high, pubescent to glabrate, glands 4, red, elliptic to suborbicular, appendages white to rose, about twice as long as the gland, sometimes absent; staminate flowers 3–5 per cyathium. Capsules ovoid-deltoid, 3-angled, 1–1.5 mm long,