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REVISION OF
THE POLYNESIAN SPECIES
OF PEPEROMIA

BY
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Revision of the Polynesian Species of *Peperomia*

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INTRODUCTION

Polynesia as defined here includes those south Pacific islands lying east of Micronesia and Melanesia and extending from the Tongan and Samoan groups on the west to Pitcairn and Henderson islands on the east. The species occurring in the Hawaiian islands I have presented in a previous paper (B. P. Bishop Mus., Bull. 112, 1933), and they are not included in the present revision.

The genus *Peperomia* is widely distributed throughout Polynesia especially on the larger islands with moderate to high elevations. Some species as the widely distributed *P. leptostachya* appear to succeed well in moderately dry situations common at lower elevations, but most of the species prefer the moist, shady ravines and forests more common at higher altitudes. The plants are terrestrial or epiphytic although this character does not appear to be constant for many of the species.

Some species are to be found on more than one island but others appear to be restricted in their distribution to a single island. *P. pellucida* which is found in the Americas, the Philippine Islands and elsewhere is comparatively rare. *P. reflexa* which occurs in many varieties throughout the range of the genus is infrequent in Polynesia except in the Hawaiian islands where it is common and abundant. *P. leptostachya* is the commonest and most widely distributed of all the Polynesian species. This wide distribution is to be accounted for, to a large extent, by the fact that it is able to thrive under more adverse environmental conditions than are most of the other species.

More of the species exhibit leaves placed alternately than opposite or whorled, in contrast to the species in the Hawaiian islands of which only three have alternate leaves. One species, *P. raivavaeana*, develops some spikes in more or less paniculately branching clusters similar to some of the Fijian species. With the exception of *P. reflexa* and *P. pellucida*, the ovaries and fruit of all of the species included in this paper have the oblique apex and subapical stigmas characteristic of the subgenus *Sphaerocarpidium*.

The present paper includes 38 species, 22 varieties, and 1 form, of which 14 species, 13 varieties, and 1 form are described as new to science. With the exception of *P. pellucida* which has been figured by Quisumbing, and

P. leptostachya and *P. reflexa* previously figured by me, all of the species in this paper are illustrated.

With the exception of *Peperomia pellucida* described by Linnaeus as *Piper pellucidum* in 1753 and *Peperomia reflexa* described by Linnaeus f. as *Piper reflexum* in 1781, both widely distributed species, the first description of any Polynesian species was that of *Peperomia pallida* described by Forster f. as *Piper pallidum* in 1786. *Peperomia leptostachya* and *P. rhomboidea* were subsequently described by Hooker and Arnott in 1832 and *P. Endlicheri* by Miquel in 1843. Additional specimens were obtained by different collectors from time to time but for more than fifty years no new species were recognized. The large Reinecke (1893-94) and Rechinger (1905) collections made in Samoa brought to light several new species which were later described by O. Warburg and by C. de Candolle.

Within the last twenty years extensive collections have been made by a number of collectors in different parts of Polynesia most of which have been made under the auspices of Bernice P. Bishop Museum. A considerable part of the *Peperomia* specimens in this accumulated material had not been critically studied. Among the more important of these collections are those made by F. B. H. Brown in the Marquesas, Erling Christophersen in Samoa, J. W. Moore in Raiatea, M. L. Grant in the Society Islands, and Harold St. John and F. R. Fosberg in southeastern Polynesia. Many of the specimens collected by St. John and Fosberg on the Bernice P. Bishop Museum Mangarevan Expedition of 1934 were taken on islands from which *Peperomia* had not been previously reported and thus serve to extend the range of the genus.

All available collections of Polynesian species have been studied. Bernice P. Bishop Museum placed at my disposal all of its specimens and it is this large collection of material which has formed the basis of the present paper. Specimens collected by J. W. Moore and M. L. Grant under the auspices of Bishop Museum were loaned to me. Loans of types and other materials were made by the following herbaria: Barbey-Boissier, Berlin, University of California, de Candolle, Gray, Kew, U. S. National Museum, Philippine Bureau of Science, Stockholm, and Vienna. Dr. H. St. John made notes and obtained photographs of three critical types in the herbaria at the British Museum, at Paris, and at Geneva. I am greatly indebted and express my appreciation and thanks to all who have thus so generously aided me in making this study.

Genus PEPEROMIA Ruiz and Pavon

More or less fleshy, terrestrial or epiphytic herbs with prostrate or ascending to erect stems, up to 1 meter in length and 1 cm in thickness. Leaves

alternate, opposite, or whorled, hairy or smooth, petiolate, or rarely sessile, venation palmate, plinerved, or more or less pinnate. Spikes terminal, axillary, or leaf-opposed, unbranched, or in branching clusters of two or more spikes, flowers numerous, in the axils of peltate, subsessile, orbicular bracts, without perianth, stamens two, lateral, pistil one, stigma smooth or pilose, apical or more commonly subapical on the oblique apex of the ovary. Fruit mostly less than 1 mm in length, commonly verrucose and viscid.

Key to the Species

1. Rachis hirtellous38. *P. reflexa*
Rachis smooth (sparingly hirtellous in *P. rapensis*).....2
2. Fruit longitudinally ribbed, leaves ovate-cordate.....1. *P. pellucida*
Fruit verrucose but not longitudinally ribbed.....3
3. Leaves predominately alternate (rarely two leaves may occur at a node).....4
Leaves predominately opposite (rarely only one leaf may occur at a node).....38
4. Some spikes borne in the axils of reduced bract-like leaves to form a more
or less branching inflorescence.....2. *P. raivavaeana*
Spikes not as above.....5
5. Spikes shorter than the leaves (mostly 2-3 cm long), mostly two or more in
leaf axils along the stem, leaves 5-subplinerved.....3. *P. Reineckei*
Spikes mostly equaling or exceeding the leaves, mostly borne in the upper
part of the stem.....6
6. Leaves and stems glabrous (leaves may be marginally ciliated or with a few
short hairs at the extreme apex).....7
Leaves and (or) stems more or less hairy.....25
7. Leaves oval- or elliptic-obovate to spatulate, mostly widest above the middle
and less than two times as long as wide, apex rounded and obtuse or
somewhat acutish (some leaves of *P. raiateensis* are subovate).....8
Leaves elliptic or oval to ovate, mostly widest at or below the middle (some
leaves of *P. rhomboidea*, *boraborensis* and *lonchophylla* may be widest above
the middle), apex acute to acuminate, rarely obtusish.....15
8. Leaves mostly less than 2.5 cm long.....9
Leaves mostly 2.5 or more cm long.....11
9. Leaves ciliated above the middle.....9. *P. raiateensis*
Leaves not ciliated.....10
10. Leaves mostly 3-nerved, oval-obovate to spatulate, commonly 1.5-2 times as
long as wide, plant more or less repent, leaves drying moderately firm....
.....23. *P. Hombronii* variety *spatulimba*
Leaves mostly 5-nerved, oval-obovate, commonly less than 2 times as long as
wide, plant erect, leaves drying membranous.....8. *P. pitcairnsensis*
11. Peduncles mostly not more than 1.5 cm long (rarely up to 2 cm).....12
Peduncles up to 3 cm long, commonly 2-2.5 cm.....13
12. Leaves palmately nerved.....5. *P. australana*
Leaves subplinerved.....31. *P. Anderssonii*
13. Leaves mostly 3 cm or less long, drying firm and rigid, apex rounded, obtuse
.....7. *P. Endlicheri*
Leaves mostly larger and mostly drying more or less thin and membranous
(some leaves smaller and somewhat firm in *P. Rechingerae* variety *aopana*)....14
14. Leaves often somewhat attenuate, 5-7-nerved, nodes more or less swollen.....
.....6. *P. hendersonensis*
Leaves apically rounded, 5-nerved, often opposite, nodes not enlarged.....
.....32. *P. Rechingerae* varieties

15. Leaves mostly not much more than two times as long as wide (some leaves of <i>P. biformis</i> longer).....	16
Leaves mostly two to three times as long as wide.....	22
16. Plants more or less repent and rooting at the lower nodes.....	17
Plants erect or ascending from a briefly decumbent base.....	20
17. Leaves mostly less than 3.5 cm long, 3-nerved.....	24. <i>P. huahinensis</i> variety <i>tahaensis</i>
Leaves mostly more than 3.5 cm long, 5-nerved.....	18
18. Leaf base obtusish, leaves ovate-elliptic.....	15. <i>P. mniophila</i>
Leaf base acute.....	19
19. Leaves oval-elliptic.....	10. <i>P. boraborensis</i>
Leaves elliptic to elliptic-lanceolate.....	14. <i>P. biformis</i>
20. Petioles mostly 1-3 cm long.....	16. <i>P. Christophersenii</i>
Petioles mostly less than 1 cm long.....	21
21. Leaves mostly 4-5 cm long and 2.5-3 cm wide.....	17. <i>P. rhomboidea</i>
Leaves mostly less than 4 cm long.....	5. <i>P. australana</i> variety <i>ovalilimba</i>
22. Leaves 5-7-plinerved, nerves coalescing 5-10 mm above the base.....	13. <i>P. novemnervia</i>
Leaves palmately nerved or the nerves coalescing only in the lowermost 2-3 mm	23
23. Spikes about equaling or but little longer than the leaves, plants mostly not branching.....	24
Spikes up to 2 times as long as the leaves, plants branching.....	4. <i>P. rurutana</i>
24. Leaves elliptic-oblancheolate, mostly less than 2 cm wide.....	11. <i>P. lonchophylla</i>
Leaves elliptic-lanceolate, mostly 2-3 cm wide.....	12. <i>P. lonchophylloides</i>
25. Stems glabrous.....	26
Stems more or less hairy at least when young (may be glabrescent in <i>P. Grantii</i> and <i>oblancifolia</i>).....	27
26. Leaves hairy above along the nerves, acute to acuminate.....	18. <i>P. societatis</i>
Leaves glabrous, obovate-spatulate, obtuse.....	23. <i>P. Hombronii</i> variety <i>spatulimba</i>
27. Hairs moderately long (up to 0.5-1 mm or more long).....	28
Hairs short (less than 0.5 mm long).....	30
28. Plants more or less repent, often vine-like, leaves 3-5-subplinerved.....	26. <i>P. Grantii</i>
Plants erect or ascending, leaves palmately nerved.....	29
29. Leaves 2.5 cm or less long, oval-ovate to orbicular, hairs on stems about 0.5 mm long.....	27. <i>P. Fosbergii</i>
Leaves mostly much longer, hairs 0.5-3 mm long.....	37. <i>P. samoensis</i>
30. Leaves mostly at least 2 times as long as wide, acute.....	31
Leaves mostly less than 2 times as long as wide, obtusish.....	33
31. Plants repent.....	24. <i>P. huahinensis</i>
Plants erect or ascending.....	32
32. Leaves hirtellous on both surfaces, spikes mostly no longer than the leaves.....	19. <i>P. tutuilana</i>
Leaves hirtellous only at the base above, spikes mostly much longer than the leaves.....	20. <i>P. oblancifolia</i>
33. Peduncles up to 2-3 cm long.....	34
Peduncles mostly not more than 1.8 cm long.....	35
34. Plants mostly erect or ascending, tufted.....	21. <i>P. rapensis</i>
Plants repent, leaves obovate to spatulate.....	22. <i>P. Setchellii</i>
35. Plants more or less repent, at least below.....	37
Plants erect or ascending.....	36
36. Leaves mostly 2.5-4 cm long.....	5. <i>P. australana</i> variety <i>puberulenta</i>
Leaves mostly about 1 cm long.....	21. <i>P. rapensis</i> variety <i>minuticaulis</i>
37. Leaves elliptic to obovate or spatulate.....	23. <i>P. Hombronii</i>
Leaves oval to ovate.....	25. <i>P. Adamsonia</i>
38. Plants repent, rooting from the majority of nodes.....	39
Plants ascending or more or less erect, often tufted.....	42
39. Leaves less than 2 cm long.....	40
Leaves mostly more than 2 cm long.....	41

40. Stems and leaves glabrous, leaves thin and membranous.....29. *P. Wilderi*
 Stems and leaves more or less minutely hispidulous, leaves more rigid.....
30. *P. marchionensis*
41. Stems glabrous.....32. *P. Rechingerae* variety *subrepens*
 Stems hirsute.....36. *P. tahitensis*
42. Spikes less than 1.5 cm long, leaves 2 cm or less long subpinnately nerved
28. *P. St.-Johnii*
 Spikes mostly much longer, leaves commonly larger.....43
43. Plants glabrous44
 Plants more or less hairy.....47
44. Leaves more or less plinerved.....45
 Leaves palmately nerved.....46
45. Leaves elliptic-lanceolate, 7-9-plinerved, up to 10 cm long.....
13. *P. novemnervia* variety *verticillifolia*
 Leaves elliptic to oval-obovate, 3-5-subplinerved, up to 5 cm long..31. *P. Anderssonii*
46. Peduncles mostly 2-3 cm long.....32. *P. Rechingerae*
 Peduncles mostly not exceeding 1 cm (rarely up to 1.5 cm)..33. *P. pallida* varieties
47. Plants hirtellous or hispidulous, hairs mostly less than 0.5 mm long.....48
 Plants hirsute, hairs mostly 0.5-3 mm long.....37. *P. samoensis*
48. Stems and leaves minutely hispidulous, hairs mostly less than 0.1 mm long,
 leaves often alternate, peduncles usually 1.5-3 cm long.....21. *P. rapensis*
 Stems and leaves hirtellous, hairs longer, leaves mostly opposite, peduncles
 much shorter49
49. Leaves and stems moderately to sparingly hairy or glabrescent, spikes com-
 monly not much longer than the leaves (longer in some specimens of
P. abscondita)50
 Leaves and all parts of the plants mostly abundantly hairy, spikes mostly two
 or more times as long as the leaves.....35. *P. leptostachya*
50. Leaves mostly less than 3 cm long.....33. *P. pallida*
 Leaves mostly more than 3 cm (up to 5 cm) long.....34. *P. abscondita*

1. *Peperomia pellucida* (Linnaeus) Humbolt, Bonpland, and Kunth.

Peperomia pellucida (Linnaeus) Humboldt, Bonpland, and Kunth: Nov.

Gen. Sp. Pl., vol. 1, p. 64, 1815; Dahlstedt: Kongl. Sv. Vet. Akad.,

Handl., vol. 33, no. 2, p. 16, tab. 1, fig. 1, 1900; Quisumbing: Philippine

Journ. Sci., vol. 43, p. 218, fig. 117, 1930.

Piper pellucidum Linnaeus: Sp. Pl., p. 30, 1753.

Stems succulent, erect, up to 25 or more cm in height and 1.5 mm in thickness when dry, branching, glabrous, internodes up to 6 or more cm in length, but commonly somewhat shorter. Leaves alternate, glabrous, not ciliated, drying very thin and membranous, punctate with small translucent dots, broadly ovate-cordate, up to 3 cm in length and 2.8 in width, but mostly smaller, palmately 5- or 7-nerved, apex acute or more rarely rounded and obtuse, base mostly more or less cordate, less commonly truncated, petioles glabrous, up to 1.5 cm in length, mostly 5 to 10 mm. Spikes leaf-opposed and terminal, slender, up to 5 cm in length, loosely flowered, peduncles glabrous, mostly about 5 mm in length, bracts round, peltate, about 0.4 mm in width, filaments about equal to the ellipsoidal anthers, ovary ovoid, pointed, stigma apical, fruit about 0.75 mm in length, ovoid-globose, rostellate, longitudinally costulate, not viscid when dry.

Samoa: Upolu, near Apia, on old stumps and mounds, altitude 100 meters, February 16, 1921, Eames no. 16 (Bishop Museum).

This species is readily recognized by the shape and texture of the leaves and the striated, apically-pointed and non-viscid fruit. It is common in

tropical America and is widely distributed throughout the Tropics but does not appear to be frequent in Polynesia.

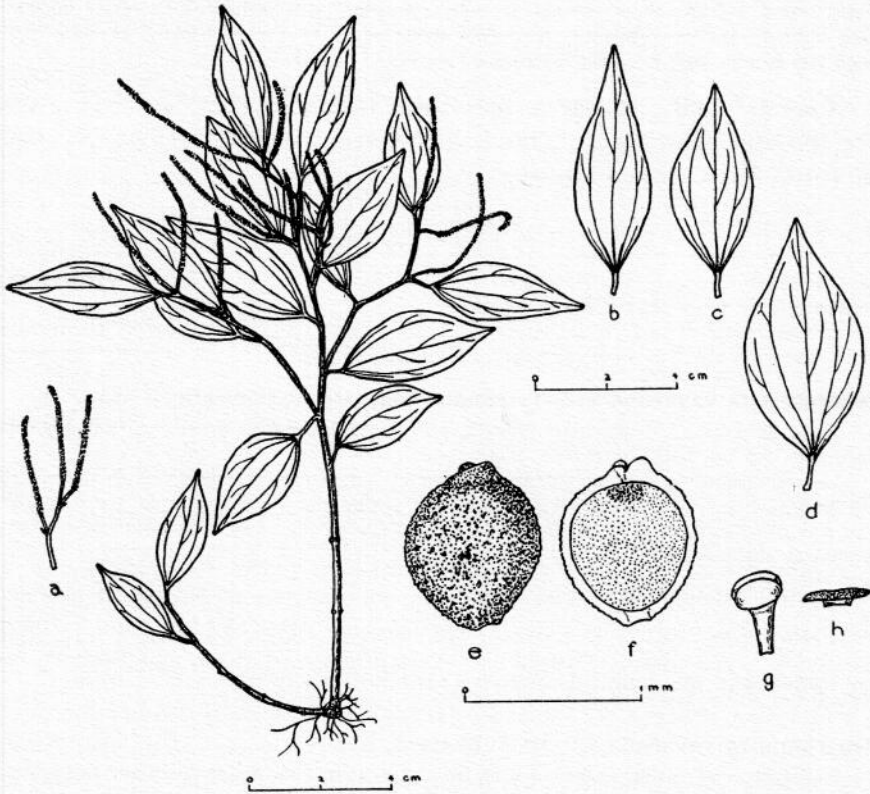


FIGURE 1.—*Peperomia raivavaeana* Yuncker: a, branching spike; b-c, leaves; d, leaf of variety *rimatarana*; e, fruit; f, section of fruit; g, stamen, enlarged; h, bract, enlarged.

2. *Peperomia raivavaeana*, new species (fig. 1).

Herbae epiphytae. Caules complures, erecti adscendesve, usque ad 15+ cm alti, glabri, internodis plerumque 1-2 cm longis. Folia alterna, glabra, non ciliata, elliptic-lanceolata aut folia inferiora elliptico-subovata, 3-5 cm longa, raro usque ad 6 cm longa, 1.3-2 cm lata, palmatim 3- aut 5-nervia, apice attenuate-acuminata, basi acuta ad subcuneatim, petiolo 3-7 cm longo, glabro. Spicae terminales axillaresque, sine ramis aut inflorescentes cum ramis paniculatis, usque ad 4 cm longae, pedunculo 3-5 mm longo, glabro, ovario obovoideo, apice obliquo, stigmatibus sub apice. Fructus circiter 0.9 mm longus, ovoideus.

Plants tufted, epiphytic, stems erect or ascending from a rooting base, up to 15 or more cm in height and 1.5 mm in thickness when dry, branching upwards, glabrous, internodes mostly 1 to 2 cm in length. Leaves alternate, glabrous, not ciliated, elliptic-lanceolate, or the lower leaves elliptic-subovate, 3 to 5 cm in length or rarely up to 6 cm, 1.3 to 2 cm in width, "thick, fleshy, dark green, shiny above, pale green beneath" when fresh, drying thin and membranous, not obviously punctate, palmately 3- or 5-nerved, apex attenuately acuminate, base acute to subcuneate, petioles 3 to 7 mm in length,

glabrous. Spikes axillary and terminal, unbranched or frequently in the axils of reduced, bract-like leaves forming paniculately branching inflorescences, spikes up to 4 cm in length, densely flowered, peduncles mostly 3 to 5 mm in length, glabrous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, punctate with yellow dots, ovary obovoid, apex oblique, stigma subapical, filaments about equal to the ellipsoidal anthers, fruit about 0.9 mm in length, ovoid, verrucose, viscid.

Austral Islands: Raivavae, pass west of Mount Hiro, on erect mossy tree trunk in moist forest, altitude 320 meters, August 11, 1934, St. John no. 16160 (type, Bishop Museum).

Key to the Varieties

Leaves mostly 2 cm or less in width..... *P. raivavaeana*
 Leaves mostly more than 2 cm in width.
 Leaves mostly 4 to 7 cm in length..... variety *rimatarana*
 Leaves mostly 3 to 4 cm in length..... variety *tubuaiana*

Peperomia raivavaeana variety *rimatarana*, new variety (fig. 1, *d*).

Folia elliptica ad ovata aut subovata, basi acuta, palmatim nervia aut subplinervia, plerumque 4-7 cm longa et 2-3 cm lata.

Leaves elliptic to oval or subovate, palmately nerved or commonly with the midrib and innermost pair of lateral nerves coalescing within the lowermost 2 or 3 mm, mostly 4 to 7 cm in length, 2 to 3 cm in width, punctate with fine dots, base acute. Otherwise similar to the species.

Austral Islands: Rimatara, Anapoto, on branches in woods on elevated dissected coral, altitude 8 meters, September 4, 1934, St. John and Fosberg no. 16889 (type, Bishop Museum); same locality, St. John and Fosberg no. 16843 (Bishop Museum).

Peperomia raivavaeana variety *tubuaiana*, new variety.

Folia ovata ad ovata, usque ad 5 cm longa et 3 cm lata, apice acuto aut sub obtuso, basi obtusa ad acuta. Spicae usque ad 8 cm longae.

Stems finely punctate with dark colored dots. Leaves ovate to oval, up to 5 cm in length and 3 cm in width, but mostly smaller, apex acute or obtusish, base obtuse to acute, punctate with small, light-colored dots. Spikes up to 8 cm in length. Otherwise similar to the species.

Austral Islands: Tubuai, southwest ridge of Taitaa, on mossy tree branch in upper woods, altitude 340 meters, August 20, 1934, St. John no. 16473 (type, Bishop Museum); northeast slope of Taitaa, deep crevice in basalt cliffs, "leaves fleshy, thick, above dark green, shiny, beneath pale green, the veins evident," altitude 380 meters, August 20, 1934, St. John no. 16435 (Bishop Museum).

3. *Peperomia Reineckeae* C. de Candolle (fig. 2).

Peperomia Reineckeae C. de Candolle: Fl. Deutsch. Schutzgebiet Südsee, Schumann and Lauterbach, p. 254, 1901.

Peperomia parvispica C. de Candolle: in Rechinger Ergebn., pt. 3, p. 267, 1910.

Stems erect or more commonly ascending from a prostrate, rooting base, up to 30 or more cm in height and 3 mm in thickness near the base when dry, commonly more or less branched, glabrous, internodes 1 to 2 cm in length above, up to 8 cm in length in the lower part of the stem. Leaves alternate, glabrous, mostly more or less ciliated towards the apex, drying membranous, more or less punctate with pellucid dots, elliptic, elliptic-lanceolate, or more rarely some leaves subovate or subobovate, 3 to 11 cm in length and 1 to 4.5 cm in width, mostly 4 to 6 cm in length and 2 to 2.5 cm in width,

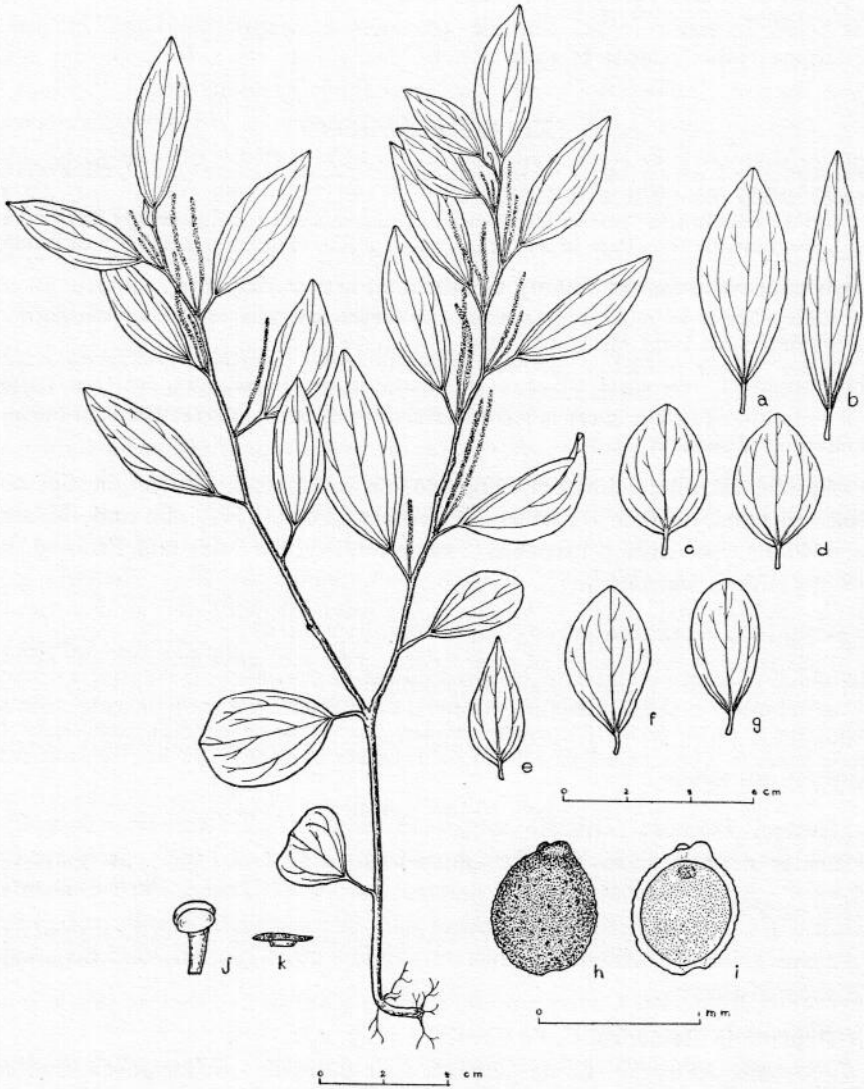


FIGURE 2.—*Peperomia Reineckei* de Candolle: a-b, leaves; c-d, leaves of variety *umbricola*; e, leaf of variety *glabrior*; f-g, leaves of variety *obovatifolia*; h, fruit; i, section of fruit; j, stamen, enlarged; k, bract, enlarged.

5-subplinerved, the innermost pair of nerves coalescing with the midrib in the lowermost 1 to 3 mm, or some large leaves 7-nerved, apex acute to acuminate, or the lower leaves obtuse, base acute, petioles 5 to 10 mm in length, glabrous, leaf scars semicircular. Spikes numerous, commonly borne in clusters of 2 or 3 in the majority of the leaf axils, mostly 2 to 3 cm in length, rarely up to 6 cm, moderately flowered, peduncles slender, glabrous, 5 to 10 mm in length, rarely up to 2 cm, rachis glabrous, bracts round, peltate, about 0.5 mm in width, filaments about equaling the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical, fruit about 0.8 mm in length, globose-ovoid, verrucose, viscid, eventually on pseudopedicels.

Samoa: Savaii, altitude 1300 meters, September 1894, Reinecke no. 434 (type, Berlin; Barbey-Boissier); "in pelvi fluvii exsiccati prope Patamea," July 1905, K. and L. Rechinger no. 80 (Vienna); "in silvis primaevis montis Maungaafi in terra," altitude about 1500 meters, July 1905, K. and L. Rechinger no. 1880 (Vienna); "in muris prope pagum Asau," July 1905, K. and L. Rechinger no. 101 (Vienna); above Salailua, in wet forest, altitude 1200-1300 meters, September 23, 1931, Christophersen no. 2754 (Bishop Museum); same location, in wet forest on fallen log, altitude about 900 meters, September 22, 1931, Christophersen no. 2701 (Bishop Museum); Le To, on rotten log in wet forest, altitude 750 meters, October 21, 1931, Christophersen no. 2894 (Bishop Museum); above Salailua, on tree trunk in wet forest, altitude about 1400 meters, November 7, 1931, Christophersen no. 3122 (Bishop Museum); above Sili, on rotten tree trunk in medium wet forest, altitude about 300 meters, November 11, 1931, Christophersen no. 3267 (Bishop Museum); Upolu: "Wälder bei Tiavi," May 26, 1905, K. and L. Rechinger no. 364 (Vienna); "bei Lauili," June 12, 1905, K. and L. Rechinger no. 194 (Vienna); Küstengebiet, September 1893, Reinecke no. 40 (U. S. National; Barbey-Boissier); "in silvis prope Tiavi, in umbrosis," May 1905, K. and L. Rechinger no. 427 (type of *P. parvispica*, Vienna); Malololelei-Lanutoo, epiphyte in forest, altitude 700 meters, August 5, 1929, Christophersen no. 43 (Bishop Museum); epiphyte, in forest on ridge above Malololelei, altitude 670 meters, August 5, 1929, Christophersen no. 3 (Bishop Museum).

Key to the Varieties

- Leaves elliptic
 Leaves mostly 4 to 6 cm (up to 11 cm) in length.....**P. Reineckei**
 Leaves mostly 3 to 4 cm in length.....variety **glabrior**
 Leaves not elliptic
 Leaves ovate, elliptic-ovate, or oval-ovate.....variety **umbricola**
 Leaves obovate or elliptic obovate.....variety **obovatifolia**

Peperomia Reineckei C. de Candolle variety **glabrior** (C. de Candolle), new combination (fig. 2, e).

Peperomia umbricola variety *glabrior* C. de Candolle: in Rechinger Ergebn. pt. 3, p. 94, 1910.

Leaves elliptic, elliptic-lanceolate, or sub-ovate, somewhat ciliated, mostly 3 to 4 cm in length and 1 to 2 cm in width.

Samoa: Upolu, "in silvestris prope Tiavi," May 26, 1905, K. and L. Rechinger, without number (type of *P. umbricola* variety *glabrior*, Vienna); Savaii, above Salailua, climbing on tree trunk in wet forest, altitude about 1,450 meters, November 6, 1931, Christophersen no. 3109 (Bishop Museum).

Peperomia Reineckei C. de Candolle variety **umbricola**, new combination (fig. 2, *c-d*).

Peperomia umbricola C. de Candolle: in Rechinger *Ergebn.*, pt. 3, p. 94, 1910.

Leaves elliptic-ovate, oval, rarely obovate, or the lower leaves ovate or suborbicular, mostly 2.5 to 4 cm in length and 1.5 to 3 cm in width, base obtuse to acute, apex sub-acute or obtuse.

Samoa: Upolu, "in silvis primaevae partis superioris montis Lanutoo," August 1905, K. and L. Rechinger no. 2510 (type of *P. umbricola*, Vienna); Savaii, above Aopo, 1902 lava field, in shrubbery, altitude 1200-1400 meters, October 7, 1929, Christophersen no. 898 (Bishop Museum); above Matavanu, in wet forest, altitude about 1500 meters, July 30, 1931, Christophersen and Hume no. 2220 (Bishop Museum); same locality, altitude about 1300 meters, July 24, 1931, Christophersen and Hume no. 2132 (Bishop Museum).

Peperomia Reineckei C. de Candolle variety **obovatifolia**, new variety (fig. 2, *f-g*).

Folia 4-6 cm longa et 2.4-3 cm lata, elliptico-obovata, sparse ciliata aut utrinque glabra, apice acuto ad obtuso.

Leaves 4 to 6 cm in length, 2.5 to 3 cm in width, elliptic-obovate, sparingly ciliated or entirely glabrous, apex acute to obtuse.

Samoa: Upolu, in wet rain forest, altitude 660 meters, April 27, 1924, Bryan no. 102 (type, Bishop Museum).

The ovate to elliptic or obovate, glabrous, more or less ciliated and mostly subplinnerved leaves and especially the numerous spikes, which are shorter than the leaves, distinguished this common Samoan species. Considerable variation in the size and shape of the leaves is common on the same plant. De Candolle described *P. parvispica* as having apical stigmas, but I find the stigmas in the type collection of that species to be the same as in *P. Reineckei*, nor am I able to distinguish them otherwise. *P. umbricola* differs from *P. Reineckei* only in the shape of the leaves and it seems best to reduce it to varietal rank under that species. The same is true of *P. umbricola* variety *glabrior* which is a small-leaved variety with less ciliation than is common for the species. In the extremes the different varieties are quite distinct. In the abundant material collected by Christophersen, however, are specimens with intermediate characteristics which suggest close relationship and which have prompted me to unite under one species plants considered as specifically distinct by de Candolle.

4. *Peperomia rurutana*, new species (fig. 3).

Herbae terrestres. Caules complures, adscendentes, usque ad 20+ cm alti, ramosi, glabri, internodis usque ad 3 cm longis, plerumque 1-2 cm. Folia alterna, glabra, non ciliata, elliptica ad plus minusve oblongo-lanceolata aut auboblanceolata, 3-6 cm longa, et 1.2-2.5 cm lata, plerumque 4.5-6 cm longa et 1.5-2 cm lata, palmatim 5- aut 7-nervia aut raro subplinervia, apice attenuate-acuto, basi acuta ad cuneatam, petiolo plerumque 3-5 mm longo, glabro. Spicae terminales axillaresque, graciles, usque ad 11 cm longae, pedunculo circum 5 mm longo, glabro, ovario obovoideo, apice obliquo, stigmatibus sub apice. Fructus circum 0.9 mm longus, ovoideus.

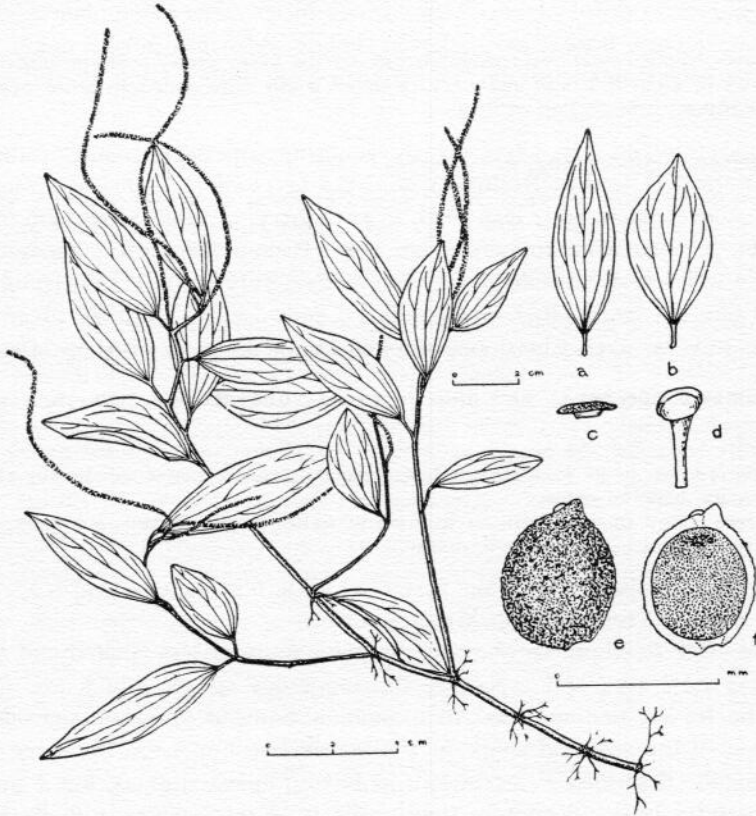


FIGURE 3.—*Peperomia rurutana* Yuncker: a-b, leaves; c, bract, enlarged; d, stamen, enlarged; e, fruit; f, section of fruit.

Plants terrestrial, stems tufted, ascending from a decumbent, rooting base, up to 20 or more cm in height and 1.5 mm in thickness when dry, branching, glabrous, internodes up to 3 cm in length, mostly 1 to 2 cm. Leaves alternate, glabrous, not ciliated, elliptic to more or less oblong-lanceolate or rarely suboblanceolate, 3 to 6 cm in length and 1.2 to 2.5 cm in width, mostly 4.5 to 6 cm in length and 1.5 to 2 cm in width, drying thin and more or less membranous, punctate with very minute dark-colored dots, palmately 5- or 7-nerved, in large leaves the innermost nerves may coalesce with the midrib in the lowermost 2 to 3 mm, apex attenuately and in some leaves more or less obliquely acute, base acute to cuneate, petioles mostly 3 to 5 mm in length, glabrous. Spikes axillary

and terminal, very slender, up to 11 cm in length, moderately to loosely flowered, peduncle about 5 mm in length, glabrous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, punctate with yellow dots, filaments longer than the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical, fruit about 0.9 mm in length, ovoid, verrucose, viscid.

Austral Islands: Rurutu, Teanapapa, in shaded crevices of dissected limestone, altitude 10 meters, August 29, 1934, St. John no. 16729 (type, Bishop Museum).

This species differs from *P. australana* in its more elliptic-lanceolate and attenuately acute leaves, more slender spikes which are mostly much longer than the leaves and with shorter peduncles. It differs from *P. raivavaeana* in its longer unbranched spikes.

5. *Peperomia australana*, new species (fig. 4).

Herbae terrestres aut epiphytae. Caules complures, erecti aut adscentes usque ad 30 + cm alti, glabri, copiose ramosi, internodes usque ad 4 cm longis. Folia alterna aut superiora folia interdum opposita, glabra, non ciliata, elliptica aut ovalo-obovata ad spatulata, usque ad 6 cm longa et 2.5 cm lata, plerumque 3-4.5 cm longa et 1.5-2.5 cm lata, palmatim 5-nervia, apice breviter acuto aut sub obtuso, basi acuta ad cuneatam, petiolo usque ad 1 cm longo. Spicae terminales axillaresque, usque ad 7 cm longae, pedunculo circum 1 cm longo, raro usque ad 2 cm, glabro, ovario obovoideo, apice obliquo, stigmatibus sub apice, piloso. Fructus globoso-ovoideus, circum 0.9 mm longus.

Plants generally tufted, with stems erect or ascending from a rooting base up to 30 or more cm in height and 3 mm in thickness near the base when dry, entirely glabrous, abundantly branching, the lowermost branches often substoloniferous and rooting at the nodes, internodes up to 4 cm in length, but mostly somewhat shorter. Leaves alternate but with the uppermost leaves not uncommonly opposite, glabrous, not ciliated, "fleshy, dark green, shiny above, whitish-green beneath" when fresh, elliptic- or oval-obovate to spatulate, up to 6 cm in length and 2.5 cm in width, commonly 3 to 4.5 cm in length and 1.5 to 2.5 cm in width, palmately 5-nerved, veiny, the midrib and the innermost pair of lateral nerves obvious, the outermost pair slender and inconspicuous, apex briefly acute or obtusish, base acute to cuneate, petioles up to 1 cm in length, mostly about 7 mm. Spikes terminal or in the uppermost leaf axils, commonly in umbellate clusters of two or three, up to 7 cm in length, moderately flowered, peduncles about 1 cm in length, or rarely up to 2 cm, glabrous, rachis glabrous, bracts round, peltate, punctate with dark colored dots, about 0.5 mm in width, filaments about equaling the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical, pilose with short hairs, fruit globose-ovoid, about 0.9 mm in length, verrucose, viscid.

Austral Islands: Raivavae, south side of Mount Araua, on mossy tree trunk, altitude 250 meters, August 14, 1934, St. John no. 16200 (type, Bishop Museum); Rimatara, Anapoto, on shaded dissected coral ledges, altitude 5 meters, September 4, 1934, St. John and Fosberg no. 16879 (Bishop Museum); Tubuai, Taitaa, northeast slope, basalt rocks in dense upper woods, altitude 300 meters, August 16, 1934, St. John no. 16329 (Bishop Museum).

Peperomia australana variety *ovalilimba*, new variety (fig. 4, d).

Folia plerumque 3-4 cm longa et 2-3 cm lata, ovalia ad subobovata. Spicae plerumque terminales, raro axillaresque.

Leaves mostly 3 to 4 cm in length and 2 to 3 cm in width, oval to subobovate, spikes mostly terminal, rarely in the axils of the upper leaves.

Austral Islands: Raivavae, south side of pass, south of Raiurua, on rocks in dense woods, altitude 75 meters, August 3, 1934, St. John and Fosberg no. 15811, in part (type, Bishop Museum).

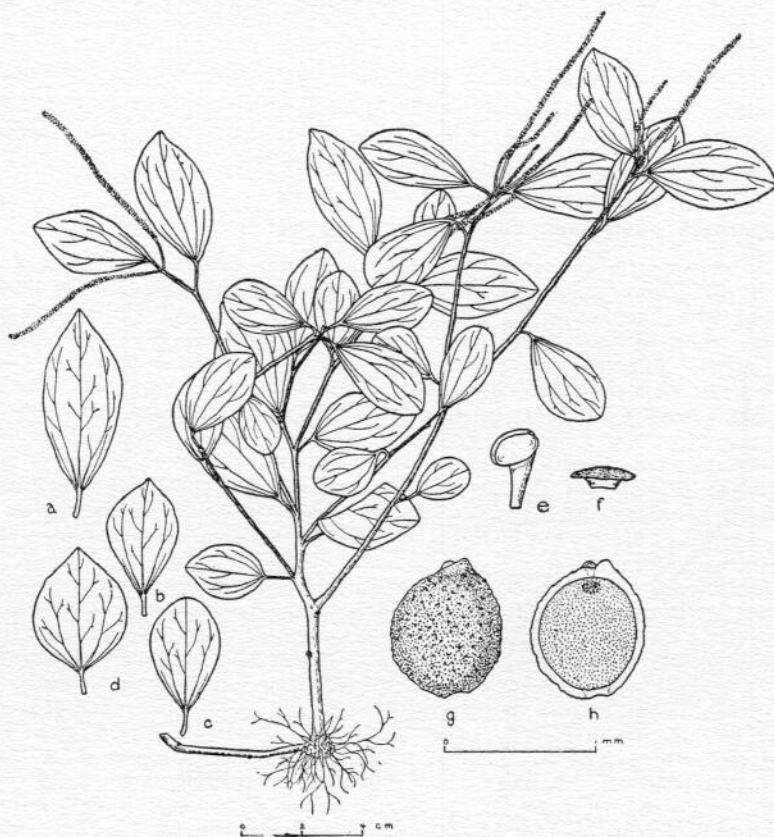


FIGURE 4.—*Peperomia australana* Yuncker: *a-c*, leaves; *d*, leaf of variety *ovalilimba*; *e*, stamen, enlarged; *f*, bract, enlarged; *g*, fruit; *h*, section of fruit.

***Peperomia australana* variety *ovalilimba* forma *puberulenta*, new form.**

Caules, pedunculi, petioli, et folia subter minute pubescentes.

Stems, peduncles, petioles and the lower surface of the leaves minutely puberulent. Otherwise entirely similar to variety *ovalilimba*.

Austral Islands: Raivavae, south side of pass, south of Raiurua, on rocks in dense woods, altitude 75 meters, August 3, 1934, St. John and Fosberg no. 15811, in part, mixed with variety *ovalilimba* (type, Bishop Museum).

6. *Peperomia hendersonensis*, new species (fig. 5).

Caules e basi breviter decumbentes aut erecti, adscentes usque ad 30+ cm alti, ramosi, glabri, internodis usque ad 7 cm longis, plerumque 2-3 cm longis, nodis plus minusve tumidis et turgidis. Folia alterna, glabra, non ciliata, ovali-obovata ad sub-orbiculata, usque ad 7 cm longa et 4 cm lata, plerumque 3-5 cm longa et 2-3 cm lata, palmatim 5- aut 7-nervia, apice rotundo, obtuso aut breviter attenuato et subacuto, basi

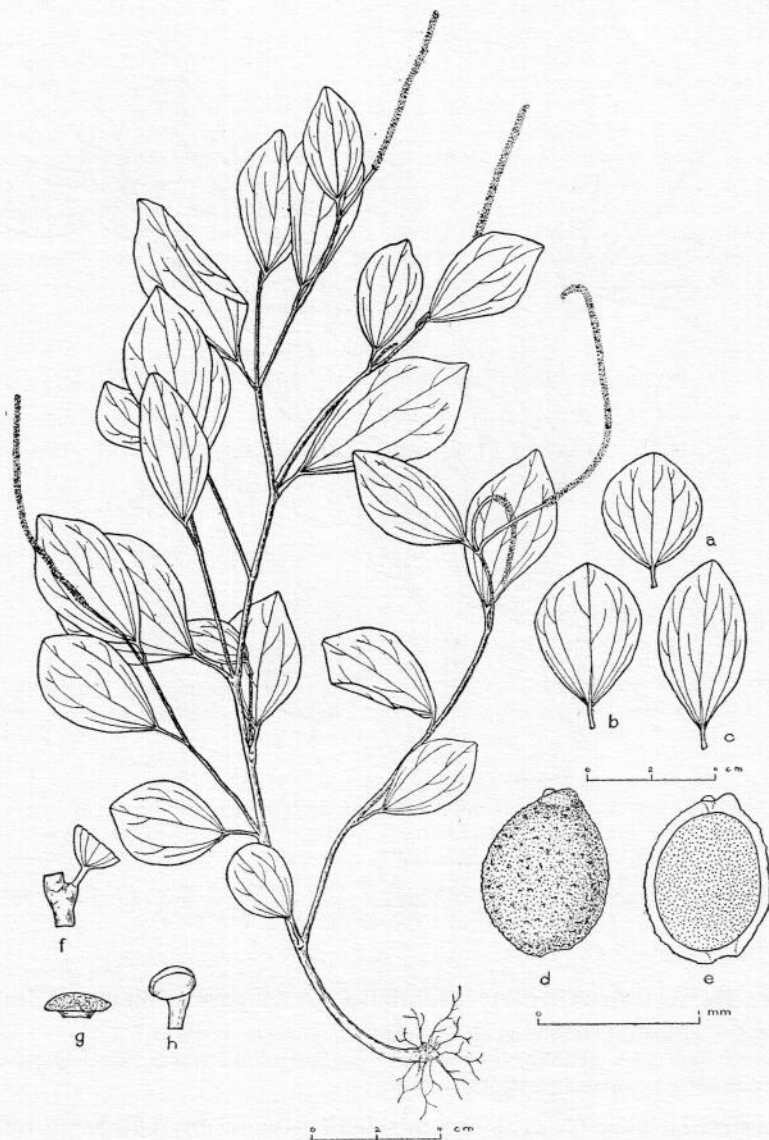


FIGURE 5.—*Peperomia hendersonensis* Yuncker: a-c, leaves; d, fruit; e, section of fruit; f, node, enlarged; g, bract, enlarged; h, stamen, enlarged.

acuta ad cuneatam, petiolo 5-8 mm longo, glabro. Spicae terminales aut folio-opposita, raro axillaresque, usque ad 15 cm longae, plerumque 6-10 cm, pedunculo plerumque 2-3 cm longo, glabro, ovario obovoideo-turbinato, apice obliquo, stigmatate sub apice. Fructus circum 1 mm longus, ovoideo-glabosus.

Stems suberect or ascending from a briefly decumbent base, up to 30 or more cm in height and 5 mm in thickness near the base when dry, branching upwards, glabrous, internodes from 1 cm in length above up to 7 cm below, mostly 2 to 3 cm in length, nodes mostly more or less enlarged and turgid. Leaves alternate, glabrous, not ciliated, "fleshy, dark shiny green above, pale green beneath, veins often reddened" when fresh, drying rather thin and membranous, punctate with dark to pellucid dots, oval-obovate to suborbicular, up to 7 cm in length and 4 cm in width, mostly 3 to 5 cm in length and 2 to 3 cm in width, palmately 5- or 7-nerved, the outer nerves often forking low, veinlets numerous, anastomosing, apex rounded, obtuse, or briefly attenuate and acutish, base acute to cuneate, petioles 5 to 8 mm in length, glabrous. Spikes terminal or leaf-opposed, uncommonly axillary, up to 15 cm in length but mostly 6 to 10 cm, moderately to loosely flowered, peduncles mostly 2 to 3 cm in length, glabrous, rachis glabrous, bracts round, peltate, punctate with yellow dots, about 0.6 mm in width, filaments about equaling the ellipsoidal anthers, ovary obovoid-turbinate, apex oblique, stigma subapical, fruit about 1 mm in length, ovoid-globose, apex oblique, stigma subapical, verrucose, viscid.

Henderson Island: north end, on moist, shaded, dissected coral, altitude 5 meters, June 17, 1934, St. John and Fosberg no. 15090 (type, Bishop Museum); north center, on mossy log, in jungle, on elevated dissected coral, altitude 30 meters, June 20, 1934, St. John and Fosberg no. 15153 (Bishop Museum).

The turgid nodes, elongated peduncles and spikes distinguish this species.

7. *Peperomia Endlicheri* Miquel (fig. 6).

Peperomia Endlicheri Miquel: Syst. Piper., p. 102, 1843.

Plants fleshy, stems erect, up to 18 or more cm in height and 3 mm in thickness near the base when dry, glabrous, unbranched, internodes mostly 1 to 2 cm in length. Leaves alternate or sometimes opposite below, glabrous, not ciliated, oval-obovate, drying firm and rigid, 2.5 to 3.2 cm in length, about 2 cm in width, palmately 3- or 5-nerved, the midrib prominent, the lateral nerves obscure, apex rounded, obtuse, base acute, petiole thick, about 3 mm in length, glabrous. Spikes axillary and terminal, up to 7 cm in length, moderately flowered, peduncles about 2 cm in length, glabrous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, punctate with yellow dots, anthers ellipsoidal, ovary obovoid, apex slightly oblique, stigma single or divided, subapical, pilose with short hairs, fruit about 0.8 mm in length, globose-ovoid, verrucose, viscid.

Samoa: Savaii, Papa'afu, rim of crater, low forest, altitude 1500 meters, September 22, 1931, Christophersen no. 2735 (Bishop Museum); "in silvis prope Aopo", July 1905, K. and L. Rechinger no. 1894 (Vienna).

I am unable to distinguish these specimens collected in Samoa from those which I have examined from the island of Norfolk, the type locality of the species. They differ from variety *fijiana* from Fiji chiefly in the more rounded apex of the leaves.

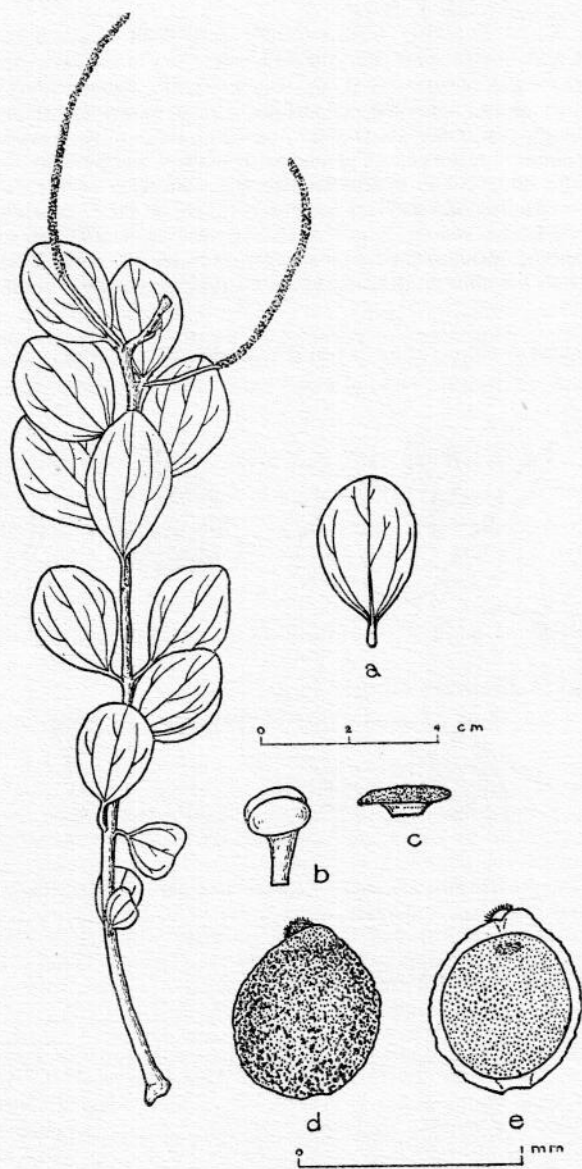


FIGURE 6.—*Peperomia Endlicheri* Miquel: a, leaf; b, stamen, enlarged; c, bract, enlarged; d, fruit; e, section of fruit.

8. *Peperomia pitcairnensis* (Lauterbach) C. de Candolle (fig. 7).

Peperomia pitcairnensis (Lauterbach) C. de Candolle: in Engler's Bot. Jahrb., vol. 56, p. 502, 1921.

Stems erect, up to 10 or more cm in height and 2 mm in thickness when dry, branching, glabrous, internodes mostly less than 1 cm in length. Leaves alternate or less commonly opposite, glabrous, not ciliated, oval-obovate, 2 to 2.5 cm in length, 1.2 to 1.8 cm in width, palmately 5-nerved, lateral nerves more or less obscure, fine nerves numerous, drying thin and membranous and with uneven margins, apex rounded, obtuse, base acute, petioles up to 7 mm in length, glabrous, leaf scars semicircular, bundle scars three. Spikes in terminal and axillary clusters of two or three, up to 5.5 cm in length and 2 mm in thickness, peduncles up to 1.8 cm in length, glabrous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, ovary ovoid, apex oblique, stigma subapical, fruit about 0.8 mm in length, globose-ovoid, verrucose, viscid, eventually on pseudopedicels.

Pitcairn Island: 1899, Miss Young no. 166 (type, Berlin).

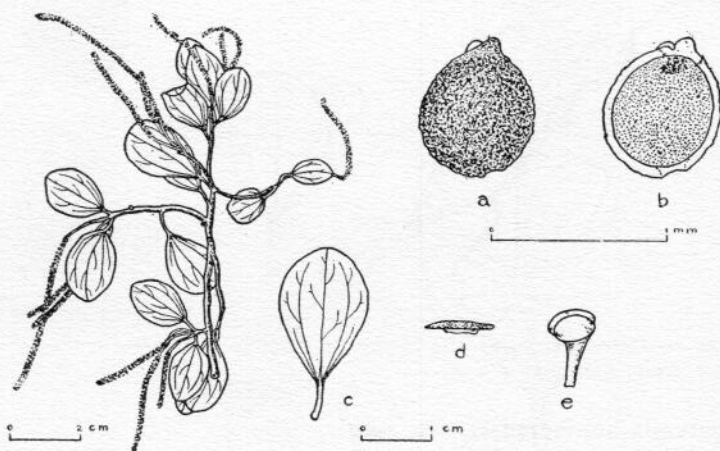


FIGURE 7.—*Peperomia pitcairnensis* de Candolle: a, fruit; b, section of fruit; c, leaf; d, bract, enlarged; e, stamen, enlarged.

9. *Peperomia raiateensis* Moore (fig. 8).

Peperomia raiateensis Moore, B. P. Bishop Mus., Bull. 102, p. 26, 1933.

Stems ascending from a decumbent, rooting base, up to 15 or more cm in height and 1.5 mm in thickness near the base when dry, branching, glabrous, internodes up to 3 cm in length. Leaves alternate or rarely some leaves nearly opposite, glabrous, finely ciliated above the middle, oval-elliptic, slightly rhomboid, more rarely subovate or obovate, up to 3 cm in length and 2 cm in width, but mostly somewhat smaller, palmately 3- or 5-nerved, or in large leaves 7-nerved, apex obtuse or acutish, base obtuse or shortly acute, petioles up to 7 mm in length, glabrous. Spikes axillary and terminal, moderately flowered, up to 3 cm in length, peduncles up to 1 cm in length, glabrous, bracts round, edge somewhat irregular, peltate, about 0.5 mm in width, filaments somewhat longer than the ellipsoidal anthers, ovary ovoid, apex oblique, stigma large, pilose, subapical, fruit about 0.8 mm in length, globose-ovoid, slightly rostrate, verrucose, viscid.

Society Islands: Raiatea, November 25, 1926, Moore no. 352 (type, Bishop Museum); Tahiti, Punaauia, Diadem, altitude, 3,210 feet, May 14, 1930, Grant no. 3603 (Bishop Museum).

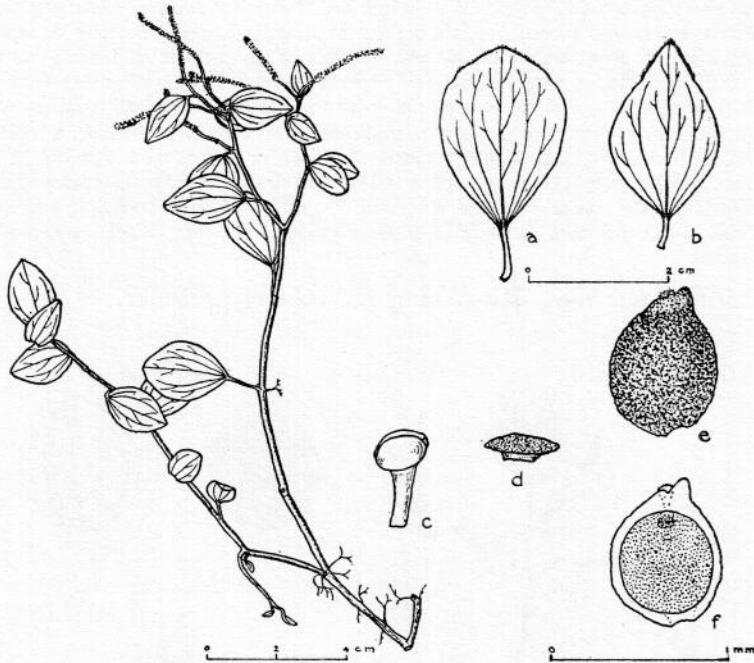


FIGURE 8.—*Peperomia raiateensis* Moore: a-b, leaves; c, stamen, enlarged; d, bract, enlarged; e, fruit; f, section of fruit.

10. *Peperomia boraborensis*, new species (fig. 9).

Herbae terrestres. Caules decumbentes, ramosis adscendentibus usque ad 30 + cm alti, glabri, internodis usque ad 6 cm longis, plerumque 2-4 cm. Folia alterna aut raro opposita, glabra, non ciliata aut raro sparse ciliata, ovali-elliptica aut raro subobovata, subovata aut suborbiculata, usque ad 8.5 cm longa et 4.5 cm lata, plerumque 4-6 cm longa et 2.5-3.5 cm lata, palmatim 5-nervia, apice acuto aut obtuso, basi acuta, petiolo 0.5-1.3 cm longo, glabro. Spicae terminales axillaresque, usque ad 7 cm longae, pedunculo usque ad 2.8 cm longo, plerumque 1-2 cm longo, glabro, ovario ovoideo, apice obliquo, stigmatibus sub apice, pilosa. Fructus circum 0.9 mm longus, ovoideus.

Plants terrestrial, stems decumbent and rooting from the lower nodes, with ascending branches up to 30 or more cm in height and 3 mm in thickness when dry, sparingly branching, glabrous, internodes from 1 cm above up to 6 cm in length in the lower part, mostly 2 to 4 cm. Leaves alternate or rarely some leaves opposite, glabrous, not ciliated or not uncommonly sparingly ciliated toward the apex, dark green above, light green beneath, fleshy when fresh, drying firm to submembranous, oval-elliptic or occasional leaves subobovate, subovate or suborbicular, 2 to 8.5 cm in length and 1.5 to 4.5 cm in width, mostly 4 to 6 cm long and 2.5 to 3.5 cm wide, palmately 5-nerved, apex acute or obtuse, base acute, petioles 0.5 to 1.3 cm in length, glabrous. Spikes axillary and terminal, up to 7 cm in length, moderately to densely flowered, peduncles up to 2.8 cm in length but mostly 1 to 2 cm, glabrous, bracts round, peltate, about 0.5 mm in width,

filaments somewhat longer than the ellipsoidal anthers, ovary ovoid, apex oblique, stigma subapical, single or divided, pilose, the stigmatic pad early deciduous, fruit about 0.9 mm in length, ovoid, verrucose, viscid.

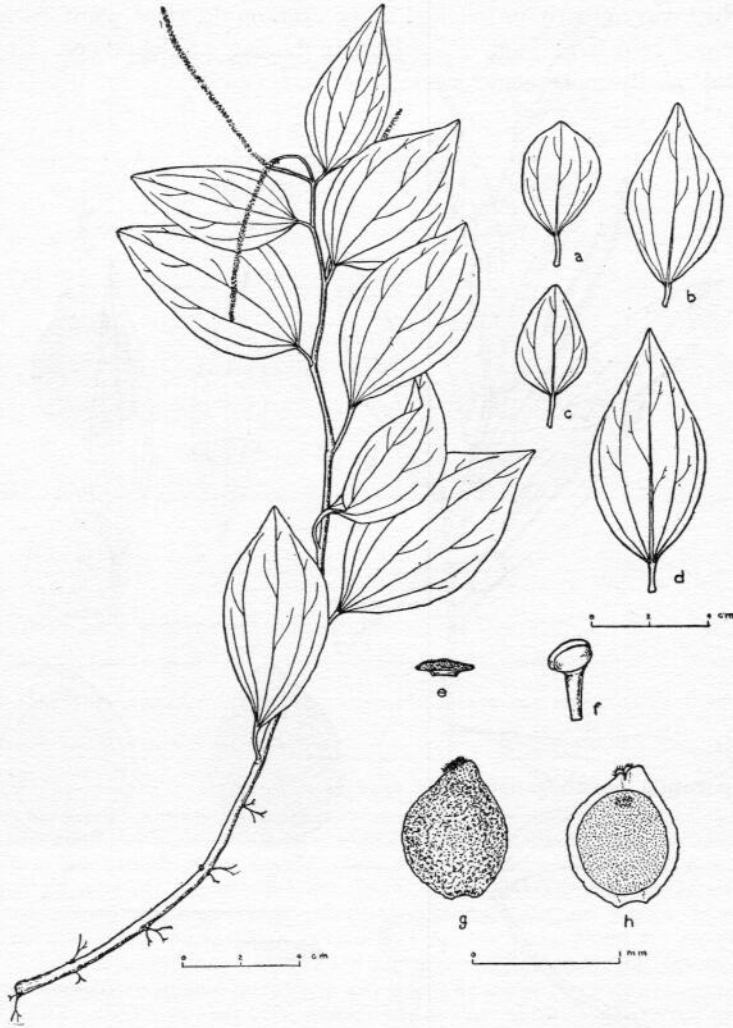


FIGURE 9.—*Peperomia boraborensis* Yuncker: a-d, leaves; e, bract, enlarged; f, stamen, enlarged; g, fruit; h, section of fruit.

Society Islands: Borabora, Anau, Teanaopea, terrestrial in forest of *Hibiscus*, *Pandanus*, *Tecoma*, altitude, 1,155 feet, January 19, 1931, Grant no. 5102 (type, Bishop Museum); Tevaitapu, Otemanu, on rocks in *Aleurites-Hibiscus* forest, altitude 1,110 feet, January 3, 1931, Grant no. 4928 (Bishop Museum); south slope of Pahio-Temanu Ridge, on mossy, shaded

base of cliff, altitude 275 meters, October 13, 1934, St. John no. 17421 (Bishop Museum).

The more or less repent and glabrous stems, and alternate, glabrous leaves which vary greatly in size and shape even on the same plant distinguish this species. It differs from *P. pallida* in having predominately alternate, larger and mostly more acute leaves.

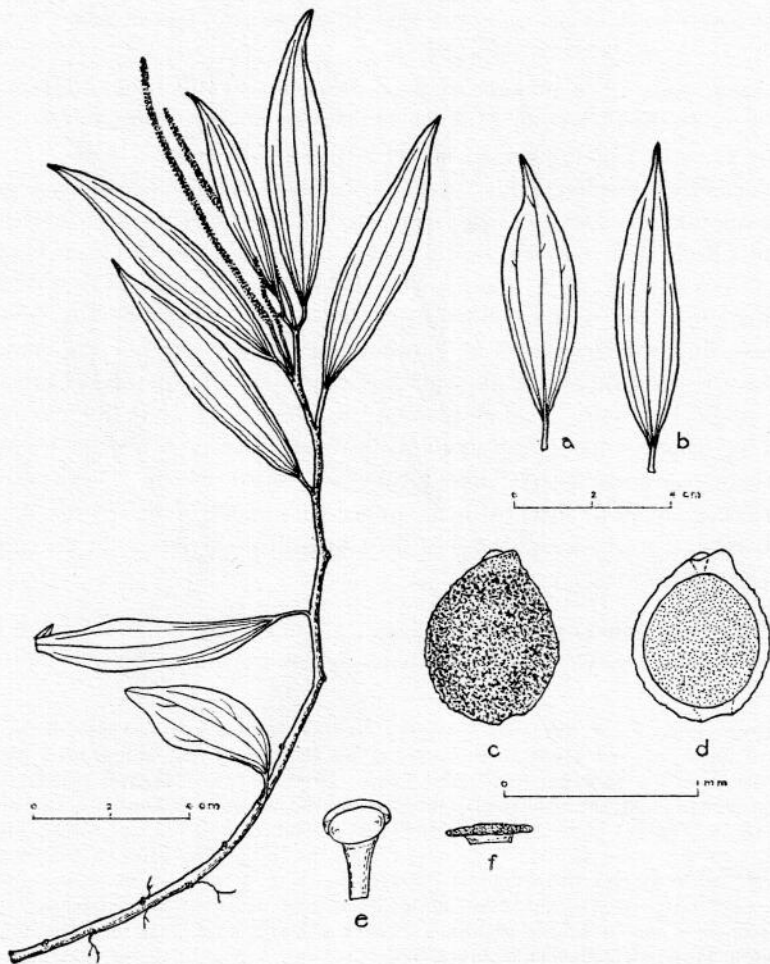


FIGURE 10.—*Peperomia lonchophylla* de Candolle: *a-b*, leaves; *c*, fruit; *d*, section of fruit; *e*, stamen, enlarged; *f*, bract, enlarged.

11. ***Peperomia lonchophylla*** C. de Candolle (fig. 10).

Peperomia lonchophylla C. de Candolle: in Schumann and Lauterbach, Fl. Deuts. Schutzgeb., p. 255, 1901.

Stems ascending from a decumbent, rooting base, up to 20 or more cm in height and 2.5 mm in thickness near the base when dry, not branching, glabrous, internodes mostly 1 to 2 cm in length. Leaves alternate, glabrous, not ciliated, elliptic-lanceolate to suboblanceolate or subfalcate, 5 to 8 cm in length and 1.5 to 2.5 cm in width but mostly about 1.7 cm wide, palmately 5-nerved, drying membranous, apex attenuately acute to acuminate, base acute, petioles up to 8 mm in length, glabrous. Spikes in the axils of the upper leaves or terminal, up to 8.5 cm in length, peduncles up to 1.5 cm in length, glabrous, densely flowered, rachis glabrous, bracts round, peltate, about 0.5 mm in width, punctate with yellow dots, filaments about equal to the ellipsoidal anthers, ovary ovoid-obovoid, apex oblique, stigma subapical, fruit ovoid, about 0.9 mm in length, verrucose, viscid.

Samoa: Savaii, "Kammgebiet über Matanta," June 1894, Reinecke no. 380 (type, Berlin); Upolu, Malololelei, canyon nearby, altitude 500 meters, August 5, 1929, Christophersen no. 71 (Bishop Museum).

I formerly considered this species to be the same as *P. oahuensis* of the Hawaiian islands. De Candolle also listed *P. lonchophylla* as occurring in Hawaii (Bull. Coll. Hawaii, no. 2, p. 31, 1913) and the specimen which he cited (Rock no. 1015) I found to be the same as *P. oahuensis*. After an examination of the type specimen of *P. lonchophylla* from Samoa, however, I believe that the Samoan and Hawaiian specimens are not the same. In *P. oahuensis* the leaves are more or less plinerved and the spikes are sometimes single but more commonly occur in clusters of 2 to 8 or rarely in branching clusters along the stem while in *P. lonchophylla* the leaves are essentially palmately nerved and in the specimens which I have seen the spikes occur singly or in twos in the upper part of the stem. *P. lonchophylla* is also related to *P. lasiostigma* of Fiji but differs from it in bearing unbranched spikes.

12. *Peperomia lonchophylloides* C. de Candolle (fig. 11).

Peperomia lonchophylloides C. de Candolle: in Rechinger Ergebn., pt. 3, p. 93, 1910.

Plants epiphytic or terrestrial, stems ascending from a rooting base up to 30 or more cm in height, and 4 mm in thickness at the base when dry, unbranched, glabrous, internodes mostly 1 to 2 cm in length. Leaves alternate, glabrous, not ciliated, drying thin and membranous, inconspicuously punctate with pellucid or yellowish dots, elliptic-lanceolate, 5 to 9 cm in length and 2 to 3 cm in width, mostly about 6 to 7 cm long and 2 to 2.5 cm wide, 5- or 7-subplinerved, the two innermost pairs of lateral nerves coalescing with the midrib within the lowermost 2 to 3 mm, or in some leaves the nerves essentially free to the base, apex attenuately acute to acuminate, base acute, petioles about 1 cm in length, glabrous. Spikes axillary, single, up to 8 cm in length, moderately flowered, peduncle glabrous, about 1.2 cm in length, rachis glabrous, bracts round, peltate, about 0.5 mm in width, filaments short, stout, anthers ellipsoidal, ovary obovoid, apex oblique, stigma subapical, fruit about 0.8 mm in length, globose-ovoid, verrucose, viscid.

Samoa: Upolu, "ad flumen Papaseea," July 1905, K. and L. Rechinger no. 138 (type, Vienna); Moa Moa plantations, on rocks by stream, altitude 200 meters, March 2, 1921, Eames no. 207 (Bishop Museum); Savaii, above

Sili, in medium wet forest, altitude about 450 meters, November 13, 1931, Christophersen no. 3226 (Bishop Museum).

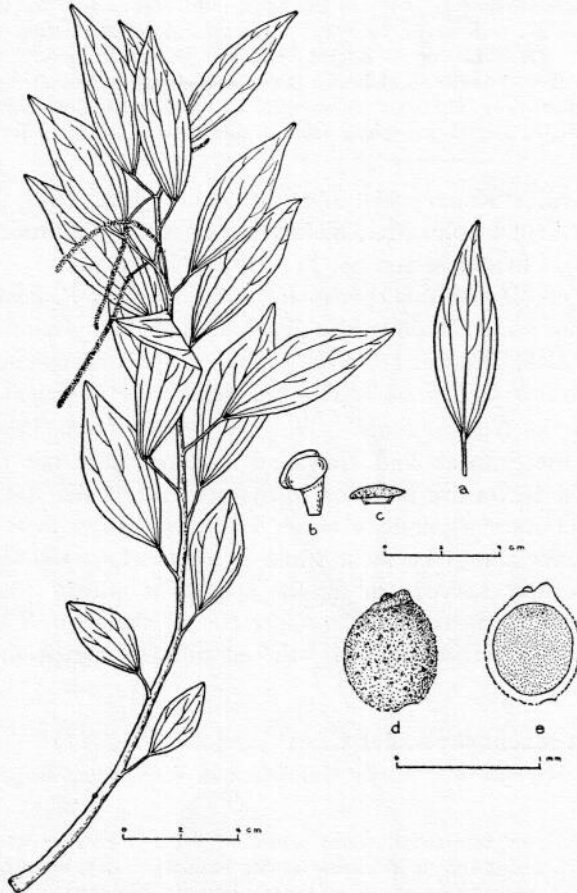


FIGURE 11.—*Peperomia lonchophylloides* de Candolle: *a*, leaf; *b*, stamen, enlarged; *c*, bract, enlarged; *d*, fruit; *e*, section of fruit.

This species differs from *P. novemnervia* chiefly in its somewhat shorter leaves in which the nerves coalesce only in the lowermost 2 to 3 mm. From *P. biformis* it is to be distinguished because of its larger plants with more upright or ascending stems and larger leaves. These three Samoan species are very closely related and more abundant materials or comparative field studies may show the need of their revision. However, on the basis of the materials which I have examined it has seemed best to maintain them as distinct species as described by de Candolle.

13. *Peperomia novemnervia* C. de Candolle (fig. 12).

Peperomia novemnervia C. de Candolle: in Rechinger Ergebn., pt. 3, p. 93, 1910. (Misspelled *noveninervia* in C. de Candolle's Clavis, Candollea, vol. 1, p. 366, 1923.)

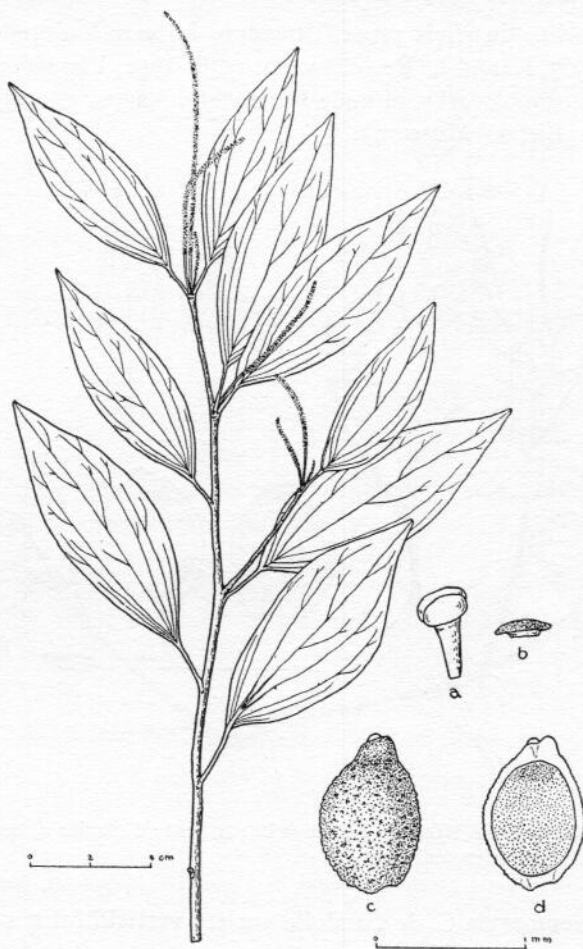


FIGURE 12.—*Peperomia novemnervia* de Candolle: *a*, stamen, enlarged; *b*, bract, enlarged; *c*, fruit; *d*, section of fruit.

Stems erect, or ascending from a rooting base, up to 65 or more cm in height and 5 mm in thickness near the base when dry, with few branches, glabrous, internodes up to 7 cm in length. Leaves alternate or rarely two at a node, glabrous, sparingly ciliated near the apex, elliptic-lanceolate or rarely some leaves oval, up to 10 cm in length and 2.5 to 3.7 cm in width, 7- or 9-plinerved, the midrib and innermost pair of nerves prominent, the outer ones less so, the innermost pair of lateral nerves coalescing with the midrib within the lowermost 8 mm, or rarely the nerves free nearly to the base, apex attenuately acute

to acuminate, base acute, petiole 1 to 2 cm in length, glabrous, leaf scars semicircular or suborbicular. Spikes axillary and terminal, single or in umbellate clusters, up to 10 cm in length, loosely flowered, peduncle 1 to 1.5 cm in length, glabrous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, filaments somewhat longer than the ellipsoidal anthers, ovary ovoid, apex somewhat rostrate, oblique, stigma subapical, fruit about 1 mm in length, ovoid, rostrate, verrucose, viscid.

Samoa: Upolu, "in silvis prope Utumapu, in terra," altitude about 500 meters, June 1905, K. and L. Reehinger no. 1576 (type, Vienna); Malololelei, canyon of Vaisingano nearby, altitude 500 meters, August 7, 1929, Christophersen no. 106 (Bishop Museum).

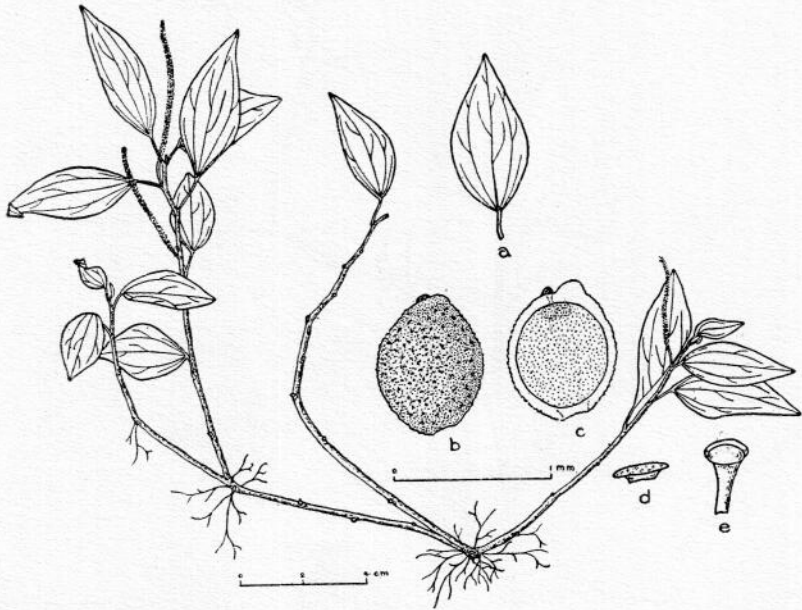


FIGURE 13.—*Peperomia bififormis* de Candolle: *a*, leaf; *b*, fruit; *c*, section of fruit; *d*, bract, enlarged; *e*, stamen, enlarged.

***Peperomia novemnervia* C. de Candolle variety *verticillifolia*, new variety.**

Folia opposita aut verticillata.

Leaves opposite or whorled. Otherwise similar to the species.

Samoa: Malu, U. S. Explor. Exped., Capt. Wilkes no. 16 (type, Gray).

14. *Peperomia bififormis* C. de Candolle (fig. 13).

Peperomia bififormis C. de Candolle: in Reehinger Ergebn., pt. 3, p. 92, 1910.

Stems mostly repent in the lower part and rooting at the nodes, branches ascending up to 25 or more cm in height, 1.5 mm in thickness when dry, branching below, erect branches rarely branching, glabrous, internodes up to 3 cm in length, mostly 1 to 2 cm.

Leaves alternate, glabrous, not ciliated, drying thin and membranous, inconspicuously punctate with small, pellucid or yellow dots, elliptic-lanceolate, rarely some lower leaves subovate or subobovate, up to 6 cm in length and 3 cm in width, mostly 3.5 to 5 cm long and 1.5 to 2 cm wide, palmately 5-nerved, the innermost pair of lateral nerves may coalesce with the midrib in the lowermost 1 to 2 mm, apex attenuate, acute to acuminate, base acute, petioles glabrous, 5 to 10 mm in length, mostly about 7 mm. Spikes axillary, up to 6 cm in length, moderately flowered, peduncle glabrous, about 8 mm in length, bracts round, peltate, about 0.5 mm in width, filaments about equal to the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical, fruit about 0.9 mm in length, ovoid, verrucose, viscid.

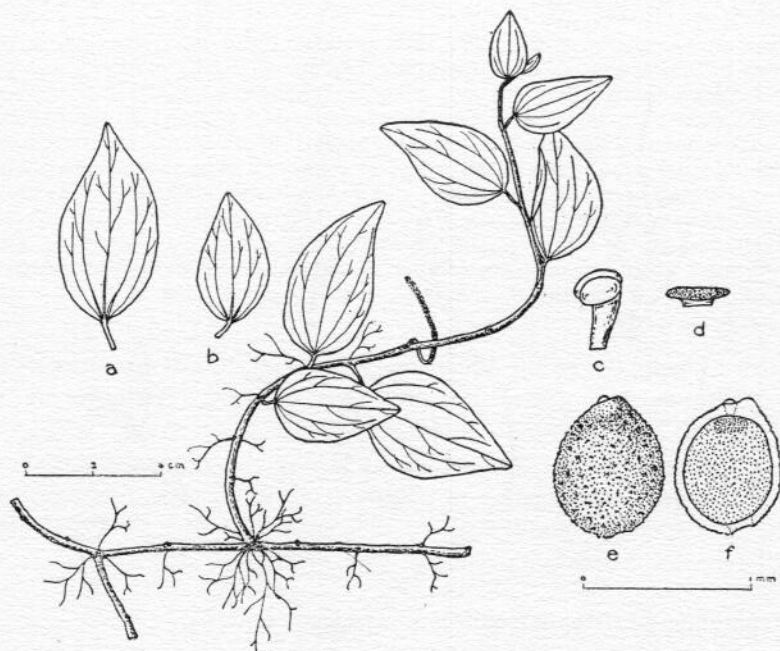


FIGURE 14.—*Peperomia muophila* de Candolle: *a-b*, leaves; *c*, stamen, enlarged; *d*, bract, enlarged; *e*, fruit; *f*, section of fruit.

Samoa: Upolu, "in silvis primaevae prope Utumpapu (?), in terra repens," June 1905, K. and L. Rechinger no. 1708 (Vienna); Olosega, Pumafua Mountain, near the top in damp forest, growing on tree trunk, June 17, 1925, Garber no. 1044 (Bishop Museum); Savaii, "in monte Maungaafi, in terra," altitude 1300 meters, July 1905, K. and L. Rechinger no. 1873 (Vienna); same locality, "in truncis arborum vetustis," altitude 1500 to 1600 meters, July 1905, K. and L. Rechinger, without number (Vienna); "in arboribus in monte Maungaafi inter muscos," altitude 1,000-1500 meters, July 1905, K. and L. Rechinger no. 653 (Vienna), (an immature specimen with leaves mostly 1.5 to 2.5 cm in length, but in other respects appearing to belong here, as indicated by de Candolle); Salailua-Lataitai, in coastal

forest, on rocks, altitude about 10 meters, October 19, 1931, Christophersen nos. 2873, 2874, and 2875 (Bishop Museum). Nos. 2873 and 2875 have some leaves which are larger than is characteristic for this species. No. 2874, however, is typical and appears to be the same in all respects as the other two numbers with the exception of the leaf size.

15. *Peperomia mniophila* C. de Candolle (fig. 14).

Peperomia mniophila C. de Candolle: in Rechinger Ergebn., pt. 3, p. 93, 1910.

Stems repent, rooting at the nodes, erect branches up to 15 or more cm in height and 2 mm in thickness when dry, branching, glabrous, internodes mostly 1 to 2 cm in length. Leaves alternate, glabrous, not ciliated, elliptic-ovate, mostly 3.5 to 6 cm in length and 2 to 3 cm in width, palmately 5-nerved, or the innermost pair of lateral nerves coalescing with the midrib in the lowermost 1 to 2 mm, but not conspicuously so, drying thin and membranous, more or less punctate with pellucid dots, apex attenuate, acute, base obtusish or sub-acute, petioles 5 to 8 mm in length, glabrous. Spikes axillary, up to 5 or more cm in length, peduncles up to 1 cm in length, glabrous, densely flowered, rachis glabrous, bracts round, peltate, punctate with yellow dots, about 0.5 mm in width, filaments about equal to the ellipsoidal anthers, ovary obovoid-turbinate, apex somewhat oblique, stigma slightly subapical, fruit about 0.75 mm in length, globose-ovoid, verrucose, viscid.

Samoa: Upolu, "in monte Vaiaberg (Apiaberg), in arborum truncis inter muscos," altitude about 350 meters, May 1905, K. and L. Rechinger no. 1759 (type, Vienna).

De Candolle described this species as having the stigma at the apex of the ovary. Careful examination of mature fruit on the type, however, shows that the apex is oblique and the stigma subapical. The repent habit of growth and elliptic-ovate leaves with obtusish base distinguish this species.

16. *Peperomia Christophersenii*, new species (fig. 15).

Herbae terrestres. Caules erecti, usque ad 25 + cm alti, ramosi, glabri aut primum sparse hirsuti, internodis 1-2 cm longis, raro inferne usque ad 10 cm. Folia alterna, glabra, non ciliata, aut primum sparse ciliata, ovala aut subovata, 5-9 cm longa et 2.5-4.2 cm lata, palmatim 5-nervia aut subplinervia, apice attenuato, acuto aut subobtusio, basi breviter acuta, petiolo 1-3 cm longo, glabro. Spicae terminales, usque ad 6 cm longae, pedunculo circum 1.2 cm longo, glabro, ovario obovoideo, apice obliquo, stigmatibus sub apice. Fructus circum 0.9 mm longus, globoso-ovoideus, plus minusve rostratus.

Plants terrestrial, stems erect, up to 25 or more cm in height and 3 mm in thickness when dry, branching, glabrous, or very young stems sparsely hirsute, internodes 1.5 to 2 cm in length above, up to 10 cm long below. Leaves alternate, glabrous, not ciliated, or somewhat ciliated with long hairs when extremely young, oval or subovate, 5 to 9 cm in length and 2.5 to 4.2 cm in width, palmately 5-nerved, or the innermost pair of lateral nerves coalescing with the midrib in the lowermost 1 or 2 mm, punctate with small, pellucid dots, apex attenuate, acute or obtusish, base shortly acute, petioles 1 to 3 cm in length, mostly 1.5 to 2 cm long, glabrous. Spikes terminal, up to 6 cm in length, loosely flowered, peduncles about 1.2 cm in length, glabrous, rachis glabrous, bracts round, peltate, punctate with yellow dots, about 0.5 mm in width, filaments somewhat longer than the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical

large, single or divided, fruit about 0.9 mm in length, globose-ovoid, somewhat rostrate, verrucose, viscid.

Samoa: Savaii, above Matavanu, rim of crater, in medium wet forest, altitude 900 meters, August 6, 1931, Christophersen no. 2286 (type, Bishop Museum); Upolu, above Saluafata, Manga Tele ridge, in forest, altitude 500 meters, September 4, 1929, Christophersen no. 543 (Bishop Museum).

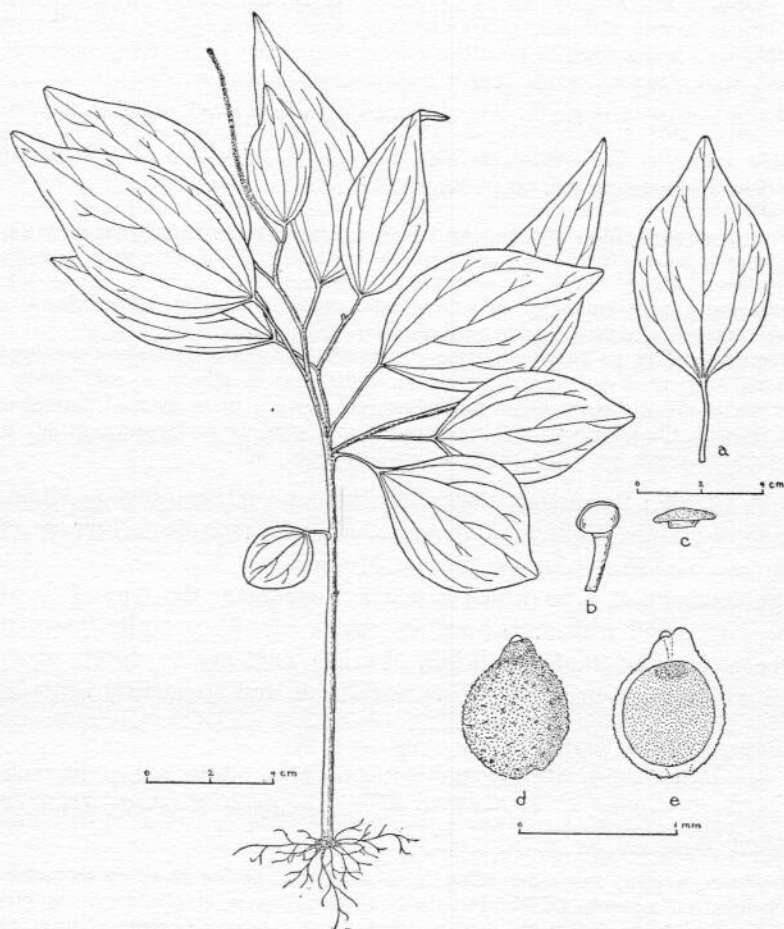


FIGURE 15.—*Peperomia Christophersenii* Yuncker: a, leaf; b, stamen, enlarged; c, bract, enlarged; d, fruit; e, section of fruit.

This species bears some resemblance to *P. mniophila*. It differs, however, in the erect habit of growth, mostly larger, oval leaves, longer petioles, somewhat rostrate fruit, and loosely flowered spikes.

17. *Peperomia rhomboidea* Hooker and Arnott (fig. 16).

Peperomia rhomboidea Hooker and Arnott: Bot. Beechey, p. 70, 1832.

Stems ascending from a short, decumbent, rooting base, up to 25 or more cm in height and 4 mm in thickness near the base when dry, unbranched, glabrous, internodes 1.5 to 3 cm in length. Leaves alternate, glabrous, not ciliated, oval-rhombic to suborbicular, up to 6 cm in length and 4.5 cm in width, mostly 4 to 5 cm long and 2.5 to 3 cm wide, palmately 5- or 7-nerved, apex briefly attenuate, acute, base acute or obtusish, petioles mostly 5 to 8 mm in length, glabrous, leaf scars semicircular, bundle scars 3. Spikes terminal and axillary, up to 7.5 cm in length, moderately flowered, peduncles 6 to 8 mm in length, glabrous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, filaments about equal to the ellipsoidal anthers, ovary ovoid, apex oblique, stigma subapical, fruit about 0.8 mm in length, globose-ovoid, verrucose, viscid.

"Coral Island": Beechey (?) (taken to represent the type Kew).

Cook Islands: Rarotonga, at the base of trees in hilly forests, common, July 1899, Cheeseman no. 644 (Kew).

Peperomia rhomboidea Hooker and Arnott variety *rarotongana*, new variety (fig. 16, b-c).

Folia usque ad 7 cm longa et 3.5 cm lata, ovata aut elliptica ad subobovata, plus minusve rhomboida, glabra, 5- aut 7-subplinervia, apice attenuato, acuto.

Stems ascending up to 30 or more cm in height from a decumbent rooting base. Leaves up to 7 cm in length and 3.5 cm in width, oval or elliptic to subobovate, more or less rhomboid, glabrous, 5- or 7-subplinerved, the innermost pair of lateral nerves coalescing with the midrib in the lowermost 2 to 4 mm, apex attenuate, acute. Spikes about 5 cm in length, peduncles up to 1.5 cm in length.

Cook Islands: Rarotonga, Parks and Parks no. 22127 (Bishop Museum); Kew; Gray; Univ. Calif.); Maungatea, altitude 1100 feet, June 21, 1929, Wilder no. 961, in part (type, Bishop Museum).

The specimen at Kew which is taken to represent the type of *P. rhomboidea* is mounted with a fragmentary specimen with opposite leaves which may be a form of *P. leptostachya*. Variety *rarotongana* differs from the species with its subplinerved and more elongate and attenuately acute leaves.

18. *Peperomia societatis* Moore (fig. 17).

Peperomia societatis Moore: B. P. Bishop Mus., Bull. 102, p. 26, 1933.

Peperomia pallida A. Dietrich variety *acuminata* Setchell: Univ. Calif.

Publ. Bot., vol. 12, p. 166, pl. 35, 1926.

Plants terrestrial, stems ascending from a repent, rooting base, up to 20 or more cm in height and 2 mm in thickness at the base when dry, sparingly branching, glabrous, internodes 2 to 6 cm in length, mostly 2 to 3 cm. Leaves alternate, glabrous on the lower surface, hairy along the nerves on the upper surface, marginally ciliated above the middle, drying thin and membranous, punctate with pellucid or yellow dots, oval to subobovate or somewhat rhomboidal, up to 8 cm in length and 1.5 to 3.5 cm in width, mostly 5 to 6 cm long and 2 to 3 cm wide, 5-subplinerved, the lateral nerves coalescing with the midrib in the lowermost 2 to 3 mm, apex attenuately acute to acuminate, base acute to cuneate, petiole about 5 mm in length, glabrous, leaf scars semicircular, bundle scar one, central. Spikes axillary, up to 12 cm in length, moderately flowered, peduncle 1 to 1.5 cm in length, glabrous, rachis glabrous, bracts about 0.5 mm in width, punctate

with yellow dots, round, peltate, filaments about equal to the subglobose anthers, ovary globose-ovoid, apex oblique, stigma subapical, divided or single, densely pilose, fruit about 0.8 mm in length, ovoid, verrucose, viscid, eventually on pseudopedicels.

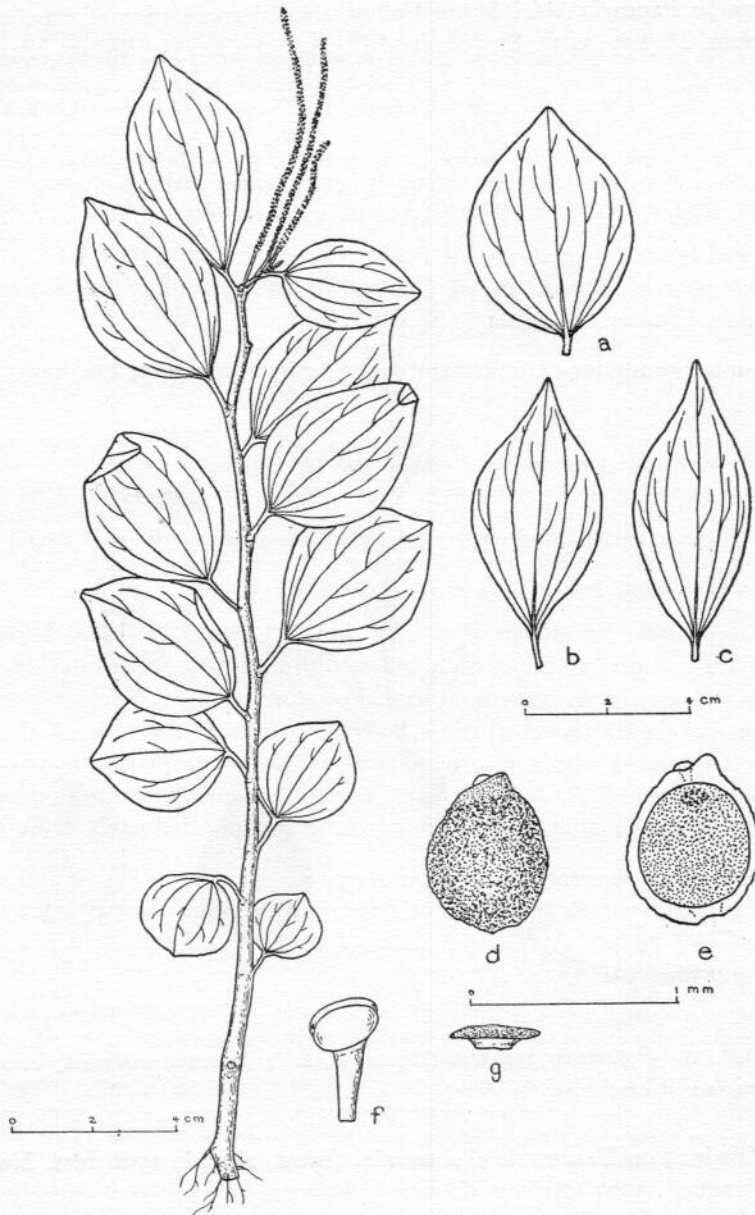


FIGURE 16.—*Peperomia rhomboidea* Hooker and Arnott: *a*, leaf; *b-c*, leaves of variety *rarotongana*; *d*, fruit; *e*, section of fruit; *f*, stamen, enlarged; *g*, bract, enlarged.

Society Islands: Tahiti, "Eimeo nāra Taheite," in 1852, Andersson (Stockholm); Tautaua Valley, on ground among rocks, June 3, 1922, Setchell and Parks no. 252 (type of *P. pallida* variety *acuminata*, Univ. Calif.; Bishop Museum); Papeari, Apiri Maué Valley, shaded rocks near stream, altitude 50 meters, May 10, 1934, St. John and Fosberg no. 14157 (Bishop Museum);

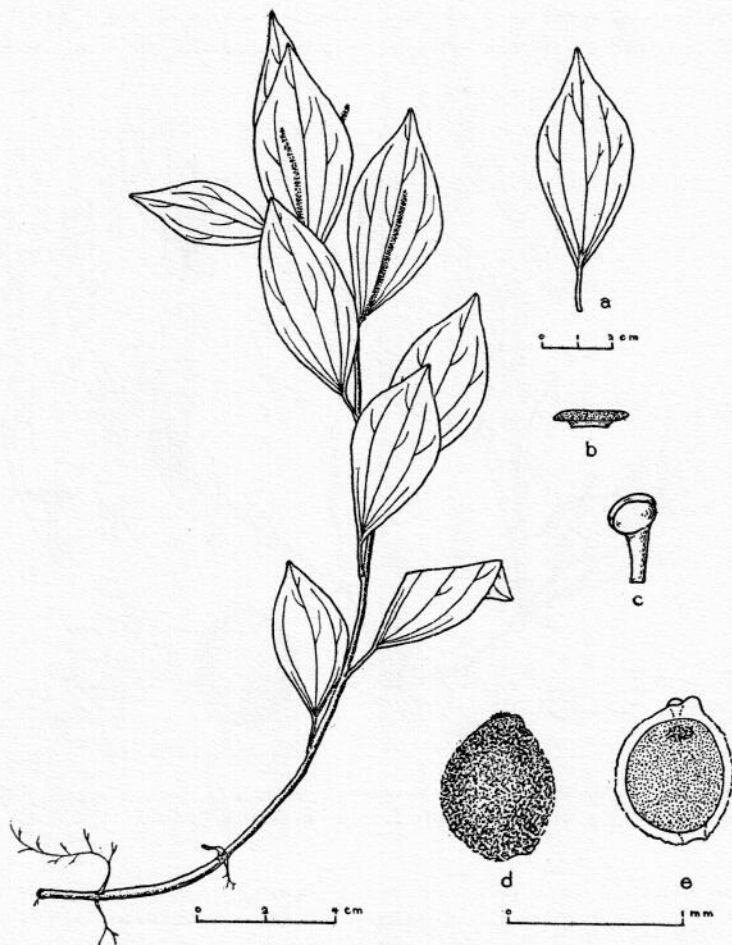


FIGURE 17.—*Peperomia societatis* Moore: *a*, leaf; *b*, bract, enlarged; *c*, stamen, enlarged; *d*, fruit; *e*, section of fruit.

Pare, Diadem, on *Tecoma* in *Neonauclea* forest, altitude 1700 feet, May 12, 1930, Grant no. 3527 (Bishop Museum); Raiatea, on moist rocks near stream, fifth valley south of Uturoa, altitude 100 meters, November 25, 1926, Moore no. 354 (type, Bishop Museum).

19. *Peperomia tutuilana*, new species (fig. 18).

Herbae terrestres. Caules complures, suberecti aut ascendentes usque ad 15 + cm alti, superne subadpresso-hirtelli, inferne glabrati, ramosi, internodis 1-2 cm longis. Folia alterna, aut inferne opposita, primum subadpressa hirtella, demum glabra, ciliata, elliptica ad suboblanceolata, 3-5 cm longa et 1.5-2 cm lata, palmatim 5-nervia, apice subattenuato, acuto, basi acuta ad cuneatam, petiolo 5-7 cm longo, hirtelli. Spicae terminales axillaresque, usque ad 4 cm longae, pedunculo 0.8-1.2 cm longo, hirtello, ovario obovoideo, apice obliquo, stigmatibus sub apice. Fructus circum 0.9 mm longus, subglobosus.

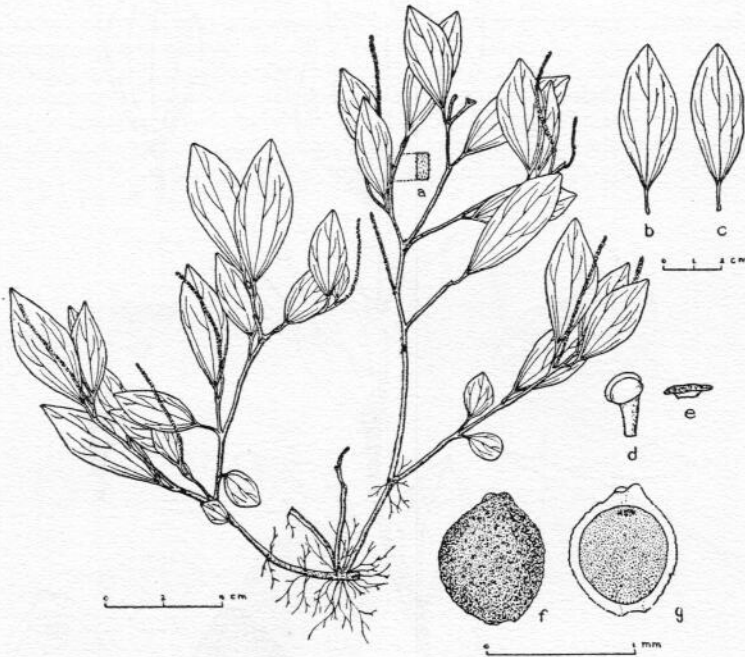


FIGURE 18.—*Peperomia tutuilana* Yuncker: a, section of stem, enlarged; b-c, leaves; d, stamen, enlarged; e, bract, enlarged; f, fruit; g, section of fruit.

Plants terrestrial, stems tufted, suberect or ascending from a rooting base, up to 15 or more cm in height and 2 mm in thickness when dry, subappressed hirtellous in the upper part, hairs less than 0.5 mm in length, glabrate below, branching freely, internodes 1 to 2 cm in length. Leaves alternate, or the lowermost opposite, subappressed hirtellous on both surfaces when young, becoming glabrate when older, marginally ciliated at the apex, elliptic to suboblanceolate, 3 to 5 cm in length and 1.5 to 2 cm in width, drying thin and membranous, palmately 5-nerved, apex subattenuate, acute, base acute to cuneate, petioles 5 to 7 mm in length, hirtellous. Spikes terminal and axillary, up to 4 cm in length, moderately flowered, peduncle 0.8 to 1.2 cm in length, hirtellous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, punctate with yellow dots, filaments about equal to the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical, fruit about 0.9 mm in length, subglobose, verrucose, viscid.

Samoa: Tutuila, Afono-Vaitia trail, small bay near Afono, on coral rock, altitude about 10 feet, December 17, 1924, Garber no. 863 (type, Bishop Museum).

This species is described from a poorly preserved specimen but I believe that it is sufficiently distinct to merit specific status. The hirtellous stems and leaves and short spikes distinguish it from *P. oblancifolia* which it resembles.

20. *Peperomia oblancifolia*, new species (fig. 19).

Caules erecti, usque ad 10 + cm alti, subdichotome aut subtrichotome furcati, sparse hirtelli ad glabrescentes, internodis 1-2 cm longis. Folia alterna aut raro opposita, subter glabra, supra ad basem hirtella, sparse ciliata, elliptico-oblancoolata, 3-5 cm longa et 1.5-2.2 cm lata, palmatim 3- aut 5-nervia aut subplinervia, apice attenuato-acuto, basi cuneata, petiolo usque ad 7 mm longo, glabro. Spicae terminales axillaresque, usque ad 6 cm longae, pedunculo 5-10 mm longo, glabro, ovario obovoideo, apice obliquo, stigmatibus sub apice, pilosa. Fructus circum 0.9 mm longus, globoso-ovoideus.

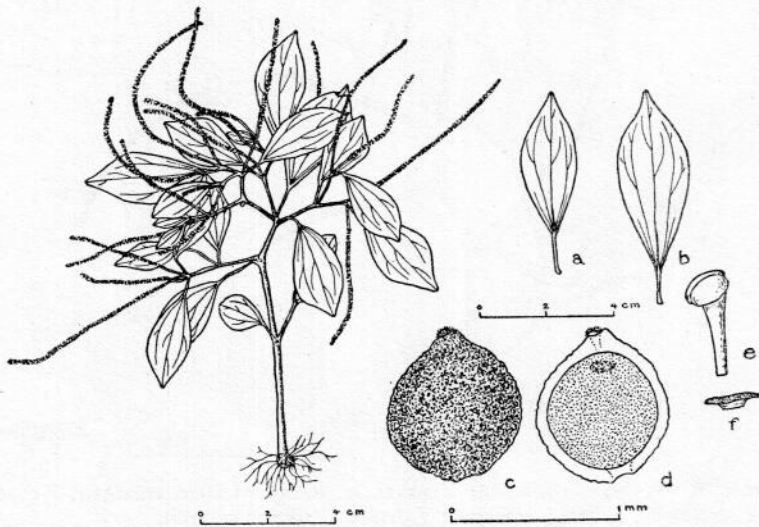


FIGURE 19.—*Peperomia oblancifolia* Yuncker: a-b, leaves; c, fruit; d, section of fruit; e, stamen, enlarged; f, bract, enlarged.

Stems erect, up to 10 or more cm in height and 2 mm in thickness near the base when dry, subdichotomously or trichotomously branching, sparingly hirtellous to glabrescent, internodes 1 to 2 cm in length. Leaves alternate or rarely some leaves opposite, glabrous on the lower surface, the upper surface hirtellous at the base, sparingly ciliated at the apex, elliptic-oblancoolate, 3 to 5 cm in length, 1.5 to 2.2 cm in width, drying firm, punctate with small, pellucid dots, palmately 3- or 5-nerved, or the innermost pair of lateral nerves coalescing with the midrib in the lowermost 2 to 3 mm, apex attenuately acute, base cuneate, petioles up to 7 mm in length, glabrous. Spikes mostly terminal, or in the axils of the uppermost leaves, up to 6 cm in length, moderately to densely flowered, peduncles 5 to 10 mm in length, glabrous, bracts round, peltate, about 0.5 mm in width, punctate with yellow dots, filaments longer than the ellipsoidal anthers, ovary

obovoid, apex oblique, stigma subapical, pilose with short hairs, fruit about 0.9 mm in length, globose-ovoid, verrucose, viscid.

Danger Islands: Pukapuka (?), altitude about 25 feet, March 1924, Whitney Expedition, Isidore, without number (type, Bishop Museum).

The short, more or less di- or trichotomously branching stems, long spikes, and oblanceolate leaves distinguish this species.

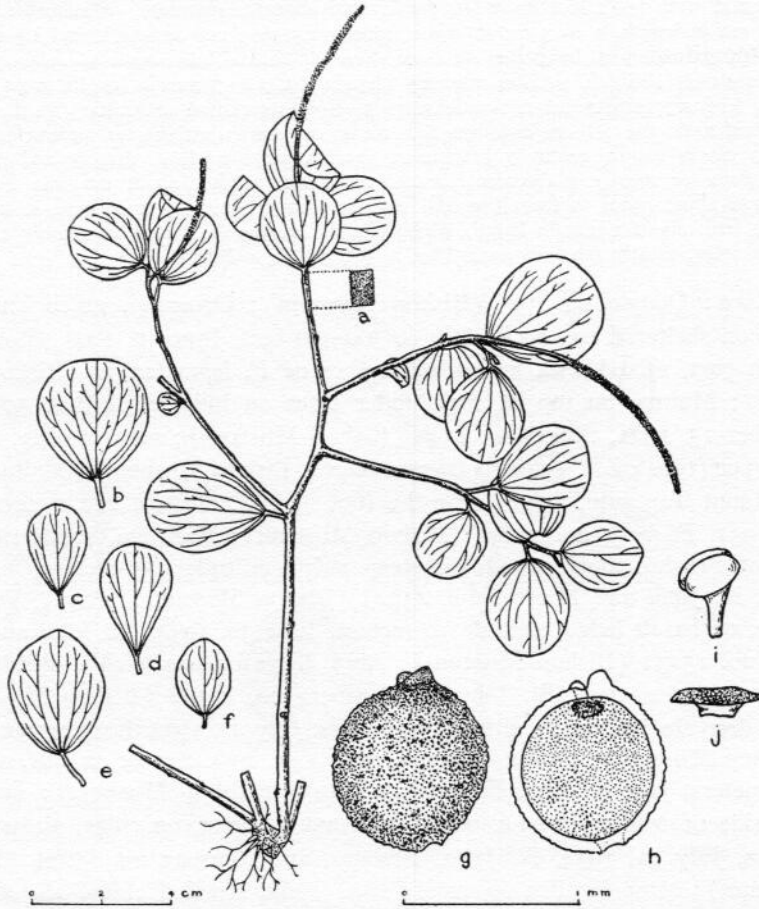


FIGURE 20.—*Peperomia rapensis* F. Brown: *a*, section of stem, enlarged; *b-f*, leaves; *g*, fruit; *h*, section of fruit; *i*, stamen, enlarged; *j*, bract, enlarged.

21. *Peperomia rapensis* F. Brown (fig. 20).

Peperomia rapensis F. Brown, B. P. Bishop Mus., Bull. 130, p. 21, fig. 2*f*, 1935.

Peperomia pallida (Forster f.) A. Dietrich variety *cuneata* F. Brown: B. P. Bishop Mus., Bull. 130, p. 21, 1935.

Stems more or less tufted, erect or ascending from a rooting base, mostly 15 to 20 cm in height, rarely up to 35 cm, up to 3 mm in thickness when dry, younger parts densely but very minutely hispidulous, hairs less than 0.1 mm in length, older parts sparingly and minutely hispidulous or glabrescent, commonly subdichotomously branching upward, red and fleshy when fresh, internodes mostly 1 to 5 cm in length, rarely longer. Leaves alternate but not infrequently with some leaves opposite, upper surface sparingly and minutely hispidulous or glabrescent, lower surface rather sparsely and very minutely hispidulous to glabrescent, drying firm, dark green above, paler beneath, fleshy and with reddish veins when fresh, oval-obovate, spatulate, or suborbicular, 1.5 to 3.5 cm in length, 1 to 3 cm in width, mostly 2.5 to 3 cm in length and 1.5 to 2 cm in width, palmately 5- or 7-nerved, apex rounded, obtuse, base acute to subcuneate, or less commonly obtusish, petioles minutely hispidulous, 3 to 7 mm in length, mostly about 5 mm, leaf scar semicircular, bundle scars 3. Spikes terminal or axillary in the uppermost leaf axils, up to 8 cm in length, but commonly somewhat shorter, peduncles mostly 2 to 3 cm in length, minutely hispidulous, rachis more or less sparsely and minutely hispidulous or mostly glabrescent, bracts orbicular, peltate, about 0.6 mm in width, filaments about equal to the ellipsoidal anthers, ovary ovoid, apex oblique, stigma subapical, fruit about 1 mm in length, globose-ovoid, verrucose, viscid, commonly a golden yellow color, mostly partially embedded in pits in the rachis.

Rapa: Quayle no. 355 (Bishop Museum); Ororangi, gulch on south slope on sheltered wet rock, altitude 300-400 feet, June 10, 1921, Stokes no. 26, in part, mixed with leaves and spikes of *P. leptostachya* (Bishop Museum); Maitua, on top of rock under trees on hillside, altitude 500 feet, October 15, 1921, Stokes no. 134b (Bishop Museum); same locality, Stokes no. 134a (type of *P. pallida* variety *cuneata*, Bishop Museum); Maitua, foot of Mount Tautautu, ledges near the foot of cliff, altitude 210 meters, July 11, 1934, Fosberg no. 11492 (Bishop Museum); Kaimaru, south ridge of Mount Perahu, moist woods on steep ridge, altitude 475 meters, July 13, 1934, St. John and Maireau no. 15525 (Bishop Museum); Area, Watering Place, on basalt ledge, altitude 10 meters, June 30, 1934, St. John and Fosberg no. 15232 (Bishop Museum); Area, ledge on basalt cliff, altitude 140 meters, July 2, 1934, St. John and Fosberg no. 15308 (Bishop Museum); Hiri, deep shaded ravine, altitude 50 meters, July 27, 1934, Fosberg no. 11634 (Bishop Museum); Mount Ruatara, east slope, rock crevice on cliff, altitude 120 meters, July 9, 1934, Fosberg no. 11455 (Bishop Museum); Taratika, east side of Mount Perahu, on ground, moist forest, on ridge, altitude 550 meters, July 21, 1934, St. John, Fosberg, and Maireau no. 15671 (Bishop Museum); same locality on mossy tree trunk, wooded ridge, altitude 600 meters, July 21, 1934, St. John, Fosberg and Maireau no. 15668 (Bishop Museum); Tapui Island, rock crevices, altitude 5 meters, July 21, 1934, St. John and Fosberg no. 15636 (Bishop Museum).

Pitcairn Island: Middle Hill, wooded, shady place, altitude 220 meters, June 14, 1934, Fosberg and Clark no. 11315 (Bishop Museum). Except for a more hispidulous rachis this specimen is similar to those from Rapa.

Austral Islands: Rurutu, Matu Arei, on sand and broken coral at beach, February 10, 1921, Stokes no. 62 (Bishop Museum).

***Peperomia rapensis* F. Brown variety *minuticaulis*, new variety.**

Caules circum 5 cm alti. Folia plerumque opposita, circum 1 cm longa et 7 mm lata, ovalo-obovata aut suborbiculata. Spicae usque ad 2.5 cm longae, pedunculo circum 1 cm longo.

Stems about 5 cm in height and 1 to 1.5 mm in thickness when dry. Leaves commonly opposite, "very fleshy, some subspherical, upper surface dark green, lower surface pale green," when fresh, drying coriaceous, about 1 cm in length and 7 mm in width, oval-obovate or suborbicular. Spikes up to 2.5 cm in length, peduncle about 1 cm in length.

Rapa: north side of Mount Lekie, ledge of highest basalt precipice, altitude 330 meters, July 20, 1934, St. John and Maireau no. 15622 (type, Bishop Museum); Mangaoa, on trunks of trees, altitude 400 meters, "leaves very fleshy, subterete," July 18, 1934, Fosberg no. 11585 (Bishop Museum).

P. rapensis is to be recognized because of its tufted habit of growth, proportionately long peduncles, leaf shape, and short, stiff hairs. Variety *minuticaulis* is obviously closely allied with the species. It has mostly opposite leaves but both alternate and opposite leaves are to be found on some plants of *P. rapensis*. Its small size and turgid leaves, however, serve to distinguish it from the species.

The degree of hairiness of the rachis varies. The hairs are comparatively few and some spikes appear to be entirely glabrous. Careful examination, however, usually reveals a few hairs on most rachises. The only other known Polynesian species which has a hairy rachis is *P. reflexa*.

This species differs from *P. Adamsonia* to which it bears some resemblance, principally in its more erect habit of growth, longer peduncles and more or less hispidulous rachis. Brown described his *P. pallida* variety *cuneata* as having glabrous stems and leaves. Examination of the type, however, shows that it is minutely hispidulous as in the other specimens included here, nor am I able to otherwise distinguish it from *P. rapensis*.

22. *Peperomia Setchellii*, new name (fig. 21).

Peperomia pallida A. Dietrich variety *longespicata* Setchell: Univ. Calif. Pub. Bot., vol. 12, p. 166, pl. 36, 1926.

Plants epiphytic, pendent, or on rocks, branches ascending to 15 or more cm in height from a repent, rooting base and up to 2 mm in thickness near the base when dry, branching, minutely hispidulous, hairs 0.1 mm or less long, erect, internodes 1 to 5 cm in length, mostly 1 to 2 cm. Leaves alternate or rarely opposite above, drying thin and membranous, glabrous or sparingly and minutely hispidulous near the base, not ciliated, oval-obovate to spatulate, some leaves rhomboidal, 2.5 to 5 cm in length, up to 3 cm in width but mostly 1.5 to 2 cm, palmately 5-nerved, apex rounded, obtuse, or very briefly attenuated, base acute to cuneate, petioles mostly about 5 mm in length, minutely hispidulous, leaf scar semicircular, bundle scars three. Spikes terminal or in the axils of upper leaves, up to 6 cm in length, densely flowered, peduncles up to 2.5 cm in length, minutely hispidulous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, filaments about equal to the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical, prominent, pilose with short hairs, fruit about 0.75 mm in length, globose-ovoid, verrucose, viscid.

Society Islands: Tahiti, above falls, Maara Valley, June 29, 1922, Setchell and Parks no. 502 (type of *P. pallida* variety *longespicata* (Univ. Calif.); below the falls, Maara Valley, June 29, 1922, Setchell and Parks no. 499 (Univ. Calif.); pendent from trees, in deep shade, Maara Valley, June 22, 1922, Setchell and Parks no 433 (Univ. Calif.; Bishop Museum); Tautira, Airua, on rocks in *Barringtonia-Hibiscus* forest, altitude 10 feet, August 7, 1930, Grant no. 4028.2 (Bishop Museum).

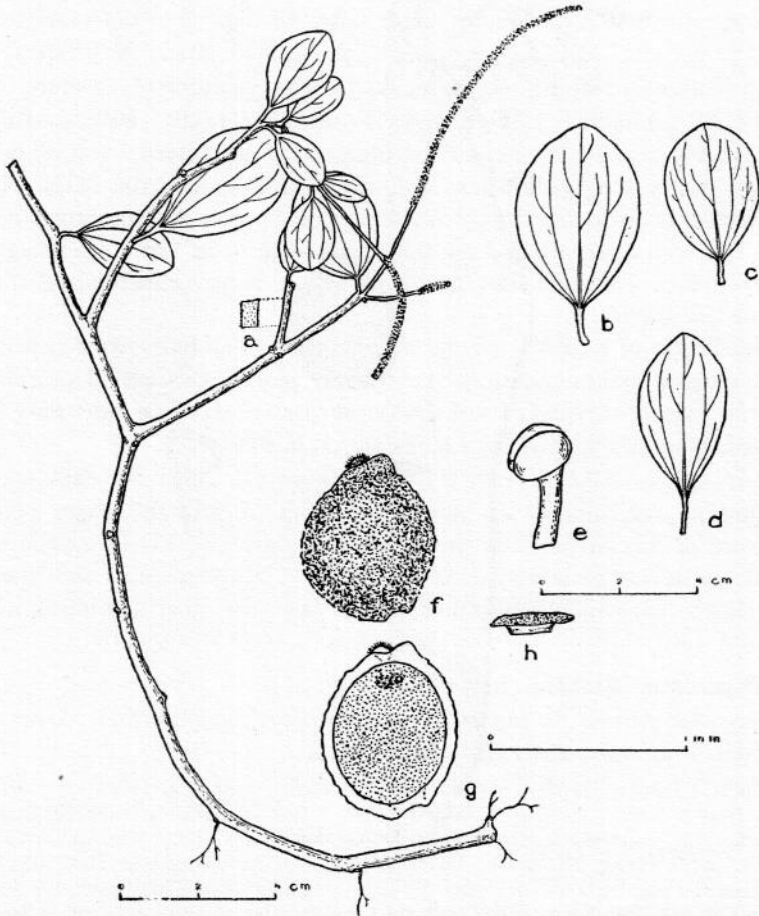


FIGURE 21.—*Peperomia Setchellii* (Setchell) Yuncker: *a*, section of stem, enlarged; *b-d*, leaves; *e*, stamen, enlarged; *f*, fruit; *g*, section of fruit; *h*, bract, enlarged.

The minutely hispidulous stems, petioles and peduncles together with the mostly glabrous, obovate to spatulate leaves and elongated peduncles, distinguish this species. It appears to be closely related to *P. Hombroonii* from

which it is to be distinguished chiefly because of its larger leaves and longer peduncles.

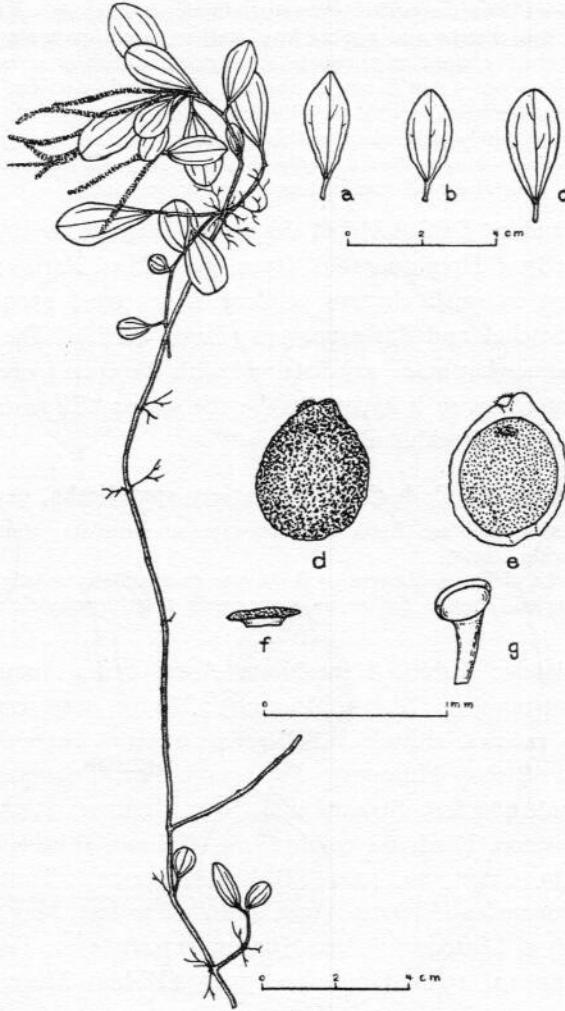


FIGURE 22.—*Peperomia Hombronii* de Candolle: *a-c*, leaves; *d*, fruit; *e*, section of fruit; *f*, bract, enlarged; *g*, stamen, enlarged.

23. *Peperomia Hombronii* C. de Candolle (fig. 22).

Peperomia Hombronii C. de Candolle: Ann. Conserv. Jard. Bot. Genève, vol. 2, p. 281, 1898; Setchell, Univ. Calif. Publ. Bot., vol. 12, p. 165, plate 34, 1926.

Stems repent and rooting at the lower nodes, with ascending branches up to 15 or more cm in height and 1.5 mm in thickness when dry; branching mostly from below, sparsely and minutely puberulent with spreading hairs when young, hairs about 0.05 mm in length, internodes up to 3 cm in length but mostly somewhat shorter. Leaves alternate or rarely some leaves opposite, glabrous, elliptic-obovate, up to 2.8 cm in length and 1.2 cm in width, mostly 2 to 2.5 cm long and 1.0 to 1.2 cm wide, palmately 3- or 5-nerved, nerves obscure, apex subattenuate or rounded, acutish or obtuse, base acute to subcuneate, petioles about 5 mm in length, sparsely and minutely puberulent when young. Spikes axillary and terminal, up to 5 cm in length, densely flowered, peduncles 1.0 to 2.3 cm in length, minutely puberulent, rachis glabrous, bracts round, peltate, about 0.5 mm in width, filaments longer than the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical, fruit about 0.8 mm in length, verrucose, viscid.

Society Islands: "Taiti-Archipel des Amis. Voyage de l'Astrolabe et de la Zélée 1838-1840," Hombron 1841 (type, herb. Mus. Paris); Tahiti, upper Fautaua Valley, in small clusters pendent from trees, 2500 feet altitude, July 8, 1922, Setchell and Parks no. 540 (Univ. Calif.). The leaves on this specimen are somewhat more spatulate and with the apex more rounded than in the type, but otherwise it appears to be the same; "Eimeo nāra Taheite," Andersson in 1852 (Stockholm).

Peperomia Hombronii C. de Candolle variety **spatulimba**, new variety.

Herbae utrinque glabrae. Folia ovalo-obovata ad spatulata, plerumque 1-2.5 cm longa, apice rotundo, obtuso.

Plants entirely glabrous. Leaves oval-obovate to spatulate, mostly 1 to 2.5 cm in length, apex rounded, obtuse. Spikes up to 7 cm in length, peduncle up to 1.5 cm in length.

Society Islands: Tahiti, Pirae-Moua Aorai trail, August 1-3, 1922, Quayle, without number (Bishop Museum); Mount Aorai trail, in moss on trees in damp ravines, altitude 1,848-2,000 meters, September 23, 1921, Quayle no. 55 (Bishop Museum); Papenoo Valley, Telamanu, epiphyte on *Hibiscus*, altitude 680 feet, September 4, 1930, Grant no 4040 (type, Bishop Museum); Papenoo, Farehape, epiphyte on *Hibiscus*, altitude 825 feet, September 5, 1930, Grant no. 4060 (Bishop Museum); Tautira, Tarui, on *Psidium* in *Neonauclea-Hibiscus* forest, altitude 840 feet, May 6, 1930, Grant no. 3992 (Bishop Museum); Pare, Diadem, epiphyte on *Fagraea*, altitude 2500 feet, May 13, 1930, Grant no. 3567 (Bishop Museum); Mahina, Ahonu, on *Fagraea*, in *Fagraea-Weinmannia* forest, altitude 2,860 feet, November 5, 1930, Grant no. 4393 (Bishop Museum); Aorai, epiphyte on *Weinmannia*, altitude 4,220 feet, June 5, 1930, Grant no. 3738 (Bishop Museum); same locality, epiphyte on *Byronia*, altitude 4,010 feet, June 4, 1930, Grant no. 3724 (Bishop Museum); same locality, epiphyte on *Weinmannia*, altitude 3,870 feet, June 4, 1930, Grant no. 5590 (Bishop Museum); Orofena, east side of south ridge, on mossy tree trunk, altitude 1,240 meters, September 20, 1934, St. John and Fosberg no. 17046 (Bishop Museum).

24. *Peperomia huahinensis*, new species (fig. 23).

Caules repentes, ramosis adscendentibus usque ad 10 + cm alti, minute pubescentes. Folia alterna, glabra aut sparse minute pubescentes, ovata, elliptica aut suboblata, usque ad 3.8 cm longa et 2 cm lata, palmatim 5-nervia, non ciliata, apice plus minusve attenuato, obtuso aut subacuto, basi sub acuta, petiolo usque ad 7 mm longo, minute pubercento. Spicae terminales axillaresque usque ad 5 cm longae, pedunculo usque ad 1.2 cm longo, ovario obovoideo, apice obliquo, stigmate sub apice, pilosa.

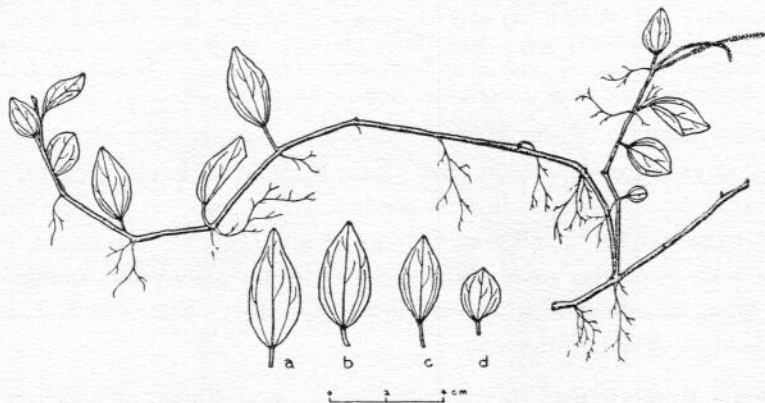


FIGURE 23.—*Peperomia huahinensis* Yuncker: a, leaf of variety *tahaensis*; b-d, leaves.

Stems repent, rooting from most of the lower nodes, with branches ascending up to 10 or more cm in length and 2 mm in thickness when dry, branching from below, very minutely puberulent with erect hairs about 0.1 or less mm in length, internodes 1 to 3 cm in length. Leaves alternate, glabrous or sparsely and very minutely puberulent near the base, elliptic or somewhat oblong, small leaves oval, up to 3.8 cm in length and 2 cm in width, palmately 5-nerved, veins prominent, not ciliated or with a tuft of very small hairs at the extreme apex, apex somewhat attenuate, obtuse or acutish, base shortly acute, petiole up to 7 mm in length, minutely puberulent. Spikes axillary and terminal, up to 5 cm in length, moderately flowered, peduncles up to 1.2 cm in length, minutely puberulent, rachis glabrous, bracts round, peltate, about 0.5 mm in width, filaments about equal to the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical, pilose with short hairs, single or divided. Matured fruit not seen.

Society Islands: Huahine, Maeva, Matoereere, on *Metrosideros* in summit forest, altitude 1,875 feet, February 7, 1931, Grant no. 5329 (type, Bishop Museum).

Peperomia huahinensis variety *tahaensis*, new variety (fig. 23, a).

Caules glabri. Folia elliptico-lanceolata, usque ad 4 cm longa et 2 cm lata, plerumque 2-3 cm longa et 1-1.5 cm lata, plerumque palmatim 3-nervia, apice acuto aut sub obtuso, basi acuta aut sub obtusa. Spicae usque ad 4.5 cm longae, pedunculo usque ad 1.7 cm longo.

Stems glabrous. Leaves glabrous, elliptic-lanceolate, up to 4 cm in length and 2 cm in width, mostly 2 to 3 cm long and 1 to 1.5 cm wide, mostly palmately 3-nerved, or if 5-nerved the outer pair of nerves very slender and inconspicuous, drying thin and membranous, apex acute or obtusish, base shortly acute or obtusish, petioles mostly about 5 mm in length. Spikes up to 4.5 cm in length, peduncles up to 1.7 cm in length, glabrous.

Society Islands: Tahaa, Ruutia, Mount Ohiri, epiphyte in *Xylosma-Fitchia-Crossostyles* forest, altitude 1,520 feet, January 25, 1931, Grant no. 5169 (type, Bishop Museum).

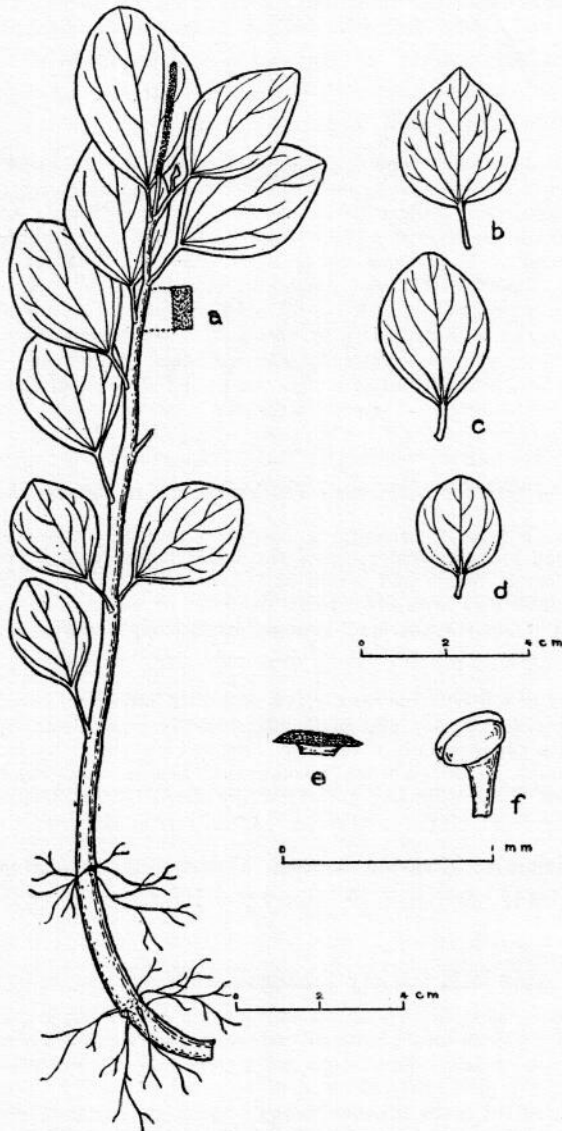


FIGURE 24.—*Peperomia Adamsonia* (F. Brown) Yuncker: *a*, section of stem, enlarged; *b-d*, leaves; *e*, bract, enlarged; *f*, stamen, enlarged.

This species bears some resemblance to *P. biformis* of Samoa but differs from it in its more repent stems, smaller leaves with less acute apices and bases, and longer peduncles. The shape of some of the leaves suggests relationship to *P. Hombronii* although the leaves of that species are mostly more obovate or spatulate.

25. *Peperomia Adamsonia* (F. Brown), new combination (fig. 24).

Peperomia pallida (Forster f.) A. Dietrich variety *Adamsonia* F. Brown:

B. P. Bishop Mus., Bull. 130, p. 21, 1935.

Plants repent below and rooting at the lower nodes, branches ascending up to 15 or more cm in height, fleshy, 5 mm in thickness in the lower part when dry, minutely puberulent in the upper younger parts, becoming glabrate below, simple or sparingly branching, internodes mostly 1 to 3 cm in length. Leaves alternate, sparingly and minutely puberulent on both surfaces when young, soon becoming glabrate, young leaves more or less minutely ciliated, oval, ovate, subobovate or suborbicular, 1.8 to 3.5 cm in length, 1.5 to 3.2 cm in width, mostly 2 to 3 cm in length and 2 to 2.5 cm in width, drying membranous, punctate with pellucid dots, palmately 5-nerved, the three innermost nerves prominent, the outer pair thin and inconspicuous, apex rounded and obtuse or acutish, base obtuse to acute, petioles 7 to 12 mm in length, minutely puberulent. Spikes axillary, 2.7 cm in length, moderately flowered, peduncles 1 cm in length, minutely puberulent, rachis glabrous, bracts round, peltate, punctate with yellow dots, about 0.5 mm in width, filaments about equaling the ellipsoidal anthers, ovary obovoid, apex oblique, stigma prominent, pilose, subapical. Matured fruit not seen.

Marquesas: Hivaoa, Tenatinaei, Mount Timetiu, altitude 3,620 feet, July 24, 1929, Mumford and Adamson no. 477 (Bishop Museum); Mount Timetiu, ridge to north of summit, altitude about 1,000 meters, May 27, 1929, Mumford and Adamson no. 417 (type, Bishop Museum).

The more or less repent stems, oval to ovate, subobovate or suborbicular leaves and minute puberulence distinguish this species.

26. *Peperomia Grantii*, new species (fig. 25).

Herbae epiphytae. Caules plus minusve repentis, saepe similes viti, ramosi adscendentes usque ad 25 + cm alti, modice hirsuti aut glabrescentes, pilis usque ad 1 mm longis, internodiis usque ad 5 cm longis. Folia alterna, subtus modice hirsuta ad glabrescentia, supra sparse hirsuta ad glabrescentia, copiose ciliata, elliptica, ovalia, subobovata, aut suborbiculata, usque ad 5 cm longa et 3 cm lata, plerumque 2-4 cm longa et 1-1.5 cm lata, 3- ad 7-subplinervia, apice attenuate-acuto aut rotunde-obtusos, basi acuta aut subobtusos, petiolo usque ad 5 mm longo, hirsuto ad glabratum. Spicae terminales axillaresque, usque ad 4.5 cm longae, pedunculo tenuo, usque ad 1.5 cm longo, hirsuto ad glabratum, ovario globoso-ovoideo, apice obliquo, stigmatibus sub apice. Fructus circum 0.7 mm longus, globoso-ovoideus.

Stems more or less repent and rooting at the lower nodes, often vine-like, with branches ascending up to 25 or more cm in height and 3 mm in thickness near the base when dry, branching, moderately hirsute with hairs up to 1 mm in length, or glabrescent, internodes up to 5 cm in length, but mostly 1 to 3 cm. Leaves alternate, moderately hirsute to glabrescent on the lower surface, sparingly hirsute to glabrescent on the upper surface, prominently and abundantly ciliated, elliptic, oval, subobovate, or suborbicular, often more or less rhombic, up to 5 cm in length and 3 cm in width, mostly 2 to 4 cm long and 1 to 1.5 cm wide, 3- to 7-subplinerved, the innermost pair of lateral nerves

mostly branching off the prominent midrib in the lowermost 2 to 4 mm, some leaves are more or less oblique with one of the lateral nerves branching off the midrib slightly higher than the other, apex attenuately acute, or rounded and obtusish in the orbicular or obovate leaves, base shortly acute or obtusish, petioles up to 5 mm in length, hirsute to glabrate, leaf scars semicircular, bundle scars 3. Spikes terminal and axillary, up to 4.5 cm in length, moderately flowered, peduncle very slender, up to 1.5 cm in length,

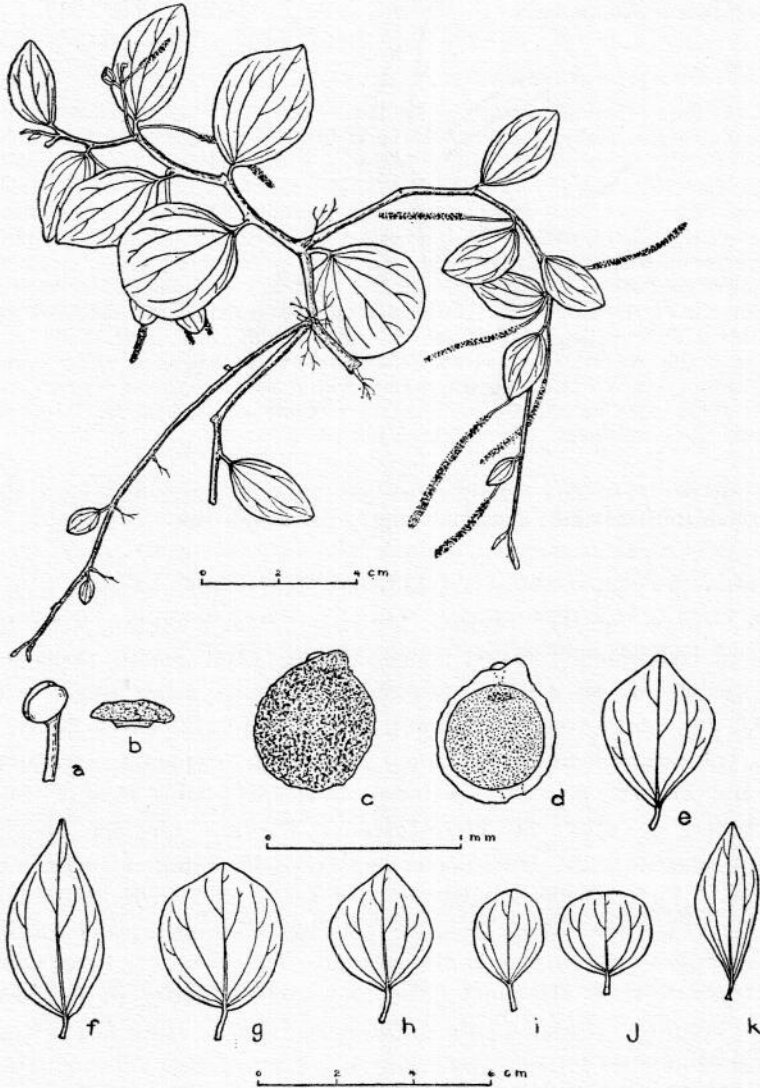


FIGURE 25.—*Peperomia Grantii* Yuncker: a, stamen, enlarged; b, bract, enlarged; c, fruit; d, section of fruit; e-k, leaves.

hirsute to glabrate, rachis glabrous, bracts round, peltate, about 0.5 mm in width, filaments slender, about equal to the ellipsoidal anthers, ovary globose-obovoid, apex oblique, stigma subapical, smooth or pilose, fruit about 0.75 mm in length, globose-ovoid, verrucose, viscid.

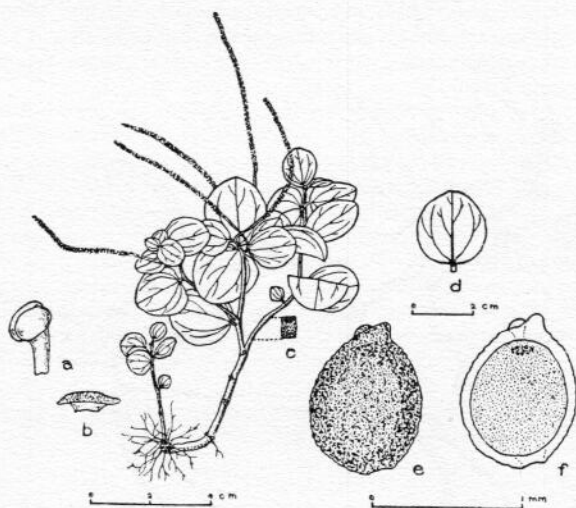


FIGURE 26.—*Peperomia Fosbergii* Yuncker: a, stamen, enlarged; b, bract, enlarged; c, section of stem, enlarged; d, leaf; e, fruit; f, section of fruit.

Society Islands: Tahiti, Pirae-Moua Aorai trail, August 1-3, 1922, Quayle, without number (Bishop Museum); Mount Aorai, Noha Ravine, depths of cool, damp forested ravine, altitude 1,090 meters, September 29, 1921, Quayle no. 89 (Bishop Museum); Orofena, south ridge, east side, vinelike, on mossy tree trunks, wet, tree-fern forest, leaves fleshy, green above, pale green beneath, altitude 1,220 meters, September 20, 1934, St. John and Fosberg no. 17031 (Bishop Museum); same locality, St. John and Fosberg no. 17052 (Bishop Museum); Papenoo, Orofena, epiphyte on *Cyathea*, altitude 3,450 feet, September 21, 1930, Grant no. 4226 (Bishop Museum); Pare, Diadem, epiphyte on *Fagraea* and *Celtis*, altitude 3,018 feet, May 13, 1930, Grant no. 3588 (Bishop Museum); same locality, on rocks in *Fagraea-Celtis* forest, altitude 3,050 feet, May 13, 1930, Grant no. 3589 (type, Bishop Museum); Mahina, Aorai, epiphyte in *Weinmannia-Tecoma-Cyathea* forest, altitude 3,870 feet, June 4, 1930, Grant no. 3707 (Bishop Museum).

The hirsute stems, shape of leaves and slender peduncles distinguish this species which I have named for M. L. Grant, the collector of the type specimen.

27. *Peperomia Fosbergii*, new species (fig. 26).

Herbae epiphytae. Caules suberecti, usque ad 10 + cm alti, ramosi, dense adpresso-hirsuti, pilis circum 0.5 mm longis, internodis usque ad 2.5 cm longis. Folia alterna aut raro opposita, supra glabra, subtus sparse hirsuta ad glabrescentia, ovali-ovata ad orbiculata, usque ad 2.3 cm longa et 2.2 cm lata, palmatim 3-nervia aut raro 5-nervia, apice rotundo, obtuso, basi obtuso aut subacuto, petiolo circum 2 mm longo, dense adpresso-hirsuto. Spicae terminales aut folio-opposae, usque ad 1.5 cm longae, pedunculo 5-8 mm longo, minute pubescente, ovario ovoideo, apice obliquo, stigmatē sub apice. Fructus circum 8 mm longus, globose-ovoideus.

Epiphytic. Stems suberect, ascending from a briefly decumbent base, up to 10 or more cm in height and 2 mm in thickness when dry, freely branching, densely appressed hirsute, hairs about 0.5 mm in length, internodes up to 2.5 cm in length. Leaves mostly alternate, rarely some leaves opposite, "fleshy" when fresh, drying firm, glabrous on the upper surface excepting for a few hairs at the base and near the margin towards the apex, the lower surface sparingly hirsute, especially near the base and along the nerves, to glabrescent, punctate with yellowish dots, oval-ovate to orbicular, up to 2.3 cm in length and 2.2 cm in width, palmately 3-nerved or rarely 5-nerved, the nerves conspicuous, apex rounded, obtuse, base obtuse or somewhat acutish, petioles about 2 mm in length, densely appressed hirsute. Spikes terminal and axillary, up to 6 cm in length, moderately to densely flowered, peduncles 1 to 2 cm in length, densely appressed hirsute, bracts round, peltate, about 0.6 mm in width, punctate with yellow dots, filaments about equal to the ellipsoidal anthers, ovary ovoid, apex oblique, stigma subapical, fruit about 1 mm in length, ovoid, verrucose, viscid.

Society Islands: Tahiti, U. S. Explor. Exped. under Captain Wilkes, 1838-42 (Gray); Orofena, south ridge, on mossy tree branches, wet thicket on ridge, altitude 1600 meters, September 25, 1934, St. John and Fosberg no. 17078 (type, Bishop Museum).

This species is named for F. R. Fosberg, junior botanist on the Bernice P. Bishop Museum Mangarevan Expedition.

28. *Peperomia St.-Johnii*, new species (fig. 27).

Caules complures, adscentes aut plus minusve decumbentes, usque ad 13 + cm alti, subdichotome aut subtrichotome furcati, primum modice et minute pubescentes, demum glabrescentes, pilis sub 0.2 mm longis, internodis usque ad 4 cm longis. Folia opposita aut raro alterna, glabra, ovalia, subovata aut subobovata, usque ad 2 cm longa et 1.5 cm lata, nervis subpinnatis, apice rotundo, obtuso, basi obtusa aut subacuta, petiolo minute pubescente, plerumque 2-3 mm longo. Spicae terminales aut folio-opposae, usque ad 1.5 cm longae, pedunculo 5-8 mm longo, minute pubescente, ovario ovoideo, apice obliquo, stigmatē sub apice. Fructus circum 8 mm longus, globose-ovoideus.

Stems several, tufted, radiating from a rooting base, ascending or more or less decumbent and rooting at the lower nodes, up to 13 or more cm in length and 1 mm in thickness near the base when dry, subdichotomously or subtrichotomously branching upward, branches slender, younger branches moderately and minutely puberulent, older parts sparingly puberulent to glabrescent, the hairs less than 0.2 mm in length, internodes up to 4 cm in length below, much shorter above. Leaves opposite or not uncommonly some leaves alternate, glabrous, "somewhat fleshy" when fresh, drying rather firm, dark green above, pale green beneath, oval, subovate, or subobovate, up to 2 cm in length and 1.5 cm in width, but mostly somewhat smaller, subpinnately nerved, the midrib prominent, the lateral nerves slender and inconspicuous, apex rounded, obtuse, base obtuse or acutish, petioles minutely puberulent, mostly 2 to 3 mm in length, leaf scars semicircular. Spikes terminal or opposite the upper leaves, up to 1.5 cm in length, peduncles 5 to 8 mm in length, minutely puberulent, rachis glabrous, bracts orbicular,

peltate, about 0.4 mm in width, filaments equal to or somewhat longer than the ellipsoidal anthers, ovary ovoid, apex oblique, stigma subapical, fruit about 0.8 mm in length, globose-ovoid, verrucose, viscid, eventually on pseudopedicels.

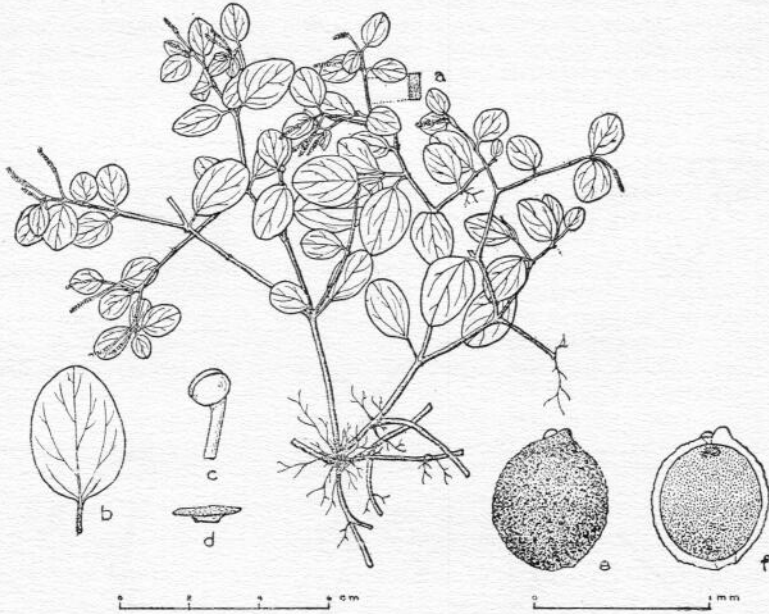


FIGURE 27.—*Peperomia St. Johnii* Yuncker: a, section of stem, enlarged; b, leaf; c, stamen, enlarged; d, bract, enlarged; e, fruit; f, section of fruit.

Austral Islands: Raivavae, pass west of Mount Hiro, in moss on tree trunk, altitude 310 meters, August 11, 1934, St. John no. 16159 (type, Bishop Museum).

I take pleasure in naming this species for Harold St. John, collector and senior botanist on the Bernice P. Bishop Museum Mangarevan Expedition. It is easily identified because of the shape and venation of the leaves and especially the very short spikes.

29. *Peperomia Wilderi*, new species (fig. 28).

Caules repentes, usque ad 60 + cm longi, ad nosa radices agentes, ramosi adscentes usque ad 5 cm alti, glabri, internodis usque ad 4 cm longis. Folia opposita, glabra, ovali-orbiculata ad subobovata, 0.8-1.5 cm longa, usque ad 1 cm lata, palmatim 3-nervia, apice rotundo, obtuso, basi obtusa aut subacuta, petiolis plerumque 4 mm longis, glabris. Spicae terminales, 3-4 cm longae, pedunculo 9-12 mm longo, ovario ovoideo-obovoido, apice obliquo, stigmatibus sub apice.

Stems repent and rooting at the nodes, up to 60 or more cm in length, spike-bearing branches erect, up to 5 cm in height and 1 mm in thickness when dry, branching from the rooting nodes, glabrous, internodes on the prostrate stems mostly 2 to 4 cm in length, somewhat shorter on the erect fruiting branches. Leaves opposite, entirely

glabrous, oval-orbicular to subobovate, 0.8 to 1.5 cm in length, up to 1 cm in width, palmately 3-nerved, the nerves very slender and with many smaller branches, apex rounded, obtuse, base obtuse or subacute, not punctate, drying very thin and membranous, petioles mostly about 4 mm in length, glabrous. Spikes single or in twos, terminal, 3 to 4 cm in length, moderately flowered, peduncle 9 to 12 mm in length, rachis glabrous, bracts about 0.5 mm in width, round, peltate, filaments about equal to the ellipsoidal anthers, ovary ovoid-obovoid, apex oblique, stigma subapical, with an easily deciduous pilose pad, fruit not matured, but presumably of the ordinary oblique-apex type characteristic of most of the Polynesian species.

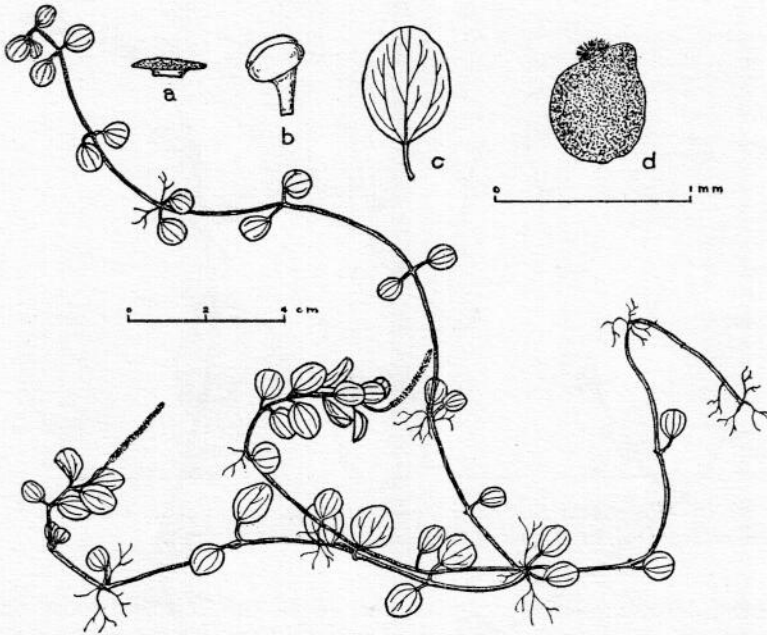


FIGURE 28.—*Peperomia Wilderi* Yuncker: a, bract, enlarged; b, stamen, enlarged; c, leaf; d, ovary.

Cook Islands: Rarotonga, altitude 1100 feet, June 20, 1929, Wilder no. 837 (type, Bishop Museum).

This species is named for the late Gerrit P. Wilder, collector. It is closely related to *P. marchionensis* but differs from that species because of its entirely glabrous stems and leaves and its thin and membranous leaves in which the midrib is no more prominent than the slender lateral nerves.

30. *Peperomia marchionensis* F. Brown (fig. 29).

Peperomia marchionensis F. Brown: Bernice P. Bishop Mus., Bull. 130, p. 22, fig. 2a-c, 1935.

Stems repent and rooting at most nodes, up to 45 or more cm in length and 2 mm in thickness when dry, infrequently branching, minutely puberulent when young, glabrescent when older, internodes 1.5 to 2.5 cm in length, mostly about 2 cm. Leaves opposite,

drying firm, punctate with yellow dots, minutely puberulent to subglabrate, oval-elliptic to obovate, up to 1.8 cm in length and 1.2 cm in width, mostly 1 to 1.3 cm in length and 0.7 to 0.9 cm in width, palmately 3-nerved, the midrib prominent, apex rounded, obtuse, base acute, petioles mostly 3 to 5 mm in length, minutely puberulent. No spikes have been seen. Brown describes them as "commonly terminal with a few axillary, the peduncle 1 cm more or less in length, minutely puberulent; floriferous portion 25 mm long, more or less, fleshy, 1 mm in diameter, glabrous; bracts suborbicular, 0.5 mm in diameter, closely spaced; ovulary partly sunken in the axis, the stigma distinctly lateral."

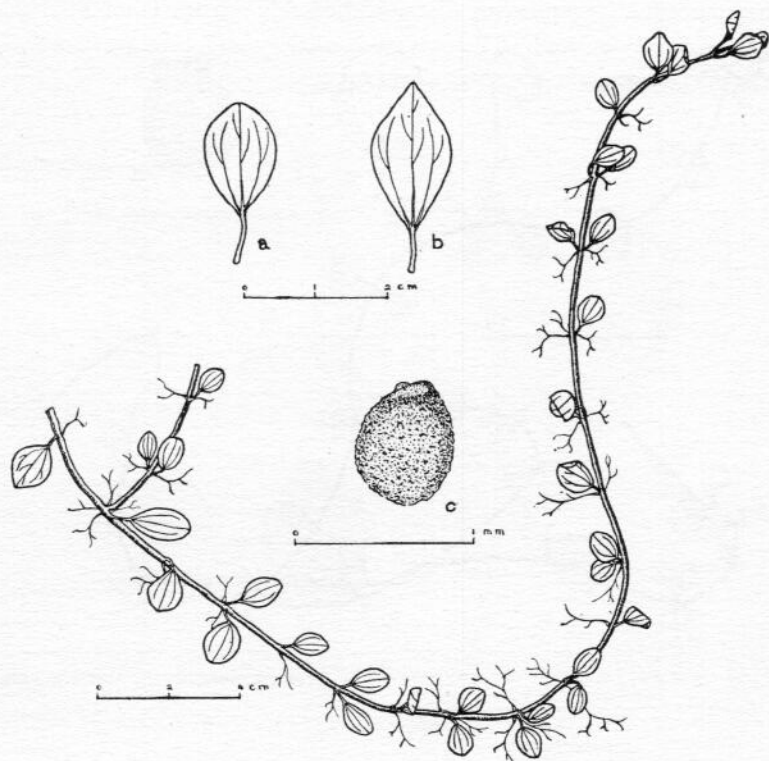


FIGURE 29.—*Peperomia marchionensis* F. Brown: a, leaf; b, leaf of variety *uapensis*; c, immature fruit of variety *uapensis*.

Marquesas: Hivaoa, Hana Iafa (Hanaiapa), altitude 300 (?) meters, October 23, 1922, Quayle no. 1630 (type, Bishop Museum).

Peperomia marchionensis F. Brown variety ***uapensis*** F. Brown (fig. 29, b-c).

Peperomia marchionensis variety *uapensis* F. Brown: Bernice P. Bishop Mus., Bull. 130, p. 22, 1935.

Stems less frequently rooting at the nodes. Internodes up to 4.5 cm in length, mostly much shorter. Leaves up to 2.8 cm in length and 1.3 cm in width, mostly some-

what smaller, elliptical to subobovate. Spikes axillary and terminal, up to 2 cm in length, peduncle about 1 cm in length, minutely puberulent, rachis glabrous, bracts round, peltate, punctate with yellow dots, about 0.5 mm in width, ovary ovoid, apex oblique, stigma small, subapical. Mature fruit not present.

Marquesas: Uapou, Mount Tikahoipu, altitude 810 meters, September 11-13, 1922, Quayle no. 1175 (type, Bishop Museum).

The puberulence, rigid condition of the dry leaves, prominent midrib, and the somewhat larger leaves distinguished this species from *P. Wilderi* to which it is closely related. The leaves of variety *uapensis* are mostly larger than the species and the stems are less repent.

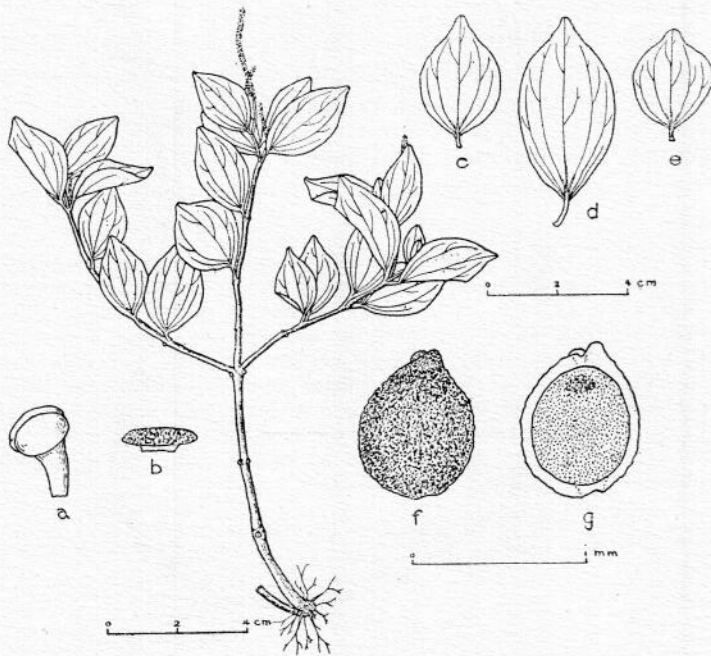


FIGURE 30.—*Peperomia Anderssonii* Yuncker: *a*, stamen, enlarged; *b*, bract, enlarged; *c-e*, leaves; *f*, fruit; *g*, section of fruit.

31. *Peperomia Anderssonii*, new species (fig. 30).

Caules adscendentes, usque ad 25 + cm alti, ramosi, glabri, internodiis usque ad 4 cm longis. Folia opposita aut raro alternata, glabra, elliptica ad ovali-obovata, usque ad 5 cm longa et 2.8 cm lata, 5- aut 7-subplinervia, apice breviter attenuato, acuto aut sub obtuso, basi acuta, petiolo usque ad 1 cm longo, glabro. Spicae terminales axillaresque usque ad 7 cm longae, pedunculo usque ad 1 cm longo, glabro, ovario ovoideo, apice obliquo, stigmatate sub apice. Fructus globoso-ovoideus, circum 0.8 mm longus.

Stems ascending from a short, decumbent, rooting base, up to 25 or more cm in height and 2 mm in thickness when dry, divaricately branching, stem and branches somewhat rigid, glabrous, internodes up to 4 cm in length, commonly 1 to 2 cm. Leaves opposite, less commonly some leaves alternate, in some specimens opposite and alternate

leaves in about the same proportion, glabrous, not ciliated, or with a few short hairs near the apex, elliptic to oval-obovate, subrhombic, up to 5 cm in length and 2.8 cm in width, mostly 2 to 3.5 cm long and 1.5 to 2.5 cm wide, 5- or 7-subplinerved, the innermost nerves coalescing with the prominent midrib in the lowermost 1 to 4 mm, apex shortly attenuate, acute or obtusish, base acute, petioles up to 1 cm in length, mostly 3 to 5 mm glabrous. Spikes axillary and terminal, up to 7 cm in length, mostly shorter, moderately to densely flowered, peduncles up to 1 cm in length, glabrous, rachis glabrous, bracts round, peltate, about 0.6 mm in width, punctate with yellowish dots, filaments about equal to the ellipsoidal anthers, ovary ovoid, apex oblique, stigma subapical, pilose with short hairs, or smooth, fruit globose-ovoid, about 0.8 mm in length, verrucose, viscid.

Society Islands: Tahiti, "Eimeo näre Taheite", September 1852, Andersson (type, Stockholm).

The shape of the leaves, more or less rigid condition of the stems and leaves, and especially the subplinerving of the leaves serve to distinguish this species from *P. pallida* with which it is closely allied.

32. *Peperomia Rechingerae* C. de Candolle (fig. 31).

Peperomia Rechingerae C. de Candolle: in Rechingen Ergebn., pt. 3, p. 94, 1910.

Stems ascending from a decumbent, rooting base, up to 25 or more cm in height and 4 mm in thickness near the base when dry, not branching in the type specimen, glabrous, internodes 3.5 to 6 cm in length. Leaves in threes, "crassa carnosae" when fresh, entirely glabrous, not ciliated, oval-obovate to obovate, upper leaves 3 to 4 cm in length and 2 to 2.4 cm in width, lower leaves much smaller, palmately 5-nerved, the midrib and innermost pair of nerves prominent, apex rounded, obtuse, base acute to cuneate, petioles mostly 4 to 6 mm in length, glabrous. Spikes one to several in the upper axils, up to 5 or more cm in length, peduncles up to 2.5 cm in length, glabrous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, "ovary obovate, stigma slightly subapical, apex oblique." Fruit not seen.

Samoa: Upolu, "in terra, in silvis primaevis prope Tiavi in umbrosis," May 1905, K. and L. Rechingen no. 380 (type, Vienna).

Key to the Varieties.

Leaves mostly in whorls of 3.....**P. Rechingerae**
 Leaves mostly opposite or more rarely some alternate
 Leaves mostly 2.5 to 3.5 cm in length.....variety **aopoana**
 Leaves mostly longer.....variety **subrepens**

Peperomia Rechingerae C. de Candolle variety **aopoana**, new variety (fig. 31, *j-l*).

Caules usque ad 15 + cm alti, erecti aut plus minusve repentes. Folia glabra, opposita aut raro alterna, usque ad 4.5 cm longa et 2.5 cm lata, plerumque 2.5-3.5 cm longa et 1.5-2 cm lata, palmatim 3- aut 5-nervia. Spicae usque ad 10 cm longae.

Plants up to 15 or more cm in height, erect or more or less repent and rooting at the lower nodes, branching from the lower nodes, unbranched above. Leaves entirely glabrous, opposite or rarely some leaves alternate, up to 4.5 cm in length and 2.5 cm in width, mostly 2.5 to 3.5 cm in length and 1.5 to 2 cm in width, palmately 3- or 5-nerved. Spikes up to 10 cm in length, mostly 4 to 6 cm, peduncles 2 to 3 cm in length,

rachis glabrous, ovary obovoid, apex oblique, stigma fleshy, single or divided, smooth or pilose, fruit about 0.9 mm in length, globose-ovoid, verrucose, viscid.

Samoa: Savaii, above Aopo, 1902 lava field, shrubbery, altitude 1200-1400 meters, October 7, 1929, Christophersen no. 893 (type, Bishop Museum).

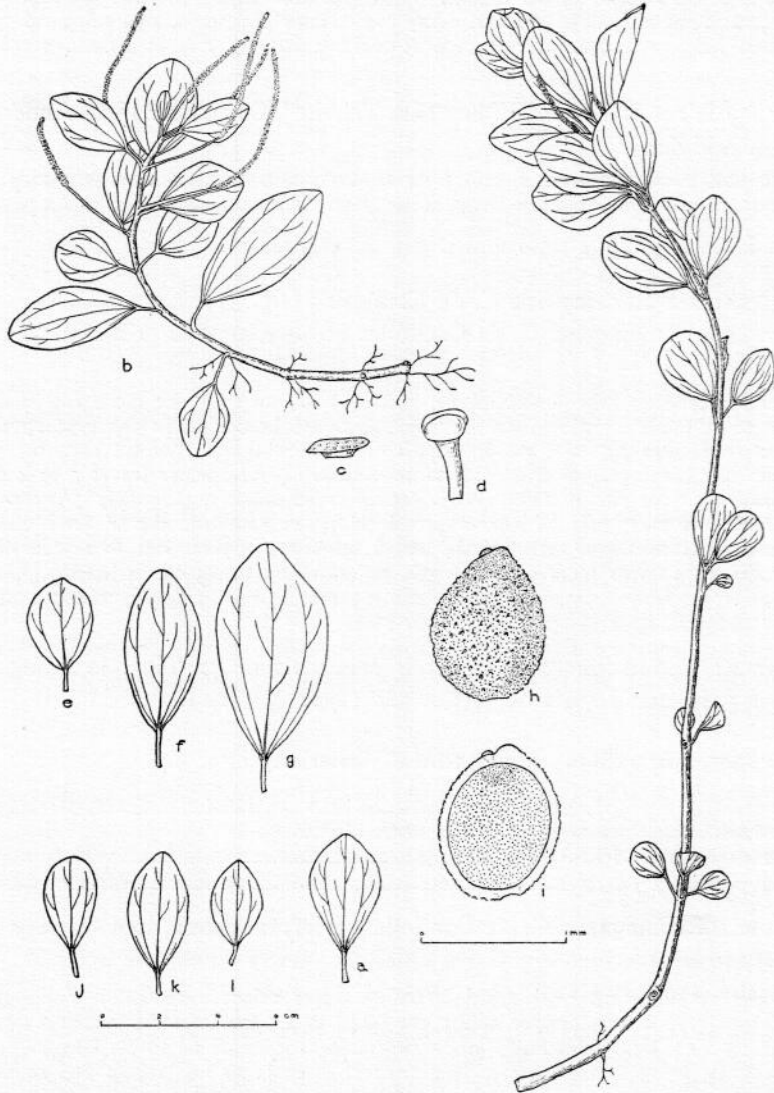


FIGURE 31.—*Peperomia Rechingerae* de Candolle: a, leaf; b, variety *subrepens*; c, bract, enlarged; d, stamen, enlarged; e-g, leaves; h, fruit; i, section of fruit (b-i variety *subrepens*); j-l, leaves of variety *aopoana*.

Peperomia Rechingerae C. de Candolle variety **subrepens**, new variety (fig. 31, b-i).

Caules repentes, ramosi adscentes usque ad 10 + cm alti, glabri. Folia opposita aut raro alterna, glabra, elliptico- ad ovalo-obovata, plerumque 2.5-5 cm longa et 2-2.5 cm lata, palmatim 3- aut 5-nervia. Spicae terminales axillaresque, pedunculo 2-3 cm longo.

Stems repent and rooting at the nodes below with erect or ascending branches up to 10 or more cm in height, glabrous, internodes up to 5 cm in length, but mostly 1 to 3 cm. Leaves not uncommonly alternate above, mostly opposite below, glabrous, not ciliated, elliptic- to oval-obovate or subrhombic, drying firm, punctate with numerous fine dots, 2.5 to 5 cm in length and 2 to 2.5 cm in width, palmately 3- or 5-nerved, the three innermost nerves prominent, the other nerves slender and inconspicuous, apex rounded, obtuse, base acute to cuneate, petiole up to 1 cm in length, glabrous, leaf scars semicircular, bundle scars 3. Spikes terminal and axillary, floriferous part up to 5 cm in length, densely flowered, peduncle 2 to 3 cm in length, glabrous, rachis glabrous, bracts round, peltate, about 0.5 mm in width, conspicuously punctate with black dots, filaments stout, becoming much longer than the ellipsoidal anthers, ovary obovoid, apex oblique, stigma subapical, pilose, fruit about 1 mm in length, globose-ovoid, verrucose, viscid.

Samoa: Upolu, Malololelei-Lanutoo, epiphytic in forest, August 5, 1929, Christophersen no. 46 (type, Bishop Museum); epiphyte in forest, on ridge above Malololelei, altitude 670 meters, August 5, 1929, Christophersen no. 1 (Bishop Museum).

The elongated peduncles, entirely glabrous condition of the stems and leaves, and leaf shape distinguish this species. There is great variety in the position of the leaves on the different specimens included here. The type of *P. Rechingerae* has most of the leaves in whorls of 3 while those of varieties *aopoana* and *subrepens* are more commonly opposite or even alternate though some of the leaves are also whorled. There is also great variation in the size of the leaves. However, because of the general similarity of the plants it seems best to include them under one species.

33. Peperomia pallida (Forster f.) A. Dietrich (fig. 32).

Peperomia pallida (Forster f.) A. Dietrich: Sp. Pl. vol. 1, pt. 1, p.153, 1831.

Piper pallidum Forster f.: Prodr., 5, 1786.

Peperomia subglabra (Setchell) Brown: Bernice P. Bishop Mus., Bull. 130, p. 24, 1935.

Peperomia Moerenhoutii C. de Candolle variety *subglabra* Setchell: Univ. Calif. Publ. Bot., vol. 12, p. 165, pl. 33, 1926.

Stems ascending from a decumbent, rooting base, up to 20 or more cm in height and 2 mm in thickness at the base when dry, branching, moderately to sparingly hirtellous above, hairs mostly less than 0.5 mm in length, becoming glabrate below, internodes up to 5 cm in length but mostly 1.5 to 2.5 cm. Leaves predominately opposite or more rarely some leaves alternate, moderately hirtellous to glabrescent on the lower surface, sparingly hirtellous near the base on the upper surface, puberulent ciliate at least near the apex, oval-elliptic to obovate, or the lower leaves commonly smaller and

obovate to suborbicular, upper surface dark green, lower surface lighter colored, mostly 2 to 3 cm in length and 1.2 to 1.8 cm in width, palmately 3- or 5-nerved, apex rounded and obtuse to somewhat attenuate and acutish, base acute to subcuneate, petioles mostly 5 to 8 mm in length, sparingly hirtellous to glabrescent. Spikes axillary and terminal, up to 5 cm in length, moderately flowered, peduncles up to 1 cm in length, sparingly hirtellous to glabrescent, bracts round, peltate, about 0.5 mm in width, ovary ovoid, apex oblique, stigma subapical, filaments longer than the subglobose to ellipsoidal anthers, fruit globose-ovoid, about 0.9 mm in length, verrucose, viscid, eventually on pseudopedicels.

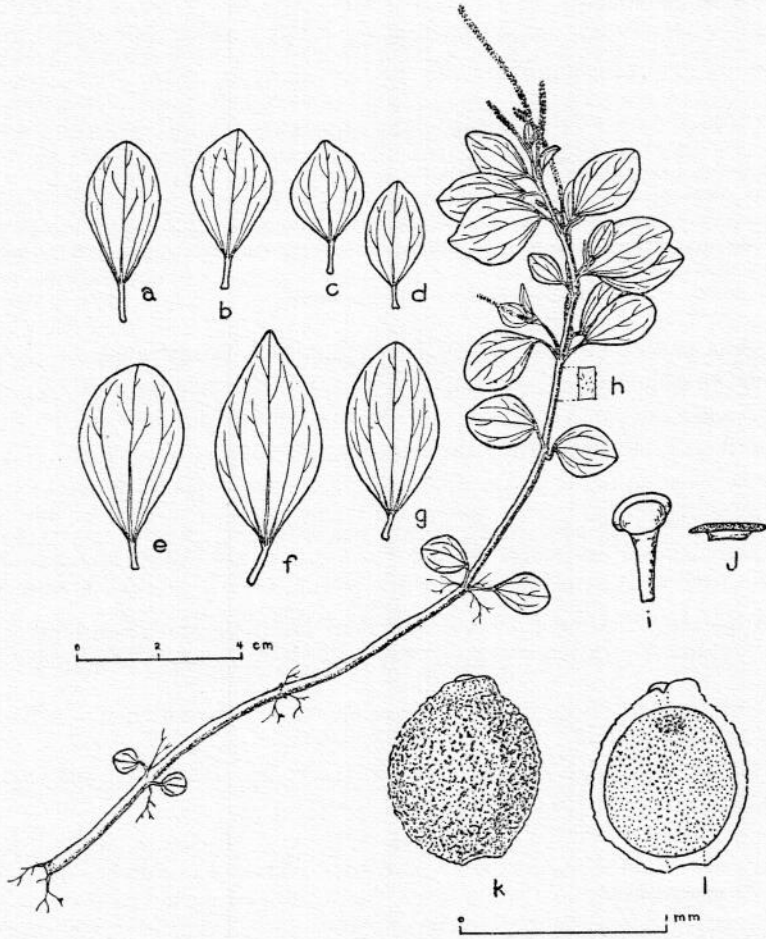


FIGURE 32.—*Peperomia pallida* A. Dietrich: a-d, leaves; e-g, leaves of variety *rurutensis*; h, section of stem, enlarged; i, stamen, enlarged; j, bract, enlarged; k, fruit; l, section of fruit.

Society Islands: Forster (type, British Museum; isotypes, Kew and Berlin); Savatier, 1877 (Kew); Tahiti, Papara, October 1909, Leland, Chase and Tilden no. 21, in part, mixed with *P. leptostachya* (Gray); on dripping

rocks, Maraa caves, May 29, 1922, Setchell and Parks no. 182 (type of *P. Moerenhoutii* variety *subglabra*, Univ. Calif.; Gray; Bishop Museum; Vienna): Tahaa, Mount Purauti, east ridge, on mossy tree branch, dense woods, altitude 410 meters. October 11, 1934, St. John no. 17410 (Bishop Museum). The leaves of this specimen are somewhat larger than normal for the species and some stems are glabrate thus resembling variety *rurutensis* to some extent.

Cook Islands: Rarotonga, Maungatea, altitude 1,000 feet, June 19, 1929, Wilder no. 959 (Bishop Museum).

Key to the Varieties

- Leaves mostly less than 3 cm in length
 Stems more or less hairy
 Stems and leaves hirtellous.....*P. pallida*
 Stems and leaves minutely hispidulous, soon glabrescent.....variety *fatuhivensis*
 Stems glabrous.....variety *tuamotensis*
 Leaves mostly 3 to 6 cm in length, stems glabrous.....variety *rurutensis*

Peperomia pallida (Forster f.) A. Dietrich variety ***fatuhivensis*** (F. Brown), new combination.

Peperomia subglabra (Setchell) F. Brown, variety *fatuhivensis* F. Brown: Bernice P. Bishop Mus., Bull. 130, p. 25, 1935.

Stems ascending up to 20 or more cm in height and 3 cm in thickness near the base when dry, drying rigid, youngest parts minutely hispidulous, soon glabrescent. Leaves drying firm, petioles mostly about 5 mm in length, minutely hispidulous when young, soon glabrescent. Spikes up to 7 cm in length but mostly somewhat shorter, peduncles slender, commonly about 1.5 cm in length, minutely hispidulous when young.

Marquesas: Nukuhiva, on moss-covered *Hibiscus* on ravine bottom, altitude 1,000 meters, October 1922, Quayle no. 1218 (Bishop Museum).

Peperomia pallida (Forster f.) A. Dietrich variety ***tuamotensis*** (F. Brown), new combination.

Peperomia subglabra (Setchell) F. Brown variety *tuamotensis* F. Brown: Bernice P. Bishop Mus., Bull. 130, p. 25, 1935.

Stems glabrous. Leaves glabrous on both surfaces, abundantly ciliated about the apex with short hairs, or these more rarely lacking, oval-elliptic to obovate, subspatulate, or suborbicular, mostly 2 to 3 cm in length, rarely some leaves up to 4 cm, 1 to 1.5 cm in width, mostly drying rather firm, apex rounded, obtuse to somewhat attenuate and acutish, base acute to subcuneate, petioles mostly about 5 mm in length. Spikes up to 7 cm in length, peduncles mostly less than 1 cm in length.

Society Islands: Meetia, U. S. Explor. Exped., Captain Wilkes, 1838-42 (Gray); Meetia, Fatia-po to Fareura, on mossy tree trunk, altitude 150 meters, May 12, 1934, St. John no. 14227 (Bishop Museum); Tahiti, Tautera, Airua, on rocks, in *Barringtonia-Hibiscus* forest, altitude 10 feet, August 7, 1930, Grant no. 4028.1 (Bishop Museum).

Tuamotu Islands: Niau, in jungle, altitude 2-4 meters, August 16, 1922, Quayle no. 845 (type, Bishop Museum); Makatea, on coral rocks in damp forests, altitude 200 feet, September 20, 1932, Wilder no. 1135 (Bishop Museum); interior, on rocks in shady, moist places, altitude 100 meters, Jones no. 863 (Bishop Museum); Anaa, Tukahora, on damp ledges of dissected coral in woods, altitude 2 meters, May 13, 1934, St. John no. 14262 (Bishop Museum).

Marquesas: Uahuka, October 1922, Quayle no. 1815 (Bishop Museum); Uapou, Quayle (Bishop Museum).

Peperomia pallida (Forester f.) A. Dietrich variety **rurutensis** (F. Brown), new combination (fig. 32, *e-g*).

Peperomia subglabra (Setchell) F. Brown variety *rurutensis* F. Brown: Bernice P. Bishop Mus., Bull. 130, p. 25, 1935.

Stems glabrous. Leaves glabrous or with a few hairs near the base, up to 6.5 cm in length and 3 cm in width, mostly somewhat smaller, obovate to suborbicular, apex rounded, obtuse, less commonly subattenuate, base cuneate, petioles 5 to 10 mm in length.

Society Islands: Tahiti, September 1852, Andersson, without number (Stockholm); Moorea, Afareaitu, Putoa, on rocks in *Hibiscus-Neonauclea* forest, altitude 720 feet, February 18, 1931, Grant no. 5375 (Bishop Museum); Huahine, Fare, Matoereere, on rocks in *Inocarpus* forest, altitude 150 feet, February 7, 1931, Grant no. 5269 (Bishop Museum), (this specimen has leaves somewhat more acute than the others included under this variety but otherwise it closely resembles them); Maitea (Meetia), Tuurapia, on rocks in *Barringtonia-Inocarpus-Casuarina* forest, altitude 50 feet, December 13, 1930, Grant no. 4679 (Bishop Museum); Meetia, Fatia-po to Fareura, on mossy tree trunk, common from 10-350 meters, altitude 100 meters, May 12, 1934, St. John no. 14217 (Bishop Museum); same locality, altitude 150 meters, St. John no. 14218 (Bishop Museum); Raiatea, south side of Taohiva Valley, on mossy rock in moist woods, altitude 175 meters, October 7, 1934, St. John no. 17309 (Bishop Museum).

Austral Islands: Rimatara, Anapoto, on shaded, elevated, dissected coral, altitude 5 meters, September 4, 1934, St. John and Fosberg no. 16866 (Bishop Museum), (leaves on this specimen mostly smaller than normal for this variety); Rurutu, Mato Arei, on raised broken coral rock under shelter of trees, altitude 75 meters, Stokes no. 153a (Bishop Museum); Moerai, north side, shaded crevices in coral cliffs, altitude 5 meters, August 25, 1934, St. John no. 16641 (Bishop Museum).

This species is much confused in different herbaria. Various species with elliptic, acute to acuminate leaves, as *P. societatis*, and *P. lonchophylloides*, are most commonly erroneously identified as *P. pallida*. The type, in the British Museum, is fragmentary and incomplete, but what are taken to represent isotypes at Kew and Berlin are sufficiently mature and complete

to enable one to determine the characteristics. The mostly opposite, obtuse, ciliated, oval to obovate leaves, together with the sparingly hairy to glabrate stems serve to distinguish this species. The leaves of variety *rurutensis* are mostly much larger than those of the species and other varieties but the specimens closely agree in other respects.

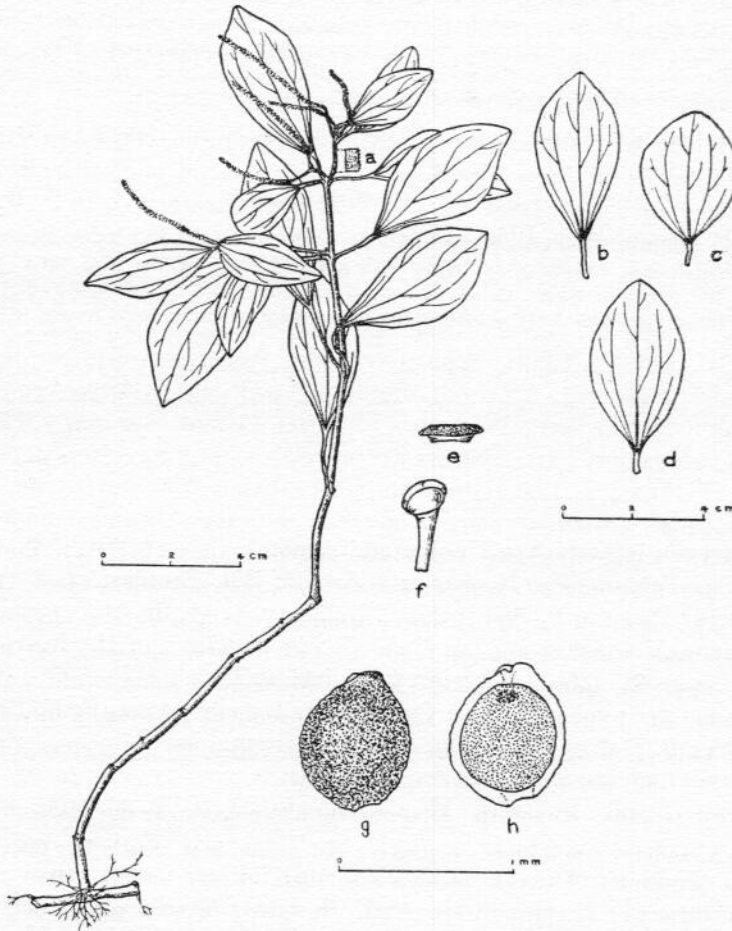


FIGURE 33.—*Peperomia abscondita* Moore: a, section of stem, enlarged; b-d, leaves; e, bract, enlarged; f, stamen, enlarged; g, fruit; h, section of fruit.

34. *Peperomia abscondita* Moore (fig. 33).

Peperomia abscondita Moore: Bernice P. Bishop Mus., Bull. 102, p. 25, 1933.

Stems ascending from a decumbent base, up to 25 or more cm in height and 3 mm in thickness near the base when dry, branching above, hirtellous above with erect hairs

which are mostly 0.25 or less mm in length, glabrescent below, internodes 2 to 3.5 cm in length above, somewhat shorter below. Leaves opposite or more rarely some leaves alternate, hirtellous on the lower surface or glabrescent, hirtellous at the base and along the nerves on the upper surface when young, glabrescent when older, ciliated with fine hairs, elliptic to oval-obovate, 2.5 to 5 cm in length, 1.5 to 2.5 cm in width, palmately 5-nerved, apex rounded and obtuse, or briefly attenuated and acutish, base cuneate, petioles up to 1.5 cm in length, mostly shorter, sparingly hirtellous to glabrescent. Spikes axillary and terminal, up to 8 cm in length, but mostly shorter, moderately flowered, peduncles up to 1 cm in length, puberulent to glabrescent, bracts round, peltate, about 0.4 mm in width, ovary ovoid or somewhat obovoid, apex oblique, stigma subapical, filaments longer than the subglobose to ellipsoidal anthers, fruit globose-ovoid, about 0.8 mm in length, verrucose, viscid, eventually on pseudopedicels.

Society Islands: Raiatea, October 28, 1926, Moore no. 260 (type, Bishop Museum); Borabora, Anau, Teanaopea, on rock face, in cave, altitude 1,410 feet, January 19, 1931, Grant no. 5106 (Bishop Museum).

Austral Islands: Tubuai, pass north of Tunarutu, shaded ledge in woods, altitude 150 meters, August 22, 1934, St. John no. 16518 (Bishop Museum).

This species is most closely allied with *P. leptostachya* with which it should perhaps be united. It differs chiefly, however, in the mostly larger plants and leaves, longer internodes and less hirtellous stems and leaves, although one or two of the specimens cited are more hirtellous than the type and suggest the close relationship. It is also closely related to *P. pallida* variety *rurutensis* differing from that variety mainly in the presence of the hairs and other minor characteristics.

35. *Peperomia leptostachya* Hooker and Arnott.

Peperomia leptostachya Hooker and Arnott: Bot. Beechey, p. 96, 1832;

Yuncker, Bernice P. Bishop Mus., Bull. 112, p. 57, fig. 16, 1933.

Peperomia Moerenhoutii C. de Candolle: in de Candolle Prodr. vol. 16, pt. 1, p. 458, 1869. (Unrevised original spelling.)

Peperomia Moerenhoutii C. de Candolle variety *mangarevensis* F. Brown: Bernice P. Bishop Mus., Bull. 130, p. 24, 1935.

Peperomia leptostachya Hooker and Arnott variety *marquesensis* F. Brown: Bernice P. Bishop Mus., Bull. 130, p. 26, fig. 2d, 1935.

Stems ascending from a shortly decumbent and rooting base, mostly less than 25 cm in height, densely hirtellous, internodes comparatively short. Leaves opposite or in whorls of three, hirtellous, oval, elliptic to obovate, mostly about 2 to 3 cm in length and 1.3 to 1.8 cm in width, palmately 5-nerved, easily deciduous, apex shortly attenuate, acutish, or rounded and obtuse, base acute to cuneate, petioles 5 to 10 mm in length. Spikes slender, numerous, axillary and terminal, up to 10 cm in length, peduncles 1 to 2 cm in length, hirtellous, fruit globose-ovoid, about 0.9 mm in length, apex oblique, stigma subapical.

The type was collected in the Hawaiian islands, Oahu, Beechey (Kew).

Tonga Islands: Eua Island, June 1889, Lister, without number (Kew); June and July 1926, Parks no. 16236A (Univ. Calif.); in pockets on exposed limestone rocks, abundant on the Liku side, plateau region, June and July

1926, Parks no. 16045 (Bur. Sci. P. I.); plateau, on exposed rocks, June and July 1926, Parks nos. 16236; 16236C; 16266, in part (Univ. Calif.); Ohonua, in thick forest in canyon, holes in rocks, altitude 3-4 meters, July 15, 1926, Parks no. 16364 (Univ. Calif.).

Samoa: Upolu, Apiaberg, common on shaded stone walls, November 1893, Reinecke no. 93 (Bishop Museum); same location, Reinecke no. 94 (U. S. Nat.; Berlin; Barbey-Boissier; Bishop Museum); same location, November 1893, Reinecke no. 34 (U. S. Nat.); Lepua, May 1895, Reinecke no. 630v (Barbey-Boissier); Savaii, July 1905, K. and L. Rechinger no. 122 (Vienna); at back of Safune, on stone wall, altitude about 25 meters, August 13, 1931, Christophersen and Hume no. 2395 (Bishop Museum); near Fagalele, on rocks, in forest, altitude about 10 meters, November 11, 1931, Christophersen no. 3401 (Bishop Museum); near Aopo, July 1905, K. and L. Rechinger no. 678 (Vienna); Aopo-Maungaafi, altitude 500-1,000 meters, July 1905, K. and L. Rechinger no. 73 (Vienna); "supra pagum Aopo," altitude 500-600 meters, July 1905, K. and L. Rechinger no. 703 (Vienna); "prope pagum Asau," July 1905, K. and L. Rechinger no. 1896 (Vienna); Avaro, December 21, 1905, Vaupel (U. S. Nat.; Berlin); same location, January 9, 1906, Vaupel, without number (Berlin); Manona, September 1893, Reinecke no. 49 (Barbey-Boissier); Manua, South Pacific Explor. Exped., Captain Wilkes, 1838-42 (Gray); Tau, Sani ridge back of Fitiuta, growing on rock, altitude 500 feet, August 9, 1921, Garber no. 599 (Bishop Museum).

Cook Islands: Rarotonga, Maungaroa, altitude 1100 feet, June 10, 1929, Wilder no. 960 (Bishop Museum); plentiful on rocks and trunks of trees, Cheeseman no. 643 (Kew); May to July 1929, Parks and Parks nos. 22020; 22117 (Kew); Maungatea, altitude 1100 feet, June 21, 1929, Wilder no. 961, in part (Bishop Museum).

Austral Islands: Rimatara, Anapoto, on shaded dissected coral ledges, altitude 5 meters, September 4, 1934, St. John and Fosberg no. 16877 (Bishop Museum); one-half mile back of Amaru on raised coral rock shaded by trees, altitude 25 feet, March 1921, Stokes no. 15 (Bishop Museum); Rurutu, on raised, dissected coral northwest of Moerai, altitude 70 meters, August 24, 1934, St. John and Fosberg no. 16563 (Bishop Museum); on side of raised coral cliff, Mato Arei, altitude 250 feet, March 3, 1921, Stokes no. 155 (Bishop Museum); on coral rock, Mato Arei, altitude 260 feet, March 3, 1921, Stokes no. 144 (Bishop Museum); Tubuai, north ridge of Taitaa, rocky knoll on ridge, altitude 150 meters, August 20, 1934, St. John no. 16455; Raivavae, Rairua (west), near the sea, February 13, 1922, Stokes no. 8 (Bishop Museum); Hotuatua Islet, in rock crevice on dry hillside, altitude 3 meters, August 11, 1934, St. John and Wight no. 16117 (Bishop Museum); north side of Mount Taraia, at base of precipice, altitude 250

meters, August 6, 1934, St. John no. 16019 (Bishop Museum); south slope of Pic Rouge, crevice of basalt rocks in woods, altitude 70 meters, August 5, 1934, St. John and Fosberg no. 15984 (Bishop Museum); Pic Rouge, northwest side, on dead log, altitude 140 meters, August 5, 1934, St. John and Fosberg no. 15952 (Bishop Museum); south side of pass, south of Raiurua, on shaded ledges, altitude 75 meters, August 3, 1934, St. John and Fosberg no. 15810 (Bishop Museum).

Rapa: on damp rocky ledges on sea cliff, April 16, 1925, Longfield no. 783 (Kew); Area, summit of great basalt boulder, July 3, 1934, St. John and Maireau no. 15344 (Bishop Museum), (leaves of this specimen all unusually small); Watering Place near Area, shaded basalt ledge, altitude 5 meters, June 30, 1934, St. John and Fosberg no. 15247 (Bishop Museum); Tapui Island, in rock crevices, altitude 5 meters, July 21, 1934, St. John and Fosberg no. 15637 (Bishop Museum).

Society Islands: Tahiti, South Pacific Explor. Exped., Captain Wilkes, 1838-42 (Gray); Papara, October 1909, Leland, Chase, and Tilden no. 21, in part, mixed with *P. pallida* (Gray; Bishop Museum; Berlin; U. S. Nat.); Punaauia, Diadem, on rocks in *Hibiscus-Aleurites* forest, altitude 1,050 feet, May 14, 1930, Grant no. 3619 (Bishop Museum); in shady, damp Fautaua Cañon, altitude 400-550 meters, July 28, 1922, Quayle no. 688, in part (Bishop Museum); in crevices of shaded rocks, near Fort Faa Rahi, Fatua Valley, May 21, 1922, Setchell and Parks no. 23 (Univ. Calif.; Gray; Berlin; Vienna; Bishop Museum); Meetia, Fatia-po to Fareura, on sunny rocky ledge, altitude 380 meters, May 12, 1934, St. John no. 14211 (Bishop Museum); Borabora, Tevaitapu, Mataihuaia, on rock cliffs, altitude 760 feet, January 9, 1931, Grant no. 5045 (Bishop Museum); Tevaitapu, Otemanu, on rocks in *Aleurites-Hibiscus* forest, altitude 1110 feet, January 3, 1931, Grant no. 4929 (Bishop Museum).

Mangareva Islands: Mangareva, January 31, 1905, Agassiz, et al. no. 100 (Gray); on rocks, top of pass west of Rikitea, altitude 120 meters, May 23, 1934, St. John no. 14467 (Bishop Museum); northwest side of Mount Duff, on mossy rocks in woods, altitude 110 meters, May 23, 1934, St. John no. 14454 (Bishop Museum); steep, bush-covered, east slope of central mountains, altitude 250 meters, April 26, 1922, Quayle and Curtis no. 426 (type of *P. Moerenhoutii* variety *mangarevensis*, Bishop Museum); Agakauitai, common on east side of island on shaded basalt ledges, altitude 20 meters, June 8, 1934, St. John no. 14921 (Bishop Museum); Taravai, northeast end, on basalt ledges near shore, altitude 5 meters, June 1, 1934, St. John no. 14785 (Bishop Museum); Kamaka, on moist, shady, basalt ledges, altitude 100 meters, May 31, 1934, St. John no. 14737 (Bishop Museum); Akamaru, north side, on basalt ledges, altitude 5 meters, May 29, 1934, St. John no. 14715 (Bishop Museum); Aukena, west end, on moist,

shaded basalt ledges, altitude 15 meters, May 28, 1934, St. John no. 14618 (Bishop Museum); Point Mata Kuiti, basalt ledges near shore, altitude 10 meters, May 28, 1934, St. John no. 14634 (Bishop Museum).

Marquesas Islands: Nukuhiva, at high altitude, July 1, 1921, Brown no. 469 (Bishop Museum); altitude 600 meters, June 18, 1921, Brown no. 441 (Bishop Museum); high altitude, July 15, 1921, Brown no. 534 (Bishop Museum); Hakauai, medium altitude, June 1921, Brown no. 663B (Bishop Museum); Taipivai, altitude 300 meters, August 19, 1921, Brown no. 663 (the type of *P. leptostachya* variety *marquesensis*, Bishop Museum); same locality, altitude 800 meters, May 1, 1921, Brown no. 896 (Bishop Museum); Uapou, altitude 700 meters, September 7, 1922, Quayle (?) no. 1072 (Bishop Museum); altitude 630 meters, September 11 to 13, 1922, Quayle no. 1182 (Bishop Museum); Hivaoa, Makemake Valley, altitude about 300 meters, February 22, 1929, Mumford and Adamson no. 15 (Bishop Museum).

Key to the Varieties

- Leaves mostly less than 3 cm in length.....**P. leptostachya**
 Leaves, at least the upper ones, up to 5 or 6 cm in length
 Apex rounded, obtuse, or only slightly attenuate.....variety **macrophylla**
 Apex or upper leaves attenuate, acute.....variety **attenuapica**

Peperomia leptostachya Hooker and Arnott variety **macrophylla** (Setchell), new combination.

Peperomia Moerenhoutii variety *macrophylla* Setchell: Univ. Calif. Publ. Bot., vol. 12, p. 164, pl. 32, 1926.

Plants large, up to 30 or more cm in height, upper leaves up to 5.5 cm in length and 3 cm in width, apex slightly attenuate, obtuse or acutish, hairs less abundant than in the species.

Society Islands: Tahiti, Papahue Valley, Paea district, on trees and rocks, June 7, 1922, Setchell and Parks no. 289 (type of *P. Moerenhoutii* variety *macrophylla*, Univ. Calif.; Bishop Museum).

Pitcairn Island: Parlver Valley Ridge, common in moist woods, altitude 300 meters, June 13, 1934, St. John no. 14977 (Bishop Museum).

Mangareva Islands: Mangareva, upper forest on south side of Mount Mokoto, on mossy basalt rock-slide in old woods, June 2, 1934, St. John no. 14856 (Bishop Museum).

Peperomia leptostachya Hooker and Arnott variety **attenuapica**, new variety.

Caules usque ad 25 + cm alti. Folia usque ad 6 cm longa et 2.5 cm lata, elliptico-ovata, plus minusve attenuata, acuta aut obtusa.

Plants robust, up to 25 or more cm in height and 4 mm in thickness near the base when dry, moderately to densely hirtellous. Leaves up to 6 cm in length and 2.5 cm in width, elliptic-obovate, lower leaves obtuse or briefly acute, upper leaves attenuate, acute, lower surface subappressed hirtellous, upper surface hirtellous, at least along the nerves, or becoming subglabrate. Spikes up to 9 cm in length.

Samoa: Savaii, Avao, January 9, 1906, Vaupel no. 133 (type, Bishop Museum; U. S. Nat.); Tutuila, Aua, on stone wall, March 4, 1920, Setchell no. 288 (Univ. Calif.); Tau, Fitiuta, Sani ridge at back, growing on rock, altitude 500 feet, August 9, 1921, Garber no. 596 (Bishop Museum).

Peperomia leptostachya is the commonest and most widely distributed of the Polynesian species. It exhibits considerable variation in the size of the plants and of the leaves, and to a lesser extent in the character of the hairs. On the basis of these variations an indefinite number of varieties might be established. Examination of a large number of herbarium specimens together with a study of the species in the field as it occurs in Hawaii, however, have indicated that these differences are minor variations seemingly caused by environmental factors. The specimens here included all agree in being mostly moderately to densely hirtellous, having stems ascending from a decumbent rooting base, opposite or whorled, oval-obovate leaves, and moderately long spikes. The specimens included under variety *macrophylla* may represent only unusually large specimens of *P. leptostachya*, but the size and general appearance seem to merit distinction. The large and attenuately pointed upper leaves of the specimens cited under variety *attenuapica* distinguish that variety.

36. *Peperomia tahitensis*, new species (fig. 34).

Caules repentes, ramosi graciles adscendes usque ad 10 + cm alti, dense hirsuti, pilis usque ad 1 mm longis. Folia opposita aut raro alterna, supra hirsuta ad basem, subtus modice hirsuta, ovata ad obovata, usque ad 3 cm longa et 2 cm lata, palmatim 3-nervia, apice obtuso, rotundo aut subattenuato, basi acuta, petiolo plerumque circa 5 mm longo, dense hirsuto. Spicae terminales axillaresque, usque ad 6 + cm longae, pedunculo usque ad 1.5 cm longo, dense hirsuto, ovario obovoideo, apice obliquo, stigmatibus sub apice. Fructus circum 1.2 mm longus, ovoideus, rostratus.

Stems long, repent and rooting from most of the nodes, with slender branches ascending up to 10 or more cm in height and 3 mm in thickness when dry, densely hirsute with spreading fuscous hairs, hairs up to 1 mm in length, internodes up to 6 cm in length but mostly somewhat shorter. Leaves opposite or rarely some leaves alternate, hirsute on the upper surface at the base or along the nerves, moderately hirsute on the lower surface or abundantly so along the nerves, oval to obovate, up to 3 cm in length and 2 cm in width, drying firm, abundantly punctate with dark-colored dots, palmately 3-nerved, apex obtuse, rounded or subattenuate, base acute, petioles mostly about 5 mm in length, densely hirsute. Spikes terminal and axillary, up to 6 or more cm in length, loosely flowered, peduncles up to 1.5 cm in length, densely hirsute, rachis glabrous, bracts round, peltate, about 0.8 mm in width, punctate with yellowish dots, ovary obovoid, apex oblique, stigma subapical, fruit about 1.2 mm in length, ovoid, rostrate, verrucose, viscid.

Society Islands: Tahiti, Pirae-Moua Aorai Trail, August 1-3, 1922, Quayle, without number (type, Bishop Museum).

The type is a poorly preserved specimen but the characteristics are sufficiently obvious, I believe, to warrant description. The hirsute, repent stems and long internodes together with the hirsute leaves distinguish this species

from the other opposite-leaved species of Polynesia. The fruit is the largest found on any of the Polynesian species outside of Hawaii. It appears to be closely related to *P. leptostachya* but the long repent stems and longer hairs sufficiently distinguish it from that species.

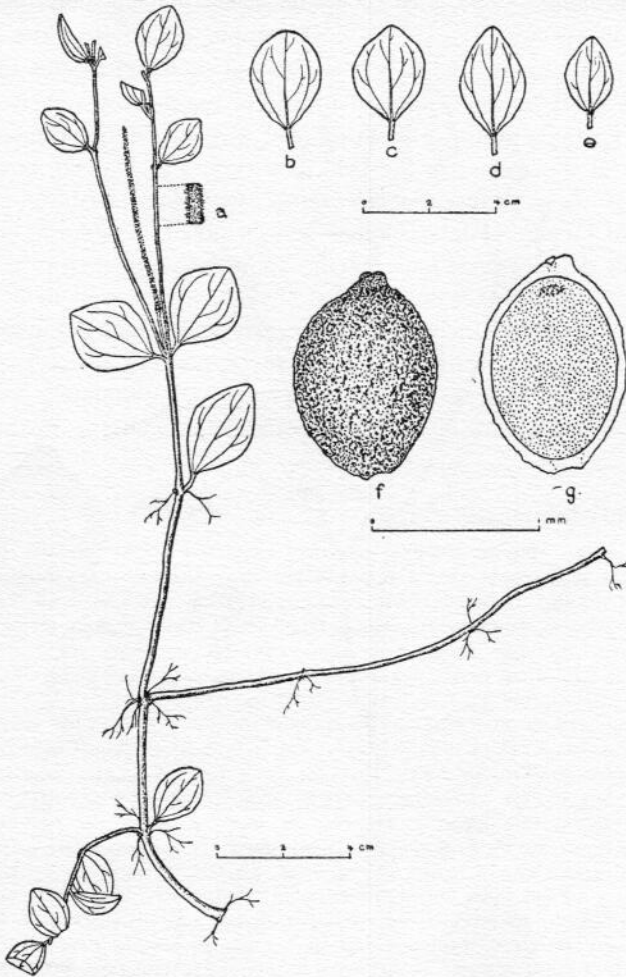


FIGURE 34.—*Peperomia tahitensis* Yuncker: a, section of stem, enlarged; b-e, leaves; f, fruit; g, section of fruit.

37. *Peperomia samoensis* Warburg (fig. 35).

Peperomia samoensis Warburg: in Engler's Botanische Jahrb., vol. 25, p. 611, 1898.

Peperomia samoensis Warburg forma *fulvescens* C. de Candolle: Ann. Conserv. Jard. Bot., Genève, vol. 15, p. 235, 1912.

Plants mostly terrestrial, stems suberect or ascending from a shortly decumbent and rooting base, up to 40 or more cm in height and up to 3 or 4 mm in thickness at the base when dry, unbranched or more or less branching above, abundantly hirsute particularly in the younger parts, the hairs up to 3 mm in length but mostly 1 to 2 mm, greyish to rusty-brown in color, internodes up to 10 cm in length but mostly 4 to 6 cm. Leaves mostly opposite or whorled or not uncommonly alternate below or on young

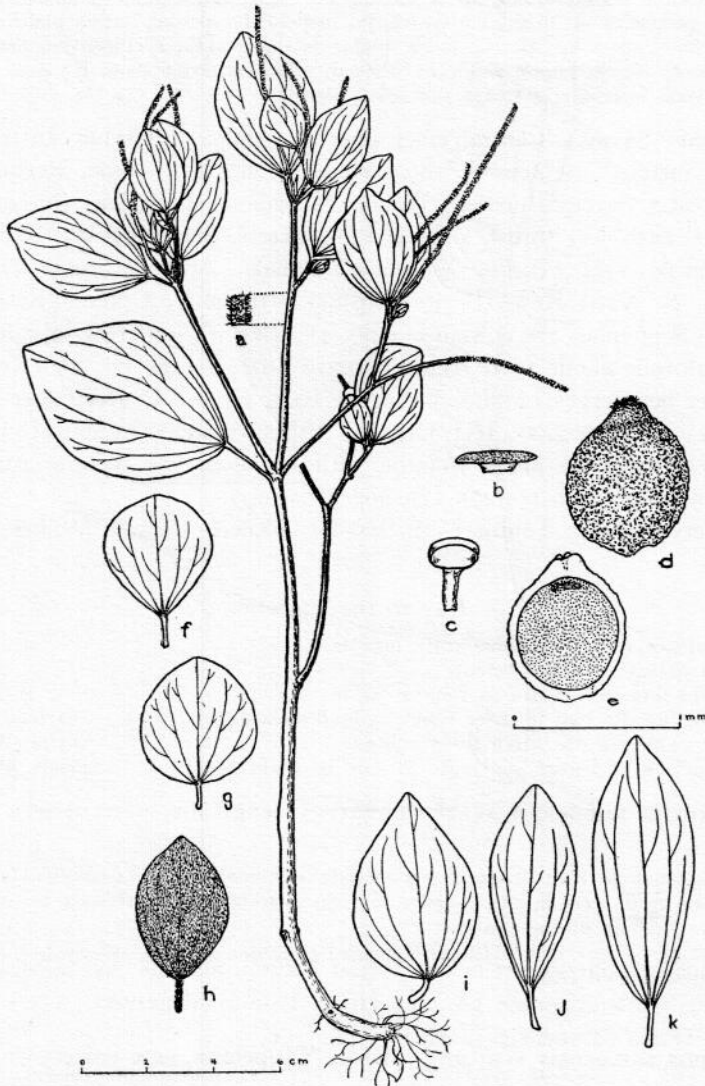


FIGURE 35.—*Peperomia samoensis* Warburg: *a*, section of stem, enlarged; *b*, bract, enlarged; *c*, stamen, enlarged; *d*, fruit; *e*, section of fruit; *f-h*, leaves; *i*, leaf of variety *Vaupelana*; *j-k*, leaves of variety *longifolia*.

growth, abundantly hirsute on both surfaces, oval-obovate or less commonly suborbicular or subovate, up to 7 cm in length and 4.7 cm in width, mostly 3.5 to 4.5 cm in length and 2.5 to 3.5 cm in width, mostly drying thin and membranous, punctate with minute dots, upper surface mostly dark green, lower surface lighter green, palmately 5- or 7-nerved, with numerous fine anastomosing veinlets, the midrib and innermost pair of nerves moderately prominent, apex rounded or rarely subacute, base rounded or short acute, petioles hirsute, mostly 5 to 12 mm in length or the lower ones up to 2 cm. Spikes axillary and terminal, up to 11 cm in length and 1 mm in diameter, densely flowered, peduncles up to 2.5 cm in length, moderately hirsute, rachis glabrous, bracts round, peltate, about 0.5 mm in width, filaments short, anthers ellipsoidal, ovary ovoid, apex oblique, stigma pilose, single or divided, subapical, fruit about 0.9 mm in length, globose-ovoid, somewhat rostrate, verrucose, viscid.

Samoa: Savaii, "Centralgebiet über Mangaloa, typisches auftreten bei 600-700 meters," September 1894, Reinecke no. 417 (type, Berlin; Kew; U. S. Nat.; Barbey-Boissier; Bishop Museum); Papa'afu, rim of crater, terrestrial herb, low forest, altitude 1500 meters, September 22, 1931, Christophersen no. 2716 (Bishop Museum); Puna'afu, April 20, 1906, Vaupel no. 386 (U. S. Nat.; Kew; Berlin; Bishop Museum); Upolu, "Kamm über Siumu," September 1893, Reinecke no. 41 (Berlin); on trees in damp shady forest, altitude about 1500 feet, February 1878, Horne no. 25 (Kew); "in Urwalder bei Berges Launtoo," August 1905, K. and L. Rechinger no. 1785 (Vienna); altitude 2,000 feet, Graeffe, without number (Vienna); in forest, Malololelei ridge to Mount Vaitou, altitude about 750 meters, August 15, 1929, Christophersen no. 275 (Bishop Museum).

Society Islands: Tahiti, U. S. Explor. Exped., Captain Wilkes, 1838-42 (Gray).

Key to the Varieties

Upper surface of leaves abundantly hirsute

Leaves obtuse or shortly acute

Leaves less than twice as long as wide.....**P. samoensis**

Leaves mostly two to three times as long as wide.....variety **longifolia**

Leaves ovate-elliptic, attenuately acute.....variety **Vaupelana**

Upper surface of leaves sparingly hirsute to glabrescent.....variety **glabrescens**

Peperomia samoensis Warburg variety **longifolia**, new variety (fig. 35, *j-k*).

Folia usque ad 8 cm longa et 2-3 cm lata, elliptico-obovata ad subspatulata.

Leaves up to 8 cm in length and 2 to 3 cm in width, elliptic-obovate to subspatulata. Otherwise similar to the species.

Samoa: Upolu, forest below Mount Vaitou, altitude 700 meters, August 15, 1929, Christophersen no. 249 (type, Bishop Museum).

Peperomia samoensis Warburg variety **Vaupelana**, new variety (fig. 35, *i*).

Folia plerumque alterna, ovali-elliptica ad ovata, 3-6.5 cm longa et 2-3.5 cm lata, plerumque 4-6 cm longa et 2.5-3 cm lata, apice attenuato-acuto aut rotundo-obtusio.

Leaves mostly alternate, moderately hirsute on both surfaces, oval-elliptic to ovate, or the lower leaves suborbicular, 3 to 6.5 cm in length and 2.5 to 3 cm in width,

palately 3- or obscurely 5-nerved, apex attenuately acute, or the lower leaves rounded and obtuse.

Samoa: Savaii, "Sudl. Mangaloa Kammgebiet," May 16, 1906, Vaupel no. 444 (type, Berlin).

Peperomia samoensis Warburg variety **glabrescens** Warburg.

Peperomia samoensis Warburg variety *glabrescens* Warburg: in Engler's Botanische Jahrb., vol. 25, p. 611, 1898.

Peperomia cililimba C. de Candolle: in Rechinger Ergebn., pt. 3, p. 92, 1910.

Peperomia cililimba C. de Candolle variety *Tiavina* C. de Candolle: in Rechinger Ergebn., pt. 3, p. 93, 1910.

Stems moderately hirsute to glabrescent, leaves sparingly hirsute to glabrescent on the upper surface, moderately hirsute to glabrescent on the lower surface.

Samoa: Upolu, Lepua, May 1895, Reinecke nos. 417a and 417b (Berlin); "in Urwaldern bei Tiavi," May 26, 1905, K. and L. Rechinger no. 362 (Vienna); "in silvis primaevae, ad terram et in truncis arborum emarcidis prope Tiavi," May 1905, K. and L. Rechinger no. 438 (type of *P. cililimba* variety *Tiavina*, Vienna); in forest above Utumapu, June 23, 1905, K. and L. Rechinger no. 1507, the type of *P. cililimba* (Vienna); "in silvis primaevae montis Launtoo," altitude about 500-600 meters, August 1905, K. and L. Rechinger no. 2511 (Vienna).

Society Islands: U. S. Explor. Exped., Captain Wilkes, 1838-42 (Gray).

The specimens included here show considerable variation in the size and abundance of the hairs. Typically, the hairs are long and very abundant on the stems, leaves and peduncles, but in the specimens included under variety *glabrescens* the hairs are mostly shorter and much less numerous. I do not believe that *P. cililimba* which, with the exception of the greater scarcity of the hairs, agrees very well with *P. samoensis*, should be maintained as a distinct species. In the specimen which de Candolle described as *P. cililimba* variety *Tiavina* the stems and leaves are sparingly hirsute to glabrescent, but I believe that this specimen represents only an extreme in the variation of this character. The hairs vary from grey to rusty-brown in color, sometimes on the same plant.

38. Peperomia reflexa (Linnaeus f.) A. Dietrich.

Peperomia reflexa A. Dietrich: Sp. Pl., vol. 1, pt. 1, p. 180, 1831.

Piper reflexum Linnaeus f.: Suppl., Pl. Syst. Veg., p. 91, 1781.

This species is pantropic in its distribution. It is abundant in the Hawaiian islands but is not common in southeastern Polynesia.

Peperomia reflexa (Linnaeus f.) A. Dietrich variety **parvifolia** C. de Candolle.

Peperomia reflexa (Linnaeus f.) A. Dietrich variety *parvifolia* C. de Candolle: in de Candolle, Prodr., vol. 16, pt. 1, p. 452, 1869; Yuncker, Bernice P. Bishop Mus., Bull. 112, p. 18, fig. 1, 1933.

Stems tufted, erect or ascending from a prostrate, rooting base, puberulent. Leaves mostly 7 to 10 mm in length, oval-orbicular or subovate, hirtellous on both surfaces with hairs up to 0.5 mm in length, apex rounded, obtuse.

Society Islands: Tahiti, mountains, U. S. Explor. Exped. Captain Wilkes, 1838-42 (Gray); Pirae-Moua Aorai Trail, August 1-3, 1922, Quayle (Bishop Museum); Pare, Diadem, on log in *Cyathea* forest, altitude 2,865 feet, May 14, 1930, Grant no. 3621 (Bishop Museum); epiphyte in *Fragranea-Tecoma* forest, altitude 2,985 feet, May 13, 1930, Grant no. 3594 (Bishop Museum).

Peperomia reflexa (Linnaeus f.) A. Dietrich variety **emarginata** F. Brown.

Peperomia reflexa (Linnaeus f.) A. Dietrich variety *emarginata* F. Brown: Bernice P. Bishop Mus., Bull. 130, p. 27, fig. 2e, 1935.

Leaves 1 to 1.5 cm in length and about as wide, glabrous on the upper surface, glabrous or sparingly hirtellous on the lower surface, ovate to suborbicular, apex emarginate, palmately 3-nerved with the outermost pair of nerves branching near the base.

Rapa: Quayle no. 373 (Bishop Museum); north slope of Mount Lekie, on crotch of tree, altitude 250 meters, July 20, 1934, St. John and Maireau no. 15623 (Bishop Museum).

KEYS TO THE SPECIES IN THE ISLAND GROUPS

The following abbreviated keys are provided for the more ready identification of the species occurring in the three largest island groups where the greatest number of different species have been found. It is to be expected, of course, that additional species will eventually be found to occur in each of these groups.

Key to the Species of Samoa

- | | |
|---|-------------------------------------|
| 1. Fruit longitudinally ribbed, leaves ovate-cordate..... | 1. P. pellucida |
| Fruit verrucose but not longitudinally ribbed..... | 2 |
| 2. Leaves characteristically alternate (rarely two at a node)..... | 3 |
| Leaves characteristically opposite (rarely only one at a node)..... | 12 |
| 3. Spikes shorter than the leaves (mostly 2-3 cm long), mostly two or more in leaf axils along the stem, leaves 5-subplinerved..... | 3. P. Reineckei |
| Spikes mostly equaling or exceeding the leaves, mostly borne in the upper part of the stem..... | 4 |
| 4. Leaves oval-obovate, apex rounded, obtuse..... | 5 |
| Leaves subovate to elliptic-lanceolate..... | 6 |
| 5. Leaves mostly 3 cm or less long..... | 7. P. Endlicheri |
| Leaves mostly larger..... | 32. P. Rechingerae varieties |
| 6. Stems glabrous | 7 |
| Stems subappressed hirtellous, at least when young..... | 19. P. tutuilana |

- | | |
|--|--------------------------------|
| 7. Plants more or less repent and rooting at the lower nodes..... | 8 |
| Plants erect or ascending..... | 9 |
| 8. Leaves ovate-elliptic, base obtusish..... | 15. <i>P. mniophila</i> |
| Leaves elliptic to elliptic-lanceolate, base acute..... | 14. <i>P. biformis</i> |
| 9. Petioles 1-3 cm long..... | 16. <i>P. Christophersenii</i> |
| Petioles mostly less than 1 cm long..... | 10 |
| 10. Leaves 5-7-plinerved, nerves coalescing 5-10 mm above the base..... | 13. <i>P. novemnervia</i> |
| Leaves palmately nerved or nerves coalescing only in the lowermost 2-3 mm..... | 11 |
| 11. Leaves elliptic-oblancoate, mostly less than 2 cm wide..... | 11. <i>P. lonchophylla</i> |
| Leaves elliptic-lanceolate, mostly 2-3 cm wide..... | 12. <i>P. lonchophylloides</i> |
| 12. Plants glabrous | 32. <i>P. Rechingerae</i> |
| Plants hairy | 13 |
| 13. Plants hirtellous or puberulent, hairs less than 0.5 mm long..... | 35. <i>P. leptostachya</i> |
| Plants hirsute, hairs 0.5-3 mm long..... | 37. <i>P. samoensis</i> |

Key to the Species of the Society Islands

- | | |
|--|--|
| 1. Rachis hairy | 38. <i>P. reflexa</i> |
| Rachis glabrous | 2 |
| 2. Leaves characteristically alternate (rarely two at a node)..... | 3 |
| Leaves characteristically opposite (rarely only one at a node)..... | 11 |
| 3. Leaves obovate to spatulate, apex rounded, obtuse..... | 4 |
| Leaves mostly orbicular to oval or elliptic-lanceolate..... | 5 |
| 4. Peduncles up to 2-3 cm long, leaves 2.5-5 cm long..... | 22. <i>P. Setchellii</i> |
| Peduncles mostly less than 2 cm long, leaves mostly less than 2.5 cm long..... | 23. <i>P. Hombroonii</i> |
| 5. Stems glabrous | 6 |
| Stems more or less hairy, leaves suborbicular to elliptic..... | 9 |
| 6. Leaves mostly less than 2.5 cm long, ciliated..... | 9. <i>P. raiateensis</i> |
| Leaves mostly larger..... | 7 |
| 7. Leaves glabrous | 8 |
| Leaves hairy on the upper surface along the nerves, elliptic-lanceolate..... | 18. <i>P. societatis</i> |
| 8. Leaves up to 8.5 cm long, mostly palmately 5-nerved..... | 10. <i>P. boraborensis</i> |
| Leaves up to 4 cm long, mostly palmately 3-nerved..... | 24. <i>P. huahinensis</i> variety <i>tahaensis</i> |
| 9. Plants repent | 10 |
| Plants mostly erect or ascending, leaves palmately nerved..... | 27. <i>P. Fosbergii</i> |
| 10. Leaves 3-5-subplinerved, hairs 0.5-1 mm long..... | 26. <i>P. Grantii</i> |
| Leaves palmately 5-nerved, hairs less than 0.5 mm long..... | 24. <i>P. huahinensis</i> |
| 11. Stems glabrous | 12 |
| Stems hairy | 13 |
| 12. Leaves more or less plinerved..... | 31. <i>P. Anderssonii</i> |
| Leaves palmately nerved..... | 33. <i>P. pallida</i> variety <i>rurutensis</i> |
| 13. Stems hirtellous or puberulent, hairs less than 0.5 mm long..... | 14 |
| Stems hirsute, hairs 0.5-3 mm long..... | 16 |
| 14. Leaves and stems abundantly hairy, spikes mostly two or more times as long
as the leaves..... | 35. <i>P. leptostachya</i> |
| Leaves and stems moderately to sparingly hairy..... | 15 |
| 15. Leaves mostly less than 3 cm long..... | 33. <i>P. pallida</i> |
| Leaves mostly more than 3 cm long (up to 5 cm)..... | 34. <i>P. abscondita</i> |
| 16. Stems more or less repent, leaves less than 3 cm long..... | 36. <i>P. tahitensis</i> |
| Stems mostly upright to ascending, leaves mostly 3.5-4.5 cm long..... | 37. <i>P. samoensis</i> |

Key to the Species of the Austral Islands

1. Leaves characteristically alternate (rarely two at a node).....2
 Leaves characteristically opposite (rarely only one at a node).....5
2. Stems glabrous3
 Stems minutely hispidulous, at least when young.....21. *P. rapensis*
3. Some spikes in the axils of reduced bract-like leaves to form a more or less
 branching inflorescence.....2. *P. raivavaeana*
 Spikes not as above.....4
4. Leaf apex attenuately acute, spikes up to 11 cm long.....4. *P. rurutana*
 Leaf apex briefly acute or obtusish, spikes shorter (up to 7 cm long).....
 5. *P. australana*
5. Spikes less than 1.5 cm long, leaves 2 cm or less long, subpinnately nerved
 28. *P. St.-Johnii*
 Spikes much longer, leaves mostly larger.....6
6. Plants glabrous33. *P. pallida* variety *rurutensis*
 Plants more or less hairy.....7
7. Leaves and stems sparingly to moderately hairy, leaves mostly more than 3
 cm long.....34. *P. abscondita*
 Leaves and stems abundantly hairy.....35. *P. leptostachya*

LIST OF SPECIMENS STUDIED

- Agassiz, A., et al.
100: leptostachya
- Brown, F. B. H.
441: leptostachya
469: leptostachya
534: leptostachya
663: leptostachya
663B: leptostachya
806: leptostachya
- Bryan, E. H., Jr.
102: Reineckeii var. obovatifolia
- Cheeseman, F. L.
643: leptostachya
644: rhomboidea
- Christophersen, E.
1: Rechingerae var. subrepens
3: Reineckeii
43: Reineckeii
46: Rechingerae var. subrepens
71: lonchophylla
106: novemnervia
249: samoensis var. longifolia
275: samoensis
543: Christophersenii
893: Rechingerae var. aopoana
898: Reineckeii var. umbricola
2286: Christophersenii
2701: Reineckeii
2716: samoensis
2735: Endlicheri
2754: Reineckeii
2873: biformis
2874: biformis
2875: biformis
2894: Reineckeii
3109: Reineckeii var. glabrior
3122: Reineckeii
3401: leptostachya
- Christophersen, E., and Hume, E. P.
2132: Reineckeii var. umbricola
2220: Reineckeii var. umbricola
2395: leptostachya
- Eames, A. J.
16: pellucida
207: lonchophylloides
- Fosberg, F. R.
11455: rapensis
11492: rapensis
11585: rapensis var. minuticaulis
11634: rapensis
- Fosberg, F. R. and Clark, R.
11315: rapensis
- Garber, D. W.
596: leptostachya var. attenuapica
599: leptostachya
863: tutuilana
1044: biformis
- Grant, M. L.
3527: societatis
3567: Hombronii var. spatulimba
3588: Grantii
3589: Grantii
3594: reflexa var. parvifolia
3603: raiateensis
3619: leptostachya
3621: reflexa var. parvifolia
3707: Grantii
3724: Hombronii var. spatulimba
3738: Hombronii var. spatulimba
3992: Hombronii var. spatulimba
4028.1: pallida var. tuamotensis
4028.2: Setchellii
4040: Hombronii var. spatulimba
4060: Hombronii var. spatulimba
4226: Grantii
4393: Hombronii var. spatulimba
4679: pallida var. rurutensis
4928: boraborensis
4929: leptostachya
5045: leptostachya
5102: boraborensis
5106: abscondita
5169: huahinensis var. tahaensis
5269: pallida var. rurutensis
5329: huahinensis
5375: pallida var. rurutensis
5590: Hombronii var. spatulimba
- Horne, J.
25: samoensis
- Jones, W. B.
863: pallida var. tuamotensis
- Leland, B., Chase, E. W. B., and Tilden, J. E.
21, in part: pallida
21, in part: leptostachya
- Longfield, C. E.
783: leptostachya
- Moore, J. W.
260: abscondita
352: raiateensis
354: societatis
- Mumford, E. P., and Adamson, A. M.
15: leptostachya
417: Adamsonia
477: Adamsonia

- Parks, H. E.
 16045: leptostachya
 16236: leptostachya
 16236a: leptostachya
 16236c: leptostachya
 16266, in part: leptostachya
 16364: leptostachya
- Parks, H. E., and Parks, Susan
 22020: leptostachya
 22117: leptostachya
 22127: rhomboidea var. rarotongana
- Quayle, E. H.
 55: Hombronii var. spatulimba
 89: Grantii
 355: rapensis
 373: reflexa var. emarginata
 688, in part: leptostachya
 845: pallida var. tuamotensis
 1072: leptostachya
 1175: marchionensis var. uapensis
 1182: leptostachya
 1218: pallida var. fatuhivensis
 1630: marchionensis
 1815: pallida var. tuamotensis
- Quayle, E. H., and Curtis, C. C.
 426: leptostachya
- Rechinger, K., and Rechinger, L.
 73: leptostachya
 80: Reineckei
 101: Reineckei
 122: leptostachya
 138: lonchophylloides
 194: Reineckei
 362: samoensis var. glabrescens
 364: Reineckei
 380: Rechingerae
 427: Reineckei
 438: samoensis var. glabrescens
 653: biformis
 678: leptostachya
 703: leptostachya
 1507: samoensis var. glabrescens
 1576: novemnervia
 1708: biformis
 1759: mniophila
 1785: samoensis
 1873: biformis
 1880: Reineckei
 1894: Endlicheri
 1896: leptostachya
 2510: Reineckei var. umbricola
 2511: samoensis var. glabrescens
- Reinecke, F.
 34: leptostachya
 40: Reineckei
 41: samoensis
 49: leptostachya
 93: leptostachya
 94: leptostachya
 380: lonchophylla
 417: samoensis
 417a: samoensis var. glabrescens
 417b: samoensis var. glabrescens
 434: Reineckei
 630v: leptostachya
- St. John, H.
 14211: leptostachya
 14217: pallida var. rurutensis
 14218: pallida var. rurutensis
 14227: pallida var. tuamotensis
 14262: pallida var. tuamotensis
 14454: leptostachya
 14467: leptostachya
 14618: leptostachya
 14634: leptostachya
 14715: leptostachya
 14737: leptostachya
 14785: leptostachya
 14856: leptostachya var. macrophylla
 14921: leptostachya
 14977: leptostachya var. macrophylla
 16019: leptostachya
 16159: St.-Johnii
 16160: raivavaeana
 16200: australana
 16329: australana
 16435: raivavaeana var. tubuaiana
 16455: leptostachya
 16473: raivavaeana var. tubuaiana
 16518: abscondita
 16641: pallida var. rurutensis
 16729: rurutana
 17309: pallida var. rurutensis
 17410: pallida
 17421: boraborensis
- St. John, H., and Fosberg, F. R.
 14157: societatis
 15090: hendersonensis
 15153: hendersonensis
 15232: rapensis
 15247: leptostachya
 15308: rapensis
 15636: rapensis
 15637: leptostachya
 15810: leptostachya
 15811, in part: australana var. ovalilimba
 15811, in part: australana var. ovalilimba forma puberulenta
 15952: leptostachya
 15984: leptostachya
 16563: leptostachya

- 16843: raivavaeana var. rimatarana
 16866: pallida var. rurutensis
 16877: leptostachya
 16879: australana
 16889: raivavaeana var. rimatarana
 17031: Grantii
 17046: Hombronii var. spatulimba
 17052: Grantii
 17078: Fosbergii
 St. John, H., Fosberg, F. R., and
 Maireau, J.
 15668: rapensis
 15671: rapensis
 St. John, H., and Maireau, J.
 15344: leptostachya
 15525: rapensis
 15622: rapensis var. minuticaulis
 15623: reflexa var. emarginata
 St. John, H., and Wight, S. G.
 16117: leptostachya
 Setchell, W. A.
 288: leptostachya var. attenuapica
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 23: leptostachya
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 499: Setchellii
 502: Setchellii
 540: Hombronii
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 15: leptostachya
 26, in part: rapensis
 26, in part: leptostachya
 62: rapensis
 134a: rapensis
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 144: leptostachya
 153a: pallida var. rurutensis
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 8: leptostachya
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 961, in part: rhomboidea var.
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