ISSN 2262-9017
Jardin Botanique de Guyane
nouvelle série RICHARDIANA
Volume 4
http://richardiana.jardinbotaniquedeguyane.com

Notes on the genus *Trichopilia* (Orchidaceae) in Guatemala with a new species

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Abstract

The checklist of the Guatemalan species of *Trichopilia* is updated. The revision of these taxa resulted in the proposition of a new species, *T. kathleeniae*. This taxon is described and illustrated, and compared to its closest relative, *Trichopilia galeottiana*. It differs from the latter mainly by its pseudobulbs ligulate to linear-ligulate, its acuminate leaves, its erected inflorescence, the flower colour, its aristate petals, its open lip tube and its short ovary. Besides the habitats are also different : whereas *T. galeottiana* grows in rainy tropical forests, *T. kathleeniae* was found in cloud forests. To our knowledge, the new taxon is now extinct, as its natural habitat has been destroyed.

Résumé

La liste des espèces de *Trichopilia* du Guatemala est mise à jour. La révision de ces taxons aboutit à la description d'une nouvelle espèce, *T. kathleeniae*. Celle-ci est décrite, illustrée et comparée à l'espèce la plus proche sur le plan morphologique, *T. galeottiana*. Elle en diffère essentiellement par des pseudobulbes ligulés à linéaires ligulés, des feuilles acuminées, une

Manuscrit reçu le 01/07/2020 Article mis en ligne le 22/07/2020 – pp. 71-80

inflorescence dressée, des fleurs de couleur différente, des pétales aristés, un labelle en tube ouvert et un ovaire plus court. En outre les deux espèces ne poussent pas dans le même type d'habitat : *T. galeottiana* se rencontre dans des forêts tropicales de pluie tandis que le nouveau taxon vient de forêts de nuages. A notre connaissance *T. kathleeniae* est aujourd'hui éteint car son habitat naturel type a été détruit.

Resumen

Se actualiza el listado de especies de *Trichopilia* presentes en Guatemala. La revisión de los taxa ha dado como resultado la propuesta de una nueva especie *T. kathleeniae*. Este taxón se describe e ilustra, y se compara con su pariente más cercano, *Trichopilia galeottiana*. Se diferencia de esta última principalmente por sus pseudobulbos ligulados a ligulados lineales, sus hojas acuminadas, su inflorescencia erecta, el color de la flor, sus pétalos aristados, su tubo labial abierto y su ovario corto. Además, los hábitats también son diferentes: mientras que *T. galeottiana* crece en bosques tropicales lluviosos, *T. kathleeniae* se encontró en bosques nubosos. Hasta donde sabemos, el nuevo taxón ahora está extinto, ya que su hábitat natural ha sido destruido.

Keywords: biogeography, Guatemala, taxonomy, Trichopiliinae.
Mots-clés : biogéographie, Guatemala, taxinomie, Trichopiliinae.
Palabras Clave: biogeografía, Guatemala, taxonomia, Trichopiliinae.

Introduction

Recent studies in Guatemalan orchids reveal that the country shows a megadiversity for this family. In fact Guatemala, a country shaped by natural strengths for millions of years, has a volcanic belt, with several active volcanoes, and is multifragmented by tectonic plates, three of which are considered major falls. The topographic relief is much rugged with many mountain ranges in the north and massifs. From an environmental point of view, we may define Guatemala as a country with broken topography, great valleys and altiplanicies, among which the volcanic range in the south, the humid arch in the north, the Went humid arch, the Petén lowlands, the western high plateaux and small valleys. The rainy season is varied, with up to 11 rainy months in the northern wet arc and 6 months in the rest of the national territory. The country has 14 Life zones

under the Holdridge system developed by René de la Cruz (1982) and multiple ecosystems.

Archila (2014) estimated the number of orchid genera at 1237.

Within these genera, *Trichopilia* Lindley (1836: t. 1863) stands out, known in the country as bells due to the lip shape and the hanging flowers. It belongs to the tribe Oncidieae Pfitzer (1887: 106) and the subtribe Trichopiliinae Pfitzer (1887: 106). It is related to genera *Cischweinfia* Dressler & N.H.Williams (1970: 991) and *Leucohyle* Klotzsch (1854: 1), of which it differs by its non-succulent leaves and its lip free from the gynostemium (Archila *et al*., 2018).

In their treatment of the Guatemalan orchids, Ames & Correll (1954) cited two species of *Trichopilia*, *Trichopilia maculata* Reichenbach f. (1855: 215) and *Trichopilia tortilis* Lindley (1836: 446). Many years later two extra species have been published: *Trichopilia archilarum* Chiron (in Archila & Chiron, 2011: 203) and *Trichopilia freulerae* Archila & Chiron (2011: 204). Archila and his associates published, 3 years later, one more species, *Trichopilia orbiculabia* Archila, Chiron & Szlachetko (2014: 114) and cited for the first time *Trichopilia subulata* (O.Swartz, 1788: 123) Reichenbach f. (1865: 278), that is placed by some authors in *Leucohyle*.

In this paper we give an updated list of *Trichopilia* species in Guatemala and we describe a different species somewhat related to *Trichopilia galeottiana* A.Richard & Galeotti (1845: 26) but growing in cloud forests whereas the latter grows in tropical rain forests.

Taxonomic treatment

Trichopilia Lindley

Edwards's Botanical Register 22: t. 1863 (1836); generitype: *Trichopilia tortilis* Lindley – Cogniaux in Urban, *Symbolae Antillanae* 6: 627-628 (1911) – Hoehne, *Icones Orchidacearum Brasilienses*: 228 (1949) – Ames & Correll, *Fieldiana, Botany* 26(2): 602 (1953) – Schultes, *Native Orchids of Trinidad and Tobago*: 230 (1960) – Schweinfurth, *Fieldiana, Botany* 30(4): 787 (1961) – Foldats, in Lasser, *Flora de Venezuela, Orchidaceae* 15(5): 109-111 (1970) – Fawcett & Rendle, *Flora of Jamaica*: 127 (1982) – Williams, *Orchids of Mexico*: 271 (1986) – Escobar, *Native Colombian Orchids* 4: 584 (1992) – McLeish, Pearce & Adams, *Native Orchids of Belize*: 142 (1995) – Atwood & Mora-Retana, *Fieldiana, Botany*, n.s. 40: 169-170 (1999) – Nir, *Orchidaceae Antillanae*: 385 (2000) – Dressler, in Hammel, *Manual de plantas de Costa Rica* 3: 566

(2003) – Ospina, *The Colombian Oncidiinae Orchids*: 95 (2008) – Pridgeon, Cribb, Chase & Rasmussen, *Genera Orchidacearum* 5: 380 (2009) – Szlachetko & Mytnik-Ejsmont, *Annales Botanici Fennici* 180: 251-252 (2009) – Archila, *Revista Guatemalensis* 17(2): 1-80 (2014).

Trichopilia and its close relative *Leucohyle*, together with *Psychopsiella* Lückel & Braem (1982: 7) and *Psychopsis* Nuttal ex Greene (1890: 134), form a branch in the *Oncidium* clade. According to Alrich & Higgins (2008), *Trichopilia* is comprised of 26 species, however Holland *et al.* (2011) cite about 30 species and, today, due to the newly described species cited above, this number is 35. They are small to medium, strong plants, usually epiphyte, but occasionally growing on the ground or on rocks, where they form large masses. They are found in very humid areas from Mexico to Amazon (Holland *et al.*, 2011). For a long time South America has been considered as the diversification center of the genus however, more recently, a great number of species have been reported from Central America and Mexico.

Epiphyte, erected plants. Pseudobulbs clustered. Leaves subcoriaceous or coriaceous, sometimes fleshy, usually elliptic-lanceolate or ligulate, rarely narrowly linear to semiterete. Inflorescences thin, short or elongated, erected arched or pendant, produced from the base of pseudobulbs, bearing 1 to a few flowers. Flowers usually showy. Sepals narrow, widely open, often twisted, usually subequal and free. Lateral sepals sometimes basely connate. Petals subequal to dorsal sepal. Lip entire or trilobed, basally clawed, adnate to the column base, convolute lateral lobes (or lip end) forming a tube; midlobe extended, disc smooth or lamellate. Gynostemium slightly swollen at the apex; column part adnate to the lip in the basal third along the midvein. Anther incumbent, operculate; sometimes the connectives form an apical projection roof-shaped in the front. Pollinia 2, deeply and inequally cleft, hard. Sticky amorphous caudicle. Clinandrium apical prominent, slightly trilobed, surpassing the anther, margin slightly fimbriate or dissected. Stigma large, deeply concave. Rostellum erected, wide and short, apically truncate. Viscidium simple, thin. Tegula simple, thin, lamellate. Remnant of rostellum with a shallow plate surrounded by 2 obscur triangular lobes (Archila *et al*., 2018).

Species reported in Guatemala

Trichopilia archilarum Chiron
Richardiana 11(4): 203, fig. 14 (2011). Type: GUATEMALA, Alta Verapaz, Senaho, 02/1993, F. & O. Archila, *FA s.n*. (Holotype: BIGU!) – Archila, *Revista Guatemalensis* 17(2): 69 (2014). Distribution: Guatemala.

Trichopilia freulerae Archila & Chiron
Richardiana 11(4): 204, fig. 15 (2011). Type: GUATEMALA, Alta Verapaz, Cobán, Bosque Siguanha, 12/2000, F. Archila, *FA-911*. (Holotype: BIGU!) – Archila, *Revista Guatemalensis* 17(2): 69 (2014). Distribution: Guatemala.

Trichopilia galeottiana A. Richard & Galeotti
Annales des Sciences Naturelles. Botanique, sér. 3, 3: 26 (1845). Type: MEXICO, *Galeotti 5105* (P00612045 and P00456047!). – Williams, Orchids of Mexico: 272 (1986) – Atwood & Mora de Retana, *Fieldiana, Botany* n.s. 40: 170 (1999) – Dressler, in Hammel, *Manual de plantas de Costa Rica* 3: 567 (2003) – Archila, *Revista Guatemalensis* 17(2): 69 (2014). Distribution: Mexico, Belize, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama.

Trichopilia maculata Reichenbach f.
Bonplandia (Hannover) 3: 215 (1855). Type: PANAMA, *Dr. Behr s.n.* (W?) – Mueller, *Annales Botanices Systematicae* 6: 681 (1861) – Ames & Correll, *Fieldiana, Botany* 26(2): 604 (1953) – Atwood & Mora de Retana, *Fieldiana, Botany* n.s. 40: 170 (1999) – Archila, *Revista Guatemalensis* 17(2): 69 (2014). Distribution: Guatemala, Honduras, El Salvador, Costa Rica, Panama, Colombia.

Trichopilia marginata Henfrey
Gardeners' Magazine of Botany 3: 185, t. s.n. (1851). Type: COLOMBIA, *Schroder s.n*. (not localized). – Schlechter, *Repertorium Specierum Novarum Regni Vegetabilis, Beihefte* 17: 76-77 (1922) – Schlechter, *Repertorium Specierum Novarum Regni Vegetabilis, Beihefte* 19: 251 (1923) – Hamer, *Icones Plantarum Tropicarum* 13(6): pl. 1297 (1985) – Atwood & Mora de Retana, *Fieldiana, Botany* n.s. 40: 170-171 (1999) – Dressler, in Hammel, *Manual de plantas de Costa Rica* 3: 567-568. 2003 – Archila, *Revista Guatemalensis* 17(2): 69 (2014). Distribution: Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia.

Trichopilia orbiculabia Archila, Chiron & Szlachetko
Richardiana 14: 112-116 (2014). Type: GUATEMALA, Alta Verapaz, Río Matanzas, La Tinata, 09/1998, F.Archila, *FA-s.n*. (Holotype: BIGU!). Distribution: Guatemala.

Trichopilia tortilis Lindley
Edwards's Botanical Register 22: t. 1863 (1836). Type: MEXICO, 1835, *G.Barker s.n*. (Holotype: K-L). – Ames & Correll, *Fieldiana, Botany* 26(2): 606 (1953) – Hamer, *Las orquideas de El Salvador* 2: 360-361 (1974) – Hamer, *Icones Plantarum Tropicarum* 13(6): pl. 1298 (1985) – Williams, *Orchids of Mexico*: 272 (1986) – McLeish, Pearce & Adams, *Native Orchids of Belize*: 142 (1995) – Atwood & Mora de Retana, *Fieldiana, Botany* n.s. 40: 171-172 (1999) – Dressler, in Hammel, *Manual de plantas de Costa Rica* 3: 568 (2003) – Archila, *Revista Guatemalensis* 17(2): 69 (2014). Distribution: Mexico, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica (?).

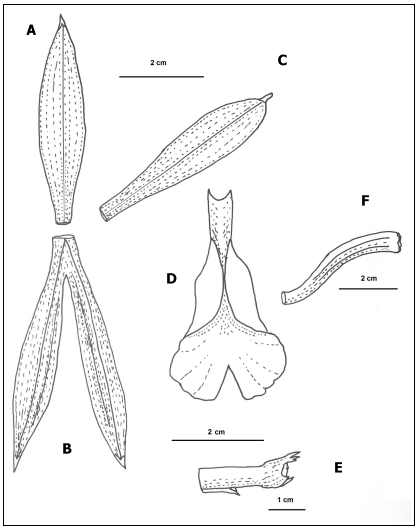
Trichopilia turialbae Reichenbach f.
Hamburger Garten-Blumenzeitung 19: 11-12 (1863). Type: COSTA RICA, *Wendland* (W! photo). Distribution: Guatemala (pers. obs.), Nicaragua, Costa Rica, Panama, Colombia.

Trichopilia kathleeniae Archila & Chiron, *sp. nov.*
Types:
Holotype: GUATEMALA, Alta Verapaz, Cobán, Bosque nuboso estadio Verapaz, 1,350 m s.n.m., col. Fredy Archila, 05/1995, sobre árbol latifoliado de Zapotaceae, *FA-sn* (BIGU).
Isotype: idem, *FA-sn* (BIGU).
Paratypes: GUATEMALA, Alta Verapaz, Cobán, Bosque nuboso estadio Verapaz, 1,370 m s.n.m., Col. Fredy Archila, 05/1998, creciendo sobre encino *Quercus sp.*, *FA-sn* (BIGU); and 05/1999, *FA-sn* (BIGU).

Etymology: named in honour of Kathleen Burger who supported the *Estación Experimental de Orquídeas de la Familia Archila*, what made this important genetic bank a reality.

Haec herba Trichopilia galeotiana A.Richard et Galeotti similis est sed pseudobulbis ligulatis (vs. elliptice-obovatis), inflorescencia erecta (vs. pendula), floribus medianis (vs. grandibus), florum colore diverso (albo cum maculas virides et ad centrum flavovirenti vs. viridi cum maculas albas rubrasque et ad centrum citreo), sepalo dorsale recto (vs. obliquo), petalis aristatis (vs. acutis), labelli marginibus haud contiguis superpositis nec involutis, labelli apice profunde emarginato bilobulato (vs. apice leviter emarginato) lobis orbicularibus oblique truncatis margine antice leviter ondulatis, ovario oblique oblongo (vs. linear), columna oblonga apice capitata 2.5 cm longa apice 0.85 cm lata basi 0.55 cm lata (vs. lineare 2 cm longa 0.35 cm lata), differt.

Plant compact very cespitose; pseudobulbs somewhat flattened, ligulate to linear-ligulate, 14 cm long, 2.2 cm wide, surrounded by green bracts; leaves elliptic, 20 × 5 cm, acuminate; inflorescence erected, 17 cm long, 1-flowered; flower green with white and faint yellow, erected, not pendulous as in the other species; dorsal sepal elliptic, apex thickened, 5 cm long, 1.1 cm wide; lateral sepals connate on the basal 0.9 cm, oblique, elliptic, acuminate apex thickened, 5.6 cm long, 0.75 cm wide; petals 5 cm long – including a 0.3 cm long apicule – and 1.1 cm wide, aristate; lip tubular with edges not overlapping or even touching, i.e. lip curled but not completely wrapped (which is not found in the other species), in natural position ca. 5 cm long, 2.7 cm wide at the apex, 1.6 cm wide in the tubular part, apex deeply emarginate-bilobulate, lobules somewhat orbicular, obliquely truncate with slightly undulate edges in front, each lobule 1.1 cm long, 1.35 cm wide; gynostemium oblong apically capitate, 2.5 cm long, 0.85 cm wide at the apex, 0.55 cm wide in the column part, staminodes acuminate, clinandrium 0.4 cm long; sterile bract obovate acuminate, 2 × 0.9 cm, floral bract oblong-elliptic, 2 × 1 cm; ovary short and thick, oblong, oblique, 3.3-3.5 cm long, 0.35-0.5 cm wide in the proximal part, 0.55 cm wide in the distal part. Fig. 1, 3 & 5 (left).



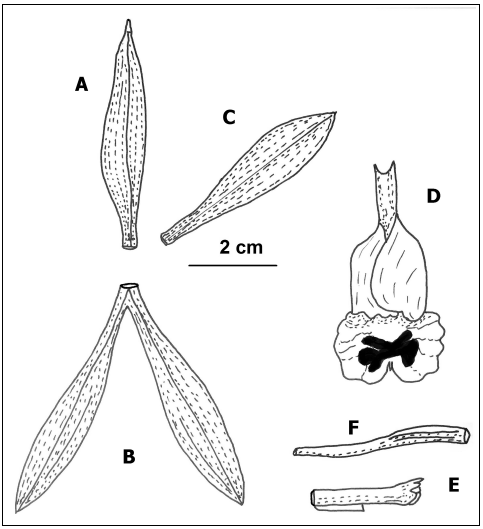


Fig. 1. ***Trichopilia kathleeniae*** **Fig. 2.** ***Trichopilia galeotiana***

[drawings Fredy Archila]

A. dorsal sepal; B. lateral sepals; C. petals; D. lip; E. column; F. ovary

Fig. 3. ***Trichopilia kathleeniae*** **Fig. 4.** ***Trichopilia galeotiana***
[ph. Fredy Archila]

Trichopilia kathleeniae is closely related to *T. galeottiana* (Fig. 2, 4 & 5 [right]). Besides the different habitats, the former can be distinguished from the latter by the pseudobulb shape (ligulate to linear-ligulate *vs.* elliptic-obovate; Fig. 5), the elliptic acuminate leaves (vs. elliptic lanceolate acute), the erected (*vs.* pendulous) scape, the flower colour and size, the aristate (*vs*. acute) petals, the aperture of the lip tube, the column shape (oblong capitate *vs*. linear) and the relatively short ovary (3.5 cm long *vs*. 5 cm long).

Notes. This species was observed by Magdalena Euler Paau, grandmother of the senior author, one day in 1925 or so when collecting firewood and observing the plants; many years later (1985) she was talking about this observation with her grandson, remembering the bell-shaped orchids. Puzzled by this talk the senior author went to the place that was only a remnant of cloud forest in the middle of the city of Cobán, already strongly degraded, due to the exploitation of trees for firewood. He explored the forest until he managed to collect a first plant on a fallen tree; on subsequent visits he found on other fallen trees more blooming plants, badly damaged by the long period of being exposed to the sun on the remnants of branches. In the type locality, the species is considered as currently extinct.

Fig. 5. Pseudobulbs of *Trichopilia kathleeniae* (left) and *Trichopilia galeotiana* (right)

It is an example of what is happening in the Neotropics, the destruction of the cloud forest causing the disappearance of many species not yet described.

References

Alrich, P. & W. Higgins, 2008. *Illustrated Dictionary of Orchid Genera*. The Marie Selby Botanical Gardens. 482 pp.

Ames, O. & D. Correll, 1954. Orchids of Guatemala. *Fieldiana. Botany* 31.

Archila, F., 2014. Listado de Orquídeas de Guatemala. *Revista Guatemalensis* 17 (2).

Archila, F. & G. Chiron, 2011. Explorations botaniques au Guatemala. 2. *Richardiana* 11: 179-206.

Archila, F., G. Chiron & D. Szlachetko, 2014. Trichopilia orbicularia, une nouvelle espèce du Guatemala, identifiée à tort comme Trichopilia turialvae. *Richardiana* 14: 114.

Archila, F., G. Chiron, D. Szlachetko, M. Lipinska, V. Bertolini & K. Mystkowska, 2018. *Orchid Genera and Species in Guatemala*. Koeltz Botanical Books, Germany. 724 pp.

De la Cruz, R., 1982. *Clasificación de Zonas de Vida de Guatemala a Nivel de Reconocimiento*. Ministerio de Agricultura, Ganadería y Alimentación. 36 pp.
Dressler, R. & N.H. Williams, 1970. *American Orchid Society Bulletin* 39(11): 991.
Holland, D., P. Harding & A. Docha, 2011. *Orchids of Brazil, Orquídeas do Brasil*. Associação Orquidofila Piracicabana. 224 pp.
Klotzsch, J.F., 1854. *Index Seminum in Horto Botanico Berolinensis*: 1. Berlin.
Lindley, J., 1836. *Natural System of Botany*, ed. 2: 446.
Lindley, J., 1836. *Edwards's Botanical Register* 22: t. 1863.
Lückel, E. & G. Braem, 1982. Psychopsis und Psychopsiella: eine alte und eine neue Gattung der Oncidium-Verwandtschaft. *Die Orchidee* (Hamburg) 33(1): 7.
Greene, E.L., 1890. Enumeration of the North American Loti. *Pittonia* 2(9): 134.
Pfitzer, E.H., 1887. *Entwurf einer naturlichen Anordnung der Orchideen*. Heidelberg.
Reichenbach, H.G., 1855. Symbolae Orchidaceae. *Bonplandia* 3: 215.
Reichenbach, H.G., 1865. Vorstudien zu einer Orchidographie der Antillen. *Flora* 48: 278.
Richard, A. & H.G. Galeotti, 1845. *Annales des Sciences Naturelles. Botanique*, sér. 3, 3: 26.
Swartz, O., 1788. *Nova Genera et Species Plantarum*: 123.