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Astrocaryum chonta Mart. (Arecaceae, Arecoideae): first record in Brazil, lectotypification and notes on distribution gaps

Gustavo Pereira LIMA[1]*, Eduardo Bezerra de ALMEIDA JR.[2]

[1] Universidade Federal do Maranhão, Programa de Pós-Graduação em Biodiversidade e Biotecnologia da Rede BIONORTE, Departamento de Biologia, São Luís - MA, Brazil

[2] Universidade Federal do Maranhão, Departamento de Biologia, São Luís - MA, Brazil

* Corresponding author: gustavo-plima@hotmail.com

ABSTRACT

The palm species *Astrocaryum chonta*, popularly known as *chonta* or *huicungo*, was known only in periodically flooded forests of the Amazon region in Bolivia and Peru. However, reviewing specimens deposited in herbaria, we expanded and confirmed its occurrence in Brazilian territory in the municipality of Porto Velho, Rondônia, approximately 515 km from its nearest known occurrence point in Bolivia. In addition to confirming the first record for Brazil, we present a detailed morphological description of the taxon, updated data on geographic distribution, phenology, vernacular names, uses, and conservation status. We also present a photographic plate and a distribution map, and here designate the lectotype for the name.

KEYWORDS: Bactridinae, palm, South America, taxonomy, typus

Astrocaryum chonta Mart. (Arecaceae, Arecoideae): primeiro registro no Brasil, lectotipificação e notas sobre as lacunas de distribuição

RESUMO

A espécie de palmeira *Astrocaryum chonta*, popularmente denominada como *chonta* ou *huicungo*, era conhecida apenas para a região da Amazônia nas florestas periodicamente inundadas na Bolívia e no Peru. Contudo, a partir da revisão de espécimes depositados em herbários, nós expandimos e confirmamos a sua ocorrência no território brasileiro, no município de Porto Velho, Rondônia, distante aproximadamente 515 km do seu ponto de ocorrência conhecido mais próximo na Bolívia. Além da confirmação do primeiro registro no Brasil, apresentamos a descrição morfológica detalhada do táxon, dados atualizados sobre a distribuição geográfica, fenologia, nomes vernaculares, usos e status de conservação. Também apresentamos uma prancha fotográfica e um mapa de distribuição, e aqui é designado um lectótipo para o nome.

PALAVRAS-CHAVE: América do Sul, Bactridinae, palmeira, taxonomia, tipo

INTRODUCTION

Astrocaryum G. Mey. is one of the most representative genera of palms in the Neotropical region (Pintaud *et al.* 2008). It comprises approximately 40 species distributed from Mexico to Brazil (Kahn 2008). The number of native species in the Brazilian territory varies between 26 (Kahn 2008) and 27 (Lorenzi *et al.* 2010), eight of which are endemic to Brazil (Kahn 2008). Vianna (2024) points to the occurrence of 23 species in the country. Four other previously referenced species, namely *Astrocaryum arenarium* Barb. Rodr., *A. kewense* Barb. Rodr., *A. pygmaeum* Drude and *A. weddellii* Drude, cited by Kahn (2008) and Lorenzi *et al.* (2010), are categorized as "unplaced names" in Vianna (2024). These four acaulescent palms are occasionally reported as endemic, with limited knowledge, and probably extinct in the country (Kahn 2008; Lorenzi *et al.* 2010). In general, the plants of this genus are densely spiny and commonly found along the Amazon basin (Kahn 2008; Pintaud *et al.* 2008). They frequently form dense populations in riparian or swampy forests and in *terra firme* forests (Kahn 2008). There are also some species in the Cerrado region and in the Atlantic Forest (Kahn 2008; Kahn and Millán 2013).

Among the clades within *Astrocaryum*, the subsection *Murumuru* Barb. Rodr. stands out. It belongs to section *Huicungo* F. Kahn and the subgenus *Monogynanthus* Burret. It is characterized by generally presenting only one pistillate flower inserted at the base of the rachilla, a sterile portion

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of glabrous rachillae, and the presence of a glabrous or glabrescent calyx, smaller than the corolla (Kahn 2008; Kahn and Millán 2013). This subsection is composed of only three species: *Astrocaryum chonta* Mart., *A. murumuru* Mart. and *A. ulei* Burret. All occur in the Amazon River basin, of which only *A. chonta* has no currently confirmed occurrence in Brazil (Kahn 2008; Lorenzi *et al.* 2010; Vianna 2024). In the past, Drude (1881) speculated about the occurrence of the species in Brazil based on a seedling specimen collected by Hugh Weddell in the former Mato Grosso province. Years later, this information concerning the occurrence of *A. chonta* in the country was perpetuated in the bibliographic synthesis of South American palms by Pintaud *et al.* (2008) without further information. However, this occurrence in Brazil has been disregarded in recent studies about *Astrocaryum* (Kahn 2008; Lorenzi *et al.* 2010; Kahn *et al.* 2011; Kahn and Millán 2013; Vianna 2024).

Astrocaryum chonta was originally described by Martius in Bolivia in 1844 in the book Voyage dans l'Amérique Méridionale (Martius 1844). It is recorded in forest areas periodically flooded on alluvial soils between the provinces of Santa Cruz, Chiquitos and Moxos. The *typus* of *A. chonta* was collected in the province of Santa Cruz in Bolivia by d'Orbigny. Based on Glassman (1972), the herbarium of the Muséum National d'Histoire Naturelle (P) is the probable collection where this type specimen was deposited in the 19th century. However, Kahn and Millán (1992) and Moraes (2020) reported that the specimen for this taxon had not yet been found nor identified in visits to the P herbarium.

In recent decades, the distribution of *A. chonta* was extended to other provinces in Bolivia and different regions of Peru, mainly along the Ucayali River basin (Kahn and Millán 2013). During our review of materials deposited in Brazilian herbaria, samples of *A. chonta* from the State of Rondônia were found, representing the first records of this species for Brazil. Here we present these first records together with a morphological description and updated data on geographic distribution, phenology, vernacular names, uses, conservation status, and location of the *typus* of this species in the herbarium of Paris.

MATERIAL AND METHODS

The new occurrence records were obtained from consultations at the collections of the CEN and INPA herbaria carried out between April and June 2022. To complement the analyses, additional materials from the AAU, LPB, MO, NY, P, and USM herbaria (all acronyms according to Thiers 2022) were analyzed through online searches using the SpeciesLink network (2023), Global Biodiversity Information Facility (GBIF 2023), and herbarium websites. The identification of the species was made based on specialized literature (Kahn and Millán 1992, 2013), as well as comparisons with images of type collections available on the digital platforms mentioned above. From the morphological analysis of the materials, the taxonomic description was prepared following the terminology proposed by Palmweb (2023) for vegetative and reproductive structures and the descriptions by Kahn and Millán (1992, 2013).

Information was also compiled on the geographic distribution, flowering and fruiting periods, vernacular names and uses, which were obtained from the labels of the specimens examined and from the literature. An illustrative plate was prepared to allow a better assimilation of the species' distinctive characters, in addition to a geographical distribution map prepared using the Quantum GIS 3.28.1 program and the WGS84 datum.

The categorization of conservation status was carried out according to IUCN (2012) for criterion B, which refers to the parameters of extent of occurrence (EOO), area of occupancy (AOO), and number of localities. These parameters were calculated using the *ConR* (Dauby *et al.* 2017) package of the R software, version 4.2.2. The EOO was estimated from a convex hull plotted to include all known occurrence points of the species. The AOO was estimated using 2×2 km grid cells (4 km^2). The number of sites was estimated with a grid resolution of 10 km. As a database, both for plotting the distribution map and for conservation analysis, the georeferenced specimens listed by Kahn and Millán (1992), Kahn *et al.* (2011) and Moraes (2020) were considered. The occurrence points were obtained from the specimens consulted at the herbaria. The coordinates of collection sites that were not available in the herbarium samples were estimated using Google Maps and the geoLoc tool of the SpeciesLink network (2023).

RESULTS

Astrocaryum chonta Mart., Voy. Amér. Mér. 7(3): 84. 1844. (Figure 1).

Type: BOLIVIA. Santa Cruz, *A.D. d'Orbigny 15* (lectotype [designated here]: P image! [P00876877]; isolectotypes: P images! [P02089529, P00876891]).

Description. Palm caulescent, single-stemmed. **Stem** up to 15 m high, 15–30 cm in diameter, sheaths of dead leaves persistent. **Leaves** 8–16, up to 9.5 m long; sheath and petiole up to 2.3 m long, fibrous, armed with flattened, black, up to 20 cm long spines; leaf rachis up to 7.6 m long, whitish-tomentose, with flattened, black, up to 10 cm long spines; pinnae 80–130 per side, regularly arranged in one plane; basal pinnae 65–120 × 0.5–3.4 cm; middle pinnae 84–163 × 4–8 cm; apical pinnae 23–48 × 1.8–6 cm; spines up to 5 mm on the pinna margins. **Inflorescences** with prophyll ca. 85 cm long, brown-setose, with a few flattened, black spines; peduncular bract up to 1.1 m long, covered with dense, soft, light to dark brown, 5–8 mm long setae, with whitish-floccose,

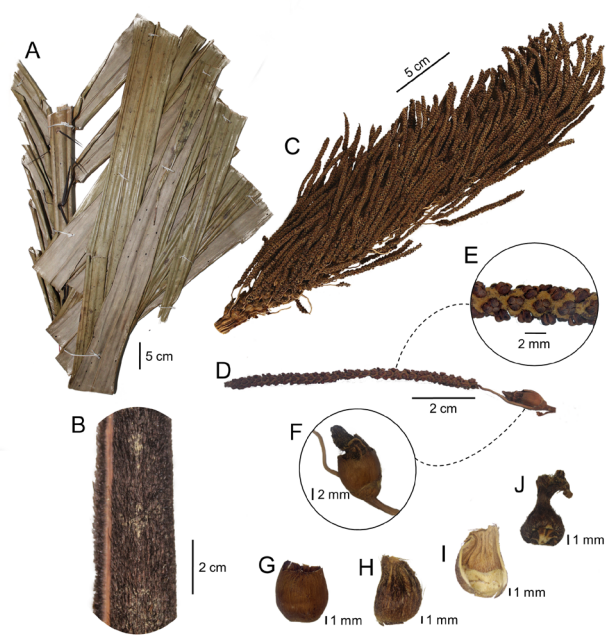

Figure 1. Morphological characters of *Astrocaryum chonta* Mart. **A** – fragment of leaf blade showing pinnae regularly distributed on the leaf rachis; **B** – proximal part of the peduncular bract; **C** – inflorescence; **D** – rachilla with only one pistillate flower at the base and abundant male flowers at mid-length and apex of the rachilla; **E** – distal part of the rachilla bearing staminate flower buds and covered with clavate hairs; **F** – pistillate flower; **G** – calyx; **H** – corolla; **I** – staminodial ring in corolla; **J** – pistil. Photographs of the Castro specimens [625 (CEN and INPA) and 634 (CEN and INPA)]. Credit: G.P. Lima.

flexuous, black, up to 2 cm long spines at apex; peduncle up to 1.1 m long; rachis 23–60 cm long; rachillae numerous, > 80; rachilla composed of a glabrous and slender proximal portion, 1–7 cm long, bearing one triad formed of two staminate flowers and one pistillate flower, inserted 3–13 mm from rachis; distal portion 5–10.5 cm long, appearing cylindrical, catkin-like, covered with hyaline and yellow clavate hairs, bearing only densely packed staminate flowers sunken into pits. **Staminate flowers** with 3 sepals, 0.6–0.9 mm long, connate basally; petals 3, 2.5–2.9 mm long, slightly connate basally; stamens 6, anthers 0.7–1.4 mm long, filaments up to 1.9 mm; pistillode irregularly 3-parted. **Pistillate flowers** with calyx truncate to cup-shaped, 5.5–10.5 mm long, glabrous or glabrate, 3-denticulate, margin setose; corolla slightly to clearly longer than calyx, 7.6–11.6 mm, tubular to ovate-urceolate with limb turned outwards, or campanulate, surface with 0.5–3 mm long setae, 3-denticulate, margin ciliate; staminodial ring entire, occasionally laciniate or reduced to 6 teeth, 0.6–3.2 mm in height; pistil conoidal, 8–10.5 mm long, tomentose, with short 0.3–0.8 mm long spines, stigmas 3. **Fruits** obovate to oblong, 3.9–6.5 × 2.2–2.7 cm, including a 0.6 cm long rostrum; epicarp brown-tomentose with soft, flexuous, 2–3 mm long setae.

New distributional record. BRAZIL. Rondônia: Porto Velho, distrito Jaci-Paraná, Igarapé do Tamanduá, 18.IX.1984, *Castro 625* (CEN, INPA); Porto Velho, distrito Jaci-Paraná, Igarapé do Tamanduá, 21.IX.1984, *Castro 634* (CEN, INPA).

Additional material examined. BOLIVIA. La Paz: Prov. Abel Iturralde, Ixiamas, 13°14'41"S, 68°19'32"W, 15.X.2009, *Couvreur & Vargas 149* (NY); NW de Ixiamas, camino de El Tigre a ASL Candelaria, 13°33'12.7"S, 68°31'26.1"W, 21.XI.2015, *Moraes & Cartagena* 2541A (LPB); Alto Madidi, al N del río Madidi a 32 km en línea recta al W de Santa María, 12°48'50"S, 67°31'46"W, 07.VI.2009, *Zenteno et al. 8355* (LPB). Santa Cruz: Prov. Guarayos, sin localidad, 15°20'S, 63°08'W, 25.IV.2003, *Vidaurre 176* (LPB); Prov. Ichilo, Parque Nacional Amboro, Tropical evergreen forest along Rio Saguayo, 1 km NE of entrance into first Andean foothills, 17°39'S, 63°43'W, 21.I.1988, *Nee 36034* (MO). PERU. Loreto: Requena, near Jenaro Herrera in the lower Ucayali River valley, 04°55'S, 73°45'W, 16-19.XII.1991, *Millán & Canayo 97*, *99* and *107* (USM); in the lower Ucayali River basin, near Jenaro Herrera, 04°55'S, 73°40'W, 20.III.1985, *Kahn & Mejia 1782* (P); in the lower Ucayali River basin, near Jenaro Herrera, 04°55'S, 73°40'W, 01.IX.1987, *Kahn & Mejia 2081* (P); Requena, Jenaro Herrera (Estero Cocha), 04°55'S, 73°40'W, 24.X.1993, *Delobel s/n* (P). Madre de Dios: Río Manu, Parque Nacional de Manú, Cashu Cocha Camp, 19.X.1979, *Gentry 26925* (MO). Ucayali: In the crutch between Río Ucayali and Río Toniromashi, 220 km S of Pucallpa, 10°17'38"S, 73°59'49"W, 06.VI.2008, *Balslev et al. 7658* (AAU); In the crutch between Río Ucayali and Río Toniromashi 220 km S of Pucallpa, 10°18'32"S, 73°59'49"W, 06.VI.2008, *Balslev et al. 7659* (AAU); Rio Ucayali, 1 km NW of San Júan, 128 km S of Pucallpa, 09°30'29"S, 74°12'40"W, 22.X.2008, *Balslev et al. 7852* (AAU); Rio Ucayali, E bank opposite Iparia, 102 km S of Pucallpa, 09°18'11"S, 74°22'44"W, 23.X.2008, *Balslev et al. 7870* (AAU); Rio Ucayali, E bank opposite Iparia, 102 km S of Pucallpa, 09°18'14"S, 74°22' 37"W, 23.X.2008, *Balslev et al. 7873* (AAU).

Geographic distribution (Figure 2). The species occurs in the west and southwest of the Amazon River basin, in Peru and Bolivia, forming dense populations in periodically flooded forests on alluvial soils (Kahn and Millán 1992; Kahn 2008). In Peru, it is found on the lower terraces of the Amazon-Ucayali rivers down to the lower Urubamba and Tambo rivers. It has been occasionally found in the lower course of the Marañón River north of the Ucayali River in Loreto, and in the Manu River valley in Madre de Dios (Kahn *et al.* 2011; Machahua *et al.* 2014). In Bolivia, it is found most frequently north of the province of Abel Iturralde in the department of La Paz, especially in the forests west of Ixiamas on the course of the Madidi River and its tributaries (Moraes 2020). It is also recorded in the region between the provinces of Chiquitos and Moxos, on river banks, and in the periodically flooded forests of the Mamoré River (Martius 1844).

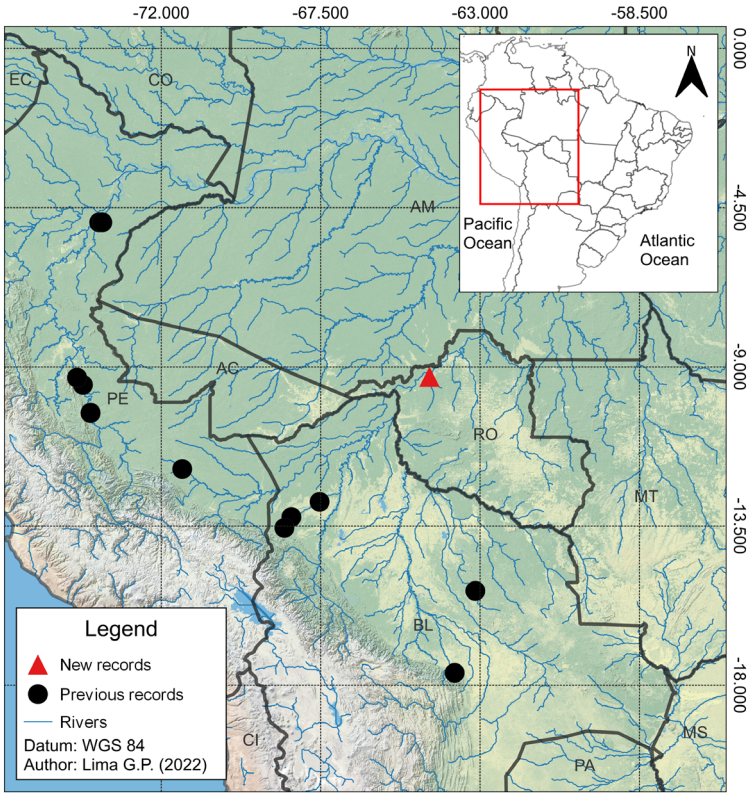

Figure 2. Distribution of *Astrocaryum chonta* Mart. in the southwestern Amazon, including the new record of the species in Rondônia (RO) state, Brazil.

In Brazil, the first records of occurrence, presented here, were collected in the 1980s on the Tamanduá Igarapé riverbank, in the Jaci-Paraná district, which belongs to the city of Porto Velho, Rondônia. The specimens were recorded in forests on alluvial soils near the riverbank. The new records are about 515 km (in a straight line) away from their nearest point of occurrence on the Madidi River in Bolivia (12°48'50"S, 67°31'46"W; *Zenteno et al. 8355*). It should be noted that the records of *A. chonta* cataloged in Bolivia, Brazil and part of Peru are distributed in the watershed of the Madeira River.

Phenology. In Bolivia, the species has been recorded flowering from October to January and fruiting between August and September (Martius 1844). Flowering events in January and March are also cited by the 19th-century author for different locations in Bolivia (Martius 1844). In Iquitos, Peru, Mejía (1992) pointed out that ripe fruits are sold at fairs between February and March. From all the material analyzed in this study, there are records of flowering in March, September and October and fruiting in January, March and October.

Uses. The stem is used for the structure of houses, as it is hard and resistant to termite attacks. The leaves are used to cover houses. Ripe fruits are edible, occasionally sold at local markets. They are also used to feed domestic animals (pigs and chickens). The liquid endosperm of immature fruits is casually ingested. The endocarp is used to make rings (Kahn and Millán 1992; Mejía 1992; Moraes 2014; Moraes 2020).

Vernacular names. It is known mainly as *chonta*, *chipichiquia* and *chic-chic* (Bolivia) and as *huicungo* (Peru) (Kahn 2008; Kahn and Millán 2013; Moraes 2020).

Conservation status. A total of 19 specimens were compiled for *A. chonta* collected in 12 different localities, which gave the taxon an EOO of 1,311,438 km^2 and an estimated AOO of 48 km^2. Because of its wide distribution in the western Amazon and because it is found in protected areas in Bolivia and Peru, *A. chonta* may be classified as of least concern (LC) in the present study.

Notes. Glassman (1972) mentions the herbarium P as holding a possible collection where the holotype of *A. chonta* (*A.D. d'Orbigny 15*) is deposited, but this record was not found by Kahn and Millán (1992) and Moraes (2020). From a new thorough search of the herbarium P, we found the referred gathering corresponding to the type collection, consisting of parts of the leaf and fruits mounted on three sheets.

On the Jstor platform, we found a specimen in herbarium M (M0209558), which was reported as a possible type of *A.*

chonta. This sample lacks information about its collector and shows ambiguity concerning collection locality ("Peruvia? Bolivia?" in the label of the exsiccata). We did observe a numbering system (n. 826) on a white ribbon on the specimen, which is usually associated with materials from Martius' collections (Loeuille *et al.* 2019). However, this numbering does not align with the specimen recorded in Martius' field notebook (Martius 1817–1820). Furthermore, the purported collection area is far out of the naturalist's documented expedition route in South America (Spix and Martius 2017). There exists the possibility that the specimen in question represents a fragment of d'Orbigny's type material or a fragment of José Pavón y Jiménez's specimen, collected in Peru and referenced in the protologue of the description of *A. chonta* (Martius 1844). Given the uncertainty and lack of conclusive information about the specimen at M, we decided to be cautious and not treat it as part of the original material.

We clarify that, although Glassman (1972) suggested d'Orbigny's gathering, possibly housed in P ("d'Orbigny 15"), as the "type specimen," this suggestion does not constitute a formal designation due to its speculative nature. Additionally, the material found in P cannot be considered the holotype, as Martius cited other original elements in the protologue. Specifically, Martius (1844) referenced illustrations (Tab. IV, Figs. 1–2; Tab. XXIX, Fig. C) and the gathering by José Pavón y Jiménez in Peru.

Since d'Orbigny's gathering was likely the main element used by the naturalist to describe *A. chonta*, we effectively designate it as the lectotype, following the guidelines of the International Code of Nomenclature for algae, fungi, and plants (Turland *et al.* 2018). Our analysis of the three sheets from d'Orbigny's gathering in P revealed that they are not clearly labelled as parts of a single specimen, as required by Article 8.3 of the Code (Turland *et al.* 2018). Because the three sheets do not bear a single, original label in common, and are not cross-labelled, they are here treated as duplicates. For this reason, we selected only the sheet [P00876877], which most aligns with Martius's illustration (Tab. XXIX, Fig. C), as the lectotype of *A. chonta*. We treat the remaining sheets in P as isolectotypes [P02089529, P00876891].

Astrocaryum chonta can be confused with *A. murumuru* and *A. ulei* by the presence of only one pistillate flower inserted at the base of the rachilla, the sterile portion of glabrous rachillae, and the glabrous or glabrescent calyx that is smaller than the corolla (Kahn 2008; Kahn and Millán 2013). However, it differs from these other *Murumuru* subsection species by its caulescent and single-stemmed habit (as opposed to the cespitose and acaulescent or caulescent habit in *A. ulei* and *A. murumuru*) and staminodial ring less than 1/3 as long as the corolla (vs. staminodial ring with or more than 1/3 as long as corolla in *A. ulei* and *A. murumuru*).

Based on the latest phylogenetic studies (Roncal *et al.* 2013, 2015; Jimenez-Vasquez *et al.* 2017; Rivas-Chamorro *et al.* 2023), the clades resulting from the analyses generally do not match the morphological classification proposed for the genus *Astrocaryum* by Kahn (2008). For instance, the clade composed of *A. chonta*, *A. murumuru*, and *A. ulei* (subsection *Murumuru* belongs to section *Huicungo*) was recovered by Roncal *et al.* (2015) but generally does not appear as monophyletic in other studies (Jimenez-Vasquez *et al.* 2017; Rivas-Chamorro *et al.* 2023).

The results of Jimenez-Vasquez *et al.* (2017) and Rivas-Chamorro *et al.* (2023) do not support the taxonomic recognition of any subsection within the *Huicungo* section, and few species also are recovered as monophyletic. One of the rare exceptions is the species *A. chonta*, which was recovered as monophyletic in the studies of Roncal *et al.* (2015) and Rivas-Chamorro *et al.* (2023).

DISCUSSION

In this study, we present the first record of *A. chonta* in Brazil. This finding highlights the knowledge gaps in the distribution of species in the Brazilian territory (Canhos *et al.* 2013; Sousa-Baena *et al.* 2013). The geographic distribution of many taxa is often poorly known in Brazil. This is a problem known as Wallacean deficit (Whittaker *et al.* 2005). The low survey frequency in remote and/or little explored areas, associated with the lack of investment in research and conservation of biodiversity, are factors that contribute to the persistence of this problem in Brazil (Hopkins 2019; Carvalho *et al.* 2023).

Prance *et al.* (1984) and Alvez-Valles *et al.* (2018) pointed out that there is a significant deficit in the collection of palm specimens in the Brazilian Amazon. Many species of palm may be underrepresented or completely absent in botanical collections, jeopardizing the understanding of the diversity and distribution of these species in the region (Milliken *et al.* 2010; Alvez-Valles *et al.* 2018). This collection deficit may be attributed to difficult access, lack of logistics, and insufficient investment in research in the region. In addition, there are strong indications of sampling bias in the area influenced by historical reasons of efficiency, logistics and convenience since collectors tend to carry out expeditions and sample collections in regions where there are research institutions (Alvez-Valles *et al.* 2018).

A notorious example is the area close to the city of Manaus (Amazonas), which has the largest number of specimen records and known richness of palms in the Brazilian Amazon. This region houses important federal and state universities, and the National Institute for Research in the Amazon (INPA) (Alvez-Valles *et al.* 2018). In addition to this effect, popularly called the "museum effect", the variation in the level of biological knowledge is generally related to factors such as attractiveness of the landscape, history of colonization in the area, and presence of transport routes (Sousa-Baena *et al.* 2013; ter Steege *et al.* 2016; Hopkins 2019).

In addition to the points above, it is essential to recognize the challenges of collecting palm specimens. As Dransfield

(1986) mentioned, the production of herbarium specimens of palms is a laborious, time-consuming, and often unpleasant task, probably leading to the poor representation of Arecaceae species in the collections. This difficulty is even more pronounced when dealing with spiny, tall or bulky palms (Trail 1877; Dransfield 1986; Henderson 2000, 2011; Alvez-Valles *et al.* 2018; Duarte and Amaral 2022), such as many species belonging to *Astrocaryum*. Wallace (1853), in his book "Palm trees of the Amazon and their uses", highlighted the repulsive aspect of species belonging to the group due to the numerous spines in almost all morphological structures. Spruce (1869) and Barbosa Rodrigues (1898) also documented the challenge of acquiring *Astrocaryum* specimens without incurring injury due to the spines.

To overcome obstacles of low sample density and sampling bias in the Brazilian Amazon, it is essential to expand sampling, especially in remote, little explored areas that probably have a high biodiversity, in addition to carrying out collection campaigns focused on priority taxa (Hopkins 2007; Milliken *et al.* 2010; ter Steege *et al.* 2016; Hopkins 2019). According to a survey carried out by ter Steege *et al.* (2016), about 7,696 species of trees and palms were collected in the Brazilian Amazon, which represents 61% of the estimated number of species in the region (12,655 species), according to their projections. The authors make it clear that more species will be found with the increase in sampling efforts in priority areas in the region. It should be noted, however, that the specimens of this new record were collected in the 1980s. The samples had been deposited in Brazilian herbaria collections for almost forty years, identified generally only to the genus level.

Goodwin *et al.* (2015) mention that more than half of all collections of tropical plants may be incorrectly named in the collections. According to projections by Bebber *et al.* (2010), it is estimated that between 47 and 66% of all undescribed species are already present in natural history collections; they are undetermined, incorrectly identified, or still undergoing the process of incorporation into the collection. If this projection is true, several hundred Amazonian species have been collected and deposited at herbaria but have not yet been "discovered" or described (ter Steege *et al.* 2016; Hopkins 2019), including palms.

The discovery of species in herbaria is a slow and complex process due to several factors. First, there is a large number of specimens not yet examined by taxonomists in the collections (Bebber *et al.* 2010; Goodwin *et al.* 2015; ter Steege *et al.* 2016). Furthermore, accurate species identification requires careful comparison of plant characteristics with book descriptions and identification keys, which can be a time-consuming process and requires specialized skills in botanical taxonomy. Another important issue is the current lack of taxonomists. The number of specialists has been decreasing over the last few decades, which makes it difficult to accurately identify species (Bebber *et al.* 2010; ter Steege *et al.* 2016; Coleman and Radulovici 2020; Lagomarsino and Frost 2020). For these reasons, we expect that new records of occurrence and new species descriptions of palms may result of the increase in sampling efforts, careful inspections of herbarium material, and training of new taxonomists specialized in the group (Bebber *et al.* 2010; ter Steege *et al.* 2016; Coleman and Radulovici 2020).

Considering all the specimens mentioned in this new occurrence record, only the sample *Castro 625*, deposited in the CEN herbarium, was identified by Francis Kahn in the late 1990s as *A. chonta*. However, despite this determination, the author did not include Brazil within the distribution range of *A. chonta* in subsequent publications (Kahn 2008; Kahn and Millán 2013). It is unclear why this information was not included, considering that the specimen in question possesses the distinctive characteristics outlined in the researcher's taxonomic keys and descriptions (Kahn and Millán 1992, 2013).

Regarding the conservation status, although we have categorized *A. chonta* as of Least Cconcern, we emphasize that this palm must be carefully monitored due to threats such as habitat loss, mainly in the region of the province of Santa Cruz, Bolivia (Romero-Muñoz *et al.* 2019), where the type specimen was collected. In the state of Rondônia in Brazil, there distributional data are still scarce. Although the new occurrence records cataloged in Rondônia are close to some conservation units, such as the Jaci-Paraná Extractive Reserve, the Karitiana Indigenous Land and the Bom Futuro National Forest, the region is within the Amazon Deforestation Arch. This area has undergone an intense process of environmental degradation with the conversion of forest areas into pastures (Assis *et al.* 2019; Floreano and Moraes 2021), in addition to the recent construction of large hydroelectric plants on the Madeira River (Fearnside 2014). The municipality of Porto Velho, for example, was the fourth Brazilian municipality with the largest deforested area (458.56 km²) between November 2021 and November 2022 (Assis *et al.* 2019; Terra Brasilis 2022). This makes the species a target of imminent threats.

CONCLUSIONS

The new record of *A. chonta* in the Brazilian Amazon is a significant discovery that broadens the species' distribution in South America and provides evidence of its preference for periodically flooded forest habitats on alluvial soils. It is noteworthy that the herbarium specimens examined in this study spent almost forty years undiscovered, which also emphasizes the importance of reviewing materials already collected and deposited at herbarium collections. We highlight that *A. chonta*, although categorized as being of Least Concern, still faces considerable threats, such as the continuous loss of habitat in the Amazon region. Therefore, it is important to carry out constant reviews regarding its conservation status in order to ensure the necessary protection and mitigate existing threats.

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