

REVISION OF HAPLOSTACHYS,  
PHYLLOSTEGIA, AND  
STENOGYNE

247

By  
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## CONTENTS

	PAGE
Introduction .....	3
Haplostachys .....	4
Key .....	5
H. Munroi .....	5
H. Grayana .....	5
H. Bryanii .....	8
H. truncata .....	10
H. linearifolia .....	10
Phyllostegia .....	12
Key .....	12
Genuinae .....	14
Holophyllae .....	14
P. vestita .....	14
P. variabilis .....	15
P. tahitensis .....	16
P. grandiflorum .....	16
P. macrophylla .....	19
P. brevidens .....	22
P. electra .....	27
P. Stachyoides .....	29
P. Hillebrandii .....	30
P. glabra .....	30
P. parviflora .....	34
P. hirsuta .....	37
P. mollis .....	40
P. Helleri .....	43
P. Lantanooides .....	46
P. bracteata .....	47
P. waimeae .....	48
P. racemosa .....	49
Lobatae .....	50
P. Mannii .....	50
P. hispida .....	53
P. Rockii .....	53
Lateriflorae .....	54
P. floribunda .....	55
P. Knudsenii .....	57
P. Wawrana .....	57
Excluded names .....	57
Stenogyne .....	59
Key .....	59
Sarmentosae .....	61

	PAGE
<i>S. Calaminthoides</i> .....	62
<i>S. Kamehamehae</i> .....	63
<i>S. Rugosa</i> .....	66
<i>S. angustifolia</i> .....	69
<i>S. purpurea</i> .....	72
<i>S. kealiae</i> .....	75
<i>S. kaalae</i> .....	76
<i>S. bifida</i> .....	77
<i>S. Scrophularioides</i> .....	77
<i>S. sororia</i> .....	82
<i>S. calycosa</i> .....	83
<i>S. sessilis</i> .....	84
Scandentes .....	89
<i>S. viridis</i> .....	89
<i>S. haliakalae</i> .....	89
<i>S. macrantha</i> .....	90
<i>S. rotundifolia</i> .....	93
<i>S. glabrata</i> .....	94
<i>S. cinerea</i> .....	94
<i>S. scandens</i> .....	96
Microphyllae .....	96
<i>S. microphylla</i> .....	96
<i>S. diffusa</i> .....	98
<i>S. affinis</i> .....	99
<i>S. crenata</i> .....	99
<i>S. vagans</i> .....	101
Excluded species .....	101

## ILLUSTRATIONS

Figures 1-38, in text

# Revision of Haplostachys, Phyllostegia, and Stenogyne

By EARL EDWARD SHERFF

## INTRODUCTION

The revisional studies summarized in the following pages were undertaken at the suggestion of Mr. Otto Degener, who has placed his large collection of mounted and unmounted Hawaiian Labiatae completely at my disposal, and has in many other ways rendered valuable assistance.

A number of the world's principal scientific institutions have cooperated most generously in facilitating the progress of the work. Their aid consisted usually in lending their entire collections of herbarium specimens in the genera studied. It is a sincere pleasure to express here my gratitude to the staffs of all these institutions, and particularly to the following individuals: Dr. Ludwig Diels, Director, and Dr. Johannes Mattfeld, Curator, Botanical Garden of Berlin; Dr. Herbert E. Gregory, Director, and Mr. Edwin H. Bryan, Jr., Curator of Collections, Bernice P. Bishop Museum; Mr. John Ramsbottom, Keeper of Botany, British Museum of Natural History; Miss Alice Eastwood, Curator of Botany, California Academy of Sciences; Dr. Karl M. Wiegand, Professor of Botany, Cornell University; Dr. B. P. G. Hochreutiner, Director, Botanical Garden of Geneva and Delessert Herbarium; Dr. Carl Skottsberg, Director, Arboretum of Götheborg; Dr. B. L. Robinson, Curator, and Mr. Charles A. Weatherby, Assistant Curator, Gray Herbarium; Sir Arthur W. Hill, Director, Royal Botanical Gardens of Kew; Dr. Boris Keller, Director, and Dr. V. P. Savicz, Assistant Director, Botanical Garden of Leningrad; Dr. Jesse M. Greenman, Curator of the Herbarium, Missouri Botanical Garden; Dr. Heinrich Handel-Mazzetti, Curator of Botany, Natural History Museum of Vienna; Dr. Elmer D. Merrill, Director, New York Botanical Garden; Dr. Henri Humbert, Director, Museum of Natural History, Paris; Dr. William R. Maxon, Associate Curator, United States National Museum.

My work was carried on almost entirely at the Field Museum of Natural History, Chicago, where I was accorded many courtesies and permitted much freedom of procedure. I am grateful especially to Mr. Stephen C. Simms, Director, to Dr. B. E. Dahlgren, Curator of Botany, and to Dr. P. C. Standley, Associate Curator of Botany, for their assistance in various ways.

Considerable editorial assistance has been rendered in the correction of geographic names and in various other matters by Miss Esther C. Anderson

and Miss Marie C. Neal of Bishop Museum. My wife, Fern R. Seeley Sherff, has aided throughout with the proofreading. It is a pleasure to acknowledge here these kindly services.

I have photographed more than 200 of the more important herbarium specimens studied. Complete sets of these photographs are in my own private collection and in the herbarium of Field Museum of Natural History. These have been drawn upon exclusively for the illustrations accompanying the text.

Wherever the term "cotype" is used in the legends accompanying the illustrations, or elsewhere in the text, it is used to connote a duplicate of the type, as shown, for example, by the use of the same collection number.

Specimens for study were loaned by the following herbaria (referred to in the text by the names in parentheses): Botanical Garden of Berlin (Berlin); Bernice P. Bishop Museum, Honolulu (Bishop); Museum of Bremen (Bremen); British Museum of Natural History, London (British); California Academy of Sciences (California); Cornell University, Ithaca (Cornell); Delessert Herbarium, Geneva (Delessert); Field Museum of Natural History, Chicago (Field); Gray Herbarium of Harvard University, Cambridge (Gray); Royal Botanical Gardens of Kew (Kew); Missouri Botanical Garden, St. Louis (Missouri); Natural History Museum, Vienna (Vienna); New York Botanical Garden (N. Y.); Museum of Natural History, Paris (Paris); Botanical Garden of Leningrad (Leningrad); United States National Herbarium, Washington, D. C. (U. S.).

#### Genus HAPLOSTACHYS (A. Gray) Hillebrand

*Haplostachys* (A. Gray) Hillebrand, Fl. Haw. Is., p. 346, 1888; *Phyllostegia* section *Haplostachys* A. Gray, Amer. Acad., Proc., vol. 5, p. 342, 1862.

Erect, herbaceous or near base ligneous, densely tomentose, with often coriaceous and rugose leaves. Flowers subsessile, in pairs in a simple terminal spike or spicate raceme. Calyx cylindrical, 5-dentate, at maturity closed or nearly so. Corolla tube nearly straight, scarcely widening at throat, exanulate; upper lip simple, lower lip 3-lobed, each lip or its lobes rounded with an undulating crisp margin. Stamens as in *Phyllostegia*. Style included, apically subentire or deeply cleft, clavately dilating and flattened near apex, emarginate with 2 equal stigmatiferous cushions on the top, more or less hairy above. Nucules dry, light to dark brown, triquetro-convex, somewhat obconical, closely packed, pubescent at top, retained with the more or less closed calyx.

Type: *Haplostachys Grayana* Hillebrand.

KEY

- a. Leaves linear, at base narrowed.....5. *H. linearifolia* and variety  $\beta$
- a. Leaves narrowly oblong-lanceolate to cordate
  - b. Calyx teeth very short and obtuse.....4. *H. truncata*
  - b. Calyx teeth acute
    - c. Stems loosely long-pilose .....1. *H. Munroi*
    - c. Stems closely tomentose or tomentulose
      - d. Leaves thickish, mostly very rugose-veiny and tomentose beneath; corolla tubes 1.4-2.2 cm long; plants of Maui, Hawaii, and Kauai.....2. *H. Grayana* and varieties
      - d. Leaves thinnish, shortly tomentulose and at most hardly rugose-veiny beneath; corolla tubes 1-1.4 cm long; plants of Molokai.....3. *H. Bryanii* and varieties

1. *Haplostachys Munroi* Forbes.

*Haplostachys Munroi* Forbes, B. P. Bishop Mus., Occ. Papers, vol. 6, p. 178, pl. p. 179, 1916.

Suberect, herbaceous; stems tetragonal, spreadingly to subretroersely long-pilose. Leaves petiolate, the slender and spreading- or subretroerse-villous petiole 4-5.5 (-9.3) cm long; blade oblong-cordate, at apex acute, on margins crenate, on both faces villous, in texture rather thin, 7-13 dm long and 3.7-9.7 cm wide. Inflorescence a lax spicate raceme 2-2.5 dm long, bracts lanceolate and 4-7 mm long or lowermost ones subfoliaceous. Calyx large, obconic or obconic-cylindric, puberulent with a few scattering longer hairs, 1.2-1.8 cm long, shortly and widely dentate with teeth abruptly subulate-tipped and 1-3 mm long; pedicel  $\pm$  2 mm long. Corolla large, pure white, the pilose tube slightly curved and 1.7-2.2 cm long; upper lip  $\pm$  8 mm long and sparsely pubescent, lower lip up to 1.6 cm long. Nucules large, slightly glandular at top (where also rugose, as well as on inner faces), 7 mm long. Flowers said by Munro (*vide Forbesii*) to emit a strong aroma.

Type: collected by G. C. Munro, no. 350, Paomai, island of Lanai, June 16, 1914 (Bishop).

Specimens examined: C. N. Forbes (with G. C. Munro) 291-L, west end of Lanai, September, 1917 (Bishop); Mrs. C. N. Forbes 486, Kaa, Lanai, February 23, 1916 (Bishop); A. S. Hitchcock 14713, dry forest, north end of Lanai, September 22, 1916 (Bishop, U. S.); G. C. Munro 218, Kaa, Lanai, June 16, 1914 (Bishop); Munro 350 (cotype, Bishop); Munro 486, Kaa, Lanai, January 6, 1916 (Bishop).

Distribution: island of Lanai.

2. *Haplostachys Grayana* Hillebrand.

*Haplostachys Grayana* Hillebrand, Fl. Haw. Is., p. 346, 1888.

*Phyllostegia haplostachya* A. Gray, Amer. Acad., Proc., vol. 5, p. 345, 1862.

- a. Blades of principal leaves mostly cordate-ovate to cordate-oblong, 2.5-5 cm wide.....**H. Grayana**
- a. Blades of principal leaves mostly lanceolate-oblong, 1-3.2 (rarely -3.7) cm wide
  - b. Leaf blades 4-6.5 cm long and 1-2 cm wide, petioles 1-2 (-2.5) cm long.....variety  $\gamma$  **leptostachya**
  - b. Leaf blades 5-10 cm long and 1.5-3.2 (rarely -3.7) cm wide, petioles 2-5 cm long .....variety  $\beta$  **angustifolia**

Erect, canescent throughout or on leaf surfaces (especially the lower) and in inflorescence whitish-tomentose, 3-6 dm tall, stems and branches distinctly tetragonal. Leaves petiolate, petiole slender, 2-5 cm long; blade cordate-ovate to cordate-oblong or for a few

upper leaves lanceolate-oblong, acute to obtuse at apex, rather fleshy, crenate, 5.5-9 cm long and 2.5-5 cm wide, the reticulate venation conspicuous on lower surface, the basal lobes rounded, the sinus mostly under 1 cm deep. Inflorescence 1-3 dm long, the flowers subsessile in axils of reflexed apically acute or subulate-acuminate lanceolate-oblong bracts mostly 4-6 mm long (but the lowermost 1 or 2 pairs perhaps twice as long and sometimes foliaceous); calyx coriaceous, tomentose, 8-11 mm long, the narrow acute teeth 0.25-0.3 the length of the tube; corolla white with purplish tinge, externally pubescent except near base, the slender tube about 1.4 cm long, the lips subequal, the upper and the lower's three lobes rotund and with strongly undulate-cripsed margins; filaments pubescent; style puberulous or glabrate; nucules closely packed, runcinate or suberose at back and sides, pilose at apex, about 3 mm long.

Type: collected by the U. S. Exploring Expedition on the sands of the isthmus of Maui, 1840 (U. S., 2 sheets).

Specimens examined: anonymous, no. 369, Kula, east Maui (Bishop); William Hillebrand, Maui (Vienna, U. S.); Hillebrand, no. 364, erect, 1-2 feet tall, in open ground, altitude 2,000 feet, Kula, east Maui (Gray; Kew; common name, honohono); J. M. Lydgate 72, Kula (Berlin); U. S. Exploring Expedition, sand hills of isthmus of Maui, 1840 (type, U. S., 2 sheets; cotype, Gray); Heinrich Wawra 2309, island of Maui 1868-71 (Vienna).

Distribution: island of Maui.

**Haplostachys Grayana** variety  $\beta$  *angustifolia* Sherff (fig. 1).

*Haplostachys Grayana* variety *angustifolia* Sherff, Amer. Jour. Bot., vol. 21, p. 698, 1934.

Leaf blades even more noticeably tomentose and reticulate-veiny beneath, the principal ones mostly lanceolate-oblong and gradually narrowed distally to a usually acute apex, 5-10 cm long but only 1.5-3.2 (rarely -3.7) cm wide. Corolla often slightly larger, the tube up to 2.2 cm long, the lips up to 9 mm long.

Type: collected by Jules Remy, no. 394, island of Hawaii, 1851-55 (Gray).

Specimens examined: C. N. Forbes 461-H, slopes of Mauna Kea, Waikii, island of Hawaii, August 1911 (Bishop, Missouri); Remy 394 (type, Gray; cotypes, Paris, 2 sheets); J. F. Rock 8350, inner slopes of crater Nohonahoe, plains of Waimea, island of Hawaii, June 1910 (Bishop, Gray, N. Y.).

Distribution: island of Hawaii.

**Haplostachys Grayana** variety  $\gamma$  *leptostachya* (A. Gray) Hillebrand.

*Haplostachys Grayana* variety *leptostachya* (A. Gray) Hillebrand, Fl. Haw. Is., p. 347, 1888.

*Phyllostegia haplostachya* variety *leptostachya* A. Gray, Amer. Acad., Proc., vol. 5, p. 345, 1862.

Leaves as in variety *angustifolia* but the petioles only 1-2 (-2.5) cm long and the blades only 4-6.5 cm long and 1-2 cm wide, less cordate at the base, their upper surface darker, less tomentose and more visibly glandular. Spikes loosely few-flowered. Calyx tomentum more greenish. Corolla tubes about 1.7-1.9 cm long.

Type: collected by the U. S. Exploring Expedition on barren ridges, mountains of Kauai, 1840 (U. S.).

Specimens examined: U. S. Exploring Expedition, Kauai, 1840 (type, U. S.; cotypes, Gray, Kew, N. Y.).



FIGURE 1.—*Haplostachys Grayana* variety *angustifolia* (type).



Deceivably like *H. Bryanii* variety *microdonta* in general habit but distinguished by the salient and broader veins on lower surfaces of leaves, also by longer corolla tubes.

Distribution: island of Kauai.

### 3. *Haplostachys Bryanii* Sherff (fig. 2).

*Haplostachys Bryanii* Sherff, Amer. Jour. Bot., vol. 21, p. 698, 1934.

- a. Leaf petioles commonly 1.5-3 cm long, blades 2.5-4.5 cm long and under 2 cm wide
- b. Leaf blades oblong or ovate-oblong, 10-24-dentate on each side.....**H. Bryanii**
- b. Leaf blades lanceolate-oblong, 25-36-dentate on each side.....**variety  $\gamma$  microdonta**
- a. Leaf petioles very slender, 4-5.5 cm long, blades 5-7 cm long and 3.5-4.5 cm wide.....**variety  $\beta$  robusta**

Erect, slender, perhaps 3-5 dm tall; stem tetragonal, minutely and densely whitish-pubescent with small and more or less retrorse hairs. Leaves slenderly petiolate with petiole commonly 1.5-3 cm long; blade oblong or ovate-oblong, at base cordate with sinus 2-4 mm deep, at apex obtuse, on margins crenate with 10-24 teeth to each side, membranaceous, on upper surface most minutely tomentulose, on lower very obscurely veiny and whitish-tomentulose, 2.5-4 cm long and 1.2-2 cm wide. Inflorescence simple, spicate,  $\pm$  2 dm long; bracts oblong-linear, acute, 4-6 mm long or lower ones 1-1.8 cm long, lowermost ones subfoliaceous. Calyx at anthesis cylindric-obconic, pubescent, 9-12 mm long, its narrow and sharp lobes 2-4 mm long. Corolla externally very pubescent, its slender tube 1-1.4 cm long, its lips marginally crenulate-incised and curled, the upper one about 6 mm long, the lower a little shorter and 3-lobed with lobes rotundate.

Type: collected by G. C. Munro, no. 553, Mauna Loa, western Molokai, June 1, 1916 (Bishop).

Specimens examined: Munro 391 pro parte, Mauna Loa, Molokai, June 6, 1916 (Bishop, cum varietate *microdonta* commixtum); Munro 553 (type, Bishop; cotype, Field); Munro 553, Mauna Loa, above Halena, Molokai, June 6, 1916 (Bishop).

Named for Mr. Edwin H. Bryan, Jr., Curator of Collections, Bernice P. Bishop Museum. It was through Mr. Bryan's invaluable assistance in assembling for my study various materials (mostly unmounted and therefore not cited here) that a description of the species and varieties here presented was rendered possible.

Distribution: western Molokai.

### *Haplostachys Bryanii* variety $\beta$ *robusta* Sherff.

*Haplostachys Bryanii* variety *robusta* Sherff, Amer. Jour. Bot., vol. 21, p. 698, 1934.

More robust, at least 8 dm tall, more ramose. Leaves larger, petiole very slender and 4-5.5 cm long; blade ovate-cordate, 5-7 cm long and 3.5-4.5 cm wide, basal sinus up to 7 mm deep, marginal teeth not more numerous. Inflorescence  $\pm$  3 dm long.

Type: collected by J. F. Rock, no. 14000, Ka Lae o Ka Laau flats, southwesternmost Molokai, May 21, 1918 (Bishop).

Specimens examined: Rock 14000 (type, Bishop).

Distribution: southwesternmost Molokai.



FIGURE 2.—*Haplostachys Bryanii* (type).

**Haplostachys Bryanii** variety  $\gamma$  **microdonta** Sherff.

*Haplostachys Bryanii* variety *microdonta* Sherff, Amer. Jour. Bot., vol. 21, p. 698, 1934.

Slender, subsimple,  $\pm$  5 dm tall. Leaf petiole 2-3 cm long; blade of principal leaves lanceolate-oblong, 3.5-4.5 cm long and under 1.8 cm wide, its teeth small and 25-36 to each side.

Type: collected by A. S. Hitchcock, no. 15139, in open, dry ground, western Molokai, October 12, 1916 (U. S.).

Specimens examined: Hitchcock 15139 (type, U. S.; cotype, Bishop); G. C. Munro 391 pro parte, Mauna Loa, island of Molokai, June 6, 1916 (Bishop, cum specie ipsa commixtum).

In the species proper the marginal foliar teeth average about 4-6 per centimeter, whereas in the variety *microdonta* they average about 9 or 10.

Deceptively like *H. Grayana* variety *leptostachya* in general habit.

Distribution: western Molokai.

**4. Haplostachys truncata** (A. Gray) Hillebrand.

*Haplostachys truncata* (A. Gray) Hillebrand, Fl. Haw. Is., p. 347, 1888.

*Phyllostegia truncata* A. Gray, Amer. Acad., Proc., vol. 5, p. 345, 1862.

Erect, apparently herbaceous, erectly branched, tomentulose throughout. Leaves slenderly petiolate, petiole 0.5-1.5 cm long; blade narrowly oblong-lanceolate, at base truncate or subcordate, at apex subacute, on margins crenulate, on lower face whitish and salient-veiny, 3-4 cm long and 6.5-8 mm wide. Inflorescence rather (in lower part extremely) lax, up to  $\pm$  1.2 dm long; bracts lanceolate, mostly 3-5 mm long and reflexed. Calyx puberulous, minutely glandular, obconic, 6-7 mm long, at top repand-truncate (the wide teeth very short and very obtuse), pedicel 1-2 mm long. Corolla white, externally pubescent; tube slender, slightly curved, 1.4-1.8 cm long; subequal lips 3.5-5.5 mm long. Style deeply cleft at apex, branches hispid. Nucules 2.5-3 mm long.

Type: collected by Jules Remy, no. 395, island of Maui, 1851-55 (Gray).

Specimens examined: Remy 395 (type, Gray).

Distribution: island of Maui.

**5. Haplostachys linearifolia** (Drake del Castillo) Sherff.

*Haplostachys linearifolia* (Drake del Castillo) Sherff, Bot. Gaz., vol. 96, p. 136, 1934.

*Phyllostegia rosmarinifolia* H. Mann, Boston Soc. Nat. Hist., Mem., vol. 1, p. 536, 1869 (nomen nudum).

*Phyllostegia linearifolia* Drake del Castillo, Illustr. Fl. Ins. Mar. Pacific, p. 47, pl. 20, 1886.

Leaves mostly 5-10 cm long and 2-7 mm wide; calyx lobes broadly triangulate, 1-1.5 mm long, the tips obtuse to subacute; corolla tube 1.7-2.2 cm long, upper lip 2-3, lower 3-4.5 mm long.....**H. linearifolia**

Leaves often 1-1.5 dm long and 6-10 mm wide; calyx lobes narrower and more elongate-acute, mostly 2-3.3 mm long; corolla tube 2-2.5 cm long, upper lip 3-5 mm, lower 5-8 mm long.....variety  $\beta$  **rosmarinifolia**

Erect herb, lignescent at base, more or less branched, 3-6 dm tall, gray-tomentulose throughout, stems obtusely tetragonal. Leaves rather crowded near or slightly above middle of stems in flowering and fruiting specimens, sessile, linear, more or less narrowed at both ends, entire or finally crenulate at revolute margins, thickish, mostly 5-10 cm long and 2-7 mm wide. Inflorescence a moderately dense spike 5-8 cm long (with occasionally 1-3 pairs of axillary flowers at the mutually remote cauline nodes in the immediately subjacent 3-9 cm of stem); bracts lanceolate to linear, acute, 3-10 mm long. Calyx 5-7 mm tall; lobes broadly triangulate, 1-1.5 mm long, the tips obtuse to subacute; pedicel 1-2 mm long. Corolla tube slender, 1.7-2.2 cm long; upper lip 2-3, lower 3-4.5 mm long. Style glabrate or sparsely setulose above; stigma almost entire, noticeably white-setose. Nucules triquetro-convex, white-hispid at apex but otherwise glabrous or glabrate.

Type: collected by Jules Remy, no. 396, Hawaiian islands, 1851-55 (known to me only through type illustration).

Specimens examined: Otto Degener 5398, dry, grass-covered ridge, east fork of Kawela Gulch, island of Molokai, June 11, 1928 (Field); William Hillebrand, Wailuku, Maui (Berlin; Bishop, where labeled "*Phyllostegia rosmarinifolia* n. sp. H. M. [in litt.]"); Hillebrand, isthmus of Maui (Kew); Hillebrand 365, near the sea, sand hills of Wailuku (Kew); J. F. Rock, island of Molokai (Gray); Rock, Mauna Loa, western Molokai, February 1910 (Gray); Rock, Mahana, western Molokai, March 1910 (N. Y.); Rock 7025 pro parte, Hawaiian islands (Bishop).

Hillebrand had submitted material from Maui to Horace Mann. A sheet of this Hillebrand material in Bernice P. Bishop Museum bears an original Mann and Brigham label, corrected to show Hillebrand as the collector and reading, "*Phyllostegia rosmarinifolia* n. sp. H. M. (*in litt.*)". This material is evidently authentic for Mann's *P. rosmarinifolia*, published posthumously and without description. It is the same as the plant later described and illustrated by Drake del Castillo with a beautiful plate from Remy 396 under the name *P. linearifolia* (my *H. linearifolia*). The *P. rosmarinifolia* later published by Hillebrand, however, was based primarily on Molokai material and, as shown in the foregoing key (variety *rosmarinifolia*), differed in several important characters from Drake's type.

Distribution: islands of Molokai and Maui.

***Haplostachys linearifolia* variety  $\beta$  *rosmarinifolia* (Hillebrand) Sherff.**

*Haplostachys linearifolia* variety *rosmarinifolia* (Hillebrand) Sherff, Bot. Gaz., vol. 96, p. 136, 1934.

*Haplostachys rosmarinifolia* Hillebrand, Fl. Haw. Is., p. 347, 1888 (exclud. ins. Maui).

Somewhat more robust, principal leaves often 1-1.5 dm long and 6-10 mm wide. Bracts of inflorescence usually longer and more acuminate. Calyx larger, 6-9 mm long. lobes narrower and more elongate-acute, mostly 2-3.3 mm long. Corolla cream-colored, larger; tube 2-2.5 cm long; upper lip 3-5 mm, lower 5-8 mm long. Nucules 3.5-4 mm long.

Type: collected by William Hillebrand, Kamalo, island of Molokai (Berlin).

Specimens examined: Professor Alexander, island of Molokai (Berlin); Urbain Faurie 887, altitude 1,000 meters, Kamalo, Molokai, June 1910 (Delessert, Paris); C. N. Forbes 134-Mo, slopes of Puu Kolekole, Molokai, July 1912 (Bishop, Missouri); ex

herb. William Hillebrand (U. S.); Hillebrand, Kamalo, Molokai (type, Berlin; cotypes, Gray, Kew); J. F. Rock 7025 pro parte, altitude 2,500 feet, above Kamalo, Molokai, April 1910 (Bishop, 2 sheets; Gray, 2 sheets); Rock 14025, Molokai (Bishop).

Distribution: island of Molokai.

#### Genus *PHYLLOSTEGIA* Benth

*Phyllostegia* Benth, Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830.

Much-branching undershrubs, leaves petiolate and usually membranous. Flowers in terminal or axillary racemes or panicles, these usually of 6 or more flowers. Calyx usually obconic to ovoid, 10-nerved, subequally 5-toothed or -lobed with teeth or lobes in age often foliaceous, ampliate and open at maturity. Corolla exserted, slightly curved, exannulate, the tube scarcely dilating at the throat, bilabiate; upper lip entire, flattish or concave; lower lip usually much longer, spreading, trifid with lobes ovate and the middle one largest and entire. Stamens 4, parallel, ascending under the upper lip, not exserted, both pairs of the same length or the outer slightly longer, the filaments adnate to near the throat and usually pubescent. Anthers 2-celled, the cells divergent or finally divaricate. Style included, shortly bifid, the lobes clavate and diverging or curved, stigmatose at the truncate ends, one lobe often rudimentary. Nucules (achenes) fleshy, obliquely affixed and connate at base, spreading and exserted at maturity. (Description in large part as by Hillebrand, Fl. Haw. Is., p. 347, 1888.)

Type: *Phyllostegia vestita* Benth, Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830.

#### KEY

- a. Inflorescence a terminal (sometimes interrupted and foliose) raceme or panicle
  - b. Leaves entire, dentate, or serrate
    - c. Pedicels on a common peduncle.....10. *P. glabra* and varieties
    - c. Pedicels not pedunculate
      - d. Racemes commonly branched and thus paniculate
        - e. Pubescence of the racemes in large part gland-tipped; lower whorls 6-10-flowered.....11. *P. parviflora* and varieties  $\gamma$ - $\epsilon$
        - e. Pubescence of the racemes not or but rarely gland-tipped
          - f. Lower whorls 2-4-flowered.....11. *P. parviflora* variety  $\beta$
          - f. Lower whorls 10-18-flowered.....12. *P. hirsuta* and variety  $\beta$
      - d. Racemes simple, or in some species (especially *P. electra*, *P. Helleri*, *P. Hillebrandii*, *P. mollis*, *P. racemosa*, *P. stachyoides*, and *P. waimeae*) frequently several or numerous, approximate and collectively simulating a panicle
        - e. Calyx prominently nerved—or if obscurely nerved (*P. tahitensis*) then long-hirsute—, with acute narrow lanceolate or subulate lobes, whorls 10-14-flowered—or if fewer-flowered then the leaves lanceolate (*P. Hillebrandii*) or (*P. tahitensis*) small (blades 3.5-6 cm long and 1.7-3 cm wide) and sharply serrate with subequilateral teeth

- f. Leaves sharply serrate with outstanding subequilateral teeth; calyx hirsute.....**3. *P. tahitensis***
- f. Leaves obscurely to subshallowly serrate with antrorse, inequilateral, often rounded teeth; calyx pubescent to glabrous
  - g. Leaves lanceolate-ovate to oblong-lanceolate, at base rounded to subcordate.....**8. *P. Stachyoides* and variety  $\beta$**
  - g. Leaves lanceolate, at base cuneate.....**9. *P. Hillebrandii***
- e. Calyx faintly or moderately nerved in most species, the lobes usually broader, obtuse or acute or rarely (e. g., sometimes in *P. mollis*) subulate
- f. Principal leaves rounded or contracted at base
  - g. Hirsute; calyx shaggy-hirsute, finally 1.2-2 cm high, the lobes becoming foliaceous and on their margins often dentate or denticulate.....**1. *P. vestita***
  - g. Pubescent or glabrous; calyx smaller, the lobes not or finally but slightly foliaceous, marginally entire
  - h. Axis of inflorescence with minute spreading pubescence; native of Kauai.....**7. *P. electra***
  - h. Axis of inflorescence glabrous or more often appressed-hispid
    - i. Pedicels mostly under 8 mm long; axis of inflorescence retrorsely appressed-hispid
      - j. Corolla large, the tube 1.5-2.5 cm long; whorls 6- or very rarely (var.  $\beta$ ) 8-10-flowered.....**4. *P. grandiflora* and variety  $\beta$**
      - j. Corolla smaller, the tube less than 1.4 cm long; whorls 8-12-flowered, or if 6-flowered then (var.  $\gamma$ ) only about 1.3-1.7 cm in diameter at fruiting.....**5. *P. macrophylla* and varieties**
    - i. Pedicels mostly 0.8-3 cm long; axis of inflorescence glabrous or antrorsely appressed- or subappressed-hispid.....**6. *P. brevidens* and varieties**
- f. Principal leaves truncate to cordate at base
  - g. Blades of principal leaves 0.8-2 cm long, basally truncate to subcordate, those of inflorescence not or scarcely reduced.....**19. *P. Mannii***
  - g. Blades of principal leaves longer, basally cordate, those of inflorescence mostly much reduced and distinctly bracteiform
  - h. Floral bracts sessile with a broad base and mostly at least as broad as high.....**17. *P. waimeae***
  - h. Floral bracts stipitate
    - i. Whorls 3-5 or rarely -8 or more in a raceme
      - j. Stems at most minutely pubescent; leaf blades oblong-ovate, serrate with inequilateral teeth; petioles conspicuously spreading- or reflexed-ciliate; calyx lobes small; corolla more or less pinkish; native of Oahu.....**15. *P. Lantanoides***
      - j. Stems spreading-pubescent or -tomentose; leaf blades more broadly ovate, dentate with more or less equilateral teeth; petioles spreading-hispid but not conspicuously ciliate; calyx lobes large; corolla white; native of leeward islands.....**2. *P. variabilis***
    - i. Whorls more numerous; leaf blades dentate with inequilateral teeth
      - j. Blades of principal leaves ovate-lanceolate to subnarrowly ovate-oblong, 1.5-5.5 cm long and 0.8-2.5 cm wide.....**18. *P. racemosa* and variety  $\beta$**
      - j. Blades of principal leaves mostly proportionately broader, larger
      - k. Floral bracts mostly surpassing the calyces.....**16. *P. bracteata***

- k. Floral bracts mostly minute or barely surpassing the calyces
  - l. Leaves glabrous to glabrate (except as to veins) on upper surface; whorls 6-flowered, loose, the spreading or recurved pedicels 1-3 mm long, the calyces becoming subglobose; native of Lanai.....14. *P. Helleri* variety  $\beta$
  - l. Leaves more or less pubescent or hispid on upper surface
    - m. Leaves sparsely to subsparingly appressed-hispid; fruiting whorls 1.4-2 cm in diameter; pubescence of pedicels not gland-tipped; native of Kauai.....14. *P. Helleri*
    - m. Leaves softly canescent to pubescent; fruiting whorls 0.7-1.4 cm in diameter or if larger their pedicels' pubescence more or less gland-tipped.....13. *P. mollis* and varieties
- b. Leaves lobed or subbipinnate; plant rough-hispid with long white hairs
  - c. Leaf petiole filiform, blade lobed almost to midrib or subbipinnate; pedicels 5-9 mm long.....21. *P. Rockii*
  - c. Leaf petiole more robust, blade shallowly lobed; pedicels 1-3 mm long.....20. *P. hispida*
- a. Flowers in small axillary racemes or panicles, these much exceeded by the leaves
  - b. Pedicels 2-4 mm long; whorls mostly 4-flowered; principal leaves subcordate to truncate at base; plant pubescent.....23. *P. Knudsenii*
  - b. Pedicels mostly 8-10 mm long; plant hirsute or hispid
    - c. Whorls 2-flowered; leaves rounded to widely cuneate at base.....22. *P. floribunda*
    - c. Whorls commonly 6-flowered; principal leaves subcordate at base.....24. *P. Wawrana*

#### Section 1. GENUINAE A. Gray

Section 1. *Genuinae* A. Gray, Amer. Acad., Proc., vol. 5, p. 342, 1862; section *Terminalis* Briquet, in Engler and Prantl, Natürl. Pflanzenf. IV, vol. 3-a, p. 222, 1897.

Inflorescence a terminal panicle or 1-several terminal racemes.

#### Subsection *A. HOLOPHYLLAE* (Briquet), new combination

Subsection *A. Holophyllae* (Briquet), new combination; for subsection *Terminalium* Briquet, Engler and Prantl, Natürl. Pflanzenf. IV, vol. 3-a, p. 222, 1897.

Leaves undivided, entire or toothed.—Nos. 1-18. No. 18, *Phyllostegia racemosa*, is included here arbitrarily. In spite of its undivided leaves it has a general habit closer to that found in subsection *B*.

#### 1. *Phyllostegia vestita* Benth.

*Phyllostegia vestita* Benth., Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830; Lab., p. 651, 1835; De Candolle, Prodr., vol. 12, p. 553, 1848.

*Phyllostegia dentata* Benth., Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830.

Suberect,  $\pm 1$  meter high, hirsute throughout with spreading (or on leaf blades appressed) sharp and often brownish hairs; the branches robust and angular. Leaves undivided, the petiole 2-7 cm long; the blade ovate, at base rounded to subcordate, at apex acute to shortly acuminate, at margin serrate, 6-18 cm long and 5-9 cm wide. Whorls 10-20-flowered, all or most of them in the axils of ordinary large leaves and distant, or much oftener the upper or even all whorls approximate in racemes, these with reduced bracteform leaves and varying from abbreviated or even spuriously capitate to elongate and  $\pm 2.8$  dm long; fruiting whorls 4-6 cm in diameter; pedicels 8-12 mm long, noticeably hirsute with spreading brown hairs; bractlets filiform or subulate, about 4-5 mm long. Calyx shaggy-hirsute, finally 1.2-2 cm high, the lobes becoming broad, foliaceous, often dentate or denticulate, subacute, often equalling or exceeding the tube. Corolla white or cream-colored, externally hispid, the tube 0.8-1.5 cm long, the lower lip 8-13 mm long, much exceeding the upper.

Type: collected by James Macrae, Byron's Bay (Hilo Bay), island of Hawaii, 1825 (herbarium uncertain).

Specimens examined; Otto Degener 5386, corollas pure white, glade in wet jungle, between Glenwood and 29 Miles, Kilauea, island of Hawaii, June 18, 1929 (Field); Alice Eastwood, cultivated from Hawaiian seed, San Francisco, California (California); Urbain Faurie 898, Glenwood, island of Hawaii, May 1909 (British); C. N. Forbes 494-H, Kohala Mountains, Waimea, island of Hawaii, September 1911 (Bishop, Missouri); Forbes 659-H, Olaa flume, island of Hawaii, June 2, 1915 (Bishop, Missouri); William Hillebrand, straggling like *P. grandiflora*, Hilo, island of Hawaii (Berlin, Kew); Hillebrand and J. M. Lydgate, same locality (Bishop); Lydgate, same locality (Berlin); Macrae, Byron's Bay (Hilo Bay), Hawaiian islands, 1825 (Kew, collection cited by Bentham for his *P. dentata*); Macrae, Hawaiian islands (herb. Benthamii in Kew, author's specimen of *P. dentata*); Macrae, Mauna Kea (Mount Kaah), island of Hawaii, June 1825 (Gray, collection cited by Bentham for his *P. dentata*); H. Mann and W. T. Brigham, in dense woods, Kaina's near Kilauea, island of Hawaii (Bishop); J. F. Rock 4313 and 4316, ditch trail, Kawainui, Alakahi, island of Hawaii, July 13, 1909 (Bishop); Rock 8312, mountains above Waimea, island of Hawaii, June 1910 (Bishop, 2 sheets; Vienna; Paris; specimina inter se florum magnitudine latissime diversa); Rock 8390, forest above Awini, Kohala, island of Hawaii, June 1910 (Bishop); Rock 13010, forest at 22 Miles, Glenwood, island of Hawaii, August 1917 (Bishop); U. S. Exploring Expedition, island of Hawaii, 1840 (Gray; U. S., 3 sheets).

Asa Gray (Amer. Acad., Proc., vol. 5, p. 342, 1862) seems to have been the first writer to realize that *Phyllostegia dentata* Bentham and *P. vestita* Bentham were identical. He chose to retain the latter name.

Distribution: island of Hawaii.

## 2. *Phyllostegia variabilis* Bitter:

*Phyllostegia variabilis* Bitter, Nat. Ver. Brem., Abhandl., vol. 16, pp. 432, 435, pl. 4, ff. *j-m*, 1900; Christophersen and Caum, B. P. Bishop Mus., Bull. 81, p. 34, 1931.

Herbaceous with a few simple spreading prostrate branches 7.5-10 dm long; stem 4.5-5 dm high or often only 1 dm high when flowers begin appearing; entire plant covered with pubescence, this thicker and more tomentose in older plants or on upper surfaces of leaves, becoming appressed. Leaves undivided, the flattish petiole (of the largest leaves) about 1-2 cm long; the blade (of the largest leaves) ovate, at base truncate to subcordate, at apex obtuse to subacute, at margin coarsely or subcoarsely serrate with subequilateral teeth, membranaceous, 5-6 cm long and 4-4.5 cm wide. Inflorescence a simple terminal raceme, the 4-6-flowered whorls bracted with gradually reduced or at



times but slightly reduced leaves; the spreading-pubescent pedicels 2-5 mm long. Calyx spreading-pubescent with hairs very seldom gland-tipped, 4-5 mm long, narrow and obscurely nerved below, expanded above and cleft almost to the middle into oblong or lanceolate, apically rounded or subacute medianly nerved lobes but slightly glandular, opening wide at fruiting. Corolla white, externally hispid with numerous delicate straightish white hairs, the tube about 8-9.5 mm long, the lower lip about 4-5.5 mm long and much exceeding the upper.

Type: collected by H. H. Schauinsland, near the shore, on west and east sides of Laysan Island, 1896-97 (Bremen).

Specimens examined: W. A. Bryan, in small patches mostly on windward side, in sand only, on Laysan Island, April 1903 (Bishop); E. L. Caum 25, altitude  $\pm$  3 meters, central plain, Eastern Island of Midway Islands, April 23, 1920 (Bishop); Schauinsland, Laysan Island, 1896-97 (Berlin, one of the original specimens studied by Bitter).

Distribution: leeward Hawaiian islands.

### 3. *Phyllostegia tahitensis* Nadeaud.

*Phyllostegia tahitensis* Nadeaud, Enum. Pl. Indig. Tahiti, no. 373, 1873; Nadeaud, ex Drake del Castillo, Illustr. Fl. Ins. Mar. Pacific, p. 50, pl. 22, 1886.

Stem and branches slender, round-angled, sulcate along center of each face, spreading-hispid. Leaves undivided, flaccid, the slender petiole spreading-hirsute and 1-3 cm long; the blade narrowly ovate to widely oblong-lanceolate, at base broadly cuneate to truncate, at apex acute, at margin ciliate and sharply serrate with subequilateral teeth, sparsely appressed-hispid, 3.5-6 cm long and 1.7-3 cm wide. Whorls normally 6-flowered, bracted by gradually reduced leaves, in a simple raceme 1-1.5 dm long; pedicels spreading-hirsute, 6-12 mm long. Calyx densely hirsute with glistening white to brownish hairs, minutely and inconspicuously glandular, about 5 mm long, the linear to lanceolate lobes often equalling the tube. Corolla externally pubescent, the tube about 7-10 mm long, the lower lip 7-8 mm long and easily exceeding the upper.

Type: collected by Jean Nadeaud, no. 373, ravines, altitude 1,200 meters, Mount Marau, Tahiti, May 26, 1859 (Paris).

Specimens examined: Nadeaud, Tahiti (Paris); Nadeaud 373 (type, Paris; cotype, Delessert).

Distribution: Tahiti, Society Islands.

### 4. *Phyllostegia grandiflorum* (Gaudichaud) Benth (fig. 3).

*Phyllostegia grandiflora* (Gaudichaud) Benth, Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830; Linnaea, vol. 6, p. 78, 1831; Lab., p. 651, 1835; De Candolle, Prodr., vol. 12, p. 553, 1848.

*Prasium grandiflora* Gaudichaud, Voy. Freycinet, Bot., p. 453, pl. 65, f. 2, 1830.

Suberect, stems often 1.8-2.4 meters long and leaning on other plants, woody below but for the greater part herbaceous, the branches more or less appressed-hispid or finally glabrate. Leaves undivided, the petiole usually somewhat puberulous, 1.5-3.5 cm long; the blade ovate, at times narrowly so, at base widely cuneate to truncate, at apex shortly acuminate, at margin crenate-serrate, sparingly hispid or glabrate above, softly appressed-pubescent beneath, somewhat firmer or thicker than in most species of the genus and finally subglossy above, commonly 6-10 cm long and 3.5-6 cm wide. Whorls 6-flowered, all in a crowded terminal raceme 1.2-1.5 dm long (the axis of which is retrorsely

appressed-hispid), all but the lowest one or two in the axils of much reduced leaves (bracts); pedicels spreading-hispid, 6-8 mm long; their individual bracts subulate, minute (1-2 or rarely -3 mm long). Calyx obconic to finally obconic-globose (or in fruit campanulate-ampliate), antrorsely and sparsely to densely appressed-hispid, usually rather distinctly ribbed, 6-8 mm long, the broad and somewhat obtuse lobes reflected at maturity and often coming to equal the tube. Corolla white with purplish tinge, externally tomen-



FIGURE 3.—*Phyllostegia grandiflora* (Degener and Shear 5406, form, Field).

tose, the slender tube far exerted and 1.5-2.5 cm long, somewhat curved, the upper lip emarginate, the lower broadly lobed and 1-2.2 cm long. Filaments spreading-pubescent with gland-tipped hairs; stigmatic branches very short, one usually rudimentary.

Type: collected by Charles Gaudichaud, Hawaiian islands, 1819 (Paris).

Specimens examined: Admiral, voyage of the, Hawaiian islands (Leningrad); Captain Beechey, island of Oahu, 1826-27 (Delessert; Kew, 2 sheets); F. D. Bennett 140, Hawaiian islands (Berlin); H. F. Bergman, in wet forest, altitude 3,500 feet, east side of Puu Kaala, Oahu, February 11, 1928 (Bishop); E. Christophersen and E. Hume 1414, altitude 500-750 meters, Kahuauli Ridge, Oahu (Bishop); Otto Degener 2100, in open rain forest, Mount Tantalus, Oahu, March 20, 1926 (N. Y.); Degener 4225, sunny, moist ridge, between Mount Tantalus and Nuuanu Valley, Oahu, March 10, 1923 (N. Y.); Degener 5381, in open rain forest, summit of Pupukea-Kahuku trail, Oahu, March 31, 1929 (Field); Degener 5401, Puu Kaala, Oahu, February 11, 1928 (Field); Degener 5404, in open rain forest, between Pauoa Flats and Konahuanui, Oahu, February 25, 1928 (Field); Degener 5408, in open rain forest between east rim of Manoa Valley and Mount Olympus, Oahu, February 28, 1928 (Field); Degener and K. K. Park 5368, in rain forest near summit, Wilhelmina Rise, Honolulu, Oahu, November 11, 1931 (Field); Degener, Park, and W. Hirai 5360, in open rain forest, Waikane-Schofield trail on Waikane side, Oahu, April 4, 1931 (Field); Degener and Noel Krauss 5377, sunny, shrubby embankment, east ridge of Manoa Valley, Oahu, February 3, 1929 (Field); Degener and C. L. Shear 5406, in open rain forest, Pauoa Flats, overlooking Nuuanu Valley, Oahu, February 20, 1928 (Field, forma plus minusve monstrosa nonnullis verticillastris 8-10 floris); J. F. Eschscholtz, island of Oahu (Leningrad, 2 sheets); Urbain Faurie 893, Punaluu, Oahu, May 1910 (Bishop, Delessert); C. N. Forbes, Lanihuli trail, Oahu, September 17, 1908 (Bishop, Missouri); Forbes, Koolauloa mountains, between Punaluu and Kaipaupau, Oahu, November 14-21, 1908 (Bishop); Forbes, Makaha Valley, Oahu, February 12-19, 1909 (Bishop, Missouri); Forbes 363-M, Honokohau drainage basin, west Maui, September 25 to October 17, 1917 (Bishop); Forbes 1644-O, Pauoa Valley and Pacific Heights, Oahu, February 14, 1911 (Bishop); Forbes 1847-O, Waolani ridge, Oahu, October 27, 1913 (Bishop); Forbes 1999-O, Waimano ridge, Oahu, October 27-30, 1914 (Bishop; Missouri); Forbes 2305-O, Kalihi, ridge, left Kalihi Valley, Oahu, March 9, 1916 (Bishop); Charles Gaudichaud, Hawaiian islands (Berlin, 2 sheets); Gaudichaud, same locality, 1819 (Paris, type); Gaudichaud, same locality, September-October, 1836 (Delessert, 2 sheets; Gray; Paris, 3 sheets); Gaudichaud 293 and 294, same date and locality (Paris); Guppy, Puu Kaala, Oahu, 1897 (Kew, 2 sheets); A. A. Heller 2299, on lower slopes of Konahuanui, above Manoa, Oahu, May 13, 1895 (Field; Gray; Kew; Missouri; N. Y.); Heller (similiter) 2299, same locality, May 23, 1895 (U. S.); Heller (similiter) 2299, same locality, June 3, 1895 (Delessert, Field); Heller (similiter) 2299, same locality, November 12-13, 1895 (Bishop, Field, Paris Leningrad); William Hillebrand, Hawaiian islands (Berlin, Vienna, U. S.); Hillebrand, island of Oahu (Gray); Hillebrand, hills between Manoa and Pauoa, Oahu, April 1861 (Berlin); Hillebrand 354, same date and locality (Kew); Hillebrand and J. M. Lydgate, Olympus ridge, Oahu (Bishop); A. S. Hitchcock 14009, altitude 2,000-4,000 feet, Puu Kaala, Oahu, July 9, 1916 (U. S.); E. Y. Hosaka 134, altitude 4,000 feet, Waianaeka, Puu Kaala, February 2, 1930 (Bishop); Raymond Inafuku, in wet forest, altitude 1,800 feet, Opauala Gulch, Paalaa, Oahu, November 9, 1930 (Bishop); Mrs. G. E. Kelly, Koolau mountains, Oahu, July 1916 (California); James Macrae, Oahu, May 1825 (Gray; Kew, 2 sheets; Vienna); H. Mann and W. T. Brigham 6, island of Oahu (Bishop; Delessert; Field, 2 sheets; Gray; Missouri; N. Y.; U. S.); A. Meebold, altitude 2,000 feet, Punaluu, Oahu, May 1932 (Bishop); K. Nitta (Otto Degener distribution no.) 5390, altitude 2,000 feet, Puu Kaala, Oahu, October 13, 1929 (N. Y.); Thomas Nuttall, island of Oahu, 1835 (Kew); Jules Remy 383, island of Oahu, 1851-55 (Gray, Paris); J. F. Rock, Palolo Valley, Oahu, November 30, 1912 (Gray); Rock, Palolo crater, Oahu, same date (Gray); Rock 8843 (Bishop); Rock 14130, Palolo-Manoa, Oahu, September 1917 (Bishop); Rock and Ballou, Palolo Valley, same date (Gray); Berthold

Seemann 2278, island of Oahu (Delessert; Gray; Kew, 2 sheets); Shaw, Palolo, Oahu, 1912 (Field); Carl Skottsberg 250, Manoa Valley, Oahu, August 18, 1922 (Bishop); Skottsberg 1079, Nuuanu-Pauoa ridge, Oahu, November 5, 1922 (Bishop); Skottsberg 1769, same locality, September 12, 1926 (Bishop); Skottsberg 1845, ridge above Kahana Bay, Oahu, September 17, 1926 (Bishop); Harold St. John 10055, branching shrub 15 feet tall, on moist ridge, with fragrant, white flowers, altitude 3,200 feet, Waianaekua, Puu Kaala, Oahu, November 24, 1929 (Bishop); St. John 10086, shrub with fragrant, white flowers, altitude 2,200 feet, upper ridge, Punaluu, Oahu, November 30, 1929 (Bishop); St. John 11657, climbing vine, stem 1 inch in diameter, altitude 1,500 feet, wet gulch, east of Puu Kamana, Koolau Range, Oahu, May 15, 1932 (Bishop); U. S. Exploring Expedition, mountains, island of Oahu, 1840 (U. S.); Adelbert von Chamisso, island of Oahu (Berlin; Kew, 2 sheets; Leningrad); Heinrich Wawra, Hawaiian islands, 1868-71 (Delessert); Wawra 1679, island of Oahu, same date (Vienna, 2 sheets; Leningrad); Wawra 2262, same date and locality (Vienna, 2 sheets); Wawra 2359, same date and locality (Vienna).

*P. grandiflora* is at once distinguished from the numerous forms of *P. brevidens* by having the hairs on the axis of the inflorescence strongly appressed and retrorse.

Distribution: island of Oahu. A specimen from Hooker's private herbarium (Kew), omitted under "Specimens examined," is attributed to the Society Islands, perhaps incorrectly so. Another specimen omitted is Urbain Faurie 901, Hilo, island of Hawaii, May 1909 (British), lacking corollas but otherwise agreeing with Oahu specimens of *P. grandiflora*. Complete flowering specimens from Hawaii are desired before admitting that island to the distributional range of the species.

**5. *Phyllostegia macrophylla* (Gaudichaud) Benth.**

*Phyllostegia macrophylla* (Gaudichaud) Benth., Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830; Lab., p. 652, 1835; De Candolle, Prodr., vol. 12, p. 554, 1848.

*Prasium macrophyllum* Gaudichaud, Voy. Freycinet, Bot., p. 453, pl. 65, fig. 3, 1830.

*Phyllostegia clavata* Benth., Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830.

- a. Corolla tube 0.7-1.4 cm long
  - b. Leaf blades moderately or sparsely appressed-hispid.....**P. macrophylla**
  - b. Leaf blades densely silky-villous or finally velvety.....**variety δ velutina**
- a. Corolla tube under 0.8 cm long
  - b. Whorls 8-10-flowered, pedicels 6-8 mm long.....**variety β Remyi**
  - b. Whorls 6-flowered, pedicels 2-5 mm long.....**variety γ Phytolacoides**

Scandent or suberect, the branches retrorsely pubescent, their nodes villous. Leaves simple, the petiole pubescent and 2-4 cm long; the blade membranaceous, widely ovate, at its base rounded or truncate or even subcordate, at apex shortly acuminate, at margin crenate-serrate, on both surfaces densely or sparsely appressed-hispid, 6-11 cm long and 3-6 cm wide. Inflorescence unbranched, up to 2 dm long; the whorls when fruiting about 2-2.4 cm in diameter, the lower ones remote, leafy-bracted, 10-12-flowered, the upper closer together, minutely bracted, 6-8-flowered. Calyx broadly obconic or at last widely

gaping, 3-6 mm long, erectly (forwardly) strigose, the short, broad, bluntish lobes 0.3-0.4 the length of the tube; pedicel pubescent, 4-6 rarely  $\pm$  8 mm long. Corolla pale lilac, strigose-pubescent, the tube 0.7-1.4 cm long, the upper lip entire, the lower lip 8-10 mm long. Filaments puberulous. Stigmatic branches both clavate and functional, but one larger. Nucules short-obovate, apically blunt, 2-2.5 mm long.

Type: collected by Charles Gaudichaud, Hawaiian islands, 1819 (Paris).

Specimens examined: Otto Degener 5388, island of Hawaii, June 23, 1929 (N. Y.); Degener 5451, in rain forest, mauka (inland) of ranches 17 miles north of Kohala Mountains along road leading toward Waimea, island of Hawaii, August 1, 1926 (N. Y.); C. N. Forbes, Kaalapuuwale, Kona, island of Hawaii (Bishop); Gaudichaud, Hawaiian islands, 1819 (type, Paris; cotype, Delessert); William Hillebrand, Hawaiian islands (U. S.); Hillebrand, woods near Kilauea, island of Hawaii, 1868 (Berlin); A. S. Hitchcock 14393, vine, Waimea, island of Hawaii, August 26, 1916 (U. S.); T. S. Lea, flowers pale lilac, in open woods, Hilo, island of Hawaii, March 1, 1887 (British); J. M. Lydgate, same locality (Berlin); James Macrae, volcano, Hawaiian islands, June 22, 1825 (Gray; Kew, etc.; type collection of *Phyllostegia clavata* Bentham); Archibald Menzies 2, Hawaiian islands (British); J. F. Rock 3442, Parker Ranch, Paauhau no. 2, island of Hawaii (Field); Rock 4312, ditch trail, Parker Ranch, Alakahi, Kawaiui, island of Hawaii July 13, 1909 (Field); Rock 8358, island of Hawaii, June 1910 (Field); Rock 8377, west of Honokanenui, Kohala, island of Hawaii, June 1910 (Bishop, Field); Rock 8378, same date and locality (Bishop, Field); Rock 8391, Awini, Kohala, June 1910 (Bishop).

Distribution: island of Hawaii.

***Phyllostegia macrophylla* variety  $\beta$  Remyi Sherff (fig. 4).**

*Phyllostegia macrophylla* variety *Remyi* Sherff, Bot. Gaz., vol. 96, p. 136, 1934.

Leaves nearly glabrous or moderately appressed-hispid. Whorls 8-10-flowered. Calyx at anthesis only about 2.5 mm long, its lobes under 0.5 mm long; the pedicel 6-8 mm long. Corolla smaller, the more slender tube about 6-8 mm long.

Type: collected by Jules Remy, no. 386, island of Maui, 1851-55 (Gray).

Specimens examined: C. N. Forbes 502-M, Honokohau drainage basin, Maui, September 25 to October 17, 1917 (Bishop, Field); Forbes 1653-M, right hand ridge, Kipahulu, Maui, November 17, 1919 (Bishop, Field); Forbes 2523-M, Papaaea, north slope of Haleakala, east Maui, June 14, 1920 (Bishop, Field, forma varietati *phytolaccoidi* adpropinquans); Remy 386 (type, Paris; cotype, Gray); J. F. Rock, Honomanu, east Maui, May 1911 (Berlin, Bishop).

Distribution: island of Maui.

***Phyllostegia macrophylla* variety  $\gamma$  *Phytolaccoides* Sherff.**

*Phyllostegia macrophylla* variety *Phytolaccoides* Sherff, Bot. Gaz., vol. 96, p. 137, 1934.

Inflorescence more slender, the whorls 6-flowered, when fruiting only about 1.3-1.7 cm in diameter, corolla tube  $\pm$  7 mm long.

Type: collected by A. S. Hitchcock, no. 14897, altitude 4,000 feet, in very wet forest along pipe line, east of Olinda, east Maui, October 1, 1916 (U. S.).

Specimens examined: Otto Degener 5429, in rain forest, Olinda pipe line trail, east Maui, June 17, 1927 (Field); C. N. Forbes 243-M, Nahiku, east Maui, July 1910 (Bishop; Field, forma floribus saepe numerosioribus pedicellis longioribus varietati *Remyi* adpropinquans); Forbes 1589-O, Popouwela, Waianae Mountains, Oahu, April 27, 1910

(Bishop, Field); Forbes 2582-M, trail up west bank of Honomanu, east Maui, June 23, 1920 (Bishop, Field); Forbes 2619-M, Waikamoi trail, east Maui, June 25, 1920 (Field); Hitchcock 14897 (type, U. S.); J. F. Rock, ditchman's house, Honomanu, east Maui, May 1911 (Bishop; Field, forma varietati *Remyi* adpropinquans); Rock 10329, Waikamoi trail, east Maui, May 1911 (Bishop, 2 sheets).

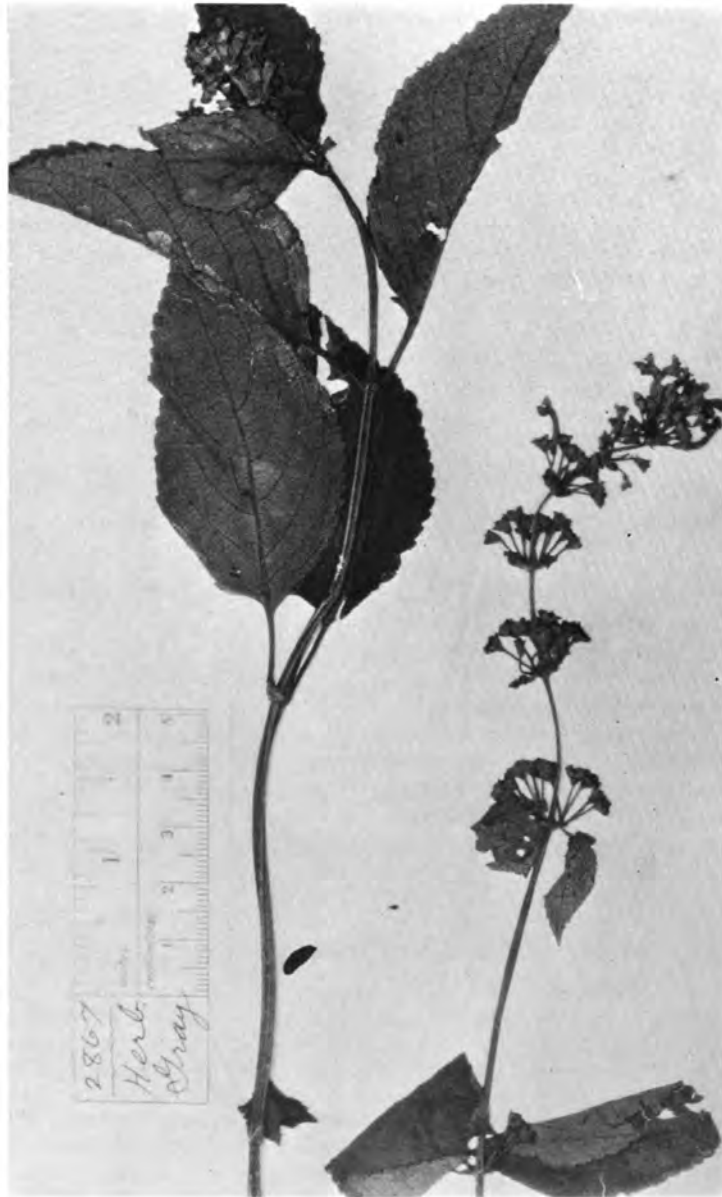


FIGURE 4.—*Phyllostegia macrophylla* variety *Remyi* (type).

The fruiting racemes of this variety suggest somewhat those of *Phytolacca decandra* Linnaeus.

Distribution: eastern Maui and western Oahu.

**Phyllostegia macrophylla** variety  $\delta$  **velutina** Sherff.

*Phyllostegia macrophylla* variety *velutina* Sherff, Bot. Gaz., vol. 96, p. 137, 1934.

Throughout densely silky-villous or finally velvety; calyx about 6-7 mm long, the lobes acute and 2-3 mm long; corolla tube 8-12 mm long.

Type: collected by the U. S. Exploring Expedition, Mauna Kea, island of Hawaii, 1840 (U. S.).

Specimens examined: J. F. Rock, in forests, Puu Lehua, Kona, island of Hawaii, January 1912 (Bishop, Field); Rock 10007, altitude 5,000 feet, above Naalehu, Kau, island of Hawaii, January 1912 (Bishop); U. S. Exploring Expedition, Mauna Kea, island of Hawaii, 1840 (type, U. S.; cotype, Gray).

The type collection of variety *velutina* is the material Asa Gray (Amer. Acad., Proc., vol. 5, p. 344, 1862) had in mind when he wrote: "Variat. . . . sericeo-villosa, canescens, lobis calycis paullo majoribus."

Distribution: island of Hawaii.

**6. Phyllostegia brevidens** A. Gray.

*Phyllostegia brevidens* A. Gray, Amer. Acad., Proc., vol. 5, p. 343, 1862.

- a. Lower whorls 6-flowered
  - b. Mature leaves sparsely pilose; pedicels 6-10 mm long.....variety  $\eta$  **expansa**
  - b. Mature leaves densely hairy beneath
    - c. Plant hirsute throughout.....variety  $\zeta$  **hirsutula**
    - c. Plant's pubescence of short hairs.....variety  $\epsilon$  **pauciflora**
- a. Lower whorls 8-many-flowered
  - b. Calyx limbs truncate to sinuate or obtusely and shallowly dentate.....**P. brevidens**
  - b. Calyx limb distinctly toothed, the teeth more or less lanceolate
    - c. Corolla small, the tube about 7-10 mm long
      - d. Leaves densely pubescent beneath.....variety  $\theta$  **pubescens**
      - d. Leaves moderately appressed-hispid beneath.....variety  $\beta$  **heterodoxa**
    - c. Corolla large, the tube about 1.7-2 cm long
      - d. Pedicels of lower whorls elongate-filiform and up to 3 cm long.....variety  $\delta$  **longipes**
      - d. Pedicels of lower whorls under 1.5 cm long.....variety  $\gamma$  **ambigua**

Suberect, the slender branches loosely foliose and nearly or quite glabrous. Leaves undivided, the petiole slender, 2-3.5 cm long; the blade variously oblong-ovate, subrhombic-ovate, or subobovate, at base widely cuneate, at apex acuminate, subremotely serrate with short mucronulate teeth, very thin, glabrous except for minute pubescence along veins on lower surface. Whorls of 14-20 flowers, all in the axils of reduced, narrow, but not bractiform reflected leaves, in an open raceme 1-1.5 dm long and the upper equalling, the lower much exceeded by the internodes. Pedicels slender, more or less hispidulous but lacking glands, 1-1.6 cm long, at very base usually united into a very stout but hardly noticeable peduncle. Calyx obconic, sparsely appressed-hispidulous to glabrous but very minutely punctulate with sessile glands, with the rather numerous nerves distinct especially below, 4-6 mm long, the limb truncate to sinuate or obtusely dentate. Corolla

externally pubescent, white, small, the tube 8-12 mm long, the lower lip broad and as long as the tube.

Type: collected by the U. S. Exploring Expedition, altitude 3,000 feet, in the forest of Mauna Kea, island of Hawaii, 1840 (U. S.).

Specimens examined: William Hillebrand and J. M. Lydgate, Hilo, island of Hawaii (Bishop); Lydgate, same locality (Berlin, Bishop); U. S. Exploring Expedition, altitude 3,000 feet, forest of Mauna Kea, island of Hawaii, 1840 (U. S., type).

Distribution: island of Hawaii.

***Phyllostegia brevidens* variety  $\beta$  *heterodoxa* Sherff.**

*Phyllostegia brevidens* variety *heterodoxa* Sherff, Amer. Jour. Bot., vol. 21, p. 700, 1934.

Branches appressedly hispidulous above, glabrate below. Leaves glabrate above but moderately appressed-hispid below, mostly ovate-oblong, widely cuneate to truncate at base, 10-13.5 cm long and 5-7 cm wide. Whorls 10-12-flowered, pedicels 7-13 mm long, the lobes 0.2-0.4 the length of the tube. Corolla externally more or less hispid, small, the tube only about 7-8 mm long, equalled or exceeded by the lower lip.

Type: collected by J. F. Rock, no. 10014, Naalehu, Kau, island of Hawaii (Bishop).  
Specimens examined: Rock 10014 (type, Bishop; cotype, Field).

Distribution: southwestern part of the island of Hawaii.

***Phyllostegia brevidens* variety  $\gamma$  *ambigua* A. Gray.**

*Phyllostegia brevidens* variety *ambigua* A. Gray, Amer. Acad., Proc., vol. 5, p. 343, 1862. ("Var. ?  $\beta$  *ambigua*.")

*Phyllostegia Menziesii* A. Gray, Amer. Acad., Proc., vol. 5, p. 343, 1862. (Nom cum dubitatione et non firme editum.)

*Phyllostegia ambigua* (A. Gray) Hillebrand, Fl. Haw. Is., p. 350, 1888.

Branches glabrous. Leaves glabrous above, sparsely hispid to glabrate beneath, rounded to subtruncate at base. Whorls 10-12-flowered, pedicels glabrous or nearly so. Calyx glabrous, eglandular, 8-9 mm long, the lobes broad and rounded-obtuse, 0.25 to 0.35 the length of the tube. Corolla externally glabrate to sparsely hispid, the tube  $\pm$  2 cm long, the lower lip not greatly expanded,  $\pm$  1 cm long.

Type: collected by the U. S. Exploring Expedition, west Maui, 1840 (U. S.).

Specimens examined: U. S. Exploring Expedition, west Maui, 1840 (U. S., type).

On a first examination of the type, Hillebrand's elevation of Gray's variety *ambigua* to specific rank might seem defensible. However, the recent discovery on Hawaii of the variety *heterodoxa*, intermediate in many respects between *P. brevidens* of the same island and variety *ambigua* of western Maui, connects *ambigua* as a variety all too closely with *P. brevidens*.

Distribution: western Maui.

***Phyllostegia brevidens* variety  $\delta$  *longipes* (Hillebrand) Sherff (fig. 5).**

*Phyllostegia brevidens* variety *longipes* (Hillebrand) Sherff, Amer. Jour. Bot., vol. 21, p. 699, 1934.

*Phyllostegia ambigua* variety *longipes* Hillebrand, Fl. Haw. Is., p. 350, 1888.





FIGURE 5.—*Phyllostegia brevidens* variety *longipes* (type).

Leaves sparsely hispid (or glabrate) beneath. Whorls 10-12-flowered, pedicels glabrous, those of lower whorls elongate-filiform and up to 3 cm long. Calyx glabrous, 7-8 mm long, the lobes broadly triangular and 1-2 mm long. Corolla tube weakly hispid, about 1.7 cm long, almost equalled by the greatly expanded lower lip.

Type: collected by J. M. Lydgate, "probably east Maui" (Berlin).

Specimens examined: William Hillebrand and J. M. Lydgate, probably east Maui (Bishop); Lydgate, probably east Maui (type, Berlin); J. F. Rock 8380, Hawaiian islands (Bishop).

The Lydgate sheet of original material (Bishop) bears five sprays which are identical. The Hillebrand sheet (Berlin), from which Hillebrand drew his description, has three sprays. Two are identical with those of the Lydgate sheet, but the third has the pedicels and calyces sparsely long-hispid, also much smaller but perhaps unrepresentative corollas. The pedicels are delicately elongate-filiform, however, and seem to indicate a close affinity with the first two specimens (which Hillebrand relied upon mainly for his description; thus, "Whorls quite glabrous. . .").

Distribution: uncertain.

***Phyllostegia brevidens* variety  $\epsilon$  *pauciflora* Sherff.**

*Phyllostegia brevidens* variety *pauciflora* Sherff, Bot. Gaz., vol. 96, p. 139, 1934.

Stem, branches, and both leaf surfaces pubescent. Whorls 6-flowered, pedicels (more often 1.4-1.8 cm long) and calyces pubescent, calyx lobes lanceolate to triangular-lanceolate, acute.

Type: collected by William Hillebrand, south Haleakala, island of Maui, September 1870 (Berlin).

Specimens examined: Otto Degener 5434, Olinda pipe line trail, east Maui, June 21, 1927 (N. Y.); C. N. Forbes 153-aM, woods near Ukulele, above Olinda, east Maui, July 1910 (Bishop, Field); Forbes 695-M, Ukulele, July 10, 1919 (Bishop); Forbes 1141-M, north slope of Haleakala, east Maui, August 15, 1919 (Bishop); Hillebrand, south Haleakala, east Maui, September 1870 (type, Berlin); G. C. Munro, ridge to Puu Kukui, west Maui, September 24, 1916 (Field); J. F. Rock, Waikamoi trail, east Maui, May 1911 (Bishop); Rock, Haleakala, east Maui, March 1912 (Field); Rock 10331, Honomanu, east Maui, May 1911 (Bishop, forma pedicellis 6-12 mm longis, demum cernuis); Rock 17313 (Bishop).

In the type most of the calyces are 7-8 mm long, but in some of the material examined (e. g., Rock, Waikamoi trail) they reach 12 mm, the lobes becoming elongate and almost or quite equalling the tube. In such material the corolla tube is 1.2-1.5 cm long and exceeded by the much-expanded lower lip.

Distribution: island of Maui.

***Phyllostegia brevidens* variety  $\zeta$  *hirsutula* (Hillebrand) Sherff.**

*Phyllostegia brevidens* variety *hirsutula* (Hillebrand) Sherff, Amer. Jour. Bot., vol. 21, p. 699, 1934.

*Phyllostegia grandiflora* variety *hirsutula* Hillebrand, Fl. Haw. Is., p. 349, 1888.

Hirsute in all parts with scarcely spreading hairs. Whorls 6-flowered, pedicels 7-12 mm long. Calyx about 8-9 mm long. Corolla tube  $\pm 1.3$  cm long, the greatly expanded lower lip  $\pm 2$  cm long.

Type: collected by E. Bishop, no. 76, west Maui (Berlin).

Specimens examined: Bishop 76 (type, Berlin).



FIGURE 6.—*Phyllostegia brevidens* variety *expansa* (type).

The type has the hairs on its raceme's axis distinctly spreading or suberect, as is characteristic of *P. brevidens*, and not retrorsely appressed as in *P. grandiflora*, to a variety of which Hillebrand referred it.

Distribution: western Maui.

***Phyllostegia brevidens* variety  $\eta$  *expansa* Sherff (fig. 6).**

*Phyllostegia brevidens* variety *expansa* Sherff, Bot. Gaz., vol. 96, p. 139, 1934.

Stem and branches sparsely, leaves finally very sparsely pilose. Whorls 6-flowered, the pedicels pubescent, 6-10 mm long. Calyx obconic-cylindric, pubescent, 7-8 mm long, the lobes mostly linear or almost subulate. Corolla externally pubescent, the tube about 1.7 cm long, the lower lip well expanded and about 1.5-1.8 cm long.

Type: collected by William Hillebrand, Puu Kukui, west Maui (Berlin).

Specimens examined: Guppy, altitude 4,000 feet, "Mt. Eke", island of Maui, 1897 (Kew, 2 sheets); A. S. Hitchcock 14745, altitude 4,000-5,000 feet, Puu Kukui, west Maui, September 24-26, 1916 (U. S.); Hillebrand, same locality (type, Berlin).

Instead of Mount Eke (Eke Crater), Guppy may well have meant the Puu Kukui of modern maps. As testified by Lydgate (in Forbes, B. P. Bishop Mus., Occ. Papers, vol. 6, p. 301, 1918) the Mount Eke of Hillebrand's numerous citations was in truth the Puu Kukui of modern maps and not the real Eke Crater. Accordingly, I have throughout the present text rendered Hillebrand's Mount Eke as Puu Kukui.

Distribution: western Maui.

***Phyllostegia brevidens* variety  $\theta$  *pubescens* Sherff (fig. 7).**

*Phyllostegia brevidens* variety *pubescens* Sherff, Bot. Gaz., vol. 96, p. 138, 1934.

Branches sparsely pilose. Lower surfaces of leaves densely pubescent. Whorls 8-14-flowered, the pedicels densely hispid and 7-15 mm long. Calyx densely pubescent, finally 9-12 mm long, its lobes rather broad but more or less acute, 0.2-0.4 the length of the tube. Corolla small, sparsely hispid, the tube about 1 cm long, the lower lip nearly as long.

Type: collected by J. M. Lydgate, upper Kula, east Maui (Berlin).

Specimens examined: Lydgate (type, Berlin).

Distribution: eastern Maui.

**7. *Phyllostegia electra* Forbes.**

*Phyllostegia electra* Forbes, B. P. Bishop Mus., Occ. Papers, vol. 6, p. 180, 1 pl., 1916.

Suberect, stem and branches tetragonal, grooved along center of each face and rounded on the angles, densely short-pubescent with mostly spreading hairs. Leaves undivided, the petiole slender, densely but shortly spreading-hispid, 0.5-3.5 cm long; the blade elliptic-lanceolate, at base widely cuneate to rounded or subtruncate, at apex acuminate, at margin crenulate-serrate, membranaceous, sparsely hispid to nearly glabrate above, shortly subspreading-hispid below at least on veins, 4-9 cm long and 2-4.4 cm

wide. Whorls 4-6-flowered, the inflorescence a simple terminal raceme, or with a pair of lateral racemes from the larger foliaceous bracts below, bracts of whorls ovate to ovate-lanceolate, sessile to short-petioled, decreasing upward in size, mostly exceeded by the pedicels, which are densely spreading-hispid, eglandular, and 4-10 mm long. Calyx subsparingly spreading-hispid, often most abundantly sprinkled with exceedingly minute resinous droplets, 6-7 mm long, the teeth triangular-lanceolate to linear-lanceolate, moderately acute, 1-2 mm long. Corolla white, externally short-pubescent, the narrow tube about 9 mm long, the lower lip about 3 mm long and slightly exceeding the upper.



FIGURE 7.—*Phyllostegia brevidens* variety *pubescens* (type).

Type: collected by C. N. Forbes, no. 143-K, power line trail between Kapaka and Kualapa, island of Kauai, August 6-9, 1909 (Bishop).

Specimens examined: C. N. Forbes, Kauai (Field, Kew); Forbes 143-K (cotype, Missouri).

Distribution: island of Kauai.

**8. *Phyllostegia Stachyoides* A. Gray.**

*Phyllostegia Stachyoides* A. Gray, Amer. Acad., Proc., vol. 5, p. 344, 1862.

Calyx 6-8 mm long, glands not black.....**P. Stachyoides**  
 Calyx about 5 mm long, conspicuously black-dotted with minute,  
 shiny glands.....**variety  $\beta$  Hitchcockii**

Suberect, the branches and inflorescence softly pubescent to somewhat glabrate. Leaves undivided, the petiole spreading-pubescent and 1-4 cm long; the blade lanceolate-ovate to oblong-lanceolate, at base rounded to subcordate, at apex cuspidate to acuminate, at margin crenate or crenate-serrate, membranaceous, pubescent or beneath sometimes almost glabrate, 6-13 cm long and 3-6 (more rarely -8) cm wide. Whorls 10-14-flowered, in axils of lanceolate, spreading or reflexed bracts mostly 5-10 mm long; pedicels with spreading eglandular pubescence and 2-7 mm long. Calyx pubescent or soon glabrate, numerously sprinkled with minute glands, distinctly nerved, 6-8 mm long, its lobes subulate and variously 0.3-0.9 the tube's length. Corolla white with pink tinge on upper lip, externally pubescent, its scarcely curved tube 5-9 mm long, the lower lip  $\pm$  7 mm long and much exceeding the upper.

Type: collected by the U. S. Exploring Expedition, district of Waimea, island of Hawaii, 1840 (U. S.).

Specimens examined: Otto Degener 5370, forest, between ohia and koa mill (opposite road leading to Hoopuloa), island of Hawaii, March 30, 1930 (Field); C. N. Forbes 34-H, Puuwaawaa, island of Hawaii, August 9-14, 1911 (Bishop; Missouri, 2 sheets); Forbes 71-M pro parte, Hanakaoo, west Maui, May 1910 (Bishop; Field, cum *P. bracteata commixta*); Forbes 1030-H, Punaulu, Puu Hualalai, island of Hawaii, July 1, 1915 (Bishop, Missouri); Forbes 2446-M, Wailuku, west Maui, May 21, 1920 (Bishop, Field); William Hillebrand 360, island of Hawaii (Kew); Hillebrand and J. M. Lydgate, South Kona, island of Hawaii (Bishop); Lydgate, same locality (Berlin); Lydgate, Parker's, Waimea, island of Hawaii, December 1872 (Berlin); J. F. Rock, Puuwaawaa, island of Hawaii (Bishop); Rock 3914, near Puuwaawaa, Puu Hualalai, June 18, 1909 (Bishop); Rock 10034, Puu Lehua, island of Hawaii (Bishop); U. S. Exploring Expedition, District of Waimea, island of Hawaii, 1840 (type, U. S.; cotype, Gray).

Distribution: islands of Maui and Hawaii.

***Phyllostegia Stachyoides* variety  $\beta$  *Hitchcockii* Sherff.**

*Phyllostegia stachyoides* variety *Hitchcockii* Sherff, Amer. Jour. Bot., vol. 21, p. 700, 1934.

Leaves appressed-pubescent beneath along the veins, otherwise glabrate but punctulate with very numerous minute black glands. Pedicels suberectly pubescent, often black-punctulate among the hairs with a few glands, about 2-4 mm long. Calyx conspicuously black-punctulate, about 5 mm long.

Type: collected by A. S. Hitchcock, no. 15069, in rain forest, Mr. Conrad's place, Pukoo, Molokai, October 8, 1916 (U. S.).

Specimens examined: Hitchcock 15069 (type, U. S.).

Through this variety, *P. Stachyoides* makes an approach to *P. mollis* variety *glabrescens*. The branching habit of the inflorescence of variety

*Hitchcockii* accords well, however, with that of *P. Stachyoides*. Variety *Hitchcockii* differs from *P. mollis* variety *glabrescens* furthermore, in having smaller calyces, which moreover are densely strewn with the same kind of minute black glands as are on the lower leaf-surfaces.

Distribution: island of Molokai.

#### 9. *Phyllostegia Hillebrandii* H. Mann.

*Phyllostegia Hillebrandii* H. Mann, ex Hillebrand, Fl. Haw. Is., p. 350, 1888.

*Phyllostegia Hillebrandii* H. Mann, Boston Soc. Nat. Hist., Mem., vol. 1, p. 536, 1869 (nomen nudum).

Spreading, 9-15 dm long, the stem tetragonal, glabrous on the rounded angles, glabrate to sparsely hispidulous in the facial grooves, more or less divaricately branching, the slender virgate branches distantly foliose and glabrous. Leaves undivided, the petiole glabrate, 1-3 cm long; the blade lanceolate, at base cuneate, at apex long-acuminate, at margin more or less serrulate. Whorls 6-10-flowered, distant or at times approximate, all in the axils of gradually diminishing leaves, forming a loose foliose raceme 1.5-3 dm long; pedicels glabrous, 5-14 mm long. Calyx at first slenderly obconic, finally subglobose, glabrous, prominently nerved, 4-6 mm long, ampliate and splitting at maturity, the lobes lanceolate, acute to acuminate, usually shorter than the tube. Corolla externally glabrate or sparsely pubescent, the tube 6-8 mm long, the lower lip  $\pm$  6 mm long and much exceeding the upper. Nucules about 3 mm long.

Type: collected by William Hillebrand, in woods of Kula, east Maui, July 1858 (Berlin).

Specimens examined: Hillebrand, Hawaiian islands (U. S.); Hillebrand, Kula, east Maui, July 1858 (type, Berlin); Hillebrand, east Maui, 1864 (Berlin, Gray, Kew); Hillebrand, south Haleakala, east Maui, September 1870 (Berlin); Hillebrand 336, Kula, east Maui (Bishop, Kew); Hillebrand and J. M. Lydgate, Ulupalakua and Kula, east Maui (Bishop); Lydgate, Kula (Berlin).

Distribution: eastern Maui.

#### 10. *Phyllostegia glabra* (Gaudichaud) Benth.

*Phyllostegia glabra* (Gaudichaud) Benth., Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830; Linnaea, vol. 6, p. 79, 1831; Lab., p. 652, 1835.

*Prasium glabrum* Gaudichaud, Voy. Freycinet, Bot., p. 452, pl. 64, 1830.

*Phyllostegia Chamissonis* Benth., Linnaea, vol. 6, p. 79, 1831.

- a. Leaves widely oblong-lanceolate, under 4 cm wide; calyx about 1-1.1 cm long.....variety  $\gamma$  **lanaiensis**
- a. Leaves ovate to oblong-ovate, the principal ones broader than 4 cm; calyx 8 mm or less in length
  - b. Corolla tube 1.4-2.2 cm long; calyx 6-8 mm long.....**P. glabra**
  - b. Corolla tube usually 8-12 mm long; calyx about 4-4.5 mm long.....variety  $\beta$  **Macraei**
- a. Leaves widely oblong-lanceolate, under 4 cm wide; calyx about 1-1.1 cm long.....variety  $\gamma$  **lanaiensis**
- a. Leaves ovate to oblong-ovate, the principal ones broader than 4 cm; calyx 8 mm or less in length
  - b. Corolla tube 1.4-2.2 cm long; calyx 6-8 mm long.....**P. glabra**
  - b. Corolla tube usually 8-12 mm long; calyx about 4-4.5 mm long.....variety  $\beta$  **Macraei**

Suffruticose, much branched, now erect and 9-1.8 m high, now procumbent with stems 3-4.8 m long, glabrous throughout. Leaves undivided, the petiole 2.5-5 cm long; the blade ovate to oblong-ovate, at base widely cuneate to rounded or rarely subcordate, at apex distinctly acuminate, at margin sharply serrate, above somewhat glossy, underneath rather pale, up to 1.4 dm long and to 7.5 cm wide. Floral leaves except bottom one or two pairs bracteiform, ovate, petiolate or subpetiolate, mostly 1-3 cm long but usually rather uniform throughout the raceme, which finally measures 1.5-4.5 dm long. Flowers 3 in each axil, raised on a common peduncle 4-8 mm long and usually exceeded by the slender pedicels, which are subtended by short setaceous bractlets. Calyx obconic, 6-8 mm long, its lobes triangular, acute, and 0.25-0.5 the tube's length. Corolla white, the tube 1.4-2.2 cm long, the lower lip 1-1.8 cm long.

Type: collected by Charles Gaudichaud, Hawaiian islands, 1819 (Paris).

Specimens examined: Admiral, Voyage of the, Hawaiian islands (Leningrad); Captain Beechey, island of Oahu (Delessert, Kew); W. A. Bryan, Puu Konahuanui, Oahu, January 10, 1904 (Bishop); Otto Degener and C. L. Shear 5405, in open rain forest, Pauoa Flats, overlooking Nuuanu Valley, Oahu, February 20, 1928 (Field); O. Degener, K. K. Park, and M. Kwon 5369, wet woods near impassable waterfall, Kaipapau, Oahu, November 8, 1931 (Field); J. F. Eschscholtz, Oahu (Leningrad); Urbain Faurie 903, Punaluu, March 1910 (Delessert); C. N. Forbes, Koolauloa mountains, between Punaluu and Kaipapau, Oahu, November 14-21, 1908 (Bishop, Missouri); Forbes, Punaluu mountains, between Punaluu and Kaipapau, Oahu, same date (Bishop, 2 sheets); D. W. Garber 123, Konahuanui trail above Pauoa Valley, Oahu, January 2, 1920 (Bishop); Gaudichaud, Hawaiian islands, 1819 (type, Paris; cotype, Delessert); Guppy, island of Oahu, 1897 (Kew); H. Hapeman, Nuuanu Valley, Oahu, May 6, 1908 (U. S.); Hapeman 14, near Pali, Oahu, same date (U. S.); A. A. Heller, on or near summit of Puu Konahuanui, Oahu, November 2, 1895 (Field); F. J. F. Meyen, Oahu, 1831 (Berlin); William Hillebrand, Hawaiian islands (Vienna); Hillebrand, Palolo, Oahu, 1868 (Berlin); Hillebrand, Nuuanu, Oahu, December 1870 (Berlin); Hillebrand 356, Hawaiian islands (Kew); Hillebrand and J. M. Lydgate, Kalihi, Oahu (Bishop); Jules Remy 385 pro parte, Oahu, 1851-55 (Paris); J. F. Rock, Punaluu, Oahu, 1908 (Bishop); Rock, Puu Konahuanui, Oahu (Bishop); Rock, Punaluu mountains, Oahu, October 31, 1914 (Bishop); Rock 572, 580, and 581, Punaluu, Koolauloa mountains, Oahu, November 14-21, 1908 (Bishop); Rock 902, same locality, November-December 1908 (Bishop); Harold St. John 10085, flowers white, shrub, altitude 2,200 feet, upper ridge, Punaluu, November 30, 1929 (Bishop); Adelbert von Chamisso, Oahu (Berlin; Kew; Leningrad, type collection of *Phyllostegia Chamissonis* Benth.); Heinrich Wawra 1752 and 2360, Oahu, 1868-71 (Vienna); E. K. Yoshinaga, Puu Konahuanui, Oahu, December 26, 1929 (Bishop).

The single sheet of the type collection extant at Paris has the corollas with tubes about 1.4 cm long, indicating an approach to the variety *Macraei*. The calyces, however, are large and typical of the large-flowered form. Hillebrand, who had had abundant opportunity to study the plants in the field, remarked (Fl. Haw. Is., p. 351, 1888) that the species proper produces its later flowers of smaller size, while in the variety *Macraei* "small flowers seem to be the rule."

Distribution: island of Oahu.

***Phyllostegia glabra* variety  $\beta$  *Macraei* (Benth.) Sherff.**

*Phyllostegia glabra* variety *Macraei* (Benth.) Sherff, Bot. Gaz., vol. 96, p. 136, 1934.



*Phyllostegia Macraei* Bentham, De Candolle, Prodr., vol. 12, p. 554, 1848.

*Phyllostegia glabra* variety  $\beta$  Hillebrand, Fl. Haw. Is., p. 351, 1888.

Flowers smaller and usually more numerous, the calyx about 4-4.5 mm long, the corolla tube usually 8-12 mm long.

Type: collected by James Macrae, island of Oahu, May 1825 (Kew).

Specimens examined: Captain Beechey, island of Oahu (Delessert); H. F. Bergman, altitude 3,500 feet, in moist woods east side of Puu Kaala, Oahu, February 11, 1928 (Bishop); Otto Degener 5378, in open rain forest, east ridge Manoa Valley, Oahu, February 3, 1929 (New York); Degener 5380, in open rain forest, summit of Puukea-Kahuku trail, Oahu, March 31, 1929 (New York); Degener 5403, rainy region, Pauoa Flats, Honolulu, Oahu, February 25, 1928 (New York); Degener 5407, in open rain forest, between east rim Manoa Valley and Mount Olympus, Oahu, February 28, 1928 (New York); Degener and C. L. Shear 5409, partly wooded moist slope, Waipio-Waiawa Ridge, Oahu, March 5, 1928 (Field); J. F. Eschscholtz, Oahu (Leningrad); Urbain Faurie 896, altitude 1,000 meters, Waimea, Kauai, March 1910 (Delessert); Faurie 902, Kalihi, Oahu, October 1909 (British); C. N. Forbes, Koolauloa mountains between Punaluu and Kaipapau, Oahu, November 14-21, 1908 (Bishop); Forbes, Punaluu mountains, Oahu, same date (California); Forbes, Makaha Valley, Oahu, February 12-19, 1909 (Bishop); Forbes 2040-O, ridge north of Waimea Valley, Oahu, February 10-13, 1915 (Bishop, 2 sheets; Missouri); Forbes 2504, Coxe's Camp, upper ditch, Kailua, north slope of Haleakala, Maui, June 14, 1920 (Bishop; caulibus magnis tetragonis utraque facie 1 cm lata); Forbes 2254-M, lateral ridge on right hand side of Olowalu Valley, west Maui, May 7, 1920 (Bishop); Charles Gaudichaud, Hawaiian islands, September-October 1836 (Delessert; Paris; a probable duplicate, ex herb. Kunthii a Gaudichaud ips. anno 1841 missum, Berlin); William Hillebrand, Hawaiian islands (U. S.); Hillebrand, woods, Pumelei, July 1858 (Berlin); Hillebrand and J. M. Lydgate, Kalihi or Puu Konahuanui, Oahu (Bishop); E. P. Hume 45, woods, wet slope, Waianaekua, Puu Kaala, Oahu, November 31, 1930 (Bishop); Mrs. G. E. Kelly 86, Koolau mountains, Oahu, July 1916 (California); Lydgate, Puu Kukui (Berlin); James Macrae, Oahu, May 1825 (Kew, type); Horace Mann and W. T. Brigham 224, west Maui (Bishop, Delessert, Field, Missouri, New York); G. C. Munro, Lanaihale, Lanai, April 11, 1916 (Bishop); Munro 354, same locality, May 6, 1914 (Bishop, 2 sheets); Kazuto Nitta (Otto Degener distribution no.) 5391, altitude 1,500 feet, Kipapa, Oahu, October 13, 1929 (New York); Jules Remy 385, Oahu, 1851-55 (Gray; alibi hic numerus 385 species ipsa est); J. F. Rock, Oahu, August 23, 1908 (Bishop); Rock, Waikamoi trail, east Maui, May 1911 (Bishop); Rock 579, Punaluu, Koolauloa mountains, Oahu, November 14-21, 1908 (Bishop); Rock 1546, Punaluu (Bishop, 2 sheets); Rock 10330, Waikamoi trail, east Maui, May 1911 (Bishop); Rock 17158, Mount Olympus trail, Oahu, September 1917 (Bishop); Carl Skottsberg 199, altitude 350 meters, Kawaiho (Kawaiiki?) ditch trail, Koolau, Oahu, August 15, 1922 (Bishop); Stewart, Oahu (Leningrad); U. S. Exploring Expedition, mountains of west Maui, 1840 (New York, 2 sheets); U. S. Exploring Expedition, islands of Maui and Oahu, 1840 (Kew); Adelbert von Chamisso, Oahu (Berlin, Leningrad).

Distribution: islands of Oahu, Lanai, and Maui. Kauai is given for Faurie 896, but needs confirmation.

*Phyllostegia glabra* variety  $\gamma$  lanaiensis Sherff (fig. 8).

*Phyllostegia glabra* variety lanaiensis Sherff, Bot. Gaz., vol. 96, p. 136, 1934.

Leaves narrower, widely oblong-lanceolate, under 4 cm wide, subobscurely serrate, becoming blackish when dry. Calyx at anthesis obconic (including its sharply subulate lobes, which are up to 7 mm long) about 1-1.1 cm long. Corolla about 1.5-1.7 cm long, its tube slightly or not at all exerted and about 1-1.1 cm long.

Type: collected by Horace Mann and W. T. Brigham 354, Lanai (Field).  
Specimens examined: Ballieu, Hawaiian islands (Paris); Mann and Brigham 354 (type, Field; cotype, Bishop); G. C. Munro, Lanai, June 20, 1914 (U. S.); Munro 349, Kaiholena, Lanai, same date (Bishop).

Distribution: island of Lanai.

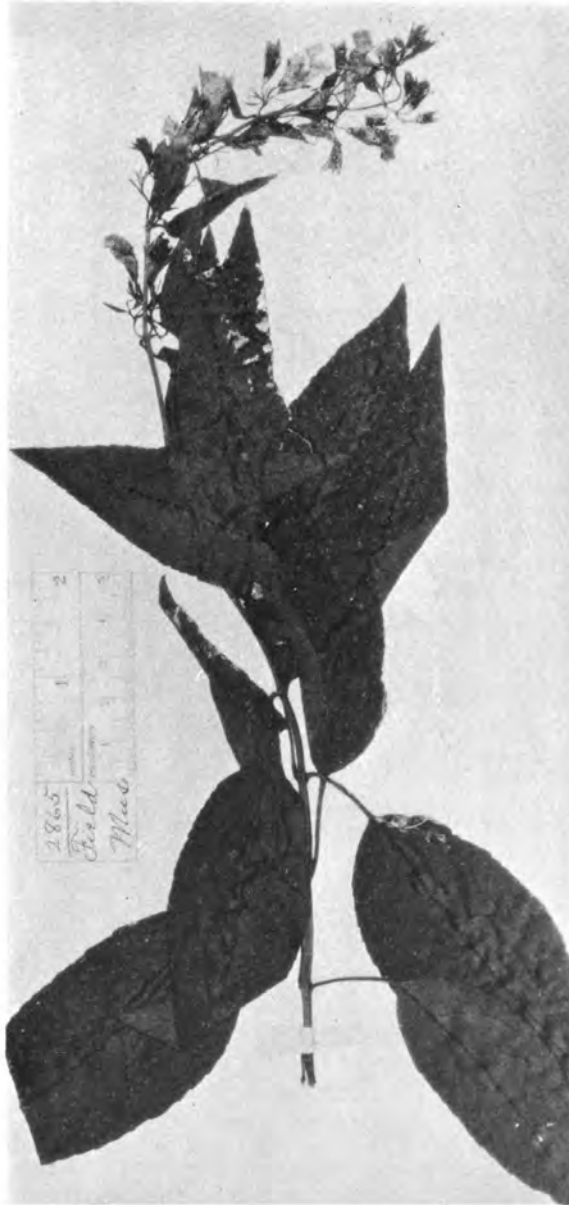


FIGURE 8.—*Phyllostegia glabra* variety *lanaiensis* (type).

11. *Phyllostegia parviflora* (Gaudichaud) Benth.

*Phyllostegia parviflora* (Gaudichaud) Benth., *Linnaea*, vol. 6, p. 79, 1831;

*Lab.*, p. 652, 1835; De Candolle, *Prodr.*, vol. 12, p. 554, 1848.

*Prasium parviflorum* Gaudichaud, *Voy. Freycinet, Bot.*, p. 453, pl. 65, f. 1, 1830.

*Phyllostegia leptostachya* Benth., *Bot. Reg.*, vol. 15, no. 1292, sub Tribo 6, *Prasieae*, 1830 (fide Benth. *ips.*).

*Phyllostegia parviflora* variety *Gaudichaudii* A. Gray, *Amer. Acad., Proc.*, vol. 5, p. 344, 1862.

*Phyllostegia parviflora* variety *Gaudichaudii* A. Gray ex Wawra, *Flora*, no. 55, p. 530, 1872 (sphalm).

*Phyllostegia parviflora* Benth. ex Drake del Castillo, *Illustr. Fl. Ins. Mar. Pacif.*, p. 50, 1886 (sphalm).

- a. Branches of inflorescence with mostly eglandular pubescence; whorls 2-4-flowered.....variety  $\beta$  **honoluluensis**
- a. Branches of inflorescence with glandular pubescence, whorls 6-10-flowered
  - b. Whorls 8-10-flowered.....variety  $\delta$  **glabriuscula**
  - b. Whorls mostly 6-flowered
    - c. Pedicels 11-15 mm long.....variety  $\epsilon$  **major**
    - c. Pedicels 6-11 mm long
      - d. Pubescence of lower leaf surfaces composed of moderately coarse hairs; plant native of Oahu.....**P. parviflora**
      - d. Pubescence of lower leaf surfaces consisting of exceedingly delicate hairs; plant native of Maui.....variety  $\gamma$  **canescens**

Erect, 6-12 dm tall; stem and branches tomentose with more or less antrorse-appressed hairs, tetragonal, sulcate along center of each face and rounded on the angles. Leaves undivided, the tomentose petiole 3-8 cm long; the blade ovate, basally rounded to barely cordate, apically short-acuminate, marginally crenate with rather small and numerous teeth (often 50-70 on each side), membranaceous, densely tomentose or softly appressed-hispid underneath (the veins rather villous), sparsely appressed-hispid to subglabrate above, 8-16 cm long and 5-11 cm wide. Inflorescence a panicle or branching raceme, 1.5-4.5 dm long, the rachises, pedicels, and calyces viscid with spreading, glandular hairs, the floral leaves or bracts small, ovate-lanceolate, mostly 4-9 mm long. Whorls 6-flowered; pedicels spreading or ascending, mostly 6-11 mm long. Calyx small, cup-shaped at maturity, 3-4 mm tall, the lobes linear to lanceolate, acute, often nearly equalling the tube, spreading. Corolla puberulous, white with a purplish tinge, the tube 8-12 mm long, the lower lip spreading and about 6-7 mm long, its lobes obtuse and rounded.

Type: collected by Charles Gaudichaud, Hawaiian islands, 1819 (Paris).

Specimens examined: Admiral, voyage of the, Hawaiian islands (Leningrad): Captain Beechey, Oahu, 1826-27 (Delessert, Kew); H. F. Bergman, wet soil, shaded slope near Keaau Makua, altitude 1,700 feet, Oahu, February 22, 1928 (Bishop); Otto Degener, K. K. Park, and W. Hirai 5362, in open rain forest, Waikane-Schofield trail on Waikane side, Oahu, April 4, 1931 (Field); J. F. Eschscholtz, Oahu (Leningrad, 2 sheets); Urbain Faurie 906, Kilauea, Kauai (Bishop, Delessert); Gaudichaud, Hawaiian islands, 1819 (type, Paris; cotypes Berlin, Delessert); C. N. Forbes 1306-O, Puu Kona-huanui, Oahu, April 16, 1909 (Missouri); Forbes 1643-O, same location, February 14, 1911 (Field); William Hillebrand, Hawaiian islands (Kew); Hillebrand, Oahu (Kew); Hillebrand, Wailupe, Oahu (Berlin); Hillebrand, Niu Valley, Oahu (Berlin); Hille-

brand 358, Nuuanu, Oahu (Gray, Kew); Hillebrand and J. M. Lydgate, Niu, Oahu (Bishop); Lydgate, Oahu (Berlin); Horace Mann and W. T. Brigham, Puu Konahuanui, Oahu (Bishop); Mann and Brigham 554, Oahu (Gray, Missouri); J. F. Rock, Punaluu mountains, Oahu, October 31, 1914 (Bishop, Field); Carl Skottsberg 1842, ridge above Kahana Bay, Koolau, Oahu, September 17, 1926 (Bishop); Nobue Tsuji, on side of trail, rainy area, Kahana, Koolauloa mountains, Oahu, October 16, 1932 (Bishop); U. S. Exploring Expedition, mountains, Oahu, 1840 (U. S.); Adelbert von Chamisso, Oahu (Berlin; Kew, 2 sheets; Leningrad).

Distribution: island of Oahu.

***Phyllostegia parviflora* variety  $\beta$  *honolulensis* (Wawra) Sherff.**

*Phyllostegia parviflora* variety *honolulensis* (Wawra) Sherff, Bot. Gaz., vol. 96, p. 138, 1934.

*Phyllostegia honolulensis* Wawra, Flora, vol. 55, p. 531, 1872; vol. 58, p. 286, 1875.

Canescent throughout. Leaves somewhat smaller and more delicate, obtuse or sub-obtuse at apex. Inflorescence devoid of glands except for the sessile glands of the calyces, its rachis and branches slender and more or less flexuous. Whorls 2- (or perhaps rarely 4-) flowered, disposed in very lax racemes, the pedicels mostly 4-6 mm long.

Type: collected by Heinrich Wawra, no. 1988, in dry, wooded places, Honolulu, Oahu, 1868-71 (Vienna, 3 sheets).

Specimens examined: William Hillebrand 366 (Kew); Horace Mann and W. T. Brigham 757 (Bishop); Wawra 1988 (type, Vienna, 3 sheets; cotype, Leningrad).

Regarded by Hillebrand (Fl. Haw. Is., p. 351, 1888) as a "depauperate form with verticils 4-2-flowered." In the number of distinguishing technical characters, however, it would seem to constitute a very distinct variety and might with some appear to merit specific segregation, particularly so because of its canescent type of pubescence and the eglandular nature of its inflorescence branches.

Distribution: island of Oahu.

***Phyllostegia parviflora* variety  $\gamma$  *canescens* Sherff (fig. 9).**

*Phyllostegia parviflora* variety *canescens* Sherff, Amer. Jour. Bot., vol. 21, p. 700, 1934.

Pubescence finer and shorter. Leaves very thin, the veins less prominent, the hairs on the lower surface exceedingly delicate and mostly confined to the veins. Pedicels 6-9 mm long.

Type: collected by the U. S. Exploring Expedition on mountains of western Maui, 1840 (U. S.).

Specimens examined: U. S. Exploring Expedition, west Maui, 1840 (type, U. S.; cotype, Gray).

The branches and foliage resemble those of variety *honolulensis* in pubescence, but the strongly glandular inflorescence and 6-flowered whorls afford a ready distinction.

Distribution: western Maui.



FIGURE 9.—*Phyllostegia parviflora* variety *canescens* (type).

***Phyllostegia parviflora* variety  $\delta$  *glabriuscula* A. Gray.**

*Phyllostegia parviflora* variety *glabriuscula* A. Gray, Amer. Acad., Proc., vol. 5, p. 344, 1862.

Stem, branches, and leaves subpubescent or glabrate; the leaf blades acuminate, very numerous resinous-dotted underneath. Inflorescence more compact, densely glandular, the whorls 8- or 10-flowered, the pedicels 1-1.7 cm long and equalling or surpassing the internodes of the rachis. Calyx slightly larger and finally more globose, its lobes proportionately shorter.

Type: collected by James Macrae, Mount Kaah (Mauna Kea), island of Hawaii, June 16-18, 1825 (Gray, 2 sheets).

Specimens examined: William Hillebrand 359, Hawaii (Kew); J. M. Lydgate, Hawaii (Berlin); Macrae, Mauna Kea, Hawaii, June 16-18, 1825 (type, Gray, 2 sheets; cotype, Kew, etc.).

Gray's citation, "*P. macrophylla*, Benth., praesertim pl. *Macraei*," might lead some to regard the Kew specimen (from Bentham's private herbarium) as the type. Practically, however, the Gray Herbarium specimens must be taken as the types, since they were the ones studied by Gray, who made the entirely new varietal name *glabriuscula* for them. Fortunately, the specimens are all identical.

The type collection by Macrae had been confused by Bentham (Bot. Reg. 15, no. 1292, sub Tribo 6, Prasieae, 1830; Lab., p. 652, 1835; De Candolle, Prodr., vol. 12, p. 554, 1848) with *Prasium macrophyllum* Gaudichaud, which latter is a quite different plant and is found on a study of the type (Paris) to be the *P. clavata* of Bentham and of various other authors since his day.

Distribution: island of Hawaii.

***Phyllostegia parviflora* variety  $\epsilon$  *major* Sherff.**

*Phyllostegia parviflora* variety *major* Sherff, Amer. Jour. Bot., vol. 21, p. 700, 1934.

Pedicels somewhat more robust, 11-15 mm long, calyces 4-5 mm long.

Type: collected by J. F. Rock, no. 565, Koolauloa mountains, Punaluu, Oahu, November 14-21, 1908 (Bishop).

Specimens examined: H. F. Bergman, in wet soil on shaded slope near Keaau Makua, Oahu, altitude 1,700 feet, November 14-21, 1908 (Bishop); Bergman 1306-O, valley and ridge east of main Konahuanui trail, Oahu, April 16, 1909 (Bishop); J. F. Rock 565 (Bishop, type); Rock 566, Koolauloa mountains, Punaluu, Oahu, November 14-21, 1908 (Field); Rock 17313, Hawaiian islands (Bishop); Nobue Tsuji, Kahana, Koolauloa mountains, Oahu, October 16, 1932 (Bishop).

The plants examined offer an illusory resemblance to *P. brevidens*, but the numerous glands of the inflorescence easily separate them from that species and its varieties.

Distribution: island of Oahu.

**12. *Phyllostegia hirsuta* Benth.**

*Phyllostegia hirsuta* Benth., Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830; Lab., p. 653, 1835; De Candolle, Prodr., vol. 12, p. 555, 1848.

(Published by Bentham with interrogation as to genus, but without interrogation by Asa Gray, Amer. Acad., Proc., vol. 5, p. 344, 1862 and by Hillebrand, Fl. Haw. Is., p. 352, 1888.)

Pediceis 1-5 mm long.....**P. hirsuta**  
 Pedicels 6-9 mm long.....**variety  $\beta$  laxior**

Erect, suffruticose, densely hirsute in all parts with yellowish-white hairs, these more or less appressed on leaf surfaces elsewhere spreading, 3-4 feet high. Leaves ovate, crenate, at base rounded or cordate and often narrowed and somewhat oblique, at apex shortly acuminate, when dry rather thin, on lower surface very minutely and numerous glandulose-punctate, the blade 1-1.5 dm long and 6-12.5 cm wide, the petiole 5-9 cm long. Inflorescence rarely racemose, usually paniculate, finally 1.5-2.5 dm long, consisting of 3-7 suberect elongate racemes up to 2.2 dm long. Whorls of 10-18 or uppermost irregularly of 3-8 flowers; pedicels 1-5 mm long. Calyx finally obconic-cupshaped and numerous and sharply ribbed, hairy, shortly and obtusely dentate, very minutely punctate with greenish or whitish glands, about 3 mm long. Corolla white, with a pink tinge, hairy, the tube 6-10 mm long, the lower lip 1.2-3 times as long as the upper. Stigmatic branches both truncate.

Type: collected by James Macrae, island of Oahu, May 1825 (Kew).

Specimens examined: Professor Alexander, Manoa, Oahu, April 1860 (Berlin); anonymous, Hawaiian islands (Kew); Otto Degener 5379, open rain forest, summit of Pupukea-Kahuku trail, Oahu, March 31, 1929 (Field); Degener, K. K. Park, and W. Hirai (Degener distribution no.) 5361, open rain forest, Waikane-Schofield trail on Waikane side, Oahu, April 4, 1931 (Field); Urbain Faurie 912, Punaluu, Oahu, May 1910 (Delessert); C. N. Forbes, Makaha Valley, Oahu, February 12-19, 1909 (Bishop); Forbes 1791-O, slopes of Puu Kaala, Oahu, April 26 to May 16, 1912 (Bishop, Missouri); D. W. Garber 291, Palolo-Olympus trail, Oahu, March 7, 1920 (Bishop); William Hillebrand, Oahu (Berlin, U. S.); Hillebrand, northern side of Puu Kaala, Oahu, March (Berlin); Hillebrand, Manoa and Puu Kaala, Oahu (Gray, Kew); Hillebrand, Palolo, Oahu (Berlin); Hillebrand 357, Manoa, Oahu (Kew); Hillebrand and J. M. Lydgate, Nuanu, Oahu (Bishop); E. Y. Hosaka 204, altitude 1,000 feet, Waikakalua Gulch, Waipio, Oahu, April 6, 1930 (Bishop); Macrae, Oahu, May 1825 (type, Kew; cotype, Gray); Alfred Meebold, altitude 1,500 feet, foot of ascent, Puu Kaala, Oahu, February 1930 (Bishop); Meebold, altitude 2,500 feet, Punaluu, Oahu, May 1932 (Bishop); Thomas Nuttall, Oahu (British); Jules Remy 390, Oahu, 1851-55 (Paris); J. F. Rock, Palolo, Oahu (Bishop); Rock, Waiahole Valley, Oahu, December 1919 (Bishop); Rock 513, Punaluu, Koolauloa mountains, Oahu, December 24-29, 1908 (Bishop); Amy Suehiro, Pupukea trail, Oahu, March 6, 1932 (Bishop); Heinrich Wawra 2060-b, Oahu, 1868-71 (Vienna, 3 sheets; Leningrad).

Distribution: island of Oahu.

**Phyllostegia hirsuta** variety  $\beta$  **laxior** Degener and Sherff (fig. 10).

*Phyllostegia hirsuta* variety *laxior* Degener and Sherff, ex Degener, Fl. Haw. Is., October 12, 1934.

Whorls more loosely flowered, the pedicels becoming 6-9 mm long.

Type: collected by Otto Degener, K. K. Park, D. L. Topping, and William Bush (O. Degener distribution no.) 5363, in open rain forest, at summit of pig god trail, Hauula, Oahu, May 31, 1931 (Field).

Specimens examined: Otto Degener 5382, in open woods near summit, Pupukea-Kahuku trail, Oahu, March 31, 1929 (Field); Degener and others 5363 (type, Field).

Distribution: northern Oahu.



FIGURE 10.—*Phyllostegia hirsuta* variety *laxior* (type).



### 13. *Phyllostegia mollis* Benth.

*Phyllostegia mollis* Benth., *Linnaea*, vol. 6, p. 79, 1831; *Lab.*, p. 652, 1835; De Candolle, *Prodr.*, vol. 12, p. 554, 1848.

*Phyllostegia parviflora* variety *mollis* (Benth.) A. Gray, *Amer. Acad. Proc.*, vol. 5, p. 344, 1862.

- a. Calyx about 2 mm long.....variety  $\delta$  *micrantha*
- a. Calyx 3-6 mm long
  - b. Pedicels beset by at least some glandular hairs; calyx 5-6 mm long; native of Oahu .....variety  $\beta$  *Lydgatei*
  - b. Pedicels clothed with eglandular pubescence
    - c. Stem and branches robust, lower surface of leaves glabrate except along the veins, very numerous and minutely punctulate with tiny black glands.....variety  $\gamma$  *glabrescens*
    - c. Stem and branches slender or delicate; lower surface of leaves softly canescent, eglandular or if slightly glandular the glands not black.....***P. mollis***

Suberect, 3-9 dm high, the herbaceous branches loosely foliose and more or less tomentose with short and soft grayish pubescence. Leaves flaccid, undivided, the petiole densely spreading-pubescent, 2-5 cm long; the blade ovate, at base more or less cordate, at apex mostly subacute to shortly acuminate, at margin crenate-serrate, in the typical form finely canescent on both surfaces but paler beneath, in some forms (for example, some plants of Molokai and east Maui) becoming rugose-veiny and sometimes less pubescent especially above, from sparsely to densely glandular-punctate beneath, 4-14 cm long and 2.5-6.5 cm wide. Inflorescence a loose terminal raceme with often one or two pairs of shorter racemes from axils of uppermost leaves, the principal raceme commonly 1-2 dm long, the 6- or 8- or even variously 2-10-flowered whorls subtended with ovate-lanceolate bracts 2-6 mm long; pedicels spreading-hispidulous with eglandular hairs, 1-4 mm long. Calyx puberulous, 3-4 mm long, the numerous nerves subobscure to manifest, the triangular to oblong-linear lobes apically acute or subacute and 0.5-2 mm long. Corolla pinkish-white, externally puberulous, the slightly curved tube 4-10 mm long, the expanded lower lip 4-7 mm long and much exceeding the upper.

Type: collected by Adelbert von Chamisso, Oahu (Leningrad).

Specimens examined: H. F. Bergman, Puu Kaala, island of Oahu, February 11, 1928 (Bishop, Field); Otto Degener 5395, valley west of east Ohia, island of Molokai, July 16, 1928 (Field); Degener 5400, Puu Kaala, Oahu, February 11, 1928 (Field); Urbain Faurie 913, Waialua, Oahu, November 1909 (British); C. N. Forbes 102-Mo, Poholua, Molokai, June 1912 (Bishop); Forbes 170-L, Maunalei Valley, island of Lanai, June 1913 (Bishop, forma inflorescentia ramosiora, verticillastris confertis); William Hillebrand, Hawaiian islands (Vienna); Hillebrand, same locality (Leningrad, forma lobis calycinis angustioribus elongatoribusque); Hillebrand, Maui and Molokai, 1870 (Gray, Kew); Hillebrand, Molokai, June 18, 1870 (Berlin); Hillebrand 361, east Maui, July 1858 (Gray; Kew; forma lobis calycinis angustioribus elongatoribusque); Hillebrand and J. M. Lydgate, Makawao, Maui (Bishop); Lydgate 68, Kula and Hamakua, east Maui (Berlin; forma lobis calycinis angustioribus elongatoribusque); Horace Mann and W. T. Brigham 404, Ulupalakua, east Maui (Bishop; Delessert; Field, 2 sheets; Gray; Missouri; New York; U. S.); Mann and Brigham 405, ridge or mountains above Kamalaea (Maalaea?) Bay, west Maui (Bishop, Gray, Kew, Missouri, U. S.); Mann and Brigham 553, Kaala mountains, Oahu (Bishop, U. S.); Archibald Menzies, Hawaiian islands, 1792-94 (British); J. F. Rock, Maui (Bishop, Field); Rock, Ukulele, east Maui, March, 1912 (Bishop, Field); Rock 6115, Hawaiian islands (Field); Rock 6119, Kamoku camp, Molokai, March 20, 1912 (Bishop, Field); Rock 6127, Hawaiian islands (Bishop, Field); Rock 7023, above Kamalo near Pelekunu, Molokai, April 1910 (Bishop); Rock 10325, Auwahi, south side of Haleakala, east Maui, March 1912 (Bishop; forma lobis calycinis

angustioribus elongatioribusque); Rock 10333, Ukulele, east Maui, March 1912 (Bishop; forma lobis calycinis angustioribus elongatioribusque); U. S. Exploring Expedition, west Maui, 1840 (U. S.); U. S. Exploring Expedition, east Maui, 1840 (Gray); U. S. Exploring Expedition, Kaala (Waianae) mountains, Oahu, 1840 (Gray, Kew, U. S.); Von Chamisso, Oahu (Leningrad, type); Dr. Heinrich Wawra 1874, dry ravines at foot of Haleakala, east Maui, 1868-71 (Vienna, 2 type sheets of *Phyllostegia haliakalae* Wawra); Wawra 1915, Kauai, same date (Vienna, 2 sheets, una inflorescentia pluriramosa; Leningrad); Wawra 2289, Oahu, same date (Vienna); Wawra 2310, Kauai, same date (Vienna).

Bentham relied somewhat reluctantly in his monographs on the Labiatae (Lab., p. 653, 1835; De Candolle, Prodr., vol. 12, p. 554, 1848), upon his "notes and sketch made at Berlin, in 1830" from a specimen in Von Chamisso's private herbarium. He had described the calyx lobes as obtuse, but the type specimen itself (Leningrad) has the lobes of those calyces which are at full anthesis broadly to narrowly triangular and tending to come to a point at the top. Some lobes are fairly acute. In other specimens examined, the lobes are mostly narrowly triangular and apically acute. In many plants from eastern Maui the lobes are so narrowly linear and so sharply pointed that they would seem at first to connote a distinct variety. Asa Gray labeled a herbarium specimen of such a plant in his own herbarium (Gray), namely Hillebrand 361, as *P. stachyoides*. To that species it does indeed make a close approach. However, he is quoted on a sheet of duplicate material in Hooker's herbarium (Kew) as having written, "*Phyllostegia mollis* Bth.? or *Ph. stachyoides* Gray. It has Bentham's *P. mollis* short pedicels and long calyx teeth." Hillebrand had opportunity to make many observations in the field and finally came to include the plants with especially slender and elongate calyx lobes in *P. mollis*, a course here followed. The shape of the lobes displays so much inconstancy, however, and the variations in shape correlate so capriciously with variations in the thickness and rugosity of the leaves, with size and pubescence of the calyx as a whole, and with the number of flowers in a whorl, that it appears useless to attempt to distinguish a separate variety.

Distribution: islands of Kauai, Oahu, Molokai, Maui, and Lanai.

***Phyllostegia mollis* variety  $\beta$  *Lydgatei* Sherff (fig. 11).**

*Phyllostegia mollis* variety *Lydgatei* Sherff, Amer. Jour. Bot., vol. 21, p. 700, 1934.

Branches of inflorescence elongate and their internodes often 2-4 cm long, the whorls commonly 6-flowered, pedicels spreading-hispid (often some hairs glandular) and 4-7 mm long. Calyx larger, numerous and subdistinctly nerved, shortly hispidulous, very minutely glandular, sharply and slenderly lobed, 5-6 mm long; tube of corolla about 8-9 mm long.

Type: collected by J. M. Lydgate, Waianae mountains, island of Oahu, 1869 (Berlin).

Specimens examined: William Hillebrand, Oahu (U. S.); Lydgate, Waianae mountains, Oahu, 1869 (Berlin, type); Lydgate, Makaleha, Oahu (Berlin).

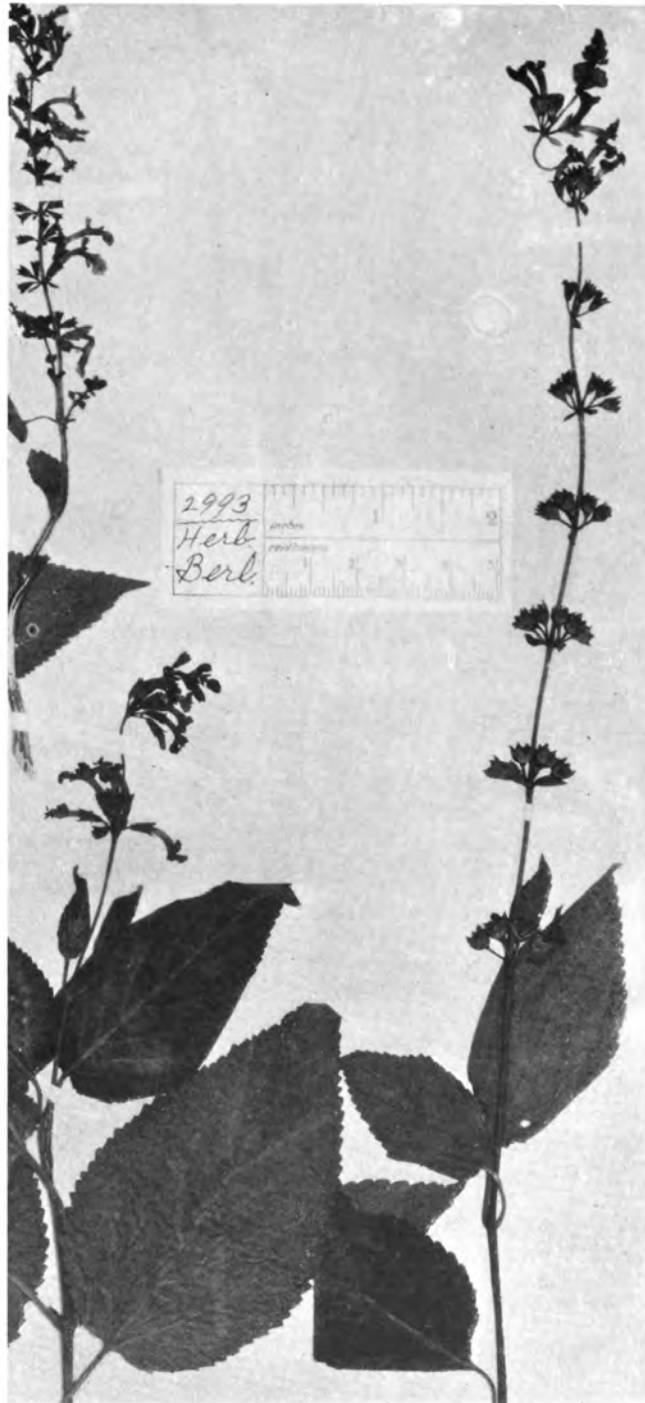


FIGURE 11.—*Phyllostegia mollis* variety *Lydgatei* (type).

*Phyllostegia mollis* variety *Lydgatei* and variety *glabrescens* have calyx lobes suggestive of *P. Stachyoides*, but the general habit of the inflorescence is distinctly that of *P. mollis*.

Distribution: island of Oahu.

***Phyllostegia mollis* variety  $\gamma$  *glabrescens* Degener and Sherff.**

*Phyllostegia mollis* variety *glabrescens* Degener and Sherff, ex Degener, Fl. Haw. Is., September 13, 1935.

Stem and branches robust, erectly and very minutely appressed-hispidulous. Leaves very thin, above sparsely and very minutely appressed-hispidulous not truly glabrous, below very minutely appressed-hispidulous along the veins elsewhere punctulate with black very numerous glands. Whorls large, commonly 8-flowered; pedicels densely and suberectly hispid with glandular hairs, 4-7 mm long. Calyx manifestly nerved, hispidulous, more or less black-punctulate with very small glands, about 5 mm long, the linear-subulate lobes commonly under 2 mm long; corolla white.

Type: collected by Otto Degener, no. 5413, in open rain forest, west of Pepeopae, island of Molokai, April 12, 1928 (Field).

Specimens examined: Otto Degener 5394, east arm of Kaluaaha Valley, Molokai, July 12, 1928 (Field, forma vix typica); Degener 5411, along pipe line in partly sunny rain forest, between head of Waikolu Valley and northern base of Puu Alii, Molokai, April 10, 1928 (Field); Degener 5413 (Field, type); Degener 5415, in open rain forest, near Puu o Wahaula, Molokai, April 17, 1928 (Field); Degener 5419, in open rain forest, at end of Hanalioliio pipe line, Molokai, April 24, 1928 (Field).

Connected as a variety with *P. mollis* very definitely, by means of the variety *Lydgatei*.

Distribution: island of Molokai.

***Phyllostegia mollis* variety  $\delta$  *micrantha* Sherff.**

*Phyllostegia mollis* variety *micrantha* Sherff, Amer. Jour. Bot., vol. 21, p. 700, 1934.

Inflorescence more numerously branched, the branches short ( $\pm 5$  cm), the whorls grouped densely together; pedicels under 1 mm long. Calyx about 2 mm long, its lobes triangular, acute, and short; corolla minute, its tube 3-5 mm long.

Type: collected by C. N. Forbes, no. 170-L, Maunalei Valley, Lanai, June 1913 (Bishop).

Specimen examined: Forbes 170-L (Bishop, type).

Distribution: island of Lanai.

**14. *Phyllostegia Helleri* Sherff (fig. 12).**

*Phyllostegia Helleri* Sherff, Bot. Gaz., vol. 96, p. 138, 1934.

Stem and branches subsparingly spreading-hispid; leaves mostly cordate at base, sparsely to subsparingly appressed-hispid underneath; corolla about 1.2-1.4 cm long; fruiting whorls about 1.5-1.8 cm across..... **P. Helleri**

Stem and branches finely and closely pubescent; leaves mostly rounded to truncate at base; softly pubescent underneath; corolla about 0.8 cm long; fruiting whorls about 1 cm across..... variety  $\beta$  *imminuta*



FIGURE 12.—*Phyllostegia Helli* (type).

Perhaps erect. Stem and branches tetragonal with angles rounded, subsparingly spreading-hispid. Leaves undivided, the petiole pilose and 2.5-4 cm long; the blade thinish, ovate to ovate-cordate, at base truncate or cordate, at apex acuminate, at margin crenate-serrate, on both surfaces sparsely to subsparingly hispid with appressed white hairs, underneath often minutely glandular, 8-10.5 cm long and 4-6.5 cm wide. Whorls 6-flowered, in fruit about 1.5-1.8 cm across; racemes simple but commonly numerous and approximate, the inflorescence thus appearing paniculate; the pedicels spreading-pubescent with eglandular hairs, 2-4.5 mm long; the bracts ovate, 3-4 mm long. Calyx glandular-pubescent, at anthesis obconic-campanulate, 4-5 mm long, the lobes subacute and about 1 mm long; in fruit globose-obconic, usually more than 3.5 mm long, subequal to the pedicels. Corolla white, pubescent, about 1.2-1.4 cm long, its tube about 6-7 mm long. Stamens and style not or scarcely exerted. Nucules triangular in cross-section, somewhat alate, about 2 mm long.

Type: collected by A. A. Heller, no. 2875, in Kaholuamanu, above Waimea, island of Kauai, October 12, 1895 (U. S.).

Specimens examined: C. N. Forbes 386-K, Kaholuamanu, behind Waimea, Kauai, September 1909 (Bishop, Missouri); Forbes 441-K, same date and locality (Bishop, Missouri); Heller 2875 (type, U. S.; cotypes, Field, Missouri, New York); A. S. Hitchcock 15367, altitude 3,600 feet, Kaholuamanu, October 20, 1916 (U. S.); J. M. Lydgate 15, Olokele, Kauai (Bishop); J. F. Rock, Kauai, October 1916 (Bishop); Rock 2096, Kaholuamanu, Kauai, March 3-10, 1909 (Bishop, Field; forma nonnullis foliis angustioribus etiam oblongo-lanceolatis); Rock 5274, 5277, 5278, Kauai (Bishop); Rock 9002 (Bishop, Field).

I have omitted here a specimen kindly lent me by Dr. B. P. G. Hochreutiner, his no. 3579, from near Gay Cottage, Waimea, Kauai, April 20, 1905; common name, *nehe kuhevi* (Delessert). In its glandular-pubescent pedicels and slightly different general habit there is a suggestion of hybridity with some other species or of varietal distinctness.

Distribution: island of Kauai.

#### ***Phyllostegia Helleri* variety $\beta$ *imminuta* Sherff.**

*Phyllostegia Helleri* variety *imminuta* Sherff, Amer. Jour. Bot., vol. 21, p. 699, 1934.

Stem and branches finely and closely pubescent. Leaves basally rounded to truncate, rarely subcordate, sparsely hispid on upper surface with very short hairs, underneath softly pubescent and very minutely more or less glandular. Whorls smaller, in fruit  $\pm$  1 cm across. Calyx somewhat smaller, in fruit usually under 3 mm long.

Type: collected by Mrs. C. N. Forbes, Kaiholena, island of Lanai, March 17, 1916 (Bishop).

Specimens examined: C. N. Forbes 21-L, Kaiholena Valley, Lanai, June 1912 (Bishop, Field); Forbes 63-L, mountains near Koele, Lanai, June 1913 (Bishop); Mrs. C. N. Forbes, Kaiholena, Lanai, March 17, 1916 (type, Bishop); G. C. Munro, same date and locality (Field); Munro 96, same locality, September 16, 1913 (Bishop); Munro 99, same date and locality (Bishop); Munro 490, Lanai (Bishop, Field); Munro 680, Kalulu, Lanai, April 2, 1919 (Bishop, Field).

In habit, variety *imminuta* seems closer to *P. mollis*, but the fruiting calyx betrays at once a strong affinity with *P. Helleri*.

Distribution: island of Lanai.

15. *Phyllostegia Lantanoides* Sherff (fig. 13).

*Phyllostegia Lantanoides* Sherff, Bot. Gaz., vol. 96, p. 137, 1934.

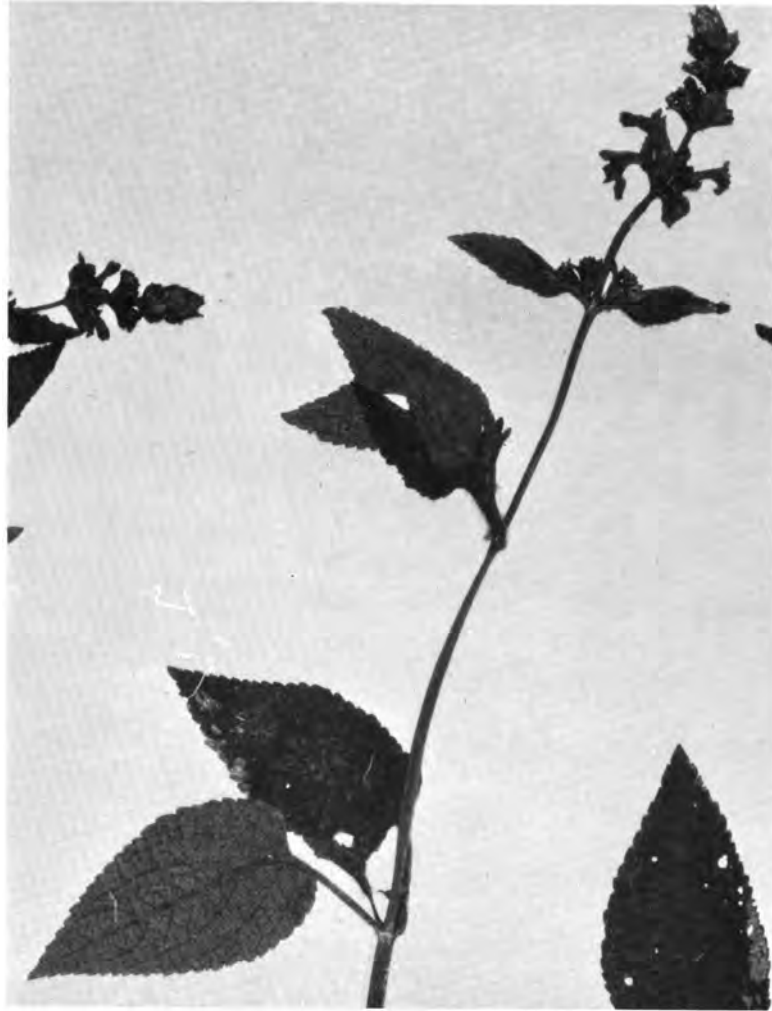


FIGURE 13.—*Phyllostegia lantanoides* (type).

Suffrutescent,  $\pm 4$  dm high, on the stem and branches most minutely glandular and at the nodes conspicuously and retrorsely glistening-setose, elsewhere either very shortly pubescent or glabrate. Leaves undivided, the petiole conspicuously glistening-ciliate and 1-2.8 cm long; the blade membranaceous, oblong-ovate, at base truncate or subcordate, at apex acute or scarcely acuminate, at margin crenate-serrate, on both surfaces most minutely and abundantly resinous-glandular, appressed-hispidulous above, not hispidulous below unless upon the veins, 3-6.5 cm long and 1.7-3 cm wide, sometimes rugose. Inflorescence unbranched, spicate-racemose, the whorls few (about 4-6), 4-6-flowered; lowermost bracts foliaceous and  $\pm 2.5$  cm long, the others gradually smaller, ovate, subsessile,

white-ciliate toward the base. Calyx obconic,  $\pm 4.5$  mm long, resinous-glandular, very minutely pubescent, subacutely dentate; the pedicel  $\pm 1.5$  mm long. Corolla white or pink, externally glandular-pubescent, about 1-1.4 cm long, the upper lip about 0.5-0.65 shorter than the lower, the filaments pubescent; nucules triangulate in cross-section, obovate, at apex subtruncate, about 2-2.3 mm long.

Type: collected by Horace Mann and W. T. Brigham, Kaala mountains, Oahu (Cornell).

Specimens examined: anonymous, Hawaiian islands (Kew); Otto Degener, K. K. Park, and W. Hirai 5354, in open rain forest, Waikane-Schofield trail, island of Oahu (Field); Degener, Park, D. L. Topping, and William Bush 5364, in open rain forest, summit of pig-god trail, Hauula, Oahu, May 31, 1931 (Field); Degener, Henry Wiebke, and Eichi Masunaga 5459, rain forest, between Pauoa Flats and summit of Puu Konahuanui, Oahu, April 2, 1926 (Field, New York); Urbain Faurie 907, Punaluu, Oahu, May 1909 (Delessert); C. N. Forbes, Makaha Valley, Oahu, February 12-19, 1909 (Bishop); Forbes 2188-O, summit of Puu Konahuanui, Oahu, March 12, 1915 (Bishop, Missouri); Forbes and C. M. Cooke, Jr., Koolauloa mountains, between Punaluu and Kaipapau, Oahu, May 3-8, 1909 (Bishop); Forbes and J. F. Rock, same locality, November 14-21, 1908 (Bishop); D. W. Garber 315, main peak of Puu Konahuanui, Oahu, March 14, 1920 (Bishop, 2 sheets); Mann and Brigham, Kaala, Waianae mountains, Oahu (type, Cornell); J. F. Rock 346, 361, Punaluu, Koolauloa mountains, Oahu, December 3-14, 1908 (Bishop); Rock 14131, Palolo-Manoa Valleys, Oahu, September 1917 (Bishop); Harold St. John 10158, flowers white with purplish tinge, trailing in wet opening, altitude 2,200 feet, Waikane-Schofield trail, Kahana, Oahu, January 19, 1930 (Bishop, Field); D. L. Topping 3061, Wahiawa-Waikane trail, Oahu, March 8, 1925 (New York).

The type is the "specimen of Mann and Brigham from Kaala, Oahu! without number," which Hillebrand (Fl. Haw Is., p. 353, 1888) treated as seeming to belong to *P. Waimeae*.

Distribution: island of Oahu.

#### 16. *Phyllostegia bracteata* Sherff (fig. 14).

*Phyllostegia bracteata* Sherff, Bot. Gaz., vol. 96, p. 137, 1934.

Subherbaceous, scandent, in all parts softly pubescent, the hairs of the stem and branches commonly retrorse. Leaves undivided, the petiole slender and 2-4 cm long; the blade membranous, ovate, at the base truncate or subcordate, at the apex subacute, at the margin crenate, on both surfaces resinous-glandular, up to 5.5 cm long and to 3.8 cm wide. Inflorescence unbranched, elongate, racemose-spicate, 1.5-2.2 cm long; the whorls more often 8-12, remote, commonly 6-flowered; the lowermost bracts foliaceous and less than 3 cm long, the others round-ovate and stipitate, surpassing the calyces. Calyx shortly pedicellate with a pedicel under 2 mm long, obconic or finally hemispherical, about 3.5 mm long, resinous-glandular among the hairs, acutely dentate with teeth under 1 mm long. Corolla small, about 9 mm long, externally pubescent, the lower lip slightly the longer; filaments almost glabrate; nucules obovate, plano-convex, alate, black, 1.7-2.4 mm long.

Type: collected by A. S. Hitchcock, no. 14746, vine in upper forest, altitude 4,000-5,000 feet. Puu Kukui, western Maui, September 24-26, 1916 (U. S.).

Specimens examined: Otto Degener 5428, in rain forest, along Olinda pipe line trail, Maui, June 17, 1927 (Field, New York); Degener 5435, same locality, June 21, 1927 (New York); Degener 5438, Maui, June 30, 1927 (New York); C. N. Forbes 71-M pro parte, Hanakaoo, west Maui, May 1910 (Field; cum *P. stachyoidi* commixtum); Forbes 153-bM, woods near Ukulele, above Olinda, east Maui, July 1910 (Bishop); Forbes 694-M, Ukulele, July 10, 1919 (Bishop); Forbes 938-M, same locality, July 25, 1919



(Bishop); Forbes 995-M, Keanae (Koolau) Gap, Haleakala, east Maui, August 2, 1919 (Bishop); Forbes 1073-M, same locality, August 7, 1919 (Bishop, Field); Forbes 1261-M, Kula pipe line, Waikamoi, east Maui, September 5-6, 1919 (Bishop); A. S. Hitchcock 14744, altitude 4,000-5,000 feet, Puu Kukui, west Maui, September 24-26, 1916 (U. S.); Hitchcock 14746 (type, U. S.); Horace Mann and W. T. Brigham 405, west Maui (Bishop); Mann and Brigham 415, mountain of west Maui, above Kamalaea (Maalaea?) Bay (Bishop, Gray, Missouri); George C. Munro 428, lower slope, forest bog, Puu Kukui, west Maui, September 24, 1916 (Bishop); Munro 599, ridge to Puu Kukui, west Maui, same date (Bishop); J. F. Rock 8181, west Maui, August 1910 (Bishop); Rock 8537, east Maui (Bishop); Rock 10333, Ukulele, east Maui, March 1912 (Bishop); Rock 17146, Puu Nianiau, Maui, August 1918 (Bishop); Skottsberg 864, Kula pipe line trail, vicinity of Olinda, east Maui, October 18, 1922 (Bishop).

Distribution: island of Maui.



FIGURE 14.—*Phyllostegia bracteata* (type).

#### 17. *Phyllostegia waimeae* Wawra.

*Phyllostegia waimeae* Wawra, Flora, vol. 55, p. 531, 1872.

Suffruticose, 1.2-1.5 meters high, stem and scandent herbaceous branches rounded on the angles, sulcate along center of each face, retrorsely to subspreading-retrorsely pubescent even to top of inflorescence. Leaves undivided, the petiole densely retrorse-hispid, 1.5-4 cm long; the blade membranaceous (at least when dried), ovate-cordate, at apex acute to acuminate, finely or at times subcoarsely crenate, more or less glandular, appressed-hispidulous above, hispid underneath especially along the veins, 4-7 cm long

and 3-4 cm wide. Whorls 6-flowered (the flowers sweet-scented), interruptedly disposed in racemes mostly 1-2 dm long and always simple (but in much-branched specimens approximate), usually hidden (except for the corollas) by bracts which are broadly deltoid or ovate, often broader than high, sessile, apically often acute; pedicels spreading-hispid, 0.5-2 mm long. Calyx hispid, glandular, now weakly now distinctly nerved, 4-6 (rarely -7.5) mm long, the acute teeth 0.2-0.35 the length of the tube. Corolla externally hispidulous, pink to pale pinkish or rarely white, the tube slightly curved and 8-10 mm long, the lower lip 6-8 mm long and much exceeding the upper; style-branches subequal and truncate or subtruncate.

Type: collected by Heinrich Wawra, no. 2115, Halemanu, Waimea district, island of Kauai, 1868-71 (Vienna, 3 sheets).

Specimens examined: C. N. Forbes 803-K, 832-K, 862-K, west side of Waimea drainage basin, Kauai, July 3 to August 18, 1917 (Bishop); A. A. Heller 2860, on Kaholuamanu, above Waimea, Kauai, September 24-30, 1895 (Field); Heller (similiter) 2860, same locality, October 1-8, 1895 (Gray, Kew, Missouri, New York, Paris, Leningrad, U. S.); A. S. Hitchcock 15334, altitude 3,600 feet, same locality, October 20, 1916 (Bishop, U. S.); B. P. G. Hochreutiner 3595, altitude about 1,400 meters, Kaaha, Waimea, Kauai, April 21, 1905 (Delessert); Valdemar Knudsen, Halemanu, Kauai (Berlin); Horace Mann and W. T. Brigham 555, altitude 2,000-3,000 feet, Waimea, Kauai (Bishop, Gray, Missouri); J. F. Rock 2091, 2092, Halemanu, Kauai, February 14-26, 1909 (Bishop); Rock 2098, Kaholuamanu, Kauai, March 3-10, 1909 (Bishop); Rock 17318 (Bishop); Carl Skottsberg 930, forest between Kokee and Kilohana, Waimea, Kauai, October 27, 1922 (Bishop); Skottsberg 1018, forest near Kokee-Kawaiiki, Waimea, Kauai, October 29, 1922 (Bishop, forma *floris albis*); Heinrich Wawra 2115 (Vienna, 3 type sheets).

Distribution: island of Kauai.

**18. *Phyllostegia racemosa* Benth.**

*Phyllostegia racemosa* Benth., Bot. Reg., vol. 15, no. 1292, sub Tribo 6. Prasieae, 1830; Lab., p. 653, 1835; De Candolle, Prodr., vol. 12, p. 554, 1848.

Leaf blades 2-5.5 cm long; whorls mostly 10-12-flowered, at fruiting about 1.5 cm in diameter; calyx 3-5 mm long.....**P. racemosa**  
 Leaf blades 1.5-3 (rare -4.3) cm long; whorls 4-6-flowered, at fruiting about 1 cm in diameter; calyx 2-3 mm long.....variety  $\beta$  **Bryanii**

Suffruticose, diffusely branching, scandent; branches and especially the flat-faced stem distinctly tetragonal, short-tomentose. Leaves undivided, the slender tomentose petiole 1-2.5 cm long; the blade ovate-lanceolate to subnarrowly ovate-oblong, at base subcordate to sometimes cordate, at apex obtuse to subrounded, at margin coarsely or subcoarsely crenate, above moderately subappressed-hispid, below tomentose, on both surfaces minutely more or less glandular, 2-5.5 cm long and 1-2.5 cm wide. Whorls in a slender unbranched terminal raceme 8-15 cm long (but in closely branching plants the racemes approximate), mostly 10-12-flowered, their subtending leaves petiolate and often gradually decreasing in size; at fruiting about 1.5 cm in diameter; pedicels tomentose, only about 1-3 mm long. Calyx tomentose and glandular, 3-5 mm long, the nerves usually subobscure, the lobes apically subacute to obtuse or subrotund, finally often ampliate and becoming 0.5-0.8 the length of the tube. Corolla externally pubescent, the tube 5-6 mm long, the lower, glandular-punctulate lip 2-4 mm long and usually exceeding the upper.

Type: collected by James Macrae, Mauna Kea (Mount Kaah), island of Hawaii, June 1825 (Kew).

Specimens examined: Urbain Faurie 905, Mauna Kea, Hawaii, July 1909 (Bishop, Delessert); C. N. Forbes 921-H, 983-H, Hawaii, June 28, 1915 (Bishop, Missouri); Macrae, Mauna Kea, Hawaii, June 1825 (type, Kew; cotypes, Berlin, Gray); U. S. Exploring Expedition, Mauna Kea, Hawaii, 1840 (Gray, U. S.).

Distribution: island of Hawaii.

**Phyllostegia racemosa** variety  $\beta$  **Bryanii** Sherff (fig. 15).

*Phyllostegia racemosa* variety *Bryanii* Sherff, Amer. Jour. Bot., vol. 21, p. 699, 1934.

Leaves somewhat smaller, the blade 1.5-3 (rarely -4.3) cm long. Whorls commonly 6- rarely 4-flowered, at fruiting about 1 cm in diameter. Flowers smaller, the calyx 2-3 mm long; the corolla tube  $\pm$  4 mm long.

Type: collected by William Hillebrand, on heights back of Kamalo, island of Molokai (Berlin).

Specimens examined: Otto Degener 5417, in open rain forest at end of Hanalioliio pipe line, Molokai, April 24, 1928 (Field); Degener 6421-b, in open rain forest east of Pepeopae bog, Molokai, May 9, 1928 (Field, New York); Urbain Faurie 908, Pukoo, Molokai June 1910 (Delessert); William Hillebrand, heights back of Kamalo, Molokai (type, Berlin); Hillebrand, Mapulehu, Molokai, 1870 (Berlin and Kew, cum *P. hispida commixta*; Gray).

Distribution: island of Molokai.

Subsection *B. LOBATAE* (Briquet), new combination

Subsection *B. Lobatae* (Briquet), new combination; pro subsect. sectionis *Terminalium* Briquet in Engler and Prantl, Natürl. Pflanzenf. IV, vol. 3-a, p. 223, 1897.

Leaves more or less lobulate or lobed or even pinnately divided. Nos. 19-21.

19. **Phyllostegia Mannii** Sherff (fig. 16).

*Phyllostegia Mannii* Sherff, Bot. Gaz., vol. 96, p. 136, 1934.

*Stenogyne Parviflora* H. Mann, Amer. Acad., Proc., vol. 7, p. 193 (Enum. Haw. Pl., no. 357), 1867.

Spreading, much branched, suffruticose at base, densely but rather shortly pubescent and very minutely more or less glandular, stems and branches delicate, tetragonal. Leaves essentially undivided, the petiole 4-10 mm long; the blade deltoid or oblong-ovate, basally truncate to subcordate, apically obtuse or subacute, marginally crenate or the larger ones more or less lobulate, very thin, 0.8-2 cm long and 0.5-0.8 as wide. Whorls mostly 6- the uppermost sometimes 4-flowered, the pedicels 1-3 mm long. Calyx obconic-campanulate, glandular,  $\pm$  3 mm long, the usually obtuse lobes often narrowed at the very base and 0.25-0.5 the length of the tube. Corolla somewhat curved, externally puberulent, 7-8 mm long (from base to tip of upper lip), the lower lip  $\pm$  4 mm long, the upper about 1 mm long; the puberulent filaments and glabrous style not exerted, the stigmatic branches thickened-clavate, truncate, one often smaller or even rudimentary.

Type: collected by Horace Mann and W. T. Brigham, no. 407, altitude 6,000-7,000 feet, northwestern side of Haleakala, eastern Maui (Gray).



FIGURE 15.—*Phyllostegia racemosa* variety *Bryanii* (type).

Specimens examined: C. N. Forbes 153-M, woods near Ukulele, above Olinda, east Maui, July 1910 (Bishop, Missouri); Forbes 796-M, east of Ukulele, July 16, 1919 (Bishop); William Hillebrand, east Maui (U. S.); Horace Mann and W. T. Brigham 407 (type, Gray; cotypes, Bishop; Delessert; Field, Kew; Missouri; U. S.); J. F. Rock, Ukulele, east Maui, March 1912 (Bishop); Rock 6198, Waikolu Pali, Molokai, March 28, 1910 (Bishop); Rock 8636, east Maui (Bishop); Rock 10323, altitude 5,000 feet, Ukulele, east Maui, March 1912 (Bishop); U. S. Exploring Expedition, east Maui, 1840 (U. S.); Heinrich Wawra, north Haleakala, east Maui, January 1870 (Berlin); Wawra 1937, Maui, 1868-71 (Vienna, 3 sheets; Leningrad).



FIGURE 16.—*Phyllostegia Mannii* (type).

In characters of corolla and style-branches, *P. Mannii* belongs very definitely to *Phyllostegia* and not, as regarded by Mann, to *Stenogyne*. The

apparently ripe nucules examined on some specimens do not exceed 1.3 mm in length, but a packet on the sheet of Mann and Brigham 407 at Kew contains numerous nucules which are much larger. These are black, irregularly obovate and thick-margined, and about 4 mm long.

Distribution: Molokai and eastern Maui.

## 20. *Phyllostegia hispida* Hillebrand.

*Phyllostegia hispida* Hillebrand, Fl. Haw. Is., p. 353, 1888.

Diffuse, much-branching, rough-hispid in all parts (except corollas), with long white, occasionally glandular, hairs. Stem distinctly tetragonal, the hairs spreading. Leaves flaccid, the spreading-hispid petiole 1-2.5 cm long; the blade usually 2-5.5 cm long and 1-2.5 cm wide, triangular-lanceolate to ovate-lanceolate in outline, at base cordate, at apex acute to obtuse, at margin shallowly lobed with bluntish and more or less dentate lobes, the hairs on both surfaces (at least in herbarium specimens) appressed. Whorls 6-flowered, in axils of much or scarcely reduced leaves and constituting short more or less leafy racemes 5-15 cm long; pedicels usually glandular among the hairs, 1-3 mm long. Calyx densely glandular as well as sparsely long-hispid, 3-4 mm long, the nerves usually obscured, the lobes acute to obtuse and  $\pm 1$  mm long, the tube open and cup-shaped when mature. Corolla white, externally glandular and sparsely hispid with short weak hairs or glabrate below, the tube about 7 mm long, the lower lip 4-5 mm long and much exceeding the upper. Nucules slender, about 2 mm long.

Type: collected by William Hillebrand, on heights of Mapulehu, island of Molokai, July 1870 (Berlin).

Specimens examined: Otto Degener 5416, flowers pure white, in open rain forest at end of Hanaliilio pipe line, Molokai, April 24, 1928 (Field); Degener 5420, in open rain forest near Ohialele Pali, Molokai, May 8, 1928 (Field); Degener 5422, forming large tangled mass 3 feet high and 10-15 feet wide, flowers pure white, on fog- and wind-swept clearing at edge of Ohialele Pali, May 10, 1928 (Field); Urbain Faurie 909, Pukoo, Molokai, June 1910 (Delessert, 2 sheets); C. N. Forbes 151-Mo, mountains about Puu Kolekole, Molokai, July 1912 (Bishop, Missouri); William Hillebrand, Hawaiian islands (U. S.); Hillebrand, Mapulehu, Molokai, 1870 (Berlin and Kew, cum *P. racemosa* varietate *Bryanii* commixta); Hillebrand, heights or ridge of Mapulehu, July 1870 (Berlin, type); A. S. Hitchcock 15087, altitude about 4,000 feet, north of Kamalo, Molokai, October 10, 1916 (U. S.); J. F. Rock, Wailau Pali, Molokai, March 1912 (Bishop); Rock 7081, Hawaiian islands (Bishop); Rock 10327, Pelekunu Pali, Mapulehu heights, Molokai, March 1910 (Bishop).

Distribution: island of Molokai.

## 21. *Phyllostegia Rockii* Sherff (fig. 17).

*Phyllostegia Rockii* Sherff, Bot. Gaz., vol. 96, p. 139, 1934.

*Phyllostegia hispida* variety  $\beta$  Hillebrand, Fl. Haw. Is., p. 353, 1888.

With habit and hispidity of *P. hispida*. Leaves more delicate, the filiform petiole 1-2.5 cm long; the blade flaccid, now pinnately lobed almost to the midrib, now toward petiole even completely pinnate with distinctly petiolulate leaflets, 1.5-3 cm long, the lobes or leaflets lobulate or dentate. Whorls commonly 6- rarely 8-flowered, pedicels somewhat glandular among the hairs, 5-9 mm long. Calyx densely glandular as well as sparsely spreading-hispid, 3-4 mm long, the nerves not prominent, the lobes usually obtuse and often half the tube's length.

Type: collected by J. M. Lydgate, altitude 4,000-5,000 feet, on flank of Haleakala, eastern Maui (Berlin).

Specimens examined: C. N. Forbes 199-M, in woods near Ukulele, above Olinda, east Maui, July 1910 (Bishop, Missouri); Lydgate, altitude 4,000-5,000 feet, flank of Haleakala, east Maui (Berlin, type); J. F. Rock, Ukulele, east Maui, March 1912 (Berlin, Bishop).

Distribution: eastern Maui.



FIGURE 17.—*Phyllostegia Rockii* (type).

#### Section 2. LATERIFLORAE A. Gray

Section 2. *Lateriflorae* A. Gray, Amer. Acad., Proc., vol. 5, p. 342, 1862; section *Axillares* Briquet, in Engler and Prantl, Natürl. Pflanzenf. IV, vol. 3-a, p. 223, 1897.

Flowers in racemes or panicles, these in the axils of the lower leaves—Nos. 22-24.

**22. *Phyllostegia floribunda* Benth.**

*Phyllostegia floribunda* Benth., Lab., p. 653, 1835; De Candolle, Prodr., vol. 12, p. 555, 1848.

Leaves more or less appressed-hispid on whole lower surface with white glistening acicular but arcuate hairs; hairs of inflorescence apically sharp and not gland-tipped; calyx at anthesis (with lobes erected) about 7 mm long.....***P. floribunda***  
 Leaves subappressedly pubescent beneath along veins, elsewhere (beneath) resinous dotted; many hairs of inflorescence gland-tipped; calyx at anthesis (with lobes erected) less than 5 mm long.....**variety  $\beta$  *Forbesii***

Suffruticose, erect, 6-9 dm high, the stem and branches suberect-appressedly hirsute or hispid. Leaves undivided, the subspreadingly hirsute petiole 3-7 cm long; the blade ovate to ovate-oblong, at base rounded to widely cuneate, at apex acute to acuminate, at margin crenate, flaccid, on both faces subsparingly to subdensely appressed-hispid with glistening white and acicular but arcuate hairs, often black-punctulate underneath with tiny glands, mostly 1-2.1 dm long and 4-8.5 cm wide. Inflorescence in axillary simple or branching racemes 4-12 cm long, spreading-hirsute throughout, the flowers opposite, a single one in the axils of small linear to lanceolate bracts 2-4 (-9) mm long; pedicels 8-10 mm long. Calyx strongly and numerously costate, at maturity about 5-6 mm long, the linear and acute lobes equalling the finally widened globose-obconic tube and much separated by the broad sinuses. Corolla pink or purple, externally pubescent, the tube 8-10 mm long, the lower lip  $\pm$  6 mm long and much exceeding the upper. Filaments hairy. Nucules about 4 mm long.

Type: collected by David Nelson, Hawaiian islands, 1778-79 (British). Known to me through a very clear and excellent photograph secured for me by Dr. John Ramsbottom, Keeper of Botany, British Museum of Natural History.

Specimens examined: Otto Degener 5383, in wet, dark jungle, between Glenwood and 29 Miles, Kilauea, island of Hawaii, June 15, 1929 (Field); Degener 5384, same locality, June 18, 1929 (Field); C. N. Forbes 421-H, mountains behind Pahala, Kau, Hawaii, August 9-11, 1911 (Missouri, 2 sheets); Forbes 493-H, Kohala mountains, Waimea, Hawaii, September 1911 (Bishop); Forbes 647-H, Oloa flume, Hawaii, June 2, 1915 (Bishop, Missouri); William Hillebrand, Hawaiian islands (U. S.); Hillebrand, Hilo, Hawaii (Berlin); Hillebrand 344, Puna, Hawaii (Berlin); Hillebrand 362, Hilo, Hawaii, 1862 (Berlin); Hillebrand (similiter) 362, Kawaihae Uka, Kohala mountains, Hawaii (Kew); Hillebrand and J. M. Lydgate, Hilo, Hawaii, April 1871 (Bishop); J. F. Rock, 23 Miles, Hilo, Hawaii, August 1917 (Bishop); Rock 4091, 4092, 4093, Holo-kaiea Gulch, Hawaii, July 10, 1909 (Bishop); Rock 8352, altitude 4,000 feet, Waipio Valley, Waimea, Hawaii, June 1910 (Bishop); Rock 13002, forest of Kilauea, Hawaii, August 1917 (Bishop); U. S. Exploring Expedition, in woods, district of Puna, Hawaii, 1840 (Gray, New York, U. S.).

Hillebrand remarks of this species (Fl. Haw. Is., p. 354, 1888), "The racemes are found in the axils of the lower older leaves, and often do not start before [the leaves have fallen]."

Distribution: island of Hawaii.

***Phyllostegia floribunda* variety  $\beta$  *Forbesii* Sherff.**

*Phyllostegia floribunda* variety *Forbesii* Sherff, Amer. Jour. Bot., vol. 21, p. 699, 1934.

Lower stem sparsely, upper stem densely short-hispid with minute erect-appressed hairs. Leaves sparsely and shortly appressed-hispid above, subappressed-pubescent be-



neath along the veins, elsewhere glabrate but most numerous and most minutely resinous-punctulate. Hairs of inflorescence shorter, often glandular-capitate; calyx smaller by a half, strongly resinous-glandular.

Type: collected by C. N. Forbes, no. 294-H, Kaalapuuwale, Kona, island of Hawaii, June 30, 1911 (Missouri).

Specimens examined: Forbes 294-H (Missouri, type).

Distribution: island of Hawaii.



FIGURE 18.—*Phyllostegia Knudsenii* (type).

**23. *Phyllostegia Knudsenii* Hillebrand (fig. 18).**

*Phyllostegia Knudsenii* Hillebrand, Fl. Haw. Is., p. 354, 1888.

*Phyllostegia Knudsenii* Hillebrand, ex Briquet, in Engler and Prantl, Natürl. Pflanzenf. IV, vol. 3-a, p. 223, 1897 (sphalm).

Erect, apparently herbaceous, the branches round-angled, sulcate along center of each face, pubescent with very short hairs. Leaves undivided, flaccid, the slender petiole shortly spreading-pubescent and 4-6 cm long; the blade ovate, at base subcordate or merely truncate, at apex shortly acuminate, at margin crenate, sparsely pubescent on both surfaces, 9-12 cm long. Racemes axillary, erect, about 4-6 cm long, their whorls mostly 4- sometimes 2-flowered, at fruiting about 11-12 mm in diameter, bracted with small spatulate bracts, these mostly 1-2 (or at base of raceme -10) mm long; pedicels spreading-hispid with hairs sometimes gland-tipped, 2-4 mm long. Calyx obscurely to distinctly nerved, obscurely glandular, hispidulous, about 2.5 mm long, broader and wide open at maturity, the lobes broad, short, and acutely tipped. Corolla (*vide Hillebrandii*) pubescent, 6-8 mm long, its style-branches both truncate. Nucules fleshy, black, 1.5-2 mm long.

Type: collected by Valdemar Knudsen, no. 190, in woods of Waimea, island of Kauai (Berlin).

Specimens examined: Knudsen 190 (Berlin, type).

Distribution: island of Kauai.

**24. *Phyllostegia Wawrana* Sherff (fig. 19).**

*Phyllostegia Wawrana* Sherff, Bot. Gaz., vol. 96, p. 139, 1934.

*Phyllostegia Knudsenii* variety  $\beta$  Hillebrand, Fl. Haw. Is., p. 354, 1888.

Entirely hirsute with soft, spreading hairs; perhaps herbaceous. Leaves undivided, large and exceeding the inflorescence by the length of their blade, the petiole up to 1 dm long; the blade very thin, suboblong-ovate, subcrenate-serrate with  $\pm 45$  teeth on each side, at base subcordate, at apex shortly acuminate, up to 2 dm long and to 1.1 dm wide. Racemes in threes (the middle one twice as long as the lateral two) terminating short axillary branches, the whorls numerous, commonly 6-flowered; bracts ovate,  $\pm 4$  mm long, uppermost at times foliaceous. Calyx at flowering obconic and about 5 mm long, at fruiting subglobose and about 4-5 mm thick, the acute lobes 1-2 mm long; pedicel about 8-9 mm long. Corolla under 1 cm long, the upper lobe very short (about 2 mm long). Nucules black, obovate, in cross-section triangulate, alate-margined, 2 cm long.

Type: collected by Heinrich Wawra, no. 2060-a, island of Kauai, 1868-71 (2 type sheets, Vienna).

Specimens examined: Otto Degener 5460, in rain forest, along Kokee Stream, Kauai, June 30, 1926 (New York); J. A. Kusche, high plateau of Waimea, Halemanu to Kaholuamanu, Kauai, 1919 (California, New York); Horace Mann and W. T. Brigham 556, Hanalei, Kauai (Cornell, type of *Phyllostegia Knudsenii* variety  $\beta$  Hillebrand); Wawra 2060-a (2 type sheets, Vienna).

Distribution: island of Kauai.

## EXCLUDED NAMES

Section *Haplostachys* A. Gray, Amer. Acad., Proc., vol. 5, p. 342. 1862.==  
*Haplostachys* (A. Gray) Hillebrand.

*Phyllostegia haplostachya* A. Gray, Amer. Acad., Proc., vol. 5, p. 345, 1862.== *Haplostachys Grayana* Hillebrand.

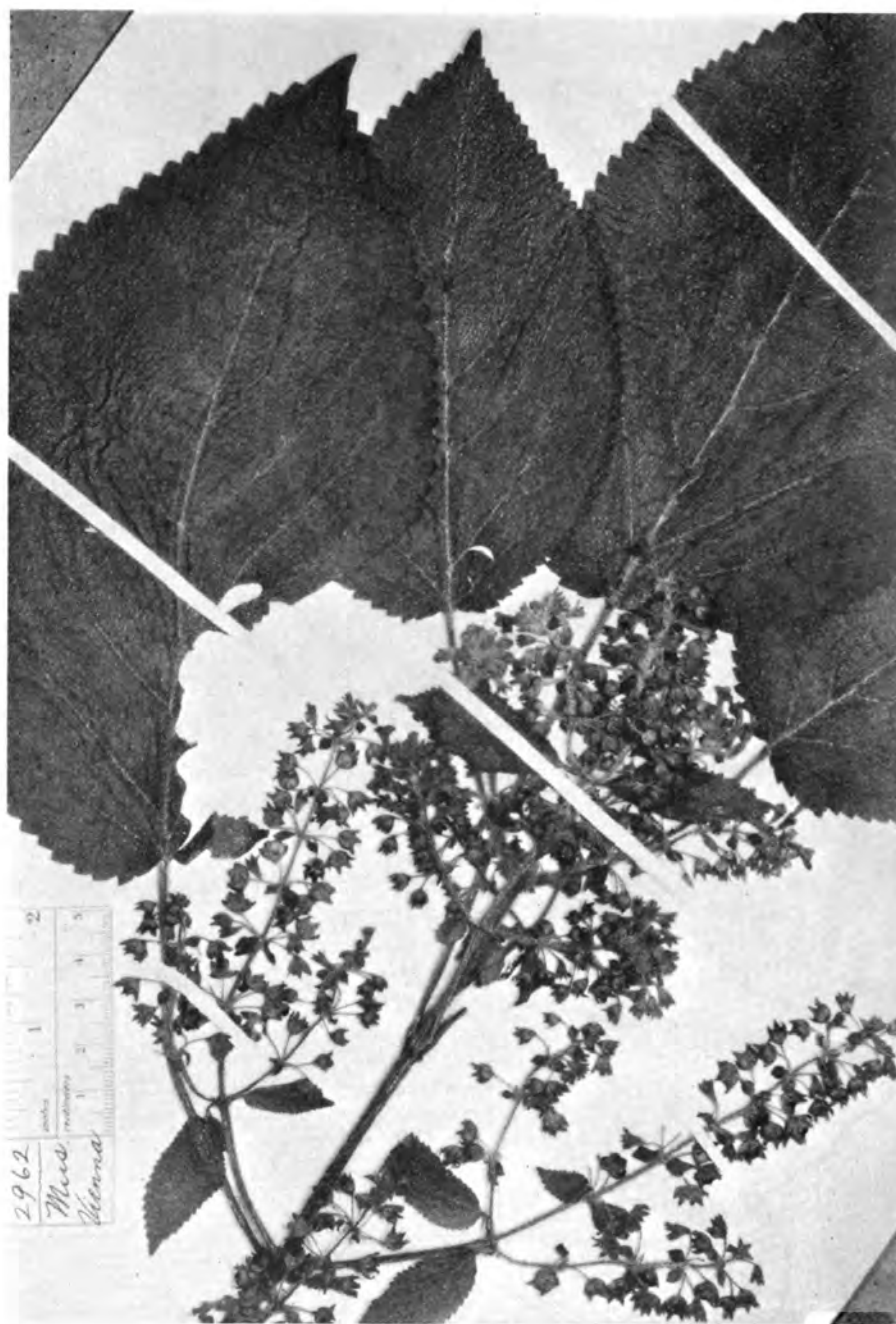


FIGURE 19.—*Phyllostegia Wawrana* (first type sheet).

*Phyllostegia haplostachya* variety *leptostachya* A. Gray, Amer. Acad., Proc., vol. 5, p. 345, 1862. = *Haplostachys Grayana* variety *leptostachya* (A. Gray) Hillebrand.

*Phyllostegia linearifolia* Drake del Castillo, Illustr. Fl. Ins. Mar. Pacif., p. 47, pl. 20, 1886. = *Haplostachys linearifolia* (Drake del Castillo) Sherff.

*Phyllostegia rosmarinifolia* H. Mann, Boston Soc. Nat. Hist., Mem., vol. 1, p. 536, 1869 (nomen nudum). = *Haplostachys linearifolia* (Drake del Castillo) Sherff.

*Phyllostegia truncata* A. Gray, Amer. Acad., Proc., vol. 5, p. 345, 1862. = *Haplostachys truncata* (A. Gray) Hillebrand.

Genus **STENOGYNE** Bentham

*Stenogyne* Bentham, Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830; Lab., p. 654, 1835; in De Candolle, Prodr., vol. 12, p. 555, 1848; *Phaeopsis* Nuttall, ex Bentham, in De Candolle, Prodr., vol. 12, p. 555, 1848 (nomen nudum).

Suffruticose, prostrate, ascending, or climbing plants, divaricately branching, the pubescence when present mostly spreading or retrorse. Leaves often coriaceous, often more or less scabrous. Verticillasters (whorls) mostly 6- or 2-flowered, rarely 8-, 10-, or 4-flowered, in axils of full-sized or little-reduced leaves. Bractlets setaceous. Calyx turbinate, campanulate, or tubular, 10-nerved, the tube splitting at maturity, the limb unequally dentate or lobed, or obliquely bilabiate with the upper lip entire or 3-toothed and the lower bifid with usually longer teeth. Corolla ampliate at throat, more or less curved, with a hairy and complete or interrupted ring or annulus (this in some species often faintly developed) inside the tube near its base, bilabiate, the upper lip exceeding the lower, entire or rarely bifid, the lower trifid with subequal lobes. Stamens exerted and spreading in two pairs, those of inner pair longer; filaments usually hairy; anthers 2-celled, the cells finally divaricate. Style exerted, the short stigmatic lobes of nearly even length and subulate, often only one stigmatiferous at apex. Nucules (achenes) fleshy, connate at base. (Description in large part that by Hillebrand, Fl. Haw. Is., p. 354, 1888; in lesser part that by Bentham and Hooker, Gen. Pl., vol. 2, p. 1217, 1876).

Type: *Stenogyne rugosa* Bentham, Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830.

KEY

- a. Leaf blades mostly large, 2.5 cm or more long
- b. Leaf blades sessile or subpetiolate
- c. Stems and branches acutely tetragonal; leaves rotund-cordate to ovate-cordate, more or less coriaceous and rugose.....12. **S. sessilis** and varieties  $\beta$  and  $\gamma$

- c. Stems and branches subterete; leaves ovate-lanceolate, chartaceous, not rugose.....11. **S. calyco**
- b. Leaf blades definitely petiolate
  - c. Whorls or verticillasters usually 2-flowered
    - d. Leaf blades lanceolate to ovate-lanceolate or oblong-lanceolate, 3.5-9 cm long.....7. **S. kaalae** and variety
    - d. Leaf blades more slender, or if wider then more or less spatulate.....4. **S. angustifolia** and variety
    - d. Leaf blades ovate-obtuse or suborbicular, at base cordate
      - e. Calyx lobes linear-lanceolate, as long as the tube or longer.....13. **S. virid**
      - e. Calyx lobes more or less obtuse, much shorter than the tube.....9. **S. Scrophularioides** variety
  - c. Whorls usually 6- (but often some 2-, 4-, 8-, or 10-) flowered
    - d. Calyx elongate, cylindrical, shortly dentate
      - e. Calyx finally 8-12 mm long; corolla 2.5-4 cm long; known only from Isl. Hawaii.....1. **S. Calaminthoides** and variety
      - e. Calyx finally 1.2-2 cm long; corolla 5-7.5 cm long; native of Isls. Maui and Molokai.....2. **S. Kamehamehae** and variety
    - d. Calyx obconic, turbinate, or campanulate
      - e. Calyx lobes linear or subulate, as long as the tube or longer
        - f. Leaf blades lanceolate to ovate-lanceolate or rarely ovate, basally rounded or subtruncate, glabrous
          - g. Leaf blades mostly more than 2 cm wide; native of Isl. Molokai.....8. **S. bific**
          - g. Leaf blades narrower; native of Isl. Hawaii.....3. **S. rugosa** variety  $\gamma$  *subulat*
        - f. Leaf blades ovate, basally cordate or truncate, cinereo-pubescent; native of east Maui.....18. **S. cinere**
      - e. Calyx lobes broader, usually shorter than the tube
        - f. Corolla purple or red (in *S. scandens* and *S. glabrata* weakly so)
          - g. Calyx teeth (lobes) short-obtuse; lower or juvenile leaves often incised.....9. **S. Scrophularioides**
          - g. Calyx lobes (teeth) more or less lanceolate, acute or subacute
            - h. Leaves becoming coriaceous or rugose or if otherwise then softly pubescent or tomentose; natives of Isl. Hawaii.....3. **S. rugosa** and variety
            - h. Leaves remaining membranaceous and erugose
              - i. Fruiting pedicels easily exceeding the calyces.....9. **S. Scrophularioides** varieties  $\beta$ ,  $\gamma$  and  $\delta$
              - i. Fruiting pedicels shorter than or about equal to the calyces. (Here belongs probably also 10. **S. sororia**, the corollas and distributional range of which are not definitely known.)
                - j. Calyx pale green; corolla slender, pale red; native of east Maui.....17. **S. glabrat**
                - j. Calyx darker green; corolla thicker, purplish-red; native, islands of Hawaii and Kauai
                  - k. Leaf blades mostly crenulate-dentate; native of Isl. Hawaii.....19. **S. scanden**
                  - k. Leaf blades subentire except toward apex, smooth, coriaceous; native of Kauai.....6. **S. kealia**
                  - k. Leaf blades minutely but sharply dentate or serrulate, membranaceous; native of Kauai.....5. **S. purpurea** and variety

- i. Corolla pale, silky with appressed white hairs
    - g. Leaves ovate-orbicular, apically very obtuse, 2-3.8 cm long; native of east Maui.....16. *S. rotundifolia*
    - g. Leaves mostly of narrower shape, often larger and usually more acute apically (but in *S. scandens* mostly obtuse)
    - h. Leaf blades densely long-hispid above.....15. *S. macrantha*
    - h. Leaf blades glabrate to sparsely appressed-hispid above
      - i. Leaf blades oblong to oblong-ovate
        - j. Leaf blades glabrous or sparsely pilose or sparsely appressed-hispid beneath
          - k. Blades of principal leaves 6-7.5 cm long; native of Isl. Hawaii.....15. *S. macrantha* variety  $\delta$
          - k. Blades of principal leaves shorter
            - l. Blades of principal leaves commonly crenulate-dentate with rounded teeth (these 4-9 per centimeter), 2.5-3.5 (more rarely -5) cm long; native of Isl. Hawaii.....19. *S. scandens*
            - l. Blades of principal leaves crenate to serrate, the teeth mucronate (and about 3 or 4 per centimeter), 4-5.5 cm long; native of east Maui.....16. *S. rotundifolia* variety  $\beta$
        - j. Leaf blades densely soft-pubescent or downy beneath; native of east Maui.....14. *S. haliakalae*
        - j. Leaf blades hispid beneath; native of Isl. Hawaii.....15. *S. macrantha* variety  $\delta$ , f. 1
      - i. Leaf blades ovate
        - j. Leaf blades densely soft-pubescent or downy beneath; calyx small, densely velvety-pubescent, about 5-7 mm long; native of east Maui.....14. *S. haliakalae*
        - j. Leaf blades more or less hispid beneath.....15. *S. macrantha* varieties  $\beta$  and  $\gamma$
- a. Leaf blades small, mostly less than 2 cm long
  - b. Whorls 2-flowered
    - c. Glabrous or pubescent
      - d. Leaf blades commonly 8-15 mm long.....22. *S. affinis*
      - d. Leaf blades 3-8 (rarely -10) mm long
        - e. Leaf blades oblong or oval-oblong.....20. *S. microphylla*
        - e. Leaf blades obtusely ovate or suborbicular.....21. *S. diffusa* and variety  $\beta$
    - c. Muriculate-hispid.....23. *S. crenata* and variety  $\beta$
  - b. Whorls 6-, 4-, or 2-flowered, leaf blades 0.8-1.7 cm long
    - c. Leaves sessile or subpetiolate with petioles thick and under 2 mm long; calyx 10-12 mm long.....12. *S. sessilis* variety  $\delta$
    - c. Leaves petiolate, the petioles slender and 2-5 mm long; calyx 4-5 mm long.....24. *S. vagans*

Section 1. **SARMENTOSAE** Hillebrand

Section 1. *Sarmentosae* Hillebrand, Fl. Haw. Is., p. 355, 1888.

Suberect or prostrate or rarely climbing, sarmentose. Corolla mostly red or reddish, with lower lip often subequal to upper. Stamens and styles scarcely longer than the upper lip.—Nos. 1-12.

1. **Stenogyne Calaminthoides** A. Gray.

*Stenogyne Calaminthoides* A. Gray, Amer. Acad., Proc., vol. 5, p. 34, 1862; Drake del Castillo, Illustr. Fl. Ins. Mar. Pacif., pl. 24, 1886.

- a. Leaves densely tomentose-hispid underneath.....variety  $\beta$  **waimeana**  
 a. Leaves glabrate to subsparingly appressed-hispid underneath  
 b. Calyx lobes broad and short.....**S. Calaminthoides**  
 b. Calyx lobes mostly acute at the apex and oblong-lanceolate to subulate-lanceolate, nearly or quite equalling the tube.....variety  $\gamma$  **oxyodon**

Suffruticose, the stems decumbent, reddish, tetragonal, sparingly branching, retrorse hispid on the angles and less densely so on the faces or more rarely entirely glabrate. Leaves undivided, the slender petiole 8-12 mm long; the blade ovate or rounded-ovate, crenate-serrate or -dentate, at base truncate or subcordate, at apex obtuse or rounded rather thin, glabrous or glabrate above, glabrate or sparsely to subsparingly appressed hispid beneath, 2-6 cm long and 1.5-4.5 cm wide. Whorls of 6 or 8 (or the upper of or 2) flowers; pedicels glabrous, finally 1.2-1.4 cm long. Calyx glabrous, obconic tubular, 8-12 mm long, the teeth broad and short. Corolla dark purplish-red, curve gradually dilating upwards, pubescent above and along the back, 2.5-4 cm long, the upper lip slightly exceeding the lower; filaments pubescent; stigmatic branches under 1 mm long; nucules blackish, cuneate, in cross-section triangular, apically truncate, about 1 mm long.

Type: collected by the U. S. Exploring Expedition, island of Hawaii, 1840 (U. S.

Specimens examined: anonymous, no. 1130, trailing plant, Volcano Road, above 2 mile post, island of Hawaii, March 21, 1908 (Bishop); Otto Degener H-96, festooning tree fern in clearing, Fern Forest, Kilauea, Hawaii, December 24, 1922 (New York); C. N. Forbes 406-H, Kapapala, Kau, Hawaii, August 8, 1911 (Bishop, Field); Forbes 676-H, kipuka (island) in flow of 1855, between Olaa Flume and Halelouolu, Hawaii, June 3, 1915 (Bishop, Missouri); Forbes 684-H, same locality, June 4, 1915 (Bishop); Forbes 705-H, same date and locality (Bishop); Dr. William Hillebrand, Hawaii (Vienna, 2 sheets); Hillebrand, Kohala mountains, Hawaii (Berlin); Hillebrand, Puu and Kau, Hawaii (Berlin); Hillebrand, near Kilauea, Hawaii (Berlin); Hillebrand 3-Kohala mountains, Hawaii (Berlin, Gray); Alfred Meebold, altitude 4,000 feet, Thurston lava tube, Kilauea, Hawaii, May 1932 (Bishop); Jules Remy 380, Hawaii, 1851- (Gray); Mrs. Carson Roberts, hills, altitude 4,000 feet, March 24, 1930 (Kew); J. Rock, Volcano House, Kilauea, Hawaii, April 1911 (Bishop); Rock, Kilauea, July 19 (Gray, 2 sheets); Rock, August 1915 (Bishop, 4 sheets); Rock 4310, ditch trail, Alaka Kawaiui, Waimea, Hawaii, July 13, 1909 (Bishop); Rock 8314, Kawaiui, Hawaii, June 1910 (Gray); Rock 8412, Hawaiian islands (Bishop, Gray); Rock and Giffard, Kilauea, Hawaii, April 1911 (Bishop); U. S. Exploring Expedition, Hawaii, 1840 (type, U. S.; cotypes, Gray, Kew).

Distribution: island of Hawaii.

**Stenogyne Calaminthoides** variety  $\beta$  **waimeana** Sherff.

*Stenogyne Calaminthoides* variety **waimeana** Sherff, Amer. Jour. Bot., vol. 21, p. 701, 1934.

Leaves densely tomentose-hispid underneath.

Type: collected by C. N. Forbes, no. 478-H, Kohala mountains, Waimea, island of Hawaii, September 7, 1911 (Bishop).

Specimens examined: Forbes 478-H (type, Bishop; cotype, Missouri); Forbes 495-Kohala mountains, Waimea, Hawaii, September 1911 (Bishop); A. S. Hitchcock 143-Waimea, August 26, 1916 (U. S.); J. F. Rock 8307, Hawaiian islands (Bishop, Gray)

Distribution: northwestern part, island of Hawaii.

***Stenogyne Calaminthoides* variety  $\gamma$  *oxyodonta* Sherff (fig. 20).**

*Stenogyne Calaminthoides* variety *oxyodonta* Sherff, Amer. Jour. Bot., vol. 21, p. 701, 1934.

Calyx 1-1.4 cm long, its lobes mostly acute at the apex and oblong-lanceolate to subulate-lanceolate, nearly or quite equalling the tube.

Type: collected by J. F. Rock, no. 8379, Hawaiian islands (Bishop).

Specimens examined: Rock 8379 (Bishop, 2 type sheets); Rock 8381, Hawaiian islands (Bishop).

Distribution: not definitely known.



FIGURE 20.—*Stenogyne Calaminthoides* variety *oxyodonta* (first type sheet).

**2. *Stenogyne Kamehamehae* Wawra.**

*Stenogyne Kamehamehae* Wawra, Flora, vol. 55, p. 532, 1872; vol. 58, p. 286, 1875.

*Stenogyne Calaminthoides* variety *Kamehamehae* (Wawra) Hillebrand, Fl. Haw. Is., p. 356, 1888.

*Stenogyne Calaminthoides* subspecies *Kamehamehae* (Wawra) Hillebrand, ex Briquet, in Engler and Prantl, Natürl. Pflanzenf. IV, vol. 3-a, p. 221, 1897.



A large, spreading, trailing, or climbing vine, the stem and branches becoming glabrate or even glabrous (especially in the topotypic plants of east Maui) or remaining retrorsely more or less hispid (plants of west Maui and of Molokai). Leaves undivided, the petiole glabrate or sparsely hispid, 1-2 cm long; the blade usually ovate or oblong, apically obtuse or acute or shortly acuminate, basally rounded or truncate or rarely somewhat subacute, sometimes suborbicular, chartaceous, crenate-serrate with teeth often mucronulate, glabrous above but sometimes sparsely white-hispid below, more or less ciliate, 1.5-5.5 cm long and 1-3.5 cm wide. Whorls 4-6-flowered, pedicels glabrate or somewhat hispid, 6-9 mm long. Calyx obconic-tubular, glabrous or glabrate, 1.2-2 cm long, with lobes short and broad, laterally splitting at maturity. Corolla rich deep purple or crimson, curved, near top densely elsewhere weakly glandular-hispid, 5-7.5 cm long, 1.2-1.9 cm across at throat, the upper lip little if at all exceeding the lower, the three lobes of lower lip broadly ovate or triangular, obtuse and nearly equal; filaments more or less pubescent; stigmatic branches 0.3-0.6 mm long. Nucules blackish, 7-8 mm long and about 5 mm wide including the subulate margins.

Type: collected by Dr. Heinrich Wawra, no. 1933, in forests of Haleakala, eastern Maui, 1868-71 (Vienna, 3 sheets).

Specimens examined: Otto Degener 5412, long-trailing over shrubs and small trees in rain forest, west of Pepeopae, island of Molokai, April 12, 1928 (Field, New York); Degener 5414, festooning bushes in open rain forest near Puu o Wahaula, Molokai, April 17, 1928 (Field); Degener 5418, in open rain forest at end of Hanalioliio pipe line, Molokai, April 24, 1928 (Field); Degener 5421-a, in open rain forest east of Pepeopae bog, Molokai, May 9, 1928 (New York); Degener 5430, in rain forest, Olinda pipe line trail, island of Maui, June 18, 1927 (Field, New York); Urbain Faurie 900, Kamalo, Molokai, June 1910 (Delessert); C. N. Forbes 144-Mo, mountains above Kolekole, Molokai, July 1912 (Bishop); Forbes 210-Mo, mountains above Puu Kolekole, Molokai, July 1912 (Bishop); Forbes 258-M, Nahiku, east Maui, July 1910 (Bishop); Forbes 364-M, 508-M, Honokohau drainage basin, Maui, September 25 to October 17, 1917 (Bishop); Forbes 688-Mo, edge of Waihanau, Molokai, March 31, 1915 (Bishop, 2 sheets; Missouri); Forbes 2575-M, trail up west bank of Honomanu, Maui, June 23, 1920 (Bishop); William Hillebrand, islands of Molokai and Maui, 1870 (Kew); Hillebrand, Kalaupapa, Molokai (Berlin); Hillebrand, Kamalo, Molokai (Berlin, Gray, U. S.); Hillebrand, Puu Kukui, above Lahaina, west Maui, August 1870 (Berlin); Hillebrand 63, path to Puu Kukui, Maui (Berlin); A. S. Hitchcock, 14753, upper forest, altitude 4,000-5,000 feet, Puu Kukui, Maui, September 24-26, 1916 (U. S.); Hitchcock 14859, altitude 3,000-5,000 feet, same date and locality (U. S.); G. C. Munro 437 pro parte, flowers purple, Puu Kukui, west Maui, September 25, 1916 (Bishop); Munro 600, forest bog, same date and locality (Bishop); Munro 626, forest, same date and locality (Bishop); J. F. Rock, Waikamoi, east Maui (Bishop, 2 sheets); Rock, ditch trail, same locality, May 1911 (Bishop, Gray); Rock, Ukulele, east Maui, March 1912 (Bishop, forma foliis infra hispidioribus); Rock 6108, Molokai (Bishop); Rock 6194, trailing over the ground, edge of Waikolu Valley, Molokai, March 28, 1910 (Bishop, Gray); Rock 7018, trailing over ground, above Kamalo, near Pelekunu, Molokai, April 1910 (Bishop, Gray); Rock 7047, climbing over shrubs, trail to Wailau Pali, Molokai, April 1910 (Bishop, Gray); Rock 8208, Hawaiian islands (Bishop); Rock 8543, east Maui (Bishop); Carl Skottsberg 764, Puu Kukui, west Maui, October 9, 1922 (Bishop); Harold St. John 10226, climber with deep magenta flowers, altitude 4,000 feet, above Honokowai, Haelaau, west Maui, February 6, 1930 (Bishop); Heinrich Wawra 1933 (Vienna, 3 type sheets; cotype, Leningrad).

Distribution: islands of Maui and Molokai.

**Stenogyne Kamehamehae** variety  $\beta$  **albiflora** Sherff (fig. 21).

*Stenogyne Kamehamehae* variety *albiflora* Sherff, Bot. Gaz., vol. 96, p. 139, 1934.

*Phyllostegia longiflora* Caum, B. P. Bishop Mus., Occ. Papers, vol. 9, no. 5, p. 9, pl. 6, 1930.



FIGURE 21.—*Stenogyne Kamehamehae* variety *albiflora* (type).

Corollas white or cream-colored or only with a weak-purplish tinge.

Type: collected by J. F. Rock, no. 8549, trailing over a tree, Puohokamoa Gulch, half-way between Waikamoi and Honomanu, forest of Hamakua, eastern Maui, September 1910 (Gray).

Specimens examined: anonymous, Wahinepee trail, Kailua, Maui, January 1909 (Bishop); C. N. Forbes 2609-M, climbing, corolla greenish-white and without odor, Waikamoi trail, east bank of the Waikamoi Stream, east Maui, June 25, 1920 (Bishop);

Forbes 2647-M, west side of Haipuaena, Maui, June 28-30, 1920 (Bishop); A. S. Hitchcock 14850, in upper forest, altitude 3,000-5,000 feet, Puu Kukui, west Maui, September 24-26, 1916 (U. S., forma nonnullis corollis aegre subpurpurascens); Hitchcock 14894, very wet forest along pipe line, altitude 4,000 feet, east of Olinda, Maui, October 1, 1916 (U. S.); G. C. Munro 437 pro parte, flowers white, Puu Kukui, west Maui, September 25, 1916 (Bishop); Munro 790, flowers beautiful cream color, altitude 4,490 feet, Haleakala Ranch pipe line, east Maui, February 19, 1928 (Bishop); J. F. Rock, altitude 5,000 feet, Hawaiian islands, December 5, 1908 (Bishop, Field); Rock, Honomanu gulch, east Maui, May 1911 (Bishop, Gray); Rock, Honomanu ditch house, east Maui, May 1911 (Bishop); Rock 8549 (type, Gray; cotypes, Bishop, 3 sheets); Harold St. John 10225, altitude 3,900 feet, above Honokowai, Haelaau, west Maui, February 6, 1930 (Bishop).

*Stenogyne longiflora* Drake del Castillo (Illustr. Fl. Ins. Mar. Pacif., p. 57, pl. 27, 1886), based upon Remy 379 from Maui, belongs here or with *S. Kamchamehae* proper. Drake was silent as to the color of the corollas, and I have been unable to find a specimen of Remy 379.

Distribution: island of Maui.

### 3. *Stenogyne rugosa* Benth.

*Stenogyne rugosa* Benth., Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Praesiaeae, 1830; Lab., p. 655, 1835; De Candolle, Prodr., vol. 12, p. 556, 1848; Drake del Castillo, Illustr. Fl. Ins. Mar. Pacif., pl. 28, 1885.

*Stenogyne rugosa* varieties 1 and 2, A. Gray, Amer. Acad., Proc., vol. 5, p. 348, 1862.

*Stenogyne rugosa* variety  $\beta$  Hillebrand, Fl. Haw. Is., p. 356, 1888 (ex auctoris typo in Herb. Berol.).

- a. Densely and softly pubescent or tomentose throughout.....variety  $\beta$  **mollis**
- a. Glabrous or glabrate or only in part pubescent
  - b. Leaf blades elliptic-lanceolate or narrowly oblong-lanceolate; lobes of calyx mostly exceeding the tube.....variety  $\gamma$  **subulata**
  - b. Leaf blades ovate-lanceolate to ovate; lobes of calyx shorter than the tube.....**S. rugosa**

Suffruticose, erect and trailing; the branches obtusely tetragonal, pubescent or glabrate, purplish-black, at least when dried, the erect branches more densely foliose, the trailing ones with narrower leaves. Leaves undivided, the glabrate or hispidulous petiole about 1-2 cm long; the blade coriaceous to chartaceous, ovate to ovate-lanceolate, basally rounded to truncate, apically acute, marginally sharp-serrate, above often rugose and glossy with impressed veins, on both surfaces varying from glabrous to moderately appressed-hispid, 3-9 cm long and 1.5-4.2 cm wide. Whorls 6-10-flowered, the pedicels often pubescent, 3-5 mm long, those of the lower whorls often joining in a very short peduncle; bracts short, linear. Calyx glabrous to sparsely pilose, distinctly nerved, 8-13 mm long, the more or less lanceolate lobes acute and 0.4-0.9 as long as the tube. Corolla reddish or brick-colored, externally hispid, slightly curved, 1.2-1.8 cm long, the upper lip  $\pm$  6 mm long, the lower about 0.5 as long and with short, triangular, obtuse lobes; filaments and style scarcely exerted.

Type: collected by James Macrae, Hawaiian islands, 1825 (Kew).

Specimens examined: Otto Degener 5373, on lava flow near Bird Park, Kilauea, island of Hawaii, April 15, 1930 (Field, corolla described as yellow, changing to brownish-red at lobes); Degener 5393, between Fern Forest and abandoned golf course near 20 Miles, Hawaii, November 22, 1929 (Field); Degener 5455, in scrub vegetation near Volcano House, Kilauea, Hawaii, December 15, 1922 (New York); Degener 5456, Kilauea,

December 28, 1922 (New York); Degener 5457, same locality, December 20, 1922 (New York); David Douglas 22, Hawaiian islands, 1834 (Kew, 2 sheets); Urbain Faurie 894, Mauna Kea, Hawaii, July 1909 (Delessert, British); C. N. Forbes 333-H, Kaunene, Kona, Hawaii, July 18, 1911 (Bishop, Missouri); Forbes 334-H, Kukui o Pii, Kona, Hawaii, July 19, 1911 (Bishop, Missouri); Forbes 469-H, slopes of Mauna Kea, Waikii, Hawaii, August 1911 (Bishop); William Hillebrand, Hawaiian islands (Gray, Vienna); Hillebrand, Hamakua, Hawaii, 1862 (Berlin); Hillebrand 344, altitude 4,000 feet, same locality (Kew); Hillebrand (similiter) 344, Kawaihae Uka, Hawaii (Kew); Hillebrand 345, central plateau of Hawaii (Kew); A. S. Hitchcock 14241, altitude 7,500 feet, Kukaiau Ranch, Hawaii, August 21, 1916 (U. S.); James Macrae, Hawaiian islands, 1825 (Kew, type); Macrae, Mount Kaah (Mauna Kea), Hawaii, June 1825 (Gray); Archibald Menzies, Hawaiian islands, 1792-94 (Kew); Jules Remy 382, Hawaii, 1851-55 (Gray; Paris; the basis of Drake's plate 28, above cited); J. F. Rock, Kilauea, Hawaii, December 1914 (Gray); Rock 8303, Mauna Kea, Hawaii, June 1910 (Bishop); Rock 8329, Hawaiian islands (Gray, 2 sheets); U. S. Exploring Expedition, Hawaii, 1840 (Kew, 2 sheets; New York; U. S.); U. S. Exploring Expedition, great crater, Hawaii, 1840 (U. S.); U. S. Exploring Expedition, Waimea, Hawaii, 1840 (U. S.); U. S. Exploring Expedition, Mauna Kea, Hawaii (Gray, Kew, Paris).

In 1835 Bentham amplified his original citation of specimens, listing first two collections by Macrae and then one by Menzies. The first of Macrae's collections cited is the one at Mauna Kea ("Mount Kaah" of Macrae's printed labels, consistently misspelled "Mount Raah" by Bentham), which was made in June 1825, as shown on the printed label of the duplicate in Gray Herbarium. However, the original sheet of Macrae material which Bentham had in his own private herbarium (and which is the one now at Kew and by me taken as bearing the type), does not specify the locality beyond giving, "Ins. Sandwich."

Hillebrand's variety  $\beta$  would seem from its description ("pubescent or tomentose in all parts, including the upper face of the leaves, which are seldom rugose") to belong rather to our variety *mollis*, but his type is not to be separated from *S. rugosa* proper.

Distribution: island of Hawaii.

***Stenogyne rugosa* variety  $\beta$  *mollis* Sherff.**

*Stenogyne rugosa* variety *mollis* Sherff, Bot. Gaz., vol. 96, p. 141, 1934.

*Stenogyne rugosa* variety  $\gamma$  Hillebrand, Fl. Haw. Is., p. 356, 1888.

Clothed throughout with short, soft pubescence or tomentum; branches often elongate, the nodes remote.

Type: collected by the U. S. Exploring Expedition, Waimea district, island of Hawaii, 1840 (U. S.).

Specimens examined: C. N. Forbes 154-H, Hanehane, Kona, island of Hawaii, June 15, 1911 (Missouri); Forbes 181-H, same locality, June 16, 1911 (Bishop, Missouri); Forbes 237-H, Kanehaha, Kona, June 23, 1911 (Bishop, Missouri); Forbes 464-H, slopes of Mauna Kea, Waikii, Hawaii, August 1911 (Bishop, Missouri); William Hillebrand, Hawaii, 1862 (Berlin); Hillebrand 347, central plateau of Hawaii (Bishop, Gray, Kew); Hillebrand 348, same locality, 1862 (Berlin, type; Bishop and Kew, cotypes of *Stenogyne rugosa* variety  $\gamma$  Hillebrand); Horace Mann and W. T. Brigham 295, woods at base of Mauna Roa (Mauna Loa), Hawaii (Bishop, 2 sheets; Delessert; Gray; Kew); J. F. Rock 10035, trailing over a-a lava, altitude 4,600 feet, above Kealakekua, Hawaii, Feb-

ruary 10, 1912 (Bishop, Gray); Rock 10040, altitude 5,300 feet, near crater, slopes of Puu Hualalai, Puu o Keanae, Hawaii, February 13, 1912 (Bishop; Gray, 2 sheets); Carl Skottsberg 621, altitude 1,200 meters, Puu Hualalai, September 23, 1922 (Bishop); U. S. Exploring Expedition, Waimea district, Hawaii, 1840 (type, U. S.; cotypes Gray; Kew).

Distribution: island of Hawaii.

***Stenogyne rugosa* variety  $\gamma$  *subulata* Sherff (fig. 22).**

*Stenogyne rugosa* variety *subulata* Sherff, Bot. Gaz., vol. 96, p. 142, 1934.

Leaves narrow, the ciliate petiole about 5-7 mm long, the blade elliptic-lanceolate or narrowly oblong-lanceolate, sharply acuminate, under 6 cm long and under 2 cm wide. Calyx lobes very sharply subulate, longer than the tube.

Type: collected by William Hillebrand between Kilauea and Kapapala, island of Hawaii (Berlin).



FIGURE 22.—*Stenogyne rugosa* variety *subulata* (type).

Specimens examined: Otto Degener 5449, at edge of Alike lava flow, among sunny rocks, Hawaii, 1926 (Field, New York); C. N. Forbes 441-H, Kapapala, Kau, Hawaii, August 1911 (Bishop); Hillebrand, between Kilauea and Kapapala, Hawaii (Berlin, type); J. F. Rock, Kilauea, August 1915 (Bishop).

Distribution: island of Hawaii.

4. ***Stenogyne angustifolia*** A. Gray (fig. 23, a).

*Stenogyne angustifolia* A. Gray, Amer. Acad. Sci., Proc., vol. 5, p. 348, 1862.

- a. Blades of principal leaves 5-7 cm long
  - b. Leaves not crowded together; calyx 1.2-1.6 cm long, its throat 4-6 mm wide.....variety  $\epsilon$  **salicifolia**
  - b. Leaves crowded together; calyx 1.6-2 cm long, its throat 8-11 mm wide.....variety  $\zeta$  **Meeboldii**
- a. Blades of principal leaves mostly less than 5 cm long
  - b. Leaf blades mostly more or less spatulate
    - c. Leaf blades becoming 3.5-4.5 cm long and 1.1-1.7 cm wide; pedicels pubescent; bracts usually attached above base of pedicels.....variety  $\delta$  **Hillebrandii**
    - c. Leaf blades commonly 2-3 cm long and 7-9 mm wide; pedicels glabrate or nearly so, their bracts basal.....variety  $\beta$  **spathulata**
  - b. Leaf blades rarely spatulate or subspatulate
    - c. Blades of larger leaves 3.3-5.5 cm long; native of Hawaii.....**S. angustifolia**
    - c. Blades of larger leaves mostly under 3.3 cm long; native of Maui.....variety  $\gamma$  **mauiensis**

Prostrate, trailing, glabrous, the slender stems divaricately branching, sarmentose, internodes often 1-1.3 dm long. Leaves undivided, narrowed below into a petiole  $\pm$  1 cm long; the blade coriaceous, oblong-linear or linear-lanceolate (rarely subspatulately so), crenulate-serrate, apically subacute, mostly 2-5.5 cm long and 6-12 mm wide. Whorls 2-flowered. Calyx as in *S. rugosa*, 1.2-1.6 cm long, the lower lobes slightly or much exceeding the tube; the usually glabrate pedicel and its linear, commonly basal bract about 5-7 mm long. Corolla puberulous, probably reddish-brown, about 2 cm long, the upper lip much exceeding the lower, filaments glabrate. Nuckles black, smoothish, obovate, about 4.2-4.4 mm long, the three faces similar. Native name (*vide Hillebrandii* Kew), *nehenehe*.

Type: collected by the U. S. Exploring Expedition, Waimea district, island of Hawaii, 1840 (U. S.).

Specimens examined: William Hillebrand, Hawaiian islands (Vienna, 2 sheets); U. S. Exploring Expedition, Hawaii, 1840 (type, U. S.; cotypes Gray; Kew, 2 sheets; New York).

Distribution: island of Hawaii.

***Stenogyne angustifolia* variety  $\beta$  *spathulata*** Sherff (fig. 23, b).

*Stenogyne angustifolia* variety *spathulata* Sherff, Bot. Gaz., vol. 96, p. 141, 1934.

Leaves spatulate, apically subobtusate, marginally somewhat more strongly serrate, the blade of the principal ones commonly 2-3 cm long and 7-9 mm wide. Calyx smaller, 8-10 mm long, at flowering about 0.65 shorter than the corolla; the nearly glabrate pedicel and basal bract minute,  $\pm$  3 mm long.

Type: collected by Jules Remy, no. 393, island of Hawaii, 1851-55 (Gray).

Specimens examined: Remy 393 (type, Gray).

Distribution: island of Hawaii.

***Stenogyne angustifolia* variety  $\gamma$  *mauiensis*** Sherff.

*Stenogyne angustifolia* variety *mauiensis* Sherff, Bot. Gaz., vol. 96, p. 141, 1934.

*Stenogyne angustifolia* variety  $\beta$  Hillebrand, Fl. Haw. Is., p. 357, 1888.



Leaves shorter, blades mostly 2-3.3 cm long. Whorls 2- or 4-flowered. Calyx 8-11 mm long, pedicel glabrate and 3-4 mm long; bract basal, capilliform,  $\pm$  1.5 mm long. Corolla hispid.

Type: collected by William Hillebrand, no. 77, at Makie's, eastern Maui (Berlin).

Specimens examined: Hillebrand 77 (type, Berlin).

Distribution: "Kula and Honuaula" (fide Hillebrandii), eastern Maui.

***Stenogyne angustifolia* variety  $\delta$  *Hillebrandii* Sherff (fig. 24).**



FIGURE 24.—*Stenogyne angustifolia* variety *Hillebrandii* (type).



*Stenogyne angustifolia* variety *Hillebrandii* Sherff, Bot. Gaz., vol. 96, p. 141, 1934.

*Stenogyne angustifolia* variety  $\gamma$  Hillebrand, Fl. Haw. Is., p. 357, 1888.

Leaves broader, often spatulate or narrow-obovate, shortly acuminate, blades becoming 3.5-4.5 cm long and 1.1-1.7 cm wide. Whorls 2-flowered. Corolla hispid, upper lip at least twice as long as lower. Pedicel pubescent, 2-4 mm long; the bract capilliform, usually attached above base of pedicel.

Type: collected by William Hillebrand on pali (cliff) of Kalaupapa, island of Molokai (Berlin).

Specimens examined: Hillebrand, pali (cliff) of Kalaupapa, Molokai (type, Berlin: cotype, U. S.).

Distribution: island of Molokai.

***Stenogyne angustifolia* variety  $\epsilon$  *Salicifolia* Sherff.**

*Stenogyne angustifolia* variety *Salicifolia* Sherff, Bot. Gaz., vol. 96, p. 141, 1934.

Leaves larger, blade linear-lanceolate, at both ends gradually or at base subabruptly narrowed, subobscurely serrate, 5-7 cm long and 9-12 mm wide. Calyx  $\pm$  1.5 cm long, about 0.4 shorter than the corolla; pedicel glabrous, 7-9 mm long; bract conspicuous, narrowly linear, 8-10 mm long.

Type: collected by William Hillebrand between Kilauea and Kapapala, island of Hawaii, 1868 (U. S.).

Specimens examined: Hillebrand, between Kilauea and Kapapala, Hawaii, 1868 (type, U. S.; cotype, Berlin).

Distribution: southeastern Hawaii.

***Stenogyne angustifolia* variety  $\zeta$  *Meeboldii*, new variety (fig. 25).**

Varietati *Salicifoliae* similis sed foliis numerosioribus glaucescens. Calyx glaucescens maximus, 1.6-2 cm longus et gutture  $\pm$  1 cm latus. Corolla circ. 2.5-2.7 cm longa.

Similar to variety *Salicifolia* but with leaves glaucescent and more numerous. Calyx glaucescent, gigantic, 1.6-2 cm long and in the throat  $\pm$  1 cm wide. Corolla about 2.5-2.7 cm long.

Type: collected by Alfred Meebold, altitude 3,000 feet, Huehue, island of Hawaii, May 1932 (Bishop).

Specimen examined: Meebold, altitude 3,000 feet, Huehue, Hawaii, May 1932 (Bishop, type).

Distribution: island of Hawaii.

**5. *Stenogyne purpurea* H. Mann.**

*Stenogyne purpurea* H. Mann, Amer. Acad., Proc., vol. 7, p. 193 (Enum. Haw. Pl., no. 354), 1867; Drake del Castillo, Illustr. Fl. Ins. Mar. Pacif., pl. 26, 1886.

*Stenogyne purpurea* variety *pedunculata* Wawra, Flora, vol. 55, p. 555. 1872; vol. 58, p. 286, 1875.

- a. Leaves ovate-lanceolate to ovate; mature calyx densely tomentose....variety  $\gamma$  **Forbesii**
- a. Leaves narrower, mature calyx more or less appressed-hispidulous
  - b. Leaf blades ovate-lanceolate to oblong-lanceolate, 6-11 cm long and 2-4.5 cm wide.....**S. purpurea**
  - b. Leaf blades lanceolate to narrowly oblong-lanceolate, commonly under 6 cm long and under 1.8 cm wide.....variety  $\beta$  **leptophylla**



FIGURE 25.—*Stenogyne angustifolia* variety *Meeboldii* (type).

Suffruticose, prostrate, divaricately branched, the purplish branches subtetragonal and at first hispidulous but finally often glabrate. Leaves undivided, the petiole weakly hispidulous and 0.8-2.5 cm long; the blade ovate-lanceolate or oblong-lanceolate, basally broad-cuneate to subtruncate, apically acuminate, marginally serrate sometimes sharply so, membranaceous, above glabrous or nearly so, below glabrate to moderately pubescent, 6-11 (rarely -14) cm long and 2-4.5 cm wide. Whorls commonly 6- rarely a very few 4- (or even 2-) flowered, the pubescent pedicels 2-7 mm long. Calyx appressed-hispidulous, 8-12 mm long, the narrowly acuminate lobes 0.3-0.9 as long as the tube. Corolla externally pubescent or hispid, purplish-red, 2-2.7 cm long, the upper lip 8-10 mm long and emarginate or perhaps sometimes entire, the lower  $\pm 0.5$  as long and obtusely lobed; style and filaments exserted. Nucules subglobose, purplish-black, about 6 mm long.

Type: collected by Horace Mann and W. T. Brigham, no. 552, altitude 2,000-3,000 feet, in mountains above Waimea, island of Kauai, (Gray).

Specimens examined: C. N. Forbes 821-K, 859-K, 975-K, Forbes 966-K, west side of Waimea drainage basin, Kauai, July 3 to August 18, 1917 (Bishop); Forbes 1104-K, same date and locality (Bishop, forma foliorum laminis usque ad 14 cm longis et ad 4 cm latis); A. S. Hitchcock 15396, 15434, altitude 3,600 feet, Kaholuamanu, Kauai, October 21, 1916 (U. S.); Hitchcock 15521, Kauluweiki swamp, Kauai, October 25, 1916 (U. S.); Valdemar Knudsen and Heinrich Wawra, Kauai, March 1870 (Berlin); J. M. Lydgate, Kaholuamanu, Kauai (Bishop); J. A. Kusche 102, high plateau of Waimea, Halemanu to Kaholuamanu, Kauai, 1919 (California); Horace Mann and W. T. Brigham 552 (type, Gray; cotypes, Cornell; Delessert; Field, 2 sheets; Missouri; New York; U. S.); C. Perkins, on Kaholuamanu above Waimea, Kauai (Field); J. F. Rock 2088, Halemanu, Kauai, February 14-26, 1909 (Gray); Rock 2094, same date and locality (Bishop); Rock 2095, same date and locality (Gray); Rock 2101, same date and locality (Bishop); Rock 8863 pro parte, Keaku Stream, higher plateau, Kauai, October 21, 1911 (Bishop); Carl Skottsberg 928, common at altitude of 1,100 meters in forest between Kokee and Kilohana, Waimea, Kauai, October 27, 1922 (Bishop); Skottsberg 929, between Kokee and Kilohana, October 27, 1922 (Bishop); Harold St. John and others 10686, Na Pali-Kona Forest Reserve, Kokee, Waimea, Kauai, December 26, 1930 (Bishop); St. John and others 10739, woods, northwest end of Alakai swamp, same locality, December 27, 1930 (Bishop); U. S. Exploring Expedition, mountains of Kauai, 1840 (U. S.); Heinrich Wawra 2076, Kauai (Vienna, 2 sheets; types of variety *brevipunctulata* Wawra).

Distribution: island of Kauai.

***Stenogyne purpurea* variety  $\beta$  *leptophylla* Sherff (fig. 26).**

*Stenogyne purpurea* variety *leptophylla* Sherff, Bot. Gaz., vol. 96, p. 142, 1934.

Leaf blades lanceolate or narrowly oblong-lanceolate, commonly under 6 cm long and under 1.8 cm wide.

Type: collected by J. F. Rock, no. 8863 pro parte, Keaku Stream, high plateau of island of Kauai, October 21, 1911 (Gray).

Specimens examined: J. A. Kusche 151, high plateau of Waimea, Halemanu to Kaholuamanu, Kauai, 1919 (California); J. F. Rock 5744, trailing on the ground, altitude 4,200 feet, forest back of Kaholuamanu, Kauai, September 1909 (Bishop, Gray); Rock 8863 pro parte (type, Gray; cotype, Bishop).

Distribution: island of Kauai.

***Stenogyne purpurea* variety  $\gamma$  *Forbesii* Sherff.**

*Stenogyne purpurea* variety *Forbesii* Sherff, Amer. Jour. Bot., vol. 21, p. 701, 1934.

Leaf blades ovate-lanceolate to ovate, softly and densely pubescent beneath; mature calyx tomentose.

Type: collected by Brodie, island of Kauai, 1909 (Bishop).

Specimens examined: Brodie, Kauai, 1909 (type, Bishop); C. N. Forbes 191-K, Wahiawa mountains, Kauai, August 1909 (Bishop, Missouri); J. M. Lydgate, same locality (Bishop).

Distribution: island of Kauai.

6. *Stenogyne kealiae* Wawra.

*Stenogyne kealiae* Wawra, Flora, vol. 55, p. 556, 1872.

*Stenogyne purpurea* variety *kealiae* Wawra, ex Hillebrand, Fl. Haw. Is., p. 357, 1888.



FIGURE 26.—*Stenogyne purpurea* variety *leptophylla* (type).

Subherbaceous, prostrate; stem and branches dark-purplish and obscurely tetragonal, very glabrous except as to the somewhat hispidulous nodes. Leaves undivided, the petiole glabrate, 2-3 cm long; the blade ovate or widely elliptic-lanceolate or more rarely narrow-obovate, basally broad-cuneate, apically acuminate, marginally subentire or toward the apex serrulate, coriaceous, glabrous, 7-11 cm long and 2.5-5 cm wide. Whorls apparently most often 4-flowered, the pubescent pedicels about 6-9 mm long, exceeding the slenderly linear-bracts. Calyx campanulate, mostly glabrous, 9-11 mm long, the lance-subulate lobes nearly as long as the tube. Corolla (only one found) purplish-red, externally hispid except near base,  $\pm$  1.4 cm long.

Type: collected by Heinrich Wawra, no. 2042, in mountain forests of Pohakupili near Kealia, northeastern Kauai, 1868-71 (Vienna, 2 sheets).

Specimens examined: C. N. Forbes 202-K, Wahiawa mountains, southern Kauai, August 1909 (Bishop, Missouri); Forbes 1038-K, Waimea drainage basin, west side, Kauai, July 3 to August 18, 1917 (Bishop); Wawra 2042 (Vienna, 2 type sheets).

Distribution: island of Kauai.

7. *Stenogyne kaalae* Wawra.

*Stenogyne kaalae* Wawra, Flora, vol. 55, p. 556, 1872; vol. 58, p. 286, 1875.

*Phacopsis montana* Nuttall ex Benthani, De Candolle, Prodr., vol. 12, p. 556, 1848 (nomen nudum).

*Stenogyne kaalae* Wawra, ex Jackson, in Ind. Kew., vol. 4, p. 989, 1895 (sphalm).

*Stenogyne kaalae* Wawra, ex Briquet, in Engler and Prantl, Natürl. Pflanzenf. IV, vol. 3-a, p. 222, 1897 (sphalm).

Leaves membranaceous to chartaceous, flat; nucules 6-10 mm long.....**S. kaalae**  
Leaves coriaceous, more or less rugose; nucules 4-4.5 mm long.....**variety  $\beta$  coriacea**

Glabrous, with habit of *S. purpurea*; stems and branches distinctly tetragonal, these and petioles becoming blackish-purple. Leaves lanceolate to ovate-lanceolate or oblong-lanceolate, membranaceous to chartaceous, at apex commonly acute or subacuminate, at margin closely crenate-dentate, at base rounded or cordate, glabrous or below rarely somewhat setose along the larger veins, blades 3.5-9 cm long and 1.2-3.7 cm wide, petioles 0.7-2 cm long. Whorls usually of 2, sometimes 4, rarely 6 flowers, the white-setose pedicels 4-7 mm long (and in the case of 4-6-flowered whorls grouped upon a common 2-3-flowered peduncle as in *Phyllostegia glabra*); bracts linear, minute. Calyx glabrous or nearly so, 10-14 mm long, the narrow, subulate lobes as long as the tube or longer. Corolla dark purplish-red, appressed-hispid above, glabrate below, about 1.8 cm long, the upper lip about 8 mm long, entire or slightly emarginate with the sinus minutely  $\pm$  2-denticulate, about twice as long as the lower lip. Annulus broken up into patches. Filaments glabrous. Nucules angular-convex, elongate, 6-10 mm long.

Type: collected by Heinrich Wawra, no. 2258, island of Oahu, presumably on Puu Kaala, 1868-71 (Vienna).

Specimens examined: H. F. Bergman, Puu Kaala, island of Oahu, February 11, 1928 (Bishop); Otto Degener 5399, on moderately dry, wooded ridge, Puu Kaala, February 11, 1928 (Field, forma floris in pedunculo 3-adgregatis); C. N. Forbes, Makaha Valley, Waianae mountains, Oahu, February 12-19, 1909 (Missouri); Forbes 1586-O, Popouwela, Waianae mountains, Oahu, April 27, 1910 (Bishop, Missouri); William Hillebrand, Hawaiian islands (U. S.); Hillebrand, Waianae mountains, Oahu, July 1869 (Berlin); J. M. Lydgate, Makaleha, Oahu, 1870 (Berlin); James Macrae, Oahu, May 1825 (Gray); Horace Mann and W. T. Brigham, Kaala (Waianae) mountains, Oahu (Cornell); Wawra 2258 (type, Vienna).

Distribution: island of Oahu.

***Stenogyne kaalae* variety  $\beta$  coriacea** Degener and Sherff.

*Stenogyne kaalae* variety *coriacea* Degener and Sherff, ex Degener, Fl. Haw. Is., September 13, 1935.

Stem and branches glabrate on angles but along center of each face and at nodes retrorsely more or less setose. Leaves coriaceous, somewhat shiny, at times becoming rugose. Corolla dull dark red, hispid with white hairs. Nucules obovate, only about 4-4.5 mm long (but in cross section and in color close to those of species proper).

Type: collected by Otto Degener, no. 5371, on lava flow between ohia and koa mills (opposite road leading to Hoopuloa), island of Hawaii, March 30, 1930 (Field).

Specimens examined: Degener 5371 (type, Field); Degener 5389, open, moderately dry forest, within Kokoolau Crater, Hawaii National Park, island of Hawaii, October 13, 1929 (Field).

Distribution: island of Hawaii.

**8. *Stenogyne bifida* Hillebrand.**

*Stenogyne bifida* Hillebrand, Fl. Haw. Is., p. 358, 1888.

Subherbaceous, prostrate; stems divaricately branching, angular, glabrous, 5-7.5 dm long. Leaves undivided, the petiole more or less hispid, 0.8-2.4 cm long; the blade lanceolate to ovate-lanceolate or rarely ovate, basally rounded or widely cuneate or in the widest leaves subtruncate, apically acuminate, marginally sharp-serrate, membranaceous, glabrous, 5-9 cm long and 1.6-4 cm wide. Whorls usually of 6, but often of 4, 8, or 10 flowers; pedicels pubescent, 2-4 mm long, often exceeded by the subulate and usually basal bracts. Calyx campanulate, glabrous, distinctly nerved, 6-12 mm long, the linear or subulate lobes longer than the tube. Corolla reddish, externally hispid-pubescent with more or less glandular hairs or perhaps sometimes glabrate, 1.4-1.8 cm long, the upper lip 6-8 mm long, acutely bifid, the lower about half as long, its middle lobe acute; filaments glabrate; stigmatic branches linear, about 1 mm long. Nucules plano-convex or angular-convex, obovate, apically somewhat roughened, black, 2.5-3 mm long.

Type: collected by William Hillebrand, island of Molokai (Berlin). The type sheet bears two specimens. An original label gives Maunahui and Kalae as the localities, but a later label says "Mopalehu auf Molokai." Hillebrand cited "Molokai! Kalae, Maunahui, Mopulehu" for the species.

Specimens examined: Otto Degener 5423, near Iaiianui, Molokai, May 18, 1928 (Field); C. N. Forbes 235-Mo, Pelekunu trail, Molokai, July 1912 (Bishop, Missouri); Forbes 417-Mo, Pukoo Ridge, Molokai, August 1912 (Bishop); William Hillebrand, Molokai, 1870 (Berlin, Gray, Kew); Hillebrand, Maunahui and Kalae (type sheet, Berlin; additional sheets without data, Leningrad, U. S.).

Distribution: island of Molokai.

**9. *Stenogyne Scrophularioides* Benth.**

*Stenogyne Scrophularioides* Benth., Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830; Lab., p. 655, 1835 (exclud. pl. *Menziesii*); De Candolle, Prodr., vol. 12, p. 556, 1848 (exclud. pl. *Menziesii*).

- a. Whorls 2-flowered.....variety  $\epsilon$  *biflora*
- a. Whorls 6-flowered
  - b. Principal leaves ovate
    - c. Blade of principal leaves commonly 2.5-3.7 cm long; calyx lobes obtuse; corolla 1.2-1.8 cm long.....**S. *Scrophularioides***
    - c. Blade of principal leaves 5-6 cm long; calyx lobes acute; corolla about 2.5 cm long.....variety  $\gamma$  *Remyi*
  - b. Principal leaves commonly oblong-lanceolate, the blade 4-7 cm long.....variety  $\delta$  *Skottsbergii*
- a. Whorls more numerous flowered; corolla subglabrous.....variety  $\beta$  *Nelsonii*

Subherbaceous, ascending or decumbent, the branches long-irrigate, tetragonal, now (especially when young) upon the faces subsparingly, but upon the angles copiously and retrorsely setose, now (when older) very glabrous, the internodes usually a little shorter than the leaves. Leaves dimorphous, flaccid, the weak petiole 0.7-1.5 cm long, the blade of lower leaves densely appressed-hispid on margins and veins but elsewhere sparsely so, subpedately 3-(5-) lobed with lobes incisely lobulate or dentate; of principal and upper leaves undivided, ovate, basally truncate (or more rarely rounded or widely cuneate) and apically acute, rather sharply crenate-serrate, glabrous or on margins more or less ciliate, mostly 2.5-3.7 cm long. Whorls 6-flowered, in axils of full-sized leaves. Calyx at flowering obconic but at fruiting globose, glabrous, with numerous but (especially above) indistinct nerves, shortly and obtusely toothed,  $\pm$  6 mm long; the pedicel delicate, glabrous, from 4-6 mm long at flowering to 12-14 mm long at fruiting. Corolla pubescent, reddish, 1.2-1.8 cm long, the lower lip half or more the length of the upper; filaments

almost glabrous. Nucules short, obovate, in cross section weakly triangulate, marginally alate, apically truncate, about 3.4 mm long. Native name (*vide Hillebrandii*), *mohihi*.

Type: collected by James Macrae, Byrns Bay (Hilo Bay), island of Hawaii, July 1825 (Kew).

Specimens examined: William Hillebrand, Hawaiian islands (U. S.); Hillebrand, Hilo, Hawaii (Berlin); Hillebrand 351, Hawaii (Kew); Hillebrand and J. M. Lydgate, Hilo, Hawaii (Bishop, 2 sheets); Lydgate, same locality, May 1871 (Berlin); Macrae, Byrns Bay (Hilo Bay), Hawaii (type, Kew; cotypes, Gray, Kew); U. S. Exploring Expedition, Hawaii, 1840 (Kew, New York, Paris); U. S. Exploring Expedition, in woods, Mauna Kea, Hawaii, 1840 (Gray, U. S.).

Distribution: island of Hawaii.



FIGURE 27.—*Stenogyne Scrophularioides* variety *Remyi* (type).

**Stenogyne Scrophularioides** variety  $\beta$  **Nelsonii** (Bentham) Sherff.

*Stenogyne Scrophularioides* variety *Nelsonii* (Bentham) Sherff, Amer. Jour. Bot., vol. 21, p. 701, 1934.

*Stenogyne Nelsonii* Bentham, Lab., p. 655, 1835; De Candolle, Prodr., vol. 12, p. 556, 1848.

*Stenogyne Scrophularioides* variety  $\beta$  A. Gray, Amer. Acad., Proc., vol. 5, p. 347, 1862.

Leaves larger; blade of principal ones subcoriaceous, somewhat flaccid, ovate, about 6-6.9 cm long and 3-3.3 cm wide. Whorls many- ( $\pm 12$ -) flowered. Corolla twice as long, subglabrous, 3-4 times as long as the longer calyx. Stamens and style long-exserted.

Type: collected by David Nelson, Hawaiian islands, 1778-79 (British).

Specimens examined: none. Mr. John Ramsbottom, Keeper of Botany at British Museum of Natural History, has supplied me with a sharp and excellent photograph of the Nelson material (three generous sprays on a single sheet). From this are taken certain details omitted in Bentham's original description.

Distribution: island of Hawaii (Hillebrand, Fl. Haw. Is., p. 358, 1888.)

**Stenogyne Scrophularioides** variety  $\gamma$  **Remyi** Sherff (fig. 27).

*Stenogyne Scrophularioides* variety *Remyi* Sherff, Bot. Gaz., vol. 96, p. 140, 1934; Drake del Castillo, Illustr. Fl. Ins. Mar. Pacif., pl. 25, 1886.

Leaves larger, the petiole very sparsely hispid, 1-1.5 cm long; the blade subglabrous, 5-6 cm long and 2.5-3.3 cm wide, the teeth sharper, shortly mucronulate. Whorls 6-flowered; calyx about 7 mm long, its lobes acute; pedicel at fruiting 6-12 mm long; corolla about 2.5 cm long, glabrate below and pubescent above.

Type: collected by Jules Remy, no. 376, island of Hawaii, 1851-55 (Gray).

Specimens examined: Remy 376 (type, Gray; cotype, Paris).

Distribution: known only from island of Hawaii.

**Stenogyne Scrophularioides** variety  $\delta$  **Skottsbergii** Sherff (fig. 28).

*Stenogyne Scrophularioides* variety *Skottsbergii* Sherff, Bot. Gaz., vol. 96, p. 140, 1934.

Leaf blades more often oblong-lanceolate and more rarely ovate, 4-7 cm long and 2-2.9 cm wide; lobes of calyx acute.

Type: collected by Charles Gaudichaud, Hawaiian islands, October 1836 (Berlin).

Specimens examined: C. N. Forbes 297-H, Kaalapuuwale, Kona, Hawaii, June 30, 1911 (Bishop); Gaudichaud, Hawaiian islands (type, Berlin; cotypes, Delessert, 2 sheets); Archibald Menzies, Hawaiian islands (Kew).

Named for Dr. Carl Skottsberg, who had studied the type in 1933 and referred it to *S. Scrophularioides*. Bentham's original description of *S. Scrophularioides* in the Botanical Register was based, however, on Macrae's plant, with obtuse calyx-lobes.

Distribution: known definitely only from island of Hawaii.





FIGURE 28.—*Stenogyne Scrophularioides* variety *Skottsbergii* (type).

**Stenogyne Scrophularioides** variety  $\epsilon$  **biflora** Sherff (fig. 29).

*Stenogyne Scrophularioides* variety *biflora* Sherff, Amer. Jour. Bot., vol. 21, p. 701, 1934.

Leaves numerous and exceeding the internodes; the blade round-ovate, basally subcordate, apically obtuse, above sparsely below somewhat more densely appressed-hispid,

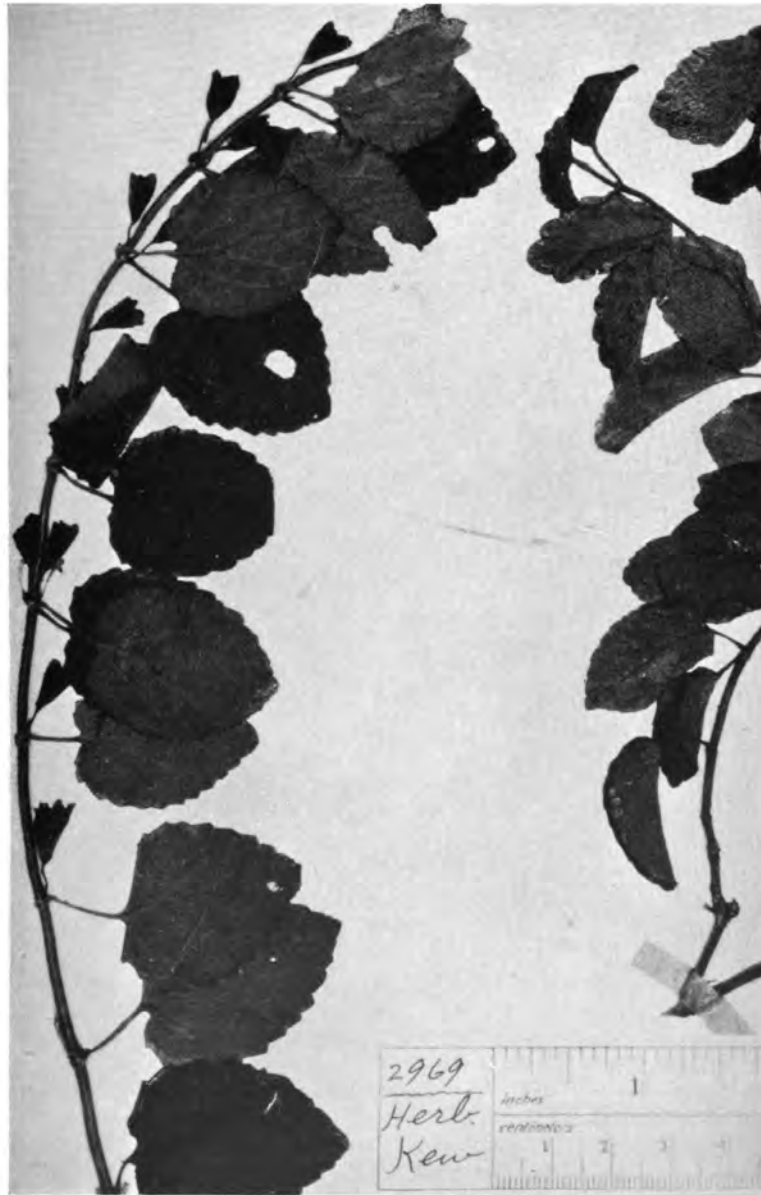


FIGURE 29.—*Stenogyne Scrophularioides* variety *biflora* (type).

2.5-3.7 cm long and 1.8-2.8 cm wide. Whorls 2-flowered, the pedicels pubescent. Calyx up to 1.2 cm long, the lobes more or less obtuse. Corolla not seen. Achenes oblong-cuneate, at apex irregularly corniculate, about 4 mm long.

Type: collected by William Hillebrand, no. 342, island of Hawaii (Kew).

Specimens examined: Hillebrand 342 (type, Kew).

Distribution: island of Hawaii.

10. *Stenogyne sororia* Sherff (fig. 30).

*Stenogyne sororia* Sherff, Bot. Gaz., vol. 96, p. 142, 1934.



FIGURE 30.—*Stenogyne sororia* (type).

Very glabrous throughout except the corollas. Leaves undivided, the petiole slender and less than 1.5 cm long; the blade thin, ovate, at base subcordate, at apex shortly acuminate, at margin remotely and weakly denticulate, about 3.5-4.5 cm long. Whorls 6-flowered. Calyx obconic, 1.2-1.4 cm long (including the large and very sharp teeth), the pedicel usually 7-9 mm long. Corolla (at least when immature) externally pubescent. Allied to (*sororia*) *S. Scrophularioides*.

Type: collected by William Hillebrand, Hawaiian islands (Kew).

Specimens examined: Hillebrand, Hawaiian islands (type, Kew).

Distribution: not exactly known.

11. *Stenogyne calycosa* Sherff (fig. 31).

*Stenogyne calycosa* Sherff, Bot. Gaz., vol. 96, p. 142, 1934.

*Stenogyne sessilis* variety  $\beta$  H. Mann, Amer. Acad., Proc., vol. 7, p. 193  
(Enum. Haw. Pl., sub no. 351), 1867.

*Stenogyne sessilis* variety  $\gamma$  Hillebrand, Fl. Haw. Is., p. 359, 1888.

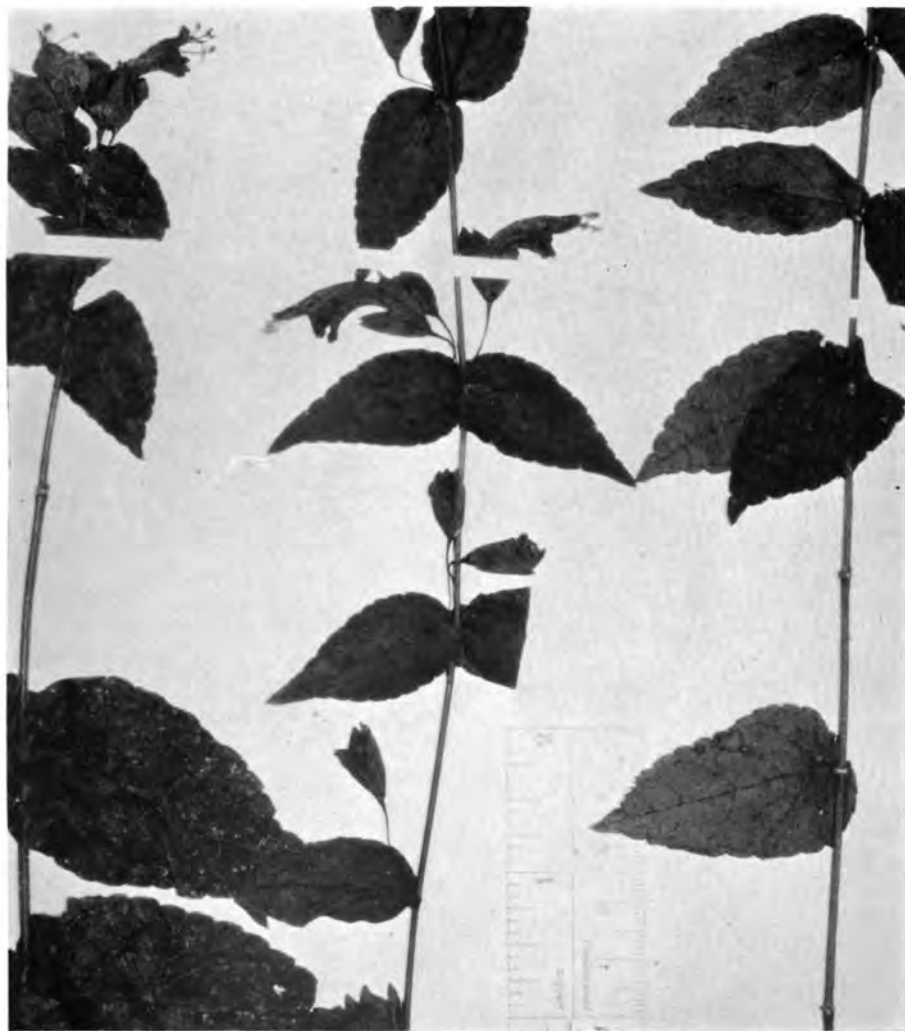


FIGURE 31.—*Stenogyne calycosa* (type).

Subherbaceous, decumbent, stems and branches very slender and elongate, subterete, purplish, very glabrous except for the hispid nodes. Leaves undivided, sessile, ovate-lanceolate, basally cordate, apically subobtuse to barely acute, marginally undulating and shallowly or subobsoletely crenate-denticulate, chartaceous, glabrous unless as to median

nerve above, not rugose, the nerves but slightly salient below, 4-6 cm long and 1.7-3.5 cm wide. Whorls 2-, but not rarely 4- or even 6-flowered, the filiform and more or less glabrous pedicels 0.8-1.8 cm long. Calyx tubular-campanulate, glabrate, 1.2-1.5 cm long, bilabiate to the middle, the upper lip subentire or shortly 3-dentate, the acute lobes of the lower lip somewhat longer. Corolla purplish-red, curved, externally more or less hispid especially above, 2.4-2.8 cm long, the lips nearly equal and with obtuse lobes; the style and pubescent filaments exserted; the stigmatic branches slender and  $\pm$  0.7 mm long. Nucules globose-obovate, black, about 6 mm long.

Type: collected by William Hillebrand, "Waiehee, Waihu, or Wailuku," western Maui, 1870 (Berlin).

Specimens examined: C. N. Forbes 229-M, in woods east of Makawao, east Maui, July 1910 (Bishop, Missouri); Forbes 2351-M, central ridge, Olowalu Valley, west Maui, May 12, 1920 (Bishop); Forbes 2377-M, ridge in Olowalu Valley, May 14, 1920 (Bishop); Forbes 2423-M, Maui (Bishop); Hillebrand, vicinity of Waihu (Waiehu), west Maui, 1870 (Berlin, type); Horace Mann and W. T. Brigham 406, in woods above Makawao, east Maui (Berlin; Bishop; Cornell; Gray; Kew, 2 sheets).

Distribution: island of Maui.

## 12. *Stenogyne sessilis* Benth.

*Stenogyne sessilis* Benth., Lab., p. 654, 1835; De Candolle, Prodr., vol. 12, p. 555, 1848.

*Stenogyne cordata* Benth., Lab., p. 654, 1835.

- a. Leaf blades mostly large, 2.5 cm or more long
  - b. Leaves closely sessile, apically narrowed and more or less acuminate, strongly rugose.....variety  $\gamma$  *lanaiensis*
  - b. Leaves sessile to short-petiolate, apically broad and obtuse or subacute, smooth or only weakly rugose
    - c. Whorls mostly 2- more rarely 4-flowered; calyx lobes mostly obtuse to subacute, rarely acute.....**S. sessilis**
    - c. Principal whorls 6- the upper 4-2-flowered; calyx lobes commonly acute.....variety  $\beta$  *hexantha*
- a. Leaf blades small, mostly less than 2 cm long.....variety  $\delta$  *Wilkesii*

Ascending or procumbent, stem and branches acutely tetragonal, glabrous or at the nodes pilose, minutely and sparsely often antrorse-spinulose on the angles. Leaves commonly numerous and exceeding the internodes, undivided, sessile or the lower ones shortly petiolate with petioles up to 4 mm long, variously cordate or rotund-cordate, at apex usually obtuse, at margin clearly or obsoletely crenate and more or less revolute, coriaceous and sometimes subrugose, glabrous or nearly so, 2-4.8 cm long and 1.5-3.8 cm wide. Whorls 2- or more rarely 4-flowered, the pedicels pubescent and  $\pm$  4 mm long, their bracts narrowly linear and usually much shorter. Calyx campanulate, irregularly bilabiate, moderately or sparsely hispid, 1-1.3 cm long, the nerves at times conspicuous, the unequal lobes broad or narrow and blunt or subacute, or rarely acute, usually under 4 mm long. Corolla curved, externally pubescent, purple, about 2-2.2 cm long, the upper lip barely emarginate and usually twice the length of the lower; filaments glabrous above, scarcely exceeding corolla's upper lip; stigmatic branches thick-subulate, about 0.6 mm long. Nucules black, obovate, 4.5-5.2 mm long.

Type: collected by Archibald Menzies, Hawaiian islands, 1792-94 (British).

Specimens examined: C. N. Forbes 155-H, Hanehane, Kona, Hawaii, June 15, 1911 (Bishop, Missouri); Forbes 276-H, Kaalapuuwale, Kona, June 29, 1911 (Bishop, Missouri); Forbes 316-H, Papaloa, Kona, July 15, 1911 (Bishop); Forbes 800-H, Halealoha,



FIGURE 32.—*Stenogyne sessilis* variety *hexantha* (first type sheet).

Hawaii, June 10, 1915 (Bishop, Missouri); Forbes 908-H, above Kipuka Ahiu, Hawaii, June 23, 1915 (Bishop); Forbes 929-H, kipuka, lava flow below Kipuka Ahiu, June 24, 1915 (Bishop); Forbes 2437-M, Olowalu Valley, west Maui, May 21, 1920 (Bishop); William Hillebrand, summit of Puu Kukui, west Maui, August 1870 (Berlin, Gray); Hillebrand 343, central plateau and crater of Kilauea, Hawaii (Kew); Hillebrand and J. M. Lydgate, south Kona, Hawaii (Bishop); Archibald Menzies, Hawaiian islands, 1792-94 (herb. Hookeri in Kew, cotype); J. F. Rock 3483, Puu Laalau, west slope of Puu Hualalai, Hawaii, June 10, 1909 (Gray); Rock 3484, west slope of Hualalai, Puu Laalau and Moanuahea, June 10, 1909 (Bishop); Rock 3674, above Moanuahea, Puu Hualalai, June 10, 1909 (Gray); Rock 3676, same date and locality (Bishop); Carl Skottsberg 622, altitude 1,200 meters in forest on a-a, Puu Hualalai, September 23, 1922 (Bishop).

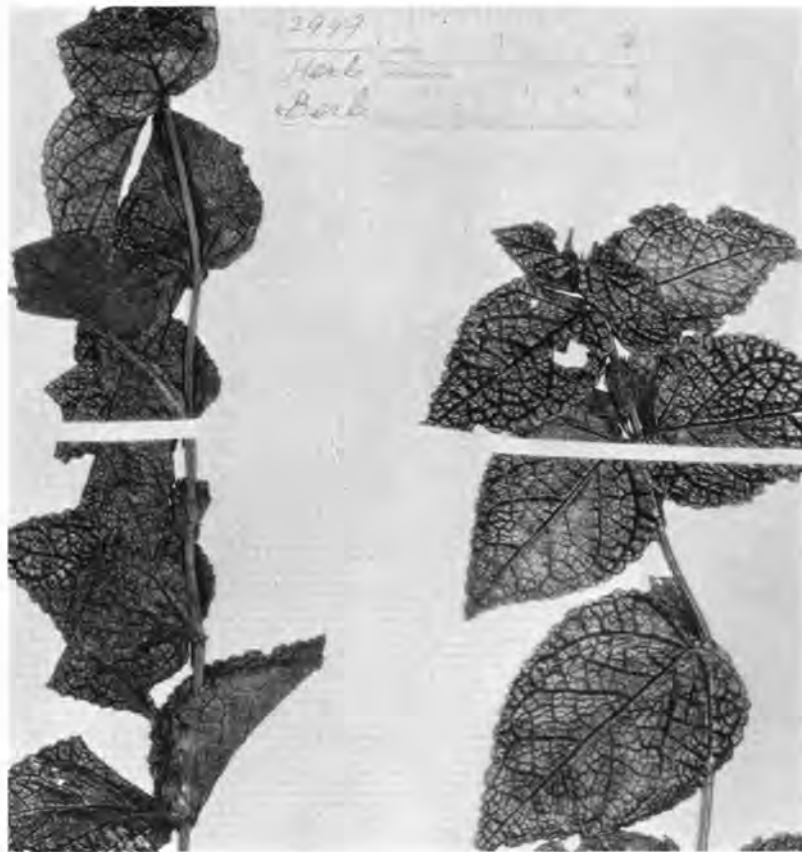


FIGURE 33.—*Stenogyne sessilis* variety *lanaiensis* (type).

The type sheet of *S. cordata* Benthams bears six well-preserved sprays. These have smaller leaves than does the type of *S. sessilis*, but the two forms are seen from various more recently collected specimens to be merely different states of the same species. I have before me excellent photographs of the

type sheets of both *S. sessilis* and *S. cordata*, kindly procured for me by Mr. John Ramsbottom, Keeper of Botany at British Museum of Natural History.

Distribution: western Maui and the island of Hawaii.

***Stenogyne sessilis* variety  $\beta$  *hexantha* Sherff (fig. 32).**

*Stenogyne sessilis* variety *hexantha* Sherff, Bot. Gaz., vol. 96, p. 142, 1934.

Leaves commonly short-petiolate, the petiole 2-5 mm long. Principal whorls 6- the upper 4-2-flowered. Calyx at anthesis about 8 mm long, the lobes acute.

Type: collected by J. F. Rock, no. 10036, Puu Lehua, between Mauna Loa and Puu Hualalai, Hawaii (Gray, 2 sheets).

Specimens examined: Urbain Faurie 899, Mauna Kea, Island of Hawaii, July 1909 (British; Delessert, 4 sheets); Rock 10036 (type, Gray, 2 sheets; cotypes, Bishop, 2 sheets).

Perhaps not to be separated from the species proper.

Distribution: island of Hawaii.

***Stenogyne sessilis* variety  $\gamma$  *lanaiensis* Sherff (fig. 33).**

*Stenogyne sessilis* variety *lanaiensis* Sherff, Bot. Gaz., vol. 96, p. 142, 1934

*Stenogyne sessilis* variety  $\beta$  Hillebrand, Fl. Haw. Is., p. 359, 1888.

Subherbaceous, decumbent, 5-7.5 dm long, the branches glabrous except for the hispid nodes. Leaves sessile, ovate-cordate, acute or barely acuminate, crenate, subcoriaceous, rugose, the nerves impressed above and strongly salient underneath, 3-6.5 cm long and 2.5-4.7 cm wide. Whorls of 4 or 6 flowers; the pedicels weakly pubescent, 4-6 mm long. Calyx glabrous, green, prominently nerved, 12-16 mm long, bilabiate, the lobes acuminate and of variable length. Corolla reddish, hispid, twice as long as the calyx, the lips of nearly equal length.

Type: collected by William Hillebrand, on central or highest ridge of Lanai, July 1870 (Berlin).

Specimens examined: Hillebrand, Lanai, July 1870 (type, Berlin; cotype, Gray).

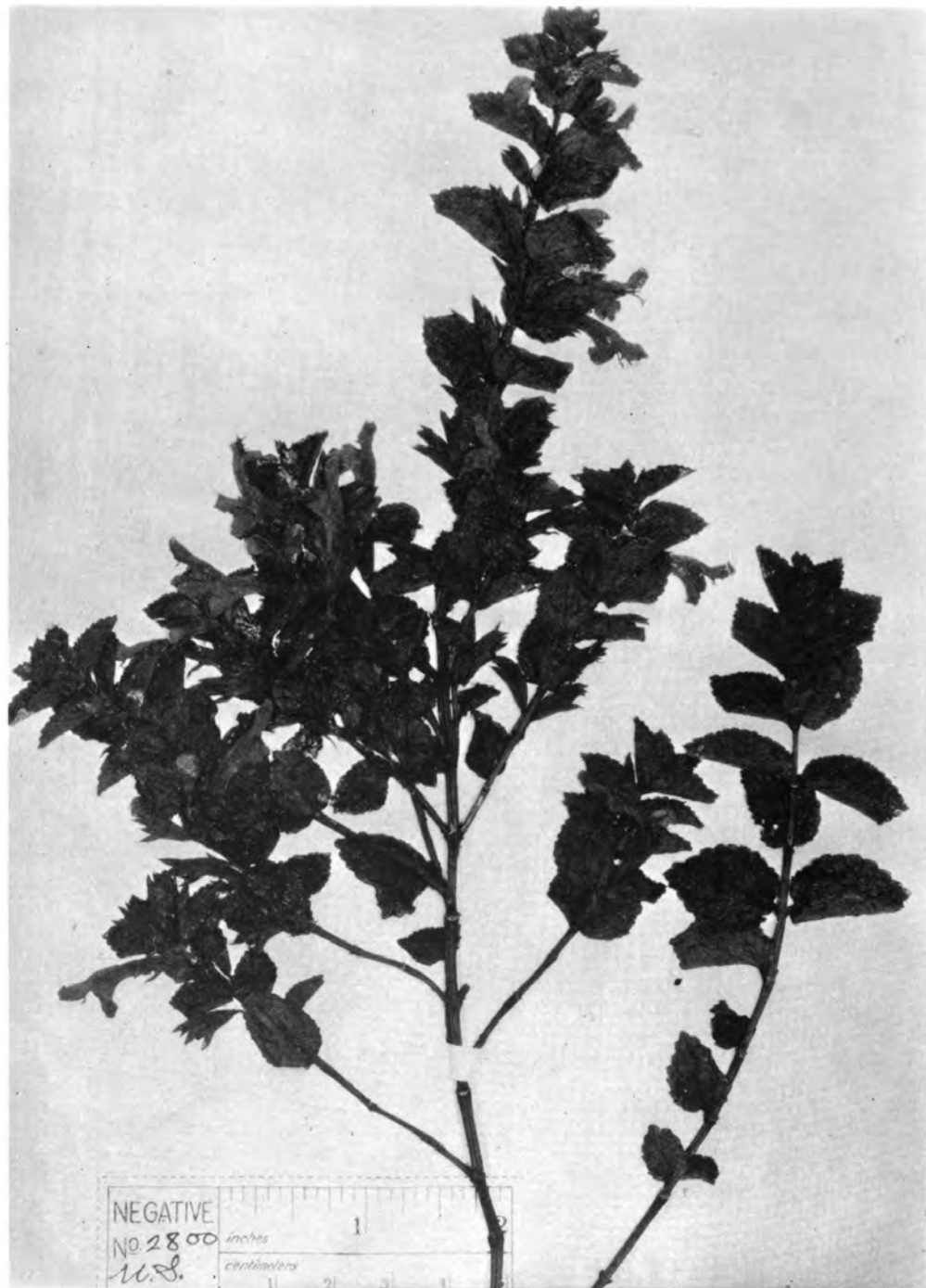
Distribution: island of Lanai.

***Stenogyne sessilis* variety  $\delta$  *Wilkesii*, new variety (fig. 34).**

Valde ramosa,  $\pm 2$  dm alta, caulibus ramisque acute tetragonis et plus minusve glabris (nodis hispidis barbatisve exceptis). Folia numerosa, sessilia vel subpetiolata, ovata, basi cordata, crenulata, coriacea, plus minusve sparsim setulosa, 1.2-2 cm longa. Verticillastra 2-6-flora; pedicellis hispidis, 2-5 mm longis. Calyx manifeste nervius, sparsim hispidus, 10-12 mm longus, irregulariter lobatus; lobis acutis, anterioribus inferioribusve tubo aequalibus. Corolla purpureo-rubra, externe (supra dense) pubescens, exannulata, circ. 2-2.3 cm longa; labro superiore circ. 5-6.5 mm longo; inferiore vix brevior et lobis rotundato.

Much branched,  $\pm 2$  dm tall, the stems and branches acutely tetragonal and glabrous or nearly so except as to the hispid or barbed nodes. Leaves numerous, sessile or subpetiolate, ovate, basally cordate, crenulate, coriaceous, more or less sparsely setulose, 1.2-2 cm long. Whorls 2-6-flowered; the pedicels hispid, 2-5 mm long. Calyx distinctly nerved, sparsely hispid, 10-12 mm long, irregularly lobed, the lobes acute, the forward or lower ones equaling the tube. Corolla purplish-red, externally pubescent (densely so above), exannulate, about 2-2.3 cm long, the upper lip about 5-6.5 mm long, the lower nearly as long and with rounded lobes.



FIGURE 34.—*Stenogyne sessilis* variety *Wilkesii* (type).

Type: collected by the U. S. Exploring Expedition, Waimea, island of Hawaii, 1840 (U. S.).

Specimens examined: U. S. Exploring Expedition, Waimea, Hawaii, 1840 (type, U. S.; cotype, Gray).

Appears to be sufficiently distinct, in its smaller leaves and dwarf habit, from the small-leaved (*S. cordata*) state of *S. sessilis* proper.

Distribution: island of Hawaii, northern part.

## Section 2. SCANDENTES Hillebrand

Section 2. *Scandentes* Hillebrand, Fl. Haw. Is., p. 360, 1888 (exclud. *Microphyllas*).

Diffusely and divaricately branching, generally climbing. Leaf blades commonly 3 cm or more long. Corolla pale purplish or pale yellowish. Stamens and style long-exserted.—Nos. 13-19.

### 13. *Stenogyne viridis* Hillebrand.

*Stenogyne viridis* Hillebrand, Fl. Haw. Is., p. 361, 1888.

Shrubby, far spreading or perhaps scandent, the slender subtetragonal curved and divaricately branching stems subglabrous or pubescent; the branches short, leafy, and pubescent. Leaves undivided, the petiole slender, pubescent, 1-2.4 cm long; the blade very membranaceous, when fresh bright green and glossy, glabrous or nearly so, broadly ovate-cordate (or at base truncate) and apically obtuse, or at times deltoid-lanceolate (and acute) or suborbicular, rather conspicuously crenate, 2-4 cm long and 1.3-3.5 cm wide. Whorls 2-flowered; pedicels hispid, 2-5 mm long. Calyx slender-obconic, glabrate or puberulous, prominently nerved, 8-12 mm long, its lobes linear-lanceolate, as long as the tube or longer. Corolla narrow, suberect, hispidulous, pale purple or greenish, 1.7-2 cm long, the lower lip very short, 3-toothed; filaments hispid, long-exserted; stigmatic branches thickish-linear, under 0.5 mm long.

Type: collected by William Hillebrand, in the forests of Kaanapali, western Maui, 1870 (Berlin).

Specimens examined: Hillebrand, forests of Kaanapali, Maui, 1870 (type, Berlin; cotype, Gray).

Distribution: western Maui.

### 14. *Stenogyne haliakalae* Wawra.

*Stenogyne haliakalae* Wawra, Flora, vol. 55, p. 533 (nom.), 554, 1872; vol. 58, p. 286, 1875.

Probably scandent, stems and branches subtetragonal, scurfy-pubescent, above or toward ends when young densely retrorse-hispid, glabrate below. Leaves undivided, the petiole sparsely or densely hispid and 0.5-1.8 cm long; the blade ovate or oblong-ovate, basally rounded or truncate, apically short-acuminate, marginally crenate-serrate, thin-nish, above flat (or rarely rugose) and finally glabrous or especially along nerves sub-appressed-hispid, below densely soft-pubescent and commonly veiny, mostly 4-6 cm long and 2.5-4.5 cm wide. Whorls mostly 6-flowered, the pedicels pubescent and 3-8 mm long. Calyx small, urceolate-obconic, densely velvety-pubescent, about 5-7 mm long, the broad and often reflexed teeth half to fully as long as the tube. Corolla uniformly and densely velvety-pubescent on entire exterior (appearing silken-woolly in bud), about 3 cm long,

distended in the throat, the upper lip about 1-1.2 cm long, the lower lip usually somewhat shorter; the glabrate style and hispid filaments long-exserted, the stigmatic branches oblong-linear or lanceolate-linear and under 1 mm long. Nucules black, obovate, rounded at top, about 4-4.5 mm long.

Type: collected by Heinrich Wawra, no. 1928, island of Maui, 1868-71 (Vienna, 2 sheets).

Specimens examined: C. N. Forbes 1833-M, east of Puu Pane, south slope of Haleakala, east Maui, March 4, 1920 (Bishop); Forbes 1908-M, Lualailua, south slope of Haleakala, March 17, 1920 (Bishop); William Hillebrand, east Maui (Berlin, Vienna, U. S.); Hillebrand, southern Haleakala, east Maui, 1871 (Berlin); Hillebrand 340, altitude 3,000-4,000 feet, southern Haleakala, Maui (Gray, Kew); Hillebrand and J. M. Lydgate, slopes of Haleakala (Bishop); Horace Mann and W. T. Brigham 402, altitude 4,000 feet, Ulupalakua, east Maui (Bishop; Cornell; Delessert; Field, 2 sheets; Gray; Kew; Missouri; New York; U. S.); Wawra 1928 (type, Vienna, 2 sheets; cotype, Leningrad); Wawra 2311, Maui (Vienna, cited by Wawra).

Confused by Mann (Amer. Acad., Proc., vol. 7, p. 193, and Enum. Haw. Pl., sub no. 348, 1867) with *S. macrantha*, from which the characters of the calyx and corolla sharply separate it. Confused by Hillebrand (Fl. Haw. Is., p. 360, 1888) with *S. rotundifolia*, from which it differs distinctly in leaf, calyx, and other characteristics.

Distribution: eastern Maui.

#### 15. *Stenogyne macrantha* Benth (fig. 35).

*Stenogyne macrantha* Benth, Bot. Reg., vol. 15, no. 1292, sub Tribo 6, Prasieae, 1830; Lab., p. 654, 1835; De Candolle, Prodr., vol. 12, p. 555, 1848.

- a. Upper surface of leaves densely long-hispid..... **S. macrantha**
- a. Upper surface of leaves sparsely setose or glabrate
  - b. Leaf blades ovate
    - c. Leaf blades under 5.5 cm long and 3.5 cm wide; calyx 7-8 mm long..... **variety  $\beta$  Grayi**
    - c. Leaf blades often 6-8 cm long and 3.5-5 cm wide; calyx 8-10 mm long..... **variety  $\gamma$  latifolia**
  - b. Leaf blades oblong or ovate-oblong
    - c. Leaf blades glabrous or glabrate beneath..... **variety  $\delta$  gracilis**
    - c. Leaf blades hispid beneath..... **variety  $\delta$  gracilis f. 1. hispida**

Trailing on ground, very hirsute, stem and branches subtetragonal to subterete, the whitish hairs retrorse-spreading. Leaves undivided, the petiole slender, 1.5-2.5 cm long, the hairs retrorse-spreading; the blade ovate, basally cordate, apically acute, marginally serrate with teeth abruptly mucronulate, thinnish, on both surfaces densely hairy with long, appressed hairs, 3-5 cm long and 2-4 cm wide. Whorls lax, 6-flowered, the pedicels hairy with weakly retrorse hairs and 1-1.3 cm long. Calyx tubular-obconic, hairy, weakly nerved, 1-1.3 cm long, the narrowish subacute or even acute teeth mostly 2-3 mm long. Corolla curved, on outer surface glabrate below but densely woolly-hirsute above, yellow or toward apex brownish on one side, 3-4 cm long, the lips  $\pm$  9 mm long, the upper at times scarcely as long as the lower, the throat dilated; filaments pubescent except toward top; stigmatic branches linear,  $\pm$  0.5 mm long.

Type: collected by James Macrae, at Mauna Kea ("Mt. Kaah"; erroneously spelled throughout by Benth "Mt. Raah"), island of Hawaii, 1825.

Specimens examined: Otto Degener 5371, trailing over lava flow, between ohia and koa mills (opposite road leading to Hoopuloa), island of Hawaii, March 30, 1930 (Field).



FIGURE 35.—*Stenogyne macrantha* (Degener 5371, Field Museum).

Asa Gray (Amer. Acad., Proc., vol. 5, p. 346, 1862) and Hillebrand (Fl. Haw. Is., p. 360, 1888) admitted Remy 381 more or less interrogatively to this species. Neither had seen Bentham's type, nor have I. The finding of Degener's interesting plant, however, matching essentially as it does the type description, enables us to definitely exclude the Remy plant, referring it (as

Horace Mann very properly did) to variety *Grayi*. The species proper has a hairiness very suggestive of that on *Phyllostegia vestita*. The upper surface of the leaves is densely long-hairy (not glabrate or very sparsely hairy as in variety *Grayi*), the calyx 1-1.3 cm (not 7-8 mm) long, the pedicel 1-1.3 cm (not 6-8 mm) long, the corolla 3-4 cm (not under 2.5 cm) long, etc.

Distribution: island of Hawaii.

***Stenogyne macrantha* variety  $\beta$  *Grayi* H. Mann.**

*Stenogyne macrantha* variety *Grayi* H. Mann, Amer. Acad., Proc., vol. 7, p. 193 (Enum. Haw. Pl., sub no. 348), 1867; Drake del Castillo, Illustr. Fl. Ins. Mar. Pacif., pl. 23, 1886.

Leaves densely short-hairy beneath, glabrate or with a few appressed hairs above. Calyx 7-8 mm long, the teeth mostly 1-2 mm long; the pedicel 6-8 mm long. Corolla under 2.5 cm long. Nucules black, obovate, triangular-swollen in cross section, 6 mm long.

Type: collected by Jules Remy, no. 381, island of Hawaii, 1851-55 (Gray).

Specimens examined: Remy 381 (type, Gray).

Distribution: island of Hawaii.

***Stenogyne macrantha* variety  $\gamma$  *latifolia* Hillebrand.**

*Stenogyne macrantha* variety *latifolia* Hillebrand, Fl. Haw. Is., p. 360, 1888.

*Stenogyne Scrophularioides* variety  $\gamma$  H. Mann, Amer. Acad., Proc., vol. 7, p. 193 (Enum. Haw. Pl., sub no. 353), 1867.

Stem and elongate branches short-hispid, often sparsely so. Leaves larger, the blade often 6-8 cm long and 3.5-5 cm wide, densely short-hispid below, finally subglabrate or very sparsely setose above, noticeably thin, coarsely serrate. Calyx 8-10 mm long, the lobes broad or narrow but usually acute, pedicel 10-14 mm long. Corolla 1.2-2 cm long, the lower lip nearly as long as the upper and with obtuse lobes. Nucules orbicular-obovate, about 6 mm long.

Type: collected by William Hillebrand, no. 339, in vicinity of Mauna Kea, island of Hawaii (Gray).

Specimens examined: Hillebrand, island of Hawaii (Vienna); Hillebrand 339 (type, Gray; cotype, Kew); Kenway and Parkers, Hamakua, Hawaii, 1862 (Berlin); J. M. Lydgate, Mauna Kea, Hawaii (Berlin).

Distribution: island of Hawaii.

***Stenogyne macrantha* variety  $\delta$  *gracilis* Sherff.**

*Stenogyne macrantha* variety *gracilis* Sherff, Bot. Gaz., vol. 96, p. 140, 1934.

Suffruticose, scandent, the branches elongate glabrous and slender, the internodes often 8-10 cm long. Leaf blades oblong or ovate-oblong, at the base truncate-rounded, at the apex shortly acuminate, membranaceous, glabrate, pale, 6-7.5 cm long and 2.7-4 cm wide; the petioles 1-2.5 cm long. Whorls 6- or sometimes 4-flowered, the fruiting pedicels 1-1.5 cm long; calyx campanulate, glabrate, sharply and irregularly lobed (lobes 2-5 mm long included) 6-7 more rarely up to 9 mm long; corolla (at least when dry) yellowish-white, toward bottom perhaps weakly tinted reddish, externally very silken-woolly, much expanded in the throat, about 2 cm long, the lower lip much shorter than the upper; filaments pilose.

Type: collected by J. F. Rock, no. 10037, Hawaiian islands (Gray, 2 sheets).

Specimens examined: Rock 10037 (type, Gray, 2 sheets; cotypes, Bishop, 3 sheets).

Distribution: island of Hawaii.

***Stenogyne macrantha* variety  $\delta$  *gracilis* form 1 *hispida* Sherff.**

*Stenogyne macrantha* variety *gracilis* form *hispida* Sherff, Bot. Gaz., vol. 96, p. 141, 1934.

Stems and branches more or less retrorsely hispid, the internodes a little shorter, the leaves green, often subrugose, hispid, and often more veiny underneath. Calyx finally 1-1.2 cm long, subequal to the pedicel. Corolla narrower, 2.5-3 cm long.

Type: collected by J. F. Rock, no. 3511, Puu Laalau, west slope of Hualalai, island of Hawaii, June 10, 1909 (Gray).

Specimens examined: J. F. Rock 3509, 3510, 3514, Puu Laalau, west slope of Hualalai, Hawaii, June 10, 1909 (Bishop); Rock 3511 (type, Gray); Rock 3513, Puu Laalau,

west slope of Hualalai, Hawaii, June 10, 1909 (Gray).

Distribution: island of Hawaii.

**16. *Stenogyne rotundifolia* A. Gray.**

*Stenogyne rotundifolia* A. Gray, Amer. Acad., Proc., vol. 5, p. 347, 1862; ex Bentham, in Hooker, Icon., vol. 13, pl. 1248, 1877.

*Stenogyne rotundifolia* variety *montana* Hillebrand, Fl. Haw. Is., p. 361, 1888.

Leaves ovate-orbicular, the blade 2-3.8 cm long.....***S. rotundifolia***  
 Leaves oblong to oblong-ovate, the blade 4-5.5 cm long.....**variety  $\beta$  *oblonga***

A large, diffusely branching shrub, far spreading and usually forming a dense matting over neighboring shrubs, at times dwarfed and with stiff branches rising from a woody base. Branches sharply tetragonal, pubescent or hispid with spreading or retrorse hairs. Leaves usually numerous and exceeding the internodes, undivided, the hispid petiole 0.8-1.8 mm long; the blade ovate-orbicular, basally more often subcordate or truncate, apically very blunt, marginally crenate-dentate or -serrate, sparsely appressed-hispid or at times rather glabrate, often rugose-veiny, 2-3.8 cm long and nearly as wide. Whorls 4-6-flowered, the pedicels more or less hispid, 5-7 mm long. Calyx urceolate or campanulate, glabrate or pubescent, 5-9 mm long, the nerves from distinct to obscure, the lobes from triangular and subobtusate to narrow and acute or mucronulate. Corolla curved, densely villous with a whitish wool, 2-3.2 cm long, the lips pale purple, the upper easily longer, the lower about 6-7 mm long with broad, deltoid, obtuse lobes; filaments villous except near top; stigmatic branches linear, under 1 mm long; nucules thick-cuneate, irregularly angular, apically more or less mucronate, blackish (or when fresh waxy-white), 4 mm long.

Type: collected by the U. S. Exploring Expedition, crater of Haleakala, eastern Maui, 1840 (U. S.).

Specimens examined: H. F. Bergman, in moist forest above Olinda, east Maui, December 29, 1927 (Bishop); Otto Degener 5439, Haleakala Crater, east Maui, August 10, 1927 (Field); Degener 5440, wind- and fog-swept region, Koolau Gap, Haleakala Crater, August 11, 1927 (Field); C. N. Forbes 797-M, east of Ukulele, east Maui, July 16, 1919 (Bishop); Forbes 980-M, same locality, July 30, 1919 (Bishop); Forbes 1002-M, Keanae (Koolau) Gap, Haleakala Crater, August 2, 1919 (Bishop); Forbes 1024-M, same locality, August 3, 1917 (Bishop); Forbes 1027-M, Keanae (Koolau Gap), Halehaku, August 3, 1919 (Bishop); Forbes 1029-M, Keanae Gap, same date (Bishop); Forbes

1037-M, same locality, August 2, 1919 (Bishop); Forbes 1114-M, Kaupo Gap, Haleakala Crater, August 10, 1919 (Bishop); Forbes 1150-M, north slope of Haleakala, August 15, 1919 (Bishop); J. M. Lydgate, Haleakala (Berlin); Horace Mann and W. T. Brigham 403, altitude 6,000-7,000 feet, northwest side of Haleakala (Bishop; Cornell; Delessert; Field, 2 sheets; Gray; Kew; Missouri; New York; U. S.); U. S. Exploring Expedition, Haleakala Crater, 1840 (type U. S.; cotypes, Gray; Kew).

Distribution: eastern Maui.

**Stenogyne rotundifolia** variety  $\beta$  **oblonga** Sherff (fig. 36).

*Stenogyne rotundifolia* variety *oblonga* Sherff, Amer. Jour. Bot., vol. 21, p. 701, 1934.

Leaves larger, petiole up to 2.5 cm long; blade oblong to oblong-ovate, 4-5.5 cm long and 2-3.3 cm wide.

Type: collected by C. N. Forbes, no. 1112-M, Kaupo Gap, Haleakala Crater, eastern Maui, August 10, 1919 (Bishop).

Specimens examined: Forbes 1112-M (type, Bishop; cotypes, Field, Kew).

Distribution: eastern Maui.

17. **Stenogyne glabrata** (Hillebrand) Sherff.

*Stenogyne glabrata* (Hillebrand) Sherff, Amer. Jour. Bot., vol. 21, p. 701, 1934.

*Stenogyne rotundifolia* variety *glabrata* Hillebrand, Fl. Haw. Is., p. 361, 1888.

Branches subacutely tetragonal, more or less sulcate along middle of each face, glabrate or very sparsely appressed-setose with more or less retrorse hairs. Leaves undivided, the slender petiole sparsely spreading-hispid; the blade apparently ovate, at base widely cuneate to probably rounded, at apex probably acute to acuminate, sparsely appressed- to subappressed-hispid on both surfaces. Whorls 4- or apparently more often 6-flowered; the pedicels glabrate, about 4-6 mm long. Calyx distinctly and numerously nerved, 8-10 mm long, the lobes narrow, acute, often elongate and 2-4 mm long. Corolla pale purplish (at least when dried), with complete annulus, externally pubescent especially above and along the back, the tube ampliate above and 2.1-2.4 cm long, the upper lip 6-8 mm long; style and spreading-pilose filaments exerted, the slender style-branches under 0.5 mm long.

Type: collected by J. M. Lydgate, no. 65-b, Kula, eastern Maui (Berlin).

Specimens examined: Lydgate 65-b (type, Berlin).

The type is a mere fragment, consisting of a piece of stem about 1.5 dm long, with two short flowering branches each less than 6 cm long. The remaining foliage has a bluish-green color beneath and, together with the calyces, offers a faint though false suggestion of glaucescence.

Distribution: eastern Maui.

18. **Stenogyne cinerea** Hillebrand.

*Stenogyne cinerea* Hillebrand, Fl. Haw. Is., p. 361, 1888.

Branches pubescent with mostly retrorse hairs. Leaves undivided, the slender petiole  $\pm$  3 cm long and tomentose with hairs often gland-tipped; the blade ovate, at base cor-

date or truncate, at apex subacute to perhaps acuminate, at margin crenate-serrate, membranaceous, softly grayish-tomentose on both surfaces,  $\pm 6$  cm long and  $\pm 3$  cm wide. Whorls of 6 or even only 2 flowers, the pedicels tomentose and 0.5-2 mm long, equaled or exceeded by their subulate, tomentose bracts. Calyx distinctly costate, densely pubescent with mostly suberect hairs, about 7-8 mm long, the linear and acute lobes equalling or exceeding the tube. Corolla pale, externally pubescent, the tube about 8 mm long and nearly equaled by the upper lip, lower lip very short, its 2 lateral teeth broad

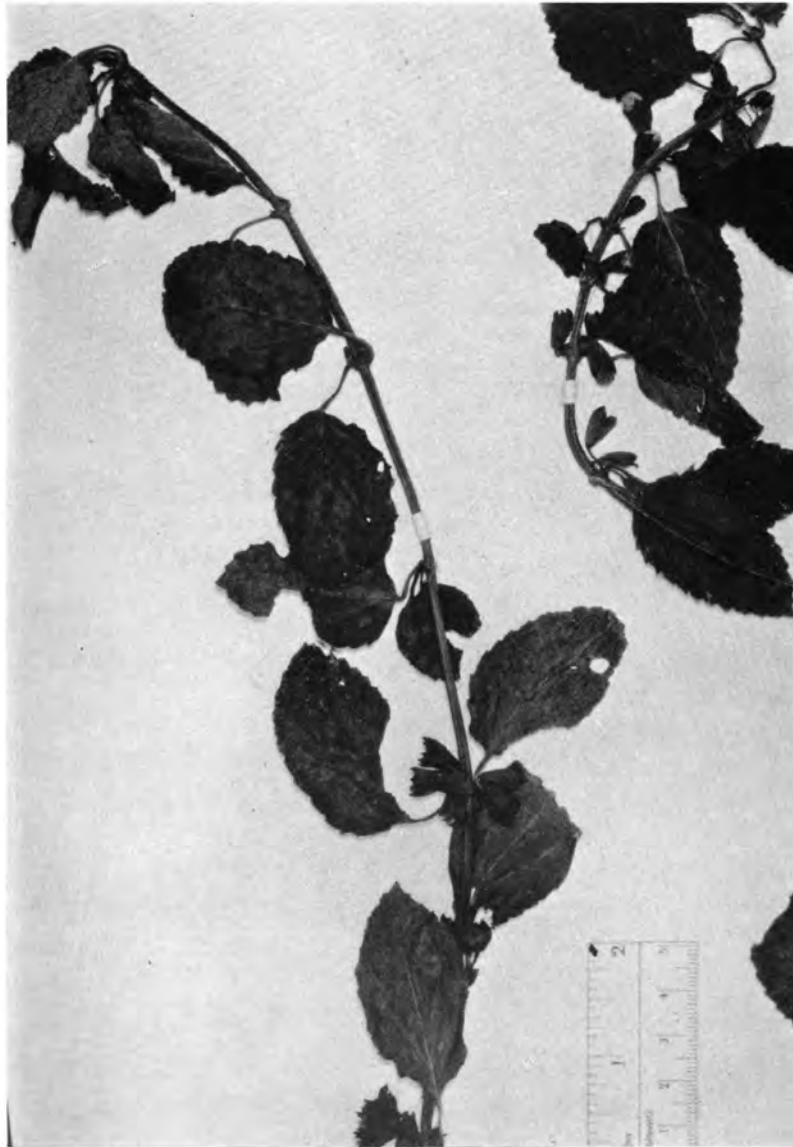


FIGURE 36.—*Stenogyne rotundifolia* variety *oblonga* (cotype, Field).



and apically acute; style and pubescent filaments exerted, style-branches about 0.25 mm long; annulus complete.

Type: collected by J. M. Lydgate, Kula, eastern Maui (Berlin).

Specimens examined: Lydgate, Kula, Maui (Berlin, type).

The type consists of four fragments, which, however, reveal a species quite distinct. The leaves offer an aspect suggestive of *Phyllostegia mollis*, but doubtless average much smaller than in that species.

Distribution: eastern Maui.

#### 19. *Stenogyne scandens* Sherff (fig. 37).

*Stenogyne scandens* Sherff, Bot. Gaz., vol. 96, p. 143, 1934.

Subherbaceous, scandent or procumbent, the stem and branches subglabrous. Leaves undivided, the petiole dorsally pubescent and 5-10 mm long; the blade thin, more often oblong rather rarely lanceolate-oblong, at base truncate or widely cuneate, at apex obtuse or more rarely subacute, at margin commonly crenulate-dentate or rarely subacutely dentate, on upper surface minutely hispidulous along the veins but otherwise glabrous, on lower surface irregularly pilose especially along the veins, 2.5-3.5 (more rarely -5), cm long. Whorls 6-flowered. Calyx broadly obconic, very sparsely setose, 6-8 mm long including the sharp and lanceolate-linear lobes; pedicel sparsely pilose, only 2-5 mm long. Corolla pale purple, externally very pubescent,  $\pm$  1.8 cm long, the lower lip very short, the filaments (which are pubescent along one side) and style long-exserted. Nucules black, rugose, obovate, about 5 mm long. In habit, similar to *Phyllostegia racemosa* and *Stenogyne vagans*.

Type: collected by William Hillebrand, no. 352, island of Hawaii (Kew).

Specimens examined: Hillebrand 352 (type, Kew; a probable duplicate, Berlin).

Distribution: island of Hawaii.

### Section 3. MICROPHYLLAE (Hillebrand), new combination

Section 3. *Microphyllae* (Hillebrand), new combination; pro subsectione, Hillebrand, Fl. Haw. Is., p. 361, 1888.

Leaf blades less than 2 cm long. Corolla greenish-yellow, suberect, with lower lip truncate or very shortly toothed. Densely entangled climbers.—Nos. 20-24.

Asa Gray (Amer. Acad., Proc., vol. 5, p. 346, 1862) first used the name *Microphyllae* for the plants included here but assigned no definite status for the group. Briquet (Engler and Prantl, Natürl. Pflanzenf. IV, vol. 3-a, p. 222, 1897), who however may have been unfamiliar with Gray's earlier use of the name (especially since Hillebrand had failed to credit Gray), attributed the name to Hillebrand.

#### 20. *Stenogyne microphylla* Benth.

*Stenogyne microphylla* Benth., Lab., p. 655, 1835; De Candolle, Prodr., vol. 12, p. 556, 1848; Drake del Castillo, Illustr. Fl. Ins. Mar. Pacif., pl. 30, 1886.

Diffusely branching and climbing, stems sharply tetragonal, glabrous except at nodes. Leaves numerous, undivided, the petiole dorsally hispidulous along its center,  $\pm 3$  mm long; the blade oblong or oval-oblong, apically acute or somewhat obtuse, basally narrowed or cuneate, marginally crenate or serrate, membranaceous, glabrous or underneath (especially toward petiole) sparsely hispid, 4-8 (rarely -10) mm long. Whorls 2-flowered, the pedicels glabrous or glabrate, 1-4 mm long, subtended by setaceous bracts. Calyx



FIGURE 37.—*Stenogyne scandens* (type).

obconic-campanulate, glabrous, unequally and acutely or less often subobtusely toothed,  $\pm 6$  mm long. Corolla greenish-yellow, pubescent, 14-18 mm long, the upper lip 6-8 mm long, much exceeding the short and broadly but acutely 3-toothed lower lip; filaments hispid except near top, these and the style long-exserted; stigmatic branches linear, barely 0.5 mm long.

Type: collected by James Macrae, at Mauna Kea, island of Hawaii, June 1825 (Kew).

Specimens examined: anonymous, Mauna Kea, island of Hawaii, December 24, 1872 (herb. Hillebrand, Berlin); William Hillebrand, Hawaii, 1862 (Berlin); Macrae, Mauna Kea, Hawaii, June 1825 (Kew, type); Jules Remy 397, island of Hawaii, 1851-55 (Gray, Paris); U. S. Exploring Expedition, Mauna Kea, Hawaii, 1840 (Gray, Kew, N. Y., Paris, U. S.).

Distribution: island of Hawaii.

### 21. *Stenogyne diffusa* A. Gray.

*Stenogyne diffusa* A. Gray, Amer. Acad., Proc., vol. 5, p. 348, 1862.

*Stenogyne microphylla* variety *diffusa* (A. Gray) Hillebrand, Fl. Haw. Is., p. 362, 1888.

Lower surface of leaves appressedly and rather densely hispid-pubescent.....**S. diffusa**  
Lower surface of leaves glabrous or sparsely hispid.....variety  $\beta$  **glabra**

Habit as in *S. microphylla* but more or less copiously pubescent. Leaves undivided, the tiny petiole 1-2 (rarely -3) mm long; the blade obtusely ovate or suborbicular, basally truncate or widely cuneate, hardly membranaceous, coarsely crenate, mostly 3-5 mm long. Whorls 2-flowered, the hispid pedicels 2-4 mm long, with short, setaceous bracts. Calyx campanulate, rather prominently ribbed, 5-6 mm long, the unequal lobes obtuse and usually 0.5-0.65 as long as the tube. Corolla greenish-yellow, externally pubescent, 1.4-1.8 cm long, the upper lip  $\pm 8$  mm long and greatly exceeding the lower; filaments hispid below; stigmatic branches oblong, under 0.5 mm long. Nucules obovate, black, mostly 2-2.5 mm long.

Type: collected by the U. S. Exploring Expedition in forests of the vicinity of Waimea, island of Hawaii, 1840 (U. S.).

Specimens examined: U. S. Exploring Expedition, forests in the vicinity of Waimea, Hawaii, 1840 (type, U. S.; cotypes, Kew, 2 sheets; N. Y.).

Distribution: northwestern part of the island of Hawaii.

### *Stenogyne diffusa* variety $\beta$ **glabra** Wawra.

*Stenogyne diffusa* variety  $\beta$  *glabra* Wawra, Flora, vol. 55, p. 532, 1872.

Stems and branches glabrate or sparsely setose. Leaf blades now 2-3 mm, now up to 8 mm long, variously ciliate or eciliate, glabrous on both surfaces or sparsely hispid above and glabrous or very sparsely hispid below.

Type: collected by William Hillebrand (Wawra herb. no. 2327; sphalm in Wawra. Flora, vol. 55, p. 532, "2326"), island of Hawaii (Vienna).

Specimens examined: Urbain Faurie 895, Mauna Kea, Hawaii, July 1909 (Delessert); C. N. Forbes 194-H, Hanehane, Kona, Hawaii, June 17, 1911 (Bishop, Missouri); Forbes 238-H, Kanehaha, Kona, June 23, 1911 (Bishop, Missouri); Hillebrand, Hawaii (Vienna, type); Hillebrand 349, Hawaii, 1862 (Berlin, Kew); Hillebrand 350 pro parte, Hawaii (Gray); Hillebrand and J. M. Lydgate, Laiha (Laeha), Mauna Kea, Hawaii (Bishop); Horace Mann and W. T. Brigham 294, in stream of a-a near camp, Puu Hualalai, Hawaii (Bishop, Cornell, Missouri); J. F. Rock 10041, altitude 5,300 feet, Puuokeanae, at crater floor, central plateau of Hawaii, February 13, 1912 (Bishop, Gray).

Distribution: island of Hawaii.

**22. *Stenogyne affinis* Forbes.**

*Stenogyne affinis* Forbes, B. P. Bishop Mus., Occ. Papers, vol. 6, p. 182, pl., 1916.

Diffuse, with sharply angular, finely pubescent stem and branches, the latter divaricate. Leaves undivided, the delicate petiole spreading-pubescent and 6-11 mm long; the blade elliptical to elliptic-oblong, basally wide-cuneate or slightly rounded, apically subrotund, marginally crenate, on both faces pubescent, commonly 0.8-1.5 cm long and 0.7-1.2 cm wide. Whorls 2-flowered, the pubescent pedicels  $\pm 3$  mm long. Calyx pubescent, about 7-8 mm long, the obtuse teeth hardly 2 mm long, nerves quite distinct. Corolla greenish,  $\pm 1.7$  cm long, the elongate upper lip exceeding the tube, the lower lip minute; filaments and style long-exserted, slightly hairy to glabrous; stigmatic branches linear-subulate, under 1 mm long. Nucules black, variously obovate and short (3-3.5 mm) to oblanceolate and longer (3.5-5 mm), more or less thick-alate on angles.

Type: collected by C. N. Forbes, no. 834-H, at Puu Huluhulu, island of Hawaii, June 12, 1915 (Bishop).

Specimens examined: Forbes 834-H (Bishop; Missouri; cotypes).

Distribution: known only from type locality on island of Hawaii. "Puu Huluhulu is a cinder cone of Mauna Kea which has become isolated by lava flows from the north side of Mauna Loa" (Forbes).

**23. *Stenogyne crenata* A. Gray.**

*Stenogyne crenata* A. Gray, Amer. Acad., Proc., vol. 5, p. 348, 1862.

Calyx visibly or strongly nerved, hispid but not muricately so..... **S. crenata**  
 Calyx conspicuously nerved, the nerves muricately hispid..... **variety  $\beta$  muricata**

Habit of *S. microphylla*. Stem sharp-angled, the angles muricately hispid with more or less retrorse, stiff hairs; branchlets closely foliose. Leaves undivided, the petiole 1-3 mm long; the blade ovate-oblong, at base widely cuneate, at apex more or less obtuse, at margin crenate, rather firm, hispid to glabrate (at times even on the same plant), 5-10 mm long. Whorls 2-flowered, the pedicels  $\pm 2$  mm long. Calyx campanulate to urceolate, visibly or even strongly nerved, sparsely long-setose, 6-8 mm long, the lobes acute and equalling the tube. Corolla greenish-yellow, externally hispid, 1.6-1.8 cm long, the upper lip about 1 cm long and much exceeding the lower; filaments pubescent below; stigmatic branches linear. Nucules black, obovate, triangular in cross section, truncate at apex, about 3.5-4 mm long.

Type: collected by the U. S. Exploring Expedition on Mount Haleakala, eastern Maui, 1840 (U. S.).

Specimens examined: Otto Degener 5437, among dry rocks, Haleakala Crater on Koolau Gap side, east Maui, June 29, 1927 (Field); C. N. Forbes 216-M, slopes of Haleakala, above Ukulele, July 1910 (Bishop, Missouri); William Hillebrand, Haleakala (Berlin); Horace Mann and W. T. Brigham, altitude 6,000-7,000 feet, west side of Haleakala (Cornell); Mann and Brigham 408, altitude 6,000-7,000 feet, Haleakala (Bishop; Delessert; Field, 2 sheets; Gray; Kew; Missouri; New York; U. S.); J. F. Rock 8523, east Maui (Bishop, Gray); U. S. Exploring Expedition, Haleakala Crater, 1840 (type, U. S.; type fragment, Gray).

Distribution: eastern Maui.

***Stenogyne crenata* variety  $\beta$  *muricata* Degener and Sherff (fig. 38).**

*Stenogyne crenata* variety  $\beta$  *muricata* Degener and Sherff, ex Degener, Fl. Haw. Is., October 12, 1934.

Leaves sparsely hispid, or often glabrate above. Calyx nerves very prominent, conspicuously muricate-hispid.

Type: collected by Otto Degener, no. 5441, forming tangle in arid, grassy kipuka (island in lava), within Haleakala Crater on Koolau side, eastern Maui, August 16, 1927 (Field).

Specimens examined: Degener 5441 (Field, type).

Distribution: eastern Maui.



FIGURE 38.—*Stenogyne crenata* variety *muricata* (type).

24. *Stenogyne vagans* Hillebrand.

*Stenogyne vagans* Hillebrand, Fl. Haw. Is., p. 362, 1888.

Habit as in *S. microphylla*; stem and branches tetragonal, retrorsely appressed-hispid (often sparsely so). Leaves undivided, the petiole hispid and 2-5 mm long; the blade ovate or elliptic-oblong, basally rounded or truncate, apically subrotund to subobtusate or rarely to subacute, marginally crenulate, membranaceous, appressed-hispid, 0.8-1.7 cm long and 6-11 mm wide. Whorls 6- or 4- or rarely 2-flowered, the pedicels glabrate or sparsely spreading-hispid, 2-6 mm long. Calyx sparsely long-setose, 4-5 mm long, the acute teeth half the length of the tube or less. Corolla curved, apparently greenish-yellow, externally hispid-pubescent, 2-2.2 cm long, the upper lip 6-8 mm long, the lower almost truncate with short, acute lobes; style and glabrate filaments exerted; stigmatic branches linear, under 1 mm long. Nucules short, about 3 mm long.

Type: collected by William Hillebrand, no. 350 pro parte, altitude 4,000 feet, in forests on southern slope of Haleakala, Ulupalakua, eastern Maui (Berlin).

Specimens examined: Hillebrand, Kula, east Maui (Berlin); Hillebrand 350 pro parte (type, Berlin; cotypes, Gray, Kew, ubi cum *S. diffusa* varietate *glabra commixta*; Bishop; Vienna).

Distribution: eastern Maui.

## EXCLUDED SPECIES

*Stenogyne parviflora* H. Mann, Amer. Acad., Proc., vol. 7, p. 193 (Enum. Haw. Pl., no. 357), 1867. = *Phyllostegia Mannii* Sherff.

*Stenogyne* (?) *serpens* Hillebrand (Fl. Haw. Is., p. 362, 1888) was described as having "the genus uncertain." Hillebrand's two sheets of material (Berlin) display forms which are sterile and, if belonging in *Stenogyne*, juvenile. Undoubtedly two species are represented, one from Oahu (leaves truncate) and one from Maui (leaves cordate). In *Stenogyne*, *S. Scrophularioides* produces a juvenile form with faintly similar aspect.

*Stenogyne Fauriei* L'éveillé, Fedde Repert. Spec. Nov. Reg. Veg., vol. 10, p. 150, 1911 (see vol. 13, p. 358, 1914). = *Coleus* species.