



Cuitlauzina (Orchidaceae): a new species and a new record for Guatemala

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Abstract

The genus *Cuitlauzina* is comprised of species of horticultural interest and is relatively well known. Hitherto six species have been recognized, all of them reported in Mesoamerica. Recently, new explorations in Guatemala revealed the existence of an undescribed taxon. In this article we describe it as *Cuitlauzina cariasii*, a striking novelty from the mountains of Guatemala, and it is compared to its closest relative, *Cuitlauzina pulchella*. We also establish the presence in Guatemala of *Cuitlauzina convallarioides*. Finally we discuss the diversity of orchids in Guatemala.

Résumé

Le genre *Cuitlauzina*, dont les membres sont de grand intérêt horticole, est relativement bien connu. A ce jour six espèces sont reconnues, toutes originaires d'Amérique Centrale. Lors de récentes explorations botaniques au Guatemala, un taxon ne correspondant à aucune de ces espèces a été

découvert. Cette espèce remarquable est ici décrite sous le nom de *Cuitlauizina cariasii* et comparée à l'espèce morphologiquement la plus proche, *Cuitlauzina pulchella*. Nous discutons aussi de la diversité des orchidées guatémaltèques et établissons la présence au Guatemala de *Cuitlauzina convallarioides*.

Resumen

El género *Cuitlauzina* tiene especies de interés hortícola y está relativamente bien conocido. Hasta la fecha se le han reconocido seis especies, todas ellas ubicadas en Mesoamérica. Recientemente, nuevas exploraciones en territorio guatemalteco arrojaron la existencia de un taxón no descrito. Aquí se propone y se describe a *Cuitlauizina cariasii* una llamativa especie de las montañas de Guatemala, se indican las diferencias con su especie más cercana, *Cuitlauzina pulchella*, y se discute sobre la diversidad de orquídeas de Guatemala. También se pudo establecer la presencia de *Cuitlauzina convallarioides* en Guatemala.

Keywords: *Cuitlauzina convallarioides*, *Cuitlauzina pulchella*, Guatemala, *Osmoglossum*, *Palumbina*, taxonomy.

Mots clés : *Cuitlauzina convallarioides*, *Cuitlauzina pulchella*, Guatemala, *Osmoglossum*, *Palumbina*, taxinomie.

Palabras clave: *Cuitlauzina convallarioides*, *Cuitlauzina pulchella*, Guatemala, *Osmoglossum*, *Palumbina*, taxonomía.

Introduction

The genus *Cuitlauzina* was proposed in 1825 by the botanists Juan La Llave and Juan José Martínez de Lexarza and dedicated to Cuitlahuatzin, the penultimate Aztec emperor. It has been considered during many years as monotypic, with *Cuitlauzina pendula* La Llave & Lexarza (1825: 33) as its only member. However, the composition of the genus recently changed radically and species that previously had been classified within the genera *Dignathe* Lindley (1849: 268), *Osmoglossum* Schlechter (1923: 79) and *Palumbina* Reichenbach (1863: 699) were incorporated (Dressler & Williams, 2003). All these groups are within the same evolutionary lineage and therefore could form a single genus, but there is some controversy about it (Carnevali *et al.*, 2009). For example, recently the genus *Palumbina* was reestablished and separated from *Cuitlauzina* (Archila *et al.*, 2019).

The genus *Cuitlauzina* is distributed in the Mesoamerican region, from Mexico to Panama (Pérez-García *et al.*, 2015). In this genus, six species are currently recognized: (1) *C. convallarioides* (Schlechter, 1923: 148) Dressler & N.H. Williams (2003: 44) from Costa Rica and Panama, (2) *C. dubia* (S. Rosillo, 1983: 85) E. Yañez & Soto Arenas ex Solano (2011: 51), endemic to the mountains of western Mexico, (3) *C. egertonii* (Lindley, 1845: 50) Dressler & N.H. Williams (2003: 44), from Mexico to Panama, (4) *C. pulchella* (Bateman ex Lindley, 1841: t. 48) Dressler & N.H. Williams (2003: 44), from Mexico to Nicaragua, (5) *C. pygmaea* (Lindley, 1849: 268) M.W. Chase & N.H. Williams (2008: 30), endemic to the mountains of northeastern Mexico, and (6) *C. pendula* typical of the Neovolcanic Transversal Axis and of the Sierra Madre of Southern Mexico (Pérez-García *et al.*, 2015). It should be noted that almost all species of this genus have predominantly white flowers (except for *C. pendula*), although some sporadic specimens usually have pink tones, and therefore the color is not a good character to differentiate species. Within the lineage of *Cuitlauzina sensu lato* three species are registered in the Republic of Guatemala (Archila, 2014): *C. egertonii*, *C. pulchella* and *Palumbina candida* (Lindley, 1843: 56) Reichenbach f. (1863: 699). Within the lineage of *Cuitlauzina sensu lato* perhaps the last-mentioned is the most distinctive species, both by the vegetative habit and by its resupinate flowers, as well as by its relatively large and extended lip (Soto-Arenas & Solano-Gómez, 2007a), a situation that led to the restitution of the *Palumbina* genus (Archila *et al.*, 2019). The Guatemalan species that remained inside *Cuitlauzina* are superficially very similar to each other, but easily distinguishable by the size and degree of opening of the flowers, as well as by the ornamentation of the column and the way in which the lip is bent. Thus, *C. pulchella* presents larger and more open flowers, the lip bends at an angle of almost 90° backward, its column is ornamented by a very prominent callus; in addition, its inflorescence is straight and, unlike *C. egertonii*, the flowers are not arranged in a fractiflex pattern (Yañez & Soto, 2002). Considering that the species of this genus reported in Guatemala are well delimited, it was possible to observe that some specimens recently collected in the field presented distinctive characteristics to those previously recognized for Guatemala. Some of these specimens correspond to a taxon described from southern Central America (and its presence in Guatemala was not confirmed), *Cuitlauzina convallarioides*. Likewise, specimens were also collected that do not coincide

with any of the previously described species. Indeed, during a recent expedition in the Department of Chimaltenango, located in the center of Guatemala, in the northern area of the Volcanic Belt, and within some humid ravines surrounded by temperate forests, populations of *Cuitlauzina* were discovered. In a first impression, based on their vegetative stage, they have been considered as very robust specimens of *C. pulchella*; however, when they subsequently bloomed in cultivation it could be established that in reality they could represent a new species not yet described.

For this reason, in this paper, a new species is described within *Cuitlauzina* and illustrated and the first record for Guatemala of *Cuitlauzina convallarioides* is reported. In addition, we give some comments about why there is a great wealth of species in Guatemalan territory.

***Cuitlauzina cariasii* Archila, Szlachetko & Chiron sp. nov.**

Type: Guatemala, Chimaltenango, 2,000 m asl, IX.2014, col. Fredy Archila FA sn (Holotype BIGU, Isotype BIGU, in spirit)

Haec species Cuitlauzina pulchella similis est sed plantis majoribus, inflorescentia arcuata, sepalis petalisque obovatis vel orbicularibus, labello quadrato, labelli callo bidentato, differt.

Etymology: dedicated to Hugo René Carias Martínez, who provided photographs and flowers of our new species and who has some specimens in cultivation.

Epiphytic herb, caespitose; pseudobulbs ovate-oblong, 8.2 cm long, 3 cm wide and 1.8 cm thick, 3-leaved; leaves linear-elliptic, 33 × 1.4 cm; inflorescence arched with the flowers grouped towards the apex, not resupinate; dorsal sepal obovate, 1.4 × 0.8 cm, apically rounded; lateral sepals orbicular-elliptic, 1.2 × 0.7 cm, apically apiculate; petals obovate, 1.4 × 1 cm, apically rounded; lip 1.45 × 1.2 cm, trilobed, lateral lobes small, median lobe quadrate apically emarginate, basal callus made of a bidentate structure on the distal portion, teeth curved, and a central strip on the proximal portion; gynostemium short, 0.7 cm long, with 2 lateral wings irregularly dentate on the margins, and an apical lobe laminar subquadrate, dentate on the margins; fruit ovoide-globose, 5.8 cm long, 1.4 cm diam.

Fig. 1 & 2.



Fig. 1. *Cuitlauzina cariasii*

flower (left) – detail of the gynostemium (right). Ph. Fredy Archila



Fig. 2. *Cuitlauzina cariasii*

drawing Natalia Olędrzyńska

Fig. 3. *Cuitlauzina pulchella*

Ph. Eduardo Pérez

Taxonomic notes. *Cuitlauzina cariasii* may be confused with *C. pulchella* (Fig. 3), which is obviously the most similar species as for the morphology. However some clear differences allow a rather easy distinction of the

species. Plants of *C. cariasii* are clearly stronger, with pseudobulbs somewhat oblong and up to more than 8 cm long whereas in *C. pulchella* pseudobulbs are around 6.5 cm long and rather elliptic. Leaves of the former are linear-elliptic, up to 33 cm long and 1.4 cm wide whereas in the latter they are shorter and thinner, 26 cm long and less than 1 cm wide. In *C. cariasii* the inflorescence has a orthotropic growth but is distinctly arched, with the flowers clustered in the apical part; in *C. pulchella*, the inflorescence is erect or somewhat recurved but the flowers are distichously arranged from its second third. In *C. cariasii* the dorsal sepal and the petals are obovate and the lateral sepals orbicular whereas in *C. pulchella* all of them present an elliptic general shape. The lip shape is different as well: in *C. cariasii* the lip has an apex extended, broad and quadrate, not linear-oblong as in *C. pulchella*. Without a doubt the most distinctive feature in *C. cariasii* is the presence of 2 curved teeth in the lip callus, a character not found in any other species of *Cuitlauzina*. In particular, the callus in *C. pulchella* presents normally 2 protuberances not forming teeth. Additionally there are some important differences in the habitats of both species. *C. pulchella* can be found in dry and hot (at noon) forests of the Centre-North of Guatemala whereas *C. cariasii* thrives in ravines in a mountain (cold) climate.

First record of *Cuitlauzina convallarioides* in Guatemala

Cuitlauzina convallarioides (Schlechter) Dressler & N.H. Williams, *Selbyana* 24(1): 44. 2003.

Basionym: *Osmoglossum convallarioides* Schlechter, *Repertorium Specierum Novarum Regni Vegetabilis Beihefte* 19: 148. 1923. Fig. 4.

Synonym: *Odontoglossum convallarioides* (Schlechter) Ames & Correll, *Botanical Museum Leaflets* 11(1): 19. 1943.

Cuitlauzina convallarioides is distributed in the southern part of Central America. It was described based on a Costa Rican specimen and was later found also in Nicaragua and Panama. It was erroneously reported for Guatemala and Mexico (Soto-Arenas & Solano-Gómez, 2007a), however the specimens were misidentified plants of *C. egertonii*. The latter is recognized by its inflorescence with a fractiflex rachis, and its lateral sepals fused on little more than two thirds of their length. *Cuitlauzina convallarioides* is similar to *C. egertonii* but it is easily differentiated by the shape of its sepals, concave and orbicular, its lateral sepals free from the base, its petals

orbicular, its lip laminar but panduriform and its callus more prominent. The specimen of *Cuitlauzina convallarioides* was collected by Fredy Archila (sn) in the town of Senahu, Alta Verapaz, and deposited in the herbarium of the University of San Carlos de Guatemala (BIGU, in spirit).

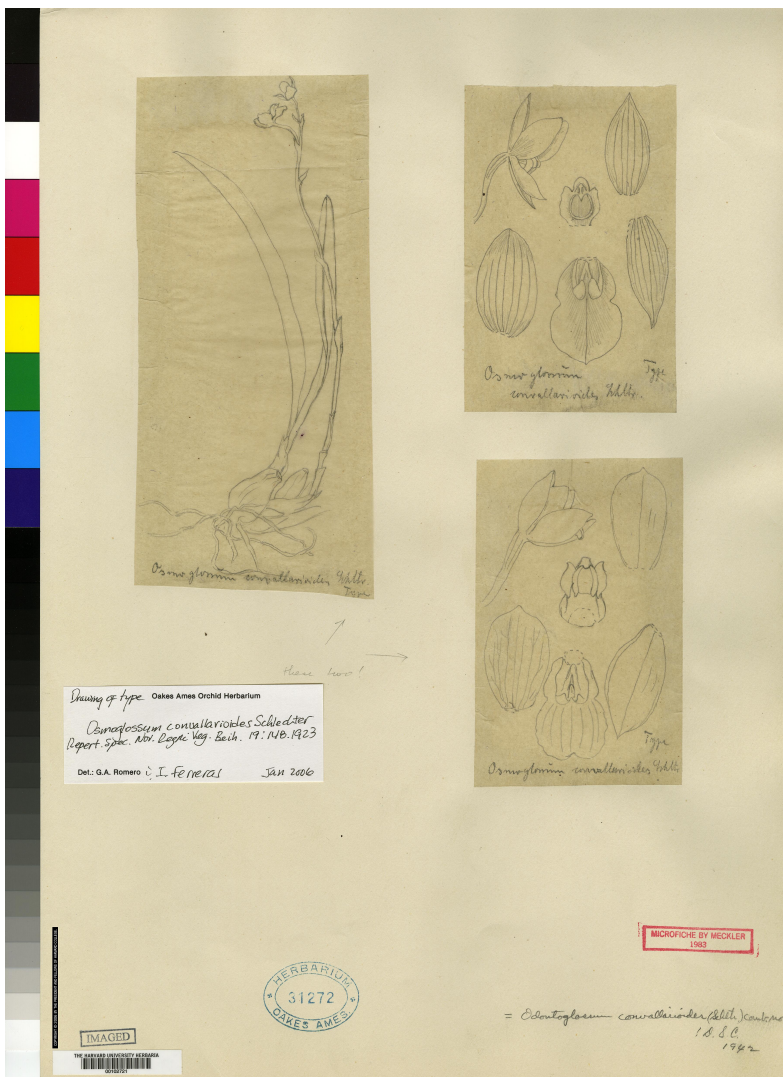


Fig. 4. *Cuitlauzina convallarioides*

drawing of the type of *Osmoglossum convallarioides* Schlechter (AMES 31272)
 Courtesy of the Orchid Herbarium of Oakes Ames, Harvard University Herbaria

Why Guatemala has a great species richness in orchids?

During a long time the richness of Guatemalan orchid flora has been underestimated; as an example the orchid species number taken into consideration for the country was 527 in Ames & Correll (1953-1954). However this number has recently increased as botanical studies were carried out in the country. So, in 1992, 800 species were recorded (Archila, 1992) and, about twenty years later, the number reached 1237 (Archila, 2014), i.e. about 55% more. According to the senior author this number is today quite likely over 1300.

Guatemala is a country with a great geological complexity: roughly we may cite, based on the origin, (a) rocks of the Yucatan platform, (b) rocks of the Chortis block and (c) rocks of the Peten Folded Belt of the Maya block (Donnell *et al.*, 1990). Besides this lithological complexity, the tectonic processes led to additional variations. Thus the topographic relief is quite heterogeneous, from lands at sea level to altitudes of 4220 m asl, and from relatively flat lands in the North and the Southeast to very rugged places. In the southern part we find the Volcanic Belt, in the North the Northern Humid Arc, while in the West there are high plateaus and the continental block of the Cuchumatanes mountains and in the northeastern region is the Sierra de las Minas. The physiographic complexity results in 14 life zones according to the Leslie Holdridge system modified by René de la Cruz (1982). In a general way, it can be said that Guatemala has a high rainfall, but two regions with different rainfall patterns may be defined: (1) the departments of the West Humid Arc with 11 months of rainfall and (2) the remaining departments with only 6 months of rainfall. All this environmental heterogeneity can help explain why there are so many species of orchids in Guatemala, even though the country does not cover a large surface. More studies are needed, associating the distribution areas of the species with the life, geographical and geological regions, to achieve a greater understanding of what the processes of orchid diversification have been in this complex country.

The orchid richness in Guatemala is slightly greater than the richness estimated for Mexico (1254 species according to Soto *et al.*, 2007b) but somewhat smaller than the richness calculated for Costa Rica (1574 species according to Bogarín *et al.*, 2016). This last comparison is interesting as the territorial extension of Guatemala (108,889 km²) is about twice that of Costa Rica (51,100 km²). It seems that there is a South-North decrease of the

orchid diversity (genera and species) from Ecuador-Colombia. However there are other variables that can affect the orchid diversity such as topography, rainfalls, pollination, isolation, etc... In this sense, we may reasonably think that the greater land area and the greater environmental complexity of Guatemala compared to Costa Rica could counterbalance the latitude effect on the species richness and that both countries could present similar orchid numbers.

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