



## Notes on Mesoamerican orchids. II: millenary use in the Q'eqchi communities of the lowlands, with a new *Vanilla* species

Fredy Archila Morales<sup>1,2\*</sup>, Rebeca Menchaca<sup>3</sup> & Guy R. Chiron<sup>4</sup>

<sup>1</sup>Estación Experimental de orquídeas de la familia Archila, Guatemala

<sup>2</sup>Herbario BIGU, Universidad de San Carlos de Guatemala

<sup>3</sup>Centro de Investigaciones Tropicales –CITRO- Universidad Veracruzana, Veracruz, México

<sup>4</sup>Herbiers, Université Claude Bernard Lyon 1, F-69622 Villeurbanne Cedex, France

\* corresponding author: [archilae@gmail.com](mailto:archilae@gmail.com)

### Abstract

Traditional gardens of the Mayas Q'eqchi are briefly presented. The plants which are cultivated in these gardens are listed together with their vernacular names and their use, as well as the orchids found there. The treatment of the vanilla fruits by the Q'eqchi communities is described. A kind of vanilla, found in only one of these communities, proved to represent a new species. It is described, illustrated and compared to its closest relative, *Vanilla pompona*.

### Résumé

Après une brève présentation des jardins traditionnels mayas Q'eqchi, une liste des plantes qui y sont cultivées est fournie, avec leurs noms latins et vernaculaires, ainsi qu'une liste des orchidées que l'on y trouve. La méthode de traitement de la vanille dans ces communautés est précisée. Une vanille, cultivée dans une seule de ces communautés, s'est révélée différente de toute espèce connue. Elle est décrite, illustrée et comparée à *Vanilla pompona*, l'espèce la plus ressemblante.

## Resumen

Después de una breve presentación de los jardines tradicionales mayas Q'eqchi, se proporciona una lista de las plantas cultivadas allí, con sus nombres en latín y vernáculos, así como una lista de Orquídeas encontradas allí. Se especifica el método de tratamiento de vainilla en estas comunidades. Se encontró una vainilla cultivada en ese lugar, la que después de ser analizada se demuestra que es diferente a todas las especies ya conocidas. Se describe, ilustra y compara con la *Vanilla pompona*.

**Keywords:** Ethnobotany, Guatemala, Orchidaceae, taxonomy, *Vanilla pompona*, Vanilloideae.

**Mots-clés :** Ethnobotanique, Guatemala, Orchidaceae, taxinomie, *Vanilla pompona*, Vanilloideae.

**Palavras-clave:** Etnobotánica, Guatemala, Orchidaceae, taxonomia, *Vanilla pompona*, Vanilloideae.

## Introduction

Ethnobotany studies the behaviour of human societies with regard to the plant world (Portères, 1970), which in turn shows how local resources have been used by local people, whether they are indigenous or have long resided in a given region (Ocampo, 1994). It is one of the branches of the plant study that has developed from the beginning of the botanical sciences, because the first studies have attempted to understand the utility and use of botanical elements of the environment. In this discipline, different areas of research are addressed in order to recognize the dynamics generated in the plant-human relationship. These include (a) "to elucidate the cultural position of the tribes who used the plants and clarify the distribution of useful plants in the past" (Harshberger, 1896); and (b) to analyze and recognize all the dynamics that develop around communities and their plant resources, where different knowledge and different areas of knowledge are needed (Carreño, 2016).

Q'eqchi Mayan culture is undoubtedly one of the fastest growing cultural groups, and it is interesting to note that, while other cultural groups are contracting, it is expanding in Guatemala and in the neighbouring countries. Traditionally, the Q'eqchi Maya are semi-nomadic, as it can be seen mainly in the lowlands, while in the uplands there are established and usually matriarchal family clans of economic power.

Thanks to the botanical explorations carried out, the members of the experimental station were able to have access to Mayan villages isolated in the forests. This approach and coexistence in the villages and in the forest with the Mayan peoples allowed access to traditional gardens normally forbidden to people outside the community. Knowledge relating to the use of these gardens made by the Maya Q'eqchi culture was shared, thanks to the trust and friendship with the members of these communities. In these populations, a traditional garden can be understood as a group of plants sown and cultivated for their utility (edible, sacred plants, textiles, medicinal, hallucinogenic, etc.).

In our recent ethnobotanical explorations in the heart of Q'eqchi culture, in the Guatemalan tropics of the Polochic valley, we have seen a very large number of useful plants (Tab. 1) established in mountain communities and observed a good knowledge of their use.

**Tab. 1. Plant species found in the Q'eqchi traditional gardens.**

[Latin names according to International Plant Names Index, retrieved September 2019]

Use: E = edible, M = medicinal, S = sacred

Scientific names	Q'eqchi names	Use
<i>Amaranthus spinosus</i> Linnaeus	Ses	E
<i>Ananas comosus</i> (Linnaeus) E.D.Merrill	Ch'op	E
<i>Andropogon schoenanthus</i> Linnaeus	Telimon	E
<i>Annona cherimola</i> P.Miller	Tzurmuy	E
<i>Bixa orellana</i> Linnaeus	Xayau	E
<i>Bursera simaruba</i> (Linnaeus) C.Sargent	Cacaj	M
<i>Byrsonima crassifolia</i> Kunth	Chi	E
<i>Capsicum annuum</i> f. <i>cobanensis</i> Archila	Ik	E
<i>Capsicum annuum</i> Linnaeus	Saki ik	E
<i>Capsicum annuum</i> var. <i>aviculare</i> (Dierbach) D'Arcy & Eshbaugh	Ninque'ik	E
<i>Capsicum</i> sp. Linnaeus	K'um ik	E
<i>Carica papaya</i> Linnaeus	Putul	E
<i>Citrus maxima</i> (J.Burman) E.D.Merrill	Nim Chin	E

<i>Citrus ×sinensis</i> (Linnaeus) Osbeck	Chiin	E
<i>Citrus limon</i> (Linnaeus) Osbeck	Lamuj	E
<i>Cocos nucifera</i> Linnaeus	Coc	E
<i>Colocasia esculenta</i> (Linnaeus) H.W.Schott	Malang	E
<i>Cucurbita moschata</i> Duchesne ex Poiret	K'um	E
<i>Dioscorea composita</i> W.Hemsley	Piyaq	E
<i>Epiphyllum crenatum</i> (Lindley) G.Don	Tikulbac	M
<i>Erygium foetidum</i> Linnaeus	Zamat	E
<i>Gliricidia sepium</i> (Jacquin) Kunth	Cante'	E
<i>Guazuma ulmifolia</i> Lamarck	Xuyul	M
<i>Heliconia</i> Linnaeus sp.	Moxl	M
<i>Licania platypus</i> Fritsch	Jolobob	M
<i>Lycopersicon esculentum</i> P.Miller	Pix	E
<i>Mangifera indica</i> Linnaeus	Mango	E
<i>Manihot esculenta</i> Cranzt	Tz'in	E
<i>Momordica charantia</i> Linnaeus	Kkaraniix	M
<i>Neurolaena lobata</i> R.Brown	Amankachi'	M
<i>Nicotiana tabacum</i> Linnaeus	May	S
<i>Ocimum micranthum</i> Willdenow	Temkana'	E
<i>Persea americana</i> P.Miller	O'	E
<i>Phaseolus vulgaris</i> Linnaeus	Lol q'eenq'	E
<i>Piper auritum</i> Kunth	Obel	E
<i>Renealmia aromatia</i> Grisebach	Tzi	E
<i>Ruta graveolens</i> Linnaeus	Arud	M
<i>Saccharum officinarum</i> Linnaeus	Utz'aajl	E
<i>Spathiphyllum blandum</i> Schott	Tzun tzab'al	E
<i>Spondius mombin</i> Linnaeus	Rum	E
<i>Tagetes tenuifolia</i> Cavanilles	Tutz	M
<i>Vanilla</i> P. Miller sp.	Che' sibik.	E
<i>Zea mays</i> Linnaeus	K'al	E, S
<i>Zingiber officinale</i> Roscoe	Xenxib	E, M

Several orchids can also be found in these gardens (Tab. 2).

### Tab. 2. Q'eqchi names of some orchids

after Archila *et al.*, 2018

Orchids	utz'u'uj
<i>Houlletia tigrina</i> Linden ex Lindley	k'am bolay
<i>Stanhopea oculata</i> Lindley	utz'u'uj hix
<i>Lycaste virginalis</i> (Scheidweiler) Linden f. <i>alba</i>	saki ixk
<i>Pleurothallis cardiothallis</i> Reichenbach f.	kuink q'een
<i>Chysis</i> Lindley <i>spp.</i>	utz'u'uj tul
<i>Vanilla</i> P. Miller <i>spp.</i>	Chesibik

The case of vanilla is interesting. Members of the Totonaca culture – established in the northern area of the Gulf of Veracruz in Mexico, where the vernacular name of vanilla is zizbic (Cardigan Menchaca, pers. comm.) – were considered to be the first producers of vanilla. However, some authors have indicated that Mayan culture inhabitants in Central America were probably the first to use this plant, at least since the 14th century, to treat skin wounds and bites. It is also known that it was the Mayans who developed the first methods of treating the fruit (Rodríguez, 2016; Bythrow, 2005). The genus *Vanilla* P. Miller (1754: 28) is undoubtedly a good example of useful plants for which knowledge relating to treatment has been important. In the communities that we visited, people harvest the fruits after ripening or when the top and bottom of the pod begin to turn yellow and apply a water treatment – water must come from sources in the forest and not from the river; then they make a pre-drying on the fire, a kind of smoking and elimination of water on an improvised pallet made of small pieces of branches allowing smoke and heat to pass through; after that the pod is dried in the sun, although avoiding the direct rays of the latter, and, in case of high temperatures, using various covers: tissues, baskets, *Geonoma* palm leaves. Among the edible plants, we noticed a vanilla, whose use as a semi-domesticated plant, climbing in traditional Mayan orchards, was limited to a single community. Upon a later visit we found it in bloom and were amazed by its short flowers with a morphology completely different from what we knew. Comparing this spectacular plant with other

*Vanilla* species, we came to the conclusion that it was a new species characterized mainly by a particularly cochleate labellum, petals with toothed distal margins and the presence of two highly developed geniculate staminodes. It is here described, illustrated and compared to the common *Vanilla pompona* Schiede (1829: 573).

***Vanilla cochlearilabia* Archila, Chiron & Menchaca, sp. nov.**

Type : Guatemala, Alta Verapaz, margen sur del río Polochic, Febrero 2001, como planta trepadora. A 60 m s.n.m. semidomesticada. FA-sn (BIGU).

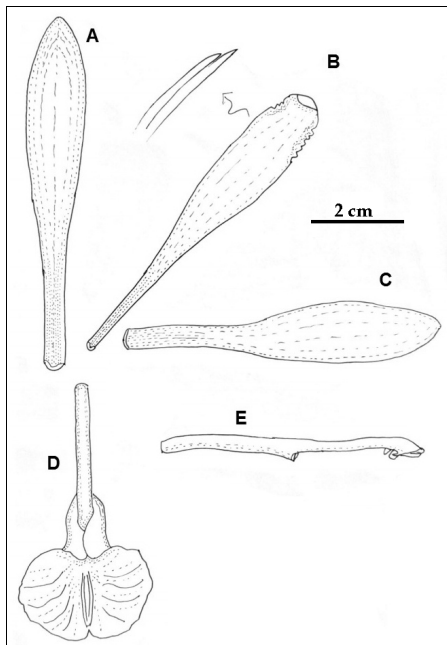
*Haec planta Vanilla pompona Schiede similis est, sed foliis carnosis oblique ellipticis (vs. ellipticis), 16 × 7 cm (vs. ultra 20 × 12 cm), sepalis lateralibus oblique obovatis (vs. late oblanceolatis), petalis obovatis (vs. oblanceolatis oblongis), rectis (vs. arcuatis), cum apice rotundato reflexo (vs. truncato rotundato), marginibus lateralibus distalibus dentatis (vs. integris), petalorum nervo externe prominente cum apice libero dentato spiniformeque, labello cochleariforme (vs. tubulare cymbiforme) margine crenulato apice retuso, gynostemio cum duobus staminibus geniculatis et basale gynopectina bilaminare (vs. sine staminodio gynopectinaque) differt.*

Etymology: the specific epithet refers to the shell shape of the lip.

Fig. 1 & 2. Climbing plant up to 8 m long, 2 cm in diameter, with internodes fleshy and wider in the median part; leaves not petiolated, fleshy, obliquely elliptic, ca. 17 × 7 cm, margins reflexed and hardened, forming a concave leaf, apex acute and curved upwards; inflorescence a short raceme, up to 3 cm long, bearing up to 8 (usually 4-7) successive flowers; flower yellowish green; floral bracts scaly, flat, 0.7 × 0.4 cm at the base; pedicellate ovary obliquely quadrate, 4 cm long; dorsal sepal obovate, 7.8 cm long, 1.3 cm wide in the wider part and 0.5 cm wide at base, obtuse; lateral sepals oblique, obovate, 7.3 × 1.3 cm, 0.5 cm wide at base, obliquely obtuse; petals obovate, 7.5 × 1.3 cm, ca. 0.25 cm wide at the linear base, 1-nerved, apex rounded and reflexed, distal margins dentate, vein externally very prominent, free at the apex and forming a thorn-shaped tooth; lip cochleariform, 6.3 × 3.2 cm, unguiculate, claw 0.4 cm wide, margins crenulate, apex retuse; disc with a callus made of caespitose laminae apically denticulate, placed at 1/4 of the length from the base; gynostemium 6.2 × 0.45 cm at base, 0.35 cm in the middle and 0.4 cm at apex, with a pair of geniculate staminodes (see Fig. 3) and, towards the base, a infrastigmatic process (gynopectine), made of 2 laminae, each lamina quadrate truncate;



**Fig. 1. *Vanilla cochlearilabia* - flower**  
ph. Fredy Archila, from the type



**Fig. 2. *Vanilla cochlearilabia***  
A. dorsal sepal; B. petal; C. lateral sepal; D. lip; E. column and ovary  
drawing Fredy Archila, from the type

rostellum very long, laminar, concave; anther globose ovate, emarginate at base; fruit obliquely triangular, slightly falcate, 8 cm long, 1.8-2.2 cm wide, 1.7 cm thick.



**Fig. 3. Column of *Vanilla cochlearilabia* (detail)**

red: one of the staminodes – yellow: gynopectine

drawing Fredy Archila, from the type

### Taxonomic notes

This species is related to *Vanilla pompona*, which is native to the western part of Guatemala near the Mexican border whereas our taxon grows in the eastern Guatemala, at hundreds kilometers from the *V. pompona* populations. Compared to *V. pompona*, *V. cochlearilabia* presents a rough (vs. smooth) stem, with 20 cm long (vs. 11-15 cm long) internodes, leaves distinctly smaller, up to 17 cm long (vs. up to 29 cm long), sepals and a column slightly bigger, a lip distinctly shell shaped (vs. tubular subquadrate), a gynostemium provided with a gynopectine (not seen in *V. pompona*), with an entire stigma (vs. trilobed) and a very shorter fruit (8 cm long vs. 15 cm long).

### References

- Archila F., D. Szlachetko, G. Chiron, M. Lipińska, V. Bertolini & K. Mystkowska, 2018. *Orchid Genera and Species in Guatemala*. Koeltz Botanical Books. Germany. 724 pp.
- Bythrow, J.D., 2005. Vanilla as a Medicinal Plant. *Seminars in Integrative Medicine* 3(4): 129-131.
- Carreño, P., 2016. *La etnobotánica y su importancia como herramienta para la articulación entre conocimientos ancestrales y científicos*. Universidad distrital Francisco José de Caldas, Facultad de ciencias y educación proyecto curricular licenciatura en biología. Bogotá Colombia. 44 pp.
- Miller, P., 1754. Vanilla, in *The Gardeners Dictionary*, ed. 4, vol. 3. London.
- Portères, R., 1970. *Cours d'ethnobotanique et ethnozoologie (1969-1970)*. Vol. I. Muséum National d'Histoire Naturelle, Paris.



- Ocampo, R.A., 1994. *Domesticación de plantas medicinales en Centro América*. Centro agronómico tropical de investigación y enseñanza. San José de Costa Rica. 132 pp.
- Harshberger, J.W., 1896. Purposes of ethnobotany. *Botanical Gazette*, 21, 146–154.
- Rodríguez, L.T., 2016. *La vainilla (Vanilla planifolia): perfume y sabor de México que conquistó al mundo: II: Usos y cultivo*. Desde el Herbario CICY 8: 93–96 (23/Junio/2016) Centro de Investigación Científica de Yucatán, A.C. [http://www.cicy.mx/sitios/desde\\_herbario/](http://www.cicy.mx/sitios/desde_herbario/) ISSN: 2395-8790
- Schiede, C.J.W., 1829. Botanische Berichte aus Mexico. *Linnaea* 4(4): 554-583.