

A new subspecies of *Bulbophyllum* (Orchidaceae, Bulbophyllinae) from The Society Islands

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Abstract

A new subspecies of the *Bulbophyllum tahitense* (Orchidaceae), from The Society Islands (French Polynesia) is proposed. A new subspecies is described and illustrated. Keys to taxa of Society Islands genus *Bulbophyllum*, is added.

Keywords: *Bulbophyllum tahitense*, French Polynesia, The Society Islands, Orchidaceae, taxonomy

Introduction

The genus *Bulbophyllum* sensu lato is one of the most numerous genera of orchids in the world and has ca. 3000 taxa (accepted names and synonyms, IPNI 2010). This genus sensu stricto includes ca. 1000 species. Most species occur as epiphytes, often forming caespitose groups in the rain or cloud forests of SE Asia, and especially richly in the mountain forests of New Guinea.

Bulbophyllum Thouars sensu stricto, generally are sympodial orchids with distinct, single-nodial pseudobulbs on elongated rhizomes. The orchids are mostly with 1 or sometimes 2 (3) coriaceous or fleshy, conduplicate leaves. Inflorescences are from few- to many-flowered, arising from the pseudobulb base. Rachis of inflorescence is sometimes flattened or swollen. Flowers are usually small, resupinate but sometimes can reach several cm in diameter and can be quite attractive. Floral bracts imbricate flower pedicel basally, and are 1-few-nerved, erect. Sepals and petals are dissimilar. Lateral sepals are specifically united with the column foot and forming a prominent mentum. Petals are smaller and narrower than sepals, often ornamented by hairs or papillae along margins. Lip is usually smaller than sepals, hinged at the column foot and motile, fleshy, thick, usually tongue-like to oblong, often adorned with long hairs or glandulae. Gynostemium is short and massive. Column foot is prominent, usually long, massive, upcurved towards the apex. *Bulbophyllum* has ovate or elliptic, deeply concave stigma and truncate, short, erect or suberect rostellum. Viscidium is single, usually thick, fleshy, and sticky. Anther is

bent forward, motile, two-chambered. Connective is fleshy, thick, often with long hairs or papillate. Pollinia are usually 4 in 2 pairs, or sometimes only two, equal or very unequal in size, laterally flattened, ellipsoid or ovoid in general outline. Neither caudiculae nor tegula present.

The Society Islands archipelago (Iles de la Société, Polynésie française) lies between 15° and 18° S and 148° and 154° W, comprising islands and atolls whose total land surface area is about 1600 km² and with their approximately 620 species of vascular plants are particularly floristically rich. Approximately 60% of these vascular plant species are endemic and at the same time usually highly endangered. The unique combinations of species that have resulted from, among others, the specific geology, diverse weather conditions and isolation, and which arose on individual islands not infrequently of very small area, have been long affected by strong anthropopressure.

Recently published works on the Orchidaceae on The Society Islands have been primarily devoted to introductory floristic analyses. Most Orchidaceae species native to The Society Islands (French Polynesia) were discovered and described between 1783 [*Stichorkis cespitosa* (Lam.) Thouars ex Marg. with basionym *Epidendrum cespitosum* [1]] and 1892, and only 3 species between 1913 and 1933.

Recently, among the verified representatives of *Bulbophyllum tahitense* Nadeaud, the endemic species to The Society Islands, a group of plants has been found with evidently different set of floral structures. This study is an attempt to resolve the question how significant this discovery may be.

Material and methods

While working on the taxonomy of Orchidaceae from The Society Islands (French Polynesia), I had the occasion to study about 100 *Bulbophyllum tahitense* and about 25 specimens of the newly proposed taxon, from both dried herbarium and preserved in liquid, deposited in various collections. I also examined living specimens: over 100 *Bulbophyllum tahitense* and 30 of the newly proposed taxon in cultivations and in

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natural situations. Pertinent bibliography and iconography (e.g. N. Halle drawings, J. F. Butaud and F. Jacq photography collections) were researched, as well. The studies were also conducted using my own digital database – Archivum Orchidarium (Arch. Orch.).

For the article the classic taxonomy method, with obligatory reference to the original taxonomic material such as type-specimens and protologues, has been used.

The Herbaria acronyms are adopted from Index Herbariorum [2]. The taxa authors' names abbreviations by Brummitt and Powell [3] have been followed.

Results

Although the *Bulbophyllum tahitense* Nadeaud lectotype specimen (P 00299144; Fig. 1) is without adult flowers, just with damaged buds, Nadeaud's protologue is rather not very precise and without icon, the isotypes (e.g. P!, BISH 454996 photo!, G!), have good quality flowers. Therefore, establishing reliable characteristic of the *Bulbophyllum tahitense* type-form is possible. The most distinguishing features of type-form are amongst other: flowers with tepals purple to red striped; dorsal sepal ovate to oblong ovate; lateral sepals ovate, along nearly the whole length gently and arcuately recurved down; petals orbicular to ovate, with distal margins more or less irregular to dentate; lip epichyle oblong ovate, with only obscurely pale yellowish top.



Fig. 1 The lectotype of *Bulbophyllum tahitense* Nadeaud (Nadeaud 265, P 00299144). Photo by H. B. Margońska.

Without any doubt, quite large number of verified preserved specimens and living plants on the many islands of The Society Islands: Tahiti and Moorea, Huahine, Bora Bora, especially Raiatea and Tahaa have different form of some flowers elements. These plants have e.g. tepals obscurely purple to red reticulate, especially well visible at their basal part, only; sepals oblong ovate to nearly lanceolate; lateral ones sinuate curved; petals strongly abbreviated, wider than longer, obcordate; lip epichyle oblong, with distinct pale yellowish top.

Both plant groups have habit identical and without flowers their distinction is impossible. Both two taxa can only be separated by floral elements comparisons.

According to the above, I propose separating these plants as new subspecies of *Bulbophyllum tahitense* Nadeaud.

Key to *Bulbophyllum tahitense* taxa from Society Islands

1a. Sepals ca. ovate, lateral ones falcately curved down, petals longer than wider, orbicular to ovate – ssp. *tahitense*.

1b. Sepals ca. lanceolate, lateral ones sinuate curved, petals wider than longer, obcordate – ssp. *butaudianum*.

Bulbophyllum Thouars, Histoire Particulière des Plantes Orchidées Table 3 of the species of orchids. 1822.: t. 3. 1822. nom. cons.

Bulbophyllum tahitense Énumération des Plantes Indigènes de l'Île de Tahiti 36. 1873.: 36 (1873).

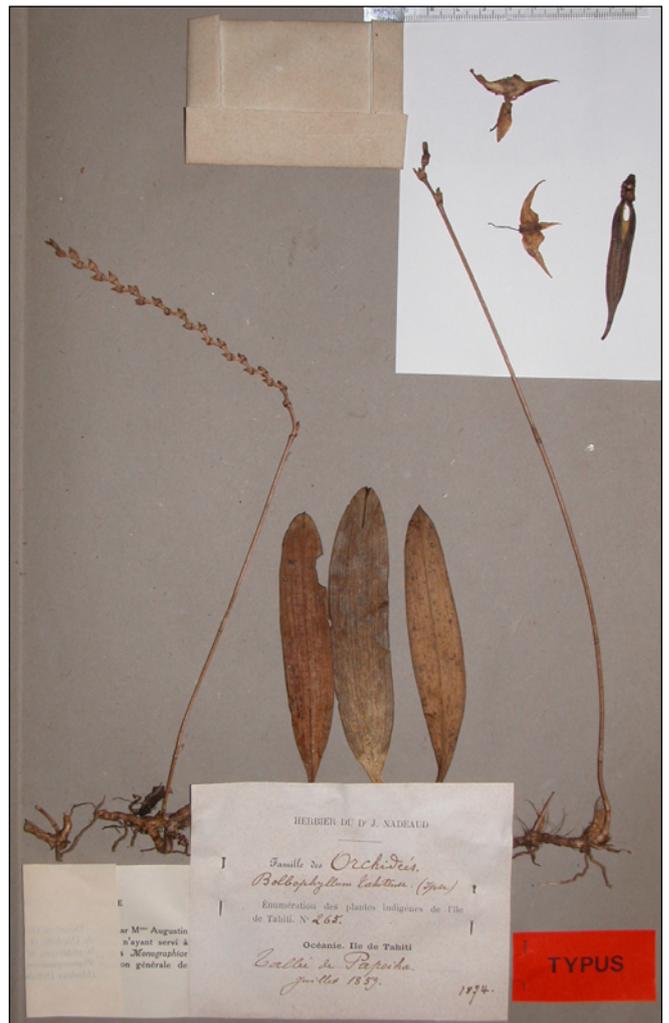


Fig. 2 The isotype of *Bulbophyllum tahitense* Nadeaud with flowers samples (G). Photo by H. B. Margońska.

TYPE. French Polynesia, The Society Islands, Tahiti, Amurahi, val. Haaripo, Paheia et Tearapau, 1857.11.17., J. Nadeaud 265 [lectotype, P 00299144!, photo BISH 454996!, lectotype designated by Margońska and Szlachetko [4], isolectotype, G! (Fig. 2), P 00368806!, P 00368805! photo BISH 454995!].

Plants middle-sized, 15-30(40) cm tall, caespitose. Rhizome decumbent, elongate, with roots and scales at nodes. Pseudobulbs distant ca. 2-8 cm, up to ca. 3 cm long and 2 cm in diameter, oblong ovoid to conical, incurved, covered by tubular scale when young, by its remains with age. Leaf single, blade 10-20 cm long, 1.5-3 cm wide, erect, oblong to oblong ovate, obscurely attenuate, acute at the apex, rather dark green above, brighter, distinctly petiolate. Inflorescence ca. 20-35 cm long, ca. twice higher than the leaf blade; raceme 10-20(30)-flowered, subax, rachis zig-zag curved. Floral bracts ovate, clasping the base of floral pedicel. Flowers ca. 3-3.8 cm in diameter, pale greenish to yellowish and whitish, with widely spread and purple to red striped, always free and gently concaved tepals (Fig. 3). Dorsal sepal ovate to oblong ovate, attenuate and acuminate at the apex, erect; lateral ones ovate, oblique, along nearly whole length gradually and falcately recurved down, apically attenuate and acuminate and incurved, basally adnate to the column foot, lateral down margins somewhat wavy at basal half. Petals abbreviate, longer than wider, ovate to orbicular, always cuspidate at the apices, irregular to dentate on distal margins. Lip lamina purple, purple-red;

epichyle moving in the breeze, erect, arcuately directed down with age, only gently falcately curved, oblong ovate, apically attenuate and acute, with oblong triangular depression along the main nerves, which bordered by distinct ridges, ending at the lip distal half, lamina papillate on surface and margins, lamina purple, purple-red with only obscure pale yellowish the top. Gynostemium 0.8-1 cm long, erect; staminodes erect exceeding the anther, oblong, acute at the apex. GENERAL DISTRIBUTION. E Polynesia: endemic to The Society Island (Tahiti, Moorea, Raiatea, Tahaa, Huahine, Bora Bora). Alt. 5-15 m in moist and cooler localities, otherwise 60-1500 m. ECOLOGY. Epiphytic, only occasionally terrestrial at higher elevations; on trunks and branches of, e.g. *Weinmannia parviflora*, *Metrosideros collina*, *Glochidion*, *Sclerotheca*, *Alstonia*, *Aleurites*, *Fagrea*, *Cyathea*, *Psychotria*, *Hibiscus tiliaceus* and *Neonauclea*, with *Miconia*, *Tecoma*, *Ilex*, *Cyrtandra* and *Ficus*, in wet to moist accumulations of humus, between mosses and other epiphytes; mostly at higher elevations on account of preferring cooler, wetter to moist conditions, usually in shade; sometimes associated with *Trichomanes* and *Dendrobium* species. Flowering May and June, September and October, sometimes in March to July and August or November. Locally common and abundant.

Bulbophyllum tahitense Nadeaud ssp. *butaudianum* Margońska. subsp. *nov.*



Fig. 3 The flower of *Bulbophyllum tahitense* Nadeaud. type-form (Tahiti, Pic Vert 160609 06 gggg d4 Arch. Orch.). Photo by H. B. Margońska.



Fig. 4 The type of *Bulbophyllum tahitense* Nadeaud subsp. *butaudiana* Marg., subsp. nov. (holotype, UGDA-HBM). Photo by H. B. Margońska.

TYPE. French Polynesia, The Society Islands, Tahiti, Hitiaa Distr., Mt. Mauru massif, slope along road, near Faraura view point, 492 m, under *Psidium cattleianum* with *Pandanus papenooensis*, *Cyathea affinis*, *Davallia solida*, *Elaphoglossum*, and orchids *Dendrobium biflorum*, *Eria rostrifolia*, *Metrosideros*, *Crossostylis*, *Glochidion*, 2010.04.28., J. F. Butaud and O. Gargominy 2664 [holotype, UGDA-HBM (Fig. 4), isotype, UGDA-HBM, AK, BISH, PAP, P, UGDA-HBM spirit collection].

Plantarum habitus pro typicam speciem typicus. Flores sepalis distincte angusteque distale attenuatis et colore propria reticulata tantum basale tinctis, typica specie differunt. Petala valde abbreviata, latiora quam longa, obcordata, in distales margines irregulariter ciliata, apice utrinque distincte serrata et in medio cuspidata. Labelli epichilus elongatus sepalis lateralibus fere subaequans manifeste oblongus colore vivida apice valde tinctus.

Plants habit typical for type species. Flowers ca. 3.6-4.2 cm in diameter. (Fig. 5) Tepals obscurely purple to red striped to rather reticulate, which well visible at their basal part, only, and very gently concaved at basal portions. Dorsal sepal oblong ovate to nearly lanceolate, distinctly and longly attenuate and acuminate at the apex, erect and gently concaved; lateral ones oblong ovate to lanceolate, distinctly attenuate at apical

half, along nearly the whole length sinuate curved, apically attenuate and acuminate, lateral down margins somewhat incurved at basal half. Petals distinctly abbreviate, wider than longer, about obcordate, irregularly ciliate on distal margins, the apex cuspidate and inside of distinct indentation. Lip with epichyle, elongate, nearly subequal to lateral sepals apices, distinctly oblong, only gently falcately recurved with age, with distinct depression along the main nerves, which bordered by very distinct ridges, lamina papillate on surface and especially at margins, markedly pale yellowish at top. GENERAL DISTRIBUTION. E Polynesia: endemic to The Society Island (Tahiti, Moorea, Raiatea, Tahaa, Huahine, Bora Bora). Alt.: 70-800 m. REPRESENTATIVES VERIFIED. French Polynesia, The Society Islands. (i) Tahiti. Papenoo: Te Faaiti, 2007.04.19, J. F. Butaud (Arch. Orch.); Hitiaa: 500-650 m, 2007.09, H. B. Margońska and M. Sawicka (UGDA-HBM Arch. Orch.); Faaone: Vaiiha, 2002.10.12, W. Teamotuitau s.n. (PAP 003374 spir coll., Arch. Orch.); Papara: valley of Taharuu river, plateau Teihomanono, 2007.12.19, recorded by J. F. Butaud (Arch. Orch.). sine prec. loc.: 2001.11.21, W. Teamotuitau s.n. and cult. (UGDA spir coll., UGDA-HBM icone, Arch. Orch.). (ii) Moorea. Mt. Mouaputa, 745 m, 2010.02.10, J. F. Butaud and N. Ingetr 2591 (UGDA 01a! UGDA 01b!



Fig. 5 The flower of *Bulbophyllum tahitense* Nadeaud subsp. *butaudiana* Marg., subsp. *nov.* (Tahiti, plateau Teihomanono, 191207 Arch. Orch.). Photo by J. F. Butaud.

UGDA 01a spir coll.!, Arch. Orch.). (*iii*) Hauhine. Crête Mont Turi, 2005.09.17, recorded by J. F. Butaud (Arch. Orch.). (*iv*) Raiatea. Crête Tetooroa, 2004.12.18, recorded by J. F. Butaud (Arch. Orch.); Crête Toomaru, Rahi, 2005.09.11, recorded by J. F. Butaud (Arch. Orch.), Taputapuata, Faaroa, 2005.06.09, recorded by J. F. Butaud (Arch. Orch.), 74-140 m, 2009.07.06, F. Jacq (Arch. Orch.), H. B. Margońska and S. Borzyszkowska 223, 225, 226, 227, 230, 231 (UGDA-HBM, Arch. Orch.); Te Mehani Ute Ute, 2006.10.04, recorded by J. F. Butaud (Arch. Orch.); Te Mehani Rahi, 436-767 m, 2009.07.07, recorded by F. Jacq (Arch. Orch.), recorded by H. B. Margońska and S. Borzyszkowska 237, 244, 245 (UGDA-HBM, Arch. Orch.). (*v*) Tahaa. Pueheru, 2006.05.02, recorded by J. F. Butaud (Arch. Orch.); Tapuamu, cliff slopes of river valley, 214 m, 2009.07.08, recorded by F. Jacq (Arch. Orch.), H. B. Margońska and S. Borzyszkowska 257 (UGDA-HBM, Arch. Orch.); Hipu, cliff slopes, 226 m, 2009.07.09, recorded by F. Jacq (Arch. Orch.), H. B. Margońska and S. Borzyszkowska 263 (UGDA-HBM, Arch. Orch.). (*vi*) Bora Bora. Otemanu, 2004.01.27, recorded by J. F. Butaud (Arch. Orch.). ETYMOLOGY. Dedicated to Dr. Jean-François Butaud, excellent expert of French Polynesian plants and one of the collector of the taxon type-specimens. NOTE. The specific form of the subspecies flowers is probably the effect of well known within Orchidales, high selective pressure of *Diptera* pollinators. It is also interesting that both taxa are isolated from each other and were never found at the same localizations.

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