

Rediscovering the diversity of Brazilian limno-terrestrial tardigrades: new species collected in the trees of the University of Campinas, SP, Brazil.

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Abstract

Due to the small size and the fragility of their bodies, that require specific handling and laboratory instruments, tardigrades have been little studied in terms of its taxonomy. In Brazil the limno-terrestrial tardigrades were not studied since the pioneers studies in the decades of 1940 and 1950. The present study aims to describe a new species of the genus *Milnesium* collected from Brazil using modern morphological techniques. This tardigrade is characterized by cuticle smooth, short cuticular bars under the claws IV, claw configuration [3-3][3-3] with internal and anterior spurs larger than external and posterior spurs, and dorsal pseudoplates.

Key words:

Tardigrada, *Milnesium*, taxonomy.

Introduction

Tardigrades are aquatic microinvertebrates (generally they measure 0,05-1,2 mm) that feature four pairs of telescoping legs terminated in claws or digits and a have fairly characteristic buccal apparatus. They are known due to their ability to undergo cryptobiosis, an extremely environmentally resistant state. Despite this, little is know about the diversity and distribution of the phylum Tardigrada. This issue is accentuated in South America, since the vast majority of studies are limited to the Palearctic. In Brazil, most of the studies were performed at least 80 years ago, based on a limited number of morphological characters. The present study aims to describe a new species of the genus *Milnesium* collected from Brazil using modern techniques for the study of the morphological features.

Results and Discussion

Several moss samplings was collected between November, 2017 and May, 2018 from trees in the Institute of Biology, University of Campinas, São Paulo, Brazil (22°49'14.5"S 47°04'08.8"W). The tardigrades collected were analysed using morphometrics, differential interference contrast (DIC) microscopy, scanning electron microscopy (SEM), and UV autofluorescence. A new species of the genus *Milnesium* was found. The *Milnesium* sp. nov. has a body yellowish to brownish and cuticle smooth, eyespot present (Fig.1B), six peribuccal papillae, two cephalic papillae, six peribuccal lamellae of unequal size (Fig.2C), claw configuration [3-3]-[3-3] with internal and anterior spurs larger than external and posterior spurs (Fig.1 A, C, Fig.2 B) primary branches on all legs with small accessory points (Fig.2B), secondary claws on all legs with rounded basal thickenings, and cuticular bars present under all claws (Fig.1 A, C). *Milnesium* sp. nov. most closely resembles *Milnesium shilohae* Meyer 2015, but differs from *M. shilohae* by the presence of short cuticular bars at the base of legs IV and by having the dorsum covered with pseudoplates (delineated geometric areas of cuticle) (Fig.2A).

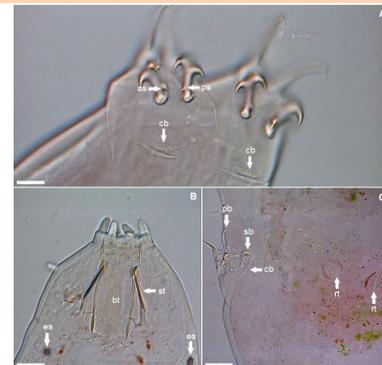


Figure 1. DIC. A- claws IV (as- anterior spur; ps- posterior spur); B- anterior region (bt- buccal tube; st- stylet; es- eyespot); C- claws II and stomach (pb- primary branch; sb- secondary branch; cb- cuticular bar; rt- rotifer mastax). Scale bars: 20µm.

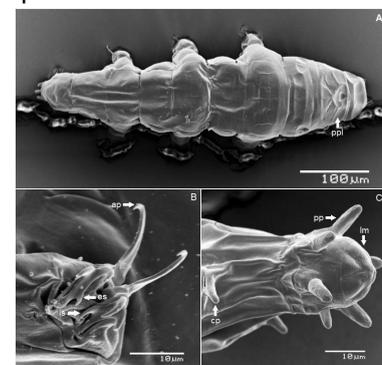


Figure 2. SEM. A- habitus, dorsal view (ppl- pseudoplates); B- claws I (es- external spur, is- internal spur); C- mouth (pp- papillae; lm- lamellae; cp- cephalic papillae).

Conclusions

To conclude, it is clear the importance of the taxonomic studies of tardigrades to understand the diversity and distribution of these animals, especially in regions that have been poorly studied that have a significant potential to reveal species that remains undiscovered.

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