

SHORT COMMUNICATION

Occurrence of the mite *Acanthonyssus proechimys* (Mesostigmata: Macronyssidae) on a spiny rat in Brazil

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ABSTRACT

Macronyssid mites are ectoparasites of terrestrial vertebrates. We slide-mounted and re-examined mite material collected in a 1987-1989 expedition to Maracá Ecological Station, Roraima State, Brazil. The specimens were identified as *Acanthonyssus proechimys* Yunker and Saunders (Mesostigmata: Macronyssidae), which were collected parasitizing a South American spiny rat, *Proechimys* sp. This represents the first record of *Acanthonyssus* in Brazil.

KEYWORDS: mites, ectoparasites, *Proechimys*, new record

Ocorrência do ácaro *Acanthonyssus proechimys* (Mesostigmata: Macronyssidae) em um echimídeo no Brasil

RESUMO

Os ácaros macronissídeos são ectoparasitas de vertebrados terrestres. Nós montamos e reexaminamos material de ácaros coletado em uma expedição entre 1987-1989 à Estação Ecológica de Maracá, Estado de Roraima, Brasil. Os espécimes foram identificados como *Acanthonyssus proechimys* Yunker e Saunders (Mesostigmata: Macronyssidae), que haviam sido coletados parasitando um echimídeo sul-americano, *Proechimys* sp. Este é o primeiro registro de *Acanthonyssus* no Brasil.

PALAVRAS-CHAVE: ácaros, ectoparasitas, *Proechimys*, novo registro

The family Macronyssidae Oudemans, 1936 has 35 known genera worldwide (Radovsky 2010; Orlova et al. 2017; Bassini-Silva et al. 2021; Gomes-Almeida and Pepato 2021). The genus *Acanthonyssus* Yunker and Radovsky, 1966 has two valid species: *Acanthonyssus dentipes* (Strandtmann and Eads, 1947) and *Acanthonyssus proechimys* Yunker and Saunders, 1973. *Acanthonyssus dentipes* was described parasitizing hispid cotton rats, *Sigmodon hispidus* Say & Ord, 1825 (Rodentia: Cricetidae) in Texas state, USA (Strandtmann and Eads 1947), while *A. proechimys* was described parasitizing the Tome's spiny rat, *Proechimys semispinus* Tomes, 1860, the cayenne spiny rat, *Proechimys guyannensis* (É. Geoffroy, 1803), and an undetermined *Proechimys* sp. (Rodentia: Echimyidae) in Zulia State, Venezuela (Yunker and Saunders 1973). Despite the possible specificity to *Proechimys*, associations of *A. proechimys* with *Heteromys anomalus* (Thompson,

1815) (Rodentia: Heteromyidae), *S. hispidus*, *Zygodontomys brevicauda* Allen & Chapman, 1893 (Rodentia: Cricetidae), a squirrel, some marsupials, and a bat have been recorded (Yunker and Saunders 1973). So far, *A. proechimys* has not been recorded outside Venezuela.

The material examined in the present study originated from an expedition to Maracá Ecological Station (3°24'04"N, 61°39'19"W), a fluvial island in Roraima state, northern Brazil, organized and sponsored by the Royal Geographical Society (UK) and Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, Amazonas State, Brazil, between 1987 and 1989. Ectoparasites including mites were collected from small mammals during this expedition and stored in 70% ethanol at the Ectoparasite Sector of the Department of Parasitology of Universidade Federal de Minas Gerais (UFMG) (Linardi et al. 1991).

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Recently, the Acari Collection of Instituto Butantan (IBSP), São Paulo, Brazil, received the expedition material identified as a novel species of the genus *Echinonyssus*, by Linardi *et al.* (1991). In order to confirm the identification, we remounted the slides according to the techniques described by Jacinavicius (2013). The specimens were deposited in the IBSP collection. More detailed information on the collection, locality description, and diversity of the hosts have been reported by Linardi *et al.* (1991) for this material.

These mites were identified using the keys to genera by Radovsky (2010). Unlike what was stated by Linardi *et al.* (1991), our examination revealed that the material did not represent a new species of *Echinonyssus*, and was in fact *A. proechimys*. In addition, we compared the specimens with the original description of *A. proechimys* (Yunker and Saunders 1973). Images were obtained using an Olympus DP73 digital camera coupled with an Olympus BX43 microscope.

Order Mesostigmata Canestrini, 1891

Family Macronyssidae Oudemans, 1936

Genus *Acanthonyssus* Yunker and Radovsky, 1966

Diagnosis. *Acanthonyssus* can be separated from the other genera in Macronyssidae by the following sets of characters: peritremes elongated (Figure 1a); sternal shield wider than

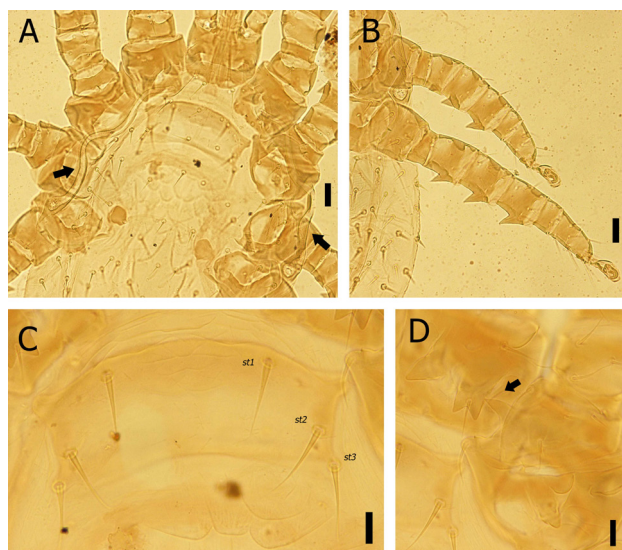


Figure 1. Morphological details of the females of *Acanthonyssus proechimys* Yunker and Saunders, 1973 (Mesostigmata: Macronyssidae) collected in Maracá Island, Roraima State. **A** – Dorsal region of the opisthosoma with the peritremes elongated, sinuous. Arrows highlight the peritremes; **B** – Legs I and II showing the ventral recurved spur in the proximal region of the segments Tfe III, Ge III-IV and Ti IV; **C** – sternal shield; **D** – Coxa I and II with ventral spurs. The arrow indicates the ventral spurs of coxae of the legs I and II. Abbreviations: *st1* = sternal setae 1; *st2* = sternal setae 2; *st3* = sternal setae 3. Scale bars: A–B = 20 µm; C–D = 10 µm. This figure is in color in the electronic version.

long (Figure 1c); presence of a recurved ventral spur in the proximal region of the leg segments Tfe IV, Ge II-IV and Ti IV (Figure 1b); all coxae with ventral spurs, sometimes bifid (Figure 1d).

Acanthonyssus proechimys Yunker and Saunders, 1973

Figure 1

Description. See Yunker and Saunders (1973).

Differential diagnosis. Compared to *A. dentipes*, *A. proechimys* has the peritreme starting from the middle of Cx I (Figure 1a), and the *st1* not reaching the posterior margin of the sternal shield (Figure 1c).

Descriptive notes. Comparing with the original description, no morphological differences were observed. In order to help the identification of future collected materials, Figure 1 highlights the diagnostic characters of *A. proechimys*.

Material examined. Three females (IBSP 17074A); Maracá Island, Roraima State, Brazil (3°24'04"N, 61°39'19"W); 10 Jan 1989; ex. *Proechimys* sp. (Rodentia: Echimyidae); P. M. Linardi coll.

Remarks on distribution. This is the first record for the genus *Acanthonyssus*, and *A. proechimys* in particular, in Brazil. Apart from this record from Maracá, no other specific locality record exists for *A. proechimys*, as the type locality in the original description was broadly defined only as Zulia state, in Venezuela. Yunker and Saunders (1973) state that they collected this species throughout the Venezuelan territory on several rodent hosts, mainly echimyid rodents, but do not mention specific localities. Therefore, the known distribution range of *A. proechimys* is based on two known locality records (Figure 2). The record described herein from Maracá Island is at a minimum distance of approximately 1400 km from the type locality in Zulia state.

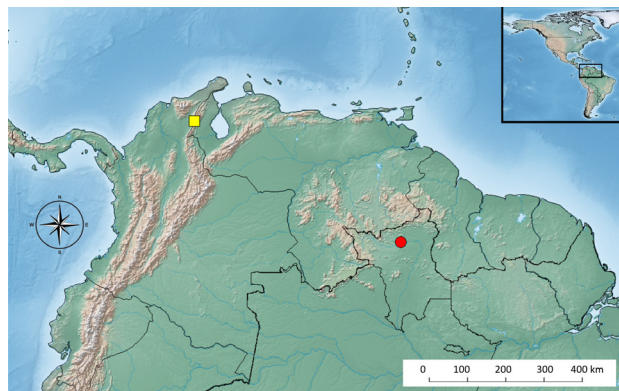


Figure 2. Known geographical distribution of *Acanthonyssus proechimys* Yunker and Saunders, 1973 (Mesostigmata: Macronyssidae). The yellow square represents the type locality, and the red dot is the new record. This figure is in color in the electronic version.

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REFERENCES

- Bassini-Silva, R.; Jacinavicius, F.C.; Huang-Bastos, M.; Dowling, A.P.G.; Barros-Battesti, D.M. 2021. A checklist of macronyssid species (Mesostigmata: Macronyssidae) from Brazil. *Journal of Medical Entomology*, 58: 625–633.
- Gomes-Almeida, B.K.; Pepato, A.R. 2021. A new genus and new species of macronyssid mite (Mesostigmata: Gamasina: Macronyssidae) from Brazilian caves including molecular data and key for genera occurring in Brazil. *Acarologia*, 61: 501–526.
- Jacinavicius, F.C.; Badari, J.C.; Ramirez, D.G.; Moraes, R.H.; Onofrio, V.C.; Barros-Battesti, D.M. 2013. Technique for restoration of mite (Acari) preparations in deteriorated Hoyer's medium. *Neotropical Entomology*, 42: 328–329.
- Linardi, P.M.; Botelho, J.R.; Rafael, J.A.; Valle, C.M.C.; Cunha, A.; Machado, P.A.R. 1991. Ectoparasitos de pequenos mamíferos da Ilha de Maracá, Roraima, Brasil. I. Ectoparasitofauna, registros geográficos e de hospedeiros. *Acta Amazonica*, 21: 131–140.
- Orlova, M.V.; Kazakov, D.V.; Orlov, O.L.; Mishchenko, V.A.; Zhigalin, A.V. 2017. The first data on the infestation of the parti-coloured bat, *Vespertilio murinus* (Chiroptera, Vespertilionidae), with gamasid mites, *Steatonyssus spinosus* (Mesostigmata, Gamasina, Macronyssidae). *Russian Journal of Theriology*, 16: 66–73.
- Oudemans, A.C. 1936. *Kritisch Historisch Overzicht der Acarologie, Deerde Gedeelte, 1805-1850*. Band A. E. J. Brill, Leiden, 430p.
- Radovsky, F.J. 2010. Revision of genera of the parasitic mite family Macronyssidae (Mesostigmata: Dermanyssoidea) of the world. Indira Publishing House, West Bloomfield, 160p.
- Strandtmann, R.W.; Eads, R.B. 1947. A new species of mite, *Ichoronyssus dentipes* (Acarina: Liponyssinae), from the cotton rat. *The Journal of Parasitology* 33: 51–56.
- Yunker, C.E.; Radovsky, F.J. 1966. The dermanyssid mites of Panama (Acarina: Dermanyssidae). In: Wenzel, R.L.; Tipton, V.J. (Ed.). *Ectoparasites of Panama*. Field Museum of Natural History, Chicago, p.83-103.
- Yunker, C.E.; Saunders, R.C. 1973. Venezuelan Macronyssidae. I. The genera *Acanthonyssus* Yunker & Radovsky, and *Argitis*, n. gen. *Journal of Medical Entomology* 10: 371–381.

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