

A NOTE ON THREE “NEW” SPECIES OF *XYLOBIUM*  
(ORCHIDACEAE, MAXILLARIINAE) FROM  
RUIZ AND PAVÓN’S PERUVIAN COLLECTIONS

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**Abstract.** The recent transfer to the genus *Xylobium* of three orchid species originally described by Ruiz and Pavón as members of *Maxillaria* is challenged on the basis of the extant evidence found in the herbarium and the archives of the Royal Botanic Garden, Madrid, where the first set of materials intended for the *Flora Peruviana et Chilensis* is deposited. The study of the taxonomic literature does not support the claims about a common usage of the three names, *Maxillaria alata*, *M. bicolor*, and *M. cuneiformis*, as being referable to *Xylobium*.

**Keywords:** *Flora Peruviana et Chilensis*, *Maxillaria*, Orchidaceae, Pavón Jiménez José Antonio, Ruiz López Hipólito, *Xylobium*

In a recently published paper, Carpio Lau and coauthors (2016) formally transferred to the genus *Xylobium* Lindl. three orchid species originally described in the late eighteenth century by Hipólito Ruiz and José Pavón as members of their broadly defined concept of *Maxillaria* (Ruiz and Pavón, 1794, 1798). The nomenclatural recombinations are apparently based on the opinions of previous authors (i.e., Schweinfurth, 1960; Brako and Zarucchi, 1993; Roque and León, 2007; Schuiteman and Chase, 2015), as well as on alleged morphological features, both vegetative and floral, of the three transferred species of *Maxillaria*.

Actually, the consideration of *Maxillaria alata* Ruiz & Pav., *M. bicolor* Ruiz & Pav., and *M. cuneiformis* Ruiz & Pav., as belonging to *Xylobium*, which the authors claim is consistent with the taxonomic literature is instead, quite circumstantial at best.

In his treatment of the Peruvian orchid flora, Schweinfurth (1960: 676, 682, 690) offered no rationale for the taxonomic treatment of these three taxa, nor did subsequent authors who, in their quotes of one or another of the concerned species of *Maxillaria*, followed Schweinfurth both explicitly (i.e., Roque and León, 2007: 824–825) and implicitly (i.e., Schuiteman and Chase, 2015). In particular, in their catalogue of Peruvian plants, Brako and Zarucchi (1993) considered *M. alata* as co-specific with *Cyrtidiorchis alata* (Lindl.) Rauschert (based on *Camaridium alatum* Lindl., the type: “In montibus Loxa,” Hartweg s.n.), while both *M. bicolor* and *M. cuneiformis* are treated as true members of *Maxillaria*, even though they recorded a personal communication by G. Carnevali, who believed that *M. bicolor* belongs to *Xylobium* (the same belief is expressed about *M. triphylla*, which truly belongs instead to *Cyrtochilium*; see Pupulin, 2012a). *Maxillaria cuneiformis* was not discussed either in the paper by Roque and León (2007) or by Schuiteman and Chase (2015), and the latter authors did not treat *M. bicolor* either. Apart from the literature cited by Carpio Lau and coauthors (2016) to support their view, the most

recent checklist of Peruvian Orchidaceae (Zelenko and Bermúdez, 2009) omits *M. alata*, and treats both *M. bicolor* and *M. cuneiformis* as good species of *Maxillaria*.

The orchid generic concepts originally proposed by Ruiz and Pavón (1794) in their preliminary introduction to the flora of Peru and Chile are quite broadly defined, and the boundaries between genera are sometimes weak enough to overlap. This explains why species that belong to the same genus according to the current classification were described by Ruiz and Pavón (1798) into different genera. So, for example, of the four species of *Cyrtochilium* Kunth described by Ruiz and Pavón, three were proposed as members of their *Maxillaria*, and the last one as a species of *Bletia* Ruiz & Pav. (Dalström, 2001; Pupulin, 2012a). Accordingly, of the 16 species of *Maxillaria* originally described in the *Systema vegetabilium florum Peruviana et Chilensis* (Ruiz and Pavón, 1798, title hereafter shortened in text as the *Systema*), only five belong to the modern concept of *Maxillaria* sensu lato, and only three if the genera *Maxillariella* M.A. Blanco & Carnevali and *Ornithidium* Salisb. ex R.Br., are recognized as distinct from *Maxillaria*. Of the remaining eleven species, one belongs to *Cyrtopodium* R.Br., three to *Cyrtochilium* Kunth, one to *Ida* A. Ryan & Oakeley (*Sudamerlycaste* Archila), one to *Oncidium* Sw., and two to *Xylobium*. Until Carpio Lau and collaborators (2016), the last three species have been treated as *incertae sedis*. When *Maxillariella*, *Ornithidium*, and *Sauvetrea* Szlach., are treated as congeneric with *Maxillaria*, three additional species of this genus must be added to the list, originally described by Ruiz and Pavón as *Fernandezia punctata* Ruiz & Pav., *F. haematodes* Ruiz & Pav., and *Bletia uniflora* Ruiz & Pav., respectively (Blanco et al., 2007; Pupulin, 2012a, 2012b).

The correct interpretation of the orchid names originally proposed by Ruiz and Pavón in their account on the orchid flora of the Viceroyalty of Peru, as well as a positive identification of the concerned species, has been

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traditionally hampered by the often extremely synthetic nature of the protologues published in the *Systema* (Ruiz and Pavón, 1798) and the fragmentary character of the main set of their herbarium specimens, conserved in Madrid (MA). The discussion and taxonomic interpretation of the unpublished orchid paintings produced during the Spanish botanical expedition to South America (Pupulin, 2012a, 2012a b, 2014) allowed, in several cases, to correctly place Ruiz and Pavón's names in the systematic context of the South American orchid flora, sometimes correcting previous erroneous identifications based on the interpretation of the protologues alone. Nevertheless, not all the species described by the Spanish botanists were illustrated at the time of the expedition, and a few illustrations that Ruiz cited in his manuscripts were eventually lost or dispersed after the incorporation of the South American materials to the Oficina Botánica in Madrid in the early nineteenth century (Steele, 1964; Miller, 1970; Rodríguez Nozal, 1994; García Guillén and Muñoz Paz, 2003; Pupulin, 2012a).

Apart from the main herbarium of the botanical expedition led by Ruiz, and the impressive body of original illustrations prepared during the journey of the botanists in the Viceroyalty, the Royal Botanic Garden of Madrid (RBGM) also hosts a monumental corpus of manuscripts of the expedition, mostly in the characteristic handwriting by Ruiz, but also with descriptions and notes by the two "agregados" (attachés) to the expedition, Juan José Tafalla and Juan Agustín Manzanilla (Pupulin 2012a), who continued the American collections after the return to Spain of the "first" and "second" botanists. For most of the species, the archives at the RBGM conserve both the original manuscripts prepared in South America and a fair copy, presumably prepared in Madrid, which often synthesize the original field writings to match the limited space allowed for the texts to be sent to the press (Fig. 1). In turn, for reasons of space and cost, the text of the protologues published in the *Systema* is often further reduced with respect to the descriptions' fair copies.

Arranging the manuscripts in anticipation of the publication of the *Systema*, and the subsequent planned volume VIII of the *Flora Peruviana et Chilensis* (including the *Gynandria monandria* and *Gynandria diandria*, or the Orchidaceae, which was never published), Ruiz unequivocally associated the manuscripts with the botanical illustrations, assigning them the same consecutive numbers (nos. 156–215 refer to the orchids). He also annotated on the fair copy of the manuscripts when no associated illustrations existed ("s.ic.," "s.icone," *sine icone*, without figure) and, less frequently, when no herbarium material had been prepared ("*sin esqueleto*," without dried specimen). Ruiz clearly annotated on the fair copy manuscript of *Maxillaria cuneiformis* (no. 166) that neither illustration nor *exsiccatum* were conserved of this taxon ("*s.ic. y sin esqueleto*"). In this case, our understanding of Ruiz and Pavón's concept has to completely rely on the published protologue (Ruiz and Pavón, 1798: 223) and the original manuscript, which fortunately includes further details about the floral shape and color. As in both the manuscript

descriptions of *Maxillaria alata* (no. 167) and *M. bicolor* (no. 168) Ruiz indicated that no illustrations of these species were prepared, **but made no reference to the lack of *exsiccata***, this strongly suggests that actual type specimens were originally incorporated into the herbarium of the *Flora Peruviana et Chilensis*.

In the herbarium of Ruiz and Pavón, which also contains the specimens sent from Peru and Ecuador by the *agregados* of the expedition (see meaning of *agregados* above), are conserved 14 sheets originally annotated by the Spanish botanists as species of "*Maxillaria*." Of these, only one (the type of *M. platypetala*) is a true *Maxillaria* in the modern sense, while four others belong to *Cyrtorchilum*, three to *Ida* and three to *Xylobium*, and one each to *Cyrtopodium*, *Epidendrum*, and *Oncidium*. There are, however, another 13 sheets variously labeled in Ruiz's and Manzanilla's handwriting as "*Fernandezia*," "*Orchys*" [*sic*], and "*Ophrys*," which do correspond to *Maxillaria* *sensu lato* according to the current classification. No specimen at MA, other than the type materials of *Maxillaria undulata* (MA 810873) and *M. variegata* (MA 801871, 810872) could be assigned to *Xylobium*. Among the specimens truly belonging to *Maxillaria*, none agree with the type localities cited in the *Systema*, with the exception of the type specimen of *Maxillaria prolifera* (annotated as «*Ophrys*»), originally collected at Huassahuassi. Nevertheless, ample possibilities exist that the type material of *M. alata* and *M. cuneiformis* could be searched for within the many herbaria where the specimens collected in Peru during the Botanical Expedition were dispersed during the nineteenth century (see, in particular, Rodríguez Nozal, 1994).

On the basis of the actual evidence, it is legitimate to challenge the transfer of the three "obscure" species of *Maxillaria* to *Xylobium*. When Ruiz and Pavón described those species that indisputably belong to *Xylobium*, i.e., *Maxillaria undulata* and *M. variegata* (Ruiz and Pavón, 1798), they clearly noted in the manuscripts and/or protologues that the leaves are many-veined or plicate ("*quinque septem nervia striata*," "*quiquenervia plicata*"), a feature that is typical of the genus. Also, in both species, Ruiz noted in his unpublished manuscripts, that the mid-lobe of the lip is tuberculate-glandulose ("*rugoso granulosum*") in *M. undulata*; "*ad apicem puntatoglandulosum*" in *M. variegata* [manuscripts at MA, AJB04-M-0004-0003-017 and AJB04-M-0004-0003-019, respectively]). In *M. cuneiformis*, the leaves are expressly described as "*ensiformia canaliculata, [...] nitida*," or conduplicate and glossy, and the manuscript description characterizes the lip as "*integrum*," entire, two features that are incompatible with *Xylobium*, whose species invariably present plicate leaves and, with a few exceptions, distinctly three-lobed labella. The pseudobulbs of *M. bicolor* are described as ancipitous, a character unknown in any *Xylobium* species, and the pedicels are "*subdichotomi*," i.e., arranged in two opposite rows in the same plane, while in *Xylobium* the flowers are spirally arranged on the rachis (Whitten, 2009). The available material relative to *M. alata* is, if possible, still more curt, and the manuscript description conserved in



Madrid has little to add to the published protologue (Ruiz and Pavón, 1798: 223). The specific epithet is derived from the winged characteristic of the fruits, but a trigonous ovary is at most rare in *Xylobium*.

There are no rational reasons to “resolve” the taxonomy of the less obvious species of *Maxillaria* originally described by Ruiz and Pavón transferring them arbitrarily to another genus. If a “consistent” use in literature of these names exists, it is including them in *Maxillaria*, albeit with uncertainty. On its side, the available evidence, which does not include the access to the type specimens of two of the concerned taxa—probably hosted in herbaria other than Madrid—suggests that at least two of the species, *M. bicolor* and *M. cuneiformis*, certainly do not belong to *Xylobium* according to their characteristic morphological features, as described by Ruiz and Pavón. The typical inflorescence arrangement of the third transferred taxon, *M. alata*, strongly suggests that it is not a species of *Xylobium* either.

The pure nomenclatural exercise of transferring “names” from one genus to another without gaining any additional information about the real nature of the concerned organism simply transforms a scientific uncertainty into a false obviousness and plainness. Artificially inflating the taxonomy of *Xylobium* with the addition of three “phantom” species from Peru not only risks obscuring the phylogeographic history of the genus and altering the information about the diversity of the Peruvian flora, but also precludes serious attempts at interpreting and understanding the original concepts of Ruiz and Pavón. There are still several herbaria remaining in Europe and the United States to search for the original material brought back from Peru by the Spanish Botanical Expedition and, most importantly, there are places in the Peruvian province of Tarma still awaiting new botanical exploration aimed at rediscovering the plants originally collected during the long journey of the Expedition to the Viceroyalty of Peru.

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