

## SHORT COMMUNICATION

# First record of *Vanilla labellopapillata* (Orchidaceae: Vanilloideae) in the state of Amazonas, Brazil

Dayse Raiane Passos KRAHL<sup>1,\*</sup>, Amauri Herbert KRAHL<sup>1</sup>, Guy CHIRON<sup>2</sup>,  
Mário Henrique TERRA-ARAÚJO<sup>1</sup>

<sup>1</sup>Instituto Nacional de Pesquisas da Amazônia – INPA, Programa de Pós-Graduação em Botânica, Av. André Araújo 2936, Aleixo, 69060-001 Manaus, AM, Brazil

<sup>2</sup>Université de Lyon 1, Herbiers, F-69622, Villeurbanne Cedex, France

\*Corresponding author: [dayseraiane@hotmail.com](mailto:dayseraiane@hotmail.com); <https://orcid.org/0000-0003-2899-9453>

## ABSTRACT

The first record of *Vanilla labellopapillata* is presented for the state of Amazonas, Brazil, in the region of Manaus, now the western limit of the species, which was previously known only from the type locality in the state of Pará. A brief description is provided and taxonomic and ecological aspects of the species are discussed in the light of this new finding.

**KEYWORDS:** Adolpho Ducke Forest Reserve, Amazon, dense ombrophilous forest, hemiepiphyte, taxonomy

## Primero registro de *Vanilla labellopapillata* (Orchidaceae: Vanilloideae) no Estado do Amazonas, Brasil

### RESUMO

É apresentado o primeiro registro de *Vanilla labellopapillata* para o Estado do Amazonas, Brasil, na região de Manaus, sendo este o limite oeste da espécie, anteriormente só conhecida da localidade tipo no estado do Pará. É apresentada uma breve descrição da espécie e comentários taxonômicos e ecológicos da espécie no contexto da nova localidade.

**PALAVRAS-CHAVE:** Amazônia, floresta ombrófila densa, hemiepífita, taxonomia, Reserva Florestal Adolpho Ducke

*Vanilla* Plumier ex Miller is a pantropical genus (Cameron 2011; Soto-Arenas and Cribb 2010) and it is composed of just over 100 species (Cameron 2003; Soto-Arenas and Cribb 2010). Its species develop preferentially in tropical forests and a few species are adapted to drier climatic and environmental conditions (Rodolphe *et al.* 2011). Moreover, the genus has the greatest economic importance among orchids, because *Vanilla planifolia* Andrews is the natural source of vanilla (Rain 2004).

Species in this genus can be terrestrial, rarely epiphytic and most often hemiepiphytic, some of them being up to 25 m long (Cameron 2003; Soto-Arenas 2003; Soto-Arenas and Cribb 2010; Soto-Arenas and Dressler 2010). Curiously, their flowers last less than 12 hours, which very often makes their observation in the wild somewhat difficult (Soto-Arenas 2003; Soto-Arenas and Cribb 2010; Soto-Arenas and Dressler 2010). The species are characterized by a hemiepiphytic habit, a flexible and lianescent stem, the lack of pseudobulb, alternate leaves with variable sizes and shapes, a lip adnate to the column, a versatile and saddle-shaped anther and entire seeds (Hoehne 1945; Dressler 1993; Soto Arenas and Cribb 2010).

According to Flora do Brasil 2020 in construction (2020), a part of the updated inventory of the Brazilian Flora (BFG 2015), 37 *Vanilla* species grow in Brazil, 20 being endemic, whereas Soto-Arenas and Dressler (2010) recognized only 26 species in their synopsis of the genus. This discrepancy is due to both new synonyms and the new species described (*e.g.* Pansarin *et al.* 2012; Koch *et al.* 2013; Pansarin and Miranda 2016; Fraga *et al.* 2017). Again according to BFG 2020 in construction (2020), 17 species have been recorded for the Brazilian Amazon, among which 13 occur in the Amazonas state.

*Vanilla labellopapillata* A.K. Koch, Fraga, J.U. Santos & Ilk.-Borg. is one of them. It has been recently described from Pará state, more precisely from the *Floresta Nacional de Caxiuanã* (Koch *et al.* 2013). Here we give details on the first record of the species for the state of Amazonas state, which enlarges its geographic distribution. In addition, our finding contributes to the knowledge of the flora of the state of Amazonas.

**CITE AS:** Krahl, D.R.P.; Krahl, A.H.; Chiron, G.; Terra-Araújo, M.H. 2020. First record of *Vanilla labellopapillata* (Orchidaceae: Vanilloideae) in the state of Amazonas, Brazil. Acta Amazonica 50: 260-262.

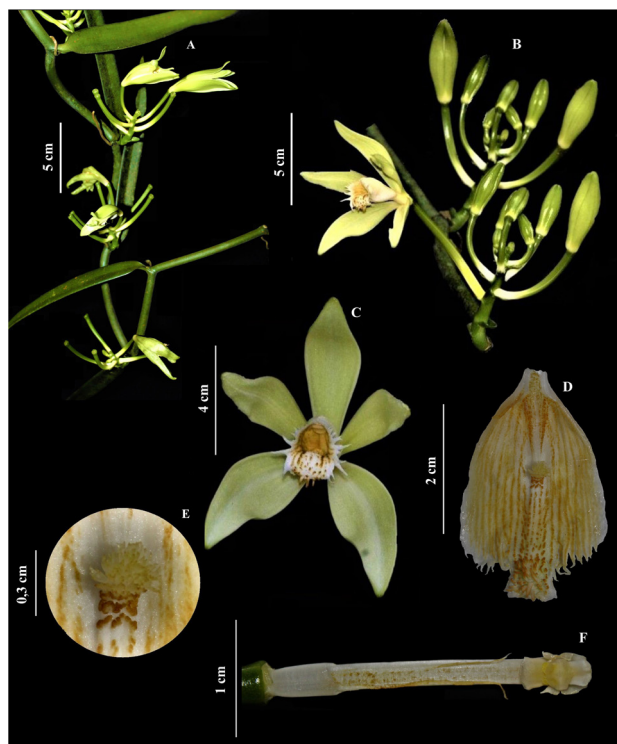
*Vanilla labellopapillata* A.K. Koch, Fraga, J.U. Santos & Ilk.-Borg., Syst. Bot. 38(4): 975. 2013. (Figure 1A-F).

Hemiepiphytic plant, scandent/lianescent, approximately 15 m long. Stem cylindrical, glabrous, flexible, dark green, internodes (n = 10)  $11.1 \pm 1.8 \times 0.9 \pm 0.09$  cm. Leaves (n = 11)  $19.47 \pm 2.75 \times 2.21 \pm 0.28$  cm, linear-lanceolate, with an acute and reflexed apex, pseudo-petiole  $0.99 \pm 0.09$  cm long. Inflorescence (n = 6)  $12.2 \pm 1.4$  cm long, racemose, 8-13-flowered, originating of the leaf axils. Floral bracts (n = 6)  $1.02 \pm 0.19 \times 0.65 \pm 0.05$  cm, ovate, apically obtuse, smaller towards the raceme apex. Flowers (n = 6) pale yellow slightly greenish, pedicellate, pedicel and ovary  $5.37 \pm 0.7$  cm long, cylindrical, green near the ovary and white near the pedicel. Sepals oblanceolate, apically obtuse, dorsal  $5.60 \pm 0.28 \times 1.00 \pm 0.13$  cm, lateral  $5.33 \pm 0.21 \times 1.13 \pm 0.12$  cm; petals  $5.40 \pm 0.27 \times 0.80 \pm 0.14$  cm, linear-lanceolate, apically obtuse, midvein prominent; lip  $3.82 \pm 0.24 \times 2.2 \pm 0.15$  cm, clawed, adnate to the column along the margins of the basal half, tubular, ventral surface with rows of imbricated and denticular scales in the middle and anterior portion, papillae becoming enlarged to form a suborbicular tuft of trichomes that covers almost entirely the surface of the median lobe, distinctly trilobed, with a callosity on the disc; penicillated callus  $0.35 \pm 0.08$  cm long.; lateral lobes  $2.75 \pm 0.12 \times 1.05 \pm 0.14$  cm, rounded, lateral margins entire, apical margin fimbriate; midlobe  $0.63 \pm 0.08 \times 0.70 \pm 0.11$  cm, oblong, truncate; column  $2.92 \pm 0.13$  cm long, semi-cylindric, slender, sparsely hairy in the ventral region, attenuated at base, with two small membranaceous wings at apex; anthers versatile, saddle-shaped, stigma trilobed; pollen free, yellow. Fruit not seen.

Material examined: Brazil, Amazonas: Manaus, Reserva Florestal Adolpho Ducke, flowered in cultivation in MUSA orchid greenhouse, 19.II.2019, fl., D.R.P. Krahl & A.H. Krahl 418 (INPA); Idem, fl., D.R.P. Krahl & A.H. Krahl 419 (INPA); Idem, fl., A.H. Krahl & D.R.P. Krahl 1093 (INPA); Idem, fl., A.H. Krahl & D.R.P. Krahl 1094 (INPA); Manaus, BR 174, Km 901, Ramal Castanheira, Sítio Angelim, Dense ombrophilous forest, fl., 24.II.2019, A.H. Krahl & J.J. Valsko 1109 (INPA); Idem, fl., A.H. Krahl & J.J. Valsko 1110 (INPA).

*Vanilla labellopapillata* has been recently described by Koch *et al.* (2013) from the Pará state. In the present study it was found in two places in a dense ombrophilous forest near the city of Manaus, namely the *Reserva Florestal Adolpho Ducke* (RFAD), near the area of the botanical garden of the *Museu da Amazônia* (MUSA) (Museum of Amazonia) and *Sítio Angelim*, located on the Ramal Castanheira road, Km 901 of the BR 174 highway, that connects Manaus (Amazonas state) to Boa Vista (Roraima state).

According to Koch *et al.* (2013), *V. labellopapillata* is a close relative of *V. insignis* Ames. In *V. insignis*, the bracts and the flower parts are larger, the leaf is oblong-elliptic with



**Figure 1.** *Vanilla labellopapillata*. A – Habit; B – Inflorescence; C – Flower; D – Lip; E – Callosity of the lip; F – Column in ventral view. This figure is in color in the electronic version.

an abruptly acuminate apex (*vs.* linear-lanceolate with an reflexed apex) and the penicillated callus is composed of ca. 13 rows of imbricated and congested scales (*vs.* 3 rows of imbricated and denticular scales) (see more details in Koch *et al.* 2013). *Vanilla insignis* was recorded from the Caribbean basin in Central America, in Honduras, Belize, Guatemala and Mexico, at an altitude of ca. 900 m. (Soto-Arenas and Cribb (2010), whereas *V. labellopapillata* is only found in the Brazilian Amazon, growing in floodplain forest (*várzea*) (Koch *et al.* 2013) and *terra firme* forest (our own observations) at an altitude of about 100 m. This last type of vegetation is therefore a novelty for *V. labellopapillata*, since it had been registered only for *várzea* forest.

*Vanilla labellopapillata* can also be confused with *V. odorata* C.Presl [= *V. uncinata* Huber ex Hoehne according to Garay (1978), Hamer (1984), Dodson and Dodson (1980), Soto-Arenas and Cribb (2010) and Koch *et al.* (2013)]. However it differs from *V. labellopapillata* in the longer internodes (approximately over 10 cm long *vs.* less than 10 cm), shorter floral bracts (less than 6 mm *vs.* more than 8 mm) and a distinctly trilobed lip without branched and thickened veins and with fimbriate margins (*vs.* obscurely trilobed lip with branched and slightly thickened veins in the distal third and long-lacerate/fimbriate to lacinate margins).

## ACKNOWLEDGMENTS

The authors thank the Programa de Pós-Graduação em Botânica (PPGBot) of Instituto Nacional de Pesquisas da Amazônia (INPA) for support and logistics given throughout the study, Fundação de Amparo à Pesquisa do Estado do Amazonas (FAPEAM) for the scholarship granted to the first author, and the team of the botanical garden of the Museu da Amazônia (MUSA) for their support.

## REFERENCES

- BFG 2020 in construction. 2020. Brazilian Flora Group. *Vanilla*. Jardim Botânico do Rio de Janeiro (<http://floradobrasil.jbrj.gov.br/>). Accessed on 03 Jun 2020.
- BFG. 2015. Brazilian Flora Group. Growing knowledge: an overview of Seed Plant diversity in Brazil. *Rodriguésia*, 66: 1085–1113.
- Cameron, K.M. 2003. Vanilloideae. In: Pridgeon, A.; Cribb, P.; Chase, M.; Rasmussen, F. (Eds.). *Genera orchidacearum*, v.3. Oxford University, Oxford, p.281–334.
- Cameron, K.M. 2011. *Vanilla* phylogeny and classification. In: Havkin-Frenkel, D.; Belanger, F.C. (Ed.). *Handbook of Vanilla Science and technology*. WileyBlackwell, Chichester, p.243–255.
- Dodson, C.H.; P.M. Dodson. 1980. *Orchids of Ecuador*. Icones Plantarum Tropicarum v.1–4, Plates 1– 400, Marie Selby Botanical Gardens, Sarasota, 800p.
- Dressler, R.L. 1993. *Phylogeny and Classification of the Orchid Family*. Cambridge University Press, Cambridge, 314p.
- Flora do Brasil 2020 em construção. 2020. *Orchidaceae*. Jardim Botânico do Rio de Janeiro. (<http://floradobrasil.jbrj.gov.br/reflora/floradobrasil/FB12347>). Accessed on 03 Jun 2020.
- Fraga, C.N.; Couto, D.R.; Pansarin, E.R. 2017. Two new species of *Vanilla* (Orchidaceae) in the Brazilian Atlantic Forest. *Phytotaxa*, 296: 63–72.
- Garay, L.A. 1978. Orchidaceae (Cypripedioideae, Orchidoideae, Neottioideae). In: Harling, G.W.; Sparre, B.B. (Ed.). *Flora of Ecuador*, v.9. University of Göteborg and Swedish Museum of Natural History, Goteborg and Stockholm, p.1–305.
- Hamer, F. 1984. *Orchids of Nicaragua*. Icones Plantarum Tropicarum. v.12. (Part. 5), Plates 1101–1200, Marie Selby Botanical Gardens, Sarasota, 400p.
- Hoehne, F.C. 1945 Orchidáceas. In: Hoehne, F.C. (Ed.) *Flora Brasílica*, Fasc. 8 (Vol. XII, II; 13–43). Secretaria da Agricultura, Indústria e Comércio de São Paulo, São Paulo, p.1–389.
- Koch, A.K.; Fraga, C.N.; Santos, J.U.M.; Ilkiu-Borges, A.L. 2013. Taxonomic notes on *Vanilla* (Orchidaceae) in the Brazilian Amazon, and the description of a new species. *Systematic Botany*, 38: 975–981
- Pansarin, E.R.; Aguiar, J.M.R.B.V.; Ferreira, A.W.C. 2012 A new species of *Vanilla* (Orchidaceae: Vanilloideae) from São Paulo, Brazil. *Brittonia*, 64: 157–161.
- Pansarin, E.R.; Miranda, M.R. 2016. A new species of *Vanilla* (Orchidaceae: Vanilloideae) from Brasil. *Phytotaxa*, 267: 84–88.
- Rain, P. 2004. *Vanilla: The Cultural History of the World's Favorite Flavor and Fragrance*. Jeremy P. Tarcher/Penguin, New York, 371p.
- Rodolphe, G.; Séverine, B.; Michel, G.; Pascale, B. 2011. Biodiversity and Evolution in the *Vanilla* Genus. In: Grillo, O. (Ed.). *The Dynamical Processes of Biodiversity—Case Studies of Evolution and Spatial Distribution*. O. InTech, Rijeka, p.1–26.
- Soto Arenas, M.A.; Cribb, P. 2010. A new infrageneric classification and synopsis of the genus *Vanilla* Plum. ex Mill. (Orchidaceae: Vanillinae). *Lanksteriana*, 9: 355–398.
- Soto-Arenas, M.A.; Dressler, R.L. 2010. A revision of the Mexican and Central American species of *Vanilla* Plumier ex Miler with a characterization of their ITS region of the nuclear ribosomal DNA. *Lanksteriana*, 9: 285–354.
- Soto-Arenas, M.A. 2003. *Vanilla*. In: Pridgeon, A.M.; Cribb, P.J.; Chase, M.W.; Rasmussen, F.N. (Ed.). *Genera Orchidacearum: Orchidoideae*. Oxford University Press, Oxford, p.321–334.

RECEIVED: 01/05/2020

ACCEPTED: 29/07/2020

ASSOCIATE EDITOR: Ricarda Riina



This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.