

**A new endemic subspecies of *Stictocardia* (Convolvulaceae) from the Marquesas Islands, French Polynesia**

G. W. Staples

Research Associate, Bishop Museum Herbarium Pacificum,  
1525 Bernice St., Honolulu, Hawaii, 96817 U.S.A.

[geozsg@gmail.com](mailto:geozsg@gmail.com)

and J.-F. Butaud

Consultant in forestry and Polynesian botany, BP 52832, 98716,  
Pirae, Tahiti, French Polynesia. [jfbutaud@hotmail.com](mailto:jfbutaud@hotmail.com)

**ABSTRACT**

Study of herbarium specimens for Convolvulaceae from French Polynesia brought to light several specimens with a distinctive morphological appearance. These are here described as *Stictocardia tiliifolia* subsp. *marquesensis*, subsp. nov., from the Marquesas Islands. Morphological evidence is presented in support of this conclusion. Published on-line [www.phytologia.org](http://www.phytologia.org) *Phytologia* 98(3): 203-206 (July 6, 2016). ISSN 030319430.

**KEY WORDS:** *Stictocardia tiliifolia* subsp. *marquesensis*, subsp. nov., biodiversity, Oceania

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In the course of preparing an account of the Convolvulaceae for the *Flore de la Polynésie française* (Florence 1997 & 2004), the available herbarium collections from BISH and P were studied between 2005 and 2013. Selected additional specimens from K, PTBG, and US were examined online, via loan, or in person. Then in 2014, when a fairly complete draft manuscript was in hand, the Convolvulaceae specimens from PAP were examined. While most of the specimens could be immediately recognized and confidently assigned to familiar Pacific taxa, a few specimens collected by J.-C. Thibault and J. Florence from the Marquesas proved to be problematic. Over time the duplicates in various herbaria for these problematic collections had been named by G. Staples as *Ipomoea violacea*, *Stictocardia tiliifolia*, or as *Ipomoea* Indet., but when material from PAP was compared with the corresponding duplicates in BISH it became clear that there was a distinctive facies about them, and they were set aside for closer scrutiny. Photographs by J.-F. Butaud of living plants on the islands of Eiao and Tahuata (Marquesas), and his recent collections from there, included in the PAP loan, added further evidence that the Marquesan plants were different from typical *Stictocardia tiliifolia* from elsewhere in the Pacific. In total, four collections are available and a new subspecies is described here, based on the available material.

*Stictocardia tiliifolia* is distributed in the tropics world-wide but is presumed to have an Old World origin with later, human-mediated dispersal to the Neotropics (Austin & Eich 2001) where the species is now naturalized. Throughout its global range, *S. tiliifolia* has a remarkably uniform appearance with very little morphological variation. Against this context, the Marquesan specimens at hand are consistently different and have a distinctive facies that can be recognized immediately.

Careful comparison of the four Marquesan collections with typical material for *Stictocardia tiliifolia* from French Polynesia (Austral Islands, Society Islands) and Hawai'i showed that in nearly all characters they match the typical phenotype for the species but they differ consistently in the denser indumentum on the vegetative plant body and in their pure white corollas. Because these Marquesan populations are geographically disjunct and isolated from the range for typical *S. tiliifolia* and their morphological differences are small but consistent, the rank of subspecies is appropriate for them.

***Stictocardia tiliifolia* (Desr.) Hallier f. subsp. *marquesensis* Staples & Butaud, *subspecies novum***

Differing from the typical subspecies *tiliifolia* by the persistent whitish villous indumentum on all vegetative parts of the plant (stems, innovations, leaves, petioles, peduncles, pedicels) and by the pure white corolla with a broader throat and spreading limb.

Figure 1A, -C, -D.

Type: Marquesas Islands. Eiao, Tetiaenui plateau, dans les parages, 350 m elev., 25 July 1987, J.-C. Thibault 1066 (holotype PAP [bar code PAP001844; FPF sticker No. 034938]; isotype P, bar code P04399830).

Distribution. Found only in the Marquesas Archipelago, and so far known from Eiao and Tahuata; possibly also Hiva Oa and Nuku Hiva (see below).

**Additional specimens examined:**

French Polynesia: Marquesas Islands. Eiao, Tohuanui, secteur Est, ravin, 475 m elev., 8 July 1988, Florence & Teikiteetini 9375 (BISH, P, PAP); Eiao, Plateau Vaituha, 200 m au Nord de l'arrivée sur le plateau en venant de Vaituha, 385 m elev., 18 June 2010, Butaud & Jacq 2684 (PAP); Tahuata, Kiinui, amont de la route traversière, début de piste pour Amatea, 422 m elev., 30 June 2010, Butaud & Girardi 2688 (BISH, PAP).

One additional sterile specimen that may belong here follows:

French Polynesia: Marquesas Islands. Hiva Oa, Makemake Valley, in native forest, ca 300 m elev., 22 Feb. 1929, Mumford & Adamson 16 (BISH).

In addition to these vouchered collections, sight records documented by digital photographs have been made by J.-F. Butaud from Nuku Hiva [Vaituku valley, 22 March 2008, 270 & 345 m elevation, (leaves, old fruits)]; Hiva Oa [Haamanaua, small valley West of Eiaone, 23 Feb 2010, 235 m elevation, dry forest (seedling)]; and Tahuata [Hanatefau valley, 2 Aug 2013, around 200 m elevation, along the road in an anthropogenic forest (leaves, flowers)]. To be sure, only the last report, with flowers, can confidently be identified as subsp. *marquesensis*, the other two are provisionally included.

Sight records by Butaud that are undocumented by voucher specimen or digital photos include sterile plants on Tahuata: Hanatuuna valley, Tehotomei'a gulch, 31 July 2013, 422 m elev., in *Hibiscus tiliaceus* wet forest (leaves); Haaoiu valley, 2 Aug. 2013, 134 m elevation, along a trail inside a coconut forest (leaves). These are provisionally placed with subsp. *marquesensis*.

Ecology. Growing at elevations from 135 to 475 m on volcanic, more or less rocky, ferralitic to brown humic soils, under all exposures. This plant can be found in disturbed, anthropogenic areas such as overgrazed and eroded fields with isolated shrubs like *Annona squamosa* L., *Cordia lutea* Lam. and *Leucaena leucocephala* (Lam.) de Wit (Eiao); extensive cattle pasture with introduced species like *Cocos nucifera* L., *Cynodon dactylon* (L.) Pers., *Desmodium incanum* (G.Mey.) DC., *Digitaria didactyla* Willd., *Cyperus brevifolius* (Rottb.) Hassk., *Cyperus mindorensis* (Steud.) Huygh, *Mangifera indica* L., *Mimosa pudica* L., *Ocimum gratissimum* L., *Oxalis corniculata* L., and *Stachytarpheta cayennensis* (Rich.) Vahl (Tahuata); on a trail in the coconut forest (Tahuata); or along a road crossing old fallow forest of *Hibiscus tiliaceus* L., *Inocarpus fagifer* (Parkinson) Fosberg, and *Mangifera indica*, between two villages (Tahuata). But this subspecies is also growing in native dry forest dominated by the trees *Hibiscus tiliaceus*, *Sapindus saponaria* L., *Thespesia populnea* (L.) Sol. ex Corrêa, and *Xylosma suaveolens* G.Forst. (Hiva Oa); or more usually in mesic to wet, dense *Hibiscus tiliaceus* forest with *Macropiper latifolium* (L.f.) Miq. in the understorey and ferns like *Angiopteris evecta* (G.Forst.) Hoffm., *Arachniodes aristata* (G.Forst.) Tindale, *Asplenium australasicum* Hook., *Diplazium harpeodes* T.Moore, and *Tectaria*

*jardinii* (Mett. ex Kuhn) E.D.Br. plus herbs like *Oplismenus hirtellus* (L.) P.Beauv. and *Stephania japonica* (Thunb.) Miers as well as other vines (Tahuata, Nuku Hiva).

Phenology. Flowering in June, July; fruiting in June.

The flowers of subsp. *marquesensis* have been observed open after 5 PM, and as early as 7 AM, which suggests night-flowering rather than diurnal flowering as in subsp. *tiliifolia*. The pure white corolla, broader throat with stamens presented higher in the throat of the flower (subsp. *tiliifolia* has stamens borne lower down in the corolla tube) suggests a moth pollination syndrome, rather than bee pollination that is typical for subsp. *tiliifolia*.

#### Vernacular names:

The Marquesan names reported for this plant are *puhipuhi* on Hiva Oa [ex label *Mumford & Adamson 16*]; *puhipuhi* on Tahuata and *'aupuhi* on Ua Pou (Sachet, 1975 citing unpublished documents of Frère (brother) S. Delmas from the Mumford and Adamson collections). These names were not confirmed with contemporary Marquesan resource persons, who seem to have put nearly all the Convolvulaceae together under the general name “*pohue*.”

#### Conservation Status:

**Vulnerable** under criterion B (VU B2 ab(ii,iii,iv,v)) and criterion D (VU population < 1000). This subspecies is endemic to the Marquesas Islands where it is known from four islands and seven locations. Its extent of occurrence (EOO) reaches 6000 km<sup>2</sup> for an area of occupancy (AOO) of 28 km<sup>2</sup> using cells 2 km wide. The size of its population is not known exactly but can be estimated at less than 1000 mature individuals (it was collected only once by the ornithologist J.-C. Thibault, and once by the botanist J. Florence who made several trips in the Marquesas; it was never collected by NTBG botanists who made intensive collections all over the Marquesan archipelago; however it could be more abundant than supposed as it looks very similar to other, more common, Convolvulaceae when not flowering). This vine, which is sometimes expansive in disturbed areas is also present in the common native *Hibiscus* forest; it appears very rare in both vegetation types and could be threatened directly by grazing mammals and indirectly by destruction of its habitats (overgrazing, fire, invasive plant species), which are considered highly fragmented.

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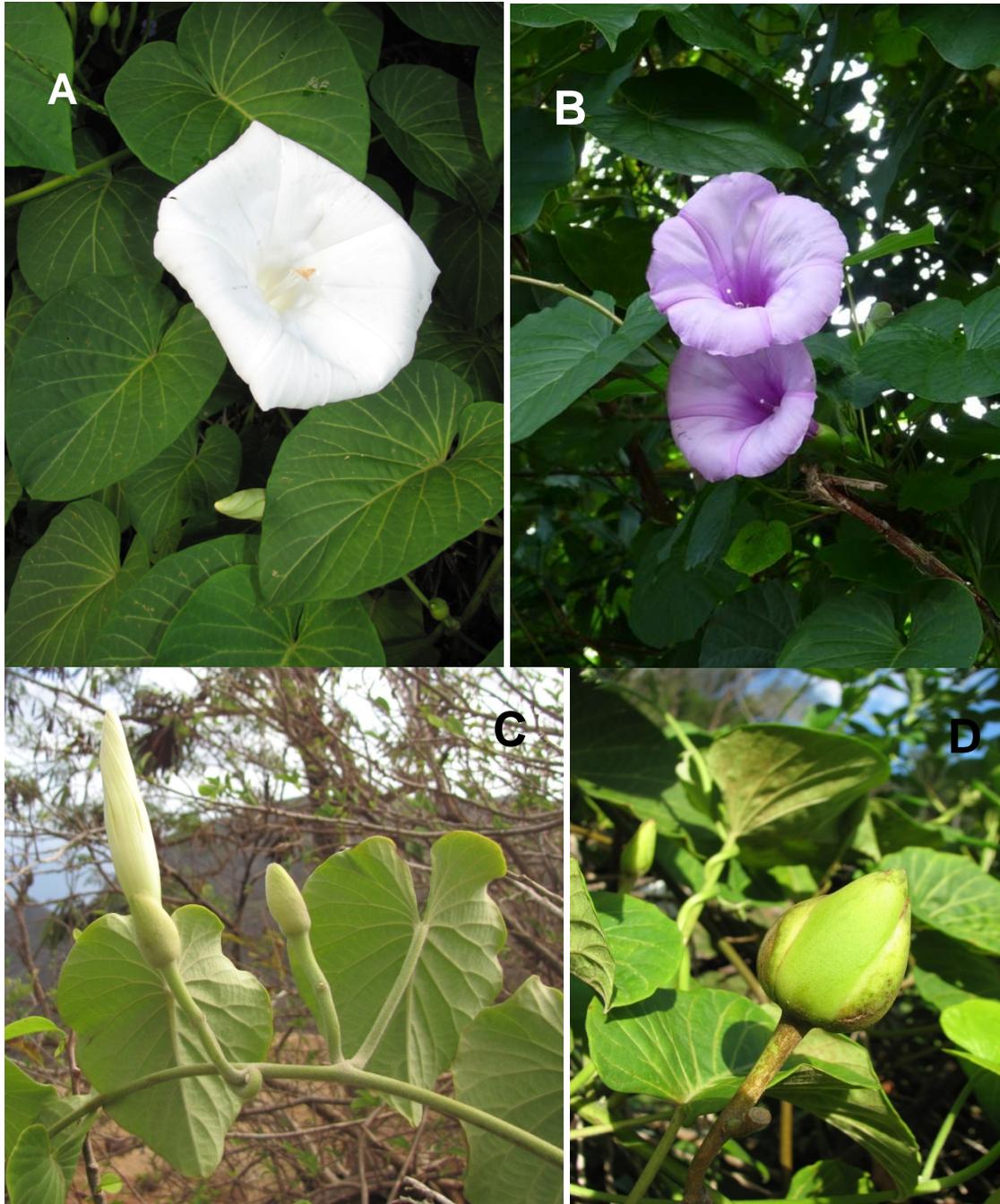


Figure 1. Comparative photographs of living plants of both subspecies of *Stictocardia tiliifolia* *in situ* with locality and voucher specimens that document the photos.

- A. Corolla of *S. tiliifolia* subsp. *marquesensis* in frontal view (Tahuata, *Butaud & Girardi* 2688, photo by J.-F. Butaud);
- B. Corolla of *S. tiliifolia* subsp. *tiliifolia* in frontal view (Hawai‘i, Oahu, *Staples* 1564, photo G. Staples);
- C. Foliage of *S. tiliifolia* subsp. *marquesensis* showing villous indumentum and flower buds (Eiao, *Butaud & Jacq* 2684, photo by J.-F. Butaud);
- D. Fruit of *S. tiliifolia* subsp. *marquesensis* enclosed by accrescent leathery calyx (Tahuata, *Butaud & Girardi* 2688, photo by J.-F. Butaud).