

Notes clarifying the status on some ethnobotanical species from the Ecuadorian Amazon

Carmen X. Luzuriaga-Quichimbo¹, Pedro Escobar García², Carlos E. Cerón-Martínez³, José Blanco-Salas³ & Trinidad Ruiz-Téllez³

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Abstract. Despite belonging to one of the most biodiverse ecoregions on Earth, the Ecuadorian Amazon remains largely unexplored. During the elaboration of an ethnobotanical checklist of the useful plants in the Kichwa community of Pakayaku (Pastaza, Ecuador), we faced taxonomical difficulties due to the lack of basic information and unknown location of type specimens for several plant names. In this contribution, we present notes clarifying the status of six taxa of the H. Karsten and E. F. Poeppig names and locate the corresponding type specimens at the herbarium W (Natural History Museum, Vienna).

Keywords: plant biodiversity, *Caryodendron*, *Erythrina*, *Inga*, *Marila*, *Swartzia*, *Tetrorchidium*, typification, H. Karsten, E. F. Poeppig, Vienna Natural History Museum, Ecuadorian Amazon.

Notas aclaratorias sobre algunas especies etnobotánicas de la Amazonía ecuatoriana

Resumen. A pesar de pertenecer a una de las ecorregiones más biodiversas de la Tierra, la Amazonía ecuatoriana permanece en gran parte inexplorada. Durante la elaboración de una lista de comprobación etnobotánica de las plantas útiles en la comunidad Kichwa de Pakayaku (Pastaza, Ecuador), enfrentamos dificultades taxonómicas debido a la falta de información básica y la ubicación desconocida de los tipos de especímenes para varios nombres de plantas. En esta contribución, presentamos notas que aclaran el estado de los nombres de seis taxones de H. Karsten y E. F. Poeppig y localizamos los especímenes de tipo correspondientes en el herbario W (Museo de Historia Natural, Viena).

Palabras clave: biodiversidad; *Caryodendron*; *Erythrina*; *Inga*; *Marila*; *Swartzia*; *Tetrorchidium*; tipificación; H. Karsten; E. F. Poeppig; Museo de Ciencias Naturales de Viena; Amazonía Ecuatoriana.

Introduction

The Ecuadorian Amazon sustains one of the most biodiverse ecosystems of the planet (León-Yáñez *et al.*, 2011) and at the same time, one of the most poorly known. Despite the effort of projects like *Flora neotropica* (Organization for Flora Neotropica, 1967 onwards), knowledge about plant biodiversity and its uses remains low in comparison with Europe and the USA (GBIF, 2017). Our project is an initiative of the Universidad de Extremadura (Spain), Universidad Tecnológica Equinoccial (Ecuador) and Junta de Extremadura (GR 15080; Luzuriaga, 2017) and aims to gain knowledge about biodiversity and plant uses in the Kichwa community of Pakayaku (Bobonaza River, Pastaza, Ecuador), a region where bio- and ethnobotanical studies are still lacking.

Separated from the rest of the country and its economic heart by the high summits of the Andes, and far away from the main maritime and land commercial routes, the Ecuadorian Amazon basin traditionally lags behind the rest of the country. Due to the scarcity and historical marginality of its native population, the only travel possibility to most of the Pastaza eastern territories is often offered solely by navigable rivers. For example, the Pakayaku community itself is only reachable after 6 hours of canoe rafting. As a result, biodiversity studies in the Ecuadorian Amazon are scarce in general terms. Within it, the southern region (Pastaza) has remained much more inaccessible and unexplored than the northern (Napo, Orellana, Sucumbíos). For this reason regional botanical studies are almost lacking, and many of the species of the

¹ Centro de Investigación Biomédicas, CENBIO, Universidad Tecnológica Equinoccial. 170147 Quito. Email: luzuriaga.cx@gmail.com

² Department of Botany, Natural History Museum of Vienna, Burggring 7, 1010, Vienna, Austria. Email: pedro.escobar.garcia@univie.ac.at

³ Herbario Alfredo Paredes QAP, Universidad Central de Ecuador. Apt. Postal 17.01.2177, Quito, Ecuador. Email: cecm57@yahoo.es

⁴ Grupo de Investigación de Biología de la Conservación, Facultad de Ciencias, Universidad de Extremadura. 06071 Badajoz, Spain. Email: pepebsalas@yahoo.es; blanco_salas@unex.es; truíz@unex.es

lowlands are described from better-communicated areas in neighbouring countries. As a consequence of this, application of names to specimens may become a challenging task. Not only biodiversity studies are lacking, ethnobiological studies are almost non-existent in Pastaza as well (Borgtoft *et al.*, 1998), despite the presence of well-structured native communities holding a wealth of traditional knowledge all along the River Bobonaza. On the other hand, significant contributions have been made in the central and northern Ecuadorian Amazon by Marles *et al.* (1988), Alarcón Gallegos (1988), Cerón (1993), Ríos & Caballero (1997), Cerón (2000), González & Sarabia (unpublished, 2003), Carrillo (2005), Reyes-Jurado (2005), Chinchero (2006), Reyes (2008) and Cerón (2008).

The doctoral Thesis of Luzuriaga (2017) on vascular plant uses from the kichwa communities living along the Bobonaza river basin, contributed to fill the knowledge gap in that particular area, but during the elaboration of the ethnobotanical catalogue, additional challenges were faced. First, the identification of Amazonian plants is far from easy (Gomes *et al.*, 2013 and references therein) because a) a dense plant community with many large-sized woody plants, climbers and a rich epiphyte flora is inherently difficult to sample; b) diffuse flowering times together with high biodiversity values and overall species rarity hamper representative specimen collection; and c) phenotypical convergence in a lauroid woody habit across a wide taxonomic spectrum hinders *de visu* discrimination among genera or even among families. Second, by the very nature of the historical process of discovery and description of the neotropical flora, the application of names to plant materials relied sometimes on assessment and was not free of doubts. National representative collections are small-sized and difficult to access and type specimens are thousands of kilometres away in the Natural History cabinets of Europe and the USA (although sometimes in unknown locations). In this paper, we aim to 1) locate type specimens for several names whose typification is unclear, 2) clarify the meaning of poorly understood binomials if needed and 3) offer complementary information to fill the gaps found in the main international databases (IPNI, The Plant List, Tropicos).

Materials and Methods

Plant materials were collected in the Pakayaku community and desiccated, mounted and deposited in the herbarium Alfredo Paredes, Universidad Central de Ecuador, QAP. Materials belong to the field collections by Luzuriaga (2017). Plant identification was performed by Cerón and Luzuriaga using standard floras (Jørgensen & León-Yáñez, 1999; Ulloa Ulloa & Neill, 2005; Neill & Ulloa Ulloa, 2011) and herbarium specimen comparison (QAP and QCNE, Herbario Nacional del Ecuador). Names were checked against the international databases Tropicos (Missouri Botanical Garden, 2017) and IPNI (2017) to search for taxonomic information (authorship, reference, status, type speci-

men, typification), and then for synonymy and current accepted name in Tropicos and The Plant List (2013). Several poorly understood names were identified, containing information gaps or inconsistencies, and type materials in unknown location. A stay in the herbarium of the Natural History Museum of Vienna (W) offered the opportunity of checking the H. Karsten and E.F. Poeppig collections, which among others, presented significant information gaps in the main international databases. An annotated list is provided below including basionym, citation, accepted name if different, type specimen (country, locality, collector number if present –otherwise *sine numero*, s. n.–; date if present –otherwise *sine dato*, s. d.–) and type status (holo- or syntype). Plant specimens were restored, included in the Herbarium W database following the JACQ guidelines (JACQ, 2014) and photographed using the Department of Botany digitation facilities. Photos were uploaded to be available on the internet at the Virtual Herbaria website (JACQ, 2017).

Results and Discussion

Taxonomic treatment

Caryodendron orinocense Karsten (1858: 91) (Euphorbiaceae)

Typus: Colombia. Cumaral. Llano de St. Martin: Karsten, H. s. n., s. d. [holotypus: W 0075880].

„Habitat in sylvis humidis ad pedem orientalem et australem cordillerae Bogotensis et Meridensis, Palo de Nuez a Varinitensibus, Taqui ab incolis planitierum fluminis Metae nominata“.

It is a traditional edible plant for its fruits and the oil that is extracted from the seeds. The wood is employed to build houses. It has been used by eastern kichwa and also by cofan, Secoya and shuar (Luzuriaga, 2017).

The type specimen of this name was assumed to be lost, but a previously unknown original collection, hand-labelled by H. Karsten himself was located in the herbarium W. The voucher lacked any annotation by reviewers of *Caryodendron* but can be considered beyond doubt as the holotype.

Inga vismifolia Poeppig (1845: 79) (Leguminosae)

Typus: Peru. Loreto. Maynas. In sylvis ad Yurimaguas: Poeppig, E.F.D. 2285, 1831 [syntypus: W 1889-0343877, W 0048787, W 0048788].

„Crescit in sylvis provinciae Maynas“.

It is used by the cofan, wao and western kichwa for its edible fruit. The steam is employed as a stringer construction of houses (Luzuriaga, 2017).

The type specimen for this name was assumed to be lost and not recorded in the international online databases. During our search at W three herbarium sheets handwritten by Poeppig himself appeared. These sheets can be considered as syntypes.

Marila tomentosa Poeppig (1845: 15) (Calophyllaceae)
 Typus: Peru. Huánuco: Poeppig, E. F. 1496, 1829–11
 [syntypes: W 1889-0120860, W 1889-0013273, W
 0048908, W 0048909].
 „Crescit in sylvis peruvianis ad Cuchero“.

It is used by the cofan, the wao, and the western kichwa. The latter employ the resin as medicinal against callosities and the rest the wood as a building element (Luzuriaga, 2017).

The location of the type specimen for this name was previously unknown. Our prospection at W yielded four herbarium sheets originally annotated by Poeppig that can be considered syntypes.

Micropteryx poeppigiana Walpers (1851: 740–741) (Leguminosae)
 ≡ *Erythrina poeppigiana* (Walpers) O.F. Cook (1901: 57).
 Typus: Peru. Peruvia subandina. In sylvis: Poeppig, E. F. 1306, 1829–09 [holotypus: W 0075881].
 „In Peruvia subandina“.

It has been used by afrecuatorian, cofan, shuar, achuar and eastern kichwa. It has been employed as a medicinal external antinflamatorial plant and the steams to make boxes, fromworks and packages. It has also a cited cultural value (Luzuriaga, 2017).

This name was given by Walpers to a specimen collected by Poeppig in the Peruvian Amazon and labelled *Erythrina micropteryx* Poepp. The specimen was annotated in the herbarium label and wears the description handwritten by Poeppig himself, but the name was not effectively published and remained *nomen in sched.* until

the publication of Walpers as *pro syn.* This specimen is therefore the holotypus for Walpers' name and the original specimen for Poeppig's unpublished name.

Swartzia calophylla Poeppig (1845: 61) (Leguminosae)
 = *Swartzia simplex* (Swartz, 1788: 82) Sprengel (1825: 567)
 Typus: Peru. Poeppig, E. F. [holotypus: W 0027003].
 „Crescit in fruticetis provinciae Maynas ad Yurimaguas. Aprili florebat“.

Ancestral plant traditionally used by some eastern kichwa. It identifies their culture. It is used to endow men with strength, courage and turn them into true warriors to dominate the jungle. The use of this plant is losing (Luzuriaga, 2017).

The type specimen for this name was not recorded in the international online databases. During our search at W a single herbarium sheet handwritten by Poeppig appeared. This sheet can be considered beyond doubt as the holotype.

Tetrorchidium rubrivenium Poeppig (1845: 23) (Euphorbiaceae)
 Typus: Peru. San Martín. Tocache: Poeppig, E. F. 1951 (probably by error handwritten 1915 in W 0049103), 1830–07 [syntypes: W 0049101, W 0049102, W 0049103].
 „Crescit in sylvis depressis Peruviae orientalis versus Missionem Tocache. Floret Julio“.

The easter kichwa use the firewood to cook (Luzuriaga, 2017). The location of the type specimen of this name was previously unknown. Our prospection at W yielded three herbarium sheets originally annotated by Poeppig himself that can be considered syntypes.

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