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Three additional species of *Peperomia* in Hawaii

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In 1933,¹ I presented a revision of the Hawaiian species of *Peperomia* which included 38 species and a number of varieties. Since the appearance of that publication, several collections not previously studied have been examined. In this material, one introduced and what are believed to be two hitherto undescribed species have been discovered, descriptions for which are presented in this paper.

***Peperomia pololuana*, new species (fig. 1).**

Caulis ascendentes usque ad 10 cm. alti, simplices aut subter ramosi, supra dense adpressi plus minusve crispe-pubescentes ad glabrescentes in veteribus inferioribus partibus, pili circiter 0.5 mm. longi. Folia opposita 1-1.7 cm. lata, usque ad 2.7 cm. longa, subter modice ad sparse adpresso-crispe-pubescentia, supra minuto alveolata, glabrescentia aut pubescentia ad nervos et ad basim, ovali-ovata, apice brevi-acuta, basi rotundi-obtusi, palmatin 5-nervia, petiolo 2-5 mm. longo, adpresso-pubescenti. Spicae terminales et axillares, usque ad 5.5 cm. longae, pedunculo circiter 1 cm. longo, adpresso-pubescenti aut glabrescenti; ovarium ovoideum, apice obliquo, stigmatibus subapice; fructus ovoideus, circiter 0.9 mm. longus.

Stems ascending up to 10 cm. in height from a decumbent, rooting base, 2 mm. thick when dry, simple or branching from the base, sparingly so above, densely appressed, more or less crisp-pubescent above to glabrescent in the older, lower parts, hairs about 0.5 mm. long, the internodes 1 cm. long above to 2 or more cm. long below. Leaves opposite, 1 to 1.7 cm. in width, up to 2.7 cm. in length, the lower surface moderately to sparingly appressed crisp-pubescent, the upper surface minutely alveolate, glabrescent or hairy at the base and along the nerves or throughout when young, sparingly ciliated toward the apex or marginal hairs none, oval-ovate, apex shortly acute, base rounded, obtuse, veins 5, palmate, or the innermost pair branching off the midrib within the lowermost 2 mm., the petioles 2 to 5 mm. long, appressed-pubescent. Spikes terminal and axillary, mostly solitary, up to 5.5 cm. in length, the peduncle

¹ Revision of the Hawaiian species of *Peperomia*, B. P. Bishop Mus., Bull. 112, 1933.

about 1 cm. long, appressed-pubescent to glabrescent, the bracts round-peltate, about 0.5 mm. in diameter, the ovary ovoid, apex oblique, stigma subapical, the fruit about 0.9 mm. long, ovoid, verrucose, viscid.

Hawaiian islands: Hawaii, Pololu Valley, rocks on side of waterfall along ditch trail, March 22, 1930, *Degener and Iwasaki 3886* (type, Bishop Museum).

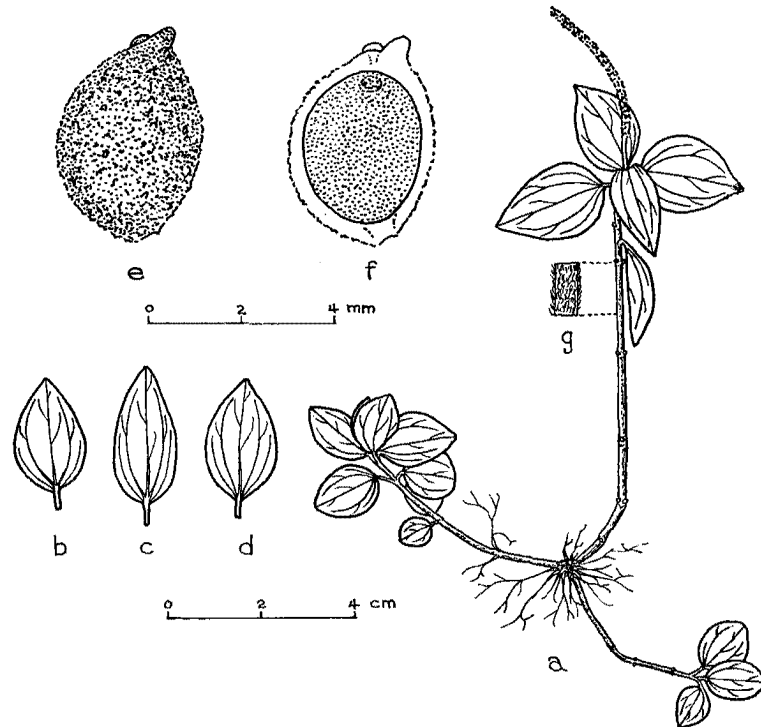


FIGURE 1.—*Peperomia pololuana*: a, plant; b-d, leaves, showing variation in size and shape; e, fruit; f, section of fruit; g, section of stem, enlarged.

This species is most closely allied to *P. Cookiana* DC. It appears to be sufficiently different, however, because of the more ovate and obtuse-based leaves, smaller plants with proportionately larger leaves (in *P. Cookiana* small plants have comparatively small leaves), more crisp, appressed, and mostly shorter pubescence, less branching and mostly single, terminal spikes. It is to be distinguished from *P. Remyi* DC because of its small size and more obtuse-based leaves.

***Peperomia kalihiana*, new species (fig. 2).**

Caulis ascendentes usque ad 20-30 cm. alti, glabri. Folia 3-6-verticillata, glabra, elliptico-oblongo-subovata, apice subacuta aut rotundata, basi brevifolia aut interdum obtusa, 5-plinervia, area inter nervos rubra, nervis flavis, petiolo plerumque 7-8 cm. longo, glabro. Spicae terminales et axillares, usque ad 4.5 cm. longae, pedunculo circiter 1 cm. longo, glabro; ovarium obovoideum aut turbinatum, stigmate apicali; fructus non visus.

Stems ascending 20-30 cm. in height from a decumbent base, rooting from the lowermost nodes up to 3 mm. in thickness in dry specimens, simple or with

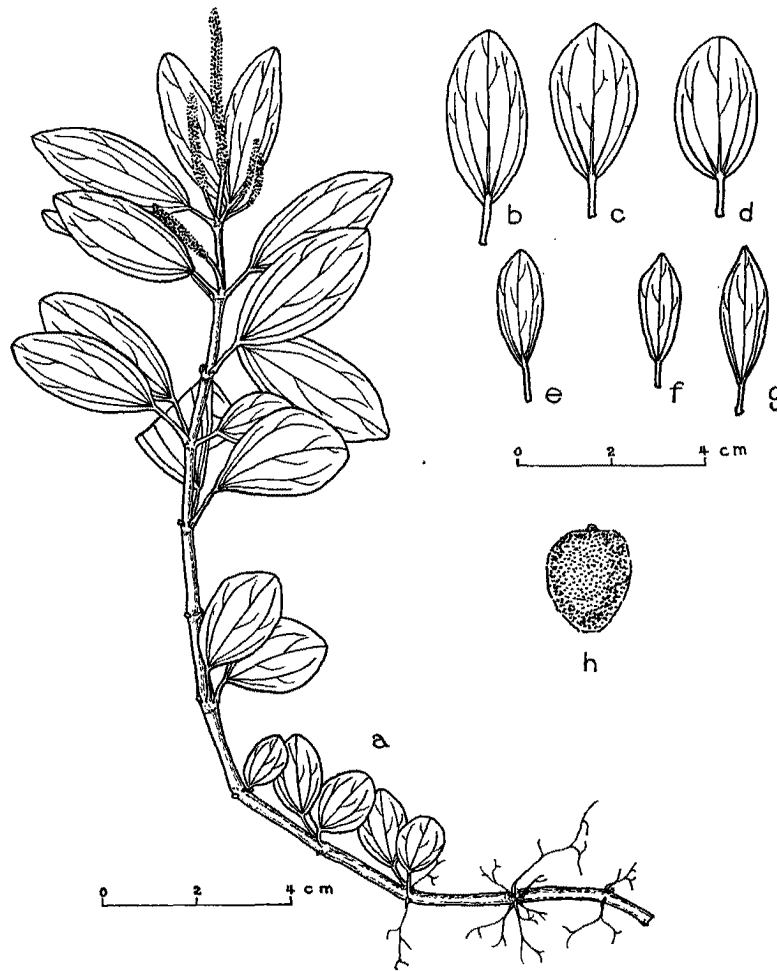


FIGURE 2.—*Peperomia kalihiana*: a, plant; b-g, leaves, showing variation in size and shape; h, ovary.

few divergent branches above, entirely glabrous (one stem examined had a few internodes sparingly pubescent with erect hairs 0.5 to 0.7 mm. in length), the internodes in young growth 1 to 2 cm. long, up to 4 to 6 cm. long below. Leaves mostly in whorls of 3, infrequently up to 6, glabrous, not ciliated, or rarely with a few hairs at the extreme apex when young, mostly 1 to 1.8 cm. in width and 2 to 3 or more rarely up to 4 cm. in length, some lower leaves smaller, 0.6 to 1.2 cm. wide and 1.2 to 1.7 cm. long, elliptic-oblong, subovate, apex rather bluntly acute or rounded, base shortly acute or less commonly obtuse, veins 5, the innermost pair branching off the midrib 2 to 4 mm. above the base, intercostal areas red beneath, nerves yellow, the petioles mostly 7 to 8 mm. long or some lower leaves with petioles up to 1.5 cm., glabrous. Spikes terminal and axillary, up to 4.5 cm. in length and 2.5 mm. in thickness, the peduncle about 1 cm. in length, glabrous, the bracts round-peltate, about 0.6 mm. in width, the anthers elliptic, on filaments about 0.3 mm. in length, the ovary obovoid or turbinate, the stigma appearing single, inconspicuous, apical. Fruit not seen.

Hawaiian islands: Oahu, Kalihi, left ridge, wet forest ridge to Puu Kahuauli, 600 m. altitude, Dec. 17, 1930, *E. P. Hume 167* (type, Bishop Museum).

No matured fruit is present on the plants examined, but from an examination of several ovaries it is believed that the fruit would have a double, apical stigma similar to that of *P. lilifolia* DC. The stigmas on young ovaries appear single, but longitudinal sections have shown some at least to be two-parted. This species on the basis of such fruit characteristics would, therefore, belong to the subgenus *Hawaiiana* where it seems to be most closely allied with *P. hawaiiensis* DC and *P. hypoleuca* Miq. The leaves of this species, however, are mostly in whorls of three or more, and the size, shape, and more obtusish base also serve to distinguish it from those species.

Peperomia pellucida (L.) HBK.: Nov. Gen. Sp. Pl. 1:64, 1815; Dahlstedt, Kongl. Sv. Vet. Akad., Handl., 33(2):16, tab. 1, fig. 1, 1900; Quisumbing, Philippine Journ. Sci. 43:218, fig. 117, 1930.

Piper pellucidum L.: Sp. Pl., 30, 1753.

This is an American species which has become widely distributed throughout the Tropics. It is, however, not common in Polynesia. The only other specimen which I have seen from that area was collected on the island of Upolu of the Samoan group by Eames in 1920. Quisumbing states that it is "common in the rainy season on and about damp walls in towns and now widely distributed in the Philippines." This is an easily recognized species because of its ovate to heart-shaped leaves, leaf-opposed, loosely-flowered spikes, and

longitudinally-grooved and costate fruit. The specimens in the collection cited below are much smaller than is characteristic for the species. The largest plant is nearly identical in size and appearance with the illustration given by Quisumbing which is less than half the usual size. The plants appear to agree in all other particulars with typical specimens of the species. It prefers a moist, shady habitat and given favorable conditions it is not improbable that this species will become permanently established in Hawaii.

Hawaiian islands: Oahu, Honolulu, Hawaiian Sugar Planters' Association nursery grounds on Vineyard St., "said to have appeared about 10 years ago. Now locally common and naturalized. Probably accidentally introduced from India with plants for reforestation." March 20, 1928, *O. Degener and H. Wiebke 2685.*