

# The "Staminodia" of the Genus *Schiedea* (Caryophyllaceae) and Three New Hawaiian Species

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THE GENUS *Schiedea* was described in 1826 by Chamisso and Schlechtendal, based upon the single species *S. ligustrina*. Successive botanists made new discoveries in, and added more species to, the genus. Lastly, Sherff (1945), published a monograph of the genus, classifying it into 19 species and 21 varieties, all endemic in the Hawaiian Islands. Since then Sherff or Degener and Sherff have added six more varieties.

The floral structure of *Schiedea* is unusual for a member of the Caryophyllaceae. Perfectly typical are the 1-celled ovary, the 3–5 styles, the mostly 10 stamens, and the 5 sepals. Atypical are the 5 structures usually called staminodia. These are placed opposite the middle of the nearest sepal, and distal of its stamen and slightly adnate to the filament base. In his monograph in the generic description Sherff (1945, p. 312) says, "Staminodia opposite the sepals and just as many, hyaline, more or less petaloid at least below, at apex entire or bifid."

In most of the species the staminodium is bifid, in a few it is truncate and entire. In the descriptions of the various species Sherff (1945, pp. 313–335) states for most of them that the base of the staminodium is enlarged or rounded. In no case does he describe the base as petal-like, yet in his generic description he said that they were more or less petaloid at least below. In reality the base contains an enlarged, rounded or bilobed gland. The statement that the base is petaloid seems erroneous.

Now, it is noted that in the pistillate flowers of *S. adamantis* these gland-bearing structures are 10 in number, equal to the stamens.

Chamisso and Schlechtendal (1826, p. 46) when describing the genus *Schiedea* and its first

species, *S. ligustrina*, said, "petalis cum sepalis alternantibus minutis albis apice bifidis persistentibus." Their description seems clearly faulty.

The holotypic specimen was in the Berlin herbarium, and the writer examined and photographed it (Fig. 1) in 1935. This holotype was destroyed in 1944. It consisted of a sheet with three flowering branches, and attached was a half sheet with a whole series of drawings, signed by Chamisso, showing everything from the inflorescence to the pollen grains and ovules. These pencil drawings show well in the photograph, but will be less distinct when published as a half-tone. Several of them we have enlarged, redrawn, and here reproduce (Fig. 2 *a-d*). Their diagrammatic cross section of a flower shows significant details. Starting from outside they show a ring of 5 sepals, next a ring of 5 parts half as broad as the sepals and opposite to them. Then within is a ring of 10 parts, opposite and alternate, small elliptic, evidently the filaments, and at the center an ovary with ovules and placenta. It is perfectly clear that the second series which they called the petals are opposite to the sepals, and not alternate as they said. These parts are the nectaries. Two others of their drawings show these nectaries with bifid tips and thick, enlarged bases, and show their relation to the stamens.

The only investigator with another interpretation of the "staminodia" was Fenzl (1833, pp. 13–16) who argued that the second circle of parts in the flowers was not of petals but of staminodia, and he described them as "basi parumpter dilatatae, et in glandulam nectariferam, poro nectarifero lineari transverso posito instructam incrassatae." In the type species, *S. ligustrina*, these "staminodia" are inserted and attached as he described. They have an outer lanceoloid sheath, thin and membranous, deeply bifid. In the perfect flowers the sheath is 1–1.5 mm long, 0.4–0.6 mm wide, broadly lanceoloid,

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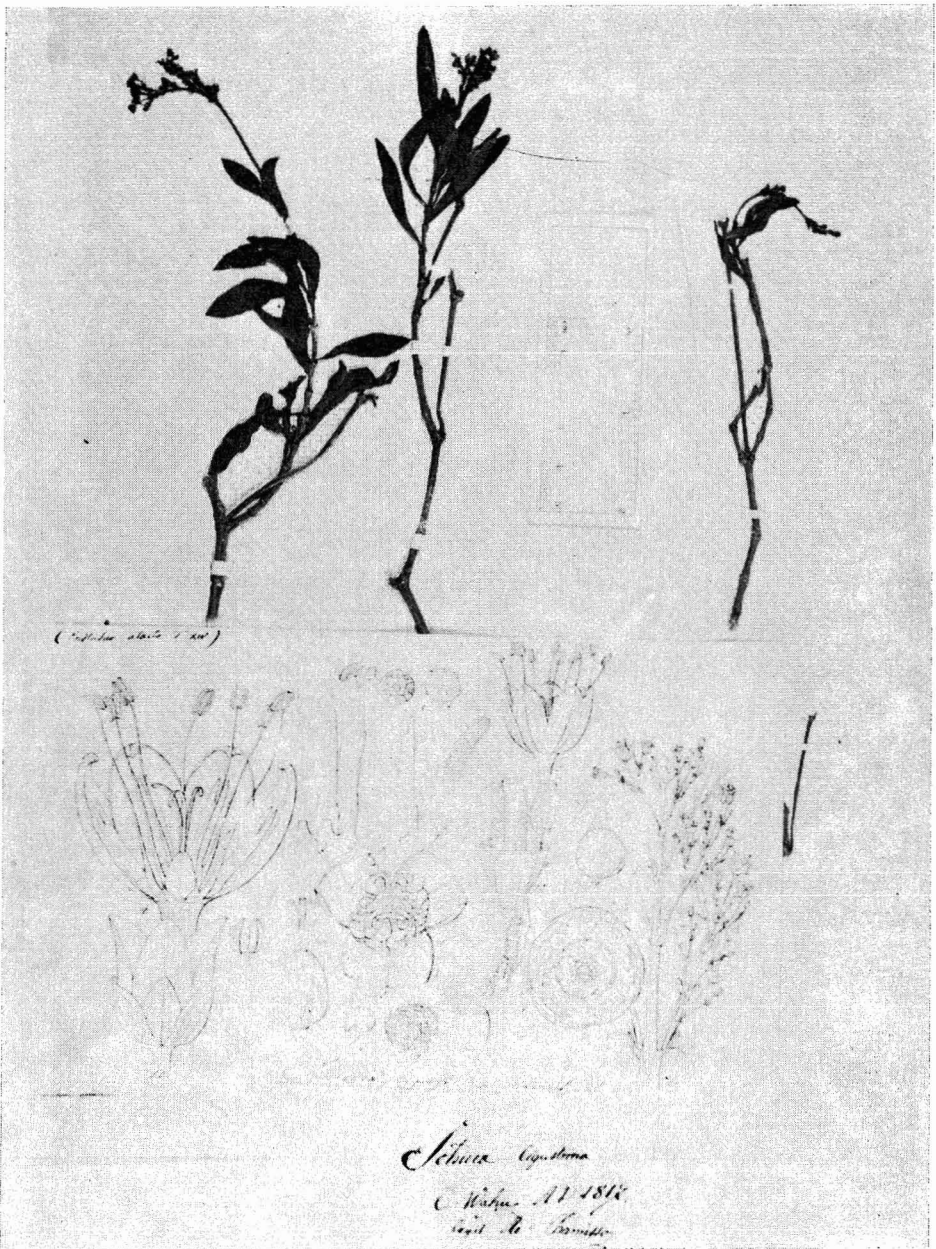


FIG. 1. *Schiedea ligustrina* C. & S., from holotype of generic type species, once in Berlin herbarium.

and its basal  $\frac{1}{5}$  is filled with a rounded, depressed, green or yellowish gland.

In the pistillate flowers the sheath is 0.4 mm long, and inside at the base is a green gland 0.07 mm long. When pressed and dried the sides of the sheath cohere and it then looks like a small

petaloid structure, except for the thick rounded gland enclosed at the base. When pressed the thick gland remains and the thin sheath adheres to it and is nearly undetectable. It is noted that Fenzl described the gland as being on the posterior side of the staminodium.

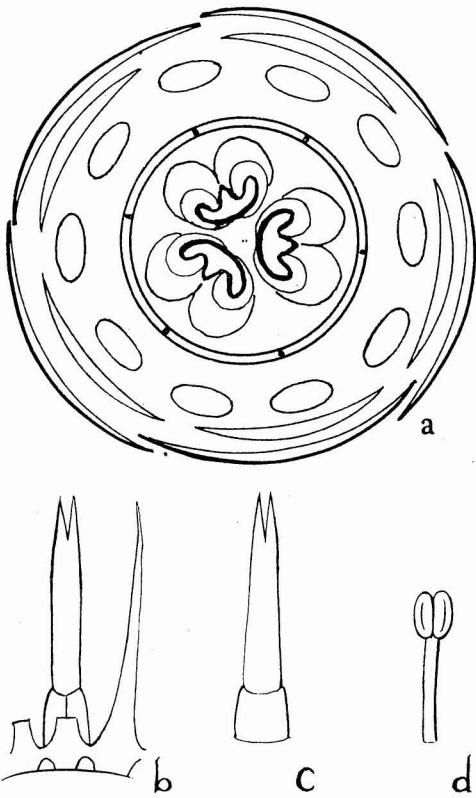


FIG. 2. *Schiedea ligustrina* C. & S. Enlargements from drawing of holotype by Chamisso. *a*, Cross section of flower,  $\times 20$ ; *b*, ring of filament bases and nectary, proximal view,  $\times 20$ ; *c*, nectary, distal view,  $\times 20$ ; *d*, stamen,  $\times 5$ .

If the reader will turn to the descriptions and the illustrations of *S. adamantis*, *S. apokremnos*, and *S. Mannii* here published, he will see the same structures, hollow flasks containing glands at the base. In *S. globosa*, which was studied with fresh specimens, the sheaths were filled with nectar. Several other species have been inspected, and all have the same glands within the base of a hollow sheath. To the observer it seems perfectly clear that these structures are not staminodia or petals, but are honey-producing nectaries which serve to attract the insects that will cross pollinate the flowers.

The family *Caryophyllaceae* is characterized by having the stamens up to 10, in a single circle. It is not a satisfactory hypothesis that calls staminodia the glandular structures in an outer circle distal to the five of the stamens that

are opposite the nearest sepals. In the pistillate flowers of *S. adamantis* the opposite stamens have the usual distal nectaries, but in addition the alternate stamens have proximal nectaries, as in these flowers the nectaries are 10 in number. In his monograph Sherff, for several of the species, described the "staminodia" as with a rounded or subglobose base, but he did not realize that the base was a gland secreting nectar and that the continuing upper part was hollow.

*Schiedea adamantis* sp. nov.

Fig. 3

DIAGNOSIS HOLOTYPI: Frutex 30–80 cm altus glaber est, ramis 4–5 mm diametro, cortice pallide brunneo vel griseo cum fissuris longitudinalibus profundis, nodis incrassatis, internodiis 3–24 mm longis plerumque 10–12 mm longis, ramulis foliosis 0.8–1.6 mm diametro, petiolis nullis, laminis 15–41 mm longis 4–12 mm latis sessilibus oblanceolatis 1-nervosis crasse chartaceis supra palliditer viridibus infra pallidioribus marginibus incrassatis et revolutis in basi foliis binis connatis et in nodo ochream perfoliatam 1 mm altam formantibus, thyrso 5–8 cm longo 5–18 mm diametro anguste cylindrico interrupto terminali, radio infero 5–11 mm longo, pedicelis 2–6 mm longis, semipolygamomonoecis sed floribus omnibus fertilibus, ramulo uno cum thyrso floribus foemineis cum pistilis fertilibus et 10 staminodeis antheridiis sterilibus ferentibus, ramulo altero in planta eadem cum thyrso floribus majoribus bisexualis cum pistilis fertilibus et cum 10 staminibus cum granis pollinis, floribus foemineis cum 5 sepalis 3 mm longis ovatis concavis minime viridibus marginibus membranaceis pallidis apice cucullato, staminodeis 10 eis oppositis 2 mm longis et tertia infra ad nectarium adnata, antheridio 0.4 mm longo elliptici-oblongo sterili, nectario cum ocrea 2.5 mm longa lanceoloidea per 0.8 mm bifida subcompressa vacua et in basi glandam 0.4 mm longam inclusa, 5 staminibus alternis minimis filamentis 0.3 mm longis antheridiis 0.3 mm longis anguste oblongis pallidis sterilibus et sine glandula, ovario 1 mm longo ovoideo firmo lucido, 3 stigmatibus 2 mm longis filiformibus papillosis, floribus perfectis cum 5 sepalis 4–4.2 mm longis simultantibus, staminibus 10 perfectis eis 5 oppositis cum filamentis 6.5 mm longis filiformibus fere

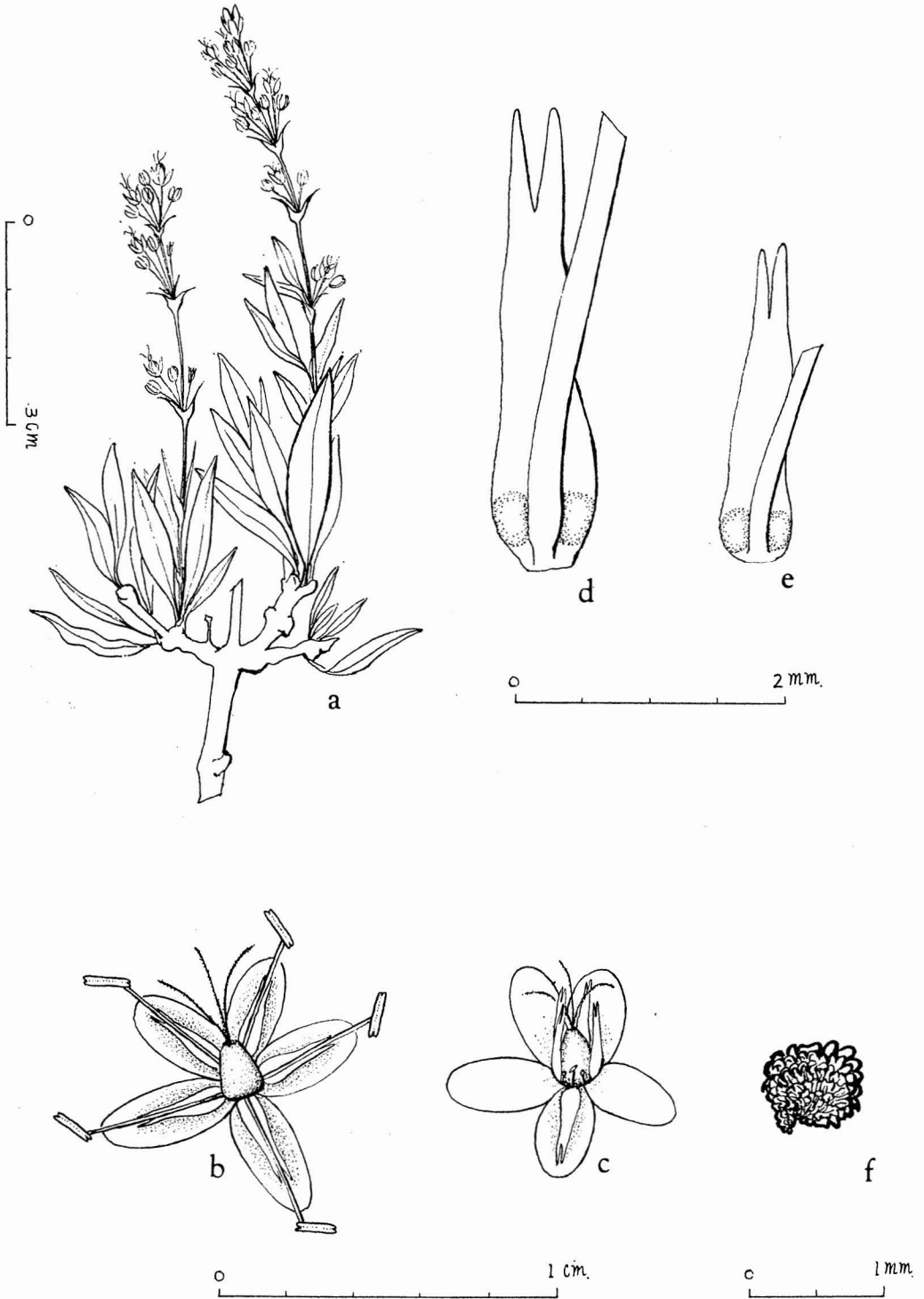


FIG. 3. *Schiedea adamantis* St. John, from holotype. *a*, Habit,  $\times 1$ ; *b*, perfect flower,  $\times 5$ ; *c*, pistillate flower,  $\times 5$ ; *d*, nectary and filament base in perfect flower, proximal view,  $\times 20$ ; *e*, nectary and filament base in pistillate flower, proximal view,  $\times 20$ ; *f*, seed,  $\times 20$ .

basifixis tertia infera ad glandulam adnata, antheris 0.8 mm longis elliptici-oblongis cum sacis binis fertilibus, nectario cum ocrea 3 mm longa alba hyalina lanceoloidea vacua subcompressa apice per 1 mm bifido in basi distenta et glandulam subluteam latam 0.5 mm longam inclusa, staminibus alternis 4 mm longis filiformibus, antheris 0.6 mm longis oblongis fertilibus sine nectario, ovario ovoideo simulanti, floribus omnibus fertilibus, floribus perfectis cum capsulis 3.5–5 mm longis ellipsoideis trilateratis cartilagineis lucidis stramineis sed quarta supera subpurpurea valvis tribus, seminibus 0.8 mm diametro compresso subsphaericis ad cochleatis subrubris tum subviridibus in superficie cum lineis cochleatis papillois.

DIAGNOSIS OF HOLOTYPE: Shrub 30–80 cm tall, glabrous; branches 4–5 mm in diameter; bark pale brown to gray, with deep longitudinal fissures; nodes swollen; internodes 3–24 but usually about 10–12 mm long; leafy branchlets 0.8–1.6 mm in diameter; petioles none; blades 15–41 mm long, 4–12 mm wide, sessile, oblanceolate, 1-nerved, thick chartaceous, pale green above and even paler beneath, the margins thickened and revolute, those of each pair uniting and forming a perfoliate ochrea 1 mm high at the node; thyse 5–8 cm long, 5–18 mm in diameter, narrowly cylindrical, interrupted, of 4–6 cymes, terminal and the lowest ray 5–11 mm long; pedicels 2–6 mm long; flowers semipolygamomonoecious, though all flowers appear to be fertile and produce seeds, yet one branchlet produces a thyse, all the flowers of which are essentially pistillate, having functional gynoecium, and 10 staminodia with antheridia but these lacking pollen and sterile; another branchlet of the same stem produces a thyse with all the flowers larger and perfect and with 10 fertile stamens that produce good pollen; pistillate flowers with the 5 sepals 3 mm long, ovate, concave, slightly greenish, the margins pale and hyaline, the apex cucullate; staminodia reduced, but 10 in number, the 5 staminodia opposite the nearest sepals 2 mm long, the lower  $\frac{1}{3}$  of the filament adnate to the proximal face of the nectary; antheridium 0.4 mm long, elliptic-oblong, sterile, the nectary with a sheath 2.5 mm long, lanceoloid, bifid for 0.8 mm, somewhat compressed, hollow, and surrounding at base a yellowish gland 0.4 mm long; the 5

staminodia alternate with the sepals even more reduced, the filaments 0.3 mm long, the antheridia 0.3 mm long, narrowly oblong, pale, sterile, and lacking a nectary; ovary 1 mm long, ovoid, firm, shining; the 3 stigmas 2 mm long, filiform, papillose; perfect flowers with the 5 sepals 4–4.2 mm long, similar; stamens 10, well formed, the 5 stamens opposite the nearest sepals with the anthers 0.8 mm long, elliptic-oblong, the 2 cells producing pollen; filaments 6.5 mm long, filiform, almost basifixed, and the lower 1 mm adnate to the inner side of the nectary sheath, this 3 mm long, white, hyaline, lanceoloid, somewhat compressed, the apex bifid for 1 mm, the sheath hollow, the base ellipsoid, distended and surrounding a 0.5 mm long, yellowish broad gland; the 5 alternate stamens with the filaments 4 mm long, filiform, their anthers 0.6 mm long, oblong ellipsoid, fertile, but lacking nectaries; ovary ovoid, similar; the 4 stigmas 3 mm long, filiform, papillose; both types of flowers with fertile, seed-bearing ovaries; capsules of perfect flowers 3.5–5 mm long, ellipsoid, 3-sided, 3-valved, cartilaginous, shining, stramineous except for the purplish upper quarter; seeds 0.8 mm in diameter, compressed, from nearly spherical to cochleate, reddish, then greenish, the surface with crowded cochleate lines of papillae.

HOLOTYPE: Hawaiian Islands, Oahu, Diamond Head, northwest rim of crater, 400 ft. alt. on dry slope, *Charles Lamoureux and E. T. Ozaki* 567, April 8, 1955.

DISCUSSION: In March 1969, after three months of rainy weather, Lamoureux led the writer to the type locality of the new *Schiedea*. It is on the outer slope, very close to the rim of the northwest side of Diamond Head, at 450 feet altitude. From a distance the outer slopes appeared very green, but the drying up had already commenced. There were several plants of the *Schiedea*, shrubs 2–3 dm tall, but with few branches and no flowers or fruit. No specimens were collected as the stand is sparse and the available herbarium material is fully adequate. This record adds another xerophytic species to the flora of Diamond Head which lies at the base of the windward, wet Koolau Range of mountains. Several other xerophytic genera and species, characteristic of the leeward, drier Waianae Mountains, are found in the rather



dry coast strip from Diamond Head to Makapuu Head at the southeast end of the Koolau Range.

*S. adamantis* is most similar to *S. ligustrina* C. & S., of the windward lower slopes of the Waianae Mountains, a species with the leaves 16–60 mm long, 2–7 wide, narrowly oblanceolate to almost linear; thyrses 5–11 cm long, the lowest rays 10–50 mm long; pedicels 0.5–7 mm long; sepals 2.2–3 mm long; seeds 0.5–0.6 mm in diameter, flattish reniform, muricate, black; perfect flowers with the nectary sheath 1.5 mm long, 0.6 mm wide, the apex bifid for 0.5 mm. *S. adamantis* has the leaves 15–41 mm long, 4–12 mm wide, oblanceolate; thyrses 5–8 cm long, the lowest rays 5–11 mm long; pedicels 2–6 mm long; pistillate sepals 3 mm long; perfect sepals 4–4.2 mm long; seeds 0.8 mm in diameter, compressed, nearly spherical to cochleate, reddish, then greenish, the surface with crowded cochleate lines of papillae; nectary sheath 2.5–3 mm long, 0.7 mm wide, the apex bifid for 0.8–1 mm.

The new epithet is the Latin noun *adamans*, diamond, used in the genitive case, *adamantis*, of a diamond, to indicate its habitat on Diamond Head.

*Schiedea apokremnos* sp. nov.

Fig. 4

DIAGNOSIS HOLOTYPE: Frutex 20–50 cm altus ramosus est, ramis 2–6 mm diametro teretibus glabris, cortice griseo cum fissuris et rugis longitudinalibus, internodiis 3–8 mm longis, foliis 3–5 cm longis 6–11 mm latis glabris carnosus pallide viridibus et in juventa glaucis anguste oblanceolatis apice subacuto basi cuneata subsessili vel cum petiolo 1–4 mm longo 1-nervis et cum nervis secundariis paucis indistinctis, thyrsis 6–12 cm longo 3–6 cm diametro aperto sed cymulis fere compactis, floribus bisexualibus, pedicellis 2–3 mm longis glabris, sepalis 2–3.2 mm longis late ovatis glabris viridibus vel plerumque in tertia apicali purpurei-rubri-tinctis margine membranaceo albo, 9 staminibus biformatis eis majoribus cum filamentis 4.5 mm longis exsertis cum antheris 0.7–0.8 mm longis ellipsoidei-oblongis pallide luteis versatilibus et cum illis minoribus cum filamentis 2.5 mm longis inclusis cum antheris 0.4–0.5 mm longis alternantibus, nectariis 0.8 mm longis lanceoloi-

deis vacuis in parte  $\frac{2}{5}$  apicali bifidis lobis linearilanceolatis, stylis 0.8 mm longis filiformibus, ovario ellipsoideo glabro, capsula 2.5 mm longa ovoidea cartilaginea straminea laevi lucida 3-valvata, seminibus 0.6–0.7 mm longis ovoideis ad cochleatis compressis obscure brunneis lucidis sed cum reticulis cellulosis elevatis.

DIAGNOSIS OF HOLOTYPE: Shrub to 20 cm tall (and inaccessible ones seen to 50 cm tall), branching; stems 2–6 mm in diameter, glabrous, terete in youth and age, the new shoots green or purple; internodes 3–8 mm long; bark gray, with longitudinal ridges and fissures; leaves 3–5 cm long, 6–11 mm wide, glabrous, fleshy, pale green and at first glaucous, narrowly oblanceolate, the apex subacute, the base cuneate, subsessile or with a petiole 1–4 mm long, with 1 main vein and a few faint secondary veins; thyrses 6–12 cm long, 3–6 cm in diameter, glabrous, open, but the cymules rather compact; flowers perfect; pedicels 2–3 mm long, glabrous; sepals 2–3.2 mm long, broadly ovate, glabrous, green or usually greenish and tinged with purplish red in the outer third, the margins white membranous, at length 3-ribbed at base; stamens 9, of 2 kinds, large ones with filaments 4.5 mm long, exserted, bearing an anther 0.7–0.8 mm long, ellipsoid oblong, pale yellow, with a versatile median attachment; these alternating with small ones having filaments 2.5 mm long, included, bearing an anther 0.4–0.5 mm long; nectary 0.8 mm long, lanceoloid, hollow, bifid for  $\frac{2}{5}$  their length, the teeth linear lanceolate; styles 0.8 mm long, filiform; ovary ellipsoid, glabrous; capsule 2.5 mm long, ovoid, cartilaginous, stramineous, smooth, shining, 3-valved; seeds 0.6–0.7 mm long, ovoid to cochleate, compressed, dark brown, shining but raised cellular reticulate.

HOLOTYPE: Hawaiian Islands, Kauai, Nualolo Kai, Waimea Dist., crevices of cliffs, 200 ft. alt., April 23, 1965, *H. St. John* 26,688 (BISH).

SPECIMENS EXAMINED: Hawaiian Islands, Kauai, without locality, *J. M. Lydgate* (BISH). This is a meager specimen of two tiny flowering branchlets. It was labeled with an unpublished binomial, the epithet capitalized, and evidently

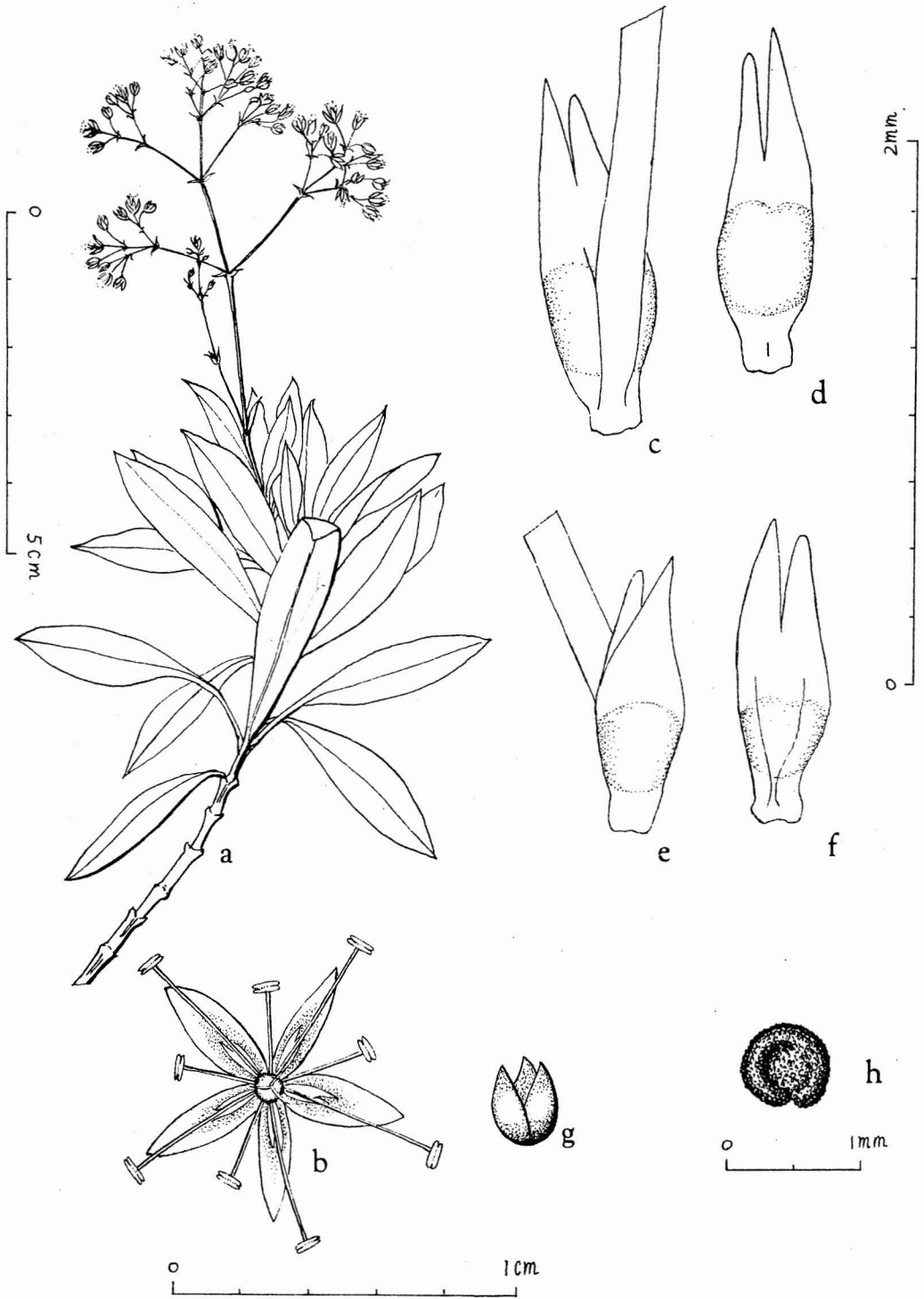


FIG. 4. *Schiedea apokremnos* St. John, from holotype. *a*, Habit,  $\times 1$ ; *b*, perfect flower,  $\times 5$ ; *c*, nectary with long filament, opposite a sepal, proximal view,  $\times 40$ ; *d*, nectary opposite a sepal, distal view,  $\times 40$ ; *e*, nectary and base of short filament, alternate with the sepals, distal view,  $\times 40$ ; *f*, nectary alternate with the sepals, proximal view,  $\times 40$ ; *g*, opened capsule, lateral view,  $\times 5$ ; *h*, seed,  $\times 20$ .

the personal name of some Hawaiian person. C. N. Forbes noted on the sheet, "n. sp., nearest *ligustrina* C. & S.?" It exactly matches our new species, but it is regrettable that there is no precise locality known for this collection.

**DISCUSSION:** This and several other species of *Schiedea* have been studied carefully with fresh material. From this examination a new interpretation of the flower structure of this genus is announced. Apparently all previous writers upon this genus have described the flowers as with 5 (-6) sepals, 10 stamens, and 5 staminodia adnate to the bases of the 5 stamens, opposite the nearest sepals. These staminodia are from linear to lanceolate and are mostly bifid. In the newly announced *S. apokremnos*, the so-called staminodia are 10, equal in number to the stamens, but that is not of any major concern. However, all the "staminodia" that we have examined are tubular, flask-shaped, or vase-shaped, truncate or bifid, and hollow, except for the lower third or quarter which is filled with a yellow, firm, glandular tissue. This structure, we maintain, is not a modified stamen or staminodium, but is a nectar-producing gland or nectary, surrounded by a membranous, hyaline, hollow sheath open at the apex to allow the entry of the tongue of a visiting nectar-seeking insect.

*S. apokremnos* is most closely related to *S. ligustrina* C. & S., of the Waianae Mountains, Oahu, a species with the leaves 1.5-4.5 cm long; thyse 1-2 cm in diameter, mostly dense, with 3-5 nodes, the lowest rays 1-5 cm long; sepals 2-2.7 mm long, commonly blackish purple, especially above; staminodia 5; seeds conspicuously spatulate-papillate. *S. apokremnos* has the leaves 3-5 cm long; thyse 3-6 cm in diameter, open, with 4-6 nodes; lowest rays 1-2 cm long; sepals 2-3 mm long, green or usually green and tinged with purplish red on the outer third; nectaries 10; seeds raised cellular reticulate.

The new epithet is the Greek adjective, *apokremnos*, precipitous, and it is given with reference to the habit of the species, on steep cliffs.

*Schiedea Mannii* sp. nov.

Fig. 5

**DIAGNOSIS HOLOTYPI:** Frutex 2-2.6 dm altus est, corona radicum 2 cm diametro cum ramis

multis (16) erectis simplicibus vel semel vel sigillatim furcatis, ramis vetustioribus brunneis glabris cum nodis multis 2-4 mm diametro, internodis 2-7 mm longis, ramulis foliosis glabris subcarnosis obscure rubiis, foliis oppositis sessilibus plerumque adscendentibus in vivo 2.2-2.4 cm longis 1.4-1.9 mm latis 0.6-0.7 mm crassis (in sicco 0.5-1 mm latis) linearibus vel filiformibus glabris clare viridibus carnosissimis compressis 1-nervosis et in paginis ambis supra nervum sulcatis apice acuto obscure rubio basi contracta et perfoliatis et tubam formantibus, pedunculo 10-17 mm longo, thyso 2-4.5 cm longo 1-3 cm diametro erecto aperto sed non interrupto cum 5-6 jugis cymulorum eis cum 3-7 floribus, cymulis inferis cum bracteis 5-10 mm longis foliosis, cymulis superis cum bracteis 1 mm longis lanceolatis, cymo ab initio obscure rubio nuper rhachidi viridescenti, pedicelis 2-6 mm longis glabris in apice incrassato alabastris ellipsoideis in toto obscure rubiis vel marginibus sepalorum pallide viridibus, floribus bisexualis, 5 sepalis 2.5-3 mm longis lanceolatis concavis squamiformis marginibus hyalinis apice cucullato obscure rubio, 5 nectariis in basi connatis et annulatis, ocreis 1.7 mm longis 0.3 mm latis tubulosis in basi lanceoloidea 0.3 mm lata in apice 0.2 mm lata per 0.3 mm bifido latere proximali longiori et per 0.3 mm bifido latere distali breviori et bifido ocreis in basi glandulam crassam luteam inclusis, staminibus 10 eorum 6 bene formati et in 45° adscendentibus, 5 staminibus oppositis in latere proximali glandulae insertis et adnatis, filamentis 2.5-3 mm longis filiformibus albis, 5 staminibus alternatis in basi annulo glanduloso extra minime adnatis, filamentis 2 mm longis, antheris omnibus 1 mm longis elliptici-oblongis subluteis, ovario 1 mm longo ovoideo subtrilaterato subviridi sed apice rubio, stylis 3 filiformibus 1.8 mm longis, ovulis in placenta centrali libera numerosis, fructibus incognitis.

**DIAGNOSIS OF HOLOTYPE:** Shrub, 2-2.6 dm tall, the root crown 2 cm in diameter, bearing many (16) erect branches that are simple or once or several times forked; older branches brown, glabrous, very nodose, 2-4 mm in diameter, the internodes 2-7 mm long; leafy branchlets glabrous, subcarnose, dark magenta; leaves opposite, sessile, mostly ascending, when fresh 2.2-4.2 cm long, 1.4-1.9 mm wide, 0.6-



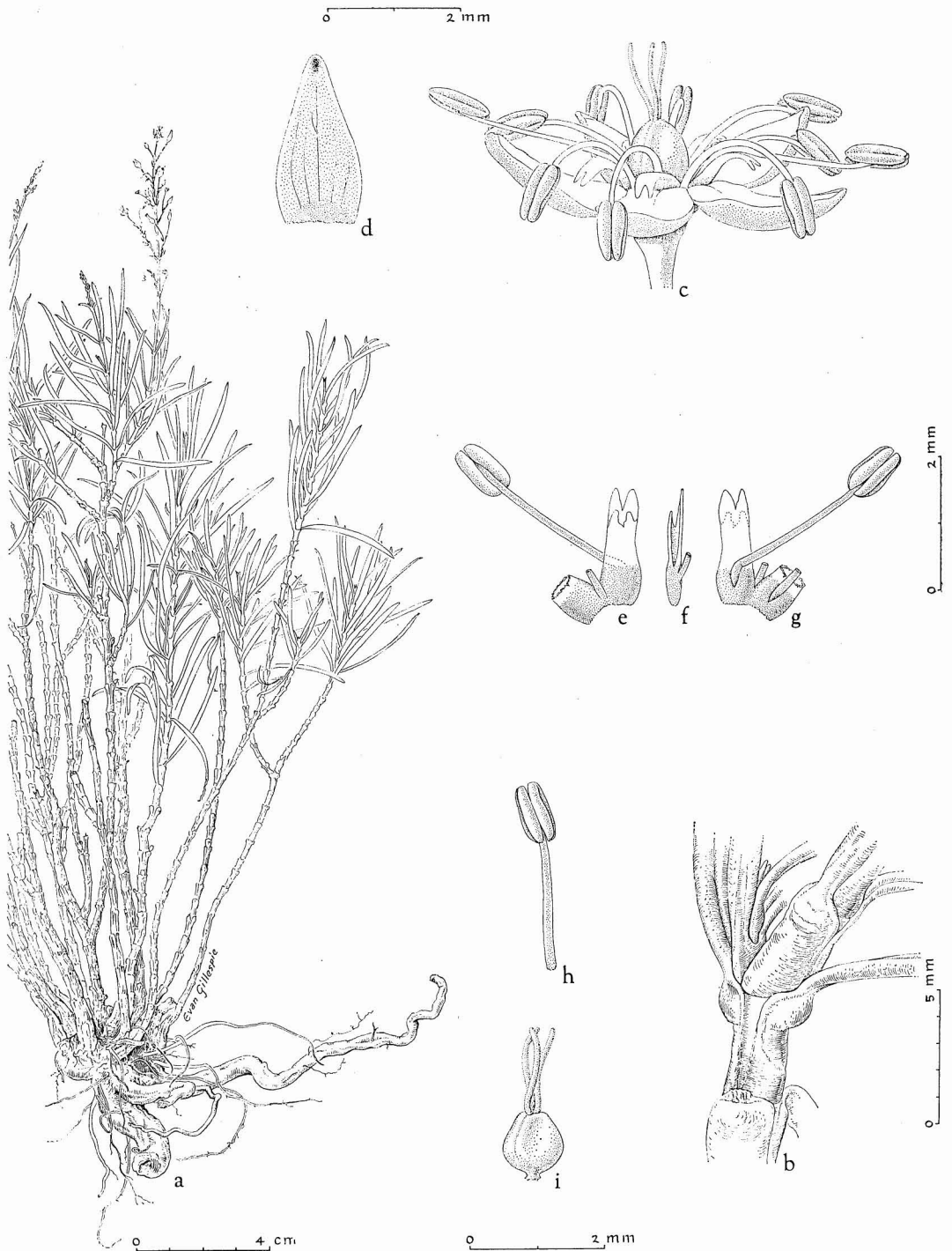


FIG. 5. *Schiedea Mannii* St. John, from holotype. *a*, Habit,  $\times \frac{1}{2}$ ; *b*, nodes with sheathing leaf bases and blades,  $\times 4$ ; *c*, perfect flower,  $\times 10$ ; *d*, sepal, inner side,  $\times 10$ ; *e*, nectaries and stamens, distal view,  $\times 10$ ; *f*, nectary, sheath, and filament base, radial section,  $\times 10$ ; *g*, nectaries and stamens, proximal view,  $\times 10$ ; *h*, stamen,  $\times 10$ ; *i*, ovary and stigmas, lateral view,  $\times 10$ .

0.7 mm thick (when dried 0.5–1 mm wide), linear to filiform, glabrous, bright green, fleshy, compressed, 1-nerved with a deep furrow above the midrib on both upper and lower surfaces, the edges thick, rounded, the cross section shaped like a figure 8, the apex acute, dark magenta, the base contracted just above the attachment, here at the apparent node the two opposite leaf bases encircling the stem and connate into a persistent tube that sheaths the stem to the actual attachment at the next lower node, this sheath with a bulbous swelling just below the tips and under each blade attachment; inflorescence a thyrses, erect, the peduncle 10–17 mm long, the thyrses 2–4.5 cm long, 1–3 cm in diameter, loose but not interrupted, composed of 5–6 pairs of 3–7-flowered cymules; bracts of lowest pair 5–10 mm long, foliose, those of the upper pair 1 mm long, lanceolate; whole inflorescence at first dark magenta, later the axis becoming green; pedicels 2–6 mm long, glabrous, enlarged at apex; buds ellipsoid, dark magenta all over or with the sepals edged with pale green; flowers perfect; calyx 5-parted; sepals 2.5–3 mm long, lanceolate, concave, scale-like with hyaline margin and cucullate dark maculate tip; nectaries 5, connate at base into a ring, the individual ones with the sheaths membranous, transparent, tubular from a lanceoloid base, 1.7 mm long, 0.3 mm wide at base, 0.2 mm wide at the apex, the apex with the proximal side longer and bifid for 0.3 mm, the distal side shorter and also bifid, surrounding at base the heavy yellow gland; stamens 10, alternate and opposite, of which 6 are well developed, ascending at 45°, the 5 stamens that are opposite the middle of the nearest sepals are adnate to and inserted in the proximal side of the glandular base of the nectary, their filaments 2.5–3 mm long, filiform, white; the 5 alternate stamens exterior to the glandular ring, and lightly adnate to it at base, the filaments 2 mm long, the anthers 1 mm long, elliptic-oblong,

yellowish; ovary 1 mm long, ovoid, slightly 3-angled, greenish except for the magenta tip; styles 3, filiform, 1.8 mm long; ovules numerous on the free central placenta; fruit unknown.

HOLOTYPE: Hawaiian Islands, Oahu, Wai-anae Mts., face of basal cliff, Makua-Ohikilolo ridge, 2,650 ft. alt., one flowering plant, but two others seen not in flower, Feb. 24, 1952, *H. St. John*, 24,793 (BISH).

DISCUSSION: *S. Mannii* is most similar to *S. spergulina* Gray var. *leiopoda* Sherff, of Hanapepe, Kauai, a variety with the internodes mostly 1–2.5 cm long; principal leaves 3–7 cm long, 0.4–0.6 (–1) mm wide when dried; lower nodes of inflorescence mostly rather distant; sepals less than 1.7–2 mm long; nectary linear subulate, becoming as long as the sepals; anthers 0.3 mm long. *S. Mannii* has the internodes 2–7 mm long; principal leaves 2.2–4.2 cm long when fresh, 0.5–1.3 mm wide when dried; lower nodes of inflorescence not noticeably remote; sepals 2.5–3 mm long; nectary tubular from a lanceoloid base, 1/2 as long as the sepals; anthers 1 mm long.

The new species is dedicated to Horace Mann Jr. (1844–1868) who in 1866 published a revision of the genus *Schiedea*.

#### LITERATURE CITED

- CHAMISSE, L. C. A. DE, and D. VON SCHLECHTENDAL. 1826. De plantis in expeditione speculatoria Romanzoffiana observatis rationem dicunt. *Linnaea*, vol. 1, pp. 1–73, and continuation.
- FENZL, EDUARD. 1833. In: S. Endlicher, *Nova genera et species plantarum descripta et iconibus illustrata*. *Atakta Botanica*, pp. 1–26, pls. 1–40.
- SHERFF, EARL EDWARD. 1945. Revision of the genus *Schiedea* Cham. & Schlecht. *Brittonia*, vol. 5, pp. 308–335.