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FURTHER CONSIDERATIONS ON THE GENUS *ANANTERIS* THORELL, 1891 (SCORPIONES, BUTHIDAE) IN BRAZILIAN AMAZONIA AND DESCRIPTION OF TWO NEW SPECIES

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Abstract: Two new species of the genus *Ananteris* Thorell have been discovered in Brazil. *Ananteris roraima* **sp. n.** is described from 6 males and 11 females collected in the region of 'Ilha de Maraca', State of Roraima, and *Ananteris madeirensis* **sp. n.** from one male collected in the state of Amazonas, Brazil. The number of *Ananteris* species described from the Amazon region of Brazil is raised to nine, although the region of Roraima is principally covered by savannah-like formations. The number of *Ananteris* species present in the scorpion fauna of Brazil is now raised to 19.
Key words: Scorpiones, Buthidae, *Ananteris*, new species, Amazonia, Brazil.

Consideraciones sobre el género *Ananteris* Thorell, 1891 (Scorpiones, Buthidae) en la Amazonia brasileña y descripción de dos nuevas especies
Resumen: Se han descubierto en Brasil dos especies nuevas del género *Ananteris* Thorell. *Ananteris roraima* **sp. n.** se describe a partir de seis machos y 11 hembras colectadas en la región de la Isla de Maraca, Estado de Roraima, y *Ananteris madeirensis* **sp. n.** de un macho recogido en el estado de Amazonas, Brasil. El número de especies descritas del género *Ananteris* de la región amazónica de Brasil se eleva a nueve, aunque la región de Roraima está principalmente cubierta por formaciones como la sabana. El número de especies de *Ananteris* presentes en la fauna de escorpiones de Brasil alcanza ahora a 19.
Palabras clave: Scorpiones, Buthidae, *Ananteris*, nuevas especies, Amazonia, Brasil.

Taxonomy/Taxonomía: *Ananteris roraima* **sp. n.** y *Ananteris madeirensis* **sp. n.**

Introduction

As discussed in recent publications (Lourenço, 2001, 2003, 2004a,b, 2005; Giupponi *et al*., 2009), the number of species described in the genus *Ananteris* Thorell, 1891 has increased continuously since it was last revised (Lourenço, 1982). It now contains 63 known species (see Rojas-Runjaic, 2005; Gonzalez-Sponga, 2006; Rojas-Runjaic & Sousa, 2007; Giupponi *et al*., 2009; Lourenço *et al*., 2009).

During a revision of the genus (Lourenço, 1982), several new species from Brazil were described in addition to *Ananteris balzanii* Thorell, 1891, the only species known from the country before that date. These species are *Ananteris dekeyseri* Lourenço, 1982, *Ananteris franckei* Lourenço, 1982, *Ananteris mariaterezae* Lourenço, 1982, *Ananteris maury* Lourenço, 1982 and *Ananteris pydanieli* Lourenço, 1982. Subsequently, other new species were described, namely *Ananteris luciae* Lourenço, 1984, *Ananteris maranhensis* Lourenço, 1987 and *Anan-teris deniseae* Lourenço, 1997 (Lourenço, 1984, 1987, 1997). More recently, *Ananteris nairae* Lourenço, 2004 was described from the West of the State of Amazonas, showing the most westerly distribution of all Brazilian species in the genus. Another Amazonian species, *Anan-teris cryptozoicus* Lourenço, 2005, was described from the region of the Tarumã Mirim River, near Manaus. This was the first species of the genus to be confirmed as an obligate soil dweller (Lourenço, 2004a, 2005). This was follo-wed by the descriptions of *Ananteris evellynae* Lourenço, 2004 from the State of Bahia and *Ananteris cachimboensis* Lourenço, Motta & Silva, 2006 from the State of Pará (Lourenço, 2004b, Lourenço *et al*., 2006). In the last two years, four other new species have been added to the Brazilian fauna: *Ananteris bernabei* Giupponi, Vasconcelos & Lourenço, 2009, *Ananteris chagasi* Giupponi, Vasconcelos & Lourenço, 2009, *Ananteris kuryi* Giupponi, Vasconcelos & Lourenço, 2009 and *Ananteris bianchinii* Lourenço, Aguiar-Neto & Limeira-de-Oliveira, 2009 (Giupponi *et al*., 2009; Lourenço *et al*., 2009).

One of the two new species described here, *Ananteris roraima* sp. n., is the first confirmed record of an *Ananteris* species in the State of Roraima. The second new species, *Ananteris madeirensis* sp. n., was collected in a distinct site in the State of Amazonas, where no *Ananteris* species had previously been reported. With the two new taxa, the number of known *Ananteris* species described from Brazil is raised to 19. Of these species, nine are clearly typical Amazonian elements.

Methods

Illustrations and measurements were made with the aid of a Wild M5 stereo-microscope with an attached drawing tube (camera lucida) and an ocular micrometer. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974) and morphological terminology mostly follows Vachon (1952) and Hjelle (1990).

Taxonomic treatment

Checklist of the known *Ananteris* species in Brazil. Asterisks indicates those present in Amazonia.

1. *Ananteris balzanii* Thorell, 1891
2. *Ananteris bernabei* Giupponi, Vasconcelos & Lourenço, 2009
3. *Ananteris bianchinii* Lourenço, Aguiar-Neto & Limeira-de-Oliveira, 2009
4. *Ananteris chagasi* Giupponi, Vasconcelos & Lourenço, 2009
5. *Ananteris cachimboensis* Lourenço, Motta & Silva, 2006*
6. *Ananteris cryptozoicus* Lourenço, 2005*
7. *Ananteris dekeyseri* Lourenço, 1982*
8. *Ananteris deniseae* Lourenço, 1997
9. *Ananteris evellynae* Lourenço, 2004
10. *Ananteris franckei* Lourenço, 1982
11. *Ananteris kuryi* Giupponi, Vasconcelos & Lourenço, 2009
12. *Ananteris luciae* Lourenço, 1984*
13. ***Ananteris madeirensis* sp. n. ***
14. *Ananteris maranhensis* Lourenço, 1987*
15. *Ananteris mariaterezae* Lourenço, 1982
16. *Ananteris mauryi* Lourenço, 1982
17. *Ananteris nairae* Lourenço, 2004*
18. *Ananteris pydanieli* Lourenço, 1982*
19. ***Ananteris roraima* sp. n. ***

***Ananteris roraima* sp. n.**
Fig. 1-7.

TYPE MATERIAL: Brazil, State of Roraima, 'Ilha de Maracá', Estação Ecológica de Maracá, pitfall, 23/II/2007 (J.L.P. Souza). Female holotype, INPA-SP 0589; Paratypes deposited in the Instituto Nacional de Pesquisas da Amazonia (INPA): 1 male, SP 0589, 1 female, SP 0576, 1 female, SP 0579, 1 male, SP 0580, 1 male, SP 0581, 1 male, 0582, 1 male, SP 584, 1 male, 1 female, SP 0585, 1 male, SP 0586, 1 male, SP 0588. Other paratypes deposited in the Museum national d'Histoire naturelle, Paris: 1 female, SP 0565, 1 male, SP 0577, 1 male 0578, 1 male, SP 0583, 1 female, SP 0587.

ETYMOLOGY: The specific name is placed in apposition to the generic name and refers to the State of Roraima, the region in which the new species was found.

DIAGNOSIS: Species of moderate size compared to average size of the other species of the genus (23.4 mm in total length for male and 29.8 for female; see Table I). General coloration reddish-yellow, intensely marked with brownish variegated spots. Pedipalps rather short; fingers with 6 rows of granules; male and female pectines with 17–19 and 16–19 teeth. Carinae and granulation strongly marked.

RELATIONSHIPS: Mainly by its pigmentation pattern, the new species shows affinities with *Ananteris balzanii* Thorell, 1891 and *Ananteris cussinii* Borelli, 1910. These two species are respectively distributed in the central savannahs of Brazil and along the Caribbean coastal region of Venezuela. The new species shows, however, a combination of distinct characters: (i) dark pedipalps with chela hand yellow; sternites weakly infuscate, yellow to pale yellow, (ii) carapace and tergites strongly granular, (iii) chela fingers with 6 rows of granules (iv) trichobothria **db** and **est** of fixed finger situated at the same level. The new species is a possible endemic element of the 'Ilha de Maracá' region.

DESCRIPTION BASED ON FEMALE HOLOTYPE AND PARATYPES.

Morphometric measurements in Table I.

Coloration. Generally yellow to reddish-yellow with brown to dark brown variegated pigmented zones on the body and its appendages. Prosoma: carapace reddish-yellow with dark brown spots on anterior, lateral and posterior edges; eyes surrounded by black pigment. Mesosoma: reddish-brown with confluent blackish zones on posterior and lateral edges of tergites. Metasoma: segments I to IV reddish-yellow; V reddish; all segments intensely marked with dark brown spots. Vesicle reddish-yellow without spots; base of aculeus yellowish. Venter yellow to pale yellow; only sternite VII slightly infuscate. Chelicerae yellowish with variegated blackish spots over the entire surface; fingers with blackish spots; teeth pale red. Pedipalps: yellow; femur and patella strongly marked with dark brown spots; chela hand yellow; fingers brown. Legs yellow, with several dark brown spots.

Morphology. Carapace with strongly marked granulation; anterior margin slightly emarginate. Anterior median, superciliary and posterior median carinae weak or absent. All furrows moderate to weak. Median ocular tubercle distinctly anterior to centre of carapace; median eyes separated by approximately 0.8–1.0 ocular diameter. Three pairs of lateral eyes. Sternum subpentagonal. Mesosoma: Tergites with moderately marked granulation, less intense than those of carapace. Median carina moderately to weakly marked on all tergites. Tergite VII pentacarinate. Venter: Genital operculum divided longitudinally, each plate more or less suboval in shape. Pectines: pectinal tooth count 19–18 in female holotype (paratypes: 17-18 in males, 16-19 in females); basal middle lamellae of pectines not dilated; fulcra absent. Sternites smooth; only VII slightly granular; spiracles moderately elongate; setation moderate; sternite VII with very weakly marked carinae. Metasomal segments I and II with 10 carinae, crenulate; segments III and IV with 8 carinae, crenulate; segment V slightly rounded, with 5 carinae; intercarinal spaces weakly granular. Telson moderately elongate and almost smooth; aculeus short and weakly curved; subaculear tooth moderately marked and spinoid. Cheliceral dentition characteristic of family Buthidae (Vachon 1963); fixed finger with two moderate basal teeth; movable finger with two weak basal teeth; ventral surface of both finger and manus with long, dense setae. Pedipalps: Femur pentacarinate; patella and chela with weak to vestigial carinae; internal face of patella with 5-6 spinoid granules; all faces weakly granular, almost smooth. Fixed and movable fingers with 6, almost linear, rows of granules; two small external and one internal accessory granule present at base of each row; three granules at distal extremity of the fingers. Trichobothriotaxy; orthobothriotaxy A-β (Vachon 1974, 1975); trichobothria **db** and **est** of fixed finger situated at same level. Legs: Tarsus with very numerous, fine, median setae ventrally. Tibial spurs strongly developed on leg IV, moderate on leg III.

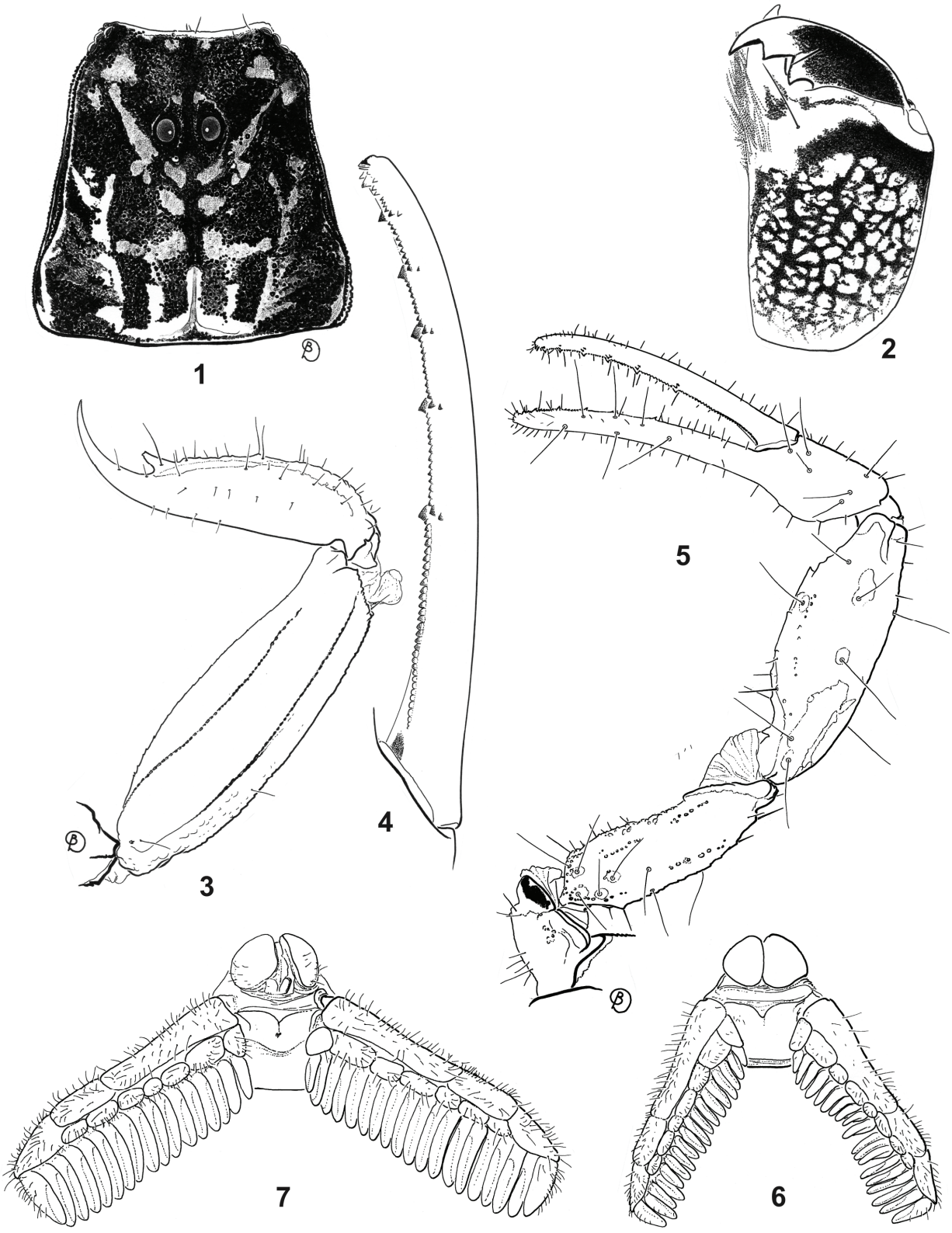

Fig. 1–7. *Ananteris roraima* sp. n., **1-4.** female holotype. **1-2.** Carapace and chelicera, dorsal aspect, showing pigmentation pattern. **3.** Metasomal segment V and telson, lateral aspect. **4.** Movable finger of pedipalp chela with rows of granules. **5-7.** female holotype and male paratype. **5.** Right pedipalp, dorsal aspect, showing trichobothrial pattern (female). **6-7.** Genital operculum and pectines. **6.** Female holotype. **7.** Male paratype.

Table I. Morphometric values (in mm) of male paratype and female holotype of *Ananteris roraima* sp. n., male holotype of *Ananteris dekeyseri* and male holotype of *Ananteris madeirensis* sp. n.

Anantheris	*roraima* sp. n.		*dekeyseri*	*madeirensis* sp. n.
	♂	♀	♂	♂
Total length*	23.4	29.8	25.5	24.3
Carapace:				
- length	2.6	3.5	2.7	2.8
- anterior width	1.6	2.3	1.7	1.7
- posterior width	2.5	3.6	2.5	2.5
Mesosoma length	5.7	7.4	5.5	5.8
Metasomal segment I:				
- length	1.5	1.8	1.7	1.6
- width	1.6	2.1	1.3	1.5
Metasomal segment V:				
- length	3.9	5.1	4.3	4.2
- width	1.3	1.8	1.2	1.2
- depth	1.3	1.6	1.2	1.4
Telson:				
- length	3.2	4.2	4.2	3.6
- width	0.8	1.0	0.7	0.7
- depth	0.8	1.1	0.7	0.7
Pedipalp:				
- Femur length	2.3	2.9	2.9	2.6
- Femur width	0.7	0.9	0.6	0.6
- Patella length	2.8	3.6	3.4	3.2
- Patella width	0.9	1.2	0.8	0.8
- Chela length	3.5	4.7	4.3	3.8
- Chela width	0.7	0.9	0.6	0.5
- Chela depth	0.6	0.9	0.6	0.4
Movable finger:				
- length	2.6	3.5	3.4	2.9

*including telson

Ananteris madeirensis sp. n.

Fig. 8-13.

MALE HOLOTYPE. Brazil, State of Amazonas, BR 319, km 350 'trilha 2 ponto 1500', pitfall, 25/VII-1/VIII/2008 (H. Guariento & L. Pierrot). Holotype deposited in the 'Instituto Nacional de Pesquisas da Amazonia' (INPA-SP 0554). No other material available.

ETYMOLOGY: The specific name refers to the region of the 'Rio Madeira', the region in which the new species was found.

DIAGNOSIS: Species of moderate size compared to average size of the other species of the genus (24.3 mm in total length; see Table I). General coloration reddish-yellow to dark red. Pedipalps and metasoma slender; fingers with 6 rows of granules; male pectines with 16–15 teeth. Carinae and granulation moderately marked.

RELATIONSHIPS: The new species can be distinguished from the other known species of the genus from the Amazonian region, and in particular from *Ananteris dekeyseri* Lourenço, 1982, which is also distributed in the State of Amazonas, by a combination of distinctive characters: (i) darker general pigmentation of the body and appendages, varying from reddish-yellow to dark red, (ii) pedipalp fingers with 6 rows of granules, (iii) male pectines with 15–16 teeth, in contrast to 17–18 in *A. dekeyseri*, (iv) some distinct morphometric values, noticeably the length of telson and pedipalps, (v) trichobothrium **db** of fixed finger in a basal position, close to trichobothrium **est**.

DESCRIPTION BASED ON MALE HOLOTYPE.

Morphometric measurements in Table I.

Coloration. Generally reddish-yellow to dark red, with dark brown to blackish variegated zones on body and appendages. Prosoma: carapace reddish-yellow with blackish spots on the anterior and posterior edges, but also in the central zone, behind median eyes; eyes surrounded by black pigment. Mesosoma reddish-yellow with confluent blackish zones on posterior and lateral edges of tergites. Metasomal segments I to III yellowish; IV and V reddish; all segments intensely marked with blackish spots. Vesicle reddish, without spots; base of aculeus yellow. Venter yellow to pale yellow, without spots or infuscate zones. Chelicerae yellow, with variegated brownish spots over almost the entire surface; pigments are rather diffuse, however; fingers blackish; teeth red. Pedipalps yellow; femur and patella intensely marked with blackish spots; chela hand yellow with blackish spots; fingers dark. Legs yellow, intensely marked with blackish spots.

Morphology. Carapace with moderately marked granulation, particularly in the central zone; anterior margin not emarginate, straight. Anterior median, superciliary and posterior median carinae weak or absent. All furrows moderate to weak. Median ocular tubercle distinctly anterior to the centre of carapace; median eyes separated by approximately 0.8 of an ocular diameter. Three pairs of lateral eyes. Sternum subpentagonal. Mesosoma: Tergites densely granulated, but less so than carapace. Median carina moderately to weakly marked on all tergites. Tergite VII pentacarinate. Venter: Genital operculum divided longitudinally, each plate more or less subtriangular. Pectines: Pectinal tooth count 16–15 in male holotype; basal middle lamellae of pectines not dilated; fulcra absent. Sternites very slightly granular laterally; III to V almost smooth; spiracles moderately elongate; setation moderate to weak; sternite VII with very weakly marked carinae. Metasomal segment I with 10 carinae, crenulate; segments II to IV with 8 carinae, crenulate; segment V slightly rounded, with 5 carinae; intercarinal spaces weakly granular. Telson elongate and smooth; aculeus moderately long and weakly curved; subaculear tooth moderately to strongly marked and spinoid. Cheliceral dentition characteristic of family Buthidae (Vachon 1963); fixed finger with two moderate basal teeth; movable finger with two weak basal teeth; ventral surface of both finger and manus with long, dense setae. Pedipalps: Femur pentacarinate; internal face with some minute spinoid granules; patella and chela with weak to vestigial carinae; internal face of patella with 6 strong spinoid granules; all faces weakly granular, almost smooth. Fixed and movable fingers with 6 almost linear rows of granules; two small external and one internal accessory granule present at base of each row; three granules at distal extremity of fingers. Trichobothriotaxy; orthobothriotaxy A-β (Vachon 1974, 1975); trichobothrium **db** of fixed finger in a basal position, close to trichobothrium **est**. Legs: Tarsus with very numerous, fine, median setae ventrally. Tibial spurs strongly developed on leg IV, moderate on leg III.

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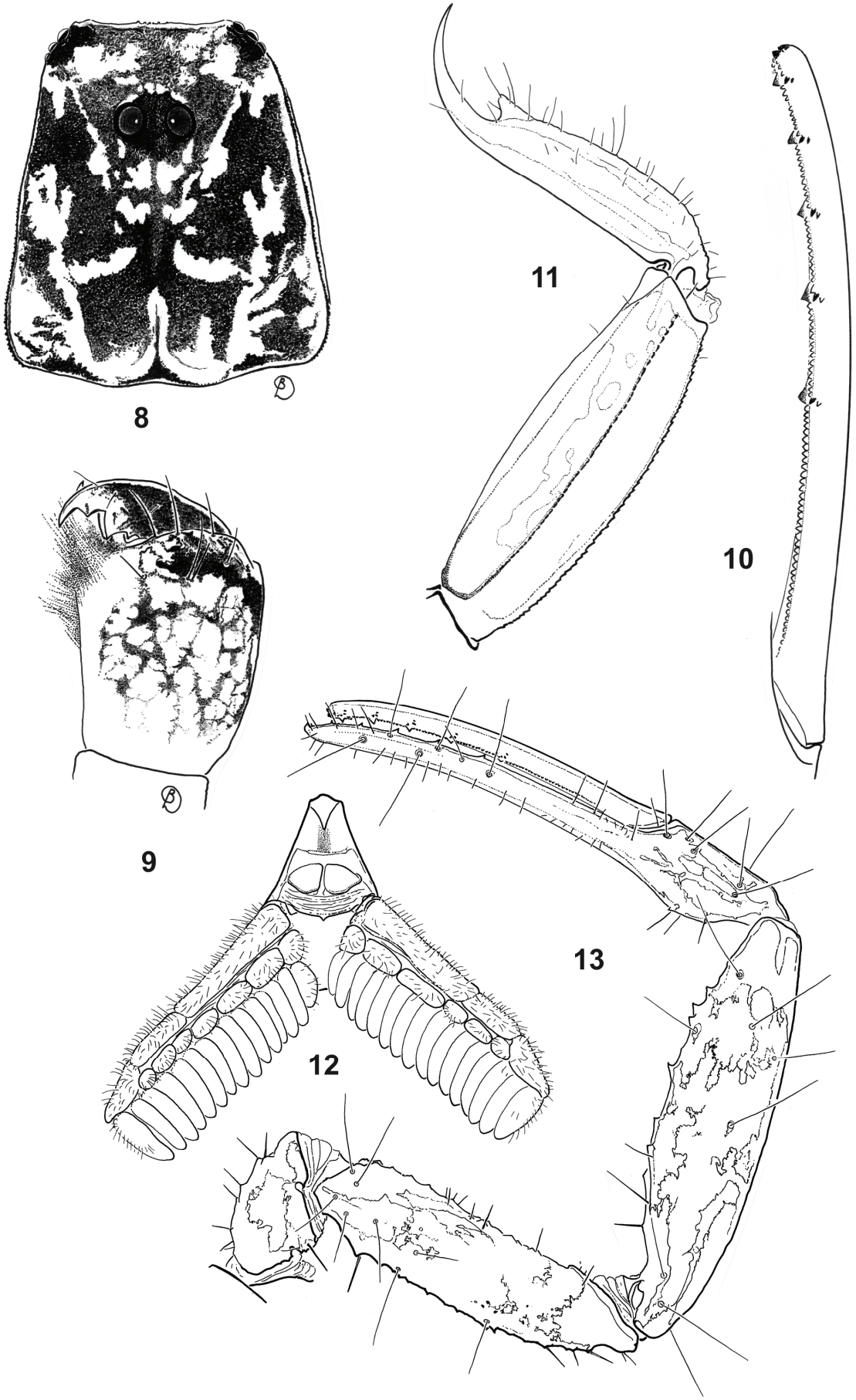

Fig. 8–13. *Ananteris madeirensis* sp. n., male holotype. **8–9.** Carapace and chelicera, dorsal aspect, showing pigmentation pattern. **10.** Movable finger of pedipalp chela with rows of granules. **11.** Metasomal segment V and telson, lateral aspect. **12.** Genital operculum and pectines. **13.** Right pedipalp, dorsal aspect, showing trichobothrial pattern.

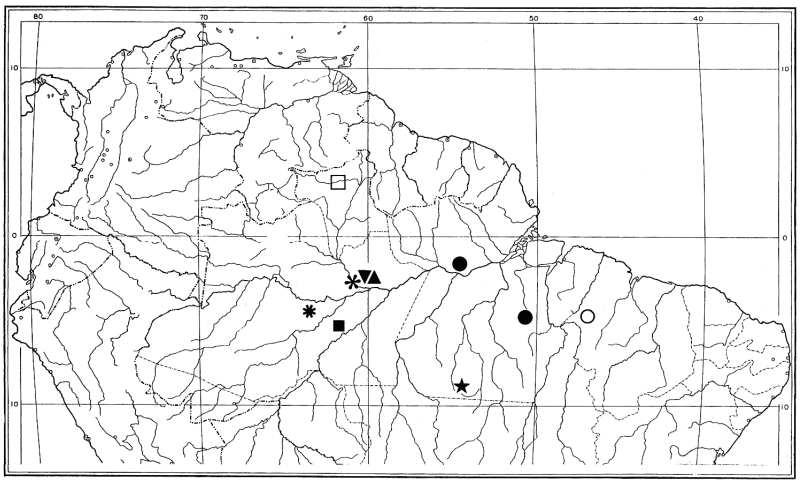

Fig. 14. Map showing the known distribution of *Ananteris* species in Brazilian Amazonia. *Ananteris dekeyseri* (black triangle). *Ananteris pydanieli* (inverted black triangle). *Ananteris luciae* (black circle). *Ananteris maranhensis* (open circle). *Ananteris nairae* (black asterisk). *Ananteris cryptozoicus* (black flower). *Ananteris cachimboensis* (black star). *Ananteris roraima* sp. n. (open square). *Ananteris madeirensis* sp. n. (black square).

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