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Two new species of pincer wasps (Hymenoptera: Dryinidae: Gonatopodinae) from blackwater floodplain forest (igapó) in the Brazilian Amazon

Evanira Maria Ribeiro dos SANTOS[1], Marcio Luiz de OLIVEIRA[1,2], André Luis MARTINS[3,4*]

[1] Instituto Nacional de Pesquisas da Amazônia, 69067-375, Manaus, AM, Brazil

[2] INABIO - Instituto Nacional de Biodiversidad del Ecuador, Quito, Ecuador

[3] Universidade Federal do Rio Grande do Sul; Departamento de Zoologia, 91509-900, Porto Alegre - RS, Brazil

[4] Universidade Federal do Paraná, Departamento de Zoologia, Centro Politécnico, 81531-980, Curitiba - PR, Brazil

* Corresponding author: andrelm3048@gmail.com

ABSTRACT

Two new species of pincer wasps (Hymenoptera: Gonatopodinae) are described: *Gonatopus jadisi* Martins **sp. nov.** and *Pareucamptonyx igapoense* Martins **sp. nov.**, collected in blackwater forest (igapó) in Amazonas state, Brazil. The specimens studied come from an ecological survey of invertebrates conducted nearly 50 years ago and taken to the Max Planck Institute in Germany for study by Dr. Adis. In 2008, the samples were repatriated to the National Institute for Amazonian Research (INPA) and deposited in the same institute's invertebrate collection. Additionally, a specimen of *Gonatopus* collected in the state of São Paulo was included in this study, forming part of the type-series of *Gonatopus jadisi* Martins **sp. nov.** In addition to the descriptions, identification keys, illustrations of the species and distribution maps are presented. These samples represent an unusual finding for a location with already well-known fauna, thus demonstrating the importance of the repatriated collection and its continued contribution to Amazonian biodiversity.

KEYWORDS: Amazonas, *Gonatopus*, tree ecletor traps, ecological survey, *Pareucamptonyx*, scientific collections

Duas novas espécies de vespas-pinça (Hymenoptera: Dryinidae: Gonatopodinae) de áreas de floresta amazônica inundável (igapó), Brasil

RESUMO

Duas novas espécies de vespas-pinça (Hymenoptera: Gonatopodinae) são descritas: *Gonatopus jadisi* Martins **sp. nov.** e *Pareucamptonyx igapoense* Martins **sp. nov.**, coletadas em uma floresta de águas pretas (igapó) no estado do Amazonas, Brasil. Os espécimes estudados provêm de uma amostragem ecológica de invertebrados conduzida há quase 50 anos e levada ao Instituto Max Planck, na Alemanha, para estudo pelo Dr. Adis. Em 2008, as amostras foram repatriadas ao Instituto Nacional de Pesquisas da Amazônia (INPA) e depositadas na coleção de invertebrados do mesmo instituto. Além disso, um espécime de *Gonatopus* coletado no estado de São Paulo foi incluído neste estudo, formando parte da série-tipo de *Gonatopus jadisi* Martins **sp. nov.** Além das descrições, são apresentadas chaves de identificação, ilustrações das espécies e mapas de distribuição. Essas amostras representam uma descoberta incomum para um local com fauna já bem conhecida, demonstrando assim a importância da coleção repatriada e sua contínua contribuição para a biodiversidade amazônica.

PALAVRAS-CHAVE: Amazonas, *Gonatopus*, ecletor de árvore, *Pareucamptonyx*, amostragem ecológica, coleções científicas

INTRODUCTION

Insects represent the most diverse group of organisms on Earth, and many groups are poorly studied and even neglected due to a lack of specialists (Beutel *et al*. 2017; Constantino 2024). One of the lesser-known and understudied groups for the Amazon biome is that of parasitoid wasps belonging to the Dryinidae family (Hymenoptera: Chrysidoidea) (Olmi and Virla 2014; Martins 2025). The Dryinidae are parasitoids wasps and predators of Auchenorrhyncha (Hemiptera) from the superfamilies Fulgoroidea and Membracoidea (Guglielmino *et al*. 2013; Martins *et al*. 2020a). Representatives of this family are popularly known as pincer wasps due to the modification present in the first leg of the females, called chelae or pincer (Martins *et al*. 2024a,b; Celante *et al*. 2025), which allows them to hold and capture their hosts.

The family is considered a monophyletic group composed of 1,526 species, 56 genera, and 17 subfamilies, with a worldwide distribution, with its highest diversity in the Neotropical

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region (Martins and Melo 2024; Martins *et al*. 2024a,b). Among the subfamilies of Dryinidae, Gonatopodinae is considered one of the most diverse, comprising 11 genera and 560 known species, of which eight genera and 130 species are recorded for the Neotropical region and five genera from Brazil: *Esagonatopus* Olmi, 1984, *Gonatopus* Ljungh, 1810, *Haplogonatopus* Perkins, 1905, *Neodryinus* Perkins, 1905 and *Pareucamptonyx* Olmi, 1991 (Olmi and Virla 2014; Martins and Domahovski 2022; Martins *et al*. 2024a; Martins 2025). Among these genera, two are the focus of this study.

One of them, *Gonatopus*, is considered the most diverse genus of the subfamily, with worldwide distribution and divided into 12 numbered species-groups, of which nine are recorded in the Neotropical region (Olmi and Virla 2014). Among the *Gonatopus* species-groups, the seventh group has the most species (Olmi and Virla 2014; Martins *et al*. 2020a,b; 2024a). Currently, *Gonatopus* genus comprises 449 species worldwide, of which 123 are recorded in the Neotropical region and 35 in Brazil (Olmi and Virla 2014; Olmi *et al*. 2019; Martins *et al*. 2020a, Martins *et al*. 2024a,b; Celante *et al*. 2025; Martins 2025). The Neotropical fauna of *Gonatopus* was revised about 10 years ago by Olmi and Virla (2014). Since then, new species and updates to the identification key were published (Martins *et al*. 2015, 2020a; Celante *et al*. 2025). Twelve species of *Gonatopus* are currently known for the Amazon biome, of which only *G. breviforceps* Kieffer, 1904 has been recorded from Amazonas state, Brazil (Olmi and Virla 2014; Martins and Krinski 2016; Martins 2025). The genus *Pareucamptonyx* is restricted to the New World, and seven species are currently known, six of which are restricted to the Neotropics, and only *P. townesi* (Olmi 1984) has been recorded for the state of Mato Grosso (Brazil), in an Amazonian rainforest (Olmi and Virla 2014; Martins and Domahovski 2022; Martins 2025).

Amazonian floodplain forest is subject to periodic flooding, which produces a complex mosaic of habitats that contribute significantly to primary productivity and regional biodiversity. A type of Amazonian forest periodically flooded by blackwater rivers (known locally as igapó) is ecologically important because it naturally creates diverse habitats that serve as refuges for endemic and endangered species (Junk *et al*. 1989, 1997; Adis 1997). Producing more biological knowledge about igapó is therefore essential, as it expands knowledge about regional biodiversity and can contribute to the conservation of these habitats in the Amazon (Junk *et al*. 1997; Myster 2018; Melack and Coe 2021). With the aim of studying the diversity of arthropods in the floodplain and igapó forests near Manaus, an ecological survey carried out by the eminent entomologist Dr. Adis, in the 1970s, providing extensive knowledge about these invertebrates in these environments over more than two decades (Adis 1977, 1981, 1984, 1997, 2002).

Part of this survey (11,210 samples) collected by Adis was repatriated from Germany to Brazil in 2008 who was returned to Brazil from his following his untimely death. We managed and sorted the igapó samples, and fortunately, recovered two new species of pincer wasps (Hymenoptera: Dryinidae: Gonatopodinae), increasing the understanding of biodiversity for this very important ecosystem for the Amazon.

The present study aimed to describe these two new species of Gonatopodinae recorded for the igapó. The descriptions are based on specimens detected among the arthropods sampled in the Amazon by Dr. Adis and repatriated to INPA. We provide illustrations of the new species, distribution maps, and a discussion of the importance of studying the recovered material, contributing the first record of species and genera for the igapó habitat in the Amazon biome.

MATERIAL AND METHODS

Material studied

Five specimens of Gonatopodinae (Hymenoptera: Dryinidae) were studied: three belonging to the genus *Gonatopus* and two to *Pareucamptonyx*. Four specimens belonged to the material repatriated from Germany, which was incorporated into the invertebrate collection at the National Institute for Amazonian Research (INPA). The material was collected by Dr. Adis between 1976 and 1988 in igapó forest by the Tarumã Mirim River (03º02'S, 60º17'W) in the municipality of Manaus, Amazonas state, Brazil. The insects were collected using ground ecletor traps placed on the surface of the ground and leaf litter, and tree ecletor traps positioned 3.60 meters from the ground around the trunks of trees greater than 20 meters in height in the igapó. Originally, the open part of the tree ecletor was directed downwards or upwards on the tree trunks in order to detect the movement of fauna on the trunk towards the canopy or towards the ground throughout the period of seasonal fluctuation of the river. For more details on these methods, see Adis (1977, 1979,1981, 2002).

The specimens were found in the sorting process of the material from Germany carried out by the first author (EMRS). In addition, a specimen of *Gonatopus* collected in the state of São Paulo and coming from the entomological collection of the Federal University of Espírito Santo (UFES), in Vitória (Espírito Santo State, Brazil) was included in the type-series of the new species of the genus.

Taxonomic study

Females of *Gonatopus* and *Pareucamptonyx* were identified by the last author (ALM), using the key proposed by Olmi and Virla (2014) and Martins and Domahovski (2022), and compared with original descriptions of closely related species. In the description of the new species, the adopted terminology followed Olmi (1984), Olmi and Virla (2014), Martins and Domahovski (2022) and, for the integument sculpture, Harris

(1979). The term rhinaria (*sensu* Olmi 1984) is interpreted herein as equivalent to "ADOs", Antennal Dorsal Organs (*sensu* Riolo *et al*. 2016).

The following abbreviations were employed in the descriptions: POL, distance between the inner edges of the lateral ocelli; OL, distance between the inner edges of a lateral ocellus and the median ocellus; OOL, distance from the outer edge of a lateral ocellus to the compound eye; OPL, distance from the posterior edge of a lateral ocellus to the occipital carina; TL, distance from the posterior edge of an eye to the occipital carina.

Color images were captured using a LEICA DFC295 digital camera coupled to a stereomicroscope and stacked with Zerene Stacker software (version 1.04 build) at the Laboratory of Comparative Biology of Hymenoptera (LBCH) and at the invertebrate's collection of INPA, using a LEICA DFC295 digital camera coupled to a Leica M205C stereomicroscope, and stacked with the Leica Application Suite V4.1. The figures were subsequently elaborated in Adobe Photoshop (version 11.0). Figures by Olmi and Virla (2014) and Martins and Domahovski (2022) are cited with a lowercase "f". The distribution map was created using SimpleMappr (Shorthouse 2010). The labels of the specimens examined were transcribed as follows: a backslash (\ ) indicates different lines on the same label, while two quotation marks (" ") indicate different labels on the same specimen.

RESULTS

Family Dryinidae Haliday 1833

Subfamily Gonatopodinae Kieffer, 1906

Genus *Gonatopus* Ljungh, 1810

Gonatopus jadisi Martins **sp. nov.** (Figures 1 and 3)

Zoobank identifier: urn:lsid:zoobank.org:act:9C34031B-5CF7-4064-84AC-FE78500646E2

Type Material: female, Brasil, Amazonas, Manaus\ Rio Tarumã-Mirim 3º2'S, 60º17'W\ Floresta de igapó; ground ecletor traps Rbof I/2\ 20.i.1988, Adis, J. leg., INPA-HYM\ 034972 (INPA).

Paratype: 1 female: Brasil, Amazonas, Manaus\ Tarumã-Mirim 3º2'S, 60º17'W\ Floresta de igapó; ground ecletor traps Rbof I/2\ 20.i.1988, Adis, J. leg., INPA-HYM\ 034973 (INPA). 1 female: "UFES nº\ 20228" "Brasil, SP- Américo Brasiliense\ Cerradão, Clube Náutico\ Moericke copa 2mB\ 29.IX-02.XI.1999,\ M.T. Tavares equipe col." "Dryinidae\ 200\ E. A. Faustino, det." (UFES).

Diagnosis

Body predominantly testaceous or brown testaceous, except part of pronotum and mesosoma dark brown testaceous; legs testaceous, except part of coxae, trochanters and protarsomeres whitish; body with sparse pilosity, predominantly smooth, except mesosoma with transversal carinae in anterior margin and in posterior margin of propodeum. Occipital carina present, restricted only to the lateral margin of posterior ocelli; frontal line incomplete; OL as long as POL. Claws of middle and posterior legs open without basal expansion; 5th protarsomere with one row of six lamellae located in the distal half of the segment and distal apex with about 11 lamellae.

Description

Female (holotype). Apterous; body length 3,25 mm. **Color:** Head brown testaceous, except gena, face yellow testaceous and part of frons and vertex dark brown testaceous (Figure 1a–d); antenna with scape, pedicel and 7-8 flagellomeres yellow testaceous, and 1-6 flagellomeres brown testaceous (Figure 1a,c); palpomeres whitish. Pronotum dark brown testaceous (Figure 1c); mesosoma dark brown testaceous (Figure 1c); legs testaceous, except part of coxa, trochanter and protarsomeres whitish (Figure 1a,c). **Pubescence:** Head with sparse pilosity; inner margin of the eye with long and erect pilosity on posterior margin; antenna with short and dense pilosity (Figure 1b,d,e); pronotum with sparse pilosity (Figure 1c); mesosoma with sparse and erect pilosity (Figure 1c,e); mesoscutum without two lateral pointed apophyses; metasoma with sparse and long pilosity (Figure

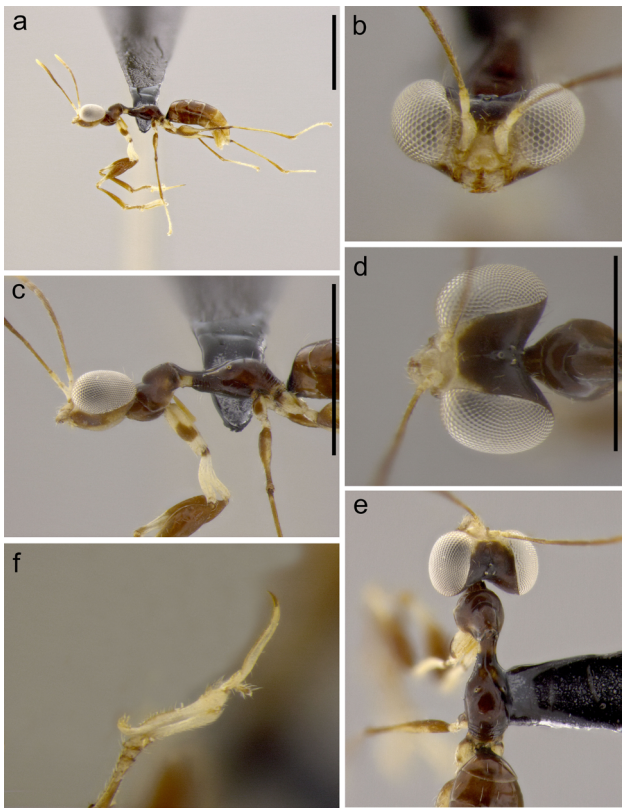

Figure 1. *Gonatopus jadisi* Martins **sp. nov. A** – habitus, lateral view; **B** – head, frontal view; **C** – head and mesosoma, lateral view; **D** – head, dorsal view; **E** – head, mesosoma and part of metasoma, dorsal view; **F** – chela. Scale bars: A-F=1.0 mm

1a). **Integumental sculpture:** Head and pronotum smooth (Figure 1a,c,d); mesosoma with transversal carinae in anterior and posterior margin of propodeum (Figure 1c,e). **Structure and proportions:** Head with vertex little excavated (Figure 1b). Ocellar ratio: OL = 3.0; POL = 3.0; OOL = 13.0; OPL = 0. Occipital carina restricted only to the lateral margin of the posterior ocelli. Antennomeres with the following proportions: 15: 11: 30: 16: 14:14: 11: 10: 10: 16. Malar space as long as mandible base. Frontal line incomplete near to the clypeus; mid portion of clypeus with anterior margin straight. Palpomeres formula 4: 2. Protarsomeres in following proportions: 22: 5: 6: 30: 45 and enlarged claw (= 40). Chela with enlarged claw with six bristles; 5th protarsomere with one row of six lamellae located in distal half of segment and distal apex with about 11 lamellae (Figure 1f). Claw of middle and posterior legs open, without basal expansion. Dorsal surface of propodeum shorter than posterior (15: 25). Tibial spurs 1/0/2.

Etymology

The name of the species is a homage to the collector Dr. Joachim Ulrich Adis.

Remarks

Among the *Gonatopus* species belonging to species-group 7 present in the Neotropical region, *Gonatopus jadisi* Martins **sp. nov**. is closely related to *Gonatopus huggerti* Olmi 1992 by the following sets of characteristics: head excavated, shiny and smooth; mesoscutum without two lateral pointed apophyses; posterior margin of the propodeum crossed by several and transversal carinae; 5th protarsomere with lamellae located in distal half. But *G. jadisi* Martins **sp. nov** differs from *G. huggerti* by having a predominantly brown testaceous body; frontal line incomplete near to the clypeus; OL as long as POL; occipital carina incomplete, restricted to the lateral margin of the posterior ocelli; mesoscutum smooth, except lateral margin crossed by several and longitudinal carina; metanotum convex; 5th protarsomere with one row of six lamellae located in the distal half of the segment and distal apex with about 11 lamellae.

Key to females of Neotropical species of *Gonatopus* of the 7th species-group (Specific couplets modified based on the numeration of the original key by Olmi and Virla 2014)

35. Mesoscutum with two lateral pointed apophyses; 5th protarsomere with lamellae beginning in proximal third (figure 195a in Olmi and Virla 2014); labial palpus 3-segmented ..... *G. providus* Olmi,1991

– Mesoscutum without two lateral pointed apophyses; 5th protarsomere with lamellae located in distal half (figure 190d in Olmi and Virla 2014); labial palpus 2-segmented ..... 35'

35'. Body predominantly testaceous; frontal line complete; OL shorter than POL; mesoscutum smooth; occipital carina absent; metanotum flat; 5th protarsomere with one row of 12 lamellae located in distal half of segment; distal apex with about 7-16 lamellae ..... *G. huggerti* Olmi, 1992

– Body predominantly brown testaceous; frontal line incomplete near to the clypeus; OL as long as POL; mesoscutum smooth, except lateral margin of mesosoma crossed by several and longitudinal carina; occipital carina incomplete, restricted on lateral margin of posterior ocelli; metanotum convex; 5th protarsomere with one row of six lamellae located in distal half of segment; distal apex with about 11 lamellae..... *Gonatopus jadisi* Martins **sp. nov.**

Genus *Pareucamptonyx* Olmi 1991

Pareucamptonyx igapoense Martins **sp. nov.** (Figures 2 and 3)

Zoobank identifier: urn:lsid:zoobank.org:act:DB42EF80-2020-400C-9EA1-13906990D0F1

Type Material: female, Brasil, Amazonas, Manaus\ Rio Tarumã-Mirim 3º2'S, 60º17'W,\ Floresta de igapó; Ecletor de árvore traps BE\ 48 A subindo,\ 22.iii.1976, Adis, J. leg., INPA-HYM\ 034970 (INPA).

Paratype: 1 female: Brasil, Amazonas, Manaus,\ Rio Tarumã-Mirim 3º2'S, 60º17'W, Floresta de igapó, Ecletor de árvore traps BE\ 49 E subindo, 17.ii.1976, Adis, J. leg., INPA-HYM\ 034971 (INPA).

Diagnosis

Head brown testaceous, except mandible whitish with teeth brown testaceous, antenna testaceous, mesosoma partially black, lateral margin of pronotum, legs, and metasoma testaceous; head, mesosoma, and metasoma with sparse pilosity; body predominantly smooth, except anterior margin of mesoscutum and posterior margin of propodeum partially rugose or with transversal carina. Occipital carina absent; frontal line incomplete near the clypeus; OL longer than POL; chela with enlarged claw with one row of five bristles; 5th protarsomere with five lamellae and distal apex with one group of 17 lamellae.

Description

Female. Apterous, body length 1,68mm. **Color:** Head brown testaceous; except mandible whitish with brown teeth testaceous; antenna testaceous; dorsal inner margin of eyes with a whitish macula (Figure 2a,b,d); pronotum black, except lateral surface testaceous (Figure 2c,e); mesoscutum black (Figure 2a,c,e); legs testaceous, except chela white; petiole black and metasoma testaceous. **Pubescence:** Head with fine and sparse pilosity, except clypeus with short pilosity; malar space with dense pilosity; gena glabrous and with sparse pilosity; pronotum with sparse and short pilosity (Figure 2a,c); mesoscutum, mesoscutellum and metanotum glabrous (Figure 2c,e); legs with short and sparse pilosity (Figure 2a); mesopleuron and metapleuron with sparse and short pilosity; propodeum glabrous; metasoma with short

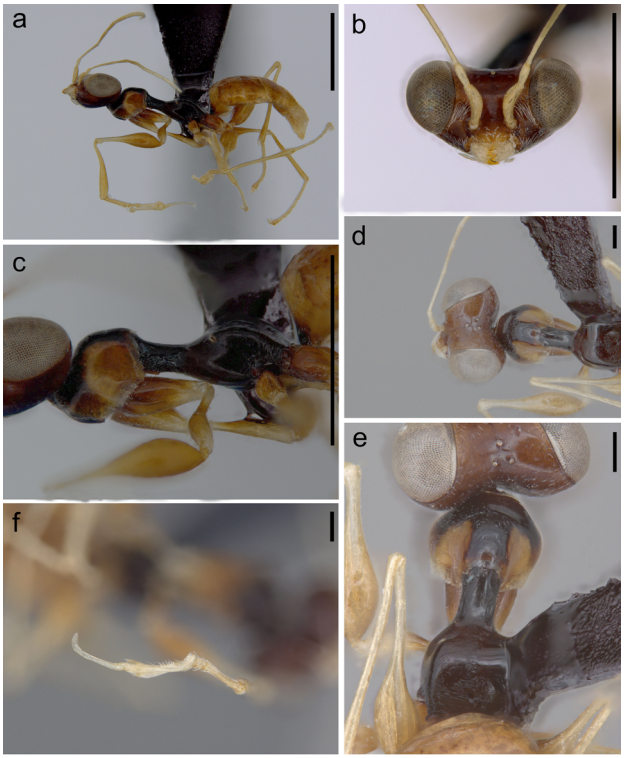

Figure 2. *Pareucamptonyx igapoense* Martins **sp. nov. A** – habitus, lateral view; B – head, frontal view; **C** – head and mesosoma, lateral view; **D** – head, dorsal view; **E** – head, mesosoma, and part of metasoma, dorsal view; **F** – chela. Scale bars: **A-C** = 1,0 mm; **D-F** = 0.2 mm.

and sparse pilosity. **Integumental sculpture:** Head smooth, except clypeus (Figure 2b,d,e) and part of malar space and vertex granulate (Figure 2a); pronotum, mesoscutellum and metanotum smooth; mesoscutum predominantly smooth except some longitudinal carina on lateral surface (Figure 2c,e); mesoscutum without lateral pointed apophyses (Figure 2c,e). Mesopleuron and metapleuron smooth, except posterior surface with some sparsely located transverse carinae (Figure 2c); propodeum partially smooth and rugose, except by crossed sparse transverse carinae (Figure 2c,e). **Structure and proportions:** Head with vertex excavated. Ocellar ratio: OL= 4.0; POL = 3.0; OOL = 18.0. Occipital carina absent. Antennomeres in following proportions:10: 5: 19: 10: 10: 8: 6: 6: 5: 8. Flagellomeres 5–8 with rhinaria. Frontal line incomplete near the clypeus. Palpomeres formula 6:3. Protarsomeres in following proportions:11: 3: 5: 10: 20 and enlarged claw (= 17). Chela with enlarged claw with one row of five bristles (Figure 2f); inner margin of 5th protarsomere with five lamellae and distal apex with one group of 17 lamellae (Figure 2f). Tibial spurs 1/0/2.

Etymology

The name of the species is allusive to the regional Brazilian name of the ecosystem where the species was collected (igapó).

Remarks: Among the *Pareucamptonyx* species present in the Neotropical region, *Pareucamptonyx igapoense* Martins **sp. nov.** is closely related to *P. kumagaiae* Martins, 2022, by the partially brown testaceous body, 5–8 rhinaria on the flagellomeres, the dorsal inner margin of the eyes with a whitish macula, and OL longer than POL. It differs from *P. kumagaiae* by the head with a smooth vertex, the whitish mandible, the malar space with dense pilosity, the propodeum with sparse carinae, the chela with an enlarged claw with one row of five bristles, the 5th protarsomere with five lamellae and the distal apex with one group of 17 lamellae.

Key to females of Neotropical species of *Pareucamptonyx* (Specific couplets modified based on the original key by Martins and Domahovski 2022)

4. Body predominantly brown testaceous (figure 4a in Martins and Domahovski 2022); legs and metasoma testaceous or brown testaceous; frontal line absent or present; mesoscutum rugose (figure 9b *ibid*), with some irregular longitudinal carinae; chela with enlarged claw and 5th protarsomere with variable number of lamellae between 10-17 ..... 4'

– Body predominantly black, except pronotum, legs and metasoma dark brown (figure 5a *ibid*); frontal line complete; mesoscutum smooth (figure 9c *ibid*), except some longitudinal carinae on lateral surface (figure 5d *ibid*); chela with inner margin of the 5th protarsomere with one row of five lamellae and two long bristles (figure 10c *ibid*) … *P. niger* Martins 2022

4'. Head rugose, except part of face and vertex smooth; frontal line and occipital carina absent; malar space glabrous; mandible dark brown; 5th protarsomere with one row of six lamellae and three long bristles and distal apex with one group of 10 lamellae (figure 10b *ibid*) ..... *P. kumagaiae* Martins 2022

- Head with smooth vertex; frontal line present; mandible whitish; malar space with dense pilosity; 5th protarsomere with five lamellae and distal apex with one group of 17 lamellae (Figure 2f) ..... *Pareucamptonyx igapoense* Martins **sp. nov.**

DISCUSSION

Historically, the Dryinidae family has been a neglected group due to the lack of specialists dedicated to studying it, especially the species found in the Neotropical region. In Brazil, this scenario has changed, and in recent years, there has been an increase in studies involving the biology, ecology, systematics and taxonomy of different genera in the family (e.g. Olmi and Virla 2014; Martins *et al.* 2015, 2020a; Martins 2022; Martins and Melo 2024; Celante *et al.* 2025).

Currently, 12 species belonging to *Gonatopus* and *Pareucamptonyx* are recorded for the Amazon biome (Table 1), and only one (Figure 3a) for the state of Amazonas (Coelho *et al.* 2011; Olmi and Virla 2014; Martins and Krinski 2016). With the description of the two new species, we expanded these figures to three species for the state of Amazonas

and 14 species for the Amazon biome. Although foraging is a common survival and reproductive success strategy in Dryinidae females are frequently in search of their hosts and males are in search of females to reproduce (Martins and Domahovski 2017a,b). There are few records of apterous females of Dryinidae collected in suspended traps with vertical displacement (Martins *et al.* 2020a).

Most studies involving apterous species of *Esagonatopus* and *Gonatopus* (Hymenoptera, Gonatopodinae) were carried out using Malaise traps at ground level (Martins *et al.* 2015; Martins 2018; Martins *et al.* 2020a; Martins and Domahovski 2022). This was the first study to record the vertical migration of adult apterous females of *Pareucamptonyx igapoense* Martins **sp. nov.** on tree trunks, possibly to adapt to flooded areas, as the flood of the Negro River submerges trees over 20 m high during long periods, forcing the fauna to migrate vertically (Iron and Adis 1979; Adis 1979, 1997). Vertical foraging in response to the flood pulse in floodplain forests has already been recorded for arthropod fauna in the region (Adis 1981, 1984, 1997; Adis and Mahnert 1990), but not for Dryinidae.

Table 1. Species of *Gonatopus* and *Pareucaptonyx* recorded for the state of Amazonas and other Brazilian states.

Genus	Species	Occurrence in Brazilian states
Gonatopus	*G. amapaensis* Olmi, 1991	Amapá
	G. breviforceps Kieffer, 1904	Amazonas; Paraná; Pernambuco and São Paulo
	G. campbelli Olmi, 1984	Pará and Santa Catarina
	G. flavipes Olmi, 1984	Pará; Piauí; Santa Catarina and São Paulo
	G. foucarti Olmi, 2004	Mato Grosso
	G. hilaris Olmi, 1995	Mato Grosso
	G. jadisi Martins **sp. nov.**	Amazonas and São Paulo (this study)
	G. matoensis Olmi, 1991	Mato Grosso
	G. neotropicus (Olmi, 1984)	Mato Grosso; Pará; Rondônia; São Paulo and Santa Catarina
	G. palliditarsis Cameron, 1888	Mato Grosso and São Paulo
	G. pecki (Olmi, 1986)	Pará and Paraná.
	G. testaceus Cameron, 1888	Espírito Santo; Mato Grosso do Sul; Minas Gerais; Pará; São Paulo and Rio de Janeiro
	G. trichosoma Virla, Espinosa and Olmi, 2010	Bahia; Mato Grosso and Mato Grosso do Sul
Pareucamptonyx	***P. igapoense*** Martins **sp. nov.**	Amazonas (this study)
	P. townesi (Olmi, 1984)	Distrito Federal; Goiás; Mato Grosso, and Paraná

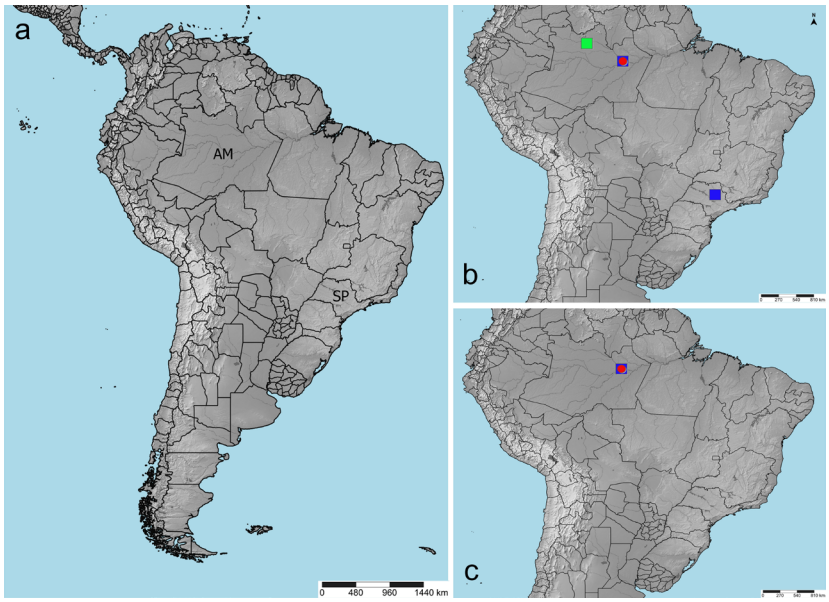

Figure 3. Distribution map of the *Gonatopus* species and *Pareucamptonyx*. **A** – South America with Brazilian states where records of the new species were found. **B** – Distribution of *Gonatopus jadisi* Martins **sp. nov.** holotype (red circle), paratype (blue square) and records of *Gonatopus breviforceps* Kieffer, 1904 from Amazonas (red square); **C** – Distribution of *Pareucamptonyx igapoense* Martins **sp. nov.** holotype (red circle) and paratype (blue square).

The occurrence of *G. jadisi* Martins **sp. nov.** in the states of Amazonas and São Paulo, respectively in the Amazon and Atlantic Forest biomes, suggests the possibility of a disjunct distribution for this species, although species of other genera, such as *Dryinus,* are widely distributed. For example, *Dryinus striatus* (Fenton) and *D. ruficeps* (Cameron) occur across the Amazon, Caatinga, and Atlantic Forest biomes (Martins, unpublished data). The distribution of Dryinidae species, especially those from apterous groups, remains a subject of limited comprehension, primarily due to the difficulty in collecting these insects, and the paucity of known or specific hosts for some species. Therefore, their actual distribution may be far broader than currently documented (Martins *et al*. 2020b, 2024a).

Our study is the first with the repatriated material from Germany described above (MLO and EMRS, personal communication). In addition to the new species of Dryinidae described here, other arthropods were also recovered, such as crustaceans and arachnids, as well as vertebrates (frogs, lizards and small fishs), all of which will be considered in other manuscripts with a more specific resolution appropriate to the taxonomic groups rescued.

It will be important to adequately manage and thoroughly process the repatriated collection, as it holds great potential for new findings of underestimated and little-studied groups in northern Brazil (Olmi and Virla 2014; Martins and Krinski 2016; Martins 2025), as well as for new location records of other groups.

CONCLUSIONS

The repatriation of a large collection of Amazonian specimens from Germany to Brazil allowed us to expand our knowledge about the Amazonian Dryinidae fauna, through the record and description of two new species, *Gonatopus jadisi* Martins **sp. nov.** and *Pareucamptonyx igapoense* Martins **sp. nov.**, collected in blackwater floodplain forest (igapó), by Manaus, Amazonas, Brazil. The description of the two new species expands our knowledge about the biodiversity of the family, increasing from 12 to 14 the number of species recorded in the Amazon rainforest. Our study emphasizes the importance of international collaboration and also highlights the need for future research to contribute to the knowledge of insect biodiversity in tropical ecosystems. To date, none of the species described for the genera have been identified in the examined material, suggesting that these species are rarely collected and are primarily found in blackwater floodplain forest (igapó).

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