

# NEW SPECIES OF PILEA FROM THE ANDES

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## INTRODUCTION

As a result of recent botanical exploration in the Andes of South America, there has been assembled a large number of specimens of the urticaceous genus *Pilea*. In the course of studying this material I have prepared a monograph of all the Andean species, giving a key, descriptions of the new species as well as diagnoses of those already known, and a complete citation of the synonymy and of the herbarium specimens examined. Since the publication of this manuscript is unavoidably delayed, it seems desirable to publish at the present time descriptions of the new species, and with these a key to all the Andean species, in order to show better the relationship of the new ones. The area covered embraces the whole of Venezuela, Colombia, Ecuador, Peru, Bolivia, and Chile, including the low-lying regions as well as the cordilleras. In view of the restricted character of the present paper, it is not possible to discuss the synonymy or to give in detail the geographical distribution of the species previously described.

The method of treating the genus here followed is mainly that of Weddell,<sup>1</sup> although admittedly it is rather artificial and perhaps does not indicate the true interrelationship of the species. Many of the species being dioecious, our present knowledge is often based solely on one kind of plant—the staminate or the pistillate—so that a more natural grouping, such as one based on the shape of the staminate perianth or the shape and size of the achenes, is not at present practicable.

In the course of these studies I have examined material in most of the principal herbaria<sup>2</sup> of Europe and this country, and I wish

<sup>1</sup> Arch. Mus. Hist. Nat. (Paris) 9: 172-277. 1856-57; DC. Prodr. 16<sup>1</sup>: 32-235. 1869.

<sup>2</sup> The herbaria in which specimens cited in the present paper have been seen are indicated thus: B, Botanisches Museum, Berlin; BM, British Museum (Natural History); F, Field Museum of Natural History; G, Gray Herbarium of Harvard University; Gen, Jardin Botanique, Geneva; K, Royal Botanic Gardens, Kew; Ma, Jardín Botánico, Madrid; N, U. S. National Museum; Par, Muséum d'Histoire Naturelle, Paris; Ph, Academy of Natural Sciences, Philadelphia; Y, New York Botanical Garden.

to express to the directors of these institutions my appreciation of their generous cooperation.

### KEY TO THE GROUPS AND SPECIES

Leaves all entire, sometimes obscurely crenulate in *P. serpyllacea* and *P. nitida*.

Plants usually monoecious.

Leaves faintly 1-nerved, less than 1 cm long----- I. MICROPHYLLAE.

Leaves 3-nerved or triplinerved, usually more than 1 cm long. II. PARIETARIAE.

Leaves (at least the larger one of a node) toothed.

Leaves pinnately 1-nerved (no pair of secondary nerves more prominent than the others)----- III. FALLACES.

Leaves (at least the smaller one of a node) 3-nerved or triplinerved.

Leaves of a node dissimilar or very unequal (sometimes similar and subequal in *P. flexuosa*), the larger more than twice as long as the smaller.

Plants mainly dioecious.

Stipules inconspicuous, less than 3 mm long, soon deciduous.

Leaves appearing to be in fours at the nodes, owing to the presence of a very short branchlet bearing a pair of leaves at its base (imperfectly so arranged in *P. weberbaueri*)----- IV. DIVERSIFOLIAE.

Leaves otherwise.

Smaller leaf of a pair oblique, subentire; pistillate cymes sessile----- V. IMPARIFOLIAE.

Smaller leaf symmetrical, toothed, rarely subentire; pistillate cymes pedunculate----- VI. CENTRADENIOIDEAE.

Stipules conspicuous, 3 mm long or more, persistent---- VII. FLEXUOSAE.

Leaves of a node similar and equal, or if unequal the larger not more than twice as long as the smaller.

Leaves averaging not more than 2 cm long (longer in *P. jamesoniana* and *P. filipes*); slender, usually prostrate plants, the branches scarcely 10 cm long, the leaves usually densely massed at the ends of the branches (see also *P. nummularifolia*)----- VIII. DAUCIODORAE.

Leaves averaging much more than 2 cm long; erect herbs or shrubs, more than 10 cm high (or the stem repent with elongate branches), the stem usually leafy throughout.

Plant glabrous throughout.

Staminate flowers in dense globose heads, these solitary and terminating slender elongate peduncles or forming a once- or twice-branched panicle; pistillate flowers in sessile or subsessile cymes shorter than the adjacent petioles (cymes diffusely branched in *P. minutiflora*)----- IX. CAPITELLATAE.

Staminate flowers in simple or decomposed, usually diffuse cymes, the pistillate inflorescence similar----- X. MULTIFLORAE.

Plant pubescent throughout, or at least with some indument on either stem, petioles, leaves, or inflorescence.

Staminate inflorescence compact, the peduncle longer than the branches; flower heads unisexual----- XI. MOLLES.

Staminate (or androgynous) inflorescence diffusely branched or, if compact, longer than the peduncles. Plant dioecious or monoecious----- XII. PUBESCENTES.

I. MICROPHYLLAE

Stem succulent; leaves fleshy, the petiole much shorter than the blade.

Cymes sessile or subsessile; leaves, at least the larger of a pair, obovate or oblong, cuneate.

Cystoliths not elevated, very faint on under surface of leaves; plant suberect, up to 30 cm high (throughout Tropics) — 1. *P. microphylla* (L.) Liebm.

Cystoliths strongly elevated, conspicuous on both surfaces of leaves; plant lax, the branches 50 cm long or more (Peru).

2. *P. foliosa* Killip, sp. nov.

Cymes pedunculate, the peduncles usually longer than the leaves; leaves nearly globular, appearing orbicular when dry, rounded at base.

3. *P. serpyllacea* (H. B. K.) Wedd.

Stem not succulent, filiform; leaves not fleshy, the petiole equaling or exceeding the blade — 4. *P. herniarioides* (Sw.) Lindl.

II. PARIETARIAE

Staminate flowers borne singly or in pairs; leaves cordate, less than 5 mm long (Peru) — 5. *P. nerteroides* Killip.

Staminate flowers in unisexual or androgynous cymes; leaves not cordate, at least 5 mm long (sometimes smaller in *P. nitida*).

Flower clusters sessile, axillary (Peru) — 6. *P. nitida* Wedd.

Flower clusters forming panicles, cymes, or spikes.

Cystoliths on lower surface of leaves none or few and inconspicuous (Venezuela and Colombia).

Staminate flowers bracteate; stipules more than 2 mm long, persistent; leaves densely hirsute — 7. *P. lindeniana* Wedd.

Staminate flowers ebracteate; stipules less than 2 mm long, soon deciduous; leaves glabrous or sparingly hirsute.

Plant slender, the cymes androgynous, shorter than the petioles; branches almost destitute of cystoliths.

8. *P. rhombea* (L. f.) Liebm.

Plant stout, the cymes unisexual, longer than the petioles; branches densely covered with cystoliths — 9. *P. alsinifolia* Wedd.

Cystoliths on lower surface of leaves numerous, conspicuous.

Leaves sessile or subsessile (Colombia) — 10. *P. argentea* Killip.

Leaves distinctly petioled.

Segments of staminate flowers mucronulate; cystoliths yellowish (Venezuela) — 11. *P. tatei* Killip, sp. nov.

Segments of staminate flowers not mucronulate; cystoliths white.

Leaves ovate; petioles 1 cm or more long (Colombia).

12. *P. aenea* Killip, sp. nov.

Leaves linear-oblong; petioles less than 1 cm long (Ecuador or Peru).

13. *P. angustata* Killip, sp. nov.

III. FALLACES

Petioles more than 1 cm long, longer than the adjacent peduncles (Colombia).

Plant glabrous; staminate inflorescence subtended by an involucre of persistent or deciduous bracts, the perianth lobes long-tipped.

14. *P. lippioides* Killip.

Plant pubescent above (staminate inflorescence unknown).

15. *P. obetiaefolia* Killip.

Petioles not more than 1 cm long, shorter than the adjacent peduncles.

Leaves of a node equal or nearly so, more than 3 times as long as broad.

Stem strigillose above; leaves strigillose on nerves beneath (Ecuador).

16. *P. hitchcockii* Killip.

Stem and leaves glabrous (Bolivia).

Leaves ovate-lanceolate or oblong-lanceolate, distinctly petioled, coarsely crenate-serrate, the teeth ascending----- 17. *P. sublobata* Rusby.

Leaves narrowly obovate or oblanceolate, sessile or subsessile, sharply serrate, the teeth divaricate----- 18. *P. pauciserrata* Killip.

Leaves of a node unequal, less than 3 times as long as broad.

Plant glabrous throughout; leaves up to 1.2 cm long (Ecuador).

19. *P. trichosanthos* Wedd.

Plant with stem and usually leaves pubescent.

Larger leaves 2 to 5 cm long, with 7 to 10 serrations to a side; coarse, suberect suffrutescent herb----- 20. *P. fallax* Wedd.

Larger leaves 0.8 to 2 cm long, with 4 to 6 serrations to a side; slender, lax herb (Colombia)----- 21. *P. vegasana* Killip, sp. nov.

#### IV. DIVERSIFOLIAE

Branches and petioles glabrous; stipules less than 2 mm long.

Larger leaves more than 4 mm wide (Peru)--- 22. *P. nutans* (Poepp.) Wedd.

Larger leaves not more than 4 mm wide.

Cymes sessile; leaves about as broad as long, 3-toothed at apex; sepals bearing cystoliths (Ecuador)----- 23. *P. myriophylla* Killip, sp. nov.

Cymes pedunculate; leaves prevailingly much longer than broad, several-toothed; sepals without cystoliths (Peru).

Leaves with conspicuous cystoliths; larger leaves with only 4 or 5 faint secondary nerves----- 24. *P. diversifolia* Wedd.

Leaves without cystoliths; larger leaves with 8 or more secondary nerves, these prominent beneath----- 25. *P. weberbaueri* Killip, sp. nov.

Branches and petioles densely pubescent; stipules more than 2 mm long (Peru).

Leaves up to 6 mm long and 4 mm wide, the cystoliths conspicuous.

26. *P. pulegifolia* (Poir.) Wedd.

Leaves much larger, the cystoliths faint beneath.

27. *P. ramosissima* Killip, sp. nov.

#### V. IMPARIFOLIAE

Larger leaf suborbicular, not more than 1.5 cm long, rounded.

28. *P. filicina* Killip.

Larger leaf ovate, obovate, or oblanceolate, more than 1.5 cm long, acute or acuminate, rarely subacute.

Smaller leaf more than 7 times shorter than the larger leaf; larger leaves strongly oblique.

Cystoliths linear and punctiform on upper surface of leaves, conspicuous; larger leaves ovate or elliptic-ovate, more than 3 cm wide (Peru).

29. *P. bassleriana* Killip, sp. nov.

Cystoliths all linear on upper surface of leaves, faint; larger leaves oblanceolate, less than 3 cm wide (Colombia)--- 30. *P. daguensis* Killip.

Smaller leaf proportionately longer; larger leaves symmetrical or nearly so.

31. *P. imparifolia* Wedd.

## VI. CENTRADENIOIDEAE

Plant with stem and under side of leaf nerves pubescent (western coastal Colombia).

Leaves crenate-serrate, the teeth rounded, ascending; nerves not white-fasciate..... 32. *P. trianaeana* Wedd.

Leaves, at least the larger, sharply serrate; the upper margin of teeth nearly normal to midnerve; nerves white-fasciate above.

Larger leaf caudate-acuminate, 10- to 12-toothed on each side, the petioles slender, about 1 cm long..... 33. *P. centradenioides* Seem.

Larger leaf acuminate, 14- to 16-toothed on each side, sessile or short-petioled..... 34. *P. seemannii* Killip.

Plant glabrous throughout.

Larger leaf not more than 3.5 cm long.

Achenes more than 1 mm wide, strongly costate at center of each face (Peru)..... 35. *P. costata* Killip, sp. nov.

Achenes not more than 1 mm wide, ecostate.

Leaves 3-nerved, the cystoliths on upper surface punctiform (Peru).

36. *P. pichisana* Killip, sp. nov.

Leaves triplinerved, the cystoliths on upper surface linear (Colombia).

37. *P. rojasiana* Killip, sp. nov.

Larger leaf more than 3.5 cm long.

Cystoliths of leaves stellate, 3-rayed..... 38. *P. crugeriana* Wedd.

Cystoliths of leaves simple, either linear, fusiform, or punctiform.

Larger leaves more than 3.5 cm wide, more than 5 times longer than the smaller leaves (Peru)..... 39. *P. haenkei* Killip, sp. nov.

Larger leaves not more than 3.5 cm wide, less than 5 times longer than the smaller leaves.

Teeth of leaves with filiform tips; cystoliths on upper surface of leaves more than 0.5 mm long (Peru).

40. *P. macrocystolithica* Killip, sp. nov.

Teeth of leaves not filiform-tipped; cystoliths of leaves not more than 0.5 mm long.

Staminate inflorescence subumbellate, borne on long filiform peduncles, the flowers long-pedicelated (Colombia).

41. *P. hydrocotyliflora* Killip, sp. nov.

Staminate inflorescence cymose or cymose-paniculate, the flowers sessile or subsessile.

Perianth of staminate flowers 2 mm wide or more, the lobes with long subulate tips (Colombia).

42. *P. macrantha* Killip, sp. nov.

Perianth of staminate flowers smaller, the lobes at most short-mucronulate (Ecuador; Colombia?).

43. *P. tetrapoda* Killip, sp. nov.

## VII. FLEXUOSAE

Stem herbaceous, succulent, straw-colored; leaves broadly ovate, rounded or cordate at base (Colombia and Ecuador)..... 44. *P. flexuosa* Wedd.

Stem woody; leaves elliptic-lanceolate or ovate-lanceolate, narrowed at base (Bolivia)..... 45. *P. cymbifolia* Rusby.

## VIII. DAUCIODORAE

Leaves incised-serrate or coarsely crenate-dentate; cymes androgynous.

Plant pubescent; leaves incised-serrate (Venezuela)--- 46. *P. urticella* Wedd.

Plant glabrous; leaves coarsely crenate-dentate (Peru).

47. *P. lamioides* Wedd.

Leaves serrulate or crenate-serrulate (sharply serrate in *P. serratifolia*); cymes usually unisexual.

Pistillate cymes sessile.

Leaves orbicular, serrulate (Peru)----- 48. *P. dombeyana* Wedd.

Leaves ovate, sharply serrate (Ecuador)----- 49. *P. serratifolia* Wedd.

Pistillate cymes with slender peduncles; leaves ovate or spatulate (suborbicular in *P. pusilla*).

Stem densely pubescent----- 50. *P. strigosa* Wedd.

Stem glabrous.

Cystoliths on lower surface of leaves punctiform.

Achenes less than 1 mm wide; leaves suborbicular or subreniform, usually broader than long (Peru)----- 51. *P. pusilla* Krause.

Achenes more than 1 mm wide; leaves ovate-lanceolate to rhombic-orbicular.

Leaves ovate-lanceolate, sharply serrate, the teeth mucronate; plants dioecious (Peru)----- 52. *P. delicatula* Killip.

Leaves rhombic-orbicular or rhombic-ovate, crenate-serrate, the teeth obtuse; plants usually monoecious (Chile).

53. *P. elliptica* Hook. f.

Cystoliths on lower surface of leaves linear or fusiform (linear and punctiform in *P. filipes*).

Stipules not more than 2 mm long, deciduous or subpersistent; leaves averaging less than 2 cm long.

Leaves ovate or orbicular-ovate, usually broadest below middle, toothed nearly to base, bearing small linear and fusiform cystoliths, glabrous----- 54. *P. dauciodora* Wedd.

Leaves spatulate or rhombic, toothed only in upper half, bearing conspicuous filiform cystoliths, usually sparsely pilosulous.

55. *P. leptophylla* Killip.

Stipules more than 2 mm long, persistent; leaves averaging at least 2 cm long.

Achenes more than 1 mm long; crenations of leaves undulate (Ecuador)----- 56. *P. jamesoniana* Wedd.

Achenes not more than 1 mm long; crenations of leaves entire (Bolivia)----- 57. *P. filipes* Rusby.

## IX. CAPITELLATAE

Lateral nerves extending scarcely beyond middle of blade (Colombia).

58. *P. discolor* Killip, sp. nov.

Lateral nerves extending well above middle of blade.

Pistillate inflorescence cymose-paniculate, diffuse (Peru).

59. *P. minutiflora* Krause.

Pistillate inflorescence in small, sessile or subsessile cymes.

Plants dioecious.

Cystoliths on upper surface of leaves punctiform; lateral leaf nerves extending to apex of blade.

- Leaves more than 7 cm long, acute or obtuse at base, bearing punctiform cystoliths beneath (Bolivia)----- 60. *P. capitellata* Wedd.  
 Leaves less than 7 cm long, cordulate at base, bearing linear, very conspicuous cystoliths beneath (Colombia). 61. *P. cuprea* Krause.  
 Cystoliths on upper surface of leaves linear or fusiform; lateral leaf nerves extending only to upper third of blade.  
 Leaves broadly ovate, membranous, bearing punctiform cystoliths beneath (Ecuador)----- 62. *P. tungurahuae* Killip, sp. nov.  
 Leaves rhombic-ovate, subcoriaceous, bearing linear cystoliths beneath (Colombia)----- 63. *P. rhombifolia* Killip.

## Plants monoecious.

- Leaves averaging less than 1 cm wide; plant drying light green (Colombia)----- 64. *P. pennellii* Killip.  
 Leaves averaging more than 1 cm wide; plant drying dark green.  
 Stem woody; leaves ovate, not more than twice as long as wide (Peru)----- 65. *P. macbridei* Killip.  
 Stem herbaceous; leaves oblong-lanceolate or elliptic-lanceolate, much more than twice as long as wide (Chile)---- 66. *P. elegans* Gay.

## X. MULTIFLOBAE

- Petioles very stout, conspicuously winged; leaves at least 12 cm long (Colombia)----- 67. *P. pteropodon* Wedd.  
 Petioles slenderer, not winged; leaves usually less than 12 cm long.

## Leaves coarsely, usually sharply, dentate.

- Stipules persistent; petioles not more than 1 cm long; leaves carinose, narrowly lanceolate; stem stramineous in drying-- 68. *P. carnulosa* Wedd.  
 Stipules soon deciduous; petioles more than 1 cm long; leaves ovate or broadly lanceolate; stem darker in drying.

Pistillate cymes diffuse, the peduncles elongate; leaves rounded or cordate at base; achenes about 1 mm long---- 69. *P. smithii* Killip, sp. nov.

Pistillate cymes compact, sessile or subsessile; leaves usually subcuneate at base; achenes less than 0.5 mm long---- 103. *P. hyalina* Fenzl.

## Leaves not coarsely or sharply dentate.

## Cystoliths stellate with 3 rays.

Leaves undulate or minutely denticulate toward apex, the petioles usually more than 2 cm long (Peru)----- 70. *P. marginata* Wedd.

Leaves crenate-serrate to below middle, the petioles less than 2 cm long (Venezuela)----- 71. *P. triradiata* Killip, sp. nov.

## Cystoliths otherwise.

Petioles (at least the longer of a node) more than 3 cm long; leaves caudate-acuminate.

Panicles diffusely branched, at least 5 cm wide; leaves broadly ovate, the nerves not reaching to acumen (Bolivia).

72. *P. rusbyi* (Britton) Killip.

Panicles less than 5 cm wide; leaves ovate-lanceolate or elliptic-lanceolate, the nerves reaching to acumen (Colombia).

Achenes 1 mm long; staminate inflorescence borne above the pistillate; leaves 3-nerved----- 73. *P. puracensis* Killip.

Achenes 0.5 mm long; staminate inflorescence borne below the pistillate; leaves triplinerved.

74. *P. antioquiensis* Killip, sp. nov.

Petioles rarely more than 3 cm long.

Leaves broadly ovate, at least 5 cm wide, borne mainly near end of the simple stem, triplinerved, the lateral nerves arising well above base (Bolivia)----- 75. *P. buchtienii* Killip.

Leaves ovate or ovate-lanceolate, less than 5 cm wide, borne throughout stem or its branches.

Stem strongly verrucose-roughened, woody; leaves averaging less than 3 cm long (Peru)----- 76. *P. verrucosa* Killip.

Stem smooth, usually herbaceous; leaves averaging more than 3 cm long.

Lobes of staminate perianth segments apiculate (Colombia).

77. *P. apiculata* Killip, sp. nov.

Lobes of staminate perianth segments not apiculate.

Staminate inflorescence less than 2 cm long, sessile or subsessile (Peru).

Leaves lanceolate or oblong-lanceolate, more than twice as long as broad, sessile or subsessile, usually amplexicaul.

78. *P. subamplexicaulis* Killip, sp. nov.

Leaves elliptic or ovate-elliptic, less than twice as long as broad, with well-developed petioles.

79. *P. punctata* (H. B. K.) Wedd.

Staminate inflorescence more than 2 cm long, pedunculate, often diffusely cymose-paniculate.

Achenes muriculate, thickened at margin; leaves narrowly elliptic-lanceolate, usually more than 4 times as long as broad (Ecuador)----- 80. *P. attenuata* Killip, sp. nov.

Achenes smooth, not thickened at margin; leaves proportionately broader.

Pistillate cymes sessile or short-peduncled, shorter than or rarely subequal to the adjacent petioles.

Leaves toothed only in upper half (Colombia).

81. *P. mutisiana* (Spreng.) Wedd.

Leaves toothed nearly to base.

Petioles 3 cm long or more; branches of inflorescence alternate; flowers sessile (Colombia and Ecuador).

82. *P. myriantha* Killip.

Petioles less than 3 cm long; branches of inflorescence dichotomous; flowers pedicellate (Colombia).

Stipules more than 1 mm long; upper surface of leaves scabrid, densely covered with elevated punctiform cystoliths. 83. *P. goudotiana* Wedd.

Stipules not more than 1 mm long; upper surface of leaves smooth, the cystoliths all linear or fusiform----- 84. *P. losensis* Killip, sp. nov.

Pistillate cymes long-peduncled, much longer than the adjacent petioles.

Cystoliths on upper surface of leaves more than 0.5 mm long, coarse, all fusiform; leaves thick-carnose.

85. *P. suffruticosa* Krause.

Cystoliths on upper surface of leaves shorter and finer, linear, punctiform, or rarely fusiform; leaves usually of thinner texture.



Achenes minute, about 0.5 mm long; leaves obtuse or short-acuminate (Peru)— 86. *P. citriodora* Wedd.

Achenes large, 1 to 1.5 mm long; leaves long-acuminate. Stipules 3 to 10 mm long, persistent (Colombia and Peru)----- 87. *P. poeppigiana* Wedd.

Stipules less than 3 mm long, soon deciduous.

Leaves oblong-lanceolate to ovate-lanceolate, the petioles (at least the longer at a node) more than 1 cm long, the teeth subequal (Peru and Bolivia)----- 88. *P. multiflora* (Poir.) Wedd.

Leaves narrowly lanceolate, sessile or subsessile, the teeth larger toward apex (Bolivia).

89. *P. macrophylla* Rusby.

#### XI. MOLLES

Flowers of staminate inflorescence in a simple globose umbel about 1.5 cm wide, the pedicels longer than the flowers, densely hirsute (Venezuela).

90. *P. mollis* Wedd.

Flowers of staminate inflorescence in compact, often globose cymes, the pedicels usually shorter than the flowers.

Nerves extending to apex of blade; peduncles of staminate heads more than 4 cm long (Venezuela)----- 91. *P. forgeti* N. E. Br.

Nerves extending only to upper third of blade; peduncles of staminate heads less than 4 cm long.

Plants monoecious, the staminate inflorescence borne at the lower nodes, the pistillate at the upper; achenes costate (Colombia).

92. *P. pittieri* Killip.

Plants dioecious, the inflorescence borne mainly at the upper nodes; achenes ecostate.

Leaves ovate, sharply serrate, thin-membranous (Colombia).

93. *P. tatamensis* Killip.

Leaves rhombic to rhombic-elliptic, rarely broadly ovate, doubly crenate-serrate, subcarnose.

Staminate perianth lobes ovate, merely mucronulate, the mucro about 0.5 mm long (Peru)----- 94. *P. submissa* Wedd.

Staminate perianth lobes filiform, about 2 mm long.

Plant suffrutescent; petioles more than 2 cm long; leaves ovate or elliptic-obovate, rounded or cordulate at base, the cystoliths linear (Venezuela and Colombia)----- 95. *P. latifolia* Wedd.

Plant herbaceous; petioles not more than 2 cm long; leaves rhombic-ovate, usually acute at base, the cystoliths fusiform and punctiform (Colombia)----- 96. *P. gallowayana* Killip, sp. nov.

#### XII. PUBESCENTES

Stem repent or trailing, with nearly equal internodes, leafy and with branches at every node; leaves all orbicular--- 97. *P. nummularifolia* (Sw.) Wedd.

Stem erect, repent only at base; at least principal leaves ovate or rhombic to elliptic.

Leaves massed at end of stem or a few, much smaller, at lower nodes; lower internodes much longer than upper; inflorescence mainly in upper axils.

Petioles usually more than 2 cm long; leaves coarsely and sharply dentate, acuminate; plants dioecious----- 98. *P. acuminata* Liebm.

Petioles usually less than 2 cm. long; leaves crenate-serrate, obtuse or acute (acuminate in *P. ceratocalyx*); plants monoecious.

Upper surface of leaves with cystoliths usually at margin only; leaves mainly obovate, rounded at apex (Venezuela and Colombia).

99. *P. involucrata* (Sims) Urban.

Upper surface of leaves covered with cystoliths; leaves ovate or elliptic, subacute or acuminate.

Cystoliths on upper surface of leaves punctiform (a few fusiform), elevated, dense.

Leaves acuminate, densely hirsute above (Peru?).

100. *P. ceratocalyx* Wedd.

Leaves subacute, glabrous above (Peru and Bolivia).

101. *P. spruceana* Wedd.

Cystoliths on upper surface of leaves all linear or fusiform, scarcely elevated, sparse.-----

102. *P. pubescens* Liebm.

Leaves of nearly equal size at all the nodes, the internodes subequal; inflorescence (at least pistillate) not confined to upper axils.

Plant annual, slender, with a pellucid stem; cymes androgynous, the staminate flowers very few (throughout Tropics).

103. *P. hyalina* Fenzl.

Plant perennial, with a coarse ligneous or subligneous stem.

Leaves narrowly lanceolate, less than 2.5 cm wide, sharply serrate; plant with numerous short, very leafy branches from a main woody stem (Colombia and Ecuador)-----

104. *P. arguta* (H. B. K.) Wedd.

Leaves ovate to ovate-oblong or oblong-lanceolate, more than 2.5 cm wide; plant with a simple or few-branched stem.

Stipules large and persistent, 1.5 cm long or more (Colombia).

105. *P. fasciata* Wedd.

Stipules smaller, soon deciduous.

Stem densely rufo-hirsute (Peru).

Plants monoecious; leaves short-acuminate.-----

106. *P. pavonii* Wedd.

Plants dioecious; leaves caudate-acuminate.

107. *P. hirsuta* (Pav.) Wedd.

Stem essentially glabrous, sparingly pubescent in *P. glaucophylla* (Colombia).

Lateral nerves close to margin of leaf; leaves tomentose on nerves beneath; staminate inflorescence much longer than petioles.

108. *P. purpurea* Killip.

Lateral nerves a third to halfway between margin of leaf and midnerve; leaves pilosulous on nerves beneath; staminate inflorescence shorter than or subequal to petioles.

Achenes averaging 0.6 mm long; leaves strongly glaucous beneath.-----

109. *P. glaucophylla* Killip, sp. nov.

Achenes averaging more than 1 mm long; leaves at most slightly paler beneath.

Plants monoecious; leaves ovate, coarsely serrate, the cystoliths linear and fusiform.

110. *P. salentana* Killip, sp. nov.

Plants dioecious; leaves oblanceolate, serrulate, the cystoliths punctiform and fusiform.

111. *P. castronis* Killip, sp. nov.

## DESCRIPTIONS OF NEW SPECIES

2. *Pilea foliosa* Killip, sp. nov.

Monoica, glaberrima, caule ramosissimo, foliis numerosissimis integerrimis vel obscure undulatis disparibus, altero obovato basi acuto breviter petiolato, altero subreniformi sessili, cystolithis linearibus elevatis, floribus ♂ in axillis superioribus plerumque solitariis subsessilibus, ♀ solitariis vel 2—4-nis, achaeniis minutissimis.

Succulent herb with lax branches 50 to 150 cm long; stipules minute, barely 2 mm long; leaves of a node unequal and dissimilar, the larger obovate, 5 to 10 mm long, 3 to 4 mm wide, obtuse at apex, acute or subobtuse at base, short (up to 2 mm)-petioled, entire or obscurely undulate, the smaller subreniform, 1.5 to 3 mm wide, sessile, entire, the cystoliths linear, elevated on both surfaces, fewer but larger on under surface; plants monoecious, the staminate flowers usually solitary in the upper nodes, subsessile, the pistillate solitary or in subsessile clusters of 2 to 4; achenes minute, barely 0.3 mm long.

Type in the U. S. National Herbarium, no. 1,463,881, collected in forest at Carpapata (Tarma Valley), Department of Junín, Peru, altitude 3,000 meters, June 7, 1929, by E. P. Killip and A. C. Smith (no. 24400). Duplicates at F and Y.

DISTRIBUTION: Central Peru, at 1,200 to 3,000 meters altitude.

PERU: JUNÍN: Huacapistana, *Killip & Smith* 24281 (F, N, Y). Chanchamayo Valley, *Schunke* 498 (F, N), 678 (F), 992 (N).

Although this species occupies a place in the foregoing key next to *P. microphylla*, it probably is more nearly related to *P. diversifolia*. The two are of similar general habit, and the cystoliths on the leaves are almost identical. The leaves of *P. foliosa*, however, are entire or very obscurely undulate, those of *P. diversifolia* conspicuously toothed.

5. *Pilea nerteroides* Killip.

*Pilea cordifolia* Killip, Journ. Washington Acad. Sci. 15: 50. 1925. Not *P. cordifolia* Benth. 1888.

PERU: HUÁNUCO: Tambo de Vaca, alt. 4,200 meters, *Macbride* 4395 (B, F, type, K, N).

11. *Pilea tatei* Killip, sp. nov.

Herba monoica vel dioica glaberrima, foliis ovatis vel subobovatis apice acuminatis basi subauriculatis integerrimis undulatis trinerviis, cystolithis supra linearibus et fusiformibus obscuris subtus fusiformibus flavescens conspicuis, inflorescentiis unisexualibus, ♂ paniculiformibus, floribus in glomerulis densis aggregatis, ♀ similibus sed brevioribus.

Plant erect, 30 cm or more high, glabrous throughout; stem simple, succulent; stipules ovate, about 2 mm long, acute, soon deciduous; petioles 1 to 2.5 cm long, slender, those of a node subequal; leaves ovate or slightly obovate, 3 to 6 cm long, 2 to 4 cm wide, acuminate at apex, subauricular at base, entire or undulate, 3-nerved (lateral nerves extending to apex of blade, the nerves impressed above), subcoriaceous, dark green, the cystoliths of upper surface linear and fusiform, faint, those of lower surface fusiform, yellowish, conspicuous; plants monoecious or dioecious, the inflorescences unisexual, borne in nearly all the axils; staminate flowers in dense, sessile glomerules about 5 mm wide, forming few-branched panicles, the panicles much longer than the petioles, the branches very slender, the perianth about 1.5 mm wide, the lobes mucronulate (teeth 0.2 mm long), the anthers ovate, 1 mm long; pistillate

flowers in loosely flowered clusters, forming panicles similar to but shorter (up to 2 cm long) than the staminate, the perianth segments ovate, unequal; achenes ovate, about 0.5 mm long, acute.

Type in the U. S. National Herbarium, no. 1,230,887, collected in humid forest, Cerro de Turumiquire, State of Anzoátegui, Venezuela, altitude 2,200 meters, in 1925, by G. H. H. Tate (no. 190). Additional material bears Tate's numbers 187 and 188.

On the basis of the entire leaves *P. tatei* is placed at this point, though perhaps it is more closely related to *P. macbridei* and *P. punctata*.

#### 12. *Pilea aenea* Killip, sp. nov.

Herba dioica (?) glaberrima, caulibus crassis, foliis ovatis subobliquis, apice obtuse acuminatis basi subauriculatis, petiolis elongatis integerrimis trinerviis crassis, cystolithis supra linearibus et punctiformibus inconspicuis subtus fusiformibus densissimis conspicuis, inflorescentiis ♂ subspiciformibus, floribus in glomerulis sessilibus densis.

Plant glabrous throughout; stem succulent, stout; stipules soon deciduous; petioles 1 to 4 cm long; leaves ovate, 2 to 4.5 cm long, 1.2 to 2.7 cm wide, obtusely acuminate at apex, subauriculate at base, entire, 3-nerved (lateral nerves reaching to apex of blade), the upper surface copper-colored, bearing numerous minute linear and punctiform cystoliths, the lower surface pale, bearing conspicuous fusiform cystoliths; plants dioecious (?); staminate flowers in dense remote glomerules about 2 mm in diameter forming a spike or a once-branched panicle, the perianth subglobose in bud, covered dorsally with linear cystoliths.

Type in the Jardín Botánico, Madrid, collected in Colombia, between 1760 and 1808, by José Celestino Mutis (no. 1908).

This species is clearly related to *P. argentea*, having a similar cystolithic marking, but the leaves are ovate, not oblong, and have well-developed petioles.

#### 13. *Pilea angustata* Killip, sp. nov.

Herba tenuis glaberrima monoica, foliis angustis lineari-oblongis apice acuminatis basi subauriculatis integerrimis trinerviis, cystolithis supra minimis linearibus inconspicuis, subtus fusiformibus elevatis conspicuis, cymis unisexualibus parvis petiolis brevioribus.

Plant slender, 10 to 15 cm high, glabrous throughout; stipules ovate, about 1 mm long, acute, subpersistent; petioles 5 to 8 mm long, very slender; leaves linear-oblong, 1.5 to 3 cm long, 4 to 5 mm wide, acuminate at apex, subauriculate at base, entire, 3-nerved (lateral nerves extending to upper quarter of blade), membranous, bearing numerous obscure linear cystoliths above and conspicuous elevated fusiform ones beneath; plants monoecious, the cymes unisexual, subequal to or usually shorter than the adjacent petioles; staminate flowers subglobose in bud, purplish distally, pale proximally, the segments obtuse; pistillate flowers with segments unequal, the largest about 0.3 mm long, the achenes minute, ovate, about 0.4 mm long.

Type in the herbarium of the Muséum d'Histoire Naturelle, Paris, collected in Ecuador or Peru by Grisar.

The shape of the leaves at once distinguishes this species from others of this relationship. The cystoliths on the under surface of the leaves are remarkably uniform in shape and are distributed evenly over the whole surface.

It is unfortunate that the locality at which this was collected is so uncertain. In view of other specimens of the Grisar collection which I have seen, I am inclined to believe that it is from Ecuador rather than Peru.

21. *Pilea vegasana* Killip, sp. nov.

Dioica, caule supra pilis crispatis hyalinis strigilloso, stipulis cordato-orbiculatis persistentibus, foliis grosse serratis inferne integerrimis penninerviis supra sparse strigillosis nunc disparibus dimorphisque, majore rhombeo-lanceolato acuto, minore rhombeo-orbiculato vel orbiculato-spathulato, nunc subaequalibus et similibus, cymis ♀ subsessilibus 2-4-floris, segmentis perigonii subaequalibus, achaeniis late ovatis.

Slender succulent herb, purplish throughout, repent below, at length erect or decumbent, with a well-marked central stem up to 25 cm long and numerous axillary leafy branches, the stem glabrescent below, strigillose above with crispate hyaline hairs; stipules cordate-orbicular, 1 to 3 mm long, hyaline, reticulate, persistent; petioles filiform, 1.5 to 7 mm long; leaves usually oblique, coarsely serrate except in lower third (serrations 4 to 6 to a side), pinnately 1-nerved, with 4 to 7 pairs of lateral nerves, green and sparingly strigillose with hyaline hairs and faintly marked with fusiform cystoliths above, paler, usually conspicuously bluish glaucous, glabrous and marked with larger fusiform cystoliths beneath; leaves of a pair unequal and dissimilar (larger leaf rhombic-lanceolate, 8 to 20 mm long, 4 to 6 mm wide, acute at apex, tapering at base, the smaller one rhombic-orbicular or orbicular-spatulate, 3 to 7 mm long, 2 to 5 mm wide, rounded or acutish at apex, rounded or slightly acute at base), or the leaves of a pair subequal and similar; plants dioecious; pistillate flowers in subsessile, 2- to 4-flowered heads about as long as the adjacent petiole; perianth segments subequal, linear, about 1 mm long; achenes broadly ovate, 1.2 to 1.5 mm long, flattened.

Type in the U. S. National Herbarium, no. 1,356,153, collected along stream in dense woods, vicinity of Las Vegas (east of Bucaramanga), Department of Santander, Colombia (Eastern Cordillera, 2,600 meters altitude), December 23, 1926, by E. P. Killip and A. C. Smith (no. 16043).

DISTRIBUTION: Eastern Cordillera of Colombia, at an altitude of about 2,600 meters.

COLOMBIA: SANTANDER: Las Vegas, *Killip & Smith* 16020 (G, N, Y), 16025 (G, N, Y), 16082 (G, N, Y). Mount San Vicente, near Charta, *Killip & Smith* 18968 (G, N, Y).

This may be only a form of *P. fallax* with much smaller leaves, although the specimens cited above have a much different aspect from typical *P. fallax*. In the case of the type specimen and no. 16025, the leaves of a node are very dissimilar; in the three other specimens they are more nearly alike, all being suborbicular.

The general habit of the plant, the indument, conspicuous, persistent stipules, and the size and shape of achenes are suggestive of *P. auriculata*, a common Central American species with distinctly triplinerved leaves.

23. *Pilea myriophylla* Killip, sp. nov.

Herba elata dioica, ramis numerosis divaricatis, foliis dense aggregatis valde diversiformibus, cuiusque jugi majore cuneato-obovato apice grosse tridentato basi attenuato 1-nervio vel obscure triplinervio, cystolithis elongatis linearibus, cymis ♀ sessilibus, segmentis perigonii anguste triangulatis cystolithis linearibus ornatis, achaeniis ovatis.

Herb, 40 cm or more high, with a main central stem and numerous lax divaricate branches, glabrous throughout; stipules ovate-triangular, less than 0.5 mm long, soon deciduous; leaves densely crowded on the branches (internodes not more than 5 mm long), appearing in fours owing to the presence at each node of a pair of leaves on very short, secondary branches, bearing elongate

linear cystoliths prominent and elevated beneath, strongly dimorphic, the larger leaves cuneate-obovate, up to 6 mm long and 4 mm wide, coarsely 3-toothed at apex, tapering to a petiole about 1 mm long, 1-nerved or obscurely triplinerved, the smaller leaves orbicular-reniform, 2 to 3 mm long, 3 to 4 mm wide, entire or shallowly toothed, triplinerved; plants dioecious; staminate inflorescence unknown; pistillate cymes sessile, about 3 mm wide, the segments narrowly triangular, unequal (one twice as long as the others), marked with linear cystoliths; achenes ovate, 1 to 1.2 mm long.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected at Uarunamaca, Ecuador, by E. André (no. K1667).

ECUADOR: "4,000-5,000 ft.", Pearce (K).

From *P. diversifolia* this is readily distinguished by the shape of the leaves and by the sessile cymes.

**25. *Pilea weberbaueri* Killip, sp. nov.**

Dioica? glaberrima, stipulis deciduis, foliis inaequalibus et disparibus, majoribus oblongo-oblongatis petiolatis ad apicem 3-5-dentatis nervis lateralibus numerosis arcuato-ascendentibus prominentibus, minoribus orbiculato-reniformibus sessilibus vel subsessilibus, floribus ♀ in subglobosis capitulis in cymis compactis, pedunculis filiformibus, achaenlis ovatis.

Plant herbaceous, up to 30 cm high, glabrous throughout, the stem repent at base, branched; stipules triangular, 0.5 mm long, soon deciduous; leaves distinctly opposite or sometimes appearing in threes or fours owing to the presence at a node of a pair of leaves on very short secondary branches, relatively thin, concolorous, without cystoliths, minutely black-punctate above, the leaves of a node unequal and dissimilar, the larger leaves oblong-oblongate, 7 to 12 mm long, 3 to 6 mm wide, obtusely acuminate at apex, acute at base, petiolate (up to 2 mm), 3- or 5-toothed toward apex, penninerved or obscurely triplinerved, the principal lateral nerves arising near middle of blade, the secondary nerves numerous (8 or more), arcuate-ascending, prominent beneath, the smaller leaves orbicular-reniform, 3 to 5 mm long, 4 to 6 mm wide, sessile or subsessile, shallowly 3-toothed at apex, 3-nerved; plants apparently dioecious; pistillate flowers in dense subglobose clusters in compact cymes 5 to 6 mm wide, the peduncles filiform, up to 8 mm long; perianth segments unequal, the larger about 0.6 mm long; achenes ovate, about 1 mm long.

Type in the herbarium of the Botanisches Museum, Berlin, collected between Palca and Huacapistana, Department of Junín, Peru, altitude 1,900 to 2,000 meters, January 7, 1903, by A. Weberbauer (no. 2022).

The leaves of this species resemble rather closely those of *P. diversifolia* in shape, size, and tothing, but cystoliths are wanting on either surface and the upper side is minutely black-punctate. The foliage is of thinner texture and different nervation. The crowding of the leaves, with the short branchlets at the nodes giving the leaves the appearance of being ternate or quaternate, is not so evident in *P. weberbaueri* as in the other representatives of this group. This arrangement prevails, however, at several of the nodes, and as the proposed species bears so close a resemblance to *P. diversifolia* it is tentatively placed in this group.

It is a pleasure to name this species for Dr. August Weberbauer, who has done so much toward making known the flora of Peru, and who gave generous assistance to Mr. Smith and myself in Lima.

**27. *Pilea ramosissima* Killip, sp. nov.**

Planta dioica, caule subligneo ramosissimo glabro, ramis rufo-villosulis, stipulis ovato-orbiculatis subpersistentibus, foliis aggregatis crenato-serratis trinerv-

viis diversiformibus, cuiusque jugi majore rhombeo-ovato apice obtuso basi cuneato petiolato, minore orbiculato vel ovato-orbiculato subsessili, cystolithis foliorum linearibus, floribus ♀ in cymis ca. 10-fl. tenuipedunculatis, achaeniis orbiculatis laevibus.

Stem elongate, glabrous, with numerous lateral rufo-villosulous branches; stipules ovate-orbicular, 3 to 4 mm long, subpersistent; leaves appearing in fours, owing to the presence at each node of a pair of leaves on short secondary branches, crenate-serrate (serrations 6 to 8 to a side) except at base, 3-nerved, glabrous, rufo-villosulous on nerves beneath, unequal and slightly dissimilar, the larger petiolate (petioles up to 1 cm long, rufo-villosulous), rhombic-ovate, 1 to 3 cm long, 0.7 to 1.5 cm wide, obtuse at apex, cuneate at base, the smaller leaves orbicular or ovate-orbicular, 4 to 5 mm long, subsessile; cystoliths of leaves linear, elevated and conspicuous above, obscure beneath; plants dioecious; pistillate flowers in about 10-flowered compact cymes up to 5 mm wide, the peduncles slender, 1 to 1.3 cm long, the perianth pinkish, the segments unequal, the lateral about half as long as the middle segment; achenes orbicular, about 1 mm wide.

Type in the U. S. National Herbarium, no. 1,192,756, collected at Chaglla, Department of Huánuco, Peru, altitude about 2,800 meters, May 12, 1923, by J. F. Macbride (no. 3650). Duplicates at B, F, K.

DISTRIBUTION: Central Peru, at 2,500 to 2,800 meters altitude.

PERU: CAJAMARCA: Hualgayoc, *Raimondi* 7092 (B).

In a report<sup>1</sup> upon the large collection of Urticaceae made by Macbride in Peru I referred this specimen with some hesitation to *P. pulegifolia*. I have since had an opportunity of making a direct comparison between this plant and the type of *P. pulegifolia*, and now believe that they are not the same. The proposed species differs in having leaves twice as large, with smaller, more numerous teeth. The pubescence of *P. pulegifolia* is more appressed, and the whole plant is of a lighter hue.

#### 29. *Pilea bassleriana* Killip, sp. nov.

Herba crassa monoica vel dioica glaberrima, foliis valde inaequimagnis et dimorphis, cuiusque jugi majore elliptico ovato-elliptico vel elliptico-lanceolato caudato-acuminato basi cuneato vel subrotundato obliquo subsessili vel breviter petiolato grosse crenato-serrato basi integerrimo triplinervio, minore orbiculato-reniformi valde obliquo leviter crenato-serrato vel subintegro sessili triplinervio, cystolithis in paginis ambis densis linearibus et punctiformibus, cymis ♂ dichotomis, in parte repente caulis orientibus, perianthio 4-partito, laciniis breve apiculatis, cymis ♀ ca. 5-floribus, minimis, achaeniis ovatis papillosis.

Coarse succulent herb, up to 50 cm high, terrestrial or on tree trunks, repent at base, glabrous throughout; stipules triangular-ovate, barely 1 mm long, soon deciduous; leaves of a node strongly unequal and dissimilar, the larger elliptic, ovate-elliptic, or elliptic-lanceolate, 8 to 15 cm long, 2.5 to 7 cm wide, caudate-acuminate at apex, cuneate or subrotund, oblique at base, subsessile or short-petioled (petiole up to 5 mm long), coarsely crenate-serrate except at base, triplinerved (lateral nerves extending to apex of blade), dark green above, paler beneath, densely covered on both surfaces with linear and punctiform cystoliths, punctate beneath, the smaller leaf orbicular-reniform 0.5 to 1.5 cm long, strongly oblique, sessile, shallowly crenate-serrate or subentire, triplinerved; plants monoecious or dioecious; staminate inflorescence in subdichotomous cymes borne along the naked rooting portion of the stem, 3 to 4 cm long including peduncle, the

<sup>1</sup> Journ. Washington Acad. Sci. 15: 54. 1925.

perianth subglobose in bud, about 1 mm in diameter, 4-parted, the segments short-apiculate; pistillate cymes about 5-flowered, up to 8 mm long; achenes ovate, about 1 mm long, papillose.

Type in the U. S. National Herbarium, no. 1,463,907, collected in dense forest at Balsapuerto (lower Huallaga basin), Department of Loreto, Peru, altitude 150 to 350 meters, August 29, 1929, by E. P. Killip and A. C. Smith (no. 28471). Duplicates at F and Y. Other collections from this locality are *Killip & Smith* 28429 (F, N, Y), 28467 (F, N, Y). The description of the staminate inflorescence is based on *Klug* 2870, from the same locality.

DISTRIBUTION: Amazonian Peru, at low elevations.

PERU: LORETO: Santa Rosa below Yurimaguas, *Killip & Smith* 28993 (N, Y).

Pongo de Manseriche, *Dennis* (*Killip & Smith* 29145, N, Y); *Tessmann* 4603 (B), 4667 (B); *Mexia* 6355 (N), 6360 (N). Mouth of Río Pastaza, *Dennis* (*Killip & Smith* 29196, N, Y).

In no other South American species is the difference between the leaves at a node so great. In this respect *P. bassleriana* resembles *P. ecbolophylla* and *P. donnell-smithiana* of Central America. Both of these have well-developed petioles and differ also in cystolithic marking and other details.

It is a pleasure to name this species for Dr. Harvey M. Bassler, the distinguished geologist, our host at Iquitos, who has done much to encourage general scientific work in the Peruvian montaña.

### 30. *Pilea daguensis* Killip.

*Pilea dendrophila major* Wedd. in DC. Prodr. 16<sup>1</sup>: 122. 1869.

DISTRIBUTION: Western Colombia, at low elevations.

COLOMBIA: Without definite locality, but perhaps type material, *Triana* 889 (B, BM, K, N, Par). EL CHOCÓ: Tutunendo, Archer 2129 (N), 2172 (N).

EL VALLE: "Province of Buenaventura, 300 meters", *Triana* (BM, type, also type of *P. dendrophila major*). Santa Rosa, Río Dagua, *Killip* 11550 (B, G, N, Ph, Y).

Described as a variety of *P. dendrophila* Miq. (= *P. imparifolia* Wedd.), this plant certainly merits specific rank. Because of the inappropriateness of Weddell's varietal name for the species, I am proposing a substitute.

### 34. *Pilea seemannii* Killip.

*Pilea variegata* Wedd. in DC. Prodr. 16<sup>1</sup>: 123. 1869. Not *P. variegata* Seem. 1854, a transfer of *Urtica variegata* Spreng.

DISTRIBUTION: Western Colombia, at low elevations.

COLOMBIA: Locality not definitely established, *Triana* (B, BM, K, N, Par, type of *P. variegata* Wedd.). Cape Corrientes, *Seemann* (BM, cited as *P. variegata* Seem.). EL VALLE: Córdoba, *Killip* 5117 (G, N, Ph, Y).

Seemann transferred *Urtica variegata* Spreng. to *Pilea*, but wrongly associated his specimen from Cape Corrientes with Sprengel's West Indian plant. *Urtica variegata* and, therefore, *Pilea variegata* are doubtless conspecific with *P. sessiliflora* Sw., as treated by Weddell.

The type material collected by Triana is variously labeled in different herbaria, the localities being given as "El Chocó", "Forêts de Barbacoas", "Prov. de Barbacoas i Chocó", and "Prov. Chocó et Barbacoas", the last being used by Weddell at the place of publication. Sometimes the number "888" is associated with this collection.

### 35. *Pilea costata* Killip, sp. nov.

Dioica, glaberrima, foliis trinervis subtus punctatis ad basim crenato-serratis dissimilibus, majore lanceolato-elliptico acuminato basi cuneato, minore ovato



obtusum vel acutiusculo, cystolithis linearibus dense ornatis, cymis ♀ sessilibus vel breviter pedunculatis, segmentis perigonii inaequalibus, achaeniis late ovatis laevibus costatis.

Succulent herb, the stem repent, at length erect, about 50 cm high, branched toward apex, the branches suberect; plant glabrous throughout; stipules less than 1 mm long, soon deciduous; leaves of a node unequal and dissimilar, crenate-serrate nearly to base (serrations mucronulate), trinerved, densely covered on both surfaces with fine linear cystoliths, dark green above, paler and black-punctate beneath, the larger leaf lance-elliptic, 2.5 to 3.5 cm long, 1.2 to 1.5 cm wide, acuminate at apex, cuneate at base, the petiole 1 to 1.5 cm long, the smaller leaf ovate, 1.5 to 2 cm long, obtuse or subacute at apex, subrotund at base, the petiole up to 5 mm long; plants dioecious; staminate flowers not seen; pistillate flowers in sessile or short (up to 5 mm)-peduncled cymes 3 to 4 mm wide, the segments unequal, the larger 1 mm long, the others half as long; achenes broadly ovate, 1 to 1.2 mm long, 1 mm wide, longitudinally costate at center of either face, smooth.

Type in the U. S. National Herbarium, no. 1,463,889, collected in dense forest along the Pichis Trail, near Eneñas, Department of Junín, Peru, altitude 1,700 meters, July 1, 1929, by E. P. Killip and A. C. Smith (no. 25638).

The achenes are unusually large for species of this immediate relationship and are conspicuously costate.

### 36. *Pilea pichisana* Killip, sp. nov.

Herba dioica glaberrima subrepens, ramis laxis, stipulis triangularibus deciduis, foliis inaequimagnis sed similibus ovato-lanceolatis acutis vel acuminatis basi rotundatis vel subacutis fere ad basim cuspidulato-crenato-serratis trinerviis, cystolithis punctiformibus, cymis ♀ parvis subsessilibus, achaeniis anguste ovatis.

Subrepent herb, the branches lax, 10 to 20 cm long; plant glabrous throughout; stipules triangular, less than 1 mm long, soon deciduous; leaves of a node unequal but similar, ovate-lanceolate, acute or acuminate at apex, rounded or subacute at base, crenate-serrate nearly to base (serrations cuspidulate), trinerved, the cystoliths all punctiform, the larger leaf 2 to 2.8 cm long, 1 to 1.3 cm wide, the petiole 0.6 to 1.5 cm long, the smaller leaf 0.5 to 1.2 cm long, 0.3 to 0.7 cm wide, the petiole up to 2 mm long; plants dioecious; staminate flowers not seen; pistillate flowers in subsessile cymes about 4 mm wide, the segments unequal, one about twice as long as the others; achenes narrowly ovate, about 0.8 mm long, 0.5 mm wide.

Type in the U. S. National Herbarium, no. 1,463,895, collected in dense forest along the Pichis Trail, near Dos de Mayo, Department of Junín, Peru, altitude 1,800 meters, July 3, 1921, by E. P. Killip and A. C. Smith (no. 25876). Duplicates at F and Y.

The cystolithic marking is quite unlike that of close relatives of *P. pichisana*. The plant has a general resemblance to *P. delicatula*, which belongs to the group with similar and equal leaves, but that has conspicuous persistent stipules and different cystoliths.

### 37. *Pilea rojasiana* Killip, sp. nov.

Herba scandens dioica glaberrima, ramis multis brevibus, stipulis parvis suborbiculatis deciduis, foliis crassis obtusis basi abrupte attenuatis supra medium 4-5-crenulatis petiolatis triplinerviis, cystolithis paginae superioris linearibus transversis conspicuis paginae inferioris punctiformibus, laminis in eodem jugo inaequimagnis et dissimilibus, majore rhombica brevipetiolata, minore ovato-

orbiculata, subsessili, cymis ♂ laxis 8-floris brevipedunculatis, perigonio globoso dentibus minutis.

Climbing herb, woody at base, glabrous throughout; stem several-branched, the branches up to 10 cm long, leafy; stipules minute, suborbicular, about 1 mm long, soon deciduous; leaves thick, obtuse, abruptly narrowed at base, 4 to 5-crenulate in upper half, petiolate, triplinerved, the cystoliths of upper surface linear, conspicuous, transverse across blade, those of the under surface punctiform, inconspicuous; leaves of a pair unequal and dissimilar, the larger rhombic, 7 to 20 mm long, 5 to 15 mm wide, the petioles 2 to 4 mm long, the smaller leaves ovate-orbicular, 5 to 8 mm long, subsessile; plants dioecious; staminate flowers borne in loose, about 8-flowered cymes, the peduncles up to 5 mm long, the perianth globose, about 1.5 mm in diameter, green distally, yellowish proximally, the segments at length spreading, the tip minute, barely 0.4 mm long.

Type in the U. S. National Herbarium, no. 1,140,090, collected at San José, near San Antonio, Western Cordillera, west of Popayán, Department of El Cauca, Colombia, altitude 2,400 to 2,700 meters, June 28, 1922, by F. W. Pennell and E. P. Killip (no. 7373).

DISTRIBUTION: Southwestern Colombia.

COLOMBIA: Without definite locality, *Triana* 492 (Par). EL CAUCA: Micay Valley, *Killip* 7678 (G, N, Ph).

Weddell referred the Triana specimen to *P. nutans*, a species which *P. rojasiana* resembles in general appearance. The leaves of the proposed species, however, are strictly in pairs, not pseudoverticillate, and the cystoliths of their lower surface are punctiform, not linear as in *P. nutans*.

This species is named for Señor Nicolás Rojas, former governor of the Department of El Cauca, whose many courtesies to the Pennell-Killip expedition are greatly appreciated.

### 39. *Pilea haenkei* Killip, sp. nov.

Herba dioica glaberrima, stipulis minutis deciduis, folis similibus sed valde inaequimagnis, ovato-lanceolatis cordulatis crenato-serrulatis, cystolithis supra fusiformibus et punctiformibus, cymis ♂ sessilibus vel brevipedunculatis.

Plant herbaceous, 25 cm high or more, glabrous throughout; stipules broadly ovate-triangular, 1 mm long, soon deciduous; leaves of a node similar but very unequal, ovate-lanceolate, acuminate at apex, cordulate at base, crenate-serrate to base, triplinerved (lateral nerves extending to base of tip of blade), membranous, dark green on both surfaces, densely covered with fusiform and punctiform cystoliths above and fusiform ones beneath, the larger leaves 9 to 13 cm long, 3.5 to 4.5 cm wide, their petioles about 1.5 cm long, the smaller leaves 1.5 to 2 cm long, 7 to 8 mm wide, subsessile; plants dioecious; staminate cymes sessile or short (about 4 mm)-peduncled, the perianth globose in bud, about 1 mm in diameter, the lobes minutely tipped; pistillate inflorescence unknown.

Type in the Národní Museum, Prague, collected in the montaña of Peru in 1790 by Thaddeus Haenke (no. 1870).

Because of the extreme difference in the size of the leaves at a node, this species most resembles *P. bassleriana* but the symmetrical smaller leaves and the toothing and shape of the larger leaves readily distinguish it.

### 40. *Pilea macrocystolithica* Killip, sp. nov.

Herba dioica (?) glaberrima, stipulis deciduis, foliis dissimilibus et inaequimagnis, cuiusque jugi majore ovato vel ovato-lanceolato, apice obtuso vel obtuse acuminato basi rotundato, minore suborbiculato, subsessili, cystolithis supra magnis filiformibus et fusiformibus, cymis ♂ pedunculatis, pedunculis tenuibus.

Plant herbaceous, glabrous throughout, the stem simple, densely covered with longitudinal linear cystoliths; stipules triangular-ovate, about 1.5 mm long, obtuse, deciduous; leaves of a node dissimilar and unequal, the larger ovate or ovate-lanceolate, 4 to 6 cm long, 2 to 3 cm wide, obtuse or obtusely acuminate at apex, rounded at base, short (3–8 mm)-petiolate, serrulate nearly to base (serrulations with filiform tips), the smaller leaves suborbicular, 1.5 to 2 cm wide, subsessile, the blades membranous, the cystoliths of the upper surface smaller and obscure; plants apparently dioecious; staminate cymes subglobose, the peduncles about 2 cm long, very slender, the flowers undeveloped.

Type in the Národní Museum, Prague, collected in the montaña of Peru in 1790 by Thaddeus Haenke (no. 1860).

From its near relatives this is separated by the large cystoliths on the upper surface of the leaves and by the filiform-tipped teeth of the leaves.

41. *Pilea hydrocotyliflora* Killip, sp. nov.

Herba tenuis monoica glaberrima, stipulis minutis mox deciduis, foliis inaequimagnis sed similibus, oblongo-lanceolatis vel lanceolatis longe acuminatis basi subrotundatis fere ad basim serrulatis papyraceis triplinerviis, nervis lateralibus apicem limbi fere attingentibus, cystolithis minutis linearibus, inflorescentiis unisexualibus, ♂ in axillis superioribus umbelliformibus in pedunculis elongatis filiformibus, floribus longipedicellatis, perigonio subgloboso, floribus ♀ in cymis paucifloris in axillis mediis, segmentis ovatis, achaeniis late ovatis.

Slender herb, 60 to 90 cm high, glabrous throughout, the stem simple; stipules minute, suborbicular, about 0.7 mm long, soon deciduous; leaves oblong-lanceolate or lanceolate, long-acuminate at apex, subrotund at base, serrulate nearly to base, triplinerved (lateral nerves arising near base and extending almost to apex), membranous, bearing minute linear cystoliths on both surfaces, the leaves of a node similar but unequal, the larger 4 to 8 cm long, 1.5 to 2.5 cm wide, the smaller 1 to 2 cm long, 0.5 to 1 cm wide; plants monoecious; staminate inflorescences borne in the upper axils, umbelliform with filiform peduncles 3 to 4 cm long, the flowers with pedicels 5 to 6 mm long when developed, the perianth subglobose, 1 to 1.2 mm wide, the lobes obtuse; pistillate flowers in few-flowered cymes up to 1 cm long (including a slender peduncle), borne in middle axils, the perianth segments ovate, unequal, the largest about 0.6 mm long, the achenes broadly ovate, 1 mm long, 0.8 mm wide.

Type in the herbarium of the Botanisches Museum, Berlin, collected near Ocaña, Department of Norte de Santander, Colombia, altitude 1,800 meters, August 22, 1878, by W. Kalbreyer (no. 691). Duplicate at K.

This species apparently is most closely related to the Costa Rican *P. angustifolia*, having an umbellate inflorescence with very slender peduncles. In that, however, the flowers are more compact and are short-pedicelled and the leaves very narrowly lanceolate, those of a node being subequal.

42. *Pilea macrantha* Killip, sp. nov.

Herba dioica glaberrima, foliis grosse serratis basi rotundatis triplinerviis, nervis lateralibus apicem limbi fere attingentibus, laminis in eodem jugo valde inaequimagnis et parum dissimilibus, majore lanceolata vel ovato-lanceolata caudato-acuminata subobliqua breviter petiolata, minore ovato-lanceolata subsessili, inflorescentia ♂ laxè paniculata in axillis superioribus, floribus in glomerulis densis, perigonio globoso vel depresso-globoso, lobis linearibus subulatis cystolithis obscuris linearibus ornatis.

Plant herbaceous, glabrous throughout, the stem apparently erect, few-branched, 35 cm high or more; stipules soon deciduous; leaves coarsely serrate

nearly to base, subrotund at base, membranous, bearing minute faint linear and few punctiform cystoliths on both surfaces, triplinerved, the lateral nerves reaching to the base of the acumen, the leaves of a node very unequal and slightly dissimilar, the larger lanceolate or ovate-lanceolate, 4 to 10 cm long, 2 to 3 cm wide, caudate-acuminate at apex, suboblique, the petioles up to 5 mm long, the smaller leaves ovate-lanceolate, 2 to 3 cm long, 1.2 to 1.5 cm wide, acuminate at apex, subsessile; plants dioecious; staminate inflorescence loosely paniculate, borne in upper axils, 4 to 7 cm long, the flowers in dense glomerules, sessile or short-pedicel, the perianth globose or depressed-globose, 1.5 to 2 mm long (exclusive of lobes), 2 mm wide, faintly marked with linear cystoliths, the lobes linear-subulate, 1 to 2 mm long; pistillate inflorescence unknown.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected on Alto del Tabano, Cordillera de Pasto, Department of Nariño, Colombia, May 4, 1876, by E. André (no. K1670, in part).

From species of this immediate relationship *P. macrantha* is at once separated by the large staminate flowers. The leaves and flowers are suggestive of *P. fallax*, but the proposed species is readily differentiated by the nervation of the leaves, cystolithic marking, and large inflorescence.

#### 43. *Pilea tetrapoda* Killip, sp. nov.

*Diolca*, glaberrima, stipulis minutis mox deciduis, foliis leviter serrulatis cystolithis inconspicuis linearibus, laminis in eodem jugo valde inaequimagnis et parum dissimilibus, majore elliptico-ovata vel elliptico-lanceolata acuminata infra medium in basim subobliquum subauriculatum attenuata, minore ovata vel orbiculato-ovata acuta basi rotundata, cymis ♀ 4-7-floris nunc in axillis mediis sessilibus nunc in axillis inferioribus pedunculatis, segmentis perigonti disparibus, achaeniis orbiculatis laevibus.

Plant 25 cm long, or more (basal portion not seen), glabrous throughout; stem somewhat succulent; stipules minute, orbicular, about 1 mm long, soon deciduous; leaves shallowly serrulate, except in lower third, triplinerved (nerves slightly elevated on upper surface, the lateral arising about 2 mm above base, extending to upper third of blade), membranous, dark green above, paler beneath, bearing numerous faint linear cystoliths above, and a few thicker, scarcely discernible cystoliths below; leaves of a pair very unequal and somewhat dissimilar, the larger elliptic-ovate or elliptic-lanceolate, 3 to 5 cm long, 1.3 to 2 cm wide, acuminate, narrowing in lower third to a slightly oblique, subauricular base, the smaller leaf ovate or orbicular-ovate, 1.5 to 2 cm long, 1 to 1.3 cm wide, acute at apex, rounded at base; plants dioecious; pistillate flowers densely or loosely clustered in 4- to 7-flowered cymes up to 5 mm wide, the cymes (4 at a node) sessile in the axils of the middle leaves or borne on slender peduncles (3 to 10 mm long) in axils of the lower leaves; perianth segments unequal, the lateral half as long as the middle segment; achenes orbicular, about 1.2 mm wide, smooth.

Type in the U. S. National Herbarium, no. 1,197,652, collected at Palmera, Río Pastaza, between Baños and Mera, Province of Tungurahua, Ecuador, altitude 1,200 meters, in 1924, by G. H. H. Tate (no. 665).

There are two staminate specimens in the Kew Herbarium, *André* 1671 and a specimen mounted with *P. macrantha* under *André* 1670, both of which from the foliage I believe represent *P. tetrapoda*. Pending the collection of more material of this species, it seems best not to include a description of the staminate inflorescence in the formal diagnosis of *P. tetrapoda*, but this may here be described as follows:

Staminate inflorescence cymose-paniculate, up to 7 cm long including peduncle, the flowers in compact clusters, the perianth globose, about 1 mm wide, the lobes ovate, obtuse.

COLOMBIA: NARIÑO: Alto del Tabano, Cordillera de Pasto, *André* K1670, in part (K). Tamba Savanilla, *André* K1671 (K).

55. *Pilea leptophylla* Killip.

*Pilea dauciodora crenata* Wedd. in DC. Prodr. 16<sup>1</sup>: 139. 1869.

*Pilea dauciodora pilosula* Wedd. in DC. Prodr. 16<sup>1</sup>: 139. 1869.

DISTRIBUTION: Northern Venezuela and northeastern Colombia, up to 1,000 meters altitude.

VENEZUELA: Without definite locality, *Gollmer* (B). ARAGUA: Colonia Tovar, *Fendler* 1247 (G, Gen, K, type, also type of *P. dauciodora crenata*, N, Ph); *Moritz* 790 (B, type of *P. dauciodora pilosula*, BM).

COLOMBIA: MAGDALENA: Santa Marta Mountains, *H. H. Smith* 1223 (B, BM, F, G, N, Ph, Y).

58. *Pilea discolor* Killip, sp. nov.

Dioica, glaberrima, caule erecto, stipulis ovatis mox deciduis, foliis in eodem jugo subaequalibus similibusque late ovatis vel ovato-lanceolatis rotundatis vel obtuse acuminatis basi subauriculatis crenato-serratis petiolatis triplinerviis nervis lateralibus medium paginae attingentibus, cystolithis in paginis ambis rectis vel curvatis linearibus vel fusiformibus, cymis ♂ solitariis in axillis superioribus 6–10-floris, pedunculo filiformi, floribus brevipedicellatis, perigonio subgloboso lobis productis, cymis ♀ paucifloris subsessilibus petiolo brevioribus, segmentis perigonii subaequalibus, achaeniis minimis.

Plant perennial, glabrous throughout; stem erect, 30 cm high or more, succulent, branched, the lower internodes up to 8 cm long, with soon deciduous leaves, the upper much shorter, the leaves persistent; stipules ovate, 2 to 4 cm long, obtuse, soon deciduous; leaves of a node subequal and similar, broadly ovate to ovate-lanceolate, 1.2 to 3 cm long, 1 to 2 cm wide, rounded or obtusely acuminate at apex, subauricular at base, crenate-serrate, entire at base, tripinnerved (lateral nerves extending barely to middle of blade), petiolate (petioles very slender, 0.5 to 1 cm long), dark green above, much paler beneath, the cystoliths straight or curved, linear or fusiform, conspicuous above, often fainter beneath; plants dioecious; staminate flowers borne in the upper axils, in solitary, 6 to 10-flowered clusters up to 5 mm wide on slender peduncles 7 to 10 mm long, sessile or short-pedicelled, the perianth subglobose, 1.5 mm wide, the lobes produced, about 1 mm long; pistillate flowers in few-flowered sessile cymes, shorter than the petioles, the perianth segments subequal; achenes less than 1 mm long.

Type of pistillate plant in the U. S. National Herbarium, no. 1,123,224, collected at Chingquirá, Department of Cundinamarca, Colombia, altitude 2,500 meters (Eastern Cordillera), July 1909, by Brother Ariste Joseph (no. A890); duplicate at Instituto de la Salle, Bogotá. Type of staminate plant in herbarium of the Royal Botanic Gardens, Kew, collected in Colombia by F. C. Lehmann (no. BT1258), the precise locality not given; duplicate at F.

The foliage of this species, especially as shown in the Lehmann specimen, is suggestive of *P. dauciodora*, but the inflorescence, both staminate and pistillate, is quite dissimilar. It is, moreover, a tall coarse plant and apparently is referable to the small section with solitary staminate heads.

62. *Pilea tungurahuae* Killip, sp. nov.

Dioica, glaberrima, caule erecto-simplici, stipulis ovatis subpersistentibus, foliis ovatis acuminatis basi rotundatis vel subcuneatis grosse serratis tripli-

nerviis vel subquintuplinerviis nervis lateralibus ad trientem superiorem limbi productis, cystolithis in pagina superiore fusiformibus subtus punctiformibus, floribus ♂ sessilibus in glomerulos densos paniculam pauciramam in axillis superioribus efficientes aggregatis, ♀ in cymis parvis sessilibus vel subsessilibus in axillis mediis et inferioribus, segmentis pergonii disparibus, achaeniis orbiculatis minimis.

Plant herbaceous, glabrous throughout, the stem slender, erect, 25 cm high or more, apparently simple; stipules ovate, 10 mm long, 5 mm wide, subsistent; petioles up to 2 cm long, those of a node often unequal; leaves of a node similar and nearly equal, ovate, 5 to 6 cm long, 3 to 3.5 cm wide, acuminate at apex, rounded or subcuneate at base, coarsely serrate nearly to base, triplinerved or subquintuplinerved (primary lateral nerves arising close to base and extending to upper third of blade), membranous, bearing conspicuous fusiform cystoliths above and punctiform cystoliths beneath, dark green above, paler and sparingly black-punctate beneath; plants dioecious; staminate flowers sessile in small dense clusters in a few-branched panicle borne in the upper axils, the peduncles about 3 cm long, the segments linear; pistillate flowers in small, sessile or subsessile cymes about 5 mm wide, borne in the middle and lower axils, the segments unequal, the larger about 0.4 mm long; achenes orbicular, 0.5 mm long.

Type in the U. S. National Herbarium, no. 1,197,577, collected at San Antonio, on the eastern slope of Tungurahua Volcano, Province of Tungurahua, Ecuador, altitude 2,000 meters, in 1924, by G. H. H. Tate (no. 585).

69. *Pilea smithii* Killip, sp. nov.

Herba dioica glaberrima, caule basi lignescente, erecto vel adscendente, stipulis ovato-lanceolatis deciduis, petiollis tenuissimis longis plerumque inaequalibus, laminis ovato-lanceolatis vel triangulari-lanceolatis caudato-acuminatis basi subcordatis grosse dentatis trinerviis, cystolithis supra linearibus, inflorescentiis ♀ cymoso-paniculatis petiolo brevioribus tenuiter pedunculatis, floribus pedicellatis, segmentis perigonii linearibus, achaeniis ovatis.

Plant herbaceous, glabrous throughout, the rootstock subligneous, with numerous fibrose rootlets; stem erect or ascending, up to 45 cm high, succulent; stipules ovate-lanceolate, 1 to 2 mm long, obtuse, deciduous; petioles very slender, those of a pair usually unequal, the longer up to 5 cm long, the shorter up to 2.5 cm long; leaves of a pair similar and subequal, ovate-lanceolate or triangular-lanceolate, 1 to 6 cm long, 1 to 3 cm wide, caudate-acuminate at apex, cordulate at base, coarsely dentate to base (teeth about 15 to a side), 3-nerved, reticulate-veined, concolorous, sparingly punctate, thin-membranous, faintly marked with linear cystoliths above; plants dioecious; pistillate inflorescence cymose-paniculate, shorter than the adjacent petiole, slender-peduncled (peduncle up to 1 cm long), the flowers pedicellate, the pedicels about 1 mm long, persistent; perianth segments linear, the middle segment about 0.7 mm long, the lateral segments half as long; achenes ovate, 1 mm long.

Type in the U. S. National Herbarium, no. 1,356,171, collected on wooded banks of the Río de la Baja, below La Baja, Department of Santander, Colombia (altitude 2,200 to 2,300 meters), January 26, 1927, by E. P. Killip and A. C. Smith (no. 18284). Duplicates at G and Y.

DISTRIBUTION: Eastern Cordillera of Colombia, at 2,200 to 3,200 meters altitude. Known only from the general vicinity of Bucaramanga.

COLOMBIA: SANTANDER: La Baja, *Killip & Smith* 17188 (G, N, Y), 18797 (G, N, Y). California, *Killip & Smith* 16990 (G, N).

This is a much slenderer plant than any of its near relatives, and the leaves are distinctly cordulate at base and coarsely dentate. In habit it suggests *P. hyalina*, but the cordulate leaves, diffuse inflorescences, and much larger fruit at once distinguish it.

71. *Pilea triradiata* Killip, sp. nov.

Frutex dioicus glaberrimus, stipulis oblanceolatis mox deciduis cystolithis elongatis filiformibus obsitis, foliis ellipticis vel elliptico-oblanceolatis obtusiusculis basi cuneatis crenato-serratis trinerviis, cystolithis utrinque densissimis triradiatis, floribus ♂ subsessilibus in glomerulos parvos paniculam valde ramosam petiolo longiorem efficientes aggregatis, perigonio globoso-obovoideo, segmentis ovatis.

Shrub, glabrous throughout, the stem sulcate when dried, densely covered with faint short linear cystoliths; stipules oblanceolate, 1.5 cm long, 3.5 mm wide, caducous, bearing elongate filiform cystoliths; petioles 5 to 13 mm long, stout, those of a node subequal; leaves of a node similar and equal, elliptic or elliptic-oblanceolate, 6 to 15 cm long, 2 to 4 cm wide, sometimes suboblique, subobtuse at apex, cuneate at base, crenate-serrate to below middle (serrations 4 per cm) 3-nerved (lateral nerves extending to apex of blade), dark green above, silvery beneath, the cystoliths very dense on both surfaces, stellate, 3-rayed; plants dioecious; staminate flowers subsessile, in small dense clusters forming much-branched panicles up to 4 cm long and borne in twos in the axils of the upper leaves, the peduncles slender, the perianth globose-obovoid in bud, up to 1 mm long, the segments ovate, obtuse; pistillate flowers unknown.

Type in the herbarium of the Botanisches Museum, Berlin, collected near Caracas, Venezuela, May 10, 1856, by J. Gollmer.

This species has the unusual stellate cystolithic marking on the leaves similar to that of *P. marginata* and *P. crugeriana*, the cystoliths, however, being far more abundant and coarser than in the other two species.

74. *Pilea antioquiensis* Killip, sp. nov.

Herba erecta monoica glaberrima, foliis ovatis vel ovato-lanceolatis attenuato-acuminatis basi subauriculatis crenato-serratis triplinerviis utrinque cystolithis linearibus vel fusiformibus dense obsitis, cymis unisexualibus ambis similibus subsessilibus, ♂ in axillis inferioribus, segmentis perigonii mucronulatis, ♀ in axillis superioribus, achaeniis orbiculatis.

Plant erect, 30 cm high or more, glabrous throughout; stem sulcate, somewhat succulent; stipules soon deciduous; leaves of a pair similar and subequal, petiolate (petioles 3.5 to 5 cm long), ovate to ovate-lanceolate, 12 to 20 cm long, 7 to 10 cm wide, attenuate-acuminate at apex, narrowed and subauricular at base, crenate-serrate nearly to base, triplinerved (principal nerves extending to apex of blade, the secondary nerves divaricate at right angles to principal nerves, conspicuous), dark green above, paler beneath, densely covered on both faces with unequal, linear or slightly fusiform cystoliths; plants monoecious, the heads unisexual, the staminate and pistillate similar, cymose, 1 to 2 cm long, subsessile, the staminate borne in the lower axils, the pistillate in the upper; segments of staminate flowers with a minute subulate tip less than 0.1 mm long; segments of pistillate flowers unequal, the largest about 0.7 mm long; achenes orbicular, 0.5 mm long.

Type in the herbarium of the New York Botanical Garden, collected at Angelopolis, Department of Antioquia, Colombia, January 22, 1928, by R. A. Toro (no. 885).

In *Pilea puracensis*, the nearest relative of the proposed species, the achenes are fully twice as large, the staminate inflorescence is more diffuse and is

borne above the pistillate, the leaves are proportionately narrower and are 3-nerved rather than triplinerved, and the cystolithic marking is much finer.

77. *Pilea apiculata* Killip, sp. nov.

Herba monolca (vel dioica?) glaberrima, stipulis parvis deciduis, foliis ovatis vel ovato-lanceolatis, apice caudato-acuminatis basi subauriculatis supra medium serrulatis trinerviis, subtus punctulatis, cystolithis fusiformibus, cymis unisexualibus, ♂ petiolos vix aequantibus aut illis brevioribus compactis demum subdiffusis petiolis longioribus, segmentis apiculatis, cymis ♀ sessilibus vel breviter pedunculatis, petiolis brevioribus, achaenis minutis ovatis.

Herb, up to 60 cm high, glabrous throughout; stipules ovate, about 0.7 mm long, soon deciduous; petioles 1 to 2.5 cm long; leaves ovate or ovate-lanceolate, 6 to 12 cm long, 2.5 to 4 cm wide, slightly oblique, caudate-acuminate at apex, subauriculate at base, sharply serrulate in upper half, 3-nerved (lateral nerves extending to apex of blade), dark green above, pale and obscurely black-punctate beneath, the cystoliths fusiform, curved, conspicuous on upper surface; plants monoecious (or sometimes dioecious?), the cymes unisexual; staminate cymes shorter than or subequal to the adjacent petioles, compact, at length somewhat diffuse and slightly exceeding the petioles, the flowers short-pedicelated or sessile in loose clusters, the perianth turbinate in bud, 1 to 1.2 mm in diameter, the segments linear, apiculate, the tip about 0.5 mm long; pistillate cymes sessile or short-pedicelated, shorter than the adjacent petioles, the segments unequal, the middle segment 0.5 mm long, the lateral segments half as long; achenes minute, ovate, 0.4 to 0.5 mm long, smooth.

Type in the U. S. National Herbarium, no. 533,531, collected at Río Piedras, near Santa Marta, Department of Magdalena, Colombia, altitude 600 meters, in 1898 or 1899, by H. H. Smith (no. 1430). Duplicates at B, BM, F, G, Ph, Y. Another specimen of this species at the New York Botanical Garden bearing this same number was collected at "Cacagualito, 1,000 to 3,000 ft."

These specimens were distributed as "*P. riparia* Donn. Smith", a Guatemalan species not closely related.

78. *Pilea subamplexicaulis* Killip, sp. nov.

Dioica, glaberrima, stipulis triangulari-ovatis subpersistentibus, foliis lanceolatis vel oblongo-lanceolatis apice acuminatis vel attenuatis basi cordatis vel subamplexicaulibus sessilibus vel breviter petiolatis subtus glaucescentibus, cystolithis supra numerosis fusiformibus et paucis punctiformibus, inflorescentiis ♂ cymosis floribus pedicellatis laxè aggregatis, perigonio rhombo-globo, cymis ♀ sessilibus.

Plant glabrous throughout; stipules triangular-ovate, about 1.5 mm long, subpersistent; leaves of a node similar and equal, lanceolate or oblong-lanceolate, 7 to 20 cm long, 2.5 to 6 cm wide, acuminate or attenuate-acuminate at apex, cordate or somewhat clasping at base, sessile or short (up to 5 mm)-petioled, trinerved or subtriplinerved (nerves extending to apex), bronze-green above, glaucous beneath, the cystoliths of upper face numerous, ornate, fusiform, with a few punctiform ones intermingled, those of the lower surface less numerous and fainter; plants dioecious; staminate inflorescence cymose, up to 2 cm long, the flowers pedicellate, in loose clusters, the perianth rhomboid-globose, the lobes 1 to 2 mm long, obtuse; pistillate inflorescence cymose, the cymes sessile, up to 5 mm long.

Type in the Goeldi Museum, Pará, Brazil, collected on Cerro de Escaler, near Tarapoto, Department of San Martín, Peru, altitude 1,100 meters, November 1902, by E. Ule (no. 6588). Duplicates at B and K. The description of the pistillate inflorescence is derived from the following collection:

PERU: SAN MARTÍN: San Roque, alt. 1,400 meters, *L. Williams* 7425 (N).



**80. *Pilea attenuata* Killip, sp. nov.**

*Dioica*, glaberrima, caule erecto simplici basi repente, foliis anguste elliptico-lanceolatis acuminatis basi cuneatis undulatis vel superne obscure crenulatis triplinerviis, cystolithis fusiformibus supra conspicuis, inflorescentiis ♀ cymoso-paniculatis, segmentis perigonii linearibus disparibus, achaeniis ovato-orbiculatis muriculatis margine crasso.

Plant glabrous throughout; stem repent at base, at length erect, simple 30 to 50 cm high; stipules linear-lanceolate, 5 mm long, 1.5 mm wide, soon deciduous, or subpersistent; petioles of a node equal or one slightly shorter than the other, 3 to 10 cm long; leaves of a node subequal and similar, narrowly elliptic-lanceolate, 9 to 15 cm long, 2 to 3.5 cm wide (extremes 25 cm long, 7 cm wide), acuminate at apex, cuneate at base, undulate or obscurely crenulate above middle, triplinerved (lateral nerves reaching nearly to acumen), the cystoliths fusiform, conspicuous above; plants dioecious; staminate inflorescence unknown; pistillate inflorescence cymose-paniculate, the peduncles slender, 3 to 4 cm long, the flowers subsessile, the perianth segments linear, unequal, the larger about 1.3 mm long, the smaller half as long; achenes ovate-orbicular, about 1.2 mm long, thickened at margin, muriculate.

Type in the herbarium of the Botanisches Museum, Berlin, collected near Pilatón, Province of Pichincha, Ecuador, in January 1889, by A. Sodiro (no. 153/24).

ECUADOR: PICHINCHA: San Nicolás, alt. 900 meters, *Sodiro* 153/29 (B).

The long narrow leaves and the muriculate achenes are the two marks by which this species may be readily recognized.

**82. *Pilea myriantha* Killip.**

*Urtica floribunda* H. B. K. Nov. Gen. & Sp. 2: 38. 1817. Not *Pilea floribunda* Baker, 1897.

*Pilea mutisiana* Wedd. Ann. Sci. Nat. III. Bot. 18: 218. 1852, in part.

*Pilea multiflora* Wedd. in DC. Prodr. 16<sup>1</sup>: 145. 1869, in part.

DISTRIBUTION: Southwestern Colombia and northern Ecuador, at 2,000 to 2,500 meters altitude.

COLOMBIA: EL CAUCA: Palacé, *Humboldt & Bonpland* (Par, type). Coconuco, *Killip* 6832 (N, Y).

ECUADOR: PICHINCHA: Mount Pichincha, *Sodiro* 153/27c (B).

**84. *Pilea losensis* Killip, sp. nov.**

Herba dioica glaberrima ad 3 m alt., stipulis parvis caducissimis, foliis similibus et subaequalibus, anguste ellipticis vel oblongo-ellipticis subobliquis apice acuminatis basi angustatis et cordulatis fere ad basim grosse crenato-serratis trinerviis, nerviis apicem attingentibus, cystolithis minutis linearibus et fusiformibus subtus obscuris, cymis ♀ petiolis brevioribus vel subaequalibus, achaeniis late ovatis.

Succulent herb up to 3 meters high, glabrous throughout; stipules narrowly ovate, up to 1 mm long, caducous; petioles 0.5 to 2 cm long, slender; leaves of a node similar and subequal, narrowly elliptic to oblong-elliptic, 6 to 12 cm long, 2 to 2.5 cm wide, acuminate at apex, narrowed and cordulate at base, coarsely crenate-serrate nearly to base, 3-nerved (lateral nerves extending to apex of blade), thin, dark green above, pale beneath, the cystoliths linear and fusiform and very small above, linear and longer beneath; plants dioecious; pistillate cymes subequal to or shorter than the adjacent petioles, divaricate, the peduncles slender, the perianth segments unequal, the largest about 1.2 mm long, the achenes broadly ovate, 1.5 to 1.8 mm long, slightly compressed.

Type in the U. S. National Herbarium, no. 1,355,424, collected at Loso, north of Toledo, Department of Norte de Santander, Colombia, 2,400 meters altitude (Eastern Cordillera), March 6, 1927, by E. P. Killip and A. C. Smith (no. 20370). Duplicates at G, Y.

COLOMBIA: NORTE DE SANTANDER: Between Pamplona and Toledo, *Killip & Smith* 19969 (G, N, Y).

This is distinguished from *P. goudotiana* in having smaller stipules, different foliar cystoliths, a more diffuse pistillate inflorescence, and larger achenes.

96. *Pilea gallowayana* Killip, sp. nov.

Herba dioica, caule basi repente erecto inferne glabro superne rufo-hirsuto, stipulis late ovato-lanceolatis subpersistentibus, petiollis rufo-hirsutis, laminis rhombeo-ovatis acutis basi rotundatis vel emarginatis inaequaliter et saepe dupliciter crenato-serratis triplinerviis vel quintuplinerviis (nervis lateralibus trientem superiorem limbi attingentibus) supra glaberrimis subtus praesertim in nervis pubescentibus, cystolithis fusiformibus et punctiformibus, cymis ♂ et ♀ similibus compactis petiolo multo longioribus, segmentis perigonii ♂ filiformibus, achaeniis late ovatis.

Plant herbaceous, the stem repent at base, at length erect, 20 to 35 cm high, leafy at summit, glabrous below, rufo-hirsute above, especially at nodes; stipules broadly ovate-lanceolate, 9 to 10 mm long, obtuse, subpersistent, glabrous, bearing a few fusiform cystoliths; petioles 0.5 to 2 mm long, rufo-hirsute; leaves rhombic-ovate, 3 to 9 cm long, 2 to 7 cm wide, acute at apex, rounded or emarginate at base, unequally and often doubly crenate-serrate, triplinerved or quintuplinerved (lateral nerves extending to upper third of blade), above glabrous and copiously covered with fusiform and punctiform cystoliths, beneath hirsute on the nerves, sparsely pilosulous elsewhere, bearing numerous punctiform and a few faint linear cystoliths; plants dioecious, the staminate and the pistillate inflorescences in compact cymes up to 1.5 cm wide, similar in shape, the peduncles slender, up to 2 cm long; staminate perianth 2 to 3 mm wide, the lobes filiform, 1.5 to 2 mm long, pilosulous; pistillate perianth with unequal segments, the middle 0.9 mm long, the lateral barely 0.3 mm long; achenes broadly ovate, about 1.2 mm long, 1 mm wide.

Type in the U. S. National Herbarium, no. 1,140,074, collected in dense forest above La Cumbre, Department of El Valle, Western Cordillera, Colombia, altitude 2,000 meters, May 21 to 25, 1922, by F. W. Pennell and E. P. Killip (no. 5878). Duplicates at G, Ph, Y.

DISTRIBUTION: Western Colombia, up to 2,100 meters altitude.

COLOMBIA: EL CHOCÓ: Between La Oveja and Quibdó, *Archer* 1701 (N). Headwaters of Río Tutunendo, east of Quibdó, *Archer* 2184 (N), 2189 (N).

NABIÑO: Armada, *André* K1680 (K).

The leaves of *P. gallowayana* and *P. pteroclada* Donn. Smith, from Costa Rica, are very similar in shape and size. The cystoliths are different, however, and the Costa Rican plant is glabrous throughout. In general leaf shape this plant is similar also to *P. latifolia*. That species, however, is described by Schlim as a shrub, and all the specimens I have examined give every indication that the plant is suffrutescent. The petioles of *P. latifolia* are much longer, and the inflorescence is an elongate narrow panicle, not a cyme.

This species is named for Dr. J. F. Galloway, physician-in-charge of the Smith Clinic, La Cumbre, at the time it served as our headquarters.

109. *Pilea glaucophylla* Killip, sp. nov.

Herba elata erecta, caule simplici sparse hirsutulo, stipulis ovatis parvis mox deciduis, petiollis inaequalibus, laminis oblongis vel oblongo-lanceolatis acutis basi rotundatis vel subcuneatis crebre crenato-serratis triplinerviis supra glaber-

rimis viridibusque infra in nervis pilosulis et glaucescentibus, cystolithis numerosissimis linearibus et fusiformibus, paucis punctiformibus adpersis, inflorescentiis unisexualibus similibus cymoso-paniculatis, petiolo suo brevioribus, inflorescentiis ♂ in axillis inferioribus, ♀ in axillis omnibus, floribus sessilibus, perigonio ♂ depresso-globoso lobis ovatis, achaeniis minutis.

Plant erect, 50 cm high or more, the stem simple, sparingly and finely appressed-hirsutulous; stipules ovate, about 5 mm long, 2 mm wide, soon deciduous; petioles of a node unequal, the longer 2 to 6 cm long, the shorter 1 to 2 cm long; leaves oblong or oblong-lanceolate, 10 to 15 cm long, 3 to 5 cm wide, subequal at a node, acute at apex, rounded or subcuneate at base, closely crenate-serrate to base, triplinerved (lateral nerves arising about 5 mm above base, extending to apex, and situated about a third of the way between margin and mid-nerve), glabrous and dark green above, finely pilosulous on the nerves and strongly glaucous beneath, the cystoliths very numerous, linear and fusiform, with a few punctiform ones intermingled; plants monoecious, the inflorescences unisexual, similar, cymose-paniculate, shorter than the adjacent petioles, the pistillate borne in all the axils, the staminate borne in the lower axils, sometimes in the same axil with the pistillate; staminate flowers sessile, the perianth depressed-globose in bud, up to 1 mm wide, the lobes ovate, obtuse; pistillate flowers sessile, the segments unequal; achenes minute, about 0.6 mm long.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected along the Quebrada Honda, Department of Tolima, Colombia, October 19, 1876, by *E. André* (no. K1669).

COLOMBIA: TOLIMA: Tambo de Savanilla, *André* K1668 (K).

110. *Pilea salentana* Killip, sp. nov.

Herba monoica basi repens, caulibus erectis, inferne glabrescentibus superne pilosulis, foliis oblongo-ovatis vel late ovatis acutis basi rotundatis vel subacutis grosse serratis trinerviis rugulosis supra sparse pilosulis infra in nervis pilosulis, cystolithis linearibus vel fusiformibus inconspicuis, inflorescentiis unisexualibus, ♂ in axillis superioribus, floribus pedicellatis, segmentis perigonii mucronulatis, ♀ in axillis mediis, petiolo suo brevioribus, segmentis perigonii disparibus, achaeniis ovato-orbiculatis.

Plant herbaceous, repent at base, the stems erect, 30 cm high or more, succulent, glabrescent below, pilosulous above; stipules triangular, 1 to 3 mm long, soon deciduous; petioles 5 to 15 mm long, pilosulous, those of a node unequal; leaves of a node similar but sometimes slightly unequal, oblong-ovate to broadly ovate, 4 to 9 cm long, 2 to 8 cm wide, acute at apex, rounded or subacute at base, coarsely serrate, 3-nerved (lateral nerves about midway between mid-nerve and margin, extending nearly to apex of blade, the nerves and veins impressed above), dark green, somewhat rugulose, sparsely pilosulous above, paler and pilosulous on nerves and veins beneath, the cystoliths linear or fusiform, inconspicuous; plants monoecious, the inflorescence unisexual; staminate inflorescence loosely cymose, 2.5 to 3 cm long, much-branched, borne in upper axils, the flowers pedicellate, in 3- to 10-flowered clusters, the perianth about 1.5 mm long, the lobes with minute filiform tips; pistillate inflorescence cymose, borne in middle axils, few-branched, the peduncles slender, 5 to 7 mm long, shorter than the adjacent petioles, the perianth segments unequal, the middle 1 to 1.2 mm long, the lateral about a third as long; achenes ovate-orbicular, nearly 2 mm long, deep orange.

Type in the U. S. National Herbarium, no. 1,140,911, collected in clearing at Pinares, above Salento, Department of Caldas, Colombia, altitude 2,700 to 2,900 meters (Central Cordillera), August 2 to 10, 1922, by F. W. Pennell (no. 9354). Duplicate at G.

COLOMBIA: CALDAS: Magaña, Old Quindío Trail, alt. 3,200 to 3,300 meters, *Killip & Hazen* 9447 (N, Ph). Páramo, Quindío Trail, *Holton*, in 1853 (Y).  
 TOLIMA: Between Ibagué and Mount Tollma, *Cuatrecasas* 2588 (Ma), 2590 (Ma).

111. *Pilea castronis* Killip, sp. nov.

Herba dioica basi repens, caulibus erectis inferne glaberrimis superne rufo-pilosulis, petiolis rufo-pilosulis, laminis oblanceolatis vel elliptico-lanceolatis caudatis basi rotundatis supra glaberrimis infra in nervis rufo-pilosulis, cystolithis numerosis fusiformibus et punctiformibus, cymis ♀ subsessilibus vel breviter pedunculatis petiolis brevioribus, segmentis perigonii linearibus subaequalibus, achaeniis late ovatis.

Plant herbaceous, repent at base, the stem erect, up to 60 cm high, simple or few-branched, succulent, glabrous below, rufo-pilosulous above; stipules lanceolate, 1.5 to 2.5 mm long, deciduous; petioles of a node subequal or one about half as long as the other, 0.5 to 3 cm long, rufo-pilosulous; leaves of a node similar and subequal, oblanceolate or elliptic-lanceolate, 6 to 14 cm long, 2 to 5 cm wide, caudate-acuminate at apex, rounded at base, serrulate or crenate-serrulate nearly to base, 3-nerved (lateral nerves about midway between midnerve and margin, extending to base of acumen; secondary nerves numerous, at right angles to primary nerves), dark green and glabrous above, paler and rufo-pilosulous on the nerves beneath, the cystoliths numerous, both fusiform and punctiform; plants dioecious; pistillate flowers in subsessile or short-peduncled cymes, shorter than the petioles, the perianth segments linear, subequal, about 1.3 mm long; achenes broadly ovate, 1.5 mm long.

Type in the U. S. National Herbarium, no. 1,356,150, collected in dense woods along stream, vicinity of Las Vegas, Department of Santander, Colombia (Eastern Cordillera, altitude 2,600 meters), December 23, 1926, by E. P. Killip and A. C. Smith (no. 16019). *Killip and Smith* 15949 and 16126, from the same locality, also belong to this species.

This species is similar to *P. salentana*, but the leaves are oblanceolate and less deeply toothed, and bear numerous punctiform cystoliths. The plants, moreover, appear to be dioecious. It is named in honor of Ramón Castro, an eminent citizen of Bucaramanga, who was a most cordial host to the collectors.