

## A New Living Species of *Gouania* (Rhamnaceae) on Oahu, Hawaiian Islands. Hawaiian Plant Studies 40<sup>1</sup>

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RECENTLY the writer published a monograph of the Hawaiian species of *Gouania* (1969). In it he recognized 14 species, of which 11 were surely extinct, not having been collected since 1886. Of the others, which may be extant, *G. Fauriei* (Lévl.) St. John was last collected in 1912; and *G. vitifolia* Gray was collected thrice at one locality in 1932. *G. Hillebrandi* Oliver, of west Maui, is known at only one locality, but in 1966 there were still several hundred plants, and it is definitely a living species.

To this small remnant of the genus is now added another living species. It was found by the entomologist W. C. Gagné and the botanist John Obata on a precipitous slope of a leeward ridge of the Waianae Mountains, Oahu. It is only at 810 to 820 meters altitude, but it is remote and the route up the dry brush-covered slope is such that it takes a determined mountaineer to get there. This new species is most closely related to *G. Oliveri* St. John, an extinct species that grew at the other end of the same mountain range.

### *Gouania Gagnei* sp. nov.

Figs. 1, 2

DIAGNOSIS HOLOTYPE: Frutex dilatatus 1.5 m altus est, ramulis 2-4 mm diametro mox glabratibus, novellis viridibus et adpresse fulvi-pilosulis, ramulis tarde cum fissuris longitudinalibus badiis, internodiis 6-15 mm longis, stipulis 3-3.5 mm longis anguste lanceolatis dense adpresse fulvi-pilosulis et quam foliis longinquiore persistentibus, cicatricibus foliorum 3 mm latis hemisphaericis sed apice concavo, petiolis 5-7 mm longis rubris gracilibus supra sulcatis adpresse minime pilosulis, laminis 5.7-7.4 cm longis 3.4-4.4 cm latis chartaceis ovatis sed ad apicem brevem obtusum deminuentibus basi

rotundata marginibus integris pagina supera obscure viridi glabra pagina inferiori pallide viridi glabra excepta midnervo adpresse pilosulo et nervis secundariis remote pilosulis, inflorescentiis in flore 6 cm longis, pedunculo 4.5 cm longo minute puberulo, pedicelis 7-12 mm longis minute puberulis, infructescentiis 7-9 cm longis, pedunculis 5-6 cm longis, pedicelis 7-12 mm longis, nodis cum bracteis 1.5-2.5 mm longis lanci-ovatis rubris et densiter adpresse badi-pilosulis, floribus monoecis, floribus in conditioni staminali in flore 7 mm diametro, tubo calycis 3.7 mm diametro fere rotato subviridi et minute adpresse albipilosulo, 5 lobis calycis rotatis albis crassis ovati-deltaeideis 2.4-2.5 mm longis 1.7 mm latis intra glabris extra sparse adpresse pilosulis ad apicem deltoideum incrassatum, petalis 1.4 mm longis albis spatulatis apice et marginibus cucullatis involutis et staminem inclusis, filamentis 0.7 mm longis subulatis, antheris 0.3-0.4 mm longis obcuneati-cordatis, disco 2.3 mm diametro viridi infra filamentis inciso in superficie papilloso, in centro cum 3 furcis styli ex forameni protrusis furcis 0.2 mm longis, stigmatibus capitatis parvis, floribus in conditioni feminali in flore 7 mm diametro rotatis 7 mm diametro, hypanthio 1.5 mm alto infundibuliformi viridi minute adpresse ascendente pilosulo, 5 lobis calycis 2.7-2.8 mm longis 1.8-2.1 mm latis albis crassis et cum ruga centrali ad apicem triangularem incrassatum intra glabris extra sparse adpresse pilosulis pilis badiscentibus, petalis 1.8 mm longis 0.5 mm latis quando plicatis albis spathulatis apice incurvato stamenes inclusis, filamenta 1.5 mm longa subulata, antheris 0.3 mm longis elliptico-oblongis, disco 2.5 mm diametro subcirculari sed infra filamentis incisus subviridibus facie concavo in centro stylo 0.5 mm longo papilloso ex forameni protruso, 3 furcis styli 0.7-0.8 mm longis divergentibus, stigmatibus subcapitatis, capsulis 3-lobatis et 3-alatis 14-16 mm longis suborbicularibus sed valde emarginatis et in

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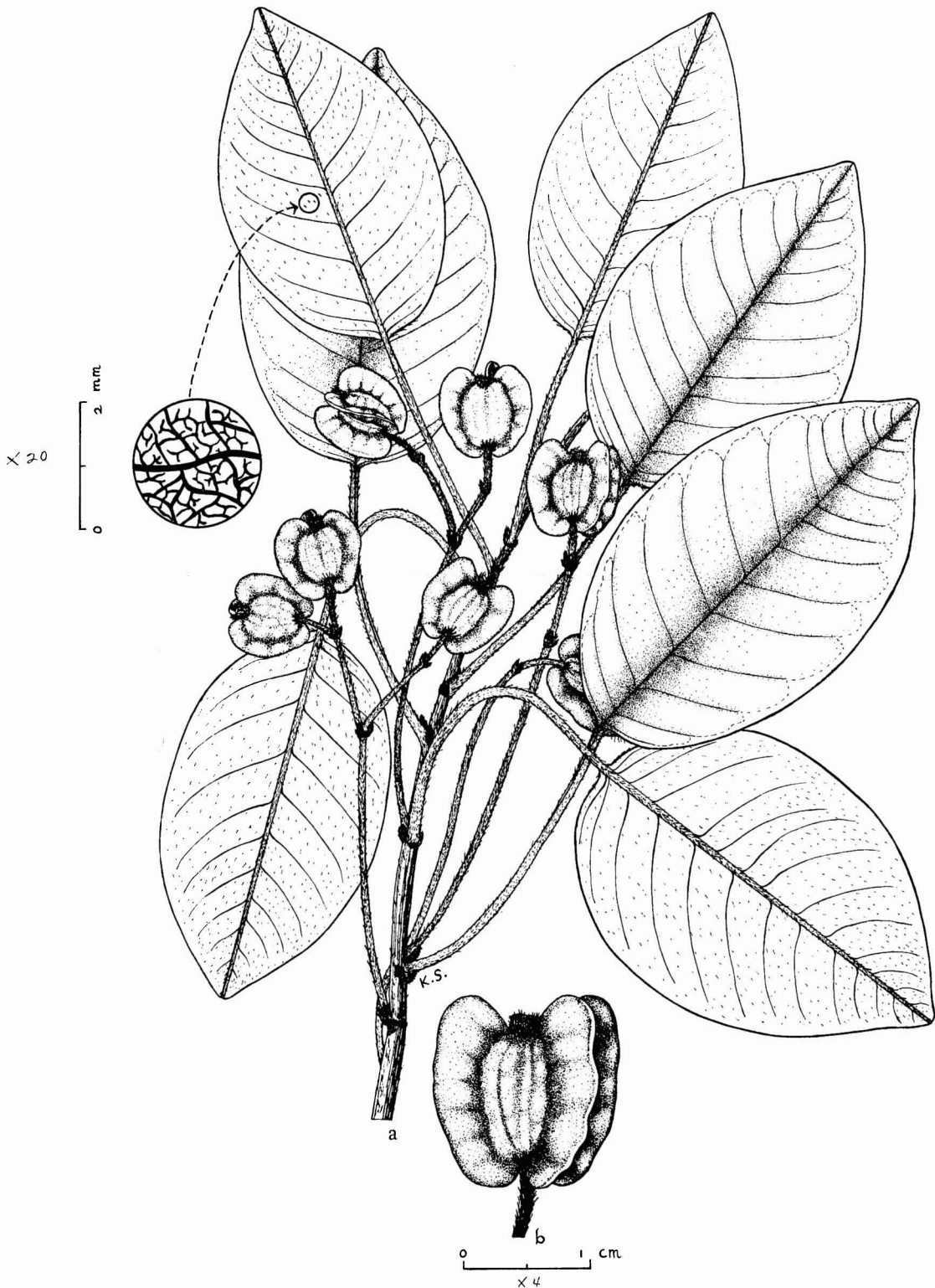


FIG. 1. *Gouania Gagnei* St. John, from holotype. *a*, habit, with fruit,  $\times 1$ ; *b*, fruit, lateral view,  $\times 2$ .

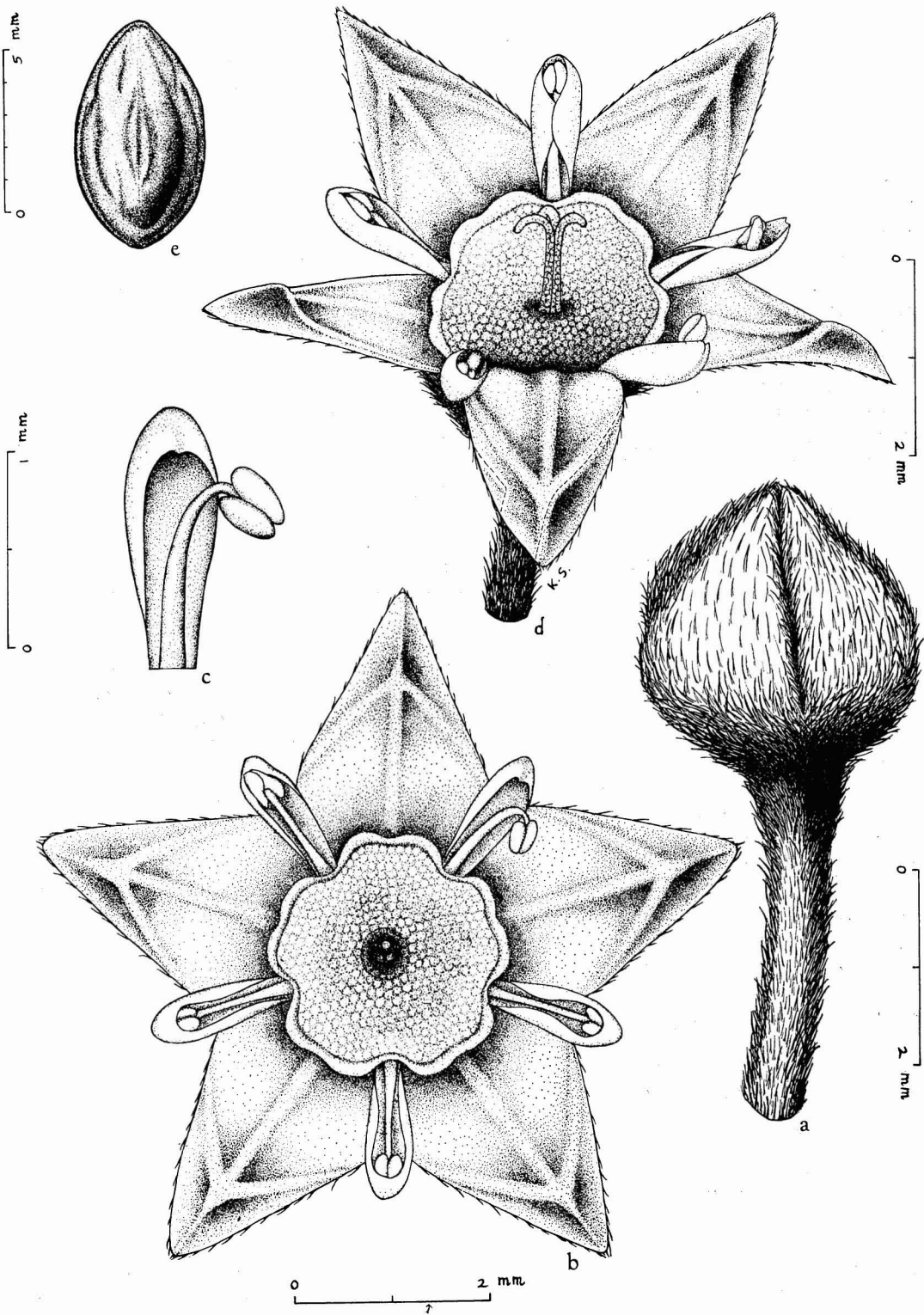


FIG. 2. *Gonania Gagnei* St. John, from holotype. *a*, bud,  $\times 15$ ; *b*, functionally staminate flower,  $\times 15$ ; *c*, its petal and stamen,  $\times 30$ ; *d*, functionally pistillate flower,  $\times 15$ ; *e*, seed,  $\times 5$ .

basi profunde cordatis glabris axili 10–12 mm longo, semine 6.5–6.8 mm longo 3.8 mm lato 1 mm crasso elliptico laevi lucido pallido tum badio pagina una fere plana altera cum ruga centrali.

DIAGNOSIS OF HOLOTYPE: Spreading shrub 1.5 m tall; branchlets 2–4 mm in diameter, early glabrate; young shoots green and appressed tawny pilosulous; branchlets later developing brown longitudinal fissures; internodes 6–15 mm long; stipules 3–3.5 mm long, narrowly lanceolate, densely appressed tawny pilosulous, persisting longer than the leaves; leaf scars 3 mm wide, hemispheric, but the upper side concave; petioles 5–7 cm long, red, slender, sulcate on the upper side, appressed fine pilosulous; blades 5.7–7.4 cm long, 3.4–4.4 cm wide, chartaceous, ovate, but narrowing to a short obtuse apex, the base rounded, the margins entire, the upper surface dark green, glabrous, the lower surface pale green, glabrous except for the appressed pilosulous midrib, and the secondaries which are remotely so; inflorescences in flower 6 cm long; peduncle 4.5 cm long, minutely puberulous; pedicels 7–12 mm long, minutely puberulous; infructescence 7–9 cm long; peduncles 5–6 cm long; pedicels 7–12 mm long; the nodes with lance-ovate bracts red and densely appressed brown pilosulous; flowers monoecious; functionally staminate flowers in anthesis rotate, 7 mm in diameter; calyx tube 3.7 mm in diameter, almost rotate, greenish and finely appressed white pilosulous; the 5 calyx lobes rotate, white, thick, ovate deltoid, 2.4–2.5 mm long, 1.7 mm wide, glabrous within, sparsely appressed pilosulous without, fleshy and towards the apex deltoid thickened; petals 1.4 mm long, white, spatulate, the apex and upper margins cucullate inrolled and enclosing the stamen; filament 0.7 mm long, subulate; anthers 0.3–0.4 mm long, obcuneate cordate; disk 2.3 mm in diameter, green, notched by each filament, the surface papillose, at the center with a hole through which the 3 style branches protrude, these 0.2 mm long; stigmas capitate, scarcely larger than the styles; functionally pistillate flowers in anthesis rotate, 7 mm in diameter, the hypanthium 1.5 mm high, funnelform, green, minutely appressed ascending, pilosul-

lous; the 5 calyx lobes 2.7–2.8 mm long, 1.8–2.1 mm wide, white, thick, fleshy, thickened with a central ridge leading to the triangular thickening near the apex, glabrous within, sparsely appressed pilosulous without, the hairs turning brown; petals 1.8 mm long, 0.5 mm wide as infolded, white, spatulate, the apex incurved but scarcely cucullate, enclosing the stamen; filament 1.5 mm long, subulate; anthers 0.3 mm long, elliptic oblong; disk 2.5 mm in diameter, subcircular but notched by each filament, greenish, the surface concave and with a central hole from which the style projects for 0.5 mm, its sides papillose, the 3 style forks 0.7–0.8 mm long, outcurving; the stigmas subcapitate; capsules 3-lobed and 3-winged, 14–16 mm long, suborbicular but deeply emarginate, at base narrowly but deeply cordate, glabrous, the center axis 10–12 mm long; seed 6.5–6.8 mm long, 3.8 mm wide, 1 mm thick, elliptic, pale, becoming brown, smooth, shining, one side nearly flat, the other rising to a low central ridge.

EXPANDED DESCRIPTION: Shrubs 0.5–1.5 m tall; internodes 2–15 mm long; older branches 4–5 mm in diameter, brown; leaf scars 2–3 mm wide; petioles 1.5–7 cm long; blades 2.6–7.4 cm long, 2–4.4 cm wide; infructescences 4–9 cm long; peduncles 1–6 cm long; pedicels 4–12 mm long; capsules 2–3-winged.

HOLOTYPE: Hawaiian Islands, Oahu Island, Waianae Mountains, w. tending side ridge off main ridge between Makaha and Waianae Kai Valleys, n. of Puu Kawiwi, beneath trees at base of pali on n. facing slope, with *Sida*, *Morinda trimera*, *Metrosideros polymorpha*, 810 m alt., 19 June 1972, Wayne C. Gagné & John Obata 637 (BISH).

SPECIMENS EXAMINED: Hawaiian Islands, Oahu Island, Waianae Mountains, Makaha-Waianae Kai ridge, same locality and data, on exposed ridge top, 820 m alt., Gagné & Obata 635 (BISH); ditto, crevice on face of pali, protected from prevailing winds, 815 m alt., Gagné & Obata 636 (BISH).

DISCUSSION: The two supplementary collections were from fully exposed, and half exposed

habitats. They show progressive degrees of dwarfing, due to the exposure.

*G. Gagnei* is most closely related to *G. Oliveri*, of Lihue, on the southeast slope of the Waianae Mountains, a species with the pedicels 1–4 mm long; calyx lobes 2–2.2 mm long; petals 1.4 mm long; filaments 1 mm long; anthers 0.5 mm long, cordate ovoid; capsules 11–12 mm long; seeds 5 mm long, 3 mm wide; stipules 2–4 mm long; petioles 1.5–4.4 cm long; blades below with the surface remotely appressed white puberulous. *G. Gagnei* has the pedicels 7–12 mm long; pistillate calyx lobes 2.7–2.8 mm long; petals 1.8 mm long; filaments 1.5 mm long; anthers 0.3 mm long, elliptic oblong; capsules 14–16 mm long; seeds 6.5–6.8 mm long, 3.8 mm

wide; stipules 3–3.5 mm long; petioles 1.5–7 cm long; blades below glabrous except for the appressed pilosulous midrib and secondary veins.

The new epithet is chosen to honor Wayne Charles Gagné (1942– ), Canadian entomologist, and research associate at the Bishop Museum, Honolulu.

#### LITERATURE CITED

- ST. JOHN, HAROLD. 1969. Monograph of the Hawaiian species of *Gouania* (Rhamnaceae). Hawaiian Plant Studies 34. Pacif. Sci. 23: 507–543, figs. 1–17*b*.