

**Two New Species of Chamaesyce (Euphorbiaceae), New Combinations, and a Key to the Caribbean Members of the Genus**



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TWO NEW SPECIES OF CHAMAESYCE (EUPHORBIACEAE),  
NEW COMBINATIONS, AND A KEY TO THE CARIBBEAN  
MEMBERS OF THE GENUS

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ABSTRACT

Two new species of *Chamaesyce* S. F. Gray from Haiti are described, and a key provided to the genus in south Florida, the Bahamas, and the Greater and Lesser Antilles. Thirteen new combinations, eight of which involve a change of status, are also made.

The group of plants which includes those treated here as the genus *Chamaesyce* S. F. Gray has been differentiated from the remainder of *Euphorbia* L. s.l. in a rather uniform fashion, even by workers who would not allow it more than subgeneric status. Experience in the field corroborates this ease of separation, and, at least in the case of New World plants, there is no doubt whether or not an unknown belongs to the group.

Segregation as a distinct genus has been suggested by a number of workers, and adopted by the authors of several floras dealing with parts of the New World and Oceania. Croizat (1936) defends this by reference to the replacement of the aborted primary axis by secondary axes which he holds to be diagnostic, and also lists other characters shared by the group but which are not alone sufficient to give a discrete separation. His conclusions, and the status of several other segregates which have been proposed at various times, are at present under consideration at the Missouri Botanical Garden in a revision which will eventually extend to cover all New World members of the *Euphorbieae*.

The work completed to date on the genus in the Caribbean region showed the existence of considerable synonymy, as might be expected in a very plastic group with wide-ranging species which has been studied for the last hundred years mostly on an island-by-island basis. The area covered includes south Florida, the Bahamas, and the Greater and Lesser Antilles, but excludes the coast of Venezuela and its islands. It was thought that these limits represented boundaries of a floristic region, and, with the exception of a few species with ranges extending into South America, and some which are of Central American origin, the distribution of the taxa studied was limited to the area defined.

Publication in this abbreviated form was chosen in order to validate names used in annotations without the delay of finding journal space for a long revision, while still providing a key which will explain the annotations and allow the identification of field material.

My thanks are due to the Curators of the following herbaria for loan of specimens or for permission to use their facilities: A, BM, BUS, DUKE, E, F, FLAS, FSU, GH, IJ, K, LINN, MO, NCU, NSC, NY, PUR, UCWI, US, USF, W. Much

of the material summarised in this key was submitted as a dissertation entitled "A Taxonomic Revision of the Genus *Chamaesyce* (*Euphorbiaceae*) in the Caribbean" to the Graduate Council of the University of Florida in August 1965.

## KEY TO THE CARIBBEAN TAXA

- 1a. Large, much-branched shrubs; stems to 2 cm diam at base, 2-6 m long.  
 2a. Leaves fleshy, subglobose or linear; branches crowded, two-ranked, usually  $\pm$  prostrate; coastal rocks, islands of the southern Bahamas  
 .....*C. vaginulata* (Griseb.) Millsp.  
 2b. Leaves membranous, ovate to ligulate; branching divaricate, erect; southern Bahamas, Puerto Rico and Lesser Antilles .....*C. articulata* (Aubl.) Britton
- 1b. Annual or perennial herbs, often woody at the base, or small shrubs, but stems rarely exceeding 1 cm diam at base or 1 m in length.  
 3a. Capsule glabrous.  
 4a. Plants erect or ascending.  
 5a. Leaf margins manifestly toothed or, if entire, leaves ligulate.  
 6a. Stems several to many from the crown of a heavy rootstock, wiry, rarely more than 1 mm diam; sandy barrens, Cuba and New Providence Island, Bahamas  
 .....*C. brittonii* (Millsp.) Millsp.  
 6b. Stems few to several, stout, to 4 mm diam; rootstock scarcely thickened.  
 7a. Cyathia few, borne singly or in groups of two or three; perennial; pinelands, mountains of northern Haiti  
 .....*C. parviflora* (Urban) Burch  
 7b. Cyathia many, grouped on short leafy laterals or in glomerules; annual or perennating.  
 8a. Capsule less than 1.4 mm long; cyathia usually in peduncled leafless glomerules; seed wrinkled; common weed throughout area .....*C. hypericifolia* (L.) Millsp.  
 8b. Capsule more than 1.6 mm long; cyathia on leafy laterals; seed with 2-4 lateral ridges on each face; a frequent weed in all parts of area except the Bahamas .....*C. hyssopifolia* (L.) Small
- 5b. Leaf margins entire or obscurely toothed below apex; leaves never ligulate.  
 9a. Leaves and young stems fleshy; stipules conspicuous, membranous, white, to 1 mm long; beaches throughout area  
 .....*C. buxifolia* (Lam.) Small  
 9b. Leaves membranous or coriaceous, young stems not fleshy; stipules inconspicuous, coriaceous, brown, ca 0.5 mm long.  
 10a. Stipules densely white-ciliate on adaxial surface; leaf and young stem minutely white-papillose; glands dark; appendages obsolete.  
 11a. Plant branching from crown of root and throughout length of stem; branches decumbent; whitelands, Turks and Caicos groups of the southern Bahamas .....*C. lecheoides* (Millsp.)  
 Millsp. var. *wilsonii* (Millsp.) Burch  
 11b. Plant with few stems from ground level, branching mostly in upper part of stem; branches erect, strict.  
 12a. Leaves linear-ovate, much longer than wide, apex acute; rocky shores and scrub, southeastern Bahamas .....*C. lecheoides* (Millsp.)  
 Millsp. var. *lecheoides*  
 12b. Leaves ovate-elliptic, scarcely longer than wide, apex obtuse; whitelands and coastal

- sands, Bahamas from Eleuthera south to Great Ragged Island .....*C. lecheoides* (Millsp.)  
Millsp. var. *exumensis* (Millsp.) Burch
- 10b. Stipules not ciliate; stem smooth, somewhat waxy, leaf surface with raised markings but not papillose; glands green or red; appendages minute to twice width of gland.
- 13a. Leaves ovate-elliptic, most nearly as wide as long, apex obtuse to rounded; usually rather sparingly branched; pinelands, Dade and Monroe counties, Florida  
.....*C. porteriana* Small var. *porteriana*
- 13b. Leaves linear-elliptic, all except the oldest much longer than wide, apex acute; freely branched, often strict and broom-like; pinelands, Lower Florida Keys  
*C. porteriana* Small var. *scoparia* (Small) Burch
- 4b. Plants prostrate to decumbent.
- 14a. Stems minute, threadlike; styles undivided at apex; capsule less than 0.7 mm long; Haiti .....*C. tumistyla* Burch
- 14b. Stems substantial; styles bifid for part of length; capsule more than 1 mm long.
- 15a. Stems wiry and stiff, rarely exceeding 0.5 mm diam, usually many from heavy rootstock.
- 16a. Leaf margins entire.
- 17a. Leaves deltoid, margin somewhat revolute; glands fleshy, appendages minute or obsolete; capsule deltoid or reniform; pinelands, Dade Co, Florida ...*C. deltoidea* (Engelm. ex Chapm.) Small subsp.  
*deltoidea* var. *deltoidea*
- 17b. Leaves orbicular to elliptic, plane; glands cupped, appendages prominent, to three times width of gland; capsule ovoid-ellipsoid; savannas, Cuba .....*C. camaguayensis* Millsp.
- 16b. Leaf margins serrate, at least in the basal leaves.
- 18a. All leaves serrate, most 4-8 mm long; plants usually decumbent; savannas, Cuba .....*C. torralbasii*  
(Urban) Millsp.
- 18b. Only basal leaves serrate, most 2-3 mm (rarely to 5 mm) long; plants usually forming a loose prostrate mat; sand and coastal rocks, Salt Key Bank and New Providence, Bahamas, Cuba  
.....*C. centunculoides* (H. B. K.) Millsp.
- 15b. Stem flexible rather than wiry, reaching 2-3 mm diam, few to several from rootstock.
- 19a. Leaves and stems pubescent; seed very strongly wedge-shaped in cross section; Cuba ..*C. paredonensis* Millsp.
- 19b. Leaves and stems glabrous; seed subequally 4-sided or terete in cross section.
- 20a. Seed terete or obscurely angled; stipules not united, or minutely so at base, deeply parted or lacinate.
- 21a. Leaves usually fleshy, size often widely different on main stem and laterals; seed 1.4-1.9 mm long; coastal sands Florida, Cuba and northern South America .....*C. ammannioides*  
(H. B. K.) Small
- 21b. Leaves not fleshy, all similar in size; seed 1-1.4 mm long; stabilised dunes, southern Florida .....*C. cumulicola* Small

- 20b. Seed angular; stipules joined, at least on upper or lower surface of tips of branches, apex fringed or entire, never lacinate.
- 22a. Stipules toothed at apex, white, prominent although only ca 0.5 mm long; seed smooth; glands brown or deep purple, appendages white; common weed, all parts of area except Florida and Bahamas; Central and South America .....*C. serpens* (H. B. K.) Small
- 22b. Stipules toothed or bifid almost to base, green or tan colored, inconspicuous although often more than 1 mm long; seed obscurely transversely ridged; glands greenish, appendages white, yellow or pink.
- 23a. Texture of all parts of plant subcoriaceous; stipules to 0.4 mm long; leaf and stem surface somewhat papillose; perennial from a thickened rootstock; Puerto Rico, Antigua .....*C. cowellii* Millsp.
- 23b. Texture rarely firmer than membranous; stipules often exceeding 1 mm; leaf and stem surface smooth; annual or perennating but rootstock not thickened; weed, particularly of coastal areas, Florida, Bahamas, Cuba, Jamaica and Cayman Islands, rare in Virgin Islands .....*C. blodgettii* (Engelm. ex Hitchc.) Small
- 3b. Capsule pubescent.
- 24a. Leaf margins manifestly serrate.
- 25a. Plants erect to ascending with one or few thick stems; roadside weed, Jamaica, Haiti, Puerto Rico; Central and South America .....*C. lasiocarpa* (Klotzsch) Arthur
- 25b. Plants prostrate to decumbent; stems several to many, rarely exceeding 2 mm diam.
- 26a. Cyathia solitary at leafy nodes, appearing clustered if on congested laterals, but not in peduncled glomerules.
- 27a. Appendages of glands subequal in size, often much reduced, or if two appendages much longer than other two, capsule not fully exerted, splitting one side of cyathium at maturity; glands subcircular, only slightly elongated transversely.
- 28a. Ovary and capsule pubescent only along the angles.
- 29a. Stem short-pubescent in lines at sides and sometimes on upper surface; seeds with deep transverse furrows; weed, throughout area .....*C. prostrata* (Ait.) Small
- 29b. Stem long-hirsute, at least in lines at sides; surface of seed rippled; weed, Cuba, Florida; Mexico and northern South America .....*C. leucantha* (Kl. & Gke.) Millsp.
- 28b. Ovary and capsule pubescent all over.
- 30a. Capsule not completely exerted, splitting side of cyathium at maturity; weed, often nr salt water, Florida and rest of area except Bahamas and Cuba; Central and South America .....*C. thymifolia* (L.) Millsp.

- 30b. Capsule completely exerted at maturity.
- 31a. Leaf margin deeply and coarsely incised, often  $\frac{1}{2}$ - $\frac{2}{3}$  distance to midrib; stems wiry, scarcely reaching 1 mm diam, many from heavy rootstock; limestone rocks, Navassa Island nr Haiti ...*C. hepatica* (Urban & Ekman) Burch
- 31b. Leaf margin serrate; stems not wiry, usually at least 1 mm diam, few to several from annual or perennating unthickened rootstock.
- 32a. Stem deliquescent through dichotomous branching in upper part; leaf texture heavy; seed strongly wedge-shaped in cross section; roadsides, northern Haiti ...*C. helwigii* (Urban & Ekman) Burch
- 32b. Stem excurrent, forming only congested leafy laterals in upper part; leaf texture membranous; seed almost square in cross section; weed of Florida as far south as Dade Co. ....*C. maculata* (L.) Small
- 27b. Appendages of glands greatly unequal in size, one pair longer than the other pair; capsule fully exerted and nutant at maturity, often concealed by the longer appendages; glands enlarged to extend much of the distance around the rim of the cyathium.
- 33a. Stems long-pilose on upper surface; leaf apex acute; cyathia congested on short laterals; pineland, Dade and Monroe counties, Florida  
.....*C. conferta* Small
- 33b. Stems short-tomentose or strigose on upper surface; leaf apex obtuse or rounded; cyathia borne singly or in small groups at upper nodes, if on laterals not congested.
- 34a. Leaves usually 5-10 mm long; stems few, sparingly branched, usually ca 1 mm diam, often strongly decumbent; seed angular, faces flat with transverse ridges; pinelands, mountains of Hispaniola ...*C. adenoptera* (Bertol.)  
Small subsp. *adenoptera*
- 34b. Leaves rarely reaching 5 mm long; stems several to many, often branching freely in upper part, rarely exceeding 0.5 mm diam; seed plump, subangulate, faces marked with short transverse grooves.
- 35a. Stems several, internodes short, forming a compact plant; appendages of glands prominent, larger pair usually more than 1 mm long; pinelands or sand, Florida, Cuba, Hispaniola and Mona Island .....*C. adenoptera* (Bertol.)  
Small subsp. *pergamena* (Small) Burch
- 35b. Stems many, internodes often long, giving plant an open appearance; appendages of glands prominent but

- larger pair usually less than 1 mm long; sand or coastal rock, Cuba  
 .....*C. adenoptera* (Bertol.)  
 Small subsp. *gundlachii* (Urban) Burch
- 26b. Cyathia in peduncled glomerules.
- 36a. Leaf margins crenate-dentate or roundly serrate, apex obtuse; weed, Bahamas, Cuba, Hispaniola, Puerto Rico; isolated collections from Antigua and Guadeloupe. ....*C. berteriana* (Balb.) Millsp.
- 36b. Leaf margins sharply serrate, apex acute.
- 37a. Cymules terminal and lateral on leafless peduncles; stem branching at base but only infrequently near tip; mostly robust, ascending, large-leaved plants; weed throughout area  
 .....*C. hirta* (L.) Millsp.
- 37b. Cymules terminal and on leafy laterals; stem branching freely; mostly low, decumbent small-leaved plants; weed in all parts of area, but uncommon from southern end of Antillean chain .....*C. ophthalmica* (Pers.) Burch
- 24b. Leaf margins entire or obscurely toothed.
- 38a. Plants strongly suffrutescent, erect or ascending, 0.3-1 m in height.
- 39a. Glands deep purple, appendages obsolete; coastal scrub and whitelands, northwestern islands of the Bahamas  
 .....*C. cayensis* (Millsp.) Millsp.
- 39b. Glands yellow or green; appendages prominent.
- 40a. Shrub, branched from base; capsules more than 2 mm long; Blue Mountains of Jamaica ....*C. myrtillifolia* (L.) Millsp.
- 40b. Suffrutescent, base mostly unbranched; capsules 1.3-1.5 mm long; coastal scrub, Lower Florida Keys  
 .....*C. porteriana* Small var. *keyensis* (Small) Burch
- 38b. Plants herbaceous, or, if woody at the base, of small stature, rarely reaching 3 dm tall.
- 41a. Branches pubescent only on upper surface.
- 42a. Stem cespitose, erect, usually less than 0.5 mm diam; upper surface of leaf glabrous; Cuba ....*C. minutula* (Boiss.) Burch
- 42b. Stems not cespitose, prostrate, usually, ca 1 mm diam; scattered white hairs on upper surface of leaf; Guadeloupe .....*C. multinodis* (Urban) Millsp.
- 41b. Branches pubescent on all surfaces.
- 43a. Cyathia in groups of 2-5 at nodes; seed strongly wrinkled; Haiti .....*C. leonardii* Burch
- 43b. Cyathia solitary at nodes; seed smooth or with transverse ridges but not wrinkled.
- 44a. Plants robust; stems not wiry, 1-3 mm diam, to 3 dm long; leaves 4-9 mm long; pineland and coastal sand, Dade and Monroe counties, Florida .....*C. garberi* (Engelm. ex Chapm.) Small
- 44b. Plants delicate; stems wiry, scarcely reaching 1 mm diam or 2 dm long; leaves 2-5 mm long.
- 45a. Plants closely appressed forming a dense mat, sometimes becoming diffuse with age.
- 46a. Leaves much longer than wide; mats becoming diffuse with age; pinelands, Lower Florida Keys .....*C. deltoidea* (Engelm. ex Chapm.) Small subsp. *serpyllum* (Small) Burch

- 46b. Leaves about as long as wide; tight mat form maintained with age; pine-lands, Dade Co, Florida .....*C. deltoidea* (Engelm. ex Chapm.) Small subsp. *deltoidea* var. *adhaerens* (Small) Burch
- 45b. Plants erect or decumbent, at most forming a loose mat.
- 47a. Stems almost unbranched, villous-hirsute, tips canescent; capsule reniform, sharply three-lobed, angles acute; pinelands, Dade Co, Florida .....*C. pinetorum* Small
- 47b. Stem branched freely, particularly in upper part, sparsely or densely short-pilose, tips only rarely canescent; capsule ovoid, roundly lobed, angles obtuse; rocky or sandy coasts, Cuba, Haiti, Puerto Rico, Anagada .....*C. turpinii* (Boiss.) Millsp.

## NEW SPECIES

*Chamaesyce leonardii* Burch, sp. nov.

*Herba* annua; caules prostrati, haud radicantes, tomentosi. *Folia* opposita; lamina ovato-elliptica, obscure serrata, tomentosa, infra purpurea; petiolus ca 1 mm longus; stipulae connatae, profunde bifidae, strigosae. *Cyathia* solitaria vel in ramis nudis brevissimis 2-5 fasciculata; involucrem obconicum, 0.6 mm diam, strigosum; glandulae transverse ellipticae substipitataeque, appendicibus nullis. Flores ♂ 3-10; flores ♀ stylo bifido 0.4 mm longo. *Capsula* albido-strigosa, ovoidea, 3-sublobata, 1 mm longa, 1.2 mm lata; semina ovoidea, 4-angulata, 0.7 mm longa, 0.4 mm lata, cineracea, parietibus rugosis.

*Annual*; prostrate; fruiting when stems 2-3 cm long; stem to 0.5 mm diam at base, internodes to 5 mm; branches reduced to groups of cyathia, not rooting at nodes, tomentose on all surfaces, greenish-yellow suffused purple. *Leaves* membranous or of a heavier texture; blades ovate-elliptic, 5-8 × 2.5-4 mm, base oblique, subcordate or rounded, margin obscurely serrated, thickened, apex obtuse, midrib prominent on lower surface, both surfaces strigose or sparsely tomentose, upper surface glabrate, lower surface minutely papillose, green suffused purple; petiole ca 1 mm long; stipules joined at base, 0.3 mm long, deeply bifid, strigose. *Cyathia* in leafless clusters of 2-5 at nodes; peduncle 0.3 mm long, involucre obconical, to 0.6 mm diam at mouth, lobes equalling glands, deltoid, strigose on outside, densely ciliate within, glands transversely elliptic, 0.05 mm long, somewhat stipitate, appendages obsolete, fifth gland short, deltoid, sinus broad, shallow. *Staminate flowers* 3-10 per cyathium, androphores glabrous, to 0.6 mm long at maturity. *Pistillate flowers* with gynophore strigose, to 1 mm long at maturity, exerted, upright or nutant; calyx a triangular pad of tissue; ovary densely white-strigose; styles spreading, 0.4 mm long, joined at base, bifid for 1/2-2/3 length. *Capsule* densely white-strigose, broadly ovoid, 1 mm long, 1.2 mm wide at equator, broadly 3-lobed, angles rounded; seed ovoid, 0.7 mm long, 0.4 mm wide, strongly angled, ventral angle rounded, faces convex, strongly wrinkled, red-brown or ashen, angles often lighter.



Type: Bluff E of Bord de Mer, vic of Jean Rabel, Haiti, 27 Jan-9 Feb 1929, Leonard & Leonard 12888 (holotype NY, isotypes GH, K, US). Known only from type collection.

The cyathia of this species are borne in a manner not encountered in other species examined. The laterals near the tip of the stems are given over entirely to cyathia production, and consist of a group of one to a few cyathia congested on a stem a few millimeters long. This probably represents an extreme reduction of the type shown by *C. maculata* or *C. thymifolia*, in which cyathia are formed on congested leafy laterals in the upper part of the stem, rather than a further reduction from the glomerules of *C. berteriana* or *C. hirta*, since close observation shows that these cyathia alternate on the short stems, while in glomerules they fall at the nodes of a dichasium.

The white, strigose-pubesence of the capsules and the prominent midrib below the purple-flushed leaves are further distinctive features of the plant, and the wrinkled seed is also unusual.

No close affinities among species of the area are apparent for this species, but more mature plants may show features which suggest possible relationships.

The epithet *leonardii* was chosen in recognition of the contribution to the knowledge of the Haitian flora made by the extensive collections of Dr. E. C. Leonard.

*Chamaesyce tumistyla* Burch, sp. nov.

*Herba* annua; caules prostrati, usque ad 0.5 mm diam, nodis incrassatis, radicantes, supra strigosi. *Folia* opposita; lamina ovato-circularis, integra vel erosa, glabra; petiolus ca 0.3 mm longus; stipulae connatae, basi vaginulatae apiceque laciniatae. *Cyathia* solitaria, subsessilia; involucrium late campanulatum, 0.6 mm diam, glabrum; glandulae transverse ellipticae, crassae, appendicibus nullis. *Flores* ♂ 5-12; flores ♀ stylo indiviso 0.3 mm longo apiceque clavato. *Capsula* glabra, late ovoidea, 3-sublobata, 0.6 mm longa, 0.7 mm lata; semina ovoidea, 4-angulata, 0.4 mm longa, 0.2 mm lata, parietibus laevibus.

*Annual* or perennating; prostrate, forming mats to 2 dm diam; stem to 0.5 mm diam, internodes to 5 mm long; branched freely in upper part, rooting at nodes, nodes thickened, sparsely strigose on upper surface, glabrous beneath, light-colored. *Leaves* membranous, somewhat thickened, blades ovate-orbicular, 2-3 × 2-3 mm, base oblique, rounded or obtuse, margin entire or somewhat erose in drying, apex rounded, glabrous, green; petiole 0.3 mm long; stipules joined at base, sheathing, parted into linear segments 0.1 mm long. *Cyathia* solitary at upper nodes; sessile or minutely peduncled, broadly campanulate, to 0.6 mm diam at mouth, lobes scarcely equalling glands, deltoid, glabrous on outside, sparsely hairy within, glands transversely elliptic, fleshy, 0.3 mm long, appendages obsolete, fifth gland short, deltoid, sinus shallow. *Staminate flowers* 5-12 per cyathium, androphores glabrous, to 0.4 mm long. *Pistillate flowers* with gynophore glabrous, to 1.2 mm long, exserted, upright; calyx obsolete or a rim of tissue; ovary glabrous; styles upright or spreading, 0.3 mm long, joined at base, swollen at apex, undivided. *Capsule* glabrous, broadly ovoid, 0.6 mm long, 0.7 mm wide below equator, broadly 3-lobed, angles rounded;

seed ovoid, 0.4 mm long, 0.2 mm wide below equator, 4-angled, ventral angle sometimes obscure, others rounded, faces convex, plump, smooth, dark tan.

Type: Aviation field N of city, Mole St. Nicholas, Haiti, 13-19 Feb 1929, *Leonard & Leonard 13146* (holotype NY, isotype GH, US). Known only from the type collection.

There are marked differences between this tiny plant and any other species examined. The prostrate habit with stems rooting at the enlarged nodes is reminiscent of *C. serpens*, but the stems are tomentose on one surface, and are threadlike and much more slender than those of that glabrous species. The stipules differ, too, in being somewhat sheathing and yellow, rather than simply fused in pairs and white.

The subsessile cyathium has not been seen elsewhere, but the most distinctive feature is the undivided style swollen for the upper third of its length. No obvious affinities exist with other species of the area.

The epithet *tumistyla* refers to the enlarged apical portion of the undivided style and stigma.

#### NEW COMBINATIONS

*Chamaesyce helwigii* (Urban & Ekman) Burch, comb. nov., based on *Euphorbia helwigii* Urban & Ekman, Ark. Bot. **22A**(8): 65, 1929. Type: Road to Bassin, Les Gonaives, Presqu'île du Nordouest, Haiti, 24 Dec 1927, *Ekman H9546* (isotypes IJ, K, NY).

*Chamaesyce hepatica* (Urban & Ekman) Burch, comb. nov., based on *Euphorbia hepatica* Urban & Ekman, Ark. Bot. **22A**(17): 113, 1929. Type: Navassa Island, Haiti, 17-25 Oct 1928, *Ekman H10809* (isotype IJ).

*Chamaesyce minutula* (Boissier in DC.) Burch, comb. nov., based on *Euphorbia minutula* Boissier in DC., Prod. **15**(2): 1263, 1866. Type: Cuba, 1864-65. *Wright 2013* (isotypes GH, K).

*Chamaesyce ophthalmica* (Pers.) Burch, comb. nov., based on *Euphorbia ophthalmica* Pers., Syn. Pl. **2**: 13, 1807. Type: Rio de Janeiro, Brazil, July 1767, *Comerson 238* (holotype P-JU not seen, identity confirmed by Wheeler (1939) on basis of fragment in F).

*Chamaesyce parciflora* (Urban) Burch, comb. nov., based on *Euphorbia parciflora* Urban, Repert. Sp. Nov. **15**: 411, 1919. Type: Prope Marmelade, Haiti, 1-2 Aug 1905, *Nash & Taylor 1269* (isotype NY).

*Chamaesyce adenoptera* (Bertol.) Small subsp. **gundlachii** (Urban) Burch, comb. et stat. nov., based on *Euphorbia gundlachii* Urban, Symb. Ant. **5**: 392, 1908. Type: Cuba, 1865, *Wright s.n.* (not seen, B if extant).

*Chamaesyce adenoptera* (Bertol.) Small subsp. **pergamena** (Small) Burch, comb. et stat. nov., based on *Euphorbia pergamena* Small, Bull. Torrey Bot. Club **25**: 615, 1898. Type: Miami, Nov 1878, *Garber s.n.* (syntype NY); Lemon City, 2 Mar 1892, *Simpson 523* (syntype NY, dup. F, GH, US).

*Chamaesyce deltoidea* (Engelm. ex Chapm.) Small subsp. **serpyllum** (Small) Burch, comb. et stat. nov., based on *Chamaesyce serpyllum* Small, Fl. Florida Keys 81, 1913. Type: Big Pine Key, Monroe Co, Florida, 17 Nov 1912, *Small 3811* (holotype NY).

*Chamaesyce deltoidea* (Engelm. ex Chapm.) Small subsp. *deltoidea* var. **adhaerens** (Small) Burch, comb. et stat. nov., based on *Chamaesyce adhaerens* Small, *Torreya* **27**: 104, 1927. Type: Pinelands between Peters Prairie and Homestead, Florida, 10 Nov 1906, *Small & Carter 2531* (holotype NY).

*Chamaesyce lecheoides* (Millsp.) Millsp. var. **exumensis** (Millsp.) Burch, comb. et stat. nov., based on *Chamaesyce exumensis* Millsp., Field Mus. Nat. Hist., Bot. Ser. **2**: 301, 1909. Type: Stocking Island, Great Exuma, Bahamas, 22-28 Feb 1905, *Britton & Millspaugh 3071* (holotype F, isotype NY).

*Chamaesyce lecheoides* (Millsp.) Millsp. var. **wilsonii** (Millsp.) Burch, comb. et stat. nov., based on *Chamaesyce wilsonii* Millsp., Field Mus. Nat. Hist., Bot. Ser. **2**: 301, 1909. Type: Castle Island, Bahamas, 22 Dec 1907, *Wilson 7795* (holotype F, isotypes K, MO, NY).

*Chamaesyce porteriana* Small var. **keyensis** (Small) Burch, comb. et stat. nov., based on *Chamaesyce keyensis* Small, *Torreya* **28**: 6, 1928. Type: No Name Key, Monroe Co, Florida, 4-5 Feb 1916, *Small 7439* (holotype NY).

*Chamaesyce porteriana* Small var. **scoparia** (Small) Burch, comb. et stat. nov., based on *Chamaesyce scoparia* Small, Fl. Florida Keys 81, 1913. Type: Big Pine Key, Monroe Co, Florida, 17 Nov 1912, *Small 3819* (holotype NY).

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