

Monograph of the Genus *Isodendrion* (Violaceae) Hawaiian Plant Studies 21¹

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INTRODUCTION

History

The taxonomic history of the genus *Isodendrion* is brief. It was described by Asa Gray in 1852, being based upon the three new species, *I. pyriformis*, *I. longifolium*, and *I. laurifolium*, collected by the United States Exploring Expedition on Oahu, Sandwich Islands. Later, Gray gave a fuller account of the same three species (1854: 92–96) and illustrated two of them (1856: Atlas, pl. 8–9).

Horace Mann, Jr., and W. T. Brigham did not find any of the species during their exploration in 1864 and 1865, and Mann's account in his incipient "Flora of the Hawaiian Islands" (1866: 121–122) followed the treatments by his professor, Asa Gray.

Hillebrand (1888: 18–19) gave a good treatment, with a key and lengthy descriptions. The several more recent collections by himself and his associates were all identified with the three species published earlier by Gray. Hillebrand added no other species.

A fourth species, *I. subsessilifolium*, was dis-

covered and described by Heller (1897: 856–857, pl. LIV) from the island of Kauai.

MacCaughy gave a summarized account of the Hawaiian Violaceae and included *Isodendrion* (1918: 9–11). He stated that his paper was "the first comprehensive account which has included all of the recorded species and varieties. It is based upon field work extending over nearly ten years and contains new ecological material." However, this paper added nothing to the knowledge of *Isodendrion*. It copied word for word, or with slight paraphrasing, the treatment given by Hillebrand (1888: 18–19). Although the paper by Heller is included in his bibliography, MacCaughy makes no mention or disposition of Heller's very distinct and well-described and illustrated species from Kauai, *I. subsessilifolium*.

Relationship

Gray, in describing the genus (1852: 324, and 1854: 93), emphasized that the flowers were regular, both calyx and corolla, and the stamens are so illustrated, but with "the *unilateral stigma*, which, in a *flower otherwise perfectly regular*, vindicates the relationship with the genuine *Violeae*." He also indicated the stamens as entirely separate, and "*destitute of any prolongation of the connective . . .*" He concluded that it was a member of the section *Alsodineae* and related to *Alsodeia*, *Paypayrola*, and *Pentaloba*.

Bentham and Hooker (1862: 115–119), not having seen any specimens of the genus *Isodendrion*, obviously relied heavily on Gray's

¹ This is the twenty-first of a series of papers designed to present descriptions, revision, and records of Hawaiian plants. The preceding papers have been published in Bernice P. Bishop Mus., Occas. Papers 10(4), 1933; 10(12), 1934; 11(14), 1935; 12(8), 1936; 14(8), 1938; 15(1), 1939; 15(2), 1939; 15(22), 1940; 15(28), 1940; 17(12), 1943; Calif. Acad. Sci., Proc. IV, 25(16), 1946; Torrey Bot. Club, Bul. 72: 22–30, 1945; Lloydia 7: 265–274, 1944; Pacific Sci. 1(1): 5–20, 1947; Brittonia 6(4): 431–449, 1949; Gray Herb., Contrib. 165: 39–42, 1947; Pacific Sci. 3(4): 296–301, 1949; Bernice P. Bishop Mus., Occas. Papers 20(6): 77–88, 1950; and Pacific Sci. 6(1): 30–34, 1952.

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detailed and illustrated account. They placed it in the tribe Paypayroleae which had unarmed connectives and subequal petals, and put it next to the genus *Paypayrola*.

The most recent tribal placement of *Isodendrion* is by Melchior in the second edition of the "Pflanzenfamilien" (1925: 347, 355-356). As was natural, he also relied heavily on Gray's original description of the genus and two folio illustrations, but Melchior also saw and dissected a specimen of *I. laurifolium* Gray and printed the first figure of its stamen showing a terminally apiculate connective. His generic description is largely a German translation of Gray's, but he adds, correctly, that the three placentae bear each 2-4 ovules (1925: 355). He also adds, incorrectly, "Stam. [ina] mit freien oder ganz am Grunde zu einem sehr niedrigen Ring verwachsen, flachen Filamenten . . . Nektarorgane auf dem Rücken der Filamente fehlend oder in Form von Schuppen in ihrer ganzen Länge den Filamenten angewachsen. . . . Blüten . . . grünlich-weiss oder rötlich . . ." After dissecting the flowers of two of the three genuine species known to Melchior (the type of *I. longifolium* having already vanished) and of the 11 additional species here described, no factual basis is seen for his statements that the stamens sometimes arise from a low, joined filament ring; that the staminal nectaries may be dorsal scales growing on the full length of the filaments; or that the flowers are ever reddish. Lévillé stated no flower color. Gray had surmised that the petals of *I. pyriformis* and *I. longifolium* were probably white; and Hillebrand stated for his composite *I. pyriformis* that the petals were greenish white. Yet MacCaughy (1918: 10) stated in his compilation that *I. longifolium* had the flowers "purplish-white." He left no specimens of this or any other *Isodendrion*, and no confirmation of his statement is known. Melchior's statement that some flowers were reddish may have been a free translation of MacCaughy's "purplish-white." He places *Isodendrion* in the sub-

family Violoideae, the tribe Rinoreae, and as the single genus in the subtribe Isodendriinae. The other members of the tribe (*Rinorea*, pantropic; *Allexis*, African; and *Gleospermum*, tropical American) all differ fundamentally in having produced, elaborate connectives and the stamens mostly connate into a filament tube.

During detailed dissection and illustration of the flowers of all the species, several corrections have been made in the generic characters of *Isodendrion*. The flowers are always zygomorphic and single. The sepals are distinct and unequal. The petals unequal, the lower being longer and larger than the lateral, and the lateral longer and larger than the upper pair. The distinct stamens (never in any way united) are unequal in size, and all the stamens, or the two distal ones, are apically aculeate or at least apiculate (in *I. pyriformis*) by a prolongation of the connective. Several of the species have a swollen gland borne dorsally on the filaments. The plants are shrubs, not trees.

Though the flowers of *Isodendrion* are definitely irregular and have a violet-like appearance, the lower petal lacks any spur or saccate enlargement, hence the genus cannot be placed in the tribe Violeae and must remain in the tribe Rinoreae. Because of the significance of the staminal characters, it does not show close relationship to and should be kept distinct from the subtribes Rinoreinae and Paypayrolinae. It is much closer to the Hymenantharinae, which differs from the Isodendriinae by having the fruit a berry, the sepals connate at base, the petals sessile, and the stipules deciduous. It has strong resemblances in this subtribe to the genus *Meliclytus*, containing four species of shrubs and trees from New Zealand, the Kermadec, Norfolk, and Fiji Islands. In *Meliclytus*, however, the flowers are dioecious; the stamens almost sessile; ovary with 3-5 many-ovuled placentae; stigma 3-5-lobed; and stipules deciduous. These characters distinguish it clearly. However, it is close to *Isodendrion* in having the

stamens free; the connective produced into a scale or prickle and with a dorsal honey gland at the base; and flowers axillary, solitary, or in few-flowered fascicles.

It is agreed that Melchior had good reason for placing *Isodendron* alone in a distinct subtribe, but he implied by his placement in his natural key that it was related most closely to the subtribe Rinoreinae. For the reasons given above, we disagree in this. Rather, it seems most closely related to *Melicytus* in the Hy-menantharinae.

Parenthetically, the comment can be made that although Melchior (1925: 355–356) lists, as the important special literature, the treatments by Gray, Hillebrand, L veill , and MacCaughey, he, too, omits the one by Heller and his very distinct species *I. subsessilifolium*. Melchior accepts only the three original species of Gray and *I. Fauriei* L vl., oblivious of the fact that the latter is based on a specimen of a well-known species of *Gouania* (Rhamnaceae).

Distribution

The 14 species of *Isodendron* are distributed unequally between the larger Hawaiian islands. Luckily all of the collections include the name of the island in the data, even though two thirds of the collections were made before 1871. Such records cannot be placed precisely on a map. However, each is shown on the map (Fig. 15) by a circle on a likely part of the island. The precise localities known for the more recent collections are indicated by black discs. For the island of Maui, the evidence has vanished. Hillebrand (1888: 18) listed two of his own collections from Olowalu and Wailuku. These are believed to have been destroyed in the bombing of Berlin in 1943. No duplicates of these two numbers have been found in any other herbaria, so the Maui records are now lost. In 1914 Rock found a single Maui sheet in the Berlin Herbarium, with the data "S. ridge of Wailuku Valley, West Maui, Aug. 1870, Oloalu? or Valley of Waihee." He noted that

the leaves from the Waihee, West Maui, plant are much larger than the others. There is no record from the now-denuded island of Kahoolawe. *Isodendron* has been found on all the other large Hawaiian islands. Kauai has three species, Niihau one, Oahu six, Molokai one, Lanai one, and Hawaii two. It will be seen that the largest numbers are on Oahu and Kauai, and that the three northernmost islands—Kauai, Niihau, and Oahu—have 11 of the 14 species. The larger northern islands are considered to be of greater geologic age than the others.

Zonation

The vegetational zones are well marked in the Hawaiian Islands, and it is of interest to consider the zonation of any new species. For the species *I. hawaiiense*, *I. lanaiense*, *I. Lydgatei*, *I. molokaiense*, and *I. Remyi*, there is no zonal information, due to the lack of precise locality data. The vegetational zones of Riperton and Hosaka (1942) are used here. In Zone B is the locality for *I. Hosakae*, and probably that of *I. Lydgatei*. In Zone C 1, are the stations for *I. Forbesii*, *I. laurifolium*, *I. longifolium*, *I. pyrifolium*, *I. subsessilifolium*, and *I. waianaeense*. In Zone D 1 is the station for *I. maculatum*, which is at an elevation of 800 feet in woods in the deep narrow gulch of Hanakapiai on the moist windward coast of Kauai. The others, listed above for Zones B and C 1, are in a region of dry scrub probably once forested with an open dry forest or in the slightly higher localities that are still covered with a dry forest. These lowland, or "kula," lands were overrun by feral cattle soon after 1782 and, as a result, the native forest was largely destroyed. During the last two or three generations, cattle pasturing has been controlled, but on these semiarid lower slopes and ridges the grazing has been continuous and heavy. Grazing during these two periods has resulted in the almost complete destruction of the plant species native to these lowland regions.

The rarity of the species of *Isodendron* is a

result of this overgrazing. This can be demonstrated statistically. The only collectors to find more than one species were Pickering and Brackenridge (collecting in 1840), Rémy (in 1851–1855), and Hillebrand (1850–1871). Of the 14 species, only 3 have been collected more than once (not counting the revisit by the same collector, Hosaka, to the known type locality of *I. Hosakae*). Since 1872 there have been only five collections of *Isodendron*, by five different collectors, representing four species. Other botanists who have collected widely in the islands, as Rock, Skottsberg, Fosberg, Mitchell, Cowan, Webster, Wilbur, *et al.*, have failed to find the genus. In a sense this revision of *Isodendron* has almost been a study in paleontology, as the investigation has been almost wholly of old collections in herbaria of species now extinct. It would have been gratifying to have many and abundant collections for each species. Such has not been the case. Though Hillebrand and others have grouped under *I. pyriformis* any collection with more or less ovate leaves, it has been learned from study of the flowers, fruits, and stipules that there has been much speciation resulting in narrow endemism. No species is known to occur on more than one island, and, furthermore, there is local endemism to a particular mountain range or even to a few adjacent mountain valleys, as is so characteristic among the older Hawaiian plant genera. Since the best characters are in the flowers and stipules, it is very helpful to find that the stipules are long persistent and that the perianth is marcescent and persistent even on mature fruits. These characteristics have made it much easier to study and understand the species of *Isodendron*.

Extinction of the Species

One cannot always prove that a given species of plant is extinct in its natural habitat, but the data presented in the discussion of distribution show that there is a great probability that the majority of the known species of *Isodendron* are extinct, as well as

the one or two probably lost species from Maui, once recorded by Hillebrand. Of the 14 known species, nearly two thirds have not been collected since 1871 and are assumed to be extinct. The remaining species have been found and collected between 1895 and 1950, and most of these are probably extant, two of them having been found two and three times. These living species are: *I. Forbesii*, *I. maculatum*, and *I. subsessilifolium* of Kauai; *I. waianaeense* of Oahu; and *I. Hosakae* of Hawaii.

Phylogeny

As is indicated by the arrangement in the key, the species fall into two groups. The first one has glabrous sepals, petals, and stipules. It appears that this is the group of more primitive species. The fully glabrous ones are only three, *I. laurifolium* and *I. longifolium* of Oahu and *I. maculatum* of Kauai. These all have elongate, more or less oblanceolate blades. There is little basis for choice between these, but it is suggested that *I. laurifolium* represents the most primitive species.

The group of really hairy species, which is considered more advanced, contains three species on Oahu, two on Hawaii, and one each on Niihau, Molokai, and Lanai.

Acknowledgments

Although parts of this study were done while visiting other herbaria, the bulk of it has been accomplished in Honolulu through the generous loan of herbarium specimens. With cordial thanks, acknowledgment is made of loans from the United States National Herbarium, Washington; the Gray Herbarium, Harvard University, Cambridge; the Royal Botanic Gardens, Kew; the Museum National d'Histoire Naturelle, Paris; and the Herbarium Barbey-Boissier, Geneva.

Explanations

The location of the specimens studied and cited is indicated by the standard abbreviations (Lanjouw, 1939). The great majority of

the specimens are in the following:

BISH = Bernice P. Bishop Museum, Honolulu. All specimens not otherwise assigned are in this collection.

GH = Gray Herbarium, Cambridge.

P = Museum National d'Histoire Naturelle, Paris.

US = United States National Herbarium, Washington.

The maturity or completeness of the specimens cited is indicated in a following parenthesis by the following abbreviations:

- b. = bud
- fl. = flower
- fr. = fruit
- i. = immature
- lf. = leaf
- st. = stem

TAXONOMY

Family *VIOLACEAE*

Genus *ISODENDRION* Gray

Am. Acad. Arts Sci., Proc. 2: 324-325, 1852;

U. S. Exploring Exped., Botany, Phanerogamia 15: 92-93, 1854; Atlas pl. 8-9, 1856.

Shrubs; stems mostly branching, woody, the bark roughened by the long persistent indurate subtriangular stipules; leaves alternate, short petioled; blades chartaceous to subcoriaceous, from linear lanceolate to elliptic, oblanceolate, or ovate, the margins toothed towards the apex; inflorescence axillary (a reduced cyme), of a single peduncle bibracteolate at apex, bearing a single 1-flowered

pedicel; flowers fragrant; sepals 5, unequal, persistent, more or less lance-ovate, glabrous or pubescent, the margins thin, glabrous or ciliate, overlapping at base; corolla clearly irregular; petals 5, greenish or whitish, the lower two thirds being a ligulate claw, the upper third a broader, more or less oval limb, the claws laterally imbricate, the uppermost exterior, the lower petal interior, the whole imitating a corolla tube, particularly the lower petal and less so the others have the upper half of the claw and at least the base of the limb fleshy, thickened, rigid and channel-like; petals and stamens marcescent, persisting around the fruit; stamens 5, unequal or subequal, free on the receptacle; filaments ligulate, with or without a dorsal enlarged nectar gland; anthers oblong to ovate or subsagittate, the two sacs oblong, dehiscing by a longitudinal medial suture; connective in all the stamens or at least in the lower ones produced into a terminal mucro, flap, or prickle, which is usually incurved; ovary glabrous, 1-celled, with 3 placenta bearing 2-4 orthotropous ovules; style glabrous, filiform, gently sigmoid, the apex decurved and enlarged; stigma oblique, deflexed, excavate; capsule ovoid, beaked, deeply 3-lobed by longitudinal furrows, cartilaginous, prominently veined, 3-valved; seeds commonly 2 to each valve, obovate, smooth, shining, the apex truncate and excavate; embryo axile; the 2 cotyledons opposite, oval, free in an ample cavity but surrounded by the abundant endosperm.

Fourteen species of the Hawaiian Islands.

KEY TO SPECIES

- A. Sepals glabrous on the midrib; petals glabrous (except in *I. Forbesii*); stipules glabrous on the midrib or central strip (and in some species on the margin also); well-developed leaves 5-23.5 cm. long; leaves glabrous,
- B. Sepals glabrous throughout,
- C. Stipules glabrous; blades oblanceolate,
- D. Stipules 2.5 times as long as wide; blades 2.2-9.2 cm. long; anthers nearly oblong in outline. 6. *I. laurifolium*
- D. Stipules less than 2 times as long as wide; blades 6.5-22 cm. long,
- E. Lower petal 10 mm. long; stamens not apiculate; leaf margin obscurely undulate. 7. *I. longifolium*

- E. Lower petal 6 mm. long; apex of connective apiculate; leaf margin distinctly serrulate. 9. *I. maculatum*
- C. Stipules ciliate; sepals 3-nerved, thin; blades elliptic or oblong-ob lanceolate,
 F. Lower petal 10.5 mm. long; leaf margins entire or subsinuate; anther acicular mucronate on apex of connective. 14. *I. waianaense*
- F. Lower petal 12.5 mm. long; leaf margin sinuate-denticulate; anther umbonate on apex of connective. 13. *I. subsessilifolium*
- B. Sepals ciliolate; stipules glabrous on the back,
 G. Stipules ciliolate generally; filaments with a distal oblong-ob lanceolate gland; petal limb glabrous; blades 5-9 cm. long. 8. *I. Lydgatei*
- G. Stipules glabrous; filaments glandless; petal limb ciliolate; blades 3.3-15 cm. long, elliptic to oblance-elliptic. 1. *I. Forbesii*
- A. Sepals and stipules pubescent on midrib or central strip and ciliate; petals pilose without; leaves 1-6.5 cm. long, pubescent at least below,
 H. Blades narrowly elliptic,
 I. Lower petal 14-18 mm. long; lateral petals symmetric; anther with strong, ascending prickle; blades serrate, acute. 4. *I. Hosakae*
- I. Lower petal 12 mm. long; lateral petals asymmetric; anther with minute reflexed mucro; blades crenate, obtuse. 3. *I. Hillebrandii*
- H. Blades obtuse, ovate or lance-ovate or oblong-ob lanceolate or elliptic,
 J. Blades lance-ovate; filament glandular on the distal side, cruciform at apex. 2. *I. hawaiiense*
- J. Blades ovate or widest at or above the middle; filament not cruciform or glandular (except in *I. molokaiense*),
 K. Filament with a distal gland; lateral petals with claw with 5 nerves, unbranched from base to apex and the limb broad ovate; sepals 4-4.6 mm. long; lower petal 10 mm. long. 10. *I. molokaiense*
- K. Filament glandless,
 L. Blades ovate, the margins serrulate; stipule midnerve pubescent,
 M. Limb of lateral petals linear-elliptic, the claw 5-nerved to the apex; sepals 4-5 mm. long. 12. *I. Remyi*
- M. Limb of lateral petals ovate or oval, the claw 3-5-nerved at base, these nerves soon forking; sepals 3-4.1 mm. long,
 N. Lower petal 11 mm. long; petals unequal in length; stipules ovate or asymmetrically so; bundle scar 1. 5. *I. lanaiense*
- N. Lower petal 8 mm. long; petals subequal in length; stipules deltoid; bundle scars 3. 11. *I. pyrifolium*
- L. Blades elliptic or oblong-ob lanceolate, the margins undulate; stipules glabrous on the back. 14. *I. waianaense*

1. *Isodendron Forbesii* sp. nov.

ILLUSTRATIONS: Figure 1.

DIAGNOSIS TYPI: Frutex ad 8 dm. alto, ramis 3-4 mm. diametro cortice nigro-fusco transverse asperato et longitudine sulcato, cicatricibus 0.8-1.5 mm. lato lunato-ovalibus pallidibus, fasciculis 3, ramulis foliferis 1.5-7

cm. longis cum 5-13 foliis adscendentibus 1.5-2.5 mm. diametro glabris rubescentibus vel viridibus a stipulis persistentibus asperatis, nodis 1-8 mm. plerumque 3 mm. distantibus, stipulis 2.5-3.1 mm. longis 1.3-1.5 mm. latis anguste oblique deltoideis vel oblongo-deltoideis glabris carina valde in-

crassata basi incrassato, petiolis 1–6 mm. longis validis subnigris deinde pallidioribus et suberiferis, laminis 3.3–15 cm. longis crassis subcoriaceis valde elevato-reticulatis ellipticis vel oblanceo-ellipticis plerumque obtusis cuneatis marginibus minime undulato-crenulatis nervis secundariis in uno latere 8–10 adscendentibus arcuatis sinuatis confluentibus, floribus solitariis axillaribus, pedunculis ad 1 mm. longis ad apicem bibracteolatis, bracteis 1.5 mm. longis ovatis acutis glabris, pedicelis 2–3 mm. longis glabris, sepalis 3.2–3.7 mm. longis 1 mm. latis anguste oblongo-lanceolatis membranaceis perspicuis albis vel minime viridibus 5- vel plurimi-nervis glabris praeter marginibus sparse ciliolatis apice plano nigro-fusco, petalis irregularibus unguibus lateraliter imbricatis tubo imitans, petala inferiore (postquam bullanda) 6.2 mm. longa, ungue 4.5 mm. longo 1.5 mm. lato 3-nervoso elliptico-ligulato ad basem membranaceo ad apicem incrassato, limbo 2.1 mm. longo 1.3 mm. lato ciliolato obovato carnosio non pellucido canaliculato apice subacuto, petalis lateralibus 6.3 mm. longis unguibus 3.9 mm. longis 1.2 mm. latis elliptico-ligulatis membranaceis 3-nervatis, limbis anguste ellipticis ciliolatis carnosis 3-nervatis, petalis superioribus 6.2 mm. longis, unguibus 4.2 mm. longis elliptico-ligulatis membranaceis 3-nervatis, limbis 2 mm. longis 0.9 mm. latis anguste oblongo-ellipticis ciliolatis, staminibus subaequalibus inferis 2 mm. longis, filamentis 0.8 mm. longis ligulatis, antheris 1.2 mm. longis 0.5 mm. latis anguste ellipticis subsagittatis, connectivo mucronato, ovario 1.2 mm. longo ovoideo longitudinaliter 3-lobato, stylo 3.6 mm. longo subulato, stigmatibus obliquo pyramido-conico; capsulis 7–8 mm. longis 3.5 mm. latis lanceo-ovoideis stramineis longitudinaliter trilobatis rostratis, placentis 2-ovulatis, seminibus 2–2.2 mm. longis 1.8–2 mm. diametro obovatis lucidis fusco-maculatis ad apicem truncatis.

DESCRIPTION OF TYPE: Shrub; at least 8 dm. tall; older branches 3–4 mm. in diameter, the

bark brown, roughened by longitudinal furrows and transverse checks, the stipules mostly inconspicuous; leaf scars 0.8–1.5 mm. wide, lunate-oval, pale, with 3 bundle scars; twigs leafy for 1.5–7 cm., bearing 5–13 leaves, these ascending at 45°, crowded; leafy twigs 1.5–2.5 mm. in diameter, glabrous, reddish to greenish, roughened by the persistent stipules; nodes 1–8 mm., commonly 3 mm. apart; stipules 2.5–3.1 mm. long, 1.3–1.5 mm. wide, narrowly oblique deltoid or oblong deltoid, glabrous on the back and margin (though a lacerate membranous margin may appear ciliate on occasion), the base thickened, pillow-like, the midrib heavy and prominent; petioles 1–6 mm. long, stout, blackish, later pale from corky distortions and cracks; blades 3.3–15 cm. long, firm, thick, subcoriaceous, prominently raised fine reticulate veined, elliptic to oblance-elliptic, mostly obtuse, the base abruptly cuneate, the margin low undulate-crenulate, the lateral veins 8–10 on a side, ascending arcuate, wavy and interconnected well back from the margin; flowers single, axillary; peduncles 1 mm. or less in length, bibracteolate at apex; pedicels 2–3 mm. long, glabrous; peduncular bracts 1.5 mm. long, ovate, acute, glabrous; sepals 3.2–3.7 mm. long, 1 mm. wide, narrowly oblong-lanceolate, membranous, transparent, whitish or slightly greenish tinged, 5- or more-nerved, glabrous except for the margin sparsely ciliate, the apex flat, dark brown; corolla irregular, the lower two thirds of each petal forming a claw, imbricate laterally, the upper ones outside, the lower inside, imitating a corolla tube, the limb expanding and reflexing in anthesis; lower petal the largest and much more fleshy, when boiled 6.2 mm. long, the claw 4.5 mm. long, 1.5 mm. wide, elliptic-ligulate, 3-nerved, membranous below the middle, above the middle gradually becoming thicker, fleshy and opaque, the limb 2.1 mm. long, 1.3 mm. broad, ciliate, obovate, fleshy and opaque, the apex subacute, the limb and upper half of the claw rigidly channeled; lateral petals 6.3 mm. long, slight-

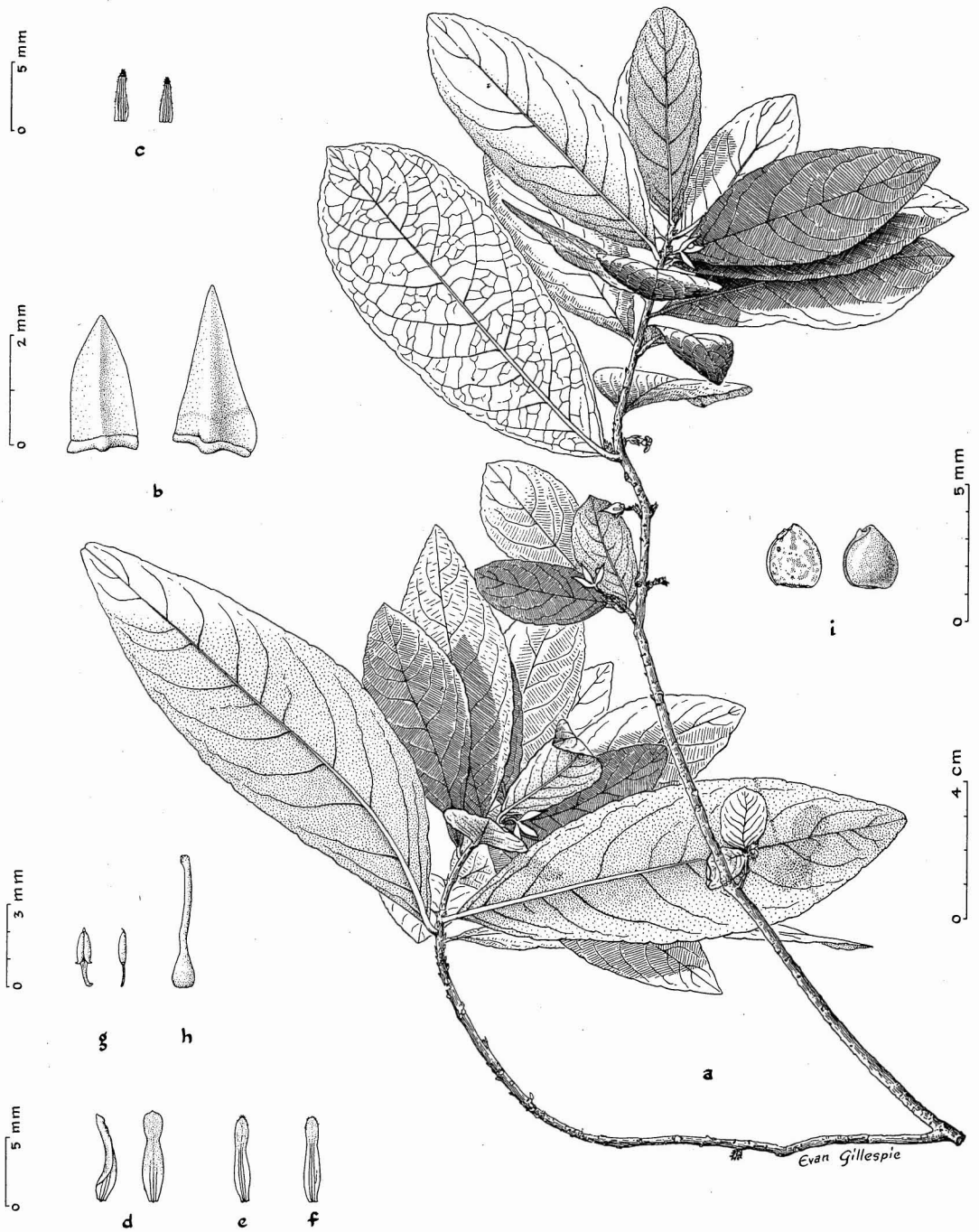


FIG. 1. *Isodendron Forbesii*. *a*, Habit $\times \frac{1}{2}$; *b*, stipules $\times 8$; *c*, sepals $\times 2$; *d*, lower petal $\times 2$; *e*, lateral petal $\times 2$; *f*, upper petal $\times 2$; *g*, lower stamen $\times 4$; *h*, pistil $\times 4$; *i*, seeds $\times 4$. From type specimen, Kipu Kai, Forbes 727.K.

ly contracted two thirds way from the base, claw 3.9 mm. long, 1.2 mm. wide, elliptic-ligulate, membranous, 3-nerved, the limb narrowly elliptic, ciliolate, fleshy thickened but the 3 veins visible; upper petals 6.2 mm. long, slightly contracted, the claw 4.2 mm. long, elliptic-ligulate, membranous, 3-nerved, the limb 2 mm. long, 0.9 mm. wide, narrowly oblong-elliptic, ciliolate; stamens slightly unequal, the lower ones 2 mm. long, the filaments 0.8 mm. long, ligulate, the anthers 1.2 mm. long, 0.5 mm. wide, narrowly elliptic, the base subsagittate, the connective with an apical flat mucro; ovary 1.2 mm. long, ovoid, longitudinally 3-lobed; style 3.6 mm. long, subulate; stigma lateral, pyramidal-conic; capsules 7–8 mm. long, 3.5 mm. wide, lance-ovoid, beaked by the persistent style, stramineous, deeply 3-lobed longitudinally; placentae 2-ovuled; seed 2–2.2 mm. long, 1.8–2 mm. in diameter, obovate, brown maculate, shining, the broad apex truncate and depressed.

TYPUS: Kauai, Haupu Range, left hand (east) side of Kipu Kai gap, on a ridge side of wet gully, only one plant seen, Nov. 1, 1916, C. N. Forbes 727.K (BISH), (st. lf. fl. fr.).

The specific name is given in honor of the collector, a vigorous explorer and botanist, Charles Noyes Forbes (1883–1920).

2. *Isodendron hawaiiense* sp. nov.

ILLUSTRATIONS: Figure 2.

VERNACULAR NAME: "Wahine-noho-kula."

DIAGNOSIS TYPI: Frutex 1–2 m. alta, ramis 1.5–3.5 mm. diametro cortice griseo sublevi longituditer sulcato, cicatricibus 0.7–1.3 mm. latis depressi-rotundati-scutelliformibus prominentibus pallidis, fasciculis 3, ramulis foliferis 3–15 mm. longis 0.5–1 mm. diametro atrorubrescentibus glabris a stipulis persistentibus abditis cum 6–9 foliis subcongregatis divergentibus, nodis 2–10 mm. plerumque 3 mm. distantibus, stipulis 2.8–3.3 mm. longis late ovato-deltaideis carina elevata et adpressi-puberulenta lateribus bruneis membranaceis marginibus ciliolatis, petiolis 5–10 mm. longis 0.3 mm. diametro gracilibus albo-

puberulentis, laminis 2–5.7 cm. longis 10–28 mm. latis anguste ovato-ellipticis vel lanceolatis vel etiam anguste lanceolatis chartaceis sparse adpressi-puberulentis summe in venis apice obtuso vel breve mucronato venis secundariis 6–8 in uno latere valde adscendentibus apicibus diffusis, supra attri-viridibus infra pallidioribus marginibus obscure depressi-serrulatis, floribus solitariis axillaribus, pedunculis 2–3 mm. longis adpressi-puberulentis bibracteolatis in apice, pedicellis 2 mm. longis adpressi-puberulentis, sepalis subaequalibus 4 mm. longis carina 5-nervosa incrassata valde adpresse puberulenta lateribus membranaceis viridibus vel brunneis glabris marginibus ciliolatis, corollis irregularibus, laminis in tempo floresco reflexis, petala inferiore maxima 12.8 mm. longa (postquam bullanda), ungue subligulo 3-nervato marginibus membranaceis in medio incrassato opaquo canaliculato, limbo anguste elliptico 5.2 mm. longo 2 mm. lato subtile petaloideo praeter in basi incrassato, petalis lateralibus 10.9 mm. longis unguibus 6.9 mm. longis 1.8 mm. latis oblongo-ellipticis 3-nervatis marginibus membranaceis in medio carnosio canaliculato, limbo 4 mm. longo 1.7 mm. lato anguste elliptico carnosio exteriore piloso non pellucido marginibus sinuatis, petalis superioribus 11.1 mm. longis unguibus 1.5 mm. latis 3-nervatis marginibus latis membranaceis in medio ad apicem incrassato non pellucido, limbo 4.7 mm. longo 1.7 mm. lato anguste elliptico firmo carnosio non pellucido, staminibus aequalibus 2.8 mm. longis, filamentis ligulatis late nervosis ad mediam partem exteriori glanduliferis ad apicem cruciformibus, apice connectivi aculeifero, antheris 1.5 mm. longis ovatis saccis anguste elliptico-oblongis, ovario 2 mm. longo ovoideo minime 3-lobato, stylo 5 mm. longo tereto sinuoso, stigmatibus obliquo, capsulis 12 mm. longis ovoideis glabris pallide viridibus valde nervosis a stylo rostratis, seminibus 3.2 mm. longis 1.8–2.2 mm. diametro obovatis olivaceofuscis ad apicem truncatis excavatis.

DESCRIPTION OF TYPE: Shrub; 1–2 m. tall, older branches 1.5–3.5 mm. in diameter; bark of older branches with long persistent stipules, but later rather smooth, gray, checked with longitudinal and a few lateral fissures; leaf scars 0.7–1.3 mm. wide, depressed rounded shield-shaped, prominent, pale, with 3 bundle scars; twigs leafy for 3–15 mm., bearing 6–9 leaves, rather crowded, diverging; upper leafy stem 0.5–1 mm. in diameter, dark reddish, glabrous, almost completely covered by the closely imbricate stipules; nodes 2–10 mm., commonly 3 mm. apart; stipules 2.8–3.3 mm. long, broadly ovate-deltoid, with the slender midrib thickened and raised and appressed puberulous, the wide sides brown membranous, the margins ciliolate; petioles 5–10 mm. long, 0.3 mm. in diameter, slender and white puberulent; blades 2–6.4 cm. long, 10–29 mm. wide, narrowly ovate-elliptic to lanceolate or even narrowly lanceolate, chartaceous, sparsely appressed puberulent, especially on the veins, secondary veins 6–8 on a side, sharply ascending, diffusing to the margin and interconnections, the apex obtuse or short mucronate, above dark green, below paler, the margin obscurely low serrulate; flowers single, axillary; peduncle 2–5 mm. long, appressed puberulent, bibracteolate at summit; pedicels 2–4 mm. long, appressed puberulent; sepals subequal, 4–5 mm. long, the thickened wide central strip densely appressed puberulent, appearing like one big midrib but containing 5 buried veins, the narrow sides thin, greenish or brownish, glabrous except for the ciliolate margins; corolla greenish, irregular, the lower two thirds of the petals forming a channel-like claw, the limb expanding and reflexing in anthesis; lower petal the largest, 12.8 mm. long (when boiled), contracted two thirds way from the base; claw almost ligulate but tapering slightly at base, 3-nerved from the base, the margins membranous, but the central strip thickened, fleshy, opaque, channeled, limb narrowly elliptic, 5.2 mm. long, 2 mm. wide, thickish at the very base, but beyond

that thin petaloid and translucent; lateral petals 10.9 mm. long, strongly contracted two thirds way from the base, the claw oblong elliptic, 6.9 mm. long, 1.8 mm. wide, 3-nerved from the base, the margins membranous, the central strip opaque, thick, fleshy, firmly channeled, the limb 4 mm. long, 1.7 mm. wide, narrowly elliptic, pilosulous without, thick, fleshy, opaque, the margin wavy; upper petals 11.1 mm. long, contracted 3/5 way from the base, the claw 1.5 mm. wide, oblong-elliptic, 3-nerved, the wide margins membranous, the central strip gradually thickening upwards to the throat which is fleshy, opaque and strongly channeled, the limb 4.7 mm. long, 1.7 mm. wide, narrowly elliptic, firm, fleshy, opaque; stamens equal, 2.8 mm. long; filament ligulate with a broad nerve, at the middle this has a deltoid enlargement which supports a distal surface swelling bearing minute short glandular hairs, hence a nectary, apex of filament and base of connective joining in a cruciform enlargement as broad as the anther; connective narrowing upwards, and on the lower stamens bearing a prominent hamate prickle; anthers 1.5 mm. long, ovate in outline, the anther sacs narrowly elliptic-oblong, salient pointed at the base; ovary 2 mm. long, ovoid, lightly 3-ribbed; style 5 mm. long, sinuous, terete, stigma oblique; capsule 12 mm. long, ovoid, deeply 3-furrowed, glabrous, greenish, strongly veined, beaked by the persistent style; seeds 3.2 mm. long, 1.8–2.2 mm. in diameter, obovoid, olive brown, the apex truncate, sunken.

TYPUS: Iles Sandwich, Hawaii, 1851–1855, *J. Remy* 535 (GH), (st. lf. fl.). An isotype (Paris) bears more data on an original ticket: "Violacée. (Vahinenohokula), Janvier, Bords du chemin dans le Kekaha, sur le lave décomposé au pied du Hualalai, Hawaii, attenu de 3 à 6 pied, fl. verdâtre."

J. Rémy (the correct spelling of his name, though on his printed labels the "e" was not accented) was in Hawaii for 5 years, long enough to learn to speak and write Hawaiian.

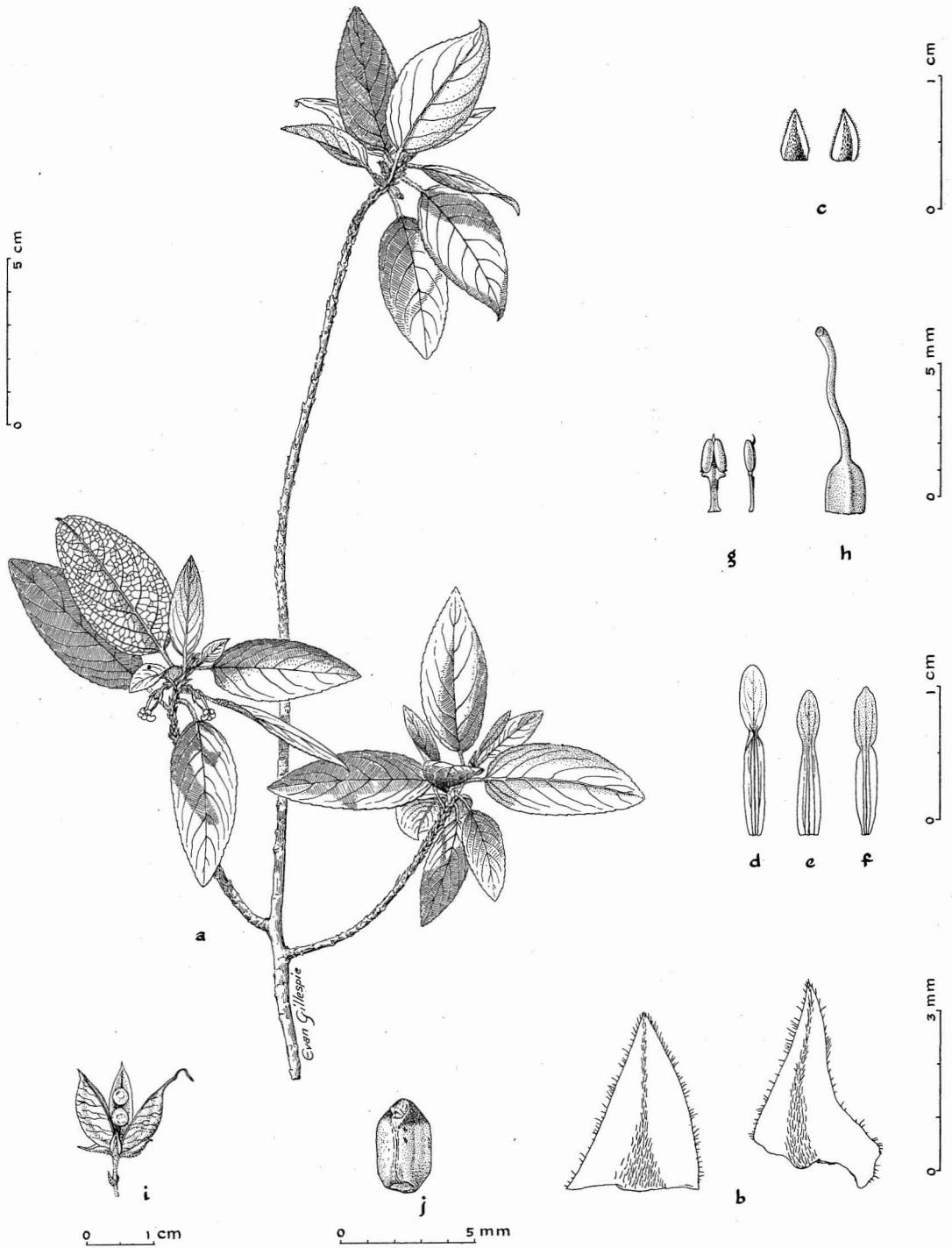


FIG. 2. *Isodendrion hawaiiense*. a, Habit $\times \frac{1}{2}$; b, stipules $\times 8$; c, sepals $\times 2$; d, lower petal $\times 2$; e, lateral petal $\times 2$; f, upper petal $\times 2$; g, lower stamen $\times 4$; h, pistil $\times 4$; i, capsule $\times 1$; j, seed $\times 4$. From the type, Hawaii, Remy 535, except i and j from isotype (P).

Hence, he certainly obtained the vernacular plant name from the natives and applied it correctly. It means the woman dwelling in the foothills. He recorded it in a French orthography, but it is here altered, "vahine" to "wahine," to make it conform to the established orthography of the Hawaiian language. The Hawaiian word "kekaha" means land unsuited for taro growth. As most of the land at the foot of Hualalai is of lava little decomposed and very arid this reference to it as rocky, waste land is apt. That makes the habitat more precise, but the locality is still vague.

The species is named for its occurrence on the island of Hawaii.

3. *Isodendron Hillebrandii* sp. nov.

ILLUSTRATIONS: Figure 3.

DIAGNOSIS TYPI: Frutex, ramis glabris 1-4 mm. diametro a stipulis persistentibus asperatis deinde semilevibus griseis sulcatis, cicatricibus 0.7-1.5 mm. latis depresso scutelliformibus, fasciculis 3, ramulis foliferis 1-5 cm. longis cum 5-11 foliis divergentibus non condensatis 1-1.5 mm. diametro viridi-vel rubro-tinctis, nodis 1-6 mm. plerumque 2 mm. distantibus, stipulis 3-3.5 mm. longis late deltoideis carina incrassata et dense adpressi-puberulenta lateribus membranaceis brunneis marginibus ciliolatis, petiolis 5-7 mm. longis 0.4-0.5 mm. diametro gracilibus dense subadpressi-puberulentis, laminis 1.9-3.3 cm. longis 8-16 mm. latis ellipticis subcoriaceis supra atriviridibus infra viridibus ab initio in venis adpressi-puberulentis praesertim infra sed supra deinde subglabris excepta ad basim, nervis secundariis 4-6 in uno latere valde adscendentibus arcuatis confluentibus, marginibus valde crenatis apicis obtusis, floribus solitariis axillaribus, pedunculis 2-4 mm. longis dense albis adpressi-puberulentis ad apicem bibracteolatis, bracteis 2 mm. longis sepalis simulantibus lanceo-ovatis ciliatis in dorso puberulentis, pedicellis 1.5-3 mm. longis dense albis adpressi-puberulentis, sepalis 3.6-3.8 mm. longis 1.8 mm. latis

oblongo-ovalibus 3-6-nervosis carina incrassata valde adpressi-puberulenta lateribus membranaceis glabris marginibus ciliolatis, petalis irregularibus exterioribus adpressi-puberulentis petala inferiore 11.9 mm. longa (postquam bullanda), ungue 7.4 mm. longo 2.2 mm. lato anguste elliptico 5-nervato in medio incrassato ad apicem incrassato et canaliculato non pellucido, limbo 4.5 mm. longo 2.5 mm. lato carnosio firmo marginibus sinuatis, petalis lateralibus 10.7 mm. longis, ungue 6.7 mm. longo oblique oblanceo-oblongo asymmetrico in medio incrassato, limbo 4 mm. longo 1.9 mm. lato oblique oblongo-ovali nervoso incrassato non pellucido, petalis superioribus 10.8 mm. longis subligulatis, ungue 7 mm. longo 1.9 mm. lato angustissime elliptico 3-nervato in medio nervoso et ad apicem semi-incrassato marginibus membranaceis, limbo 3.8 mm. longo 1.9 mm. lato oblique oblongo-ovali incrassato et nervoso, staminibus 1.5-1.8 mm. longis subaequalibus omnibus in apicibus connectivorum armatis mucro 0.1 mm. longo, filamentis 0.5-0.7 mm. longis subulatis ad basem exteriore inflato glanduloso, antheris 1.3 mm. longis 0.8 mm. latis oblongis saccis in basi submucronatis, ovario 2.8 mm. longo 1.2 mm. diametro lanceoloideo, stylo 5.1 mm. longo crasse filiforme, stigmatibus oblique suborbiculare, fructu ignoto.

DESCRIPTION OF TYPE: Shrub; stems glabrous, older ones 1-4 mm. in diameter, roughened by the long persisting stipules, later nearly smooth, gray, checked with longitudinal and transverse fissures; leaf scars 0.7-1.5 mm. wide and half as high, very depressed rounded shield-shaped, with 3 bundle scars; twigs leafy for 1-5 cm., bearing 5-11 leaves that are well spaced and divergent; upper leafy stem 1-1.5 mm. in diameter, greenish or reddish; nodes 1-6 mm., commonly 2 mm. apart; stipules 3-3.5 mm. long, broadly deltoid, the midrib heavy, raised and densely appressed puberulent, the sides membranous, brown, the margin ciliate; petioles 5-7 mm. long, 0.4-0.5 mm. in diameter,

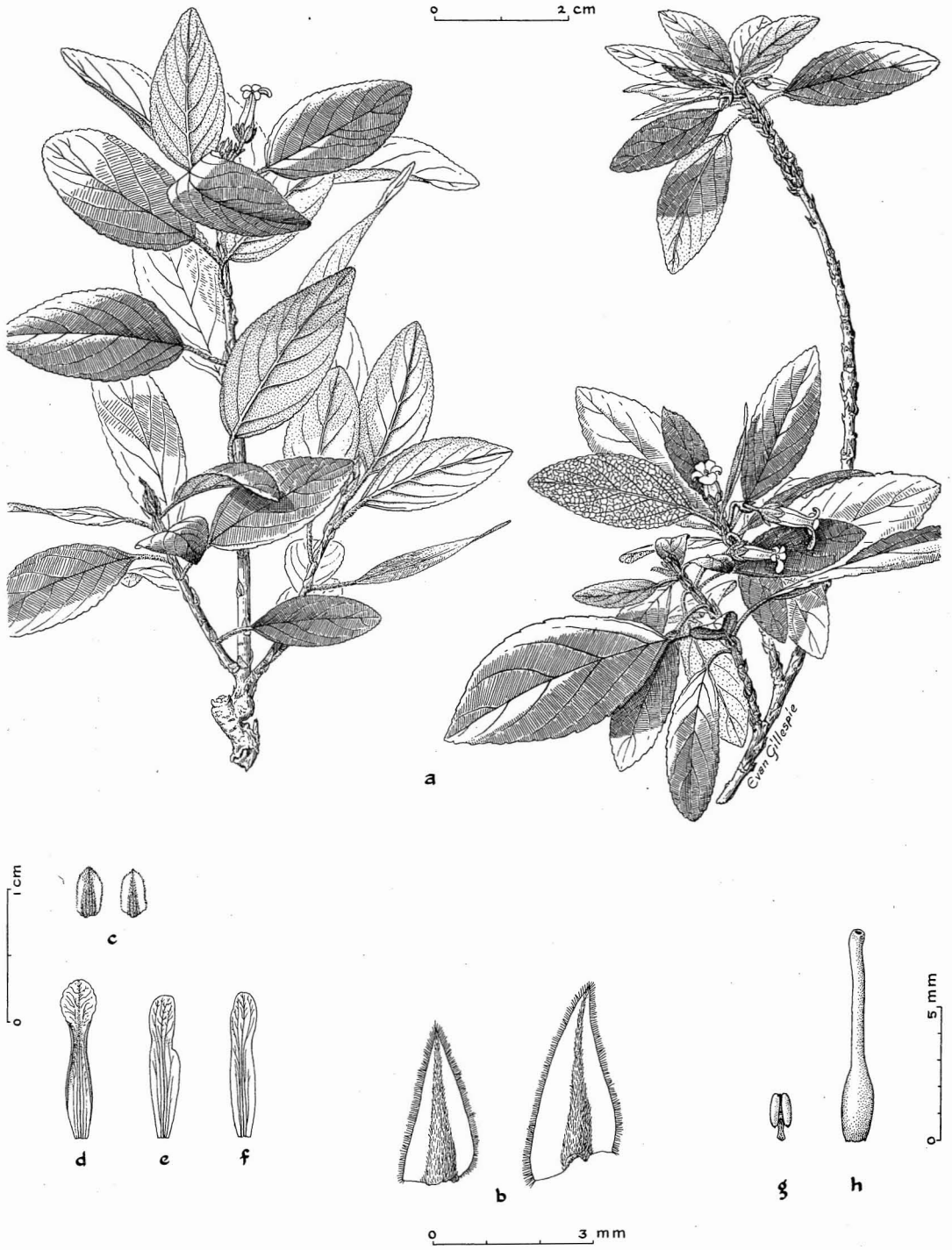


FIG. 3. *Isodendrion Hillebrandii*. a, Habit $\times 1$; b, stipules $\times 8$; c, sepals $\times 2$; d, lower petal $\times 2$; e, lateral petal $\times 2$; f, upper petal $\times 2$; g, stamen $\times 4$; h, pistil $\times 4$. From the type, Waianae, Hillebrand.

slender, densely subappressed puberulent; blades 1.9–3.3 cm. long, 8–16 mm. wide, elliptic, subcoriaceous, above dark green, below green, at first appressed puberulent on the veins above and below but more densely so below, above finally subglabrate except on the main veins towards the base, the margin strongly crenate, the apex obtuse, secondary veins 4–6 on a side, sharply ascending, in-arched and connecting well back from the margin; flowers single, axillary; peduncles 2–4 mm. long, densely appressed white puberulent, bibracteolate at apex; bracts 2 mm. long, sepeloid, lance-ovate, ciliate, puberulent on the back; pedicels 1.5–3 mm. long, densely appressed white puberulent; flowers axillary, single, the peduncles 2–4 mm. long, appressed white puberulent, bibracteolate at apex; pedicels 2–3 mm. long, appressed white puberulent; sepals 3.6–3.8 mm. long, 1.8 mm. wide, oblong-oval, the thickened central strip 3–6-nerved from the base, this strip and a little of the adjacent membranous sides toward the tip closely appressed puberulent, the margin ciliolate; corolla irregular, appressed puberulent distally, the lower two thirds of the petals forming a channel-like claw, imbricate laterally, the upper ones outside, the lower inside, imitating a corolla tube, the limb expanding and reflexing in anthesis; lower petal the largest, 11.9 mm. long (when boiled), the claw 7.4 mm. long, 2.2 mm. wide, narrowly elliptical channeled, 5-nerved from the base, but the lateral nerves forking, the central strip of firm tissue containing the veins, the broad margins membranous for the lower two thirds, then in the upper third the entire width veiny, much thickened, fleshy, firmly channeled, opaque, the slightly contracted neck long, the limb 4.5 mm. long, 2.5 mm. wide, ovate, thick, fleshy, firm, with several veins and the margin crimped up between the vein ends; lateral petals 10.7 mm. long with a short distinct neck, the claw 6.7 mm. long, obliquely oblance-oblong, the upper side larger and more abruptly narrowed at apex, the central

strip thickened and opaque in the upper third, the limb 4 mm. long, 1.9 mm. wide, obliquely oblong-oval, veiny, thickened and opaque; upper petals 10.8 mm. long, almost ligulate though there is a very shallow neck one third way from the apex, the claw 7 mm. long, 1.9 mm. wide, very narrowly elliptic, 3-nerved from the base, but the lateral nerves soon forking, the central strip veiny and slightly thickened especially towards the apex, the wide margins membranous, the whole slightly channeled; the limb 3.8 mm. long, 1.9 mm. wide, obliquely oblong-oval, veiny, thickened and opaque; stamens subequal, all with a blunt, recurved mucro 0.1 mm. long at the apex of the connective, 1.5–1.8 mm. long, the filaments 0.5–0.7 mm. long, subulate; the connective swollen and probably glandular on the distal side just above the base; anthers 1.3 mm. long, 0.8 mm. wide oblong, the anther sacs submucronate at base; ovary 2.8 mm. long, 1.2 mm. in diameter, lanceoloid; style 5.1 mm. long, stout filiform; stigma subterminal, distal, suborbicular; fruit unknown.

TYPUS: Oahu, Waianae, on bare rocky hills, in 18—. *W. Hillebrand* (GH), (st. lf. fl.).

Hillebrand in his flora (p. 18) includes this in *I. pyriformis* Gray and cites this collection as "in Waianae," apparently meaning Waianae Valley rather than on the Waianae Mountains. Furthermore, Rock saw the duplicate of this in 1914 in Berlin, and copied the data as "1869. On rocks in the plains of Waianae, Oahu."

The species is named in honor of Dr. William Hillebrand (1821–1886), physician and botanist, resident in Honolulu from 1850 to 1871.

4. *Isodendrion Hosakae* sp. nov.

ILLUSTRATIONS: Figure 4.

DIAGNOSIS TYPI: Frutex 45–75 cm. alta, ramis 4–8 mm. diametro cortice griseo deinde albescenti asperato cum sulcis longitudinalis et stipulis persistentibus, cicatricibus 1.2–1.5 mm. latis lunati-ellipticis pallidis suberatis,

fasciculis 1 grandis transversis, ramulis foliiferis 1–18 cm. longis cum 7–29 foliis divergentibus deinde reflexis subcondensatis, ramulis 1–2.3 mm. diametro subviridibus et albo-adpressi-puberulentis plerumque a stipulis rigidis imbricatis clausis, nodis 1–6 mm. plerumque 1.5 mm. distantibus, stipulis 2.5–4 mm. longis late oblique ovatis cordatis in parte medio dense adpressi-albi-puberulentis carina incrassata lateribus membranaceis brunneis glabris marginibus albi-ciliatis, petiolis 3–11 mm. longis albi-puberulentis, laminis 2–6 cm. longis 6–17 mm. latis coriaceis lanceolatis supra nigri-viridibus sublucidis in nervo mediale et minus in nerviis secundariis albi-puberulentis infra luteo-viridibus et eodem modo puberulentis valde reticulato-nervis margine subcrenulatis, nerviis secundariis 5–7 in uno latere valde adscendentibus confluentibus, floribus odoratis singulis axillaribus, pedunculis 2–4 mm. longis albi-adpressi-puberulentis, pedicellis 2–2.5 mm. longis albi-adpressi-puberulentis, bracteis peduncularibus 2.3–3.2 mm. longis in medio puberulentis marginibus ciliatis, sepalis 4.5–5.5 mm. longis 2.3–2.7 mm. latis lanceo-ovatis apiculatis firmis viridibus in carina incrassata 5-nervosa et dense adpressi-puberulentis lateribus angustis membranaceis glabris marginibus ciliatis, corollis albescentibus irregularibus, petalis extra in linea media et limbo toti dense adpressi-puberulentis, petala inferiore (in vivo) 18 mm. longa (in sicco 12–14 mm. longa), ungue 10 mm. longo 3-nervoso ligulato canaliculato ad apicem incrassato et carnoso, limbo 7 mm. longo 4.5 mm. lato ovali crassi carnoso non pellucido in linea media sulcato, petalis lateralibus 15.5 mm. longis unguibus 9.7 mm. longis elliptici-ligulatis 3-nervis ad apicem incrassatis et canaliculatis, limbis 6 mm. longis ovalibus subacutis carnis praesertim ad basim, petalis superioribus 14.5 mm. longis unguibus elliptici-ligulatis 3-nervis marginibus membranaceis in linea media incrassatis, limbis 5.5 mm. longis ovalibus praesertim ad basim non pellucidis et carnis, staminibus subaequali-

bus 3.5 mm. longis, filamentis 1.3 mm. longis validis subulatis, antheris 1.3 mm. longis ovatis connectivo staminarum inferiorum in aculea valida adscendentia prolongato, ovario 2 mm. longo 3-anguloso, stylo 6.5 mm. longo crasse filiforme, stigmati obliquo crateriforme, capsulis 9–10 mm. longis 6–8 mm. diametro ellipsoideis profunde 3-lobatis viridibus et rubro-tinctis valde nervosis rostratis, placentis 2- vel 4-ovulatis, seminibus 2.8–3 mm. longis 1.8–2 mm. diametro obovoideis lucidis olivaceis et atri-maculatis ad apicem truncatis minime rotundato-excavatis.

DESCRIPTION OF ALL SPECIMENS EXAMINED: Shrub; 45–75 cm. tall; older branches 4–8 mm. in diameter, with the bark gray, roughened by longitudinal furrows, and also by the long persisting stipules, finally the bark whitish; leaf scars 1.2–1.5 mm. wide, lunate-elliptic, pale, corky; bundle scar 1, large, transverse; twigs leafy for 1–18 cm., bearing 7–29 leaves, these spreading and eventually reflexing, rather crowded; upper leafy stems 1–2.3 mm. in diameter, greenish, the surface white appressed puberulent but largely concealed by the persistent, rigid, imbricate stipules; nodes 1–6, commonly 1.5 mm. apart; stipules 2.5–4 mm. long, broadly oblique ovate, the base cordate, the midrib heavy, raised, it and the central strip densely white appressed puberulent, the wide sides membranous, brown, glabrous, the margins white ciliate; petioles 3–11 mm. long, white puberulent; blades 2.6 cm. long, 6–19 mm. wide, coriaceous, lanceolate, the margin perceptibly remotely low crenulate, above dark green, sublucid, white puberulent on the midrib and remotely so on the smaller veins, below yellowish green and similarly puberulent, strongly reticulate veined; the secondary veins 5–7 on a side, sharply ascending and inarched connecting well in from the margin; flowers fragrant, single, axillary; peduncle 2–8 mm. long, appressed white puberulent; pedicels 2–4 mm. long, appressed white puberulent; peduncular bracts 2.3–3.2 mm. long, puberulent on midrib and margin like the stipules; sepals

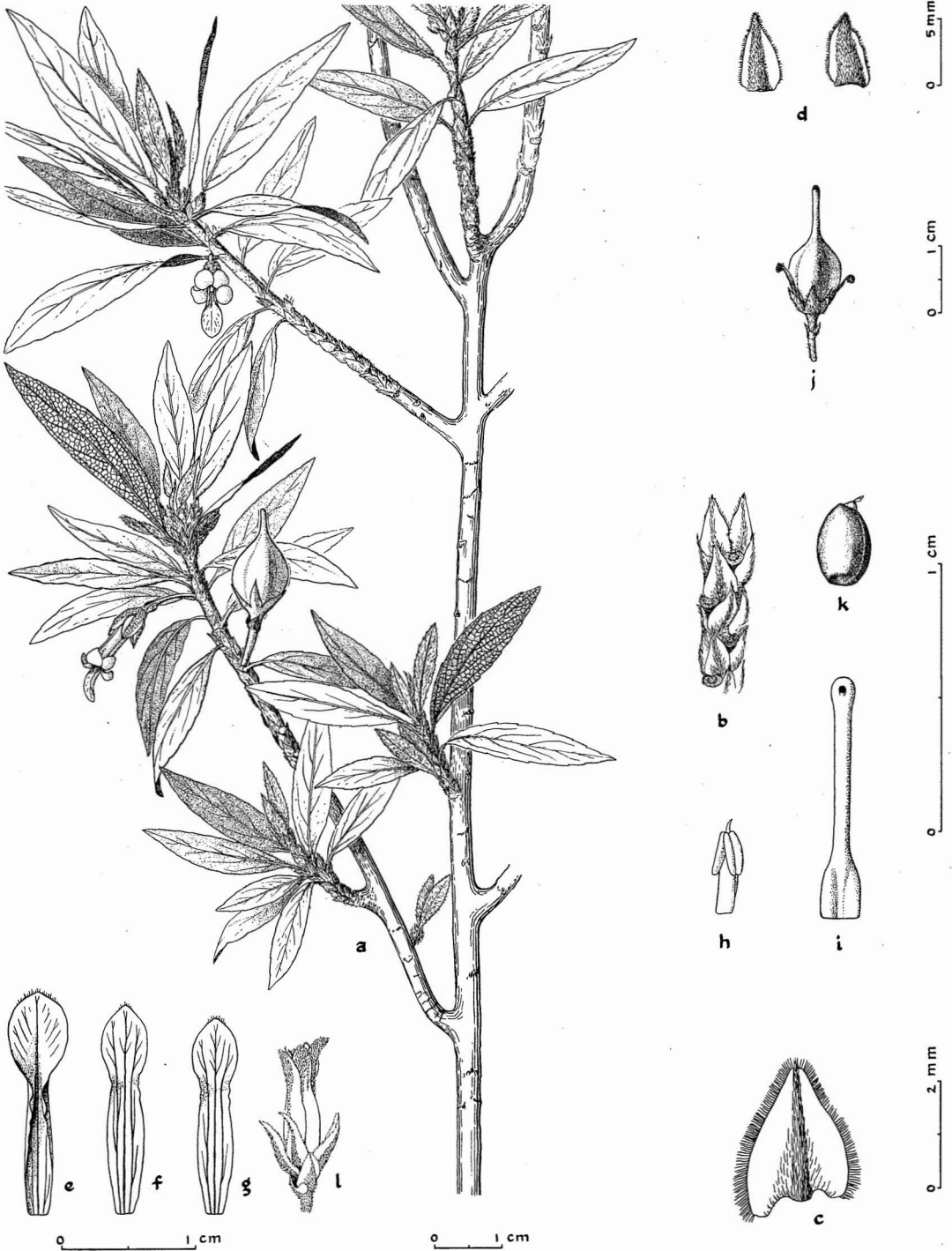


FIG. 4. *Isodendron Hosakae*. a, Habit $\times 1$; b, stem and stipules $\times 4$; c, stipule $\times 8$; d, sepals $\times 2$; e, lower petal $\times 2$; f, lateral petal $\times 2$; g, upper petal $\times 2$; h, stamen $\times 4$; i, pistil $\times 4$; j, capsule $\times 1$; k, seed $\times 4$; l, bud $\times 4$. From the type, Waikaloa, Hosaka 3,594.

4.5–5.5 mm. long, 2.3–2.7 mm. wide, lance-ovate, apiculate, firm, greenish, 5-nerved in the thickened central strip and there closely appressed puberulent, the narrow sides membranous, glabrous, the margins ciliate; corolla whitish, irregular, the lower two thirds of each petal forming a channel-like claw, imbricate laterally, the upper ones outside, the lower inside, imitating a corolla tube, the petals without densely appressed puberulent up the middle of the claw and generally on the limb, the limb expanding and reflexing in anthesis; lower petal the largest, 18 mm. long when fresh (12–14 when dried), the claw 10 mm. long, 3-nerved from the base, ligulate, channeled and towards the apex thickened and very fleshy, the limb 7 mm. long, 4.5 mm. wide, oval, thick, fleshy, opaque, creased down the middle; lateral petals 15.5 mm. long, the claw 9.7 mm. long, elliptic-ligulate, 3-nerved from the base, thickened and channeled towards the apex, the limb 6 mm. long, oval, subacute, fleshy especially at base; upper petals 14.5 mm. long, the claw elliptic-ligulate, 3-nerved from the base, the margins membranous, the center strip thickened, the limb 5.5 mm. long, oval, opaque and fleshy particularly at base; stamens subequal 3.5 mm. long, the filament 1.3 mm. long, stout subulate; anthers 1.3 mm. long, ovate, the connective of the lower stamens prolonged into a stout ascending prickle; ovary 2 mm. long, ovoid, 3-angled; style 6.5 mm. long, stout filiform; stigma oblique, crateriform; capsule 7–10 mm. long, 6–8 mm. in diameter, ellipsoid in outline, deeply 3-lobed, green and tinged with dull red, prominently veined, beaked with the persistent style; placentae 2- or 4-ovulate; seeds 2.8–3 mm. long, 1.8–2 mm. in diameter, obovoid, the surface shining, olivaceous with blackish mottlings, the apex truncate, small circular excavate.

TYPUS: Island of Hawaii, South Kohala, Waikalua, el. 3,390 ft., rare, near top of a cinder cone, small woody shrub 1½ to 2½ ft. high, fl. whitish, fragrant, associated with

Dodonaea, *Wikstroemia*, *Railliardia Menziesii*, *Bidens filiformis*, *Sida*, and *Eragrostis*, Feb. 3, 1949, E. Y. Hosaka 3,594 (BISH), (st. lf. fl. fr.).

SPECIMENS EXAMINED: Hawaii, Waikalua, the same locality as above, Nov. 4, 1948, E. Y. Hosaka 3,593 (BISH), (root, st. lf. b. fl. fr.).

The species is named for the collector, Edward Yataro Hosaka (1906–).

5. *Isodendrion lanaiense* sp. nov.

ILLUSTRATIONS: Figure 5.

DIAGNOSIS TYPI: Frutex, ramis erectis simplicibus 3–4 mm. diametro, cortice rufo-brunneo cum sulcis multis propinquis deinde griseo et subsuberoso, nodis prominentibus, internodis 1–10 mm. longis juvenioris cum stipulis rigidis persistentibus, cicatricibus 1.3–1.8 mm. latis depresso-obcordatis, fasciculis 1 late lunatis, ramulis adpressi-puberulentis etiam in parte defoliata et asperatis a stipulis, ramulis foliosis 5–15 mm. longis puberulentis sed a stipulis imbricatis clausis, foliis 4–9 adscendentibus vel divergentibus plumam formantibus, stipulis 3.9–5 mm. longis 1.4–1.8 mm. latis oblique ovatis vel oblongo-lanceolatis carina incrassata pallida et adpressi-puberulenta lateribus brunneis glabris et marginibus ciliolatis, petiolis 3–5 mm. longis adpressi-puberulentis, laminis 13–40 cm. longis 8–19 mm. latis ovalibus chartaceis plus minusve perpetuiter in nervis puberulis apice breve apiculato vel obtuso marginibus apiculato-crenatis, floribus axillaribus pluribus, pedunculis pedicellisque 2–4 mm. longis adpressi-puberulentis, bracteis 3–4 mm. longis stipulaceis ovatis, sepalis 3–3.5 mm. longis ovatis in nervo centrali maximi albi-adpressi-puberulis lateribus membranaceis brunneis marginibus ciliolatis, petalis inaequalibus limbo extra in nervis adpressi-puberulentis, petala inferiore maxima spatulata 11 mm. longa (postquam bullanda), limbo 3 mm. longo 2.5 mm. lato ovali crassi carnosio in linea media sulcato apice retuso revoluto, ungue 7.5 mm. longo 1.5 mm. lato subrigido canaliculato 5-

nervoso marginibus membranaceis, petalis lateralibus 10 mm. longis anguste spatulatis limbis 2.8 mm. longis 1.5 mm. latis ovatis firmis valde pinnati-nervosis, unguibus 7 mm. longis 1.3 mm. latis canaliculatis in medio firmis 3-nervosis marginibus membranaceis, petalis superioribus angustiore spatulatis limbis 2 mm. longis 1.5 mm. latis ellipticis firmis, unguibus 7.2 mm. longis 1.3 mm. latis 3-nervosis firmis canaliculatis marginibus membranaceis, staminibus subaequalibus, filamentis 0.8–1 mm. longis 0.2 mm. latis in basi planis attenuatis, antheris 0.9 mm. longis 0.5 mm. latis sagittato-ovatis, connectivo armato in apice aculeam incurvatam 0.2 mm. longam ferrentibus, capsulis 8–11 mm. longis ovoideis profunde 3-lobatis apice rostrato, placentis 4-ovuliferis biseminiferis, seminibus 3–3.5 mm. longis 2–2.2 mm. diametro obovatis olivaceo-brunneis sublucidis in apice truncatis excavatis.

DESCRIPTION OF ALL SPECIMENS EXAMINED: Shrub; branches often erect and simple, the older branches 3–4 mm. in diameter, bark reddish brown with many close longitudinal fissures, finally somewhat corky and gray, the nodes prominent and salient; internodes 1–10 mm. long, the younger rigidly scaly from the persistent stipules; leaf scars 1.3–1.8 mm. wide, depressed obcordate; bundle scar 1, broad lunate; small twigs appressed puberulent and, even well below the leaves, rough from the stiff, persistent stipules; young branchlets leafy for a distance of only 5–15 mm., the bark appressed puberulent but this almost completely concealed by the overlapping stipules; the leaves 4–9, ascending or spreading in a close terminal plume; stipules 3.9–5 mm. long, 1.4–1.8 mm. wide, obliquely ovate or oblong-lanceolate, with a heavy, thickened, pale midrib and dark brown body, appressed puberulent on midrib and central strip, the membranous margin ciliolate; petioles 3–5 mm. long, appressed puberulous; blades 1.3–5.0 cm. long, 8–28 mm. wide, oval, chartaceous, more or less permanently appressed puberulous on the veins,

apex short apiculate or obtuse, margins apiculate crenulate; flowers axillary, numerous; peduncles 2–4 mm. long; pedicels single, 5–8 mm. long, closely appressed puberulous, at the apex of the peduncle bearing two subopposite bracts like the stipules but ovate, 3–4 mm. long; sepals 3–4 mm. long, ovate, appressed white puberulous on the enormous midrib, the sides membranous, brown, the margins ciliolate; corolla irregular, the lower three fifths of the petals forming a concave channel-like claw, the limb expanding and reflexing in anthesis, the outer surface appressed puberulent along the veins; lower petal longer and larger than the others, spatulate, 11 mm. long (when boiled), the limb 3 mm. long, 2.5 mm. wide, oval, thick and fleshy, the halves down-curved to the narrow median crease, the apex retuse and revolute; claw 7.5 mm. long, 1.5 mm. wide, rather firm, concave and channeled, 5-nerved from the base, the margin membranous; lateral petals 10 mm. long, narrowly spatulate, the limb 2.8 mm. long, 1.5 mm. wide, ovate, firm, strongly pinnate nerved, the claw 7 mm. long, 1.3 mm. wide channeled, the body firm, the margins membranous, 3-nerved at base; upper petals 8.3 mm. long, very narrowly spatulate, the limb 2 mm. long, 1.5 mm. wide, elliptic, firm, the claw 7.2 mm. long, 1.3 mm. wide, the margins membranous, the rest firm, channeled, 3-nerved at base; stamens subequal, filaments 0.8–1 mm. long, 0.2 mm. wide at base, flat, tapering upwards; anthers 0.9 mm. long, 0.5 mm. wide, sagittate-ovate, the connective bearing from the distal side of its apex a firm, incurved prickle 0.2 mm. long; capsule 8–11 mm. long, ovoid, deeply 3-furrowed, the apex tapering into the persistent style, the placentae 4-ovuled, the attachment in two oblique pairs, 2-seeded; seeds 3–3.5 mm. long 2–2.2 mm. wide, obovate, the apex truncate, sunken, the surface olive brown, sublucid.

TYPUS: Lanai, collected by Dr. *William Hillebrand* and *J. M. Lydgate*, ex Herb. J. M. Lydgate (BISH), (st. lf. fl. fr.).



FIG. 5. *Isodendrion lanaiense*. *a*, Habit $\times 1$; *b*, stipules $\times 8$; *c*, sepals $\times 2$; *d*, lower petal $\times 2$; *e*, lateral petal $\times 2$; *f*, upper petal $\times 2$; *g*, stamen $\times 4$; *h*, pistil $\times 4$; *i*, capsule $\times 1$; *j*, seed $\times 4$. From the type, Lanai, Hillebrand 17,060.

SPECIMENS EXAMINED: Lanai, 18—, *W. Hillebrand* (GH), (s. lf. fl. fr.); Lanai, rec'd 12/72, *W. Hillebrand* (K), (st. lf. b. fl. fr.); Lanai, July 1870, [*W. Hillebrand*], Ex Museo botanico Berolinensi, College of Hawaii Herbarium 17,060 [i. e., J. F. Rock added his number 17,060 which is not a Hillebrand number]. Two original tickets are in Hillebrand's writing, and the printed label, Ex Mus. bot. Berol., is characteristic of the set of isotypes or clastotypes of Hillebrand's species, obtained by Professor Rock from the Berlin Museum for the College of Hawaii and now deposited in the Bishop Museum. There is also a third sheet from Lanai with the Berlin label and a College of Hawaii label, Rock No. 17,060. It seems positive that these are all duplicates from the Hillebrand collection on Lanai, one given to his young field companion, Lydgate, and two later obtained by Rock from the Hillebrand collection after its placement in Berlin. The Berlin originals, two sheets seen by Rock in 1914, were probably destroyed in World War II. The specimen at Kew: Lanai, Hillebrand, is also doubtless an isotype.

The species is named for its occurrence on the island of Lanai.

6. *Isodendron laurifolium* Gray, Amer. Acad. Arts and Sci., Proc. 2: 324, 1852; Gray, U. S. Explor. Exped. [official ed.] 15 (1): 96, 1854; [public ed.] Botany, Phanerogamia 1: 96, 1854.

ILLUSTRATIONS: Figure 6.

DESCRIPTION OF TYPE: Shrub; glabrous, erect, with a few short, ascending branchlets; older branches 3 mm. in diameter, the bark smooth, pale brown, with a few longitudinal fissures; leaf scars 2 mm. wide, suborbicular-shield-shaped, pale, with 3 bundle scars; twigs leafy for 16 cm., bearing 15 or more leaves, these ascending at about 45° divergence from the stem, not crowded; upper leafy stem 1.8–2.9 mm. in diameter, smooth, shading downwards from green to reddish brown, roughened by the rigid stipules; nodes

2–20, commonly 2–10 mm. apart; stipules 1.9–3 mm. long, obliquely linear-lanceolate, glabrous, the midrib prominent, raised, towards the base broadened, the narrow margins brown membranous, glabrous and smooth; petioles 1–2.5 mm. long, stout, becoming corky wrinkled; blades 2.2–9.2 cm. long, 11–30 mm. wide, firm, subcoriaceous, prominently finely reticulate veined, linear-oblongate, the base abruptly short cuneate, the apex subacute, the margin slightly undulate or even remotely low subserrate; flowers single, axillary; peduncles 2 mm. long, bracteate; pedicel 1 mm. long; sepals 1.9–2.25 mm. long, 0.9–1 mm. wide, deltoid to obliquely lance-deltoid, glabrous, chartaceous, nerved only by the slender midrib; corolla irregular, the lower two thirds of each petal forming a channel-like claw, imbricate laterally, the upper ones outside, the lower inside, imitating a corolla tube, the limb expanding and reflexing in anthesis; lower petal the broadest and equalling the upper ones in length, 7.1 mm. long (when boiled), claw 5.2 mm. long, 1.3 mm. wide, the lower two thirds membranous, 3-nerved from the base but the lateral nerves forking above, the distal quarter opaque, fleshy, strongly channeled, the limb 1.9 mm. long, 1.4 mm. wide, oval, thick and fleshy, the veins almost invisible; lateral petals 6.9 mm. long, somewhat ligulate, scarcely contracted two thirds from the base, claw almost plane, membranous, 3-nerved, ligulate but slightly widened near the distal end, the limb narrowly elliptic, the veins obscured in the fleshy opaque tissue; upper petals 7.1 mm. long, slightly contracted and channeled two thirds way from the base, the claw 5.3 mm. long, ligulate but broadened near the base, membranous, 3-nerved, the limb 1.8 mm. long, 0.8 mm. wide, narrowly elliptic, fleshy and opaque; stamens about equal, unarmed, 1.7–1.9 mm. long, the filaments 0.8–1 mm. long, subulate, the anthers 0.8–0.9 mm. long, 0.7 mm. wide, ovate above the sagittate base; ovary 3.4 mm. long, 2.2 mm. in diameter, ovoid, longitudin-

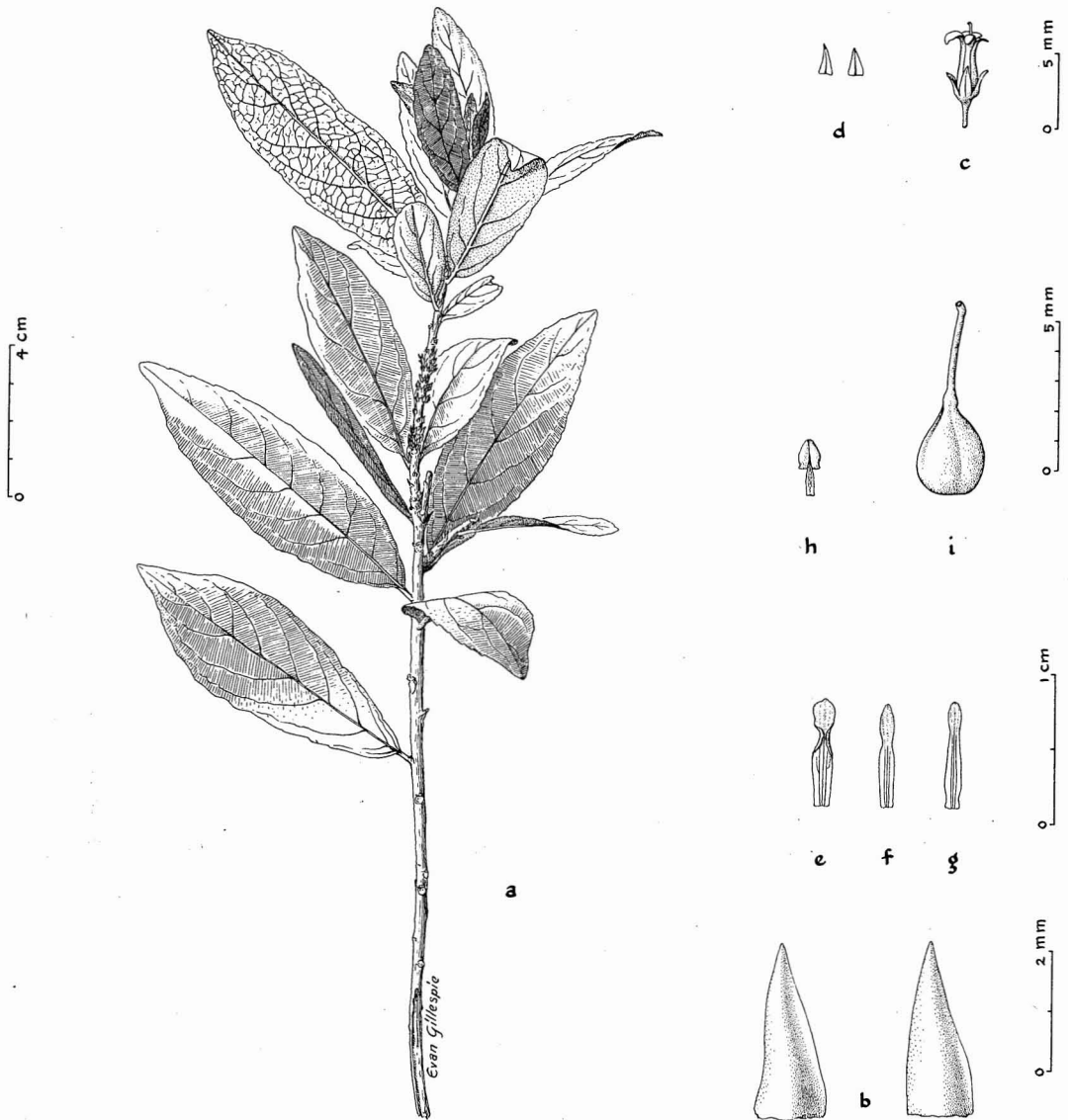


FIG. 6. *Isodendrion laurifolium*. a, Habit $\times 1/2$; b, stipules $\times 8$; c, flower $\times 2$; d, sepals $\times 2$; e, lower petal $\times 2$; f, lateral petal $\times 2$; g, upper petal $\times 2$; h, stamen $\times 4$; i, pistil $\times 4$. From type, Kaala Mts., Wilkes Exped.

ally 3-lobed; style 3 mm. long, slender cylindrical; stigma subterminal, orbicular, penicillate; fruit not seen.

TYPE: Sandwich Islands, Oahu, Kaala Mts., U. S. Exploring Expedition under Capt. Wilkes (US), (st. lf. fl. i. fr.). Type examined. Also isotype (GH), (st. lf.).

In the original description Gray stated (1852: 96) that the blades were "oblong-

lanceolate, somewhat narrowed at both ends, obtuse at the base . . ." "Only a single and incomplete specimen of this plant was gathered." The isotype in the Gray Herbarium is only a scrap, a branch tip with three expanded leaves. The type in the U. S. National Herbarium is herewith illustrated in detail. The blade shape is better described as oblanceolate.

The species was obviously named from *Laurus*, the laurel tree; and Latin *folium*, leaf, indicating a resemblance in the leaves to those of the laurel.

7. *Isodendrion longifolium* Gray, Amer. Acad. Arts and Sci., Proc. 2: 324, 1852; Gray, U. S. Explor. Exped. [official ed.] 15 (1): 95-96, 1854, Atlas pl. 9, 1856; [public ed.] Botany, Phanerogamia 1: 95-96, 1854, Atlas pl. 9, 1857.

ILLUSTRATIONS: Figure 7.

DESCRIPTION OF ISOTYPE (US): Shrub (according to Pickering, 1854: 400, 6 feet high); glabrous, erect; older branches 5-8 mm. in diameter, its top broken, and from its apex arise 3 small secondary branches, bark of older twigs thick, corky, yellowish, with a few longitudinal fissures; leaf scars 3-5 mm. wide, suborbicular-shield-shaped, pale corky, with 3 bundle scars; twigs leafy for 1 cm., bearing 2-3 leaves, these ascending or diverging, not crowded; upper leafy stem 2.5-4 mm. in diameter, green, smooth but for the scattered wart-like developing patches of cork; nodes 3-10 mm. apart; stipules 3-4 mm. long, broadly deltoid, a little asymmetric, the thick, raised midrib much widened toward the base, the sides membranous, yellowish shading to brown at the edge; petioles 8-16 mm. long, channeled above, at base becoming thickened and corky; blades 11-16.3 cm. long, 30-65 mm. wide, oblanceolate or oblance-elliptic, subcoriaceous, finely reticulate veined, green above, yellowish green below, the apex obtuse, the base short cuneate, the margin subrepand; no flowers preserved.

Since this species is known only from the original collection, every effort was made to locate the type. It is not, as expected, in Washington. Instead, in that herbarium is an isotype, a smaller, sterile branch, broken at the top and with three weak shoots bearing broader and much shorter leaves than those

described and illustrated by Gray from the better specimen then available. In the Gray Herbarium, in the fragmentary set of the Wilkes Expedition collections kept by Gray, there is a sheet of *I. longifolium* containing two short stem pieces, with only one good leaf 26.5 cm. long, 6 cm. wide, one broken leaf, one depauperate leaf, but no flowers or fruit. It has Isaac Sprague's pencil drawings, the originals for the published plate. No other isotype has been located in any herbarium, and the fine flowering branch, illustrated as the type, seems now to be lost. Since it is impossible to re-examine the type and make new detailed descriptions and drawings, a photographic copy of Gray's plate is here reproduced, and his description is here quoted. Since his first publication in 1852 contained only the Latin diagnosis, and as this is repeated verbatim in his fuller 1854 account, the latter is here quoted:

"2. ISODENDRION LONGIFOLIUM, SP. NOV. (TAB. 9.)

I. glabrum; foliis subcoriaceis obovato-lanceolatis seu cuneato-oblongis in petiolum angustatis subrepandis; sepalis ovatis stipulisque laevibus; floribus in ramos crassos brevissime pedicellatis.

HAB. Kaala Mountains, Oahu, Sandwich Islands.

Stems 6 feet high, with rather few very stout branches, roughened with the cicatrices of fallen leaves, and above with the persistent stipules. *Leaves* alternate, approximate at the summit of the branches, of a coriaceous texture, entirely glabrous, as is the whole plant, 6 to 8 inches long, 1½ to 2½ inches wide, obovate-lanceolate, varying from obovate-oblong to oblong-lanceolate, somewhat acute or acuminate, or rarely obtuse at the apex, below tapering to an acute base, veiny, and with the veinlets reticulated, the midrib very prominent underneath; the margins obscurely repand-undulate, or obsoletely and sparingly serrulate. Petioles ½ to 1½ inches long. *Stipules* geminate, subulate-triangular from a broad

FIG. 7. *Isodendrion longifolium*. A copy of Gray's Plate 9, habit×½; 1, stipules×2; 2, floral diagram×8; 3, flower×4; 4, petal×5; 5, 6, and 7, stamens and pistil×2½. From type, Kaala Mts., Wilkes Expedition.



base, *glabrous*, carinate with a thickened axis, and with somewhat scarious margins, appressed, persistent long after the leaves have fallen. *Flowers* axillary, *solitary*, on *very short drooping pedicels*, which are bibracteolate next the base, and only one or 2 lines long. Calyx of 5 nearly distinct, ovate and glabrous sepals, quincuncially imbricated in aestivation, not at all produced at the base, scarcely a line long, persistent. Corolla hypogynous or obscurely perigynous, regular, apparently white, scarcely 3 lines long; petals 5, linear-spatulate, connivent for two-thirds of their length into a tube, the upper and dilated portion spreading, convolutedly imbricated in aestivation, as in *Violeae*, marcescently persistent. Stamens 5, hypogynous or obscurely perigynous, alternate with the petals and much shorter than they, scarcely exceeding the ovary, all similar, entirely unconnected, glabrous. Filaments subulate-linear, flattened, about the length of the anthers which terminate them, destitute of any dorsal or terminal appendages. Anthers oblong, inappendiculate, exactly like those of the foregoing species. Disk none. Ovary, ovules, style, stigma, &c., nearly as in the foregoing species. Mature fruit not seen.—The leaf-bearing and flowering branches are about a quarter of an inch in diameter: the flowers are small and inconspicuous.

PLATE 9.—ISODENDRION LONGIFOLIUM. Fig. 1. Stipules, front and back view, enlarged. 2. Diagram of the flower. 3. A flower, enlarged. 4. A petal, more enlarged. 5. Stamens and pistil, magnified. 6. The same after removal of the stamens. 7. Vertical section of the ovary, magnified."

From measurements given in Gray's text and after comparison with his other two species and their illustrations, it is deduced that his habit sketch is magnified $\times 1$; fig. 1, $\times 4$; fig. 2, $\times 16$; fig. 3, $\times 8$; fig. 4, $\times 10$; figs. 5, 6, and 7, $\times 5$. Our Figure 7 reproduces Gray's at $\frac{1}{2}$ his scale of magnification.

For a discussion of the type locality, see the present treatment of *I. pyriformis*.

TYPE: "Kaala Mountains, Oahu, Sandwich Islands," U. S. Exploring Expedition under Capt. Wilkes (Isotypes seen: GH, US).

The collector, Pickering, stated (1854: 400) that the flowers were "inconspicuous, greenish."

The species was obviously named from the Latin *longus*, long; and the Latin *folium*, leaf.

8. *Isodendrion Lydgatei* sp. nov.

ILLUSTRATIONS: Figure 8.

DIAGNOSIS TYPI: Frutex, ramis 3 mm. diametro, cortice brunneo glabro laevi sed asperato a stipulis persistentibus, cicatricibus 1.5–2.2 mm. latis rotundato-scutelliformibus pallide brunneis, fasciculis 3, ramulis foliosis 5–10 mm. longis 2 mm. diametro glabris viridibus plerumque a stipulis aggregatis occultantibus 4–5 foliis in fasciculum ferrentibus, nodis 1–14 mm. plerumque 1 mm. distantibus, stipulis 2.3–3.5 mm. longis 1.1–1.9 mm. latis oblique deltoideo-lanceolatis vel oblique lanceolatis stramineis marginibus membranaceis ciliolatis sed jam erosis carina incrassata cartilaginea longe durantibus, petiolis 1–2.5 mm. longis validibus anguste alatis, laminis 5–8 cm. longis 18–30 mm. latis subcoriaceis glabris oblongo-oblongeolatis obtusis minute nervosis contortis elevatis marginibus minime sinuatis, floribus solitariis axillaribus, pedunculis 1 mm. longis bracteatis, pedicellis 1 mm. longis, sepalis 3–3.3 mm. longis 0.9–1.2 mm. latis medio-crite vel anguste deltoideo-lanceolatis 3-nervosis glabris subviridibus chartaceis sed marginibus membranaceis ciliolatis, petalis inaequalibus, petala inferiora 7.5 mm. longa 1.2 mm. lata (postquam bullanda) ungue 5.8 mm. longo 1.2 mm. lato ligulato 3-nervato infra membranaceo tertia exteriore crassa carnosae et profunde canaliculatae, limbo 1.7 mm. longo 1.5 mm. lato ovali carnosae opaco, petalis lateralibus 7.2 mm. longis unguibus 5 mm. longis 1.2 mm. latis membranaceis 3-nervatis subligulatis sed in medio latioribus ad apicem canaliculatis, limbis 2.2 mm. longis 1.3 mm. latis ellipticis semiopacis, petalis superioribus 6.6 mm. longis unguibus 4.7 mm. longis 3-nervatis ligulatis membranaceis, limbis 1.9 mm. longis 1.2 mm.

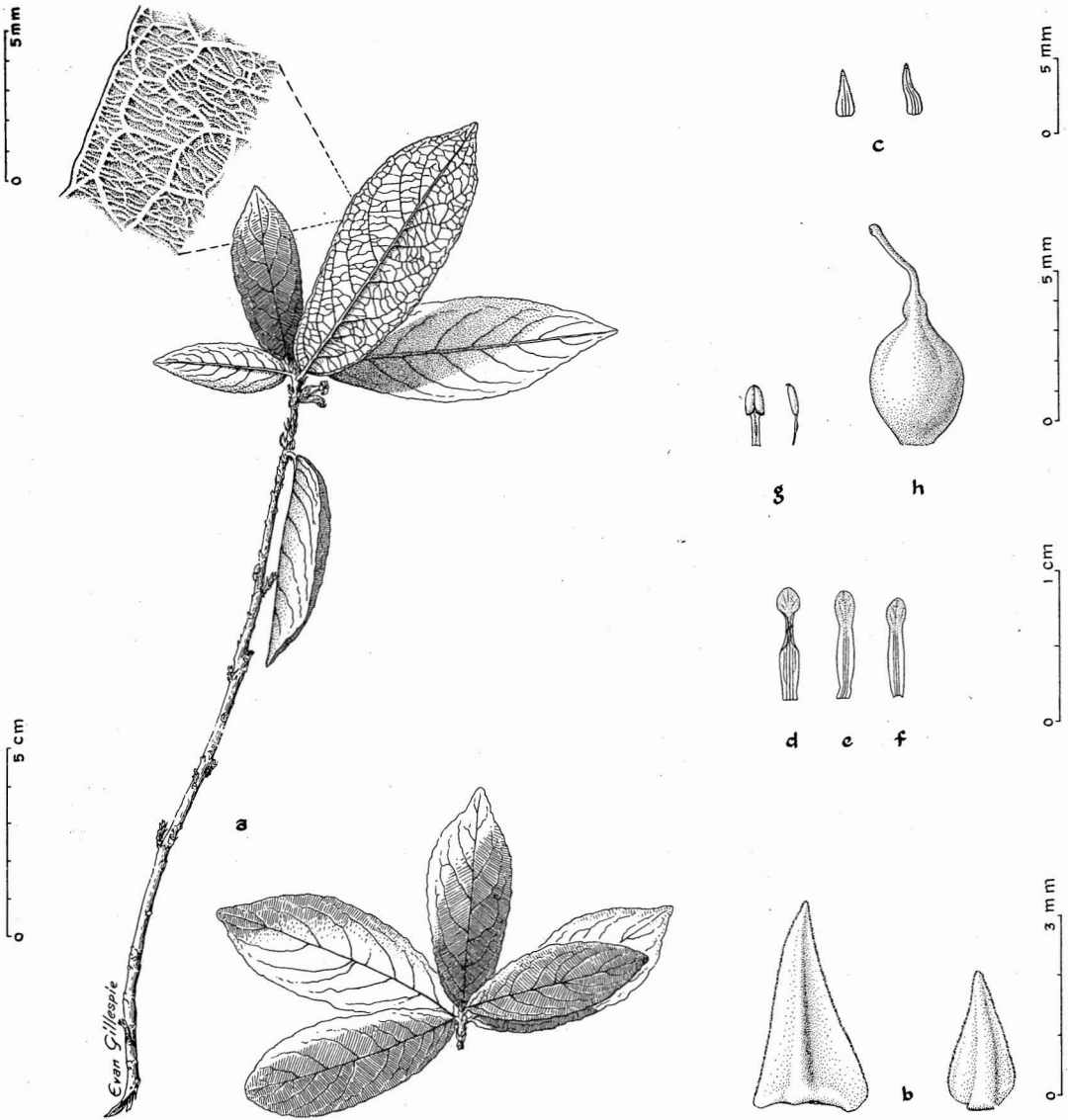


FIG. 8. *Isodendrion Lydgatei*. a, Habit $\times \frac{1}{2}$; b, stipules $\times 8$; c, sepals $\times 2$; d, lower petal $\times 2$; e, lateral petal $\times 2$; f, upper petal $\times 2$; g, lower stamen $\times 4$; h, pistil $\times 4$. From the type, Manoa and Wailupe, Hillebrand & Lydgate.

latis ellipticis semiopaquis, staminibus subaequalibus sed superioribus minoribus et inarmatis, staminibus inferioribus 2 mm. longis, filamentis 1 mm. longis ligulatis lateribus subtilibus sed nervo in medio incrassato et in pagina exteriora glandulosa, antheris 1 mm. longis 0.6 mm. latis oblongo-ovatis subsagittatis, ovario vetustiori 5 mm. longo ovoideo 3-lobato, stylo 2.9 mm. longo

filiforme, stigmate obliquo parvi crateriformi penicillati, fructu ignoto.

DESCRIPTION OF ALL SPECIMENS EXAMINED: Shrub; older branches 3–4 mm. in diameter, the bark brown, smooth, but the persistent rigid stipules giving it a rough, scaly look; leaf scars 1.5–2.2 mm. wide, rounded shield-shaped, pale brown, with 3 bundle scars; twig leafy for 5–10 mm., bearing 4–5 leaves

in a close cluster; upper leafy stem 2 mm. in diameter, glabrous, greenish, largely concealed by the crowded stipules; nodes 1-14 mm., commonly 1 mm., apart in the leafy section; stipules 2.3-3.5 mm. long, 1.1-1.9 mm. wide, obliquely deltoid-lanceolate or obliquely lanceolate, straw-colored, the margins membranous, closely ciliolate, soon eroding, the midrib prominent, thickened, raised, cartilaginous and long persisting; petioles 1-2.5 mm. long, stout, glabrous, narrowly winged; blades 5-9 cm. long, 18-30 mm. wide, subcoriaceous, glabrous, oblong-oblancoate, obtuse, the base elliptic-rounded, then short decurrent on the petiole, the surfaces finely and intricately raised reticulate veined, the margin perceptibly low sinuate; flowers single, axillary; peduncles 1 mm. long, bracteate; pedicel 1 mm. long; sepals 3-3.3 mm. long 0.9-1.2 mm. wide, deltoid-lanceolate or narrowly so, glabrous, greenish, chartaceous except at the membranous margins, 3-nerved, the margins ciliolate; corolla irregular, the lower three fourths of each petal forming a channel-like claw, the limb expanding and reflexing in anthesis; lower petal the longest but the lateral petals equal it in width, 7.5 mm. long, 1.2 mm. wide (when boiled), the claw 5.8 mm. long, 1.2 mm. wide, ligulate, membranous two thirds way from the base, 3-nerved from the base but the lateral nerves forking, in the upper third the tissue thick, fleshy and the margins upcurved forming a firm, deep channel, the limb 1.7 mm. long, 1.5 mm. wide, oval, fleshy, opaque; lateral petals 7.2 mm. long, the claw 5 mm. long, 1.2 mm. wide, membranous, subligulate but gradually widened at the middle, channeled at the tip, 3-nerved, limb 2.2 mm. long, 1.3 mm. wide, elliptic, semiopaque; upper petals 6.6 mm. long, the claw 4.7 mm. long, 1 mm. wide, ligulate, membranous, 3-nerved, limb 1.9 mm. long, 1.2 mm. wide, elliptic, semiopaque; stamens subequal, though the upper are slightly smaller and unarmed; lower stamens 2 mm. long, the filament 1 mm. long, ligulate, the sides thin, but the heavy vein

bearing midway on the distal side an enlarged protruding glandular thickening; anthers 1 mm. long, 0.6 mm. wide, oblong-ovate, the bases of the anther sacs thickened and subsalient; ovary well past anthesis 5 mm. long, ovoid, 3-lobed; style 2.9 mm. long, terete; stigma lateral, small crateriform, penicillate; fruit unknown.

TYPUS: Oahu, Manoa and Wailupe, *William Hillebrand & J. M. Lydgate* (BISH), (st. lf. fl.).

SPECIMENS EXAMINED: Oahu, Wailupe, Ex Museo botanico Berolinensi, ex coll. *Hillebr.* (*J. F. Rock 17,062*), (BISH).

DISCUSSION: The data on these specimens need interpreting. The specimen to which Professor J. F. Rock added in his own hand his collection number 17,062 on the label of the College of Hawaii Herbarium, also has a printed label with "Ex Museo botanico Berolinensi" and in Rock's hand, "Isodendron laurifolium Gray, Oahu, Wailupe." On a visit to the Berlin herbarium in the spring of 1914, Rock was given clastotypes of nearly all of Hillebrand's new Hawaiian species, that is, of all that were large enough to divide. He also received fragments or duplicates of some of Hillebrand's other collections. These precious specimens came to the College of Hawaii; later they were transferred and are now in the B. P. Bishop Museum. This is the history of this one and many similar sheets. In this case it consists of a single detached good leaf, and two minute branch tips and two broken, tiny, depauperate leaves.

The second sheet, the one chosen as the type, has a different story. While living on Oahu, Dr. Hillebrand inspired several men to be his companions in exploring, helpers, or independent collectors. One such, when a young man, was the Reverend John M. Lydgate. He made many valuable contributions to Hillebrand's herbarium. Later, from Germany, Hillebrand sent to Lydgate named duplicates, not only of the ones that Lydgate collected, but of many others. These were labeled on loose tickets in Hillebrand's hand, giving the name and the locality. The writer

has studied many of these specimens. Most of them lack the collector's name, and nearly all lack the date. Many of them include a mixture of material. It seems as if Hillebrand tried to send to Lydgate duplicates from as many collections as possible but that he frequently combined several under a single label, omitting some of the localities. Many sheets contain three specimens, and, in critical genera, they may represent two or three species. They are certainly authentic Hillebrand specimens, and the written label is in Hillebrand's hand, but it is often generalized and incomplete. When Hillebrand's own collection was mounted in Berlin, the original label was usually discarded. Years later Lydgate sold his set to Charles N. Forbes for the Bishop Museum. Forbes made the new printed second label, "Collected by Dr. William Hillebrand and J. M. Lydgate," and this was placed on all the Honolulu sheets, regardless of the identity of the actual collector. It is certain in many cases that Lydgate had nothing to do with the collecting and was merely the recipient and owner of the specimens years later. Forbes mounted the collection and inserted it in the Bishop Museum Herbarium. Though this Hillebrand and Lydgate specimen is placed in the same species, it may perhaps be different. Its single good leaf blade is 88×24 mm., or $3\frac{1}{2}$ times as long as broad. Typical leaves of the Manoa and Wailupe, Hillebrand and Lydgate collection, are $2\frac{1}{2}$ times as long as broad. The same ratio is seen in the ink sketch of the Wailupe and Manoa original specimen in the Berlin Herbarium, made by Rock in 1914. In his "Flora of the Hawaiian Islands" (p. 19) Hillebrand lists *I. laurifolium* only from his collection at "Ridges of Wailupe!" But apparently he had collected the plant at Manoa Valley also. If the fragment, obtained by Rock, of Hillebrand's Wailupe collection is characterized by the narrowly oblanceolate blades, then the broader-leaved one, labeled Manoa and Wailupe, may well have come from Manoa, and this seems a reasonable inference. Were the Wai-

lupe specimen complete, one could settle its exact identity. But, as it consists of only a few fragments of herbage, and as it has a general similarity, it is for the time being classed as of the same species as the other Hillebrand collection from Manoa. Manoa and Wailupe Valleys are on the lee side of the southern end of the Koolau Range, Oahu, and are only 4 miles apart.

The species is named for the Reverend John Mortimer Lydgate (1854–1922) who, in his youth, was field companion and coöperator with Hillebrand in the botanical exploration of the Hawaiian Islands.

9. *Isodendrion maculatum* sp. nov.

ILLUSTRATIONS: Figure 9.

VERNACULAR NAME: "Aupaka."

DIAGNOSIS TYPI: Frutex 2 m. alta glaber, ramis erectis simplicibus 3–4 mm. diametro cortice griseo cum sulcis longitudinalibus paucis, cicatricibus 3–4 mm. latis pallidis suborbicularibus in summo minime concavis, fasciculis 3, nodis 2–30 mm. plerumque 10–20 mm. distantibus, ramulis 10–19 cm. longis cum 8–12 foliis adscendentibus in 45° et non aggregatis, stipulis 3–3.5 mm. longis paene symmetrici-deltaoideis glabris carina incrassata marginibus brunneis membranaceis, petiolis 5–17 mm. longis, laminis 6.4–22 cm. longis 18–77 mm. latis firme chartaceis supra nigri-viridibus infra pallide viridibus oblanceolatis apice breve subacuminatis et late obtusi marginibus remote humiliter serrulatis excepta ad basim nervis elevatis reticulatis prominentibus praesertim infra, inflorescentibus axillaribus unifloris glabris, pedunculis 1 mm. longis, bracteis 1 mm. longis lanceolatis, pedicellis 2.5 mm. longis, sepalis 2–2.5 mm. longis lanceo-ovatis glabris subtilibus in centro obscuro-lineatis marginibus membranaceis pellucidis, petalis irregularibus glabris, petala inferiora 7.8 mm. longa (postquam bullanda) limbo 2.6 mm. longo 1.7 mm. lato ovali subcarnoso praesertim in parte basali, ungue 5.2 mm. longo 1.4 mm. lato in basi 5-nervoso membranaceo ad apicem firmo

et profunde canaliculato, petalis lateralibus 7.6 mm. longis oblongo-spatulatis limbis 2.5 mm. longis 1.4 mm. latis anguste ovatis incrassatis et firmis praesertim ad basim, unguibus 5.1 mm. longis 1.5 mm. latis subtilibus et cum 2 nervis tenuibus adjectis, petalis superioribus 7.3 mm. longis oblongis obtusis limbis 2.3 mm. longis 1.2 mm. latis anguste ovali-oblongis ad basim incrassatis, unguibus 5 mm. longis 1.5 mm. latis anguste oblongis 5-nervis in centro canaliculato incrassato marginibus amplis membranaceis, staminibus subaequalibus, filamentis 0.9 mm. longis, antheris 0.8–1 mm. longis 0.4 mm. latis obtusis apice connectivi minute apiculato, ovario 3 mm. longo ovoideo, stylo 3 mm. longo filiforme, stigmate orbiculare obliquo, capsulis 9–10 mm. longis ovoideis acuminatis a stylo rostratis rubro-maculatis profunde 3-lobatis, seminibus 2.9–3 mm. longis 2 mm. diametro ovoideis sublucidis obscure rubescenti-brunneo-maculatis apice truncato depresso.

DESCRIPTION OF ALL SPECIMENS EXAMINED: Shrub; 2 m. tall, glabrous, the branches erect, simple, older branches 3–4 mm. in diameter, bark gray, with a few longitudinal fissures; leaf scars 3–4 mm. wide, suborbicular, the top slightly concave, pale, with 3 bundle scars; nodes 2–30 mm., commonly 10–20 mm. apart; leafy branchlets 2–4 mm. in diameter, leafy for 10–19 cm., bearing 8–12 leaves that ascend, diverging at 45° from the stem and not crowded; stipules 2.5–3.5 mm. long, almost symmetrically deltoid, glabrous, the midrib thickened, the margins brown membranous; petioles 5–17 mm. long; blades 6.4–22 cm. long, 18–77 mm. wide, oblanceolate, firm chartaceous, above dark green, below pale green, the apex abruptly contracted and short subacuminate and broadly obtuse, the margin remotely low serrulate in the outer two thirds, the veins raised reticulate and prominent, especially below; inflorescences 1-flowered, axillary, glabrous; peduncles 1 mm. long; peduncular bracts 1 mm. long, lanceolate; pedicels 2.5 mm. long; sepals 2–

2.5 mm. long, lance-ovate, glabrous, thin, the center dark lined, the membranous margins translucent; corolla glabrous, irregular, the lower two thirds of the petals forming a concave channel-like claw, the limb expanded and reflexing in anthesis; the lower petal slightly larger than the others, 7.8–9 mm. long (when boiled), the limb 2.6–2.7 mm. long, 1.7–1.8 mm. wide, oval, thickened and somewhat fleshy, especially in the lower third, reflexed and the apex subcucullate; claw 5.2–6.3 mm. long, 1.4–1.6 mm. wide, at base membranous and 5-nerved, towards the apex firm and deeply channeled; lateral petals 7.6–8.8 mm. long, oblong-spatulate, the limb 2.5–3.2 mm. long, 1.4–1.9 mm. wide, narrowly ovate, thickened and firm especially at base; claw 5.1–5.6 mm. long, 1.5–1.9 mm. wide, thin and with the broad margins membranous, strongly 3-nerved and with 2 more weak lateral nerves; upper petals 7.3–8 mm. long, oblong, obtuse, the limb 2.2–2.3 mm. long, 1.2–1.9 mm. wide, narrowly oval-oblong, thickened towards the base; claw 5–5.8 mm. long, 1.5–1.6 mm. wide, narrowly oblong, 5-nerved, the central strip thicker, the broad margin membranous; stamens subequal, filaments 0.9–1.3 mm. long; anthers 0.8–1 mm. long, 0.4 mm. wide, obtusely-oblong, obtuse, the apex minutely apiculate; sepals 4.5–4.7 mm. long, 1.6–2.4 mm. wide, deltoid ovate and obtuse to deltoid-lanceolate, acute, the body greenish and 5–7-nerved, the margin membranous, ciliate above; corolla glabrous, irregular, the lower two thirds of the petal forming a concave, channel-like claw, imbricate laterally, enfolding the neighboring ones and together imitating a corolla tube, the limb expanded and reflexing in anthesis; lower petal slightly longer than the rest, 9 mm. long (when boiled), the limb 2.7 mm. long, 1.8 mm. wide, almost oblong, thickened and somewhat fleshy, the apex subcucullate; claw 6.3 mm. long, 1.6 mm. wide, oblong, membranous, essentially flat, 3-nerved; lateral petals 8.8 mm. long, spatulate, slightly constricted at apex of claw, the limb

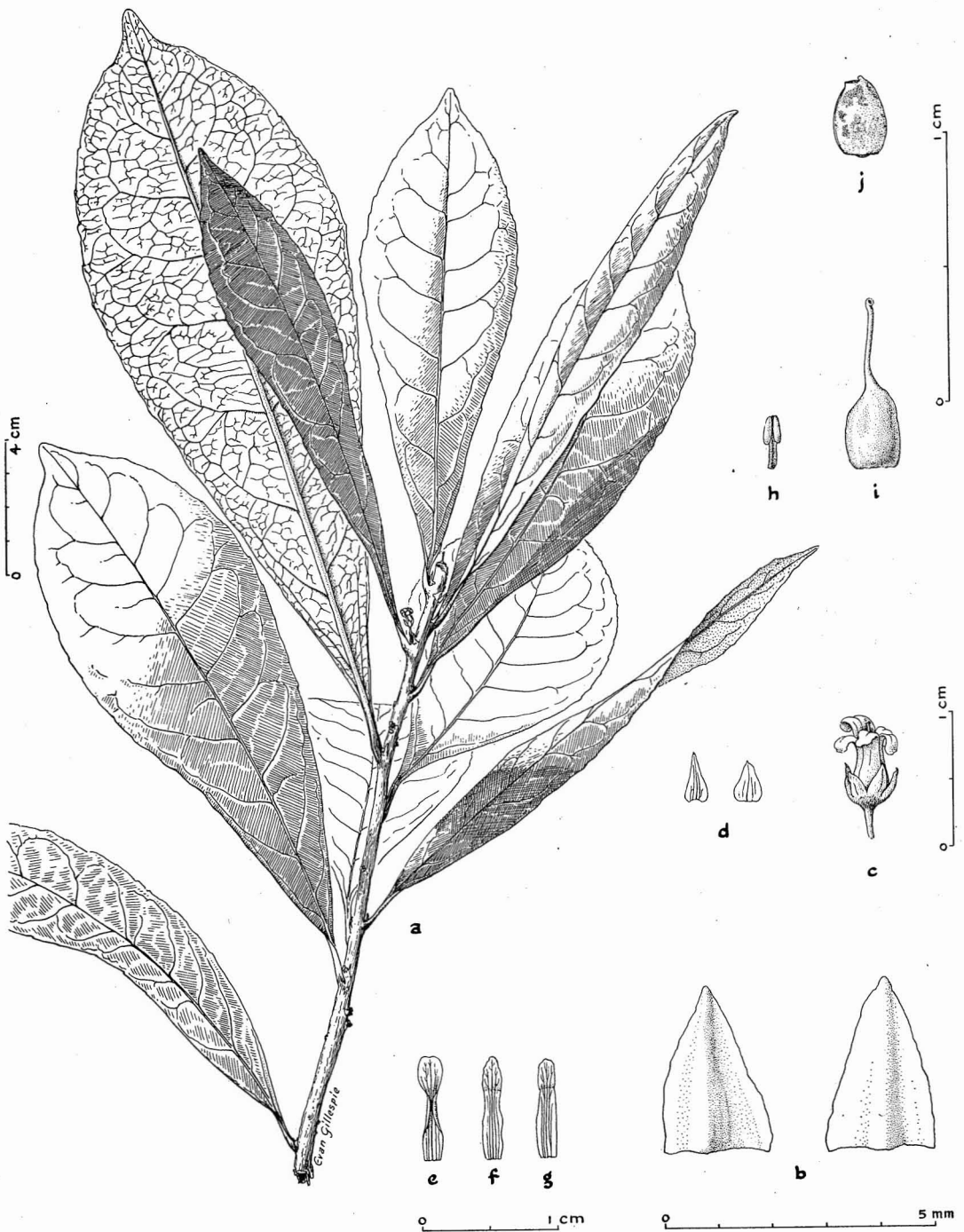


FIG. 9. *Isodendrion maculatum*. a, Habit $\times \frac{1}{2}$; b, stipules $\times 8$; c, flower $\times 2$; d, sepals $\times 2$; e, lower petal $\times 2$; f, lateral petal $\times 2$; g, upper petal $\times 2$; h, stamen $\times 4$; i, pistil $\times 4$; j, seed $\times 4$. From the type, Hanakapiai, St. John *et al.* 10,988.

3.2 mm. long, 1.9 mm. wide, oval, emarginate, thickened, claw 5.6 mm. long, 1.9 mm. wide, ligulate, essentially flat, membranous, 3-nerved; upper petals 8 mm. long, oblong-spatulate, obtuse, the limb 2.2 mm. long, 1.9 mm. wide, oval, thickened, the claw 5.8 mm. long, 1.6 mm. wide, ligulate, membranous, essentially flat, 5-nerved; stamens subequal, filaments 1.3 mm. long, ligulate but narrowed above, anthers 0.8 mm. long, cuspidate at apex, the anther sacs ellipsoid, diverging towards the base; ovary 2 mm. long, ovoid; style 3.8 mm. long, subulate; stigma broad hippocrateriform; ovary 3 mm. long, ovoid; style 3 mm. long, filiform; stigma oblique, circular; capsules 9–10 mm long, ovoid, acuminate and beaked by the style, red maculate, deeply 3-lobed; seeds 2.9–3 mm. long, 2 mm. wide, obovoid, dark reddish-brown maculate, a little shiny, the apex truncate, depressed.

TYPUS: Kauai, Hanakapiai, Napali Coast, in woods, 800 ft., Jan. 2, 1931, *H. St. John et al.* 10,988 (BISH), (st. lf. fl. fr.).

SPECIMENS EXAMINED: Kauai, Wahiawa Mts., *J. M. Lydgate* (BISH), (st. lf. fl.); ex Museo botanico Berolinensi, *Knudsen* 196 (BISH), (lf. fl.).

There are slight differences between the two latter collections and the type which came from the north, or Napali, coast of Kauai. The specimen from the Wahiawa Mountains, collected by Lydgate, consists of small snips from a shrub, but when assembled these show the stem, stipules, leaves, flowers, and young fruit. Only the sepals differ slightly in having a few ciliolations towards the tip. All other parts match well those of *I. maculatum*, hence it seems best to keep it within that species.

The collection, *Knudsen* 196, consists of fragments given to Rock from the Hillebrand collection in Berlin. It contains five loose blades and one loose flower. It was identified by Hillebrand as *I. longifolium* and so cited in his flora (1888: 19). The blades are similar in texture and general outline to the oblance-

olate, undulate ones of *I. longifolium*, but they are only 5.4–9.5 cm. long, far below the dimensions of the former, and are crenate instead of merely undulate. The flower differs from those of *I. maculatum* only in having the calyx lobes slightly longer and narrower and glabrous. Rock studied the original sheet when in Berlin in 1914 and made an ink sketch of it. This shows a large plant with six leaves fully outlined, 11–16 cm. long, 30–42 mm. wide, linear-oblanceolate, and like those of *I. maculatum*. Rock also listed as identical another specimen, *Knudsen* 3.

In view of the fragmentary nature of the material and the slight differences, the specimens collected by Knudsen and by Lydgate are, for the present, included within the population limits of *I. maculatum*.

The vernacular name "aupaka" is recorded for *I. pyriforme* Gray by Hillebrand (1888: 18) and is the only published record of a common name for any of the species. Though Hillebrand was a very accurate man and his flora is a scientific model, there seems to be an error at this point. Recently it was learned that, in the library of the Hawaii National Park at Kilauea, there was a copy of H. Mann's *Enumeration of Hawaiian Plants* (1867) bearing Hillebrand's signature. As shown by the book plate and the library stamp and accession number 25,290, this copy was once in the library of the United States Geological Survey in Washington. Later it was removed and the entry cancelled, and it was sold, probably as a duplicate. As the son, William F. Hillebrand, lived in Washington and was long a staff member of the U. S. Geological Survey, it appears that Hillebrand's annotated copy passed to his son, to the Geological Survey, then was sold in 1935 to the Hawaii National Park. This copy has recently been loaned to the Bishop Museum, and there it has been collated. On the front cover Hillebrand wrote his name in ink, and throughout the pamphlet made additions in the margin in ink or pencil. These are mostly to supply the Hawaiian vernacular names, none of

which had been included by Mann. There are also some notes, including some on geographic occurrence. Well placed, even with No. 14, *Isodendron longifolium* Gray, there is the marginal note in pencil in Hillebrand's hand, "Aupaka (Kauai)." This is at variance with Hillebrand's own printed record of the name "aupaka" for *I. pyriformis* which is No. 13, the species just above in Mann's *Enumeration*. It could be supposed that his hand had slipped and the words were written a little too low on the page, but he gave Kauai as the locale of the name. Gray had described *I. pyriformis* from Oahu alone, then Hillebrand, using a wider species concept, recorded it from Oahu, Lanai, Maui, and (by implication) from Hawaii, and Niuhau also. In this present monographic treatment only the Oahu specimens remain in *I. pyriformis*, while the specimens from other islands are allocated to different species. The only Kauai collection known to Hillebrand was by Knudsen, and he classified that as the same as the Oahu species *I. longifolium*. The Knudsen specimen is here identified as *I. maculatum*. Mr. Valdemar Knudsen of Waiawa, Kauai, was one of Hillebrand's most active collectors and coöperators. He made pioneer explorations of the forests and mountains of Kauai. Since we have, in Hillebrand's own writing, the record that "aupaka" was the name of *Isodendron* on Kauai, it is apparent that this name should go with the Knudsen collection from Kauai. Hence, the vernacular name is transferred to the new *I. maculatum*.

The species is named from the Latin, *maculatus*, spotted, in allusion to the red-spotted fruits.

10. *Isodendron molokaiense* sp. nov.

ILLUSTRATIONS: Figure 10.

DIAGNOSIS TYPI: Frutex, ramis 3–5 mm. diametro cortice griseo in longitudinem sulcatis a nodis et stipulis asperratis, cicatricibus 1.2–1.8 mm. latis depresso-cordatis, fasciculis 3, ramulis 5–10 cm. longis 1–2 mm. diametro nigri-rubro-viridibus puberulentis

parte superiore a stipulis imbricatis clausis 10–18 foliis aggregatis ferrentibus, nodis 2–12 mm. distantibus, stipulis 4.2–5 mm. longis 2.3–2.5 mm. latis deltoideis vel oblongo-deltoideis carina incrassata et ad basim distenta albi-adpressi-puberulenti ad apicem lateribus membranaceis glabris in sicco brunneis marginibus dense pilosuloso-ciliatis, petiolis 4–9 mm. longis 0.5–0.8 mm. diametro albi-adpressi-puberulentis, laminis 22–52 mm. longis 16–26 mm. latis firme chartaceis ovatis acutis in basi rotundatis supra nigri-viridibus et sparse puberulentis in nervo medio infra pallide viridibus et minute reticulatis sparse albi-adpressi-puberulentis, inflorescentiis 1-floriferis axillaribus, pedunculis 4 mm. longis adpressi pilosulis in apice cum 2 bracteis 3.5–4.5 mm. longis stipulaceis, pedicellis 2 mm. longis adpressi-pilosulis, sepalis 4–4.6 mm. longis oblongo-ovatis carina et nervo medio dense albi-adpressi-pilosuli ad apicem excurrenti marginibus pallidis vel brunneis pilosuloso-ciliatis, petalis irregularibus, petala inferiora 10 mm. longa (postquam bullanda) limbo 2.8 mm. longo 2.5 mm. lato late ovali carnosio sed nervis evidentibus apice cucullato recurvato extra dense adpressi-albi-pilosuloso, ungue 7.2 mm. longo 2.2 mm. lato oblongo sed ad basim membranaceo diminuendo 5-nervoso ad apicem carnosiori extra adpressi-pilosuloso, petalis lateribus 9.5 mm. longis oblongo-spatulatis extra adpressi-pilosulosis, limbis 2.7 mm. longis 2.4 mm. latis ovatis carnosis, unguibus 6.8 mm. longis 1.9 mm. latis 5-nervosis oblongis sed ad basim diminuendis membranaceis, petalis superioribus 9.3 mm. longis extra pilosulosis, limbis 2.6 mm. longis late ovalibus carnosis ad basim subcontractis, unguibus 6.7 mm. longis oblongis sed ad basim diminuendis membranaceis 3-nervosis, staminibus inaequalibus superioribus minoribus et inarmatis et eglandulosis, staminibus inferioribus cum filamentis 1.4 mm. longis subulatis in pagina exteriori glandulosis, antheris 1.2 mm. longis 0.9 mm. latis ovatis connectivo in apice cum aculeo

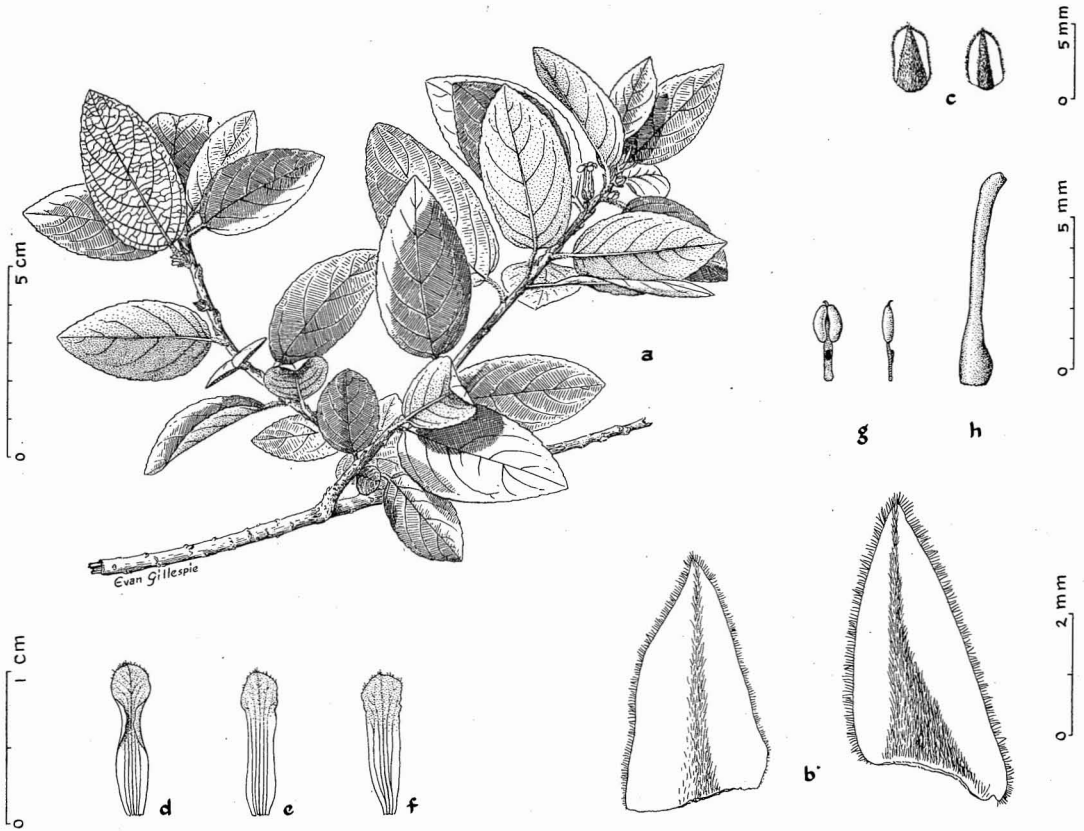


FIG. 10. *Isodendrion molokaiense*. a, Habit $\times \frac{1}{2}$; b, stipules $\times 8$; c, sepals $\times 2$; d, lower petal $\times 2$; e, lateral petal $\times 2$; f, upper petal $\times 2$; g, lower stamen $\times 4$; h, pistil $\times 4$. From the type, Molokai, Remy 533.

0.1 mm. longo, ovario 1.5 mm. longo oblique lanceoloideo glabro, stylo 5.7 mm. longo tereto pallido glabro, stigmatate orbiculari obliquo; fructu ignoto.

DESCRIPTION OF TYPE: Shrub; older branches 3–5 mm. in diameter, the bark gray, longitudinally ridged, roughened by prominent nodes and persistent stipular bases; leaf scars 1.2–1.8 mm. wide, depressed obcordate; bundle scars 3; twigs leafy for 5–10 cm., bearing 10–18 leaves, these crowded; upper leafy stem 1–2 mm. in diameter, dark reddish green, puberulent, at least the upper part concealed by the imbricate stipules; nodes 2–12 mm. apart; stipules 4.2–5 mm. long, 2.3–2.5 mm. wide, deltoid to oblong-deltoid, the midrib much widened below, thick and densely appressed white pilosulous distally, the sides membranous, drying brown, gla-

brous, the margins closely pilosulous ciliate; petioles 4–9 mm. long, 0.5–0.8 mm. in diameter, appressed white puberulent; blades 22–52 mm. long, 16–26 mm. wide, firm chartaceous, ovate, acute, the base rounded, above dark green and puberulent, with a few hairs appressed along the midrib, below pale green and finely reticulate, sparsely appressed white puberulent; inflorescences 1-flowered, axillary; peduncle 4 mm. long, appressed pilosulous, at apex with two stipule-like bracts 3.5–4.5 mm. long; pedicel 2 mm. long, appressed pilosulous; sepals 4–4.6 mm. long, oblong ovate, the very heavy, triangular midrib densely white appressed pilosulous and excurrent as an acute tip, the pale or brownish margins pilosulous ciliate; corolla irregular, the lower two thirds of the petals forming a concave channel-like claw, the limb reflexing

in anthesis; the lower petal the largest, 10 mm. long (when boiled), the limb 2.8 mm. long, 2.5 mm. wide, broadly oval, thickened and fleshy but the pinnate venation visible, the apex cucullate recurved, densely appressed white pilosulous without; claw 7.2 mm. long, 2.2 mm. wide, oblong but narrowing towards the base, 5-nerved from the base, membranous below, fleshy toward the limb, the back appressed pilosulous; lateral petals 9.5 mm. long, appressed pilosulous without, oblong spatulate, the limb 2.7 mm. long, 2.4 mm. wide, broad ovate, fleshy; claw 6.8 mm. long, 1.9 mm. wide, 5-nerved, oblong but narrowed at base, membranous; upper petals 9.3 mm. long, pilosulous without, the limb 2.6 mm. long, broadly oval, fleshy, little contracted at base; claw 6.7 mm. long, oblong but narrowed at base, membranous 3-nerved at base; stamens unequal, the upper ones smaller and unarmed and glandless; lower stamens with filaments 1.4 mm. long, subulate, with a thickened dorsal gland; anthers 1.2 mm. long, 0.9 mm. wide, ovate, bearing a curved apical prickle 0.1 mm. long; ovary 1.5 mm. long, obliquely lanceoloid, glabrous; style 5.7 mm. long, terete, pale glabrous; stigma oblique, orbicular; fruit unknown.

TYPUS: Molokai, 1851–1855, *J. Remy* 533 (P), (st. fl. lf.).

The species is named with reference to its occurrence on the island of Molokai.

11. *Isodendrion pyriforme* Gray, Amer. Acad. Arts and Sci., Proc. 2: 324, 1852; Gray, U. S. Explor. Exped. (official ed.) 15 (1): 93–95, 1854, Atlas pl. 8, 1856; (public ed.) Botany, Phanerogamia 1: 93–95, 1854, Atlas pl. 8, 1857.

ILLUSTRATIONS: Figure 11.

DESCRIPTION OF TYPE SPECIMEN: Shrub; "about 6 feet high," freely branched with several ascending secondary branches; older branches 3 mm. in diameter, the bark reddish brown, smooth but with persistent, appressed white puberulence, and rough from the persistent stipules; leaf scars 2–2.2 mm. wide,

obovate-shield-shaped, pale with 3 bundle scars; nodes 3–15 mm., commonly 3–10 mm. apart; leafy branchlets 1.5–3 mm. in diameter, leafy for 5–20 mm., bearing 4–8 leaves in a terminal crowded plume, the leaves mostly ascending; this upper stem closely appressed white puberulent but stem and hairs both largely concealed by the crowded, imbricate stipules; stipules 4–4.7 mm. long, narrowly deltoid, slightly oblique, the heavy raised midrib densely appressed puberulent, the sides brown membranous and ciliate; petioles 5–9 mm. long, slender, closely appressed white puberulent; blades 2.5–5.4 cm. long, 12–28 mm. wide, chartaceous, above dark green, subglabrate except for the veins towards the base, below paler and appressed puberulent, ovate or even elliptic, the margin subentire or on the larger leaves barely subserrulate, the veins not conspicuous; flowers axillary, single; peduncle 4–6 mm. long, canescent, bracted; pedicels 3–4 mm. long, canescent; sepals 3.9–4.1 mm. long, 1.5–1.7 mm. wide, broadly lanceolate, 3-nerved within the central large, thickened, closely ascending hirsutulous area, the margins membranous; corolla irregular, the lower two thirds of the petals forming a channel-like claw, the limb expanding and reflexing in anthesis; lower petal the largest 8.2 mm. long (when boiled), 2.1 mm. wide, contracted two thirds way from the base, both the claw and the limb elliptic, the upper two thirds fleshy and thickened, from the base 5-nerved, claw 5 mm. long, 2.1 mm. wide; lateral petals 7.8 mm. long, 2 mm. wide, scarcely contracted at the apex of the fleshy claw, 3-nerved from the base; upper petals 7.1 mm. long, 1.5 mm. wide, the claw broad ligulate, 3-nerved from the base, the claw slightly broader and oval and somewhat fleshy; stamens equal 1.9 mm. long; filaments subulate; anthers 1.1 mm. long, 0.7 mm. wide, the cells narrowly oblong, diverging at base, the apex barely minutely apiculate; ovary 1 mm. long, narrowly ovoid, 3-angled; style 4.5 mm. long, the lower half subulate, the upper half

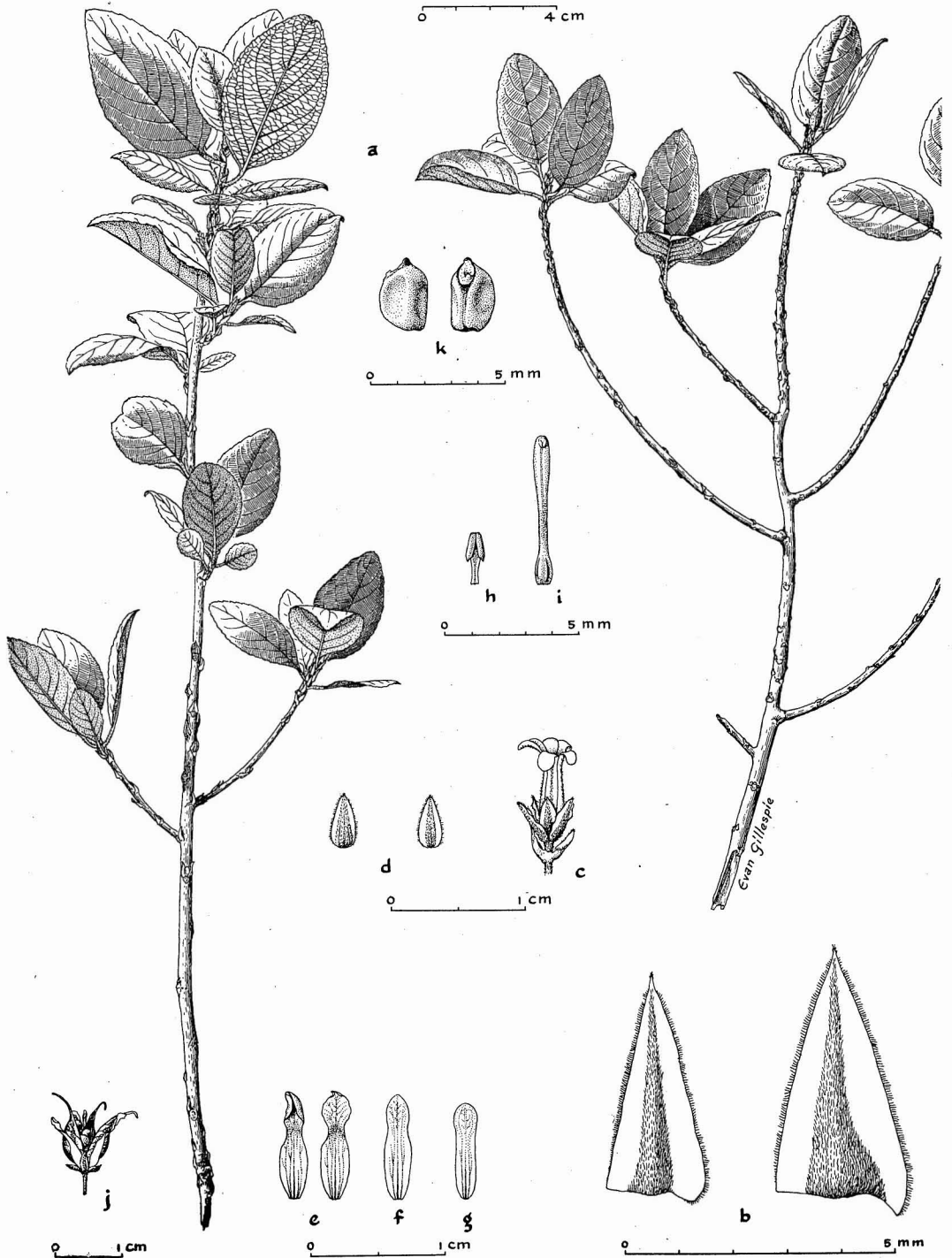


FIG. 11. *Isodendron pyriformum*. a, Habit $\times \frac{1}{2}$; b, stipules $\times 8$; c, flower $\times 2$; d, sepals $\times 2$; e, lower petal $\times 2$; f, lateral petal $\times 2$; g, upper petal $\times 2$; h, stamen $\times 4$; i, pistil $\times 4$; j, capsule $\times 1$; k, seeds $\times 4$. From the type, Oahu, Wilkes Expedition.

widened and inflated; stigma lateral, obovate.

TYPE: Sandwich Islands, Oahu, U. S. Exploring Expedition under *Capt. Wilkes* (US), (st. lf. fl. fr.). Type examined. Also isotype (GH), (st. lf. fr.). Pickering (1854: 400) gave further details, "in a ravine on the southern flank of Mauna Kaala at an elevation of a thousand feet . . ."

Known only from the type collection. In Gray's second publication on it—that in the United States Exploring Expedition series—he gave more details. As to the locality, he added (1854: 93): "Wooded portion of the Kaala Mountains, Oahu, Sandwich Islands." This species, it seems, has not been collected subsequently, as all of the other records given by Hillebrand (1888: 18) are here referred to other species. Gray gives a lengthy description, which is not quoted here as it seemed best to make a new, detailed, independent description. Gray says (1854: 94) of the petals that "They are all alike in size and shape, about 4 lines long . . ." That statement was inaccurate, as can be noted by comparing the enlarged drawings of the petals (our Fig. 11), prepared from the type specimen.

The three new species of *Isodendron* described by Gray in 1852 were all cited as from the Kaala Mountains, Oahu, but in the U. S. Exploring Expedition series in 1854, he expanded (1854: 93) the habitat for *I. pyriformium* only, to "Wooded portion of the Kaala Mountains." This and the other two species were apparently collected on November 4, 1840. More data can be gleaned from the volume by Pickering who was one of the collectors (1854: 400). In the Violaceae they collected on Oahu only the three species of *Isodendron* and *Viola Chamissonis* Ging. Pickering (1854: 386), speaking of the drier mountain range near "Waianaï" [Waianae], says "High up along this Leeward flank of the Mauna Kaala ridge, Mr. Brackenridge and myself met with various remarkable plants that were not seen elsewhere: as . . . the remarkable Violaceous shrubs, with flowers arising from the old wood . . ." Then (p. 399)

he lists them: "Viola (No. 1). Normal, though becoming a shrub, upright, and one to two feet high; leaves ovate, cordate at base, long pointed. On 'Mauna Kaala,' within the Leeward portion of Oahu, Brackenridge." [This is surely *V. tracheliifolia* Ging., which is common on the ridge near Mt. Kaala.]

On page 400 Pickering lists three species of another violaceous genus [*Isodendron*].

"Gen. Violac., (No. 1). A shrub, six feet high; leaves oblong-ovate, serrulate. Growing in a ravine on the southern flank of Mauna Kaala, at the elevation of a thousand feet; (pointed out to me by Mr. Brackenridge).

————— (No. 2). A shrub, six feet high; large obovate coriaceous leaves, six inches by two; flowers small, inconspicuous, and greenish, arising along the stem from the old wood, short pet. Growing in the same locality, on the Southern flank of Mauna Kaala; (pointed out to me by Mr. Brackenridge).

————— (No. 3); habit of the last, but the leaves smaller, subsessile, with few crenatures. Growing in the same locality, on the Southern flank of Mauna Kaala; (pointed out to me by Mr. Brackenridge)."

This enumeration contains enough descriptive material to make possible the identification of these numbered Violaceae as: No. 1, *Isodendron pyriformium* Gray; No. 2, *I. longifolium* Gray; No. 3, *I. laurifolium* Gray.

The vernacular name "aupaka" given by Hillebrand (1888: 18) is discussed under *I. maculatum* and here transferred to that species.

The specific name was obviously coined from the generic name *Pyrus*, the pear; and the Latin *folium*, leaf, indicating a resemblance between its leaves and those of the pear tree.

12. *Isodendron Remyi* sp. nov.

ILLUSTRATIONS: Figure 12.

DIAGNOSIS TYPI: Frutex, ramis pluribus ascendentibus glabris 2–4 mm. diametro cortice laevi griseo, cicatricibus 1.5 mm. latis depresso-obcordatis, fasciculis 3 inferiore majori, ramulis a stipulis persistentibus asper-

ratis, ramulis foliferis 3–20 mm. longis cortice adpressi-pilosulo sed plerumque a stipulis imbricatis clausis, foliis 5–8 adscendentibus vel divergentibus, stipulis 5–5.5 mm. longis oblique lanceolatis acuminatis marginibus ab initio ciliolatis posthac glabratis vel subglabratis carina incrassata cartilaginea dense adpressi-albi-pilosula, petiolis 6–10 mm. longis adscendenti-albi-pilosulis, laminis 25–60 mm. longis 17–32 mm. latis ovalibus vel lanceo-ovalibus chartaceis infra in nervis adpressi-pilosulis et remote pilosulis in intervallis supra glabris excepta nervo medio minute adpressi-pilosulis apice subacuti marginibus minute depresso-crenatis vel apiculato-crenatis, inflorescentiis adpressi-puberulentis axillaribus solitariis, pedunculis 3–6 mm. longis, bracteis 2 mm. longis ovatis, pedicellis 2–4 mm. longis, floribus divergentibus, sepalis 4–5 mm. longis ovato-lanceolatis 1.5 mm. latis nervo medio 0.5 mm. lato eo et regio mediale dense adpressi-albi-pilosulo lateribus membranaceis bruneis glabris marginibus ciliolatis, petalis inaequalibus extra albi-hirsutulis, petala inferiora 14.5 mm. longa (postquam bullanda) spatulata limbo 2.4 mm. lato carnosio, ungue 1.8 mm. lato, petalis lateralibus 13 mm. longis anguste spatulatis, limbis 0.9 mm. latis, unguibus 1.4 mm. latis carnosio canaliculatis marginibus angustis membranaceis, petalis superioribus 12.2 mm. longis anguste spatulatis, limbis 4.2 mm. longis, 1.7 mm. latis carnosio, unguibus 1.8 mm. latis, filamentis 1.3 mm. longis ligulatis, antheris 1 mm. longis saccis linearibus infra divergentibus, staminibus duobus inferioribus in apice connectivo cum seta 0.3 mm. longa, ovario 6 mm. longo 2.8 mm. diametro ovoideo glabro, stylo 5 mm. longo subulato, ad apicem deflexo, stigmatibus semiglobosis, capsulis 12 mm. longis 7 mm. latis brunneis cartilagineis verrucosis reticulatis, valvis tribus anguste canaliculatis sed in dorso rotundatis, quisque 4-seminiferis, seminibus non visis.

DESCRIPTION OF TYPE: Shrub; the several ascending branches glabrate, the bark smooth,

gray, 2–4 mm. in diameter; leaf scars 1.5 mm. wide, depressed obcordate; bundle scars 3, the lower one large, the two lateral ones much smaller; small twigs, even well-below the leaves, rough from the stiff, persistent stipules; young branchlets leafy for a distance of only 3–20 mm., the bark appressed pilosulous but this almost completely concealed by the overlapping stipules; the leaves 5–8, ascending or diverging in a terminal plume; stipules 5–5.5 mm. long, obliquely lanceolate, acuminate, at first the margin ciliate, later glabrate or nearly so, the sides and margins thin brown, membranous, the midrib heavy, cartilaginous and raised, densely appressed white pilosulous; petioles 6–10 mm. long, ascending white pilosulous; blades 20–65 mm. long, 9–32 mm. wide, oval or lance-oval, chartaceous, below appressed pilosulous on the veins and sparsely so on the intervals, above glabrous except for the minutely appressed pilosulous midrib, the apex subacute, the margin minutely low crenate or apiculate crenate; inflorescences axillary, appressed puberulent, 1-flowered, single; peduncle 3–6 mm. long; bracts 2 mm. long, ovate; pedicels 2–4 mm. long, ascending white pilosulous, near the middle bearing two subopposite bracts like the stipules but ovate, 2–3 mm. long; flowers divergent; sepals 4–5 mm. long, ovate-lanceolate, 1.5 mm. wide, the thickened, heavy midrib 0.5 mm. wide, it and the broad central strip densely appressed white pilosulous, the rest brown, membranous, glabrous but for the ciliate margin; corolla irregular, the lower two thirds of the petals forming a claw, concave and channel-like, the limb expanded and reflexing in anthesis, white hirsutulous without; lower petal longer and larger than the others, spatulate, 14.5 mm. long (13 mm. when dried), the limb fleshy, 2.4 mm. wide, the claw 1.8 mm. wide, channeled, fleshy, with narrow membranous margins; lateral petals narrowly spatulate 13 mm. long (when boiled), the limb 0.9 mm. wide, sharply bent and reflexing, the claw 1.4 mm. wide, channeled and fleshy

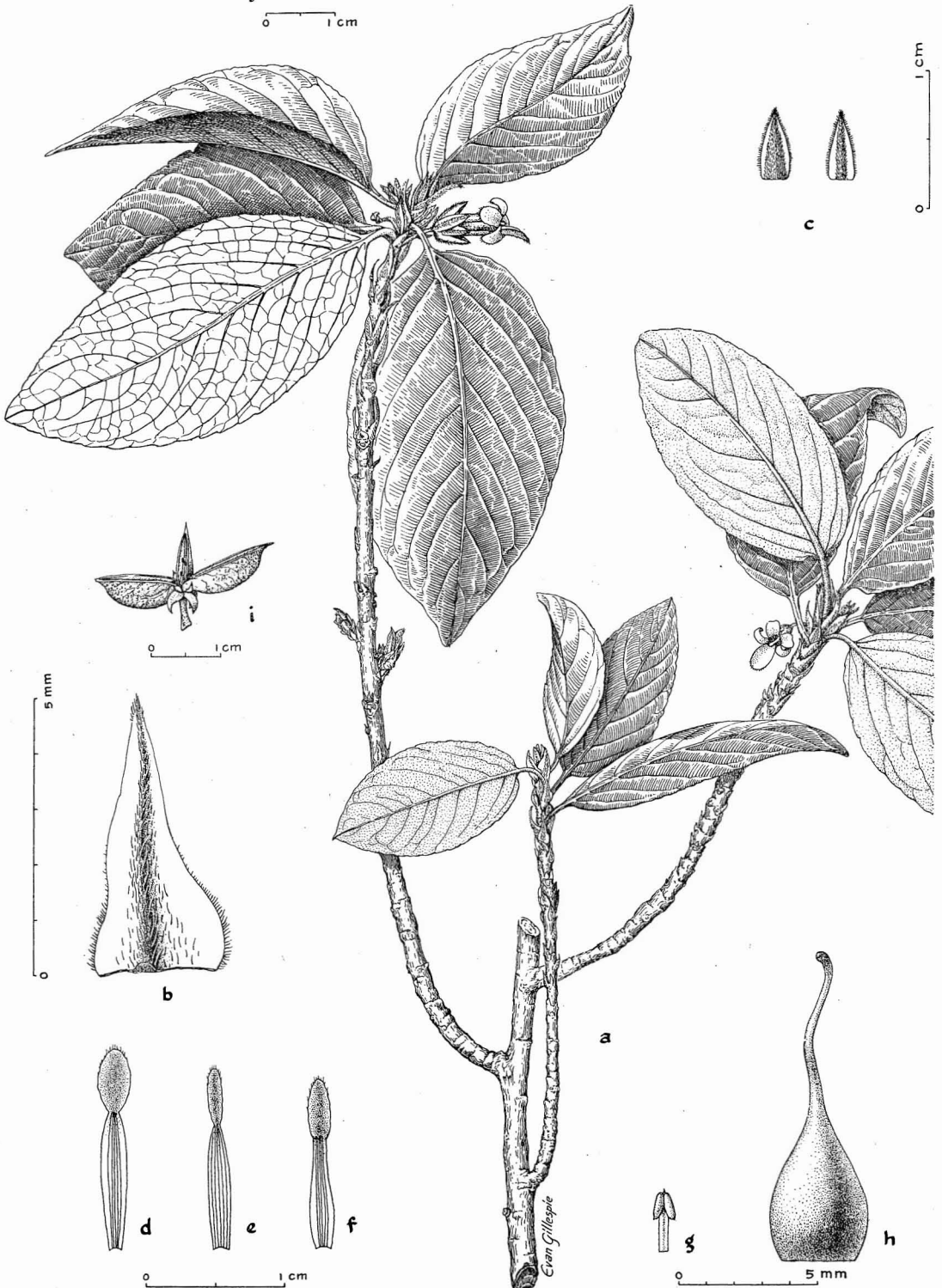


FIG. 12. *Isodendrion Remyi*. *a*, Habit $\times 1$; *b*, stipule $\times 8$; *c*, sepals $\times 2$; *d*, lower petal $\times 2$; *e*, lateral petal $\times 2$; *f*, upper petal $\times 2$; *g*, lower stamen $\times 4$; *h*, pistil $\times 4$; *i*, capsule $\times 1$. From the type, Nihau, Remy 534.

with narrow membranous margins; upper petals narrowly spatulate, 12.2 mm. long (when boiled), the thickened fleshy limb 4.2 mm. long, 1.7 mm. wide, the claw 1.8 mm. wide; filaments 1.3 mm. long, ligulate, anthers 1 mm. long, the oblong anther sacs divergent below, connivent at the apex on the two lateral stamens, lacking any appendage, on the upper and two lower stamens with a terminal bristle-like appendage 0.3 mm. long; ovary 6 mm. long, 2.8 mm. in diameter, ovoid, glabrous; style 5 mm. long, subulate, deflexing at the slightly larger, semiglobose stigma; capsule 12 mm. long, 7 mm. wide, brown, cartilaginous, reticulate, warty, splitting into 3 valves which are narrow trough-shaped but rounded at the back ridge; seeds not seen, 4 per valve.

TYPUS: Iles Sandwich, Nihau, spec. nova?, pyrifolio aff., foliis acuminatis flore xxx [illegible], 1851-1855, *J. Remy* 534 (GH); also isotypes (L, P), (st. lf. fl. fr.).

Named in honor of Jules Rémy who collected plants in the Hawaiian Islands from 1851 to 1855.

13. *Isodendrion sessilifolium* Heller, *Minn. Bot. Stud.* 1: 856-857, pl. LIV, 1897.

ILLUSTRATIONS: Figure 13; and Heller, Plate LIV.

DESCRIPTION OF TYPE: "A slender, wand-like shrub, two to six feet high, simple or sometimes sparingly branched, the branches ascending;" plant glabrous; older bark brown to gray, smooth or longitudinally wrinkled, the stems 3-5 mm. in diameter, roughened by the persistent rigid stipules; leaf scars 2 mm. wide, depressed rounded shield-shaped, pale, with 3 bundle scars; leafy branchlets 2-3 mm. in diameter, leafy for 10-25 cm., the internodes 4-23 mm. long, hence the stipules remote; leaves alternate, spreading, numerous but not crowded; stipules 3.2-4 mm. long, obliquely narrow deltoid, with a broad thickened midrib, the membranous margin ciliolate; petioles 2-3 mm. long, stout;

blades 3-10.5 cm. long, 12-44 mm. wide, oblong-oblancoelate to elliptic-oblancoelate, subcoriaceous, prominently netted reticulate veined above and below, above dark green, below tawny green, the margins shallowly undulate or obscurely serrulate; flowers axillary, single or several, the peduncle 2-3 mm. long, covered by stiff bracts similar to but smaller than the stipules; sepals 2.8-3.1 mm. long, 0.9 mm. broad, lanceolate, the back glabrous, prominently 3-nerved and dark in the center third, the rest pale and membranous, the margins puberulous ciliate in the upper third; corolla irregular, glabrous, the lower two thirds of the petals forming a concave channel-like claw, imbricate laterally, enfolding the neighboring ones (but not spirally so, as shown in Heller's plate LIV) and imitating a corolla tube, the limb expanding and reflexing in anthesis; the lower petal longer and larger than the others, 13 mm. long (when boiled), the limb 4.7 mm. long, 2.8 mm. wide, elliptic oblong, thick and fleshy, almost flat, the apex retuse; claw 8.5 mm. long, 2.5 mm. wide, at base membranous and 5-nerved, towards the apex firmer and channeled; lateral petals 12 mm. long, narrowly spatulate, slightly contracted at apex of claw, membranous, especially below; limb 3.3 mm. long, 2 mm. wide, oval; claw 8.5 mm. long, 1.8 mm. wide, 3-nerved from the base; upper petals 11 mm. long, narrowly spatulate, membranous; the limb 3.2 mm. long, 2 mm. wide, oval; claw 7.8 mm. long, 3 mm. wide, membranous, 3-nerved; stamens subequal, filaments 1.7 mm. long, tapering upwards from the 0.4 mm. wide base; anthers 1.1 mm. long, 0.6 mm. wide, elliptic oblong, bearing at the apex an incurved bristle 0.1 mm. long; capsules 9-10 mm. long, ovate-lanceoloid in outline, deeply 3-lobed, beaked by the persistent style, greenish to brown, reticulate veined, the lobes 2-seeded, dehiscing to the base; seeds 2.1-2.3 mm. long, 1.7 mm. wide, shining, stramineous, the apex truncate, depressed.

TYPE: Kauai, Kaholuamanoa [=Kaholua-

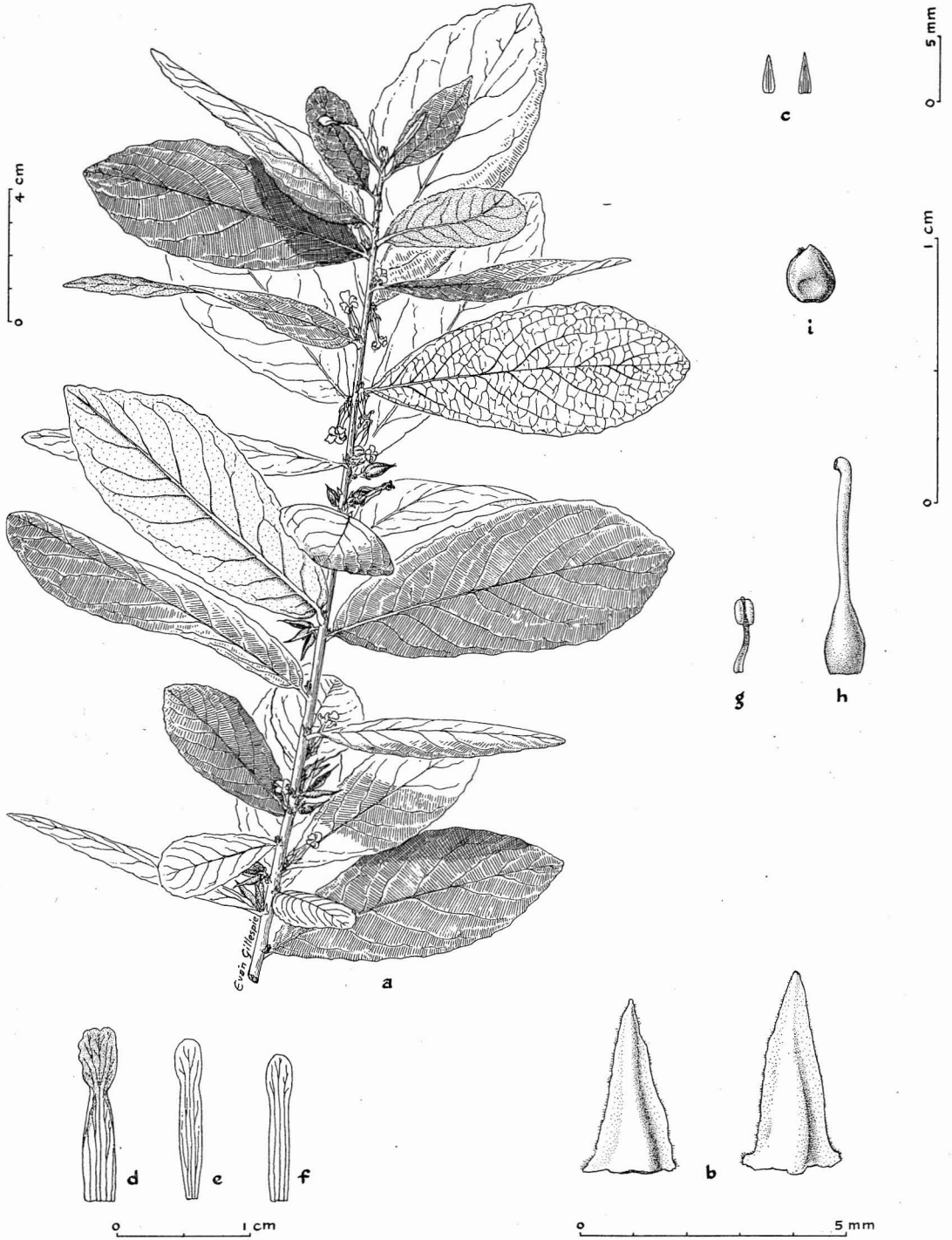


FIG. 13. *Isodendron subsessilifolium*. *a*, Habit $\times \frac{1}{2}$; *b*, stipules $\times 8$; *c*, sepals $\times 2$; *d*, lower petal $\times 2$; *e*, lateral petal $\times 2$; *f*, upper petal $\times 2$; *g*, stamen $\times 4$; *h*, pistil $\times 4$; *i*, seed $\times 4$. From isotype, Kaholuamanoa, Heller 2,828.

manu], above Waimea, Sept. 10-16, 1895, *A. A. Heller* 2,828. There were examined four isotypes at (BISH), (st. lf. fl. fr.); one at (US), (st. lf. fl.); one at (GH), (st. fl. lf. fr.); one at (E), (st. lf. fl.); and one at (L.), (st. lf. fr.). In his original account Heller added that it was growing at 2,000 feet in a ravine between the forks of the Waimea river.

Heller's excellent and abundant type collection included mature fruit, but he neither described nor figured that state of the plant.

SPECIMENS EXAMINED: Kauai, Olokele Canyon, shaded slope, only one plant seen, July 3, 1926, *O. Degener* 17,348 (NY), (specimen sterile); (GH), (st. lf. fl. fr.).

The specific name was obviously formed from the Latin, *sub-*, somewhat so; *sessilis*, sitting close (or stalkless); *folium*, leaf, in allusion to its nearly stalkless leaves.

14. *Isodendrion waianaense* sp. nov.

ILLUSTRATIONS: Figure 14.

DIAGNOSIS TYPI: Frutex 3 m. alta, ramis 3-4 mm. diametro divergentibus cortice brunneo vel griseo sublaevi, cicatricibus 2-2.3 mm. latis suborbiculari-scutelliformibus pallidis laevibus, fasciculis 3, ramulis foliferis 1-16 cm. longis 2-3 mm. diametro cum 4-18 foliis divergentibus non aggregatis, internodis 2-15 mm. plerumque 3-5 mm. longis, foliis alternis, stipulis 2.3-3.2 mm. longis oblique deltoideis carina incrassata dorso glabro marginibus ciliatis, petiolis 1-3 mm. longis validibus glabris, laminis 3.9-12.5 cm. longis 19-43 mm. latis glabris crassis firme chartaceis elliptico-vel oblongo-oblanco-latis supra olivaceis et prominente reticulatis infra pallide viridibus prominente reticulatis, floribus singulis axillaribus, pedunculis 0.2-1 mm. longis bracteatis, pedicellis 0.2-1 mm. longis glabris, sepalis 3.4-3.5 mm. longis 1.5 mm. latis lanceolatis vel anguste deltoideo-lanceolatis chartaceis 3-nervatis carina incrassata in regio mediale purpureo sed in sicco brunnescenti ad apicem marginibus membranaceis ciliolatis, petalis inaequalibus, petala inferiore 10.5 mm. longa (postquam

bullanda), ungue 6.5 mm. longo 1.7 mm. lato ligulato sed in medio latiore membranaceo 5-nervoso ad apicem canaliculato opaquo purpureo sed in sicco brunneo, limbo 4 mm. longo 2.7 mm. lato ovali cucullato carnosu opaquo viridescenti, petalis lateralibus 10 mm. longis ligulatis ad basim et apicem angustioris 3-nervosis, limbis 3.5 mm. longis 1.7 mm. latis carnosus, petalis superioribus 9.5 mm. longis 1.5 mm. latis ligulatis 3-nervosis, limbis obtusis carnosus, staminibus aequalibus 5.2 mm. longis, filamentis ligulatis 1-nervosis, antheris 2.5 mm. longis ovatis sacis anguste ellipsoideis connectivo in apice plano extenso, ovario 3-11 mm. longo lanceoloideo, stylo 3.5-4 mm. longo filiforme, stigmatate laterali orbiculari, capsulis 7 mm. longis lanceo-ovoideis valvis 1.5-1.8 mm. profundis extra viridescens et purpureo-brunneo-striatis nervis vix evidentis, seminibus 3 mm. longis 2.1 mm. diametro late ovalibus obscure viridescens.

DESCRIPTION OF TYPE: Shrub; 3 m. tall, the first branch 1 m. from the ground, the crown open; older bark brown to gray, nearly smooth, these twigs 3-4 mm. in diameter, largely free of stipules; leaf scars 2-2.3 mm. wide, suborbicular-shield-shaped, pale, smooth, with 3 bundle scars; leafy branchlets 2-3 mm. in diameter, leafy for 1-16 cm., the internodes 2-15 mm., commonly 3-5 mm. long; leaves alternate, spreading 4-18 in number, but not crowded; stipules 2.3-3.2 mm. long, obliquely deltoid, the back smooth and with thickened, heavy midrib, the margin ciliate; petioles 1-3 mm. long, stout, glabrous; blades 3.9-12.5 cm. long, 19-43 mm. wide, glabrous, thick, firm chartaceous, elliptic or oblong-oblanco-late, the margin irregularly low undulate, the upper surface olive green and prominently raised reticulate veined, the lower pale green and similarly veined; flowers axillary, single, the peduncle 0.2-1 mm. long, many bracted; pedicel 0.2-1 mm. long, glabrous; sepals 3.4-3.5 mm. long, 1.5 mm. wide, lanceolate to narrowly deltoid lanceolate, chartaceous, but near the obtuse

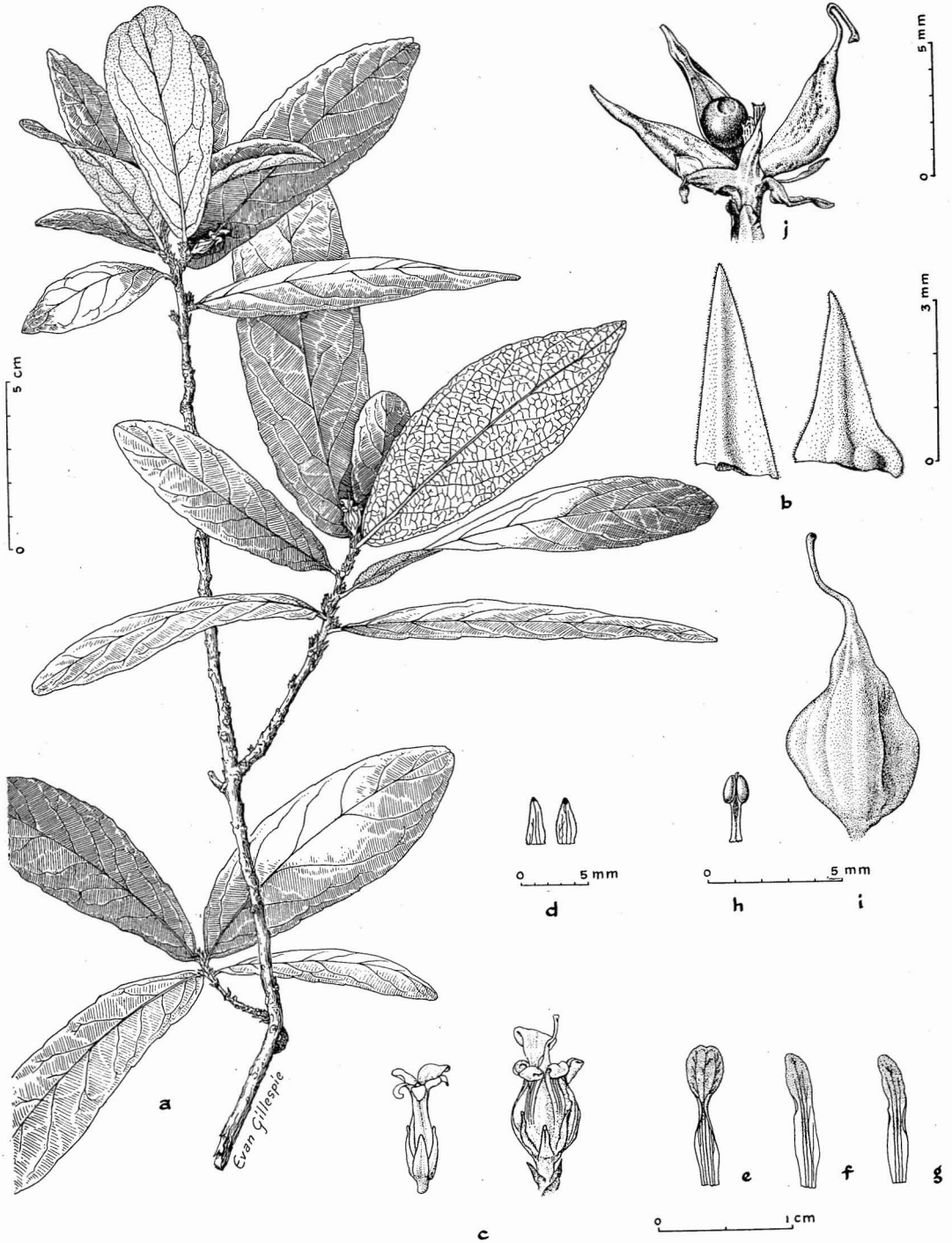


FIG. 14. *Isodendrion waianaense*. a, Habit $\times \frac{1}{2}$; b, stipules $\times 8$; c, flowers $\times 2$; d, sepals $\times 2$; e, lower petal $\times 2$; f, lateral petal $\times 2$; g, upper petal $\times 2$; h, stamen $\times 4$; i, pistil $\times 4$; j, capsule $\times 4$. From the type, Makaleha, Hatheway 398.

apex, the narrow membranous margins pale and ciliate, the central strip distally "purple" but drying madder brown, 3-nerved from the base, the midnerve stronger, the laterals weak and soon forking; corolla irregular, the lower two thirds of the petal forming a channel-like claw, the limb expanding and reflexing in anthesis; lower petal the largest, 10.5 mm. long (when boiled), the claw 6.5 mm. long, 1.7 mm. wide, ligulate but slightly widened near the middle, membranous, 5-nerved from the base, but only the 3 central nerves strong, towards the throat the tissue thick, firm opaque and the shape channel-like, it and the other petals distally with a heavy central strip "purple," drying madder brown, the limb 4 mm. long, 2.7 mm. wide, oval, cucullate, fleshy, firm and opaque, greenish; lateral petals 10 mm. long, ligulate, slightly narrowed at base and at the throat, 3-nerved, the nerves nearly simple, the limb elliptic, 3.5 mm. long 1.7 mm. wide, thick, fleshy; upper petals 9.5 mm. long, 1.5 mm. wide, ligulate, the claw 3-nerved from the base, the limb obtuse, thick, fleshy; stamens equal, 5.2 mm. long; filaments ligulate, 1-

nerved; anthers 2.5 mm. long, ovoid in outline, the anther sacs narrowly ellipsoid, the connective distally bearing a projecting flat membrane, incurved and homologous to the prickle of the other species; ovary 3-11 mm. long, lanceoloid; style 3.5-4 mm. long, filiform; stigma lateral, orbicular; capsule 7 mm. long, lance-ovoid, the wide-spreading valves 1.5-1.8 mm. deep, the surface greenish, streaked with madder-brown, the veins scarcely evident; the only seed seen 3 mm. long, broadly oval in outline, 2.1 mm. wide, dull greenish.

TYPUS: Oahu, Mokuleia, Waianae Range, West Branch of East Makaleha Stream, in side gulch, elev. 1,820 ft., dark dryland slope forest of *Diospyros ferrea* var. *sandwicensis*, *Ceodes*, *Planchonella*, etc., my quadrat No. 7, 9-ft. tree, first branch 3 ft. from ground, crown open, flrs. greenish purple, Oct. 4, 1950, *William H. Hatheway* 398 (BISH), (st. lf. fl. fr.); isotypes sent to (F, NY, C. Skottsberg).

Superficially this species resembles *I. subsessilifolium* of Kauai, but there are several technical differences. It grows near the type

HAWAIIAN ISLANDS ASSEMBLED

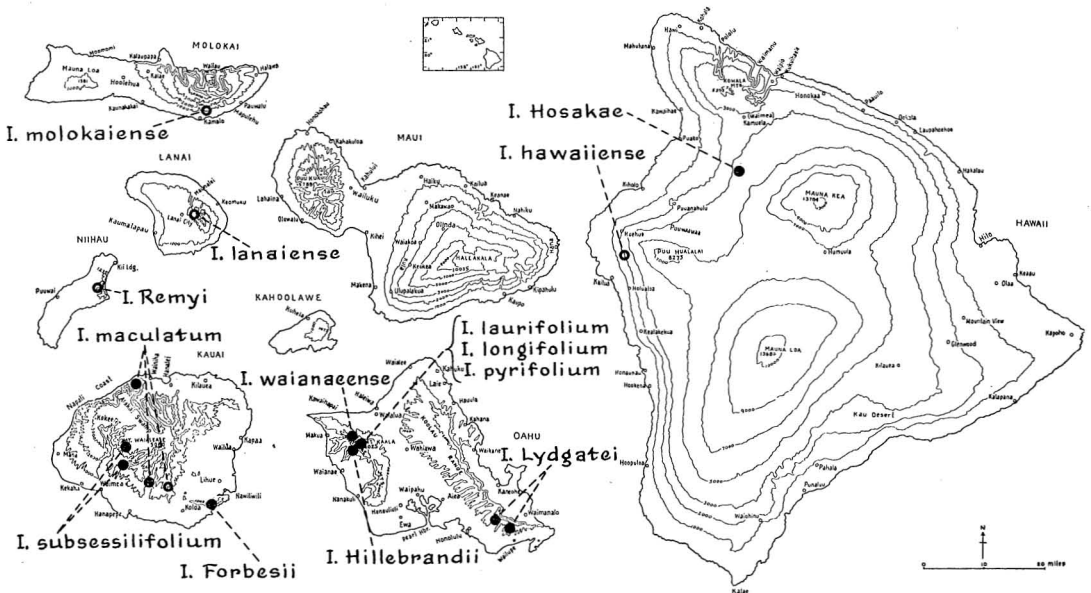


FIG. 15. Map of distribution of the species of *Isodendron*.

localities of *I. pyrifolium*, *I. longifolium*, *I. laurifolium*, and *I. Hillebrandii*, but this new species is found in a different valley on the east, or windward, side of the Mt. Kaala massif. Its foliage suggests that of *I. laurifolium*, but the characters of stipules, sepals, petals, and anthers are quite different.

The specific name is made from the name of the Waianae Mountains, and the Latin place suffix, *-ensis*.

Excluded Species

Isodendron Fauriei Lévl., Fedde Repert. Spec. Novarum Regni Veg. 11: 63, 1912.

This binomial had the generic name misspelled; it should have read *Isodendron*, the genus of Violaceae intended by Lévillé. His labels on the two isotypes in the Bishop Museum also have "*Isodendron*" in his handwriting. His 3-line diagnosis, brief, as was his custom, gave few characters. This diagnosis was worded so as to state the contrasting differences from "*I. pirifolio*" [= *I. pyrifolium* Gray]. It is certainly distinct from that, but so, too, is any alleged new species distinct if placed in the wrong family. Rock purchased a set of these Faurie collections from Lévillé (the ones now in the Bishop Museum), then published a critical review of Lévillé's work. He reduced *I. Fauriei* Lévl. to *I. pyrifolium* Gray. The two isotypes examined agree with the original description and positively are flowering specimens, from Molokai, of *Gouania Hillebrandii* Oliver in Hillebrand, Flora of the Hawaiian Islands 83, 1888, a member of the Rhamnaceae. This latter species was described from Maui, but now is known to occur also on Lanai and Molokai.

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