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A Revision of *Psychotria* (Rubiaceae) in the Marquesas Islands (French Polynesia)

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ABSTRACT

During the preparation of the *Vascular Flora of the Marquesas Islands* and *Flore de la Polynésie française*, seven new species of *Psychotria* L. (Rubiaceae, Psychotrieae) have come to light and are described herein: *Psychotria florencei* Lorence & W. L. Wagner, *P. gagneorum* Lorence & W. L. Wagner, *P. oliveri* Lorence & W. L. Wagner, *P. schaeferi* Lorence & W. L. Wagner, *P. temetiuensis* Lorence & W. L. Wagner, *P. upapoensis* Lorence & W. L. Wagner, and *P. uahukensis* Lorence & W. L. Wagner. In addition to these new taxa, we recognize the following six species of *Psychotria* previously described from the Marquesas: *P. adamsonii* Fosberg, *P. hivaoana* Fosberg, *P. marchionica* Drake, *P. mumfordiana* F. Brown, *P. taupotinii* F. Brown, and *P. toviana* F. Brown. Two names are reduced to synonymy: *P. bowermanae* Fosberg, syn. nov. under *P. toviana*, and *P. lebronnecii* Fosberg, syn. nov. under *P. marchionica*. Based on morphology, the 13 endemic species appear to represent three independent colonizations of the Marquesas Islands: 1) *P. oliveri* and *P. schaeferi*; 2) *P. adamsonii*; and 3) the remaining 10 species.

INTRODUCTION

Psychotria L. (Psychotrieae) is the largest genus of Rubiaceae, with estimates ranging from approximately 1000 (Taylor 2002) to 1500 or even as high as 2000 species (Nepokroeff et al. 1999; Smith & Darwin 1988). Most species are shrubs or small trees with white or cream-colored entomophilous, often distylous flowers, valvate corolla lobe aestivation, an inferior usually bilocular ovary, each locule with a single, basally attached ovule, and drupaceous fruits with usually two plano-convex pyrenes (Hamilton 1989). Recent studies using both morphological and molecular data have demonstrated that *Psychotria* is phylogenetically complex (Nepokroeff et al. 1999; Andersson & Rova 1999; Piesschaert 2001; Andersson 2002; Taylor 2002). The

genus traditionally has been subdivided into two subgenera: *Psychotria* subg. *Psychotria*, which is pantropical, and *Psychotria* subg. *Heteropsychotria*, which is neotropical in distribution. A current trend based in part on the recent molecular results is to segregate smaller, presumably monophyletic groups such as *Notopleura* (Hook. f.) Bremek. (Nepokroeff et al. 1999; Taylor 2001) and *Margaritopsis* Sauvalle (Andersson 2001). The variation in total number of *Psychotria* species obviously depends on the various authors' generic delimitations (see Andersson 2002 for a synopsis).

Psychotria subg. *Psychotria* occurs in the tropics and subtropics of both hemispheres and has undergone dramatic speciation, particularly in tropical lowland and lower montane areas where its members are con-

spicuous and important components of the understory and middle stratum vegetation. Subg. *Psychotria* species have fruits with two pyrenes and fleshy, red, orange, bluish black, or white pericarps that are readily dispersed by birds. Consequently the genus has reached most of the high oceanic islands in the Pacific and elsewhere, often displaying high levels of insular endemism (Sohmer 1988). Current estimates of *Psychotria* species give 76 species in Fiji (Smith & Darwin 1988), 20 in Samoa (Whistler 1986), 17 in Micronesia (Fosberg & Sachet 1991), and 11 in the Hawaiian Islands (Wagner et al. 1999). In French Polynesia, 11 species are currently recognized in the Society Islands (with eight on Tahiti including at least one undescribed species) and 3 species in the Austral Islands (Meyer et al. 2003, pers. comm. 2004). With 13 endemic species recognized in this revision, *Psychotria* is the most species-rich genus of vascular plants in the Marquesas archipelago where it occurs on the six largest of 12 islands (Florence & Lorence 1997).

Andersson (2002) suggests the best approach for a stable classification of the *Psychotria* complex is to subdivide it into smaller natural groups. Although most Hawaiian *Psychotria* species have been referred to a separate genus, *Straussia* (DC.) A. Gray by various authors (e.g., Andersson 2002; Hooker 1873; Piesschaert 2001), others have preferred to retain them in a more broadly defined *Psychotria* (Nepokroeff 1997; Nepokroeff et al. 1999; Sohmer 1977, 1978; Wagner et al. 1999). The primary distinguishing features of *Straussia* are the semicircular pyrenes that are “. . . smooth to knobby abaxially, or provided with a single median crest, which have usually long marginal preformed germination slits [PGS], and by an endosperm which is \pm ruminant, at least insofar as having a \pm deep adaxial intrusion” (Andersson 2002). Andersson further suggests *Straussia* may be applicable to a more widely distributed group extending across the Pacific from the

Hawaiian Islands to Fiji and Sri Lanka; however, he notes that there is no molecular evidence to support the monophyly of this group. The correct name for this group, if delimited with these characters, would most likely be *Grumilea* Gaertn. However, in light of available evidence and pending further sampling and study of Pacific taxa of this alliance, we here maintain the Marquesan taxa in the currently broadly paraphyletic *Psychotria* rather than segregating them into a poorly defined *Straussia* (= *Grumilea*).

COMMENTS ON SELECTED MORPHOLOGICAL FEATURES

STIPULES

Stipules provide useful morphological characters in defining species groups in *Psychotria*, even at the level of subgenera (Andersson 2002; Smith & Darwin 1988; Taylor 2002). Stipules of all Marquesan *Psychotria* species have an abscission layer and are caducous soon after leaf maturity, leaving a ring or fringe of reddish brown hairs and/or digitate colleters at the node. Taxa with caducous stipules and persistent colleters have traditionally been placed in subgenus *Psychotria* (Nepokroeff et al. 1999; Taylor 2002), and this appears to be the ancestral state in the *Psychotria* complex. Nevertheless, recent molecular evidence suggests that secondary reversals to non-caducous stipules may have occurred in some clades (Andersson 2002).

Stipules of Marquesan *Psychotria* species are characterized as “sheathing intrapetiolar” (Robbrecht 1988) with the following two subtypes distinguishable on the vegetative buds:

1. Stipules usually calyprate and sheathing in bud, ovoid to oblong, entire or shallowly to deeply 2-lobed at the apex (4-lobed in *P. gagneorum* and sometimes in *P. temetiensis*), the halves valvate and eventually separating along two sides to the base (Figures 4, 11, 14). This form is found in all species except *P. oliveri* and *P. shaeferi*.

2. Stipules cylindrical in bud, free and deeply 4-lobed at the apex, eventually separating along one side to base (Figures 8, 9). This form is found only in *P. oliveri* and *P. schaeferi*.

FLOWERS

Flowers of many Marquesan *Psychotria* species appear to be homostylous, with included styles shorter than the stamens, which are also included in the distal half of the floral tube. Style length and degree of exertion are variable in *P. taupotini*. The few known flowering collections of *P. oliveri* and *P. schaeferi* have exerted styles and are possibly distylous, although further collections are needed to substantiate this. Mature flowers are unknown for *P. adamsonii* and *P. uahukensis* and styles are unknown for *P. gagneorum*. The corollas of all Marquesan species are pure white, relatively fleshy, externally glabrous to pubescent, and have a well developed tube. Collectors' notes for many species indicate they are fragrant. The morphology and fragrance together suggest moth pollination.

FRUIT

Compared to other members of the genus, fruits of Marquesan *Psychotria* species are medium to relatively large in size, glabrous to puberulent, and range in length (when dry) from 6 to 15 mm and in width from 4 to 10 mm in most species. Fruits of *P. gagneorum*, however, are exceptionally large, 18–24 mm long by 14–20 mm in diameter. Among the largest known fruits in *Psychotria*, they represent a shift to fruit gigantism, an evolutionary trend found in a number of other insular plants (Carlquist 1974). Fruit gigantism often results in a loss of dispersibility, possibly explaining why *P. gagneorum* is so rare.

PYRENES

Marquesan *Psychotria* species have two (rarely one by abortion) ellipsoid or ob-

ovoid, plano-convex pyrenes per fruit. In most species the pyrenes have very hard, bony walls that are semicircular in cross section, dorsally prominently 2–3-ridged and ventrally smooth or somewhat rugose. In some species the pyrenes have paired shallow depressions ventrally toward the base separated by a ridge (*P. mumfordiana*), and in others another ventral depression exists toward the apex (*P. taupotini*). In *P. oliveri* pyrenes are dorsally smooth, whereas in *P. schaeferi* they are dorsally sulcate with a deep median slit exposing the endosperm (although only immature fruit was examined). Pyrenes of *P. gagneorum*, *P. oliveri*, and *P. schaeferi* possess 2–4 longitudinal dorsal cavities beneath the ribs, hollow or filled with pithy parenchyma, that are visible in cross section (Figures 3, 8, 9). Significantly, the Marquesan species for which mature seeds were available lack ventral pyrene invaginations with a T-shaped intrusion or ruminations of the endosperm supposedly characteristic of *Straussia*. Seeds of most species are ventrally either flat or shallowly 1–2-furrowed (in *P. hivaoana*, *P. marchionica*, *P. mumfordiana*, *P. taupotini*, *P. temetiuensis*). The few species examined appear to lack the alcohol-soluble red-brown pigmentation of the testa characteristic of *Straussia*.

Preformed germination slits (PGS) were observed in the pyrenes of all Marquesan species for which mature fruits were available. The single slit is marginal and semicircular, running along the basal half of the pyrene and opening as a flap when lifted (in *P. hivaoana*, *P. marchionica*, *P. mumfordiana*, *P. schaeferi*, *P. tovana*), or confined to the basal third of the pyrene and not apparently lid-like (*P. florencei*). Nepkroeff et al. (1999) stated in error that Pacific members of *Psychotria* subg. *Psychotria* lack PGSs (Andersson 2002; Pieschaert 2001).

Although the presence of PGSs in the Marquesan species corresponds with *Straussia* (Andersson 2002), the absence of

T-shaped intrusions or ruminations and ethanol-soluble red-brown testa pigment do not. Furthermore, Andersson (2002) suggested that presence of PGSs and the testa pigment are equivocal in the Pacific clade of the *Psychotria* complex, concluding there is not a simple way in which to subdivide the genus.

HISTORICAL BACKGROUND

Psychotria marchionica Drake was first to be described from the Marquesas in 1890 (Drake del Castillo 1886–1892). Subsequently Forrest Brown recognized five species of *Psychotria* in the Marquesas Islands in his Rubiaceae treatment for the *Flora of Southeastern Polynesia* (Brown 1935), of which four were newly described by him. Based on additional new collections, Fosberg (1939) revised the Marquesan species of *Psychotria*, describing four additional species and one variety for a total of nine species and additional two varieties. One species, *Psychotria esulcata* A. Gray, was subsequently transferred to *Coprosma* as *C. esulcata* (A. Gray) Fosberg (Fosberg 1956). This treatment gradually became outdated as intensive botanical exploration of the Marquesas began in the 1970s, and new collections were made. These projects included Fosberg and Sachet's *Flora of the Marquesas* project (Sachet 1975), the *Flore de la Polynésie française* project under the auspices of Jacques Florence at IRD, Paris (formerly ORSTOM), and the current *Vascular Flora of the Marquesas Islands* project under the direction of David H. Lorence and Warren L. Wagner (Lorence 1998; Wagner & Lorence 1997). This present paper represents a precursor to the last project.

TAXONOMIC TREATMENT

METHODOLOGY

All measurements given herein are taken from dried herbarium specimens, although

certain features such as shapes were supplemented with information from alcohol-preserved flowers and fruits, field notes, and color slides or digital photos. Measurements are presented in the descriptions as follows: length \times width, followed by units of measurement (mm or cm). Specimens from the following herbaria were studied: BISH, MO, MPU, P, PAP, PTBG, and US. All specimens cited in this paper have been seen by the authors unless indicated by "n.v." Leaf measurements were taken on leaves from branchlets as far down as 7–10 nodes from the branchlet apex.

The following definitions are used in the descriptions. Branchlets are defined as distal, leafy portions of twigs, and their diameter was measured at internodes. Inflorescences of all species (with the possible exception of the imperfectly known *P. gagneorum*) are initially terminal but often become laterally displaced by subsequent elongation of an axillary vegetative bud and development of a new leader shoot. This inflorescence position is herein termed pseudoaxillary. Style measurements include the two stigmatic lobes. Fruit measurements comprise the pericarp and enclosed pyrenes but do not include the umbo (accrescent calyx cup) and nectary disc.

ISLAND NAMES

Orthographic variation exists for certain of the Marquesas Islands. For the sake of consistency we herein utilize the names accepted by the French Polynesian Government (see the website at: www.presidence.pf) for the islands with *Psychotria* species. In the following list accepted names are in boldface and alternative spellings are listed in parentheses: **Fatu Hiva** (Fatuhiva, Fatu Iva), **Hiva Oa** (Hivaoa), **Nuku Hiva** (Nukuhiva), **Tahuata**, **Ua Huka** (Uahuka), and **Ua Pou** (Uapou).

KEY TO THE MARQUESAN SPECIES OF *PSYCHOTRIA*

1. Stipules cylindrical in bud, 4-lobed at apex, eventually separating along one side to base. 2
- 1'. Stipules usually calyprate and sheathing in bud, ovoid, entire or 2-lobed at apex, or 4-lobed in *P. gagneorum* and sometimes in *P. temetiuisensis*, eventually separating along two sides to the base. 3
- 2(1). Stipule lobes 1–2 mm long; calyx limb 1–1.5 mm long in flower and 2.5–3 mm long in fruit; Tahuata. 7. *P. oliveri*
- 2'. Stipule lobes 3–6 mm long; calyx limb 0.6–0.8 mm long in flower and 1 mm long in fruit; Hiva Oa. 8. *P. schaeferi*
- 3(1). Leaves narrowly elliptic or oblong, apex acuminate; flowers borne in umbelliform cymules of 3–6 flowers with pedicels 3–8 mm long at the ends of secondary axes 1. *P. adamsonii*
- 3'. Leaves obovate to elliptic, broadly obovate, broadly elliptic, elliptic-obovate, oblong, or oblanceolate, apex abruptly short-acuminate, acute, obtuse, rounded, or truncate; cymules not appearing umbelliform, 2–12-flowered with pedicels 0.5–20 mm long. 4
- 4(3). Inflorescences appearing axillary, compact subglobose or elongate clusters of cymules, sessile and lacking well developed axes, densely reddish-brown sericeous-tomentose with hairs to 3 mm long; corolla tube ca. 20 mm long; fruits 18–24 × 14–20 mm. 3. *P. gagneorum*
- 4'. Inflorescences terminal sometimes becoming pseudoaxillary, usually trichotomous with well developed primary and secondary axes, glabrous to puberulent, villous, or villosulous; corolla tube 6–15 mm long; fruits 6–12 × 4–9 mm. 5
- 5(4). Leaf blade sparsely to densely villous or villosulous below with spreading hairs. 6
- 5'. Leaf blade glabrous or glabrescent below, or villosulous along costa and barbate in vein axils, or arachnoid-tomentose with matted hairs when young (*P. hivaoana*) 7
- 6(5). Leaf blade sparsely villous above, lacking barbate domatia in secondary vein axils below, secondary veins 15–20 pairs. 9. *P. taupotinii*
- 6'. Leaf blade glabrous above, barbate domatia present in secondary vein axils below, secondary veins 9–12 pairs 11. *P. toviana*
- 7(5). Blade arachnoid-tomentose below with matted hairs, at least when young 4. *P. hivaoana*
- 7'. Blade glabrous or glabrescent below, or villosulous along costa and barbate in vein axils 8
- 8(7). Blade glabrous or glabrescent below 9
- 8'. Blade villosulous or tomentose along costa and/or barbate in vein axils below (*P. marchionica*, *P. temetiuisensis*, *P. uapoensis*) 10
- 9(7). Stipule sheath glabrous, the lobes 3–7 mm long; petioles 14–36 mm long; blade with domatia in secondary vein axils below 6. *P. mumfordiana*
- 9'. Stipule sheath villous, at least along suture, the lobes 1–2 mm long; petioles 1–15 mm long; blade lacking domatia in secondary vein axils below 2. *P. florencei*
- 10(8). Secondary veins 13–17 pairs; inflorescence axes and pedicels densely matted rufous tomentose 12. *P. uahukensis*
- 10'. Secondary veins 6–13 pairs; inflorescence axes and pedicels glabrous or sometimes very sparsely puberulent 11
- 11(10). Inflorescence 3–20-flowered; calyx limb 1.5–4.5 mm long 5. *P. marchionica*
- 11'. Inflorescence 22–75-flowered; calyx limb 0.7–1.5 mm long 12
12. Blade with 3° and 4° venation conspicuous and prominulous above; calyx limb margin denticulate; corolla tube 14–15 mm long; fruit 9–12 × 6–9 mm 10. *P. temetiuisensis*
- 12'. Blade with 3° venation inconspicuous and not prominulous above; calyx limb margin entire; corolla tube 8–13 mm long; fruit 6–7 × 5–6 mm 13. *P. uapoensis*

1. ***Psychotria adamsonii*** Fosberg, Notul. Syst. (Paris) 8: 172. 1939. TYPE: MARQUESAS ISLANDS: UA POU: Pepehitoua Valley, elev. ca. 2500 ft [762 m], 6 Dec. 1929, E. P. Mumford & A. M. Adamson 640 (Holotype BISH 578773, Isotype BISH 578774). Figure 1.

Small tree (?) to 5 m tall, branchlets 3–3.5 mm diam., glabrous. Leaves with blade 9.5–18 × 2.7–5.8 cm, narrowly elliptic or

oblong, chartaceous, glabrous except for barbate domatia with tufts of villous rufous hairs present in vein axils below, margins plane, base cuneate, slightly decurrent, apex acuminate, the acumen 0.7–1.2 cm long, secondary veins 9–11 pairs, eucamptodromous, higher order venation inconspicuous; petioles 1.2–2.3 cm long, glabrous, narrowly winged distally; stipules calyprate, 9–10 mm long, apex entire or shallowly 2-lobed, glabrous except for fringe of reddish hairs basally within and scattered

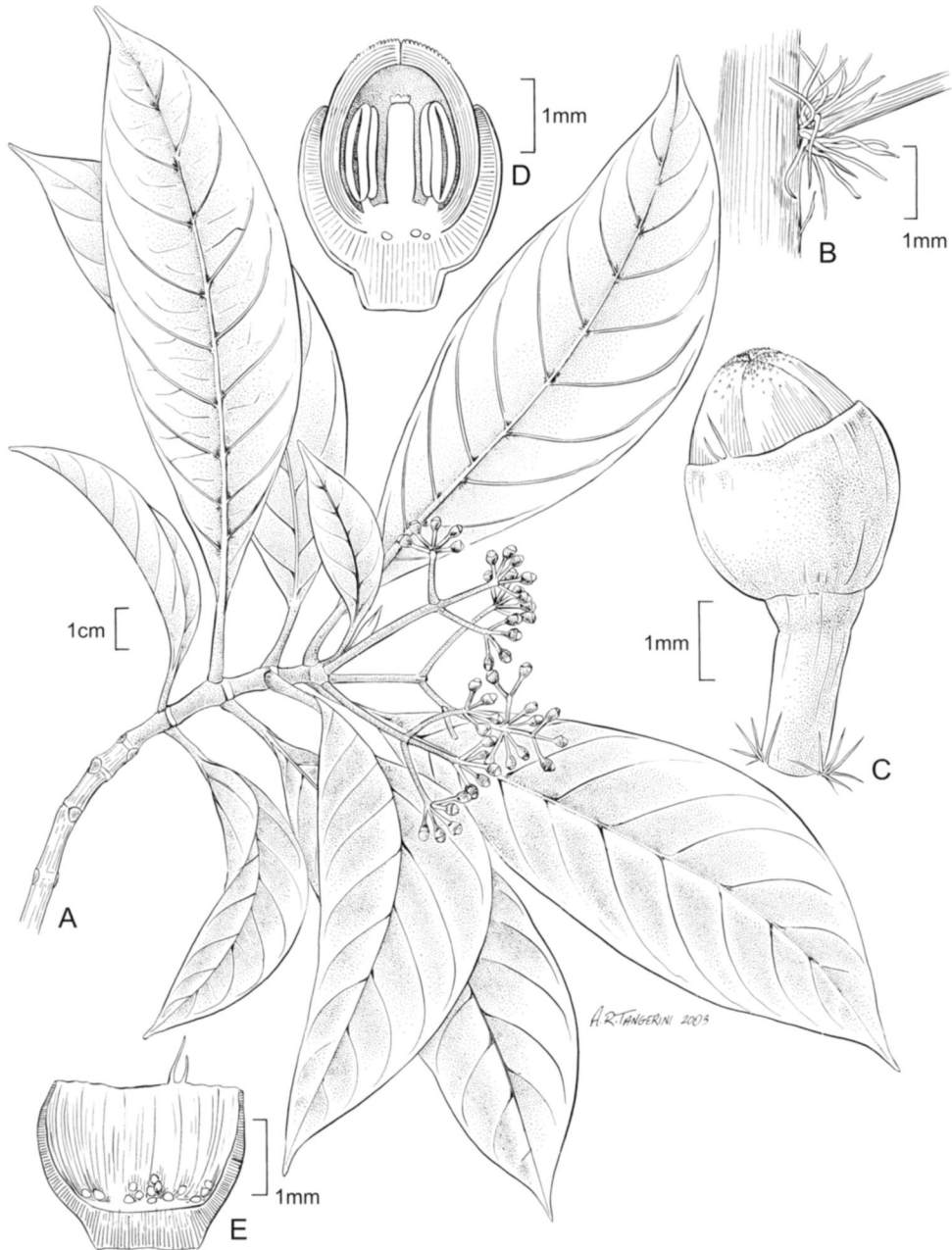


FIGURE 1. *Psychotria adamsonii*. A, habit, with inflorescence in bud; B, leaf, abaxial surface showing detail of barbate domatia in secondary vein axil; C, immature flower in bud; D, same, longitudinal section; E, longitudinal section of calyx. (Based on Mumford & Adamson 640, BISH.)

marginal hairs, deciduous. Inflorescences terminal, ca. 6–7 × 6–7 cm (with corollas in young bud), cymose-corymbiform, glabrous, sessile and trichotomous, flowers ca.

45–50, primary axes 25–35 mm long, secondary axes 10–28 mm long, ending in umbelliform cymules of 3–6 flowers, bracts ca. 0.5 mm long, triangular, scarious, glabrous

or pilose basally with reddish-brown hairs, pedicels 3–8 mm long, pilose basally. Flowers (in young bud) with hypanthium 0.5–0.7 mm long, obconic, glabrous; calyx limb 1.5–2 mm long, glabrous, cyathiform, truncate or margin sparsely and minutely denticulate or with scattered hairs, disc n.v.; corolla in young bud ca. 2 mm long, externally minutely scabrid on lobes, otherwise apparently glabrous, internally apparently glabrous, anthers and style ca. 1 mm long. Mature flowers and fruits unknown.

Distribution, phenology, and habitat. Known only from the type collection made on Ua Pou at ca. 762 m, probably in mid-elevation moist or wet forest, collected with immature inflorescence in December. Recent intensive searches of the Pepehitoua Valley and many other localities on Ua Pou have failed to relocate this species.

Discussion. *Psychotria adamsonii* differs from other Marquesan species by its unusual inflorescence structure, the ultimate axes bearing umbel-like cymules of 3–6 flowers, resembling those of *P. raivavaensis* Fosb. from Raivavae and *P. tubuaiensis* Fosb. from Tubuai (Austral Islands), although cymules in the latter two species are consistently 3-flowered. The large barbate domatia are also distinctive. Fosberg (1939: 173) stated “Not like any species known to me. Superficially resembling *Tarennia sambucina*, to which Brown referred it (B. P. Bish. Mus. Bull. 130: 290. 1935). . . .” Fosberg also notes that the bilocular ovary is typical of *Psychotria*, with an erect, basifixed ovule in each locule, which our study of the type confirms. Other characters confirming its placement in *Psychotria* include the sheathing, calyptrate stipules which are deciduous, leaving a fringe of reddish trichomes and colleters at each node, leaves with abaxially barbate secondary vein axils, and valvate corolla aestivation. The holotype collection has, unfortunately, only very young, immature flower buds and the isotype collection is sterile. Additional collec-

tions with mature flowers and fruit are required to further evaluate the status of this species. Because of its distinctive inflorescence structure with flowers in umbel-like cymules of 3–6, *Psychotria adamsonii* appears to represent a separate introduction compared with the other Marquesan species.

2. *Psychotria florencei* Lorence & W. L. Wagner, sp. nov. TYPE: MARQUESAS ISLANDS: NUKU HIVA: Toovii Plateau; l’Economie Rurale, along new road, in *Metrosideros*, *Weinmannia*, *Freycinetia* forest, elev. 3260 ft [993 m], 16 July 1988, S. Perlman, W. L. Wagner, J. Florence, & D. Lorence 10097 (Holotype PTBG; Isotypes BISH, E, MO, P, PAP, US). Figure 2.

Differt a congeneribus Marquesanis lamina obovate usque ad late obovate 9.5–22 × (–3.5) 5–12 cm, cum duplicibus secundariis venis 7–11 parium sine domatiis; inflorescentia 4–6 × 4–7 cm cum 39–90 floribus; fructibus ellipsoidalibus 7–8 × 5 mm.

Tree or sometimes a shrub, 2.5–4 m tall, glabrous, except for stipules and inflorescence, branchlets 6–7 mm diam., bark smooth, brown. Leaves with blade 9–11 × (4.4–)6–8.5 cm, obovate to very broadly obovate, chartaceous to subcoriaceous, glabrous, when fresh yellowish green and lustrous above, drying duller above and below, margins plane, base short-attenuate to broadly cuneate, apex rounded to truncate and abruptly very short-acuminate, the acumens ca. 1–2 mm long, secondary veins 7–11 pairs, eucamptodromous, domatia absent, tertiary venation relatively conspicuous to inconspicuous, higher order venation inconspicuous; petiole 0.5–1.5 cm long, stout, glabrous or sparsely hirtellous above, narrowly winged; stipules calyptrate, ovoid, sheath 12–20 mm long, lobes 2, 1–2 mm long, oblong, rufous villous throughout or sometimes only along the sutures, decidu-

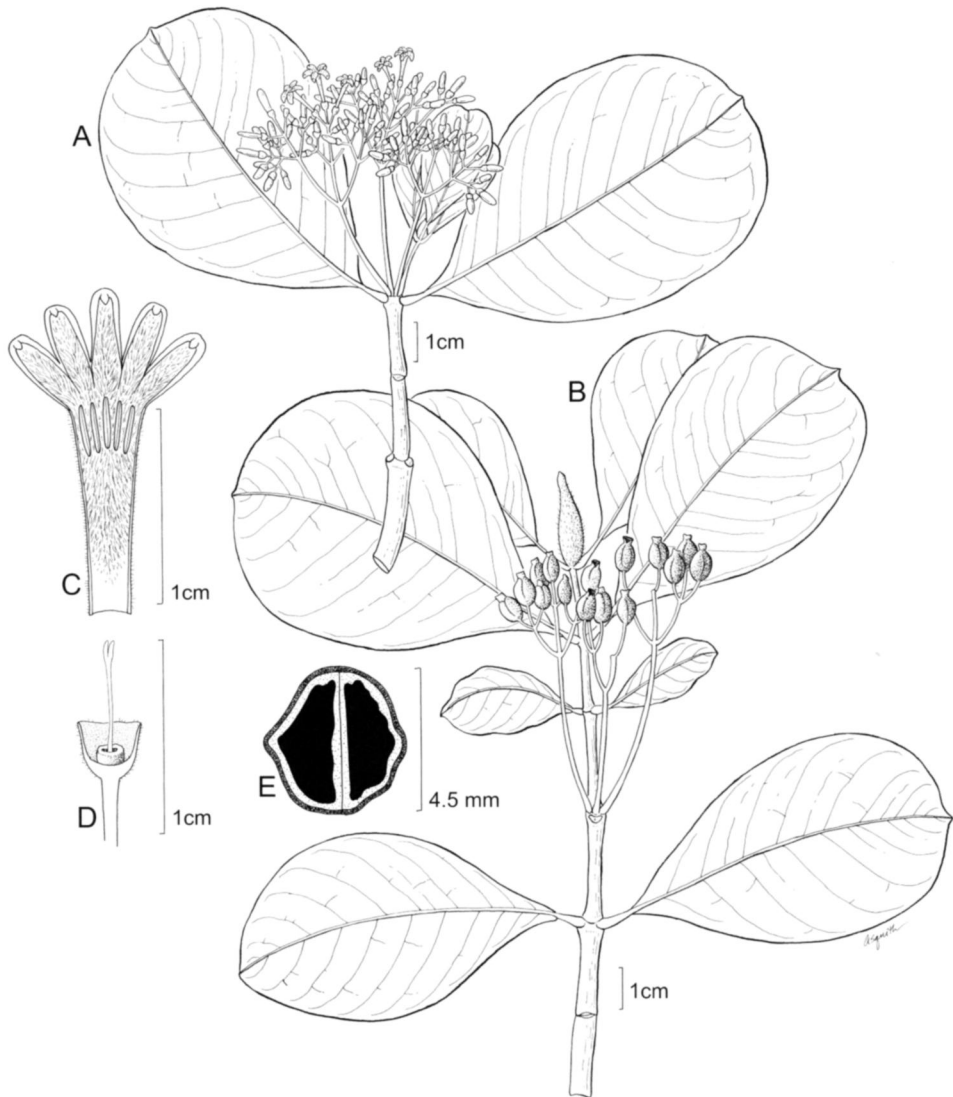


FIGURE 2. *Psychotria florencei*. A, habit, with inflorescence; B, habit, with infructescence and stipule; C, corolla, tube opened to reveal stamens; D, gynoecium with part of calyx cut away showing style and disc; E, fruit in transverse section showing pyrenes. (A, B, E based on *Pearlman 10097*, PTBG; C, D based on *Florence 7492*, PAP.)

ous, leaving a fringe of rufous hairs at the nodes. Inflorescences terminal, 4–6 × 5–7 cm (including corollas), densely cymose-corymbiform, rufous hirtellous or glabrous, sessile and usually trichotomous, (or with up to 7 primary axes), flowers 36–90, primary axes somewhat flattened, 20–43 mm long, secondary axes 4–10 mm long, tertia-

ry axes 1–2.5 mm long, ending in 3-flowered cymes, bracts 0.5–1 mm long, narrowly to broadly triangular, margins usually with minute glandular teeth, pedicels 1–3.5 mm long, glabrous or hirtellous. Flowers monomorphic, with hypanthium 1–1.5 mm long, narrowly obconic, glabrous or densely hirtellous; calyx limb 0.5–1.5 mm long, cy-

athiform, margin truncate, glabrous or ciliate, sometimes denticulate, sometimes splitting down one side, externally densely to sparsely hirtellous or rarely glabrous, internally puberulent basally, disk glabrous; corolla 10–15 mm long, hypocrateriform to narrowly funnellform, white, externally densely hirtellous or rarely glabrous, internally densely villous in the distal half of the tube, tube 6–11 mm long, lobes (4–)5, 3.5–6 mm long, oblong, externally hirtellous or glabrous except minutely hirtellous toward apex, internally villosulous in basal half, apices adaxially thickened into hooked appendages, anthers 2.5–2.8 mm long, attached below top of tube, tips included, style 5–7 mm long. Fruits 7–8 × 5 mm, ellipsoid, ribbed, umbonate; pyrenes hemispherical in cross-section, dorsal surface with 1–3 low ribs and thickened margins, ventral surface flat.

Distribution, phenology, and habitat.

This new species is apparently endemic to Nuku Hiva where it is known from the vicinity of the Toovii Plateau and surrounding mountains leading to Ooumu and Tekao peaks. *Psychotria florencei* is scarce and localized from about 800 to 1170 m elevation on steep, forested slopes, ridge crests, and occasionally valleys in primary montane wet forest associated with *Metrosideros*, *Weinmannia*, *Freycinetia*, *Cyathea*, *Crossostylis*, *Fagraea*, *Coprosma*, *Hibiscus*, *Macropiper*, *Myrsine*, *Dicranopteris*, *Carex*, and *Ilex*, with pteridophytes and *Peperomia* in the understory. Flowers, said to be fragrant, have been collected from March to September, and fruits from May to July.

Discussion. We are pleased to dedicate this new species to French botanist Jacques Florence, whose enthusiasm and extensive knowledge of the Polynesian flora have been a constant inspiration to us. Distinguishing characters of *P. florencei* include its large obovate to broadly obovate, obtuse leaf blades with 7–11 pairs of secondary

veins, the axils lacking domatia, the large inflorescence with 36–90 flowers, and the relatively small ellipsoid fruits. The type collection of this species was initially distributed as *P. nukuhivensis* Florence, *ined.* Two collections (*Perlman & Wood 15045* and *Wood & Perlman 4646*) have externally glabrous corollas, but they correspond to *P. florencei* in all other morphological features. Similar variation in pubescence is found within other *Psychotria* species such as *P. marchionica*.

Additional specimens examined. **MARQUESAS ISLANDS: NUKU HIVA:** Toovii, face SE du Mt. Tuhokia, *Florence 7515* (PAP 2 sheets); Toovii Est, secteur SSE du Mt Ooumu, *Jourdan 613* (PAP); Toovii Plateau, trail behind l'Économie Rurale, toward Ooumu peak, on summit, *Perlman 10131* (BISH, MO, PTBG, US); Toovii region, trail along ridge from near l'Économie Rurale complex to Ooumu peak, steep, forested slopes, *Lorence et al. 6108* (PAP, PTBG, US); Toovii, epaulement au-dessus du réservoir, *Florence 4334* (P, PAP 2 sheets); Toovii, epaulement S de la crête E du Mt Tekao, *Florence 7491* (P, PAP); Toovii, epaulement S de la crête E du Mt Tekao, *Florence 7492* (P, PAP), *Florence 7494* (BISH, P, PAP), *Florence 7496* (BISH, P, PAP); Toovii, epaulement SE du Mt. Tekao, ravin sous-cretal, *Florence 6810* (PAP), *Florence 6812* (BISH, P, PAP); Toovii, epaulement SW du Mt. Ooumu, *Florence 6867* (BISH, P, PAP); Toovii, flanc N de l'epaulement SE du Mt Ooumu, *Florence 6847* (PAP); spur of Mt. Ootua, Toovii Plateau, *Gagné 1072A* (BISH, US); W part of Toovii, along new road W of l'Économie Rurale, *Wagner et al. 6095* (BISH, MO, PTBG, US); Toovii, N of agriculture station, along drainage and up to ridge, 8°50.86'S, 140°08.68'W, 22 June 1997, *Wood & Meyer 6329* (BISH, MO, PAP, P, PTBG, US); along the old airport road W of the summit crest of Peak #1227 m [Tekao], drainages of Tapueahu Valley,

Perlman & Wood 15045 (BISH, P, PAP, PTBG, US) [glabrous corolla form]; summit of ridge S of Tekao, 0.5 mi. (0.8 km) N of new airport road, *Perlman & Wood 15061* (P, PAP, PTBG, US); gulch to south of Peak #1227 m [Tekao], *Perlman & Wood 15063* (BISH, MO, P, PAP, PTBG, US); Toovii, Ooumu area, top of Tapueahu Valley off new highway 8°51'S, 140°19'W, *Wood & Perlman 4646* (BISH, MO, PAP, PTBG, US) [glabrous corolla form].

3. ***Psychotria gagneorum*** Lorence & W. L. Wagner, sp. nov. TYPE: MARQUE-SAS ISLANDS: HIVA OA: Central part, Mt. Ootua, elev. 650 m, 27 July 1977, *B. H. Gagné 1175* (Holotype US; Isotype BISH 422801). Figure 3.

Differt a congeneribus Marquesanis stipulis magnis cum 4 lobis anguste ellipticis foliaceis 14 × 3.5 mm; inflorescentia pseudo-axillari subsessili, subglobosi vel elongati, pubescentia brunnea rubenti; corollis magnis tubo 20 mm longis; fructibus magnis, 18–24 × 14–20 mm, in axillis foliorum dense fasciculatis.

Shrub to 3 m tall, branchlets 7–8 mm diam., densely reddish-brown appressed-tomentose distally, soon glabrate, bark pale brown, wrinkled. Leaves with blade (9–) 12.6–14.7 × (3.8–)6.9–8.3 cm, elliptic-obovate, subcoriaceous, glabrous except sparsely villous below toward costa and on margins, domatia absent, margins slightly revolute toward base, costa wide and conspicuously raised above, base cuneate, slightly decurrent, apex acute to obtuse, secondary veins 18–22 pairs, eucamptodromous, tertiary venation oblique, prominently raised on both surfaces; petioles (1–)1.4–2.2 cm long, stout, usually narrowly winged with abaxially pubescent wings; stipules calyptrate, 40 mm long, ovoid, sheath 26 mm long, lobes 4, foliaceous, 14 × 3.5 mm, narrowly elliptic, externally densely reddish-brown villous-tomentose with hairs to 3 mm long, deciduous leaving

a fringe of rufous hairs at the nodes. Inflorescences pseudoaxillary, ca. 1–1.5 × 1 cm (excluding corollas), subsessile, subcapitate-cymose, subglobose or slightly elongate, the short axes obscured by dense reddish brown sericeous-tomentose pubescence to 3 mm long, flowers ca. 18–27. Flowers subsessile, bracteolate, bracts narrowly triangular, ca. 1 mm long, hypanthium 0.5–1 mm long, obconic, densely sericeous-tomentose; calyx limb 1–1.5 mm long, cupuliform-cyathiform, truncate, externally sericeous-tomentose, internally glabrous; disc cylindrical, ca. 0.5 mm long; corolla (only 1 seen) narrowly funnelform, white when fresh, externally glabrous, tube ca. 20 mm long, internally sparsely villosulous distally, lobes 4 (–5?), ovate-lanceolate, 4–5 × 2 mm, apices with thickened appendages; anthers included, 1.5–2 mm long, attached below top of tube, style not seen. Fruit 18–24 × 14–20 mm, broadly ellipsoid, with umbo to 5 mm long, sparsely villosulous or glabrate, ripening yellow-orange; pyrenes hemispherical in cross section, dorsal surface with 3–4 prominent ribs separated by internal cavities, margins thickened, ventral surface flat.

Distribution, phenology, and habitat.

This distinctive new species is known from the type locality at Mt. Ootua at 650 m and the Mt. Temetiu summit area in east-central Hiva Oa at c. 1130 m elevation, where it occurs in montane wet forest with *Freycinetia*, *Crossostylis*, and *Reynoldsia*. It was collected in flower in July and in fruit in July and February.

Discussion. The large stipules with 4 foliaceous lobes, subsessile, subglobose or elongate reddish-brown pubescent inflorescence, large corollas ca. 25 mm long, and very large yellow-orange fruits 18–24 mm long densely clustered in the leaf axils distinguish *Psychotria gagneorum* from all its Marquesan congeners. Its subcapitate, pseudoaxillary inflorescences becoming laterally displaced when in fruit resemble those of

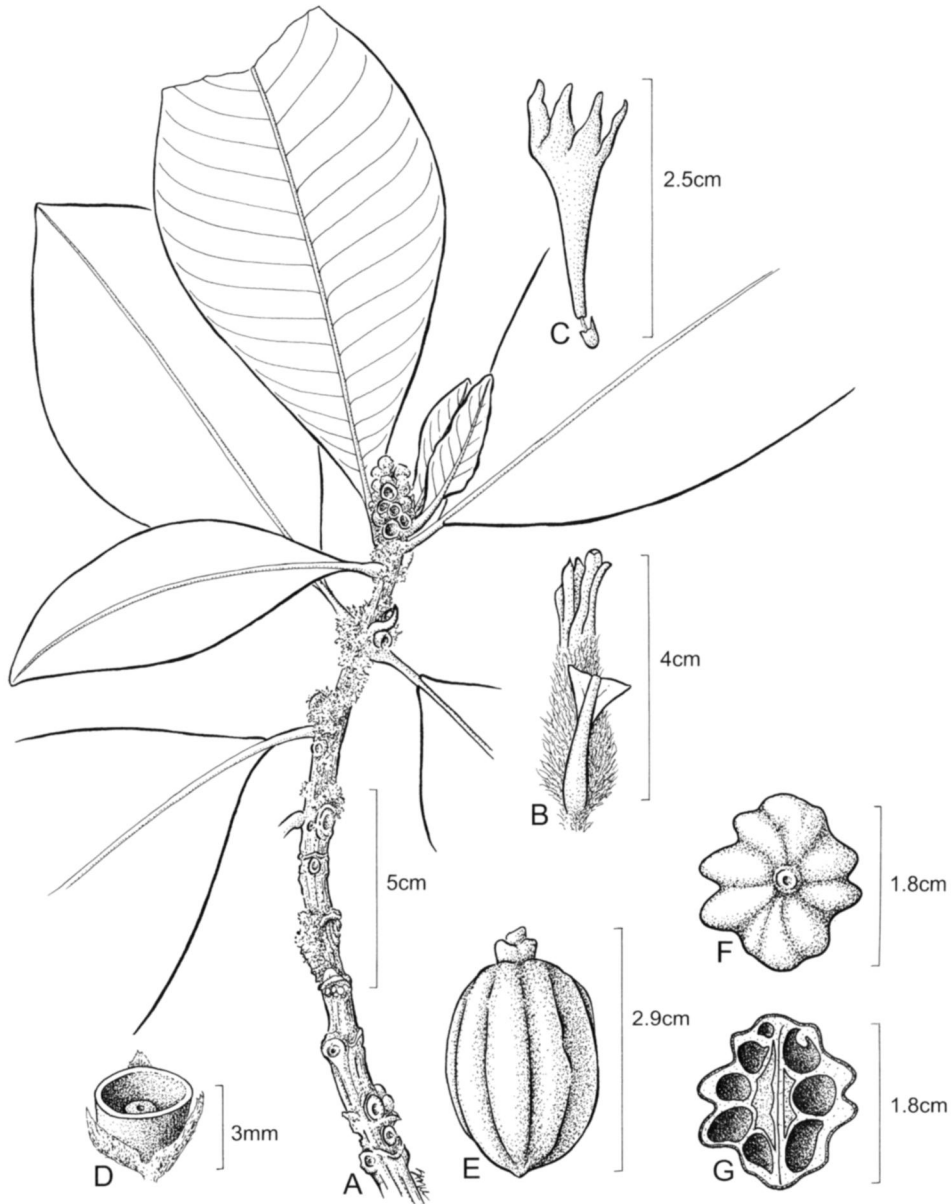


FIGURE 3. *Psychotria gagneorum*. A, habit with inflorescence (corollas fallen); B, stipule showing 4 lobes and subtending leaf pair; C, flower with corolla and calyx; D, detail of calyx and disc; E, fruit, side view; F, fruit, apical view; G, fruit in transverse section showing pyrenes and chamber-like cavities. (A, C, E based on Gagné 1175, US; B, D based on Gagné 1175, BISH; F, G based on Meyer 828, PTBG).

P. speciosa G. Forst. from Tahiti (Meyer et al. 2003), but that species has smaller ellipsoid fruits $12\text{--}13 \times 5\text{--}7$ mm. We are pleased to name this new species for Bishop Museum entomologist Wayne C. Gagné

(1942–1988) and his wife Betsy Harrison Gagné who collected the type in 1977.

Additional specimen examined. **MARQUESAS ISLANDS: HIVA Oa.** Mt. Temetiu, near summit, Meyer 828 (PAP, PTBG).

4. ***Psychotria hivoana*** Fosberg, Notul. Syst. (Paris) 8: 166. 1939. TYPE: MARQUESAS ISLANDS: HIVA OA: Feani, 3900 ft (1185 m), *Le Bronnec 800* (Holotype BISH-578820; Isotypes BISH-578818, BISH-578819). Figure 4.

Shrub or small tree to 5 m tall, branchlets 4–5 mm diam., when young sometimes with matted, pale brown tomentum, soon glabrate, bark brown, smooth. Leaves with blade 6.5–22 × 4.5–12 cm, elliptic or oblong to broadly elliptic or obovate-elliptic, chartaceous, glabrous and dull above, paler and dull below with thin, light brown arachnoid tomentum, glabrate except tomentum persisting along costa and secondary veins, domatia absent, margins plane, base acute to obtuse, rarely short-attenuate, apex obtuse to rounded and very short-acuminate, acumen 3–5 mm long, secondary veins 12–20 pairs, eucamptodromous, disappearing near margin, tertiary venation oblique, usually prominently raised on both surfaces, higher order venation inconspicuous; petiole 1–4 cm long, stout, narrowly winged distally, when young with matted brown tomentum, soon glabrate; stipules calyprate, 15–50 mm long, ovoid to ovoid-oblong, thinly matted tomentose and soon glabrate or glabrous and pubescent only along the sutures, deciduous, sheath 10–40 mm long, lobes 2, elliptic to obovate, 5–10 mm long, deciduous leaving a few short brown hairs. Inflorescences terminal rarely becoming pseudoaxillary, 3.5–7.5 × 4–8 cm (including the corollas), cymose-corymbiform, glabrous or sparsely brown arachnoid-tomentose, sessile and trichotomous, flowers 45–90, primary axes somewhat flattened, 20–30 mm long, secondary axes 8–20 mm long, tertiary axes 5–7 mm long, ending in (1–)3-flowered cymules, bracts narrowly to broadly triangular, 0.4–1 mm long, margins glandular-fimbriate; flowers sessile or pedicels to 1 mm long, glabrous or puberulent basally. Flowers monomorphic, with hypanthium 1–1.5 mm long, obconic, gla-

brous; calyx limb 0.5–1.5 mm long, cupuliform to shallowly cyathiform, glabrous externally and internally, margin truncate, glabrous or ciliolate, disc glabrous, 0.5 mm long; corolla hypocrateriform, 12–18 mm long, white, externally glabrous or minutely puberulent apically, tube 7–15 mm long, internally densely hirtellous in distal 1/3, lobes 5, 4–5 mm long, oblong, externally glabrous except minutely puberulent apically, internally densely hirtellous or hirtellous only toward base, apices adaxially thickened into hooked appendages, anthers 2.5–4 mm long, attached below top of tube, included, style ca. 6 mm long, included. Fruits ripening orange or red, ellipsoid, 8–10 × 6–7 mm, ribbed, umbonate; pyrenes hemispherical in cross section, dorsal surface with 2–3 prominent ribs and thickened margins, ventral surface flat.

Distribution, phenology, and habitat. Known from Hiva Oa and Tahuata, in montane wet forest with *Freycinetia*, *Metrosideros*, *Weinmannia*, *Crossostylis*, *Cyathea*, *Myrsine*, *Cheirodendron*, *Reynoldsia*, *Angiopteris*, *Dicranopteris*, *Psychotria*, *Ficus*, *Vaccinium*, *Hibiscus tiliaceus* L., at 780–1194 m elevation. Collected in flower and fruit in January, August, and September.

Discussion. This species can be distinguished by its large, elliptic, broadly elliptic, oblong, or obovate-elliptic leaf blades covered beneath with a thin layer of light brown arachnoid tomentum when young but soon glabrate, numerous secondary veins (12–20 pairs), large stipules 10–40 mm long, large inflorescences with 45–90 flowers, and large fruits 8–10 × 6–7 mm. It resembles *P. florencei* from Nuku Hiva, but that species has fewer secondary veins and smaller stipules and fruits.

Additional specimens examined. MARQUESAS ISLANDS: HIVA OA: trail to Hanamenu, *Perlman 10195* (BISH); summit of Mt. Temetiu, along ridge between Temetiu and Hanamenu trail at spring (Vaiumete et Vaiumioi), *Perlman et al. 14881* (P, PAP, PTBG, US); Mt. Temetiu,

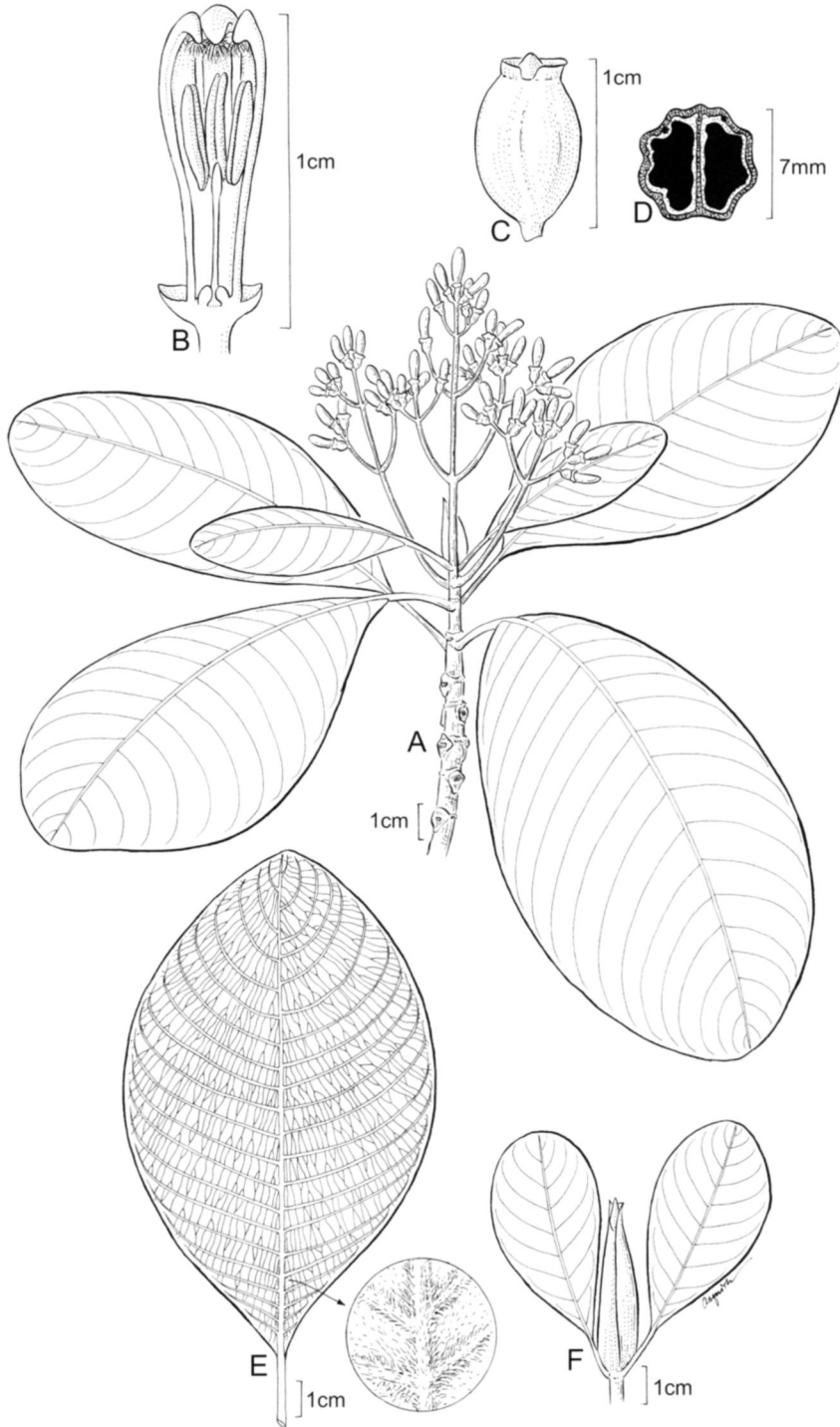


FIGURE 4. *Psychotria hivaoana*. A, habit with inflorescence; B, flower in bud, longitudinal section; C, fruit; D, fruit in transverse section showing pyrenes; E, leaf, abaxial surface showing veins and detail of pubescence; F, stipule with subtending leaf pair. (A, B, E, F based on *Perlman 10231*, PTBG; C, D based on *Lebronec 800*, BISH).

about half way up between top of Hanamenu and Temetiu summit, on W side of ridge crest, *Perlman, Wood & Meyer 14886* (BISH, P, PAP, PTBG, US), *Perlman, Wood & Meyer 14888* (P, PAP, PTBG, US); summit of Temetiu and along ridge between Vaiumete et Vaiumioi (spring) and summit, *Perlman, Wood & Meyer 14877* (BISH, P, PAP, PTBG, US); Temetiu, 0.2 km W of where trail between Atuona and Hanamenu follows summit ridge, *Price 207* (PTBG, US); Teakatu, valley on N side of Hanamenu trail leading down to Hanameu past summit crest, between Teakatau and Tepuna, *Perlman & Meyer 14891* (P, PAP, PTBG, US); Mountains of Vaipikopiko, new road from Hahaiapa, cut off to Vaipahee Falls, on Kaava Ridge, *Perlman 10231* (AD, BISH, F, K, MO, P, PAP, PTBG, US, WU); Vaipahee Falls area, ridge crest, Kaava ridge further toward Feani, *Perlman 10252* (BISH). TAHUATA: Haaioiputeomo, on SE side of slope above village of Hanatetena, summit ridge of island, *Perlman et al. 14930* (PAP, PTBG, US); Haaioiputeomo, summit ridge, 9°57'S, 139°05'W, *Wood & Perlman 6548* (PTBG); off trail from Amatea to Moteve, above Haaioipu Bay to NE of Hanatetena, top of ridge crest on W-facing slope, *Perlman et al. 15994* (PTBG, US).

5. ***Psychotria marchionica*** Drake, Ill. Fl. Ins. Mar. Pac. 198. 1890. *Uragoga marchionica* (Drake) Drake, Fl. Polynes. Fr. 97. 1893. TYPE: MARQUESAS ISLANDS [apparently NUKU HIVA] "Noukahiva", 1844, *Le Batard 43* [cited in error as 93] (Holotype P; Isotype P). Figures 5, 6.

Psychotria lebronnecii Fosberg, Notul. Syst. (Paris) 8: 168. 1939, **syn. nov.**; as "le-bronnecii". TYPE: MARQUESAS ISLANDS: HIVA OA: Matauuna, 4000 ft, *Mumford & Adamson HO.1004* (Holotype BISH).

Psychotria lebronnecii Fosberg var. *tahuatensis* Fosberg, Notul. Syst. (Paris) 8:

169. 1939, **syn. nov.** TYPE: MARQUESAS ISLANDS: TAHUATA: Amatea, 2500 ft, *Lebronnec 604* (Holotype P).

Shrub or small tree to 5 m tall, trunk to 25 cm diam., branchlets 3–5 mm diam., glabrous, nodes often with swollen leaf scars, bark brown, wrinkled or becoming fissured. Leaves with blade (3.5–)4.5–12 × 2.1–7.5 cm, elliptic to broadly elliptic, obovate-elliptic, obovate, or broadly oblanceolate, subcoriaceous to coriaceous, glabrous and usually glossy above, glabrous below or with reddish-brown villous pubescence extending as a fringe along the costa or sometimes reduced to patches in the secondary vein axils as barbate domatia, or domatia absent, margins plane, base acute to obtuse or rarely short-attenuate, apex obtuse to rounded and very short-acuminate, acumen 2–5 mm long, secondary veins 6–13 pairs, eucamptodromous, disappearing near margin, tertiary venation oblique, usually raised and conspicuous on both surfaces, higher order venation inconspicuous; petiole (0.3–)0.8–1.7(–2.7) cm, stout, narrowly winged distally, glabrous or sparsely rufous-villous proximally along wing; stipules, calyptrate, 12–38 mm long, ovoid to ovoid-oblong, sheath 10–35 mm long, lobes 2, elliptic, 1–3 mm long, sparsely to densely rufous-villous or thinly matted strigose, or glabrous and pubescent only along the sutures, deciduous leaving a fringe of rufous hairs. Inflorescences terminal, 2–5 × 2.5–4 cm (including the corollas), cymose-corymbiform, glabrous or sometimes very sparsely puberulent, sessile and trichotomous, flowers 3–20, primary axes somewhat flattened, (5–)8–20 mm long, ending in (2–)3–9(–12)-flowered cymules, bracts narrowly to broadly triangular, 0.5–1 mm long, margins glandular-fimbriate; flowers subsessile or pedicels to 20 mm long, glabrous or sometimes very sparsely puberulent. Flowers monomorphic, with hypanthium 1–3 mm long, obconic, glabrous; calyx limb 1.5–4.5 mm long, cupuliform to shal-

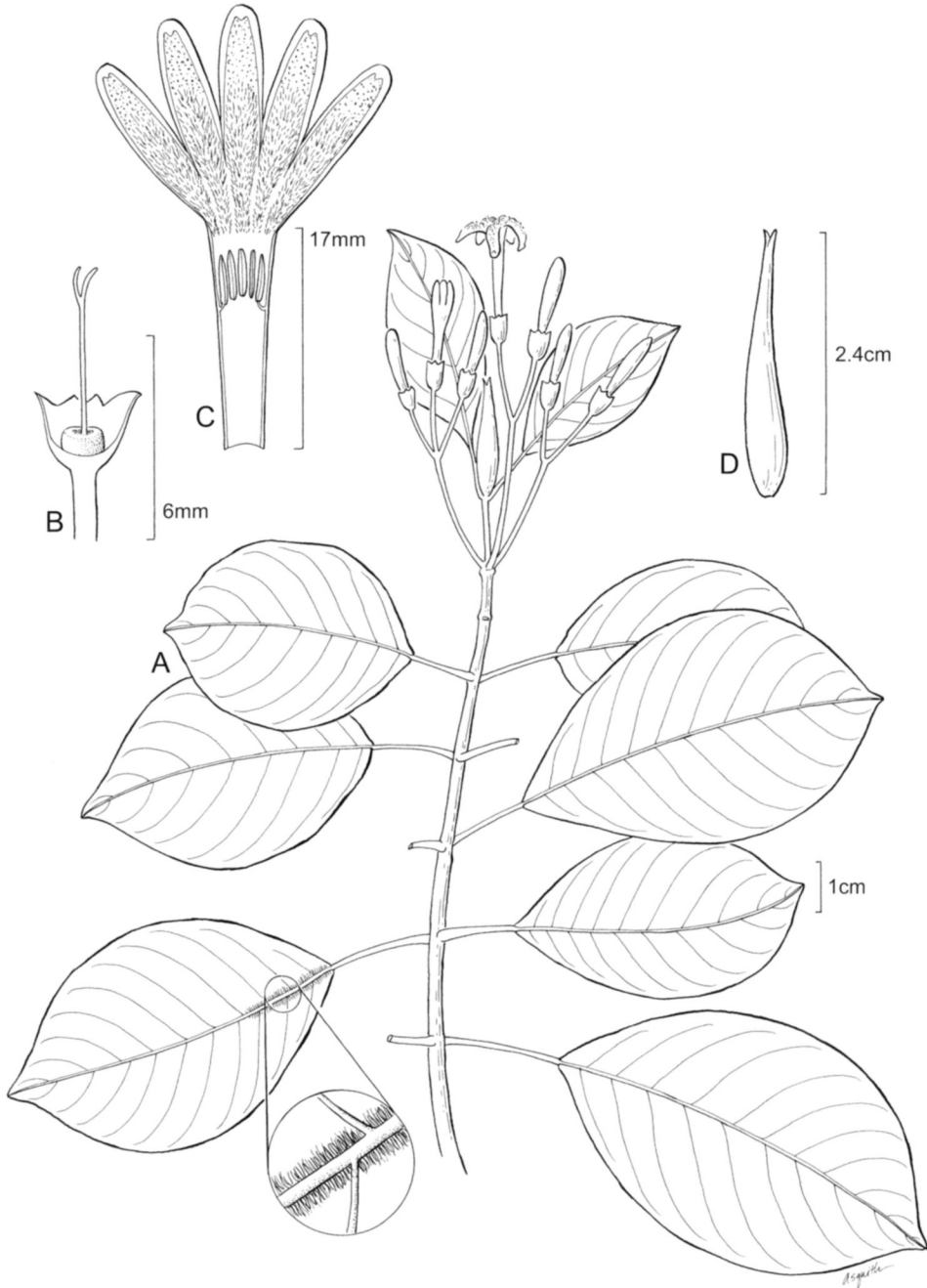


FIGURE 5. *Psychotria marchionica*, form from Hiva Oa with broadly elliptic, long-petiolate leaves. A, habit with inflorescence; B, gynoecium with calyx partly cut away showing style and disc; C, corolla, tube opened to show stamens; D, stipule. (Based on *Perlman 10190*, PTBG.)

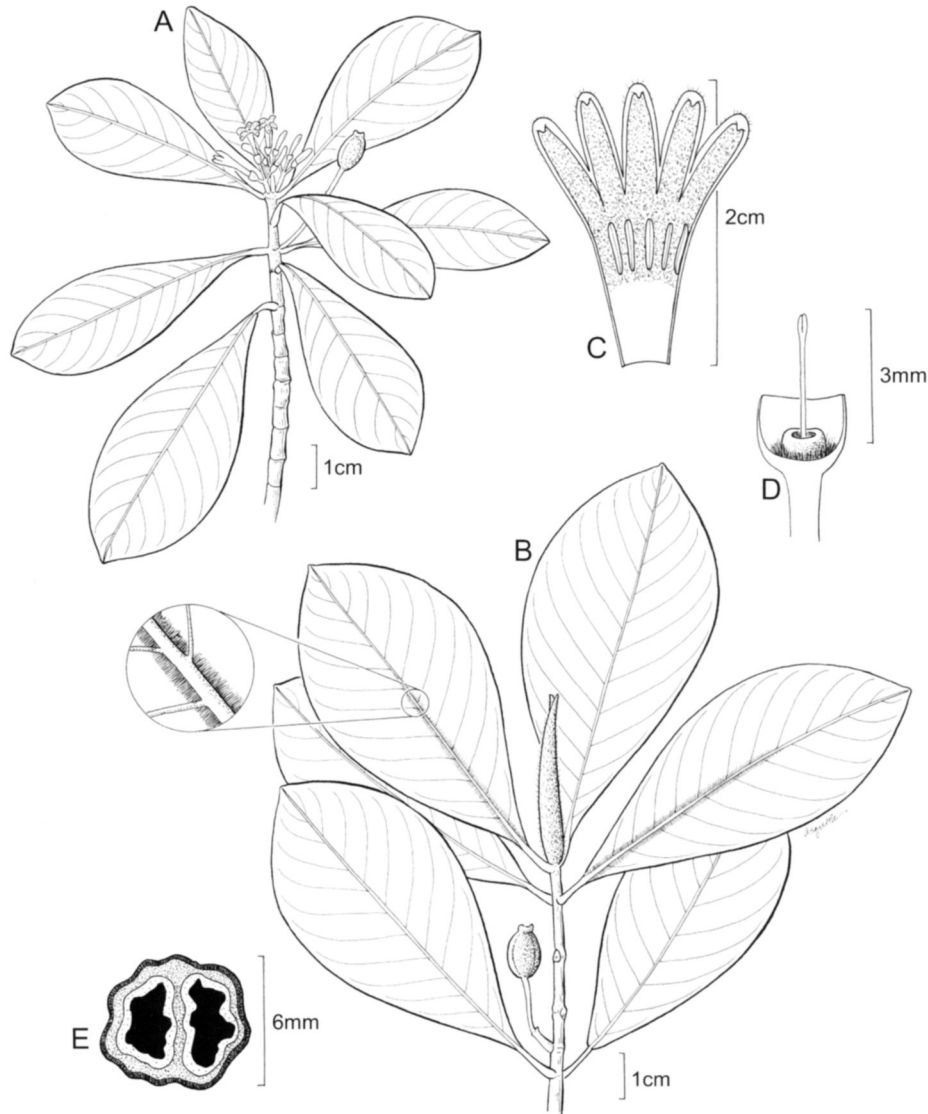


FIGURE 6. *Psychotria marchionica*, form from Hiva Oa with obovate, shortly petiolate leaves. A, habit with inflorescence and infructescence; B, habit with stipule and infructescence, inset with detail of abaxial leaf surface; C, corolla opened showing stamens; D, gynoecium with calyx partly cut away showing style and disc; E, fruit in transverse section showing pyrenes. (Based on *Lorence et al. 6241*, PTBG.)

lowly cyathiform, glabrous externally and internally or with scattered hairs along margin, margin truncate, denticulate or with deltoid teeth to 1 mm long, sometimes splitting along one side; disc glabrous, ca. 0.5 mm long; corolla hypocrateriform, 9–30 mm long, white, tube 6–19 mm long, externally glabrous or puberulent distally (Ta-

huata), internally densely short-villosus in distal half to below stamens, lobes 5, 3–11 mm long, oblong, externally glabrous or minutely hirtellous especially apically, internally densely hirtellous-villosulous or hirtellous only toward base, apices adaxially thickened into hooked appendages, anthers 1.5–3.5 mm long, attached below top

of tube, tips included, style 2.5–7.5 mm long, included. Fruits ripening orange or red, ellipsoid to ovoid-ellipsoid or spheroidal, 7–11 × 7–10 mm, ribbed, umbonate; pyrenes hemispherical in cross section, dorsal surface with 3–5 prominent, acute ribs and thickened margins, ventral surface flat.

Distribution, phenology, and habitat. Known from Hiva Oa, Tahuata, Fatu Hiva, and a single collection (the type) from Nuku Hiva. *Psychotria marchionica* occurs from ca. 800 to 1300 m as an understory or mid-stratum shrub or tree in montane wet forest and cloud forest on slopes and valleys with *Weinmannia*, *Cyathea*, *Metrosideros*, *Wikstroemia*, *Psychotria*, *Alstonia*, *Freycinetia*, *Crossostylis*, *Dicranopteris*, *Lycopodium*, *Blechnum*, *Reynoldsia*, *Gahnia*, and *Leptochloa*, in low, dense wind-swept cloud forest on upper ridges and summits with *Freycinetia*, *Metrosideros*, *Weinmannia*, *Cheirodendron*, *Reynoldsia*, numerous epiphytes, and a rich pteridophyte understory, and in low *Metrosideros*-*Dicranopteris* summit shrubland. Collected in flower and fruit from February to September.

Discussion. Although the printed labels for the holotype and isotypes of *Psychotria marchionica* (*Le Batard 43*) state “Noukahiva [Nuku Hiva], îles Marquises”, the original hand-written label on the holotype indicates no island, only stating “arbrisseau à feuilles tres odorantes, ne croiss . . . [unintelligible] que sur les montagnes.” None of the Marquesan *Psychotria* species have odoriferous leaves, suggesting the label may have pertained to another plant altogether. Furthermore, this species has never been recollected on Nuku Hiva, and the type locality is likely cited in error. Although little information is available regarding Le Batard’s itinerary, it is possible that he could have collected on Hiva Oa (J. Florence, pers. comm. 2002).

In his protologue Drake (1890) cited the type as “*Le Batard 93*,” apparently in error, as the only Le Batard *Psychotria* collec-

tions from the Marquesas located at Paris are two sheets of *Le Batard 43*. These specimens correspond well with the original description of *P. marchionica*, and Drake likely misread the collection number as 93. The type of *Psychotria marchionica* is a close morphological match for material of *P. lebronnecii*. Fosberg (1939) described *P. lebronnecii* for essentially the same taxon we treat here as *P. marchionica*. He considered Drake’s original description of *P. marchionica* inadequate and was unable to locate the type at the Paris herbarium and therefore uncertain as to how to apply the latter name. He nevertheless maintained *P. marchionica* and separated it from *P. lebronnecii* and the other Marquesan species by its having the fewest number of flowers. When the type of *P. marchionica* was located at P, it was clear that it represented the same taxon as *P. lebronnecii*. We here adopt *P. marchionica* as the oldest available epithet for this species.

Psychotria marchionica is the most widespread and morphologically variable of all Marquesan *Psychotria* species. It may be distinguished from its Marquesan congeners by the following combination of characters: thick branchlets with short internodes and prominent leaf scars; leaves with relatively short, usually winged petioles, with the blade obovate-elliptic to broadly elliptic or oblanceolate, subcoriaceous, glossy and glabrous above, glabrous below or with reddish brown villous pubescence extending as a fringe along the costa or sometimes reduced to patches in the secondary vein axils (i.e., barbate domatia); stipules calyptrate, sheathing, externally glabrous to rufous villous, with apex shortly 2-lobed; relatively few-flowered (9–27) inflorescences; flowers robust and usually pedicellate with cupuliform to deeply cyathiform calyces that often split along one side; large, fleshy corollas with the lobes externally hirtellous apically and internally densely white papillose-puberulent throughout and the stout tube externally

glabrous and internally villosulous; and relatively large fruits having pyrenes with 4–5 dorsal ribs.

The considerable morphological variation in this species may be a reflection of its broad geographical and ecological range. Because these distinctive vegetative and floral characters vary independently and intergrade continuously between the extreme states and do not seem to have any ecological or habitat correlation, we have do not formally recognize any infraspecific variants here. Collections from central Hiva Oa and Tahuata, where *P. marchionica* is most abundant, are more variable than populations elsewhere. The following four morphological variants of *Psychotria marchionica* are discernable.

1. The type of *P. marchionica* and certain collections from central Hiva Oa (800–1264 m) are characterized by relatively small, broadly elliptic to suborbicular leaf blades, relatively longer and slender narrowly winged petioles, the blade glabrous or hairy below along the costa, relatively sparse and lax 4–12-flowered inflorescences, and flowers with pedicels 5–15 mm long, a deep, cyathiform calyx, large externally glabrous corollas 12–20 mm long, and anthers 2.5–3.2 mm long (Figure 5). However, this form intergrades with the following ones.

2. Plants from central Hiva Oa (800–1264 m) recognized as *P. lebronnecii* by Fosberg (1939) have leaves with stout and broadly winged petioles 6–15 mm long, broadly obovate blades with abruptly short-acuminate to obtuse or rounded apices, compact inflorescences, flowers with pedicels 3–5 mm long, corollas 15–30 mm long with externally glabrous to minutely puberulent lobes, and anthers 3–3.5 mm long (Figure 6).

3. Fosberg (1939) recognized plants from Tahuata (762–884 m) as *P. lebronnecii* var. *tahuatensis* based on their leaves, which in most collections are sessile or with petioles to 6 mm long and have ob-

ovate-elliptic blades that are glabrous or pubescent along the costa below, with acute or short-acuminate apices, and compact inflorescences having sessile flowers with pedicels 1–10 mm long, corollas 12–20 mm long, and anthers 1.8–2.2 mm long. These differences fall within the overall morphological variability displayed by *P. marchionica* on Hiva Oa and Fatu Hiva.

4. Collections from Fatu Hiva (732–820 m), where *P. marchionica* is rare and localized, have sessile leaves with broad, winged petioles 3–5 mm long, blades with pubescence confined to the costa or patches in the secondary vein axils below, and more compact inflorescences with relatively smaller flowers with pedicels 2–4 mm long, corollas 10–15 mm long, and anthers 1.5–3 mm long. Most of these characters intergrade with forms of *P. marchionica* from other islands.

Additional specimens examined. **MARQUESAS ISLANDS: HIVA Oa:** Along old Atuona–Hanamenu trail, on high ridge leading to Mt. Feani, *Lorence et al.* 6235 (PTBG, US), *Lorence, et al.* 6241 (BISH, PAP, PTBG, US); summit plateau, trail to Hanamenu from Vaiumete et Vaiumioi, W for 1.5 mi. toward Hanamenu, *Perlman & Meyer* 14872 (BISH, P, PAP, PTBG, US), 14874 (MO, P, PAP, PTBG, US), 14875 (BISH, P, PAP, PTBG, US), *Perlman & Meyer* 14876 (BISH, NY, P, PAP, PTBG, US); below Temetiu summit, *Perlman et al.* 14877A (BISH, MO, NY, P, PAP, PTBG, US); Temetiu summit, *Perlman et al.* 14879 (PTBG); base camp near Vaiumete to ridge crest S of Teakatau, 9°48'S, 139°4'W, *Lorence et al.* 8933 (PAP, PTBG); Atuona, piste de Hanamenu, NW du Mt. Temetiu, *Florence et al.* 9632 (BISH, P, PAP), *Florence et al.* 9636 (PAP), *Florence & Perlman* 9659 (BISH, P, PAP, US), *Florence & Perlman* 9663 (BISH, P, PAP); montagnes NW de Temetiu, entre la haute vallée de Hanamenu et la crête de Temetiu–Feani, *Schäfer* 5925 (PTBG, US); Atuona–Feani Trail, crest of ridge and top of leeward

slope, *Sachet & Decker 1146* (BISH, CBG, CHR, L, MO, NSW, P, PTBG, US); Chemin d'Atuona à Hanamenu par Feani, crête sommitale, *Schäfer 5181* (MPU, US); Chemin d'Atuona par Feani pente vers Hanamenu, *Schäfer 5196* (MPU, PTBG, US); Feani, *LeBronnec 801* (BISH 3 sheets); Mt. Feani ridge to upper slopes of dry side of island, *Oliver & Schäfer 3120* (BISH, MO, P, PTBG, US), *Oliver & Schäfer 3129* (BISH, P, PTBG, US); Mt. Feani, trail from Atuona to Hanamenu, *Oliver & Schäfer 3231* (BISH, PTBG, US), *Oliver & Schäfer 3232* (BISH, US); Mt. Feani, on top of ridge, *Clarke HO6* (US); Sentier d'Atuona à la crête de Feani, *Schäfer 5947* (MPU, PTBG, US); Feani area, on Hanamenu trail, summit crest from Vaiumete and Vaiumioi (source) toward Hanamenu, 9°47.872'S, 139°4.750'W, *Perlman et al. 18339* (BISH, P, PAP, PTBG, US), 18340 (BISH, P, PAP, PTBG, US), 18341 (BISH, P, PAP, PTBG, US), 18342 (BISH, P, PAP, PTBG, US), 9°47.694'S, 139°4.900'W, *Perlman et al. 18346* (BISH, P, PAP, PTBG, US); Trail to Feani and Hanamenu, along plateau rim and ridge trail, *Perlman 10183* (BISH, PTBG), 10190 (BISH, PAP, PTBG); Trail toward Hanamenu, low forest, *Perlman 10197* (BISH, PTBG); Hanamenu region, up Hanamenu valley to drainages below and W of Temetiu, 9°76'S, 139°0'W, *Wood 10242* (BISH, MO, NY, P, PAP, PTBG, US); along trail between Mt. Feani and Temetiu, just in lee of summit, *Wagner & Lorence 6224* (BISH, PTBG, US 2 sheets), *Wagner & Lorence 6230* (BISH, K, PAP, PTBG, US); Mt. Temetiu, about half way between top of Hanamenu and Temetiu summit, W side of ridge crest, 9°48'30"S, 139°4'00"W, *Perlman et al. 14889* (AD, BISH, F, MO, NY, P, PAP, PTBG, US, WU); Mt. Temetiu summit, *Perlman et al. 14878* (MO, P, PAP, PTBG, US); Mountains of Vaipikopiko, new road from Hahaiapa, cut off to Vaipahee Falls, on Kaava Ridge, *Perlman 10234* (BISH, MO, PTBG); Mt. Feani, *Cherrier in McKee 44693* (PAP); Mt. Ootua, off road between airport and Puamau, ridge and summit, *Perlman & Wood 14862* (BISH, PAP, PTBG, US); Mt. Ootua, summit area, E and NE-facing slopes, 9°46'S, 138°58'W, *Perlman et al. 14902* (BISH, P, PAP, PTBG, US), 9°46.43'S, 138°58.257'W, *Perlman 18471* (BISH, P, PAP, PTBG, US), *Perlman 18478* (BISH, P, PAP, PTBG, US). **TAHUA- TA:** Amatea, *Lebronnc 604* (P); ridge from Amatea to Moteve passing Meikaea, *Perlman et al. 15975* (PAP, PTBG, US); Amatea near antenna, near top of trail from Kuae, over Hanatetena village, *Perlman et al. 15957* (BISH, P, PAP, PTBG, US); Amatea region around Haaioiputeomo satellite dish, *Wood & Timau 10254* (PTBG, US), 10255 (PAP, PTBG, US), 9°56'36"S, 139°5'5"W, *Dunn 199* (PTBG, US); Amatea to Moteve, above Haaioipu Bay to NE of Hanatetena, 09°56'S, 139°04'W, *Perlman et al. 16004* (PAP, PTBG, US); ridge up to Amatea from Kuae, 09°56'S, 139°04'W, *Perlman et al. 16006* (BISH, MO, P, PAP, PTBG, US), 16009 (PTBG); summit of ridge above Vaitahu near Haaioiputeomo, *Perlman et al. 14913* (BISH, P, PAP, PTBG, US), 14914 (BISH, MO, NY, P, PAP, PTBG, US), 14924 (PTBG); Haaioiputeomo, SE side of slope above village of Hanatetena, *Perlman et al 14931* (PAP, PTBG, US); Haaioiputeomo near satellite dish, NE from Vaitahu to summit ridge, *Wood 4448* (BISH, MO, P, PAP, PTBG, US, WU), *Wood 4455* (BISH, P, PAP, PTBG, US), 09°57.19'S, 139°05.74'W, *Wood 6564* (PTBG), 6568 (P, PAP, PTBG, US); ridge between Amatea and Haaioiputeomo, SE facing slopes over Hanatetena village, *Perlman et al. 15951* (PAP, PTBG, US). **FATU HIVA:** Crête ouest du Mt Mounanui, *Florence & Perlman 9591*(PAP); Crete Ouest du Mt. Mounanui, *Florence 9572* (P, PAP), *Florence & Perlman 9588* (BISH, P, PAP); Slopes of Mounanui above Vaieenui Falls, on ridge top below Mounanui, *Perlman & Florence 10167* (BISH, MO, PTBG); W side of Mounanui, *Perlman 14979* (PTBG).

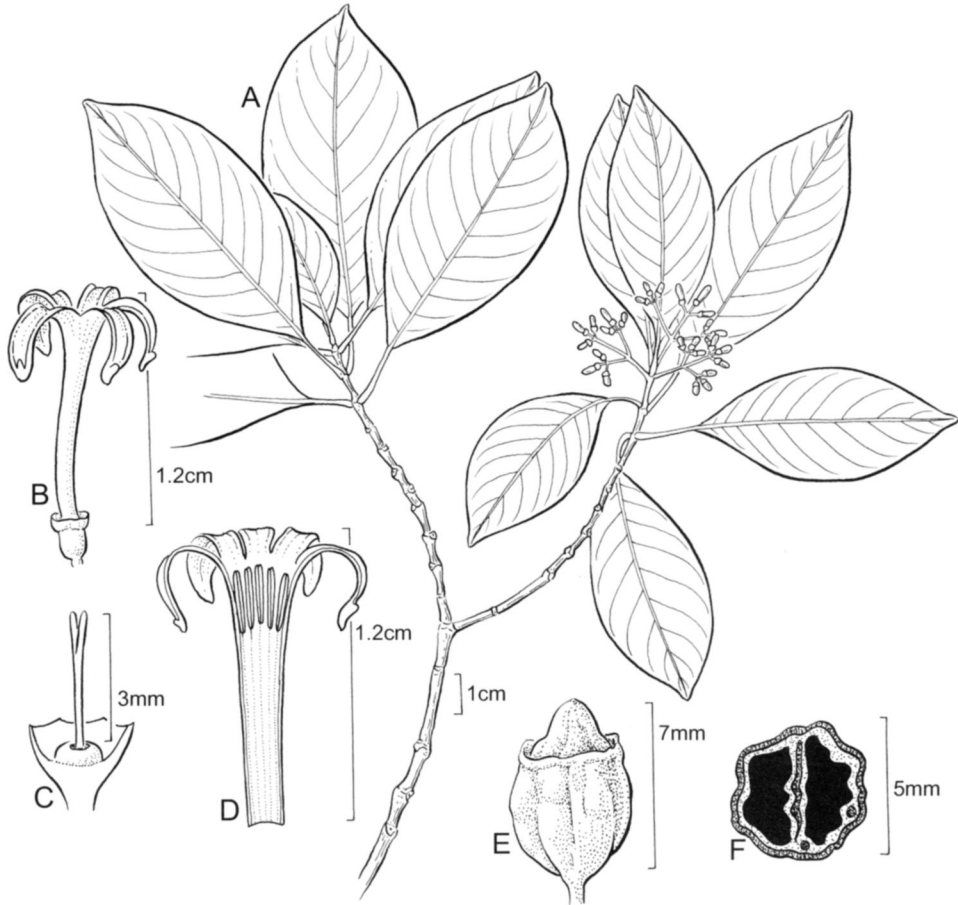


FIGURE 7. *Psychotria mumfordiana*. A, habit with inflorescence; B, flower; C, gynoecium with calyx partly cut away showing style and disc; D, corolla, tube opened to show stamens; E, fruit; F, fruit in transverse section showing pyrenes. (A–D based on Schäfer 5918, PTBG; E, F based on Schäfer 5919, PTBG.)

6. ***Psychotria mumfordiana*** F. Brown, Bernice P. Bishop Mus. Bull. 130: 311. 1935. TYPE: MARQUESAS ISLANDS: HIVA OA. NE slopes of Mt. Temetiu, 700 m, 23 Feb. 1929, *Mumford & Adamson 47* (Holotype BISH). Figure 7.

Shrub or small tree to 4 m tall, glabrous throughout; branchlets 2.5–3.5 mm diam., bark smooth, pale brown. Leaves with blade 7.3–18 × 3.6–8.2 cm, elliptic-ovate or elliptic, chartaceous, glabrous except for minute, sparsely barbate domatia below, dull, margins plane, base narrowly to broadly cuneate, apex short-acuminate to

round and very shortly acuminate, the acuminate 2–7 mm long, secondary veins 9–13 pairs, eucamptodromous, tertiary venation oblique, more prominent than higher order venation; petioles 1.4–3.6 cm long, narrowly winged, the wing merely a narrow ridge throughout proximal $\frac{3}{4}$; stipules calyptrate, bulbous, glabrous, sheath 12–17 mm long, lobes 2, 3–7 mm long, linear to oblong, deciduous leaving a few rufous hairs. Inflorescences terminal, 3–4 × 3.5–7 cm, trichotomous, cymose-corymbiform, flowers ca. 27, primary axes 8–18 mm long, secondary axes 5–10 mm, cymules 3-flowered, bracts triangular to acicular, 0.5–2 mm

long, glabrous, glandular-tipped; pedicels 0.5–6 mm long. Flowers apparently dimorphic (only presumed short-styled form seen), hypanthium ca. 1 mm long, narrowly obconic, glabrous; calyx limb glabrous, 0.6–1 mm long, shallowly cyathiform, truncate, margin with minute teeth, disc 0.5 mm long; corolla white when fresh, hypocrateriform, tube 10–12 mm, glabrous externally and internally, lobes 5, 5–6 mm long, linear-oblong, with adaxially thickened appendages at apex, short-styled flowers with stamens attached just below top of tube, anthers ca. 4 mm long, tips exerted, style 3–3.5 mm long. Fruits 6–7 × 5 mm, obovoid-ellipsoid, glabrous, umbonate; pyrenes hemispherical in cross section, dorsal surface rugose with 2–3 low ribs and thickened margins, ventral surface flat.

Distribution, phenology, and habitat. Known only from Hiva Oa, *Psychotria mumfordiana* occurs in mid-elevation wet and secondary forest along dry stream beds at 600–930 m. Associated secondary forest species include *Mangifera indica* L., *Coffea arabica* L., and *Syzygium cumini* (L.) Skeels (all naturalized), and the indigenous species *Pandanus tectorius* Parkinson ex Z., *Freycinetia* sp., *Hibiscus tiliaceus* L., and *Angiopteris evecta* (G. Forst.) Hoffm. *Psychotria mumfordiana* occurs sympatically here with *P. schaeferi*, and both species are threatened by habitat degradation due to invasive alien species.

Discussion. Distinguishing characters of *P. mumfordiana* include its lack of pubescence on all parts except the minute, sparsely barbate domatia on the lower surface of the leaf blade and its slender inflorescence axes. It resembles *P. uapoensis*, which differs by its leaves lacking domatia and more robust inflorescence axes with more numerous (24–50) flowers.

Additional specimens examined. **MARQUESAS ISLANDS: HIVA Oa:** Montagnes NW du Temetiu, entre la haute vallée de Hanamenu et la crête de Temetiu–Feani, Schäfer 5918 (BISH, K, MO, P, PAP,

PTBG, US), Schäfer 5919 (BISH, P, PTBG, US), 5925 (US); sentier de Atuona menant à Vaiumete, 9°48'5"S, 139°4'24"W, Meyer 941 (PAP, PTBG); trail from Atuona up to ridge crest leading to Mt. Temetiu (old Atuona–Hanamenu trail), 9°48'S, 139°4'W, Lorence et al. 8929 (PAP, PTBG).

7. *Psychotria oliveri* Lorence & W. L. Wagner, sp. nov. TYPE: MARQUESAS ISLANDS: TAHUATA: Vaitahu, vers la crête d'Uuau, pente SW de la crête, 680 m elev., 8 Apr. 1975, P. A. Schäfer 5462 (Holotype US; Isotypes BISH, K, MO, MPU, P, PAP, PTBG). Figure 8.

Differt a congeneribus Marquesanis stipulis tubularibus cylindricalis ad apicem 4-lobis quadrifidis et findens secus unilaterialis ad basim, differt a *P. schaefero* lobis stipularibus 1–2 mm longis, limbo calycis cupuliformis vadosis, 1–1.5 mm longis per anthesim et fructiferis 2.5–3 mm.

Small tree to 3 m tall, trunk to 7.5 cm diam near base; branchlets 2.5–3.5 mm diam., glabrous, bark smooth, pale brown. Leaves with blade (5–)8–14.5 × (1.5–)2–3.8 cm, narrowly elliptic or narrowly oblong, chartaceous, glabrous except for domatia with tufted brown hairs present in medial vein axils below, margins plane, base narrowly cuneate, slightly decurrent, apex long acuminate, the acumen 1–2 cm long, secondary veins 10–14 pairs, eucamptodromous; petioles (0.5–)1–3 cm long, glabrous, narrowly winged distally; stipules cylindrical, sheath 4–8 mm long, lobes 4, 1–2 mm long, narrowly to broadly triangular, glabrous, deciduous, leaving a fringe of reddish hairs basally within. Inflorescences terminal, 3.5–4.5 × 4–6.5 cm (including corollas), cymose-corymbiform, glabrous, sessile and trichotomous, flowers 8–14, primary axes 8–18 mm long, unbranched, bearing 3-flowered cymules, bracts 0.2–0.5 mm long, broadly triangular to obtuse, glabrous, pedicels 3–7 mm long. Flowers possibly dimorphic (but only pre-

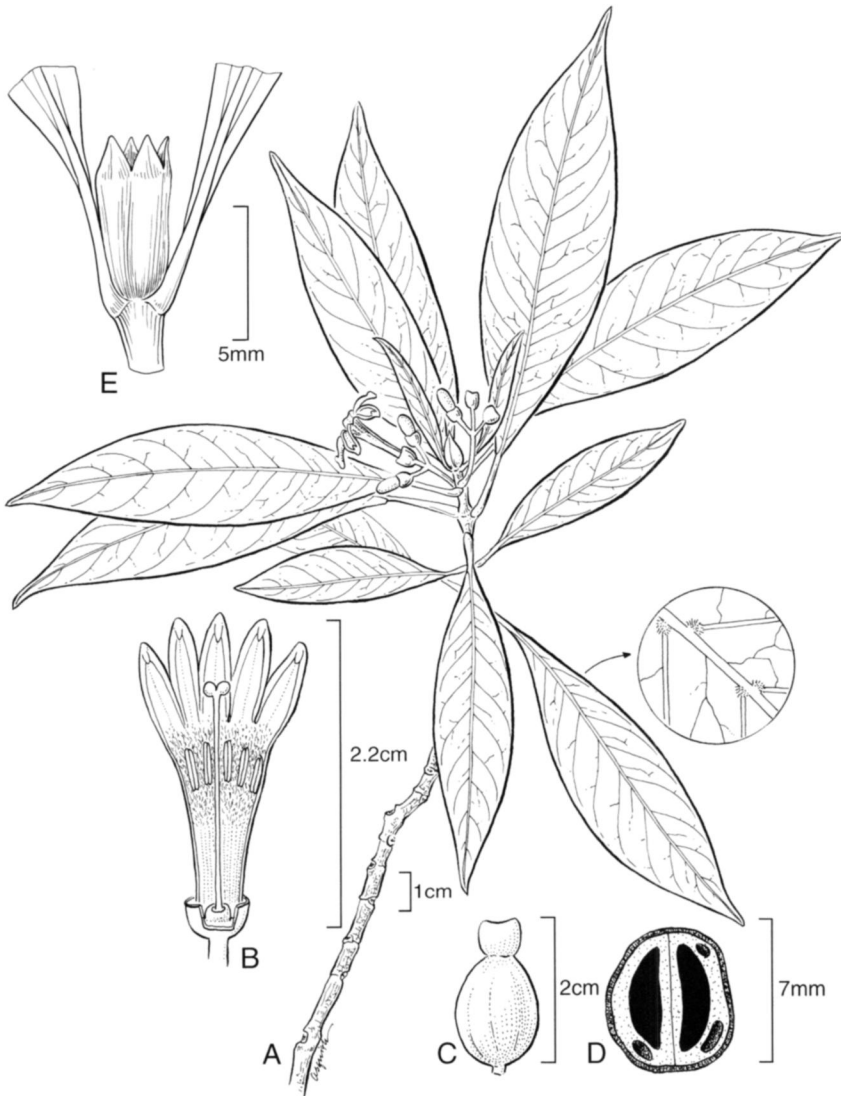


FIGURE 8. *Psychotria oliveri*. A, habit with inflorescence; B, flower in bud, partially dissected; C, fruit; D, fruit, transverse section showing pyrenes; E, stipule with stem, petioles, and leaf bases. (Based on Schäfer 5462 PTBG, US.)

sumed long-styled form seen), hypanthium 1–1.5 mm long, narrowly obconic, glabrous; calyx limb 1–1.5 mm long, glabrous, cupuliform to rotate, truncate or margin sparsely ciliolate-denticulate; disc 0.5 mm long; corolla hypocrateriform, white and fragrant when fresh, tube 15–17 mm long, externally glabrous, internally villosulous toward top of tube, lobes 5, 7–9 mm long,

oblong, internally rufous-villous basally, apices with adaxial appendages; presumed long-styled flowers with anthers ca. 3 mm long, attached near top of tube, tips exerted; style 22–23 mm long, exerted. Fruits (immature) 10–12 × 7–8 mm, ellipsoid, prominently umbonate with persistent calyx limb 2.5–3 mm long, glabrous, color when mature unknown; immature pyrenes hemi-

spherical in cross section, dorsal surface with 2 broad, rounded ribs, ventral surface flat.

Distribution, phenology, and habitat. This rare new species is apparently restricted to Tahuata from 680 to 823 m in humid montane shrubland and wet forest with *Freycinetia* and *Weinmannia* dominant. Associated taxa include *Cyrtandra*, *Metrosideros*, *Morinda*, *Psychotria*, *Vaccinium*, and numerous pteridophytes and bryophytes. Collector's notes (*Schäfer 5462*) indicate that 680 m is the lower altitudinal limit of the species. Flowers, noted to be very fragrant at 4 pm, were collected in April and July and fruits in April.

Discussion. *Psychotria oliveri* is apparently closely related to *P. schaeferi* based on its cylindrical, apically 4-lobed stipules, narrow leaves with long acuminate apices, and flowers with a long, slender corolla tube and lobes. *Psychotria schaeferi* differs in having a larger 27–40-flowered inflorescence, flowers with a shorter calyx limb 0.6–0.8 mm deep, and longer stipule lobes 3–6 mm long. These two species appear to be derived from an introduction to the Marquesas separate from the remaining *Psychotria* species found there. This new species is named for Smithsonian botanist Royce Oliver (1929–1997) who collected in the Marquesas in 1975 with Peter A. Schäfer and Marie-Hélène Sachet and collaborated with Sachet and F. R. Fosberg on Marquesan plant studies.

Additional specimen examined. **MARQUESAS ISLANDS: TAHUATA:** summit ridge near Haaiputeomo, satellite dish region NE of Vaitahu, *Wood 6567* (BISH, PAP, P, PTBG, US).

8. *Psychotria schaeferi* Lorence & W. L. Wagner, sp. nov. TYPE: MARQUESAS ISLANDS: HIVA OA: Montagnes NW de Temetiu, entre la haute vallée de Hanamenu et la crête de Temetiu–Feani, elev. 925 m, 23 Oct. 1975, P. A.

Schäfer 5921 (Holotype US; Isotypes BISH, MPU, P, PTBG). Figure 9.

Differt a congeneribus Marquesanis stipulis tubularibus cylindricalis 4-lobis ad apicem quadrifidis et findens secus unilateralis ad basim, differt a *P. olivero* lobis stipularibus 3–6 mm longis, limbo calycis cyathiformis, 0.6–0.8 mm longis per anthesim et fructiferis 1 mm.

Shrub or small tree to 5 m tall; branchlets 3–5 mm diam., glabrous, bark smooth, pale brown. Leaves with blade (6–)10–19 × (2–)3–6.5 cm, narrowly ovate-elliptic, narrowly elliptic or narrowly obovate-elliptic, chartaceous, glabrous except for large barbate domatia with tufted brown hairs present in secondary vein axils below, margins plane to scarcely revolute, base acute to cuneate, slightly decurrent, the apex long acuminate, the acumen 1–1.5 cm long, secondary veins 6–12 pairs, eucamptodromous; petioles 1–3.5 cm, glabrous, narrowly winged distally; stipules cylindrical, sheath 2–7 mm long, lobes 4, 3–6 mm long, narrowly triangular-subulate or oblong, glabrous, deciduous leaving a fringe of rufous hairs. Inflorescences terminal, 4.5–5.5 × 5.5–6.5 cm (including corollas), cymose-corymbiform, glabrous, sessile and trichotomous, flowers 27–40, primary axes 12–20 mm long, secondary axes 6–20 mm long, bearing 2–3-flowered cymules, bracts 0.2–0.5 mm long, broadly triangular to obtuse, glabrous; pedicels 3–7 mm long, glabrous. Flowers possibly dimorphic (only presumed long-styled form seen), hypanthium ca. 1 mm long, narrowly obconic, glabrous; calyx limb 0.6–0.8 mm long, shallowly cupuliform to rotate, truncate, glabrous; disc 0.8–1 mm long; corolla hypocrateriform, 20–22 mm long, white and fragrant when fresh, externally glabrous, tube 12–20 mm long, internally rufous villous toward top of tube, lobes 5, 7–8 mm long, oblong, internally rufous-villosulous, apices with adaxial appendages; presumed long-styled flowers with anthers ca. 3 mm long, attached near



FIGURE 9. *Psychotria schaeferi*. A, habit with inflorescence; B, flower; C, leaf, abaxial surface showing venation and inset with detail of domatia; D, infructescence with nearly mature fruits; E, fruit in transverse section showing pyrenes; F, stipule with subtending leaf pair; G, corolla in bud opened to show stamens. (Based on Schäfer 5921, PTBG, US.)

top of tube, tips exserted; style 20–24 mm long, exserted. Fruits 10–15 × 7–8 mm, ellipsoid to ovoid-ellipsoid, glabrous, prominently umbonate with disc and fruit apex protruding, calyx limb 1–2 mm long, color

when mature unknown; immature pyrenes hemispherical in cross section, dorsal surface with 2 broad, low rounded ribs, ventral surface flat.

Distribution, phenology, and habitat.

This new species is known only from Hiva Oa along the old trail from Atuona to Hanamenu up along the crest from Mt. Temetiu to Mt. Feani from 550 to 925 m elevation. It grows in wet forest with *Weinmannia*, *Fagraea*, *Crossostylis*, *Hibiscus tiliaceus*, and *Pandanus tectorius* with *Angiopteris evecta* in the understory. In the lower limits of its range *P. shaeferi* occurs in wet and secondary forest along dry stream beds associated with alien species including *Mangifera indica*, *Syzygium cumini*, and *Coffea arabica*. Flowers, said to be very fragrant, were collected in February and October, and unripe fruits in February, October, and November. *Psychotria mumfordiana* and *P. shaeferi* occur sympatrically here and are both rare and threatened.

Discussion. Among the Marquesan species *Psychotria shaeferi* is most closely related to *P. oliveri*, which differs in having a smaller 8–14-flowered inflorescence, flowers with a longer calyx limb 1–1.5 mm deep, and shorter stipule lobes 1–2 mm long. We are pleased to name this distinctive new species for its first collector Peter A. Schäfer (Laboratoire de Botanique, Montpellier), who made nearly 700 botanical collections in the Marquesas in 1975.

Additional specimens examined. **MARQUESAS ISLANDS: HIVA Oa:** along old Atuona–Hanamenu trail, on lower slopes of Mt. Feani and Mt. Timetiu massif, above Atuona, *Lorence et al.* 6258 (PTBG); lower part of trail from Atuona to Hanamenu, *Oliver & Schäfer* 3095 (US, PTBG); sentier de Atuona menant à Vaiumete, 09°48'5"S, 139°4'24"W, *Meyer* 941bis (PAP, PTBG); trail from Atuona up to ridge crest leading to Mt. Temetiu (old Atuona–Hanamenu trail), 9°48'S, 139°4'W, *Lorence et al.* 8930 (PAP, PTBG); Hanamenu region, up Hanamenu valley to the drainages below and W of Temetiu, 9°76'S, 139°0'W, *Wood* 10234 (PTBG, US).

9. *Psychotria taupotinii* F. Brown, *Bernice P. Bishop Mus. Bull.* 130: 313.

1935. TYPE: MARQUESAS ISLANDS: NUKU HIVA: Tovii [Toovii], 1000 m, Sept. 1922, *Quayle* 1241 [coll. *Tikei Taupotinii*] (Holotype BISH). Figure 10.

Shrub or small tree 3–5 m tall, branchlets 6–7 mm diam., densely white villous when fresh, the hairs drying rufous, erect-spreading or somewhat appressed, glabrate, bark smooth, brown. Leaves with blade 12–20 × 4.5–12 cm, obovate to broadly obovate or elliptic-obovate, chartaceous, sparsely short-villous above, densely rufous villous below on venation, domatia absent, moderately villous elsewhere, margins plane, base cuneate, sometimes narrowly so, apex rounded and abruptly short-acuminate, the acumen 3–7 mm long, occasionally acute, secondary veins 15–20 pairs, eucamptodromous, tertiary and higher order venation inconspicuous; petiole 1.5–3.5 cm long, densely rufous-villous, scarcely or not winged; stipules calyptrate, ovoid, sheath 16–24 mm long, lobes 2, 6–8 mm long, oblong, each sometimes bilobed about half-way, rufous villous, deciduous leaving a fringe of rufous hairs. Inflorescences terminal, 1.5–3 × 3.5–4.5 cm (including corollas), cymose-corymbiform, rufous-villous, sessile and trichotomous, flowers 21–36, primary axes somewhat flattened, 2–10 mm long, unbranched, bearing 7–12-flowered cymules, bracts reduced to minute glandular teeth, pedicels 0.5–2.5 mm long. Flowers distylous, hypanthium 1–2 mm, narrowly obconic, densely villous; calyx limb 1–1.5 mm long, cupuliform to shallowly cyathiform, margin truncate and ciliate, densely villous externally, internally strigulose, disc ca. 0.5 mm long; corolla hypocrateriform to funnelliform, 16–19 mm long, white, externally hirtellous, internally densely villous in distal half of tube, tube 9–11 mm long, lobes 5, 6–8 mm long, oblong, externally hirtellous, internally glabrous, apices adaxially thickened into hooked appendages, anthers 2.5–3 mm

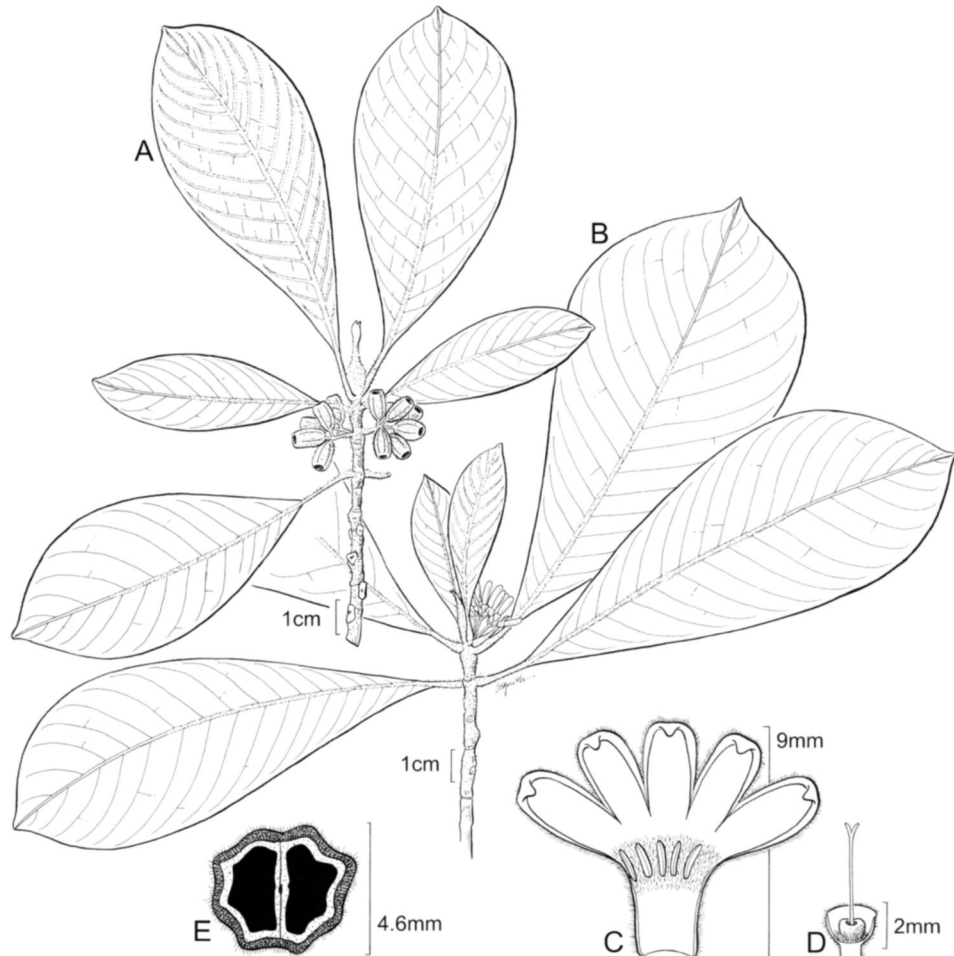


FIGURE 10. *Psychotria taupotinii*. A, habit with infructescence; B, habit with inflorescence; C, corolla opened showing stamens; D, gynoecium with calyx partly cut away showing disc and style; E, fruit, transverse section showing pyrenes. (A, E based on *Lorence et al.* 6082, PTBG; B–D based on *Perlman et al.* 10096, PTBG).

long, attached below top of tube, tips included, style 9–12.5 mm long and exerted in long-styled form, ca. 2.5 mm long and included in short-styled form. Fruits 9–10 mm × 6–9 mm, ellipsoid, ribbed, umbonate; pyrenes hemispherical in cross-section, dorsal surface with 3–4 ribs and thickened margins, ventral surface flat or slightly grooved.

Distribution, phenology, and habitat. Known only from Nuku Hiva, where it occurs from 825 to 1175 m in the understory of montane wet forest in valleys and along streams with *Cyathea affinis* (G. Forst.)

Sw., *Ilex anomala* Hook. & Arn., *Weinmannia marquesana* F. Br., and *Coprosma*, and also on slopes with *Metrosideros collina* (J. R. Forst. & G. Forst.) A. Gray, *Cyathea affinis*, *Crossostylis biflora* J. R. Forst. & G. Forst., *Freycinetia*, *Fagraea berteriana* A. Gray ex Benth., *Weinmannia marquesana*, and an understory of ferns including *Nephrolepis*, *Dicranopteris linearis* (Burm. f.) Underw., and *Histiopteris incisa* (Thunb.) J. Sm. *Psychotria taupotinii* has been collected in flower and fruit from July to December.

Discussion. Based on morphology *Psy-*

chotria taupotinii seems most closely related to *P. toviaana*. Their sympatric distribution on Nuku Hiva suggested at first that they may represent variants of the same species. However, further study convinced us that despite their apparent close relationship they represented distinct species. There are correlated differences in pubescence (blade hirtellous or sometimes glabrate above in *P. taupotinii* and consistently glabrous above in *P. toviaana*), number of secondary veins (15–17 pairs in *P. taupotinii* and 10–12 pairs in *P. toviaana*), barbate domatia (absent in *P. taupotinii* and present in *P. toviaana*), inflorescence structure (branched once in *P. taupotinii* and twice in *P. toviaana*), number of flowers per inflorescence (21–36 in *P. taupotinii* and 30–54 in *P. toviaana*), and corolla lobes (6–8 mm long in *P. taupotinii* and 2–4 mm long in *P. toviaana*). Additional support for their recognition is found in the absence of any intermediates despite the apparent sympatric occurrence. Style length is dimorphic in *P. taupotinii*, with the style either exerted or included. There is, however, no apparent variation in either the anther length or the stamen insertion point, and the anthers are always included in the tube or with only tips exerted. Nepokroeff (1997) reported gynodioecy in some Hawaiian *Psychotria* species, and an analogous situation may exist in *P. taupotinii*.

Additional specimens examined. **MARQUESAS ISLANDS: NUKU HIVA:** Toovii region, NW of l'Economie Rurale complex along new road to airport over flanking mountains, *Lorence et al.* 6082 (BISH, PAP, PTBG, US), *Perlman* 10096 (BISH, PAP, PTBG); along the old airport road across the summit crest from Toovii, back drainages of Tapueahu valley, *Perlman & Wood* 15027 (AD, BISH, F, HAST, MO, NY, P, PAP, PTBG, US, WU); summit of ridge S of Tekao, 0.5 mi. N of new airport road, between airport road and Tekao, main ridge above Tovii, *Perlman & Wood* 15057 (BISH, F, K, MO, NY, P, PAP, PTBG, US);

forêt de Tovii, *F. Hallé* 2069 (US); Toovii, vallon au-dessus du réservoir, 8°52'S, 140°9'W, *Florence* 4317 (BISH, K, NY, P, PTBG 2 sheets, US 2 sheets); Toovii, vallon du réservoir, *Florence* 6757 (PAP).

10. ***Psychotria temetiuiensis*** Lorence & W. L. Wagner, sp. nov. TYPE: MARQUESAS ISLANDS: HIVA OA: montagnes NW du Temetiu, entre la haute vallée de Hanamenu et la crête de Temetiu–Feani, crête avec brousse assez ouverte à *Santalum*, assez commun, 830 m, 23 Oct. 1975, *Schäfer* 5933 (Holotype US; Isotypes BISH, K, MPU, P, PAP, PTBG). Figure 11.

Differt a congeneribus Marquesanis foliis relative magnis, laminae ellipticis, 8–18 × 5.2–11.5 cm, coriaceis, illustribus, 3°–4° venationibus prominulis.

Shrubs 2–4 m tall, branchlets 3–5 mm diam., glabrous, bark smooth, brown. Leaves with blade (6.5–)8–18 × (3.8–)5.2–11.5 cm, elliptic to broadly elliptic, subcoriaceous to coriaceous, glabrous or occasionally sparse rufous tomentose pubescence below along costa toward base, often with a few barbate domatia, glabrous and lustrous above, margin slightly revolute, base cuneate to obtuse, decurrent, apex acute to obtuse or rounded, occasionally with short acumen 2–5 mm long, secondary veins 9–12 pairs, eucamptodromous, tertiary and quaternary venation prominulous and conspicuously reticulate; petiole 0.6–2.5 cm long, stout, glabrous, flattened, narrowly winged; stipules calyprate, ovoid-oblong, sheath 10–55 mm long, lobes 2, 1–6 mm long, narrowly triangular to oblong, occasionally bilobed and stipule therefore 4-lobed, rufous villous or villous only along suture lines, deciduous leaving a fringe of rufous hairs. Inflorescences terminal, 3–4.5 × 4–7 cm (including corollas), cymose-corymbiform, glabrous except puberulent in bract axils, sessile and trichotomous, flowers 22–75, primary axes flattened, 10–20

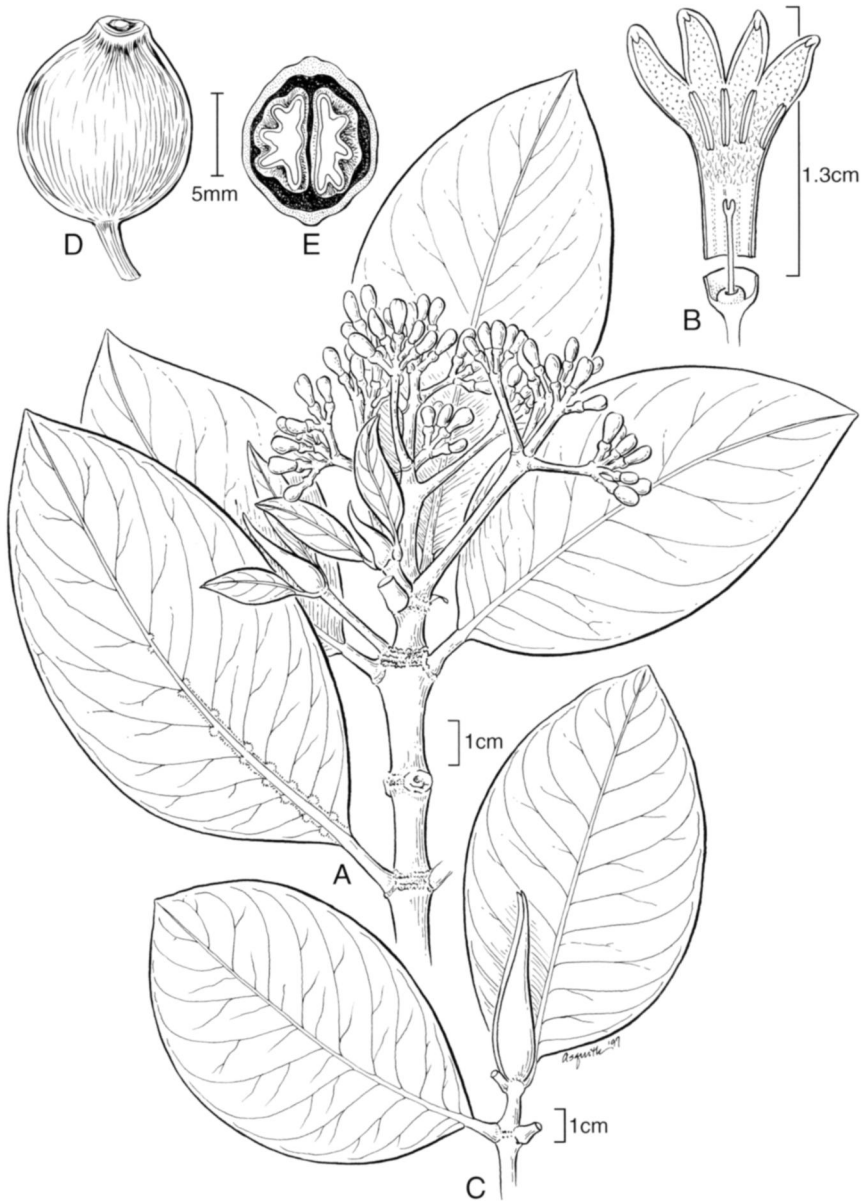


FIGURE 11. *Psychotria temetiensis*. A, habit with inflorescence; B, flower, corolla opened showing stamens and gynoecium with calyx partly cut away showing style and disc; C, branchlet with stipule; D, fruit; E, fruit in transverse section showing pyrenes. (A–C based on Schäfer 5933, PTBG, US; D, E based on Schäfer 5910, PTBG).

mm long, secondary axes 10–20 mm long, ending in 2–5-flowered cymes, bracts 0.2–1 mm long, narrowly to broadly triangular, villosulous within, margins glandular-fringed; pedicels 1–5 mm long. Flowers

with hypanthium ca. 1 mm long, narrowly obconic, glabrous; calyx limb 0.7–1.5 mm long, cupuliform to shallowly cyathiform, margin truncate or undulate to irregularly denticulate, glabrous externally and inter-

nally; disc ca. 0.5 mm long; corolla hypocrateriform to narrowly funnelliform, white and fragrant when fresh, externally glabrous, tube 14–15 mm long, internally densely villosulous in distal half of tube, lobes 5, 3.5–4.5 mm long, oblong, externally glabrous or minutely puberulent apically, internally glabrous, apices adaxially thickened into hooked appendages, anthers 2–3 mm long, attached below top of tube, tips exerted, style included, 2–4 mm long. Fruits 9–12 × 6–9 mm, ellipsoid, ribbed, umbonate, ripening red; pyrenes hemispherical in cross-section, dorsal surface with 3 ribs and thickened margins, ventral surface flat.

Distribution, phenology, and habitat. Known from Hiva Oa on ridgetops NW of Mt. Temetiu at 840–870 m elevation, and from Tahuata on the summit ridge leading from Amatea to Moteve at 840 m elevation. This new species occurs in wet forest and wet shrubland. Associated taxa include *Weinmannia*, *Reynoldsia*, *Crossostylis biflora*, *Cyathea*, *Dicranopteris linearis*, *Freycinetia*, *Angiopteris evecta*, *Santalum insulare* Bertero ex A. DC., *Metrosideros collina*, *Hibiscus tiliaceus*, *Wikstroemia*, and *Psychotria*. Flowering collections were made in July and October and fruiting collections in October. Collector's notes indicate this species is rare to relatively common locally, and the flowers are said to have a very pleasant fragrance.

Discussion. This species is notable among Marquesan *Psychotria* for its large coriaceous leaves that are lustrous above and with prominent tertiary and quaternary venation when dry. It resembles *P. uapoensis*, which differs by its inconspicuous, non-prominent higher order venation, flowers with a shorter corolla tube 8–13 mm long, and smaller fruits 6–7 × 5–6 mm.

Additional specimens examined. **MARQUESAS ISLANDS: HIVA Oa:** Montagnes NW du Temetiu, crête au SE du campement, N de la haute vallée de Hanamenu, *Schäfer 5902* (BISH, CHR, PTBG, US),

Schäfer 5910 (BISH, CHR, MPU, PTBG, US). **TAHUATA:** ridge from Amatea to Moteve passing Meikaea, *Perlman et al. 15972* (PAP, PTBG, US).

11. ***Psychotria tovana*** F. Brown, *Bernice P. Bishop Mus. Bull.* 130: 311. 1935. **TYPE:** MARQUESAS ISLANDS: NUKU HIVA: Tovii [Toovii], 1000 m, *Quayle 1323* (Holotype BISH-578868). Figure 12.

Psychotria bowermanae Fosberg, *Notul. Syst. (Paris)* 8: 170. 1939, **syn. nov.** **TYPE:** MARQUESAS ISLANDS: NUKU HIVA: Puokoke, 3500 ft, *Pacific Entomological Survey 563* (Holotype BISH-578766).

Shrubs or small trees 1.5–5 m tall, trunk to 25 cm diam., branchlets 3–5 mm diam., compressed, glabrous or at first sparsely to moderately white-villosous when fresh, the hairs drying dark brown, soon glabrescent, bark smooth, dark brown. Leaves with blade 7–25 × 3.5–12 cm, elliptic to obovate, obovate-elliptic or oblanceolate-oblong, chartaceous, glabrous above, sparsely to densely villosulous below along costa and secondary veins or rarely entire surface villosulous, domatia with tufted dark brown hairs present in vein axils, drying dull brown, margin plane to slightly revolute, base narrowly to broadly cuneate, narrowly decurrent, apex acute to obtuse or rounded, occasionally with short acumen 2–6 mm long, secondary veins 9–12 pairs, eucamptodromous to brochidodromous toward apex, tertiary and quaternary venation prominulous and conspicuously reticulate on both surfaces; petiole 0.8–3.5 cm long, glabrous or at first villosulous, narrowly winged distally; stipules calyprate, oblong-cylindrical to ovoid, sheath 10–35 mm long, lobes 2, 3–10 mm long, ovate to oblong, their apex rarely bifid, villous, deciduous leaving a fringe of rufous hairs. Inflorescences terminal becoming pseudoaxillary, 2.5–5 × 2–4 cm (including corollas),

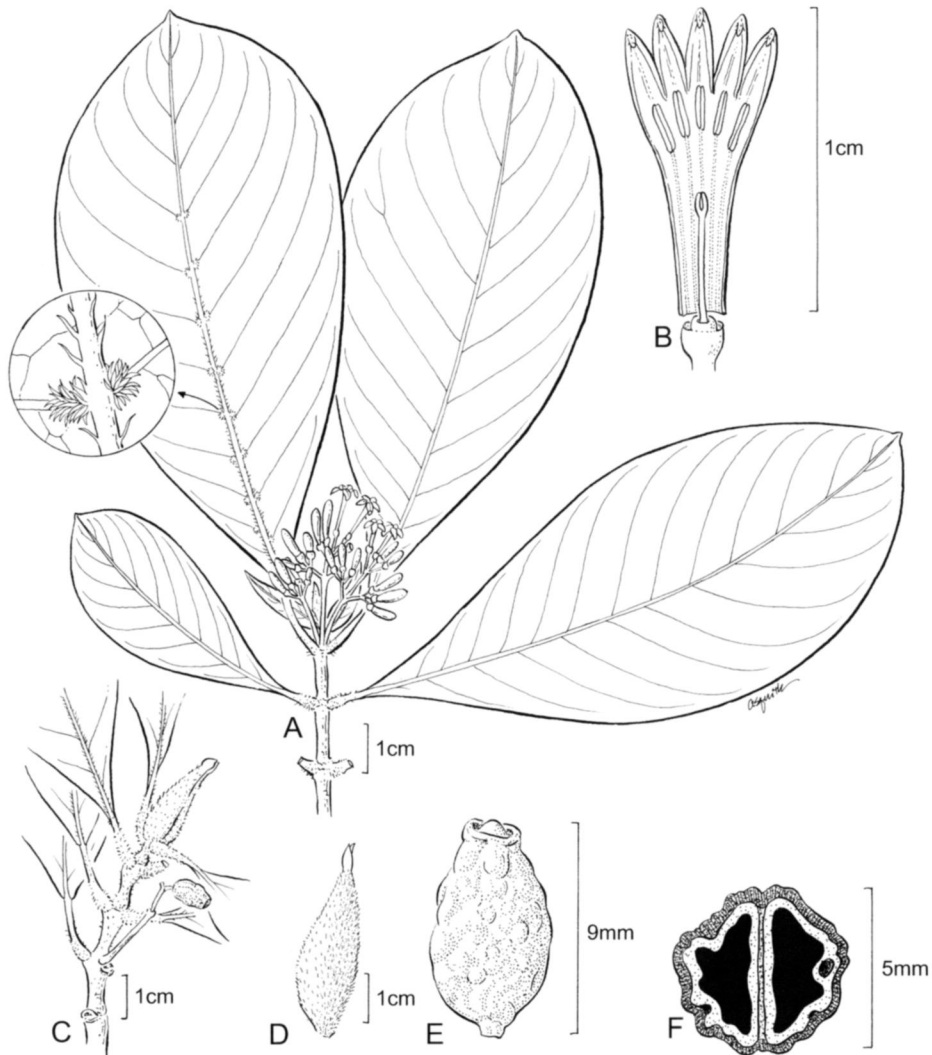


FIGURE 12. *Psychotria tovana*. A, habit with inflorescence and inset with detail of abaxial leaf surface showing domatia; B, flower, corolla opened showing stamens and gynoecium; C, branchlet with stipule and infructescence; D, stipule; E, fruit; F, fruit in transverse section showing pyrenes. (A based on *Lorence et al. 6110*, PTBG; D based on *Lorence et al. 6110*, PTBG; B, C, E, F based on *Lorence et al. 6093*, PTBG.)

compactly cymose-corymbiform, sessile and trichotomous, axes densely hirtellous-villosulous or sometimes glabrate, flowers 30–54, primary axes 6–15 mm long, secondary axes 2–5 mm long, bearing dense 3–5-flowered cymules, bracts 0.5–1 mm long, narrowly to broadly triangular, villosulous; pedicels 0.5–1.5 mm long or lacking. Flowers apparently monomorphic, hypanthium 1–1.2 mm long, narrowly obcon-

ic, ribbed, glabrous to densely villosulous; calyx limb 0.6–1.5 mm long, shallowly to deeply cyathiform, margin truncate to irregularly denticulate or ciliolate, glabrous externally, internally glabrous or with minute colleters; disc 0.4–0.5 mm long, glabrous or sometimes densely hirtellous; corolla hypocrateriform, white and fragrant when fresh, tube 7–12 mm long, externally glabrous or sometimes hirtellous, internally

glabrous, lobes 5, 2–4 mm long, linear-oblong, externally glabrous or papillose-puberulent apically, internally glabrous, apices adaxially thickened into hooked appendages; anthers 2–2.5 mm long, attached just below top of tube, tips exerted, style included, 3.5–5 mm long. Fruits 8–9 × 4–5 mm, ovoid to ellipsoid, ribbed and rugose, glabrous to hirtellous, umbonate, ripening red; pyrenes hemispherical in cross-section, dorsal surface with (2–)3 prominent ribs and thickened margins, ventral surface flat.

Distribution, phenology, and habitat. Known only from Nuku Hiva where it is one of the most frequently collected species. *Psychotria toiviana* occurs in montane wet forest from 800 to 1170 m, usually in ravines or along streams, along with *Weinmannia*, *Metrosideros collina*, *Hernandia nukudivensis* F. Brown, *Hibiscus tiliaceus*, *Freycinetia*, *Crossostylis biflora*, *Cyathea*, *Ilex anomala*, *Cheirodendron bastardianum* (Decne.) Frodin, *Fagraea berteroa*, *Psychotria*, *Cyrtandra*, *Myrsine*, *Macropiper latifolium* (L.f.) Miq., and numerous pteridophytes in the understory. Collected with flowers and fruits from July to December.

Discussion. The type of *Psychotria bowermanae* Fosberg falls comfortably within the pattern of variation displayed by *P. toiviana* and is here considered synonymous. *Psychotria toiviana* is most closely related to *P. taupotinii*, which differs in having its leaf blade hirtellous or sometimes glabrate, more numerous secondary veins (15–17 pairs) lacking barbate domatia, inflorescence only branched once and with fewer (21–36) flowers per inflorescence, and longer corolla lobes 6–8 mm long.

Additional specimens examined. **MARQUESAS ISLANDS: NUKU HIVA:** Spur of Mt. Ootua, Toovii Plateau, *Gagné 1072B* (BISH, US); slopes of Mt. Tapuaooa, above Toovii Valley, *Gillett 2175* (BISH, US), *Gillett 2176* (BISH, US); Toovii, epaulement S du Mt Ooumu, 8°51'S, 140°8'W, *Florence 4278* (BISH, P, PTBG), *Florence 4338* (BISH, K, P), *Florence 4343* (BISH,

P), *Florence 7471* (PAP), *Florence 4234* (PAP 2 sheets); Toovii, epaulement SW du Mt Ooumu, *Florence 6875* (PAP); Toovii, face S du Mt. Ooumu, 8°51'S, 140°8'W, *Florence 8406* (BISH, P); Toovii, vallon au-dessus du réservoir, *Florence 4323* (PAP); Toovii, 2ème vallée après le réservoir, *Florence 6860* (PAP); Toovii, vallon du réservoir, 8°51'S, 140°9'W, *Florence 7444* (BISH, P); Toovii region, trail along ridge from near l'Economie Rurale complex to Ooumu peak, *Lorence et al. 6110* (PTBG); Toovii, Ooumu area, top of Tapueahu Valley off new highway, 8°51'S, 140°19'W, *Wood & Perlman 4565* (P, PAP, PTBG, US), *4586* (MO, P, PAP, PTBG, US), *4589* (MO, PAP, PTBG), *4609* (BISH, P, PAP, PTBG, US); Toovii, N of agriculture station, 8°50.86'S, 140°08.68'W, *Wood & Meyer 6327* (PTBG, US); S of airport road, drainages of Tapueahu gulch NW of Toovii over summit crest, *Perlman & Wood 15017* (BISH, MO, P, PAP, PTBG, US), *15019* (BISH, MO, P, PAP, PTBG, US); off the new airport road W of summit crest of Peak #1227 m [Tekao], drainages of Matatekouaehi, *Perlman & Wood 15038* (BISH, MO, P, PAP, PTBG, US), *15047* (PTBG, US), *15048* (NY, PAP, PTBG, US); summit of ridge S of Tekao, 0.5 mi. N of the new airport road, between airport road and Tekao, the main ridge above Toovii, *Perlman & Wood 15059* (BISH, HAST, P, PAP, PTBG, US, WU), *15066* (AD, MO, P, PAP, PTBG, US); ridge crest 2 valleys S of airport road at the back of Tapueahu gulch, NW of Toovii over the summit crest, *Perlman & Wood 15023* (BISH, MO, NY, P, PAP, PTBG, US, WU) [distributed as *P. florencei*]; Toovii plateau, l'Economie rurale, along new road, *Perlman et al. 10096* (BISH, PTBG); Toovii region, NW of l'Economie Rurale complex along new road to airport, *Lorence et al. 6082* (BISH, PAP, PTBG, US); western part of Toovii, along new road NW of l'Economie Rurale, *Wagner et al. 6093* (BISH, PTBG, US); *6094* (BISH, P, PTBG, US); Toovii, secteur NW

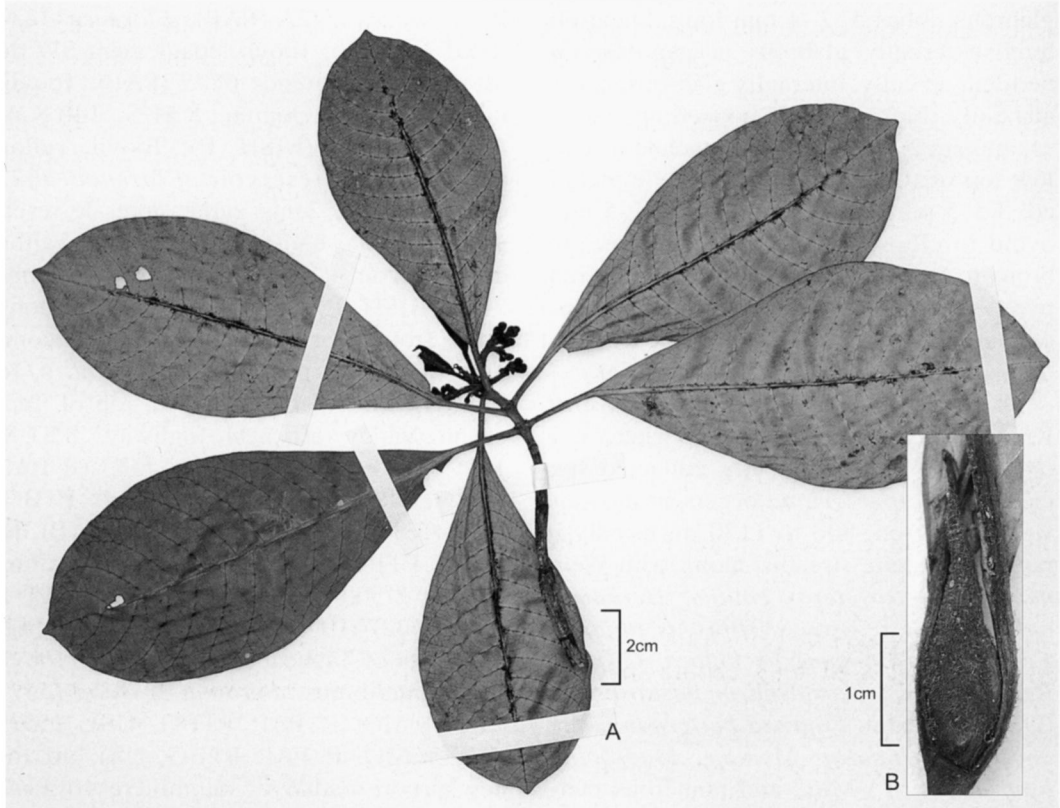


FIGURE 13. *Psychotria uahukensis*. A, habit with inflorescence in bud; B, stipule at twig apex with petioles and leaf bases. (Photograph of the holotype, Wood 10795, PTBG.)

de la Haute Taipivai, *Florence* 7509 (PAP); Route Toovii–Terre Deserte, 6 km après le col, 8°51'S, 140°10'W, *Florence* 6912 (BISH, P, PAP); Toovii, vallon du réservoir, *Florence* 6735 (PAP); Toovii, vallon du réservoir, 8°51'S, 140°9'W, *Florence* 7442 (BISH, K, P); forêt de Toovii, *Hallé* 2069 (US); Toovii, N de Terre Deserte, sous le col, *Florence & Teikiteetini* 9686 (BISH); Terre Deserte, crête du Mt. Akaupe, *Jordan* 83 (PAP); Toovii, Terre Deserte, km 6.5 après le col, *Florence* 4373 (PAP); Terre Deserte, haute Tapueahu, face W du Mt. Akaupe, 8°52'S, 140°10'W, *Florence* 8535 (BISH, P).

12. ***Psychotria uahukensis*** Lorence & W. L. Wagner, sp. nov. TYPE: MARQUE-SAS ISLANDS: UA HUKA: eastern

summit rim of Vaikivi above Hanahouua, *Freycinetia impavida*–*Hibiscus tiliaceus* mixed wet shrub and fernland, 2030 ft. (616 m), 8°54'S, 139°30'W, 26 June 2004, K. R. Wood 10795 (Holotype PTBG; Isotypes PAP, US). Figure 13.

Differt a congeneribus Marquesanis nervatura secundaria 13–17 parium domatiis tomentosis-barbatis in axillis, et axibus inflorescentiarum tomentosis rufis et similiter ad tegetem.

Small tree to 2 m tall, branchlets 2.5–4.5 mm diam., glabrous, bark brown, bark wrinkled. Leaves with blade (7–)12–22 × (3–)5–11 cm, elliptic to obovate-elliptic, chartaceous, glabrous above, with dark brown or rufous villous or matted-tomen-

tose pubescence below extending as a fringe along the costa and concentrated in the secondary vein axils forming barbate domatia, margins plane, base acute to rarely short-attenuate, apex acute, obtuse or rounded and very short-acuminate, acumen 2–5 mm long, secondary veins 13–17 pairs, eucamptodromous becoming brochidodromous toward apex, tertiary venation irregular, oblique, prominulous on both surfaces, higher order venation sometimes visible to quaternary; petiole 7–30 mm long, narrowly winged distally, abaxially sparsely rufous-villosulous or glabrate; stipules calyptrate, ovoid to ovoid-oblong, sheath 12–30 mm long, lobes 2, oblong, 1–1.5 mm long, densely brown-tomentose, deciduous leaving a fringe of long rufous hairs. Inflorescences terminal, ca. 2 × 2.7 cm (immature, in bud), axes densely rufous-tomentose, primary axes 7–10 mm long, secondary axes 1–2 mm long ending in (2–)3-flowered cymules, bracts not visible, perhaps obscured by pubescence; pedicels 0–1 mm long, densely rufous-tomentose. Flowers in bud with hypanthium obconic, sparsely tomentulose, ca. 1 mm long, calyx tube ca. 1.5 mm long, truncate, rim sparsely villosulose; mature flowers unknown. Fruit unknown.

Distribution, phenology, and habitat.

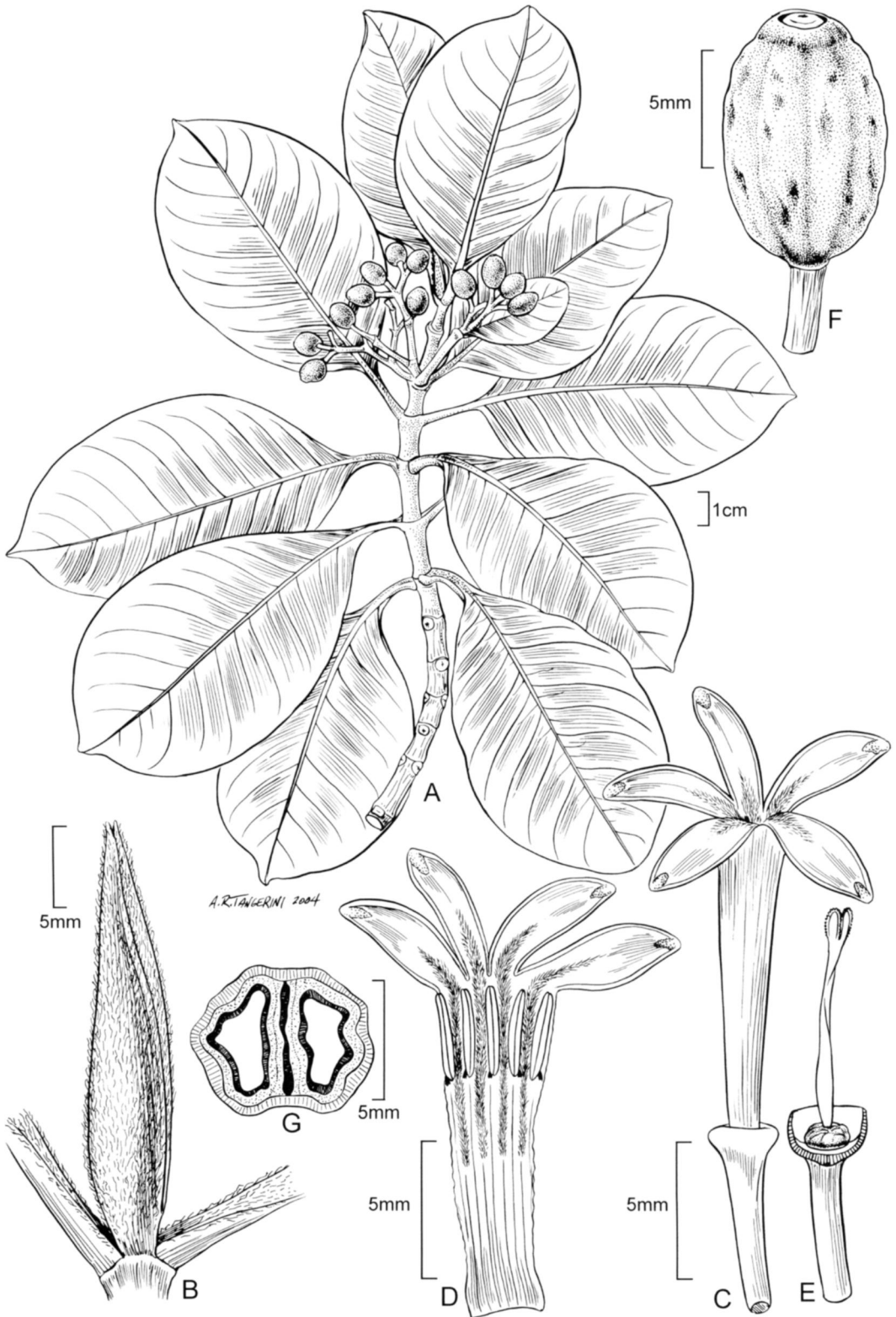
This new, apparently endemic species is known only from recent collections made on Ua Huka in the Hane/Hokatu cliff zone where three plants were located in lowland wet shrubby and herbaceous vegetation on basaltic cliffs at 520 m elevation, and from the island's summit area at Vaikivi where a single plant was located in wet shrubland and fernland at 616 m elevation. Associated species in the cliff zone include *Alyxia stellata* (J. R. Forst. & G. Forst.) Roem. & Schult., *Bidens uapensis* (F. Brown) Sherff, *Boehmeria virgata* (G. Forst.) Guill., *Glochidion* sp., *Maytenus crenata* (G. Forst.) Loeb.-Callen, *Macropiper latifolium*, *Morinda myrtifolia* A. Gray, *Peperomia pallida* (G. Forst.) A. Dietr., and *Xylosma suaveo-*

lens (J. R. Forst. & G. Forst.) G. Forst. subsp. *pubigerum* Sleumer. Mixed wet shrubland and fernland on the Vaikivi summit region consists of *Freycinetia impavida* (Gaudich. ex Hombr.) B. C. Stone, *Hibiscus tiliaceus*, *Crossostylis biflora*, *Marattia salicina*, and *Macropiper latifolium*.

Discussion. Although the only known fertile material of this species consists of a young inflorescence, *P. uahukensis* differs from all other Marquesan species by the following unique combination of morphological characters: relatively numerous secondary veins (13–17 pairs) with tomentose barbate domatia in axils below, and matted rufous-tomentose inflorescence axes. This new species is similar to *P. toviana* in leaf shape, but in that species the leaf and inflorescence pubescence consists of erect-spreading (hirtellous) hairs and the secondary veins are fewer (9–12 pairs). It resembles *Psychotria adamsonii* in having secondary vein axils below with matted tomentose barbate domatia, but the leaf blades in *P. uahukensis* are broader and elliptic to obovate-elliptic, the stipules are externally tomentose rather than glabrous, and the inflorescence axes are densely rufous-tomentose. Collected in June with young inflorescence.

Additional specimens examined. **MARQUESAS ISLANDS: UA HUKA.** Hane/Hokatu cliff zone, *Wood & Meyer 10543* (PTBG, US); Hane/Hokatu cliff zone, prominent large basalt outcrop region at top of ridge that separates Hane from Hokatu, *Wood 10739* (PTBG).

13. ***Psychotria uapoensis*** Lorence & W. L. Wagner, sp. nov. TYPE: MARQUESAS ISLANDS: UA POU: Tekohepu, windswept and cloud-shrouded summit ridge, 2500–3000 ft. (762–914 m), 9°24.31'S, 140°4.21'W, K. R. Wood & S. Perlman 6472 (Holotype PTBG; Isotypes BISH, P, PAP, US). Figure 14.



Species affine *Psychotrio hivoano* Fosberg, a quo differt foliis laminis glabris abaxiale nervaturis secundariis paucioris, petiolis villosulosis adaxiale, pedicellis florum 1–7 mm longis et fructibus parvioribus 6–7 × 5–6 mm.

Small tree or shrub to 5 m tall, moderately branched, branchlets 3–4 mm diam., internodes compressed, bark brown, smooth. Leaves with blade 5–11 × 3–7 cm, obovate, obovate-elliptic or occasionally elliptic, chartaceous to subcoriaceous, slightly glossy, glabrous above or the costa rufous villosulous proximally, glabrous below, domatia absent, margins plane, base narrowly to broadly cuneate, rarely slightly decurrent, apex obtuse to rounded and very short-acuminate, acumen 2–4 mm long, secondary veins 9–11 pairs, eucamptodromous, tertiary venation oblique, raised and prominulous on both surfaces, quaternary venation finely reticulate, raised on both surfaces; petiole 0.5–1 cm long, narrowly winged distally, rufous villosulous adaxially, glabrous abaxially; stipules calyprate, oblong, sheath 20–22 mm long, lobes 2, elliptic, 1–2 mm long, externally rufous-villosulous, deciduous leaving rufous hairs in leaf axils. Inflorescences terminal rarely becoming pseudoaxillary, 4–6 × 4–9 cm (including the corollas), cymose-corymbiform, glabrous, sessile and trichotomous, flowers 24–50, primary axes somewhat flattened, 15–28 mm long, secondary axes 5–15 mm long, sometimes with tertiary axes to 3 mm long, ending in 1–3-flowered cymules, bracts narrowly to broadly triangular, 0.3–1 mm long, dark brown with margins glandular-fimbriate; flowers sessile or on glabrous pedicels 1–7 mm long. Flowers monomorphic, with hypanthium 1–1.5 mm long, obconic, glabrous, calyx limb

1–2 mm long, shallowly cyathiform, glabrous externally and internally, margin truncate, entire, disc ca. 0.5 mm long; corolla hypocrateriform, 12–15 mm long, white, fragrant when fresh, tube 8–13 mm long, externally glabrous, internally densely hirtellous-villosulous in distal $\frac{2}{3}$ – $\frac{3}{4}$, lobes 5, 4–5 mm long, oblong-elliptic, externally glabrous except papillose-puberulent toward apex, internally densely hirtellous-villosulous toward base and papillose toward apex, apices adaxially thickened into hooked appendages, anthers 2–3 mm long, attached below top of tube, tips included, style 5–7 mm long, included. Fruits broadly ellipsoid, 6–7 × 5–6 mm, ribbed, umbonate; pyrenes hemispherical in cross section, dorsal surface with 2–3 prominent, acute ribs and thickened margins, ventral surface flat or slightly grooved longitudinally.

Distribution, phenology, and habitat.

Known only from Ua Pou at 762–930 m elevation on slopes and ridges growing in windswept summit shrubland of *Metrosideros collina* and *Dicranopteris linearis*, with *Scaevola*, *Paesia*, *Freycinetia*, and numerous ferns. Also occurs in transitional diverse mesic to wet forest with *Metrosideros collina*, *Pandanus tectorius*, *Freycinetia*, *Weinmannia*, *Crossostylis*, *Fagraea*, *Ficus*, and many other associated taxa.

Discussion. This new species is most similar to *Psychotria hivoana*, from which it differs by its leaves with blades glabrous below and having fewer secondary veins (9–11 pairs), petioles and costa villosulous above proximally, flowers with longer pedicels 1–7 mm long, and smaller fruits 6–7 × 5–6 mm. *Psychotria adamsonii*, also from Ua Pou, differs in having narrowly elliptic or oblong leaf blades with an acumi-

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FIGURE 14. *Psychotria uapoensis*. A, habit with infructescence; B, stipule with subtending petioles; C, flower; D, corolla opened to show stamens; E, gynoecium with calyx partly cut away showing disc and style; F, fruit; G, fruit in transverse section showing pyrenes. (A based on *Perlman & Wood 10425*, PTBG; B based on *Wood 10836*, PTBG; C–E based on *Perlman & Wood 15918*, PTBG; F, G based on *Wood 10841*, PTBG).

nate apex and large barbate domatia below, and inflorescences with umbelliform, 3–6-flowered cymules.

Additional specimens examined. **MARQUESAS ISLANDS: UA POU:** Tekohepu, windswept and cloud-shrouded summit ridge, 9°24.31'S, 140°4.21'W, *Wood & Perlman 6471* (P, PAP, PTBG, US), *6472* (BISH, P, PAP, PTBG, US), *6489* (BISH, P, PAP, PTBG, US); Teavahaakiti, steep slopes of main ridge to S of Oave, N & E facing cliffs between Teavahaakiti and Tekohepu, *Perlman & Wood 15903* (PTBG, US), *15909* (BISH, MO, P, PAP, PTBG, US), *15918* (P, PAP, PTBG, US); slopes up to Pouakei, NW side, 9°24'S, 140°5'W, *Wood 10425* (BISH, MO, NY, P, PAP, PTBG, US), *10427* (BISH, MO, NY, P, PAP, PTBG, US).

EXCLUDED SPECIES

Psychotria esulcata F. Brown, Bernice P. Bishop Mus. Bull. 130: 315. 1935.
TYPE: MARQUESAS ISLANDS: UA POU: without precise locality, 1000 m, *Quayle 1136* (Holotype BISH). = *Coprosmia esulcata* (F. Brown) Fosberg.

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This work is dedicated to the memory of the late Lennart Andersson (1948–2005), whose research on Rubiaceae systematics was an inspiration to many of us. The contribution by WLW to this study was partially supported by the Smithsonian Research Opportunities Fund and while appointed as McBryde Chair at the National Tropical Botanical Garden. This study was greatly facilitated by useful discussions, field observations, and specimens provided by Jacques Florence of IRD [ex ORSTOM], Paris in conjunction with the ongoing *Flore de la Polynésie française* project, Peter A. Schäfer (MPU), Jean-Yves Meyer (Delegation à la Recherche, Polynésie française), and Ken Wood and Steve Perlman (NTBG). Important observations and new collections resulted from fieldwork carried out during

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Note added in proof:

Additional specimens of *Psychotria* species collected by Dr. Jean-Yves Meyer on Hiva Oa and Fatu Hiva have come to our attention and are cited below.

Psychotria hivaoana Fosberg. **Marquesas Islands: HIVA OA:** gulch under Mount Temetiu, 1130 m, 11 Feb. 2000, *Meyer 828 bis* (PAP), *828c bis* (PAP).

Psychotria marchionica Drake. **Marquesas Islands: HIVA OA:** trail to Mount Temetiu, 1125 m, 11 Feb. 2000, *Meyer 822* (PAP), *823* (PAP), *823 bis* (PAP).

Psychotria schaeferi Lorence & W. L. Wagner. **Marquesas Islands: HIVA OA:** trail to Viaumete, 625 m, 11 Feb. 2000, *Meyer 825* (PAP).

Psychotria temetiuensis Lorence & W. L. Wagner. **Marquesas Islands: FATU HIVA:** under crest between Tekou and Touaouoho, 915 m, 15 Feb. 2000, *Meyer 837* (PAP), *837 bis* (PAP). [Differs from Hiva Oa collections in having more densely villous stipules.]

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