Systematic review and cladistic analysis of the genus *Eusarcus*
Perty 1833 (Arachnida, Opiliones, Gonyleptidae)

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Abstract

Eusarcus Perty 1833 is one of the oldest described genera of Pachylineae, comprising 36 species distributed from northeastern to southern Brazil (including the central west region), northeastern Argentina, eastern Paraguay and Uruguay. The genus is reviewed and a new classification is proposed based on a cladistic analysis.

A cladistic analysis was performed with the 34 valid species of Eusarcus and 11 species belonging to certain Gonyleptidae subfamilies. The data matrix has 67 characters: 14 from dorsal scutum and pedipalp, 38 from male legs and femur, and number of tarsal articles) and did not allow for the inclusion of new characters. The rationale characters to propose taxonomical categories (i.e. armature of the ocularium, dorsal scutum and pedipalpal femur) and number of tarsal articles) and did not allow for the inclusion of new characters. The rationale

Introduction

The order Opilionidae includes about 6000 species (Machado et al. 2007; Hallan 2010) and is the third largest group in Arachnida. The study of Neotropical harvestmen began with European researchers, such as Kirby (1818), Perty (1833), Koch (1839a, b), among others. At that time, descriptions were not standardized and frequently lacked illustrations. A new system of studying them was proposed by the German researcher Carl F. Roewer (1912a, b). He standardized descriptions, illustrated species and proposed type species for many genera. However, his system (later referred to as the Roewerian system) relied heavily on sets of certain characters to propose taxonomical categories (i.e. armature of the ocularium, dorsal scutum and pedipalpal femur, and number of tarsal articles) and did not allow for the inclusion of new characters. The rationale

Key words: Brazilian fauna, taxonomy, Neotropical harvestmen, Pachylineae

Introduction

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behind his system of classification was to use the least number of characters to propose groups, based on the combination of the states of these characters. Thus many artificial groups were proposed. On the other hand, by this system, intraspecific variation was overlooked, several identical species were described under different names (e.g. Kury 1990), in addition to the creation of many monotypic genera.

Changes in the study of harvestmen began with the inclusion of information from genitalia, as highlighted by Šilhavý (1938, 1961), and by the adoption of cladistic analyses. The advantages of cladistic methodology over the Roewerian system are in not limiting the number of characters used in the analysis, and in the impartial way of optimizing these characters (using parsimony). As examples we can cite Shultz (1998), Shultz & Regier (2001) and Giribet et al. (2002), who tested the monophyly of the suborders and superfamilies and the relationships among them. However, there are few efforts in the lower categories, such as families or subfamilies, and the situation is even worse regarding laniatorean Neotropical species. There is only one family (Stygidae, see Pinto-da-Rocha 1997) and three subfamilies (Caelopyginae, see Pinto-da-Rocha 2002, Bourguyiinae, see Yamaguti & Pinto-da-Rocha 2009 and Stygnicranainae, see Orrico & Kury 2009) completely reviewed using cladistic methodology, and one family (Gonyleptidae, treated by Kury 1994), which was revised focusing on early lineages. A more robust theory of relationships among species of Gonyleptidae was proposed by Pinto-da-Rocha (2002), but no data matrix or character list was provided. Nowadays the great challenge in harvestmen systematics is to propose monophyletic groups based on cladistic analysis in an attempt to solve the “taxonomic nightmare” (Kury 2003a) inherited by the Roewerian system.

The subfamily Pachylinae is the largest one proposed in Gonyleptidae (the largest family of the suborder Laniatores), and it is polyphyletic (Pinto-da-Rocha 2002). Among the oldest genera in Pachylinae, the genus *Eusarcus* Perty stands out as one of the most species-rich, with 31 species (Kury 2003a). The genus was once briefly reviewed in a catalogue by Soares & Soares (1954b) but they have neither redescribed the species nor presented an identification key. As a consequence, one finds it difficult to identify very similar species, besides raising doubts regarding their identities. Nowadays the identifications of species of *Eusarcus* are still based on the poor descriptions (for modern standards) of ca. half a century ago. Thus a comprehensive review is needed to better describe the richness of the genus as well as test its monophyly.

The goal of this study is to revise this genus, to propose relationships among its species and to propose a new classification based on a cladistic analysis.

**Historical aspects of Eusarcus Perty 1833**

Perty (1833) created the genus *Eusarcus* when he described four species collected on the trip of Spix and Martius through Brazil: *E. grandis*, *E. pumilio*, *E. armatus* and *E. muticus*, but he did not designate a type species. Koch (1839a, b) first revised the genus and transferred *E. grandis* and *E. muticus* to *Gonyleptes* Kirby, and redescribed and synonymized *E. pumilio* under *E. armatus*. Although Kollar (in Koch 1839a) described *E. oxyacanthus* in the same book, Koch (1839a) did not subsequently designate a type species for the genus. Roewer (1913) redescribed the genus, designating *E. armatus* as the type species, and also established five other genera which are closely related to *Eusarcus*: *Eusarcoides*, *Metapucrolia*, *Neopucrolia*, *Orguesia* and *Pucrolioides*. Mello-Leitão (1932) established *Enantiocentron*, which is very similar to *Eusarcus*, but the ocularium is unarmed. The same author (1935a) established another genus which is also related to *Eusarcus*: *Pareusarcus*. Piza (1940a) established *Goyazia*. Canals (1943) noticed that *Pareusarcus* was a homonym because this name had already been used by Roewer (1929) and proposed the substitute name *Pindaiba*. At the same time, Roewer (1943) also noticed this nomenclatural mistake and proposed the substitute name *Papageia*.

B. Soares (1943a), after examining specimens of *Enantiocentron aduncum* Mello-Leitão, and consulting the diagnosis of *Eusarcus* in a key elaborated by Mello-Leitão (1940), verified that the ocularium varies from the unarmed state to a state with a pair of tubercles or spines. Therefore, he proposed the synonymy of *Enantiocentron*, *Pareusarcus* and *Goyazia* with *Eusarcus*. On that occasion, we can observe changes in the Roewerian system, with the acceptance of variation in some structures used to diagnose genera.
Mello-Leitão (1945) agreed with B. Soares (1943a) findings and also proposed the synonymy of *Eusarcoïdes* with *Eusarcus*. He alleged that the presence of two subapical setae on the pedipalpal femora of *Eusarcoïdes* could be an “accident”. In the same article, he considered the type species of *Goyazia, G. sulcata*, as a valid species (as *Eusarcus sulcatus*), but he suggested it could be the female of *E. bifidus*. Soares & Soares (1954b), in their large monograph which catalogued all the Pachylinae known at that time, proposed the synonymy of *Neopucrolia, Pucrolioides* and *Papageia* with *Eusarcus*, without giving any explanation. At that time, the tendency to synonymize genera and/or species is evident and this lasted until the end of the 80’s. Ringuelet (1957a) proposed the synonymy of the monotypic genera *Neopucrolia* with *Pucrolioides*, with reports of poecilandry (male polymorphism) in *E. argentinus* (formerly *Pucrolioides argentina* Roewer 1913 and *Neopucrolia pectinigera* Roewer 1913). The same study later appeared in a more detailed form (Ringuelet 1959).

After these studies, H. Soares (1966b, c) described *E. maquinensis* and *E. grumani*. Soares & Soares (1985) published the last important work related to *Eusarcus*, proposing the synonymy of *Metapucrolia armata* Roewer 1913 (type species) with *E. argentinus*. They were clearly influenced by Ringuelet, and proposed this nomenclatural act without examining the type material. Such an action reveals an excessive tendency to propose synonymies, mistakenly relegating differences between species to intraspecific variation, and showing a lack of concern in examining type material to verify the identity of the species.

After all these studies, *Eusarcus* contained 29 species, and until 2003 this genus was only mentioned in faunistic surveys or in catalogues of collections in museums. Kury (2003a), in his catalogue, proposed the synonymy of *Orguesia* (type species *O. armata* Roewer 1913) under *Eusarcus* and proposed the replacement name *E. organensis* to avoid homonymy with the type species, *E. armatus*. Finally, the same author (2008) described *E. elinae*. Therefore, the genus is presently composed of 31 species. For a summary see Table 1.

**TABLE 1.** Summary of the main taxonomic publications on the genus *Eusarcus* Perty 1833.

<table>
<thead>
<tr>
<th>Publication</th>
<th>Taxonomical act</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perty (1833)</td>
<td>Description of the genus <em>Eusarcus</em>, with the species <em>E. grandis, E. muticus, E. armatus</em> and <em>E. pumilio</em>.</td>
</tr>
<tr>
<td>Koch (1839b)</td>
<td>Transfer of <em>E. grandis</em> and <em>E. muticus</em> to <em>Gonyleptes</em>; <em>E. pumilio</em> placed in the synonymy of <em>E. armatus</em>.</td>
</tr>
<tr>
<td>Roewer (1913)</td>
<td>Establishment of <em>E. armatus</em> as type species; establishment of <em>Eusarcoïdes, Metapucrolia, Neopucrolia</em> and <em>Pucrolioides</em>.</td>
</tr>
<tr>
<td>Mello-Leitão (1932)</td>
<td>Establishment of <em>Enantiocentron</em>.</td>
</tr>
<tr>
<td>Mello-Leitão (1935a)</td>
<td>Establishment of <em>Pareusarcus nec</em> Roewer 1929.</td>
</tr>
<tr>
<td>Piza (1940a)</td>
<td>Establishment of <em>Goyazia</em>.</td>
</tr>
<tr>
<td>Roewer (1943)</td>
<td>Proposal of replacement name <em>Papageia</em> for <em>Pareusarcus</em> Mello-Leitão 1935.</td>
</tr>
<tr>
<td>B. Soares (1943a)</td>
<td><em>Enantiocentron, Pareusarcus</em> and <em>Goyazia</em> placed in the synonymy of <em>Eusarcus</em>.</td>
</tr>
<tr>
<td>Mello-Leitão (1945)</td>
<td>Acceptance of the proposition of B. Soares (1943a) and placement of <em>Eusarcoïdes</em> in the synonymy of <em>Eusarcus</em>.</td>
</tr>
<tr>
<td>Soares &amp; Soares (1954b)</td>
<td><em>Neopucrolia, Pucrolioides</em> and <em>Papageia</em> are also considered synonyms of <em>Eusarcus</em>.</td>
</tr>
<tr>
<td>Ringuelet (1957a, 1959)</td>
<td>Explanation of the synonymy between <em>Neopucrolia</em> and <em>Pucrolioides</em> and their placement as synonyms of <em>Eusarcus</em>.</td>
</tr>
<tr>
<td>Kury (2003b)</td>
<td>Transfer of <em>O. armata</em> Roewer 1913 from <em>Gonyleptinae</em> to <em>Pachylinae</em>, <em>Eusarcus</em>; proposal of replacement name <em>E. organensis</em> for <em>O. armata</em> to avoid homonymy with <em>E. armatus</em> (type species).</td>
</tr>
</tbody>
</table>
**Material and methods**

**Material examined:** The acronyms of institutions, names of the collections studied and their depository follow Pinto-da-Rocha (1997, 2002) and Kury (2003a), and are listed below. The curators of the respective collections are in parentheses.

- **IBSP** Instituto Butantan; Laboratório de Artrópodes Peçonhentos, São Paulo, São Paulo, Brazil (A. Brescovit).
- **FCE** Facultad de Ciencias, Sección Entomología, Montevideo, Montevideo, Uruguay (M.R. Simó).
- **MHNC** Museu de História Natural Capão de Imbuia, Paraná, Curitiba, Brazil (J.C. de Moura Leite).
- **MZSP** Museu de Zoologia da Universidade de São Paulo, São Paulo, São Paulo, Brazil (R. Pinto-da-Rocha). The material indicated as “DZ” or “MZUSP” on the labels belongs to this institution, and was standardized as “MZSP”. Otto Schubart’s private collection was incorporated into this institution.
- **MNRJ** Museu Nacional do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, Brazil (A.B. Kury). The material labeled as “HEMS” (Hélia E. M. Soares’ private collection, which includes E.W. Gruman’s private collection), also belongs to this institution.
- **MZLQ** Museu de Zoologia “Luiz de Queiroz”, Escola Superior de Agricultura, São Paulo, Piracicaba, Brazil (M. Inomoto).
- **SMF** Naturmuseum Senckenberg, Frankfurt am Main, Germany (P. Jäger).
- **UNB** Universidade de Brasília, Distrito Federal, Brasília, Brazil (P. Motta).
- **ZMB** Institut für Systematische Zoologie, Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany (J. Dunlop).
- **ZMUC** Zoologisk Museum, Universitet København, Copenhagen, Denmark (N. Scharff).

To verify synonymies, we tried to examine all the type material. We succeeded in examining most of it, except for:

- **Bacigalupo tenax** Mello-Leitão 1933: Due to changes in the loan policy of biological material between Brazil and Argentina, this material could not be examined. However, Ringuelet (1959) provided a satisfactory redescription, including an examination of all the type material, with many remarks. Thus, we agree with Ringuelet (1959) regarding the synonymy of this species with *Pygophalangodus canalsi* (Mello-Leitão 1930).
- **Eusarcus aberrans** Mello-Leitão 1939a: Depository unknown. Not found in MNRJ, the main institution where Mello-Leitão worked.
- **Eusarcus armatus** Perty 1833: The type material was deposited in the Zoologische Staatssammlung München. According to Kury (2003a), this material has been lost, as is the case in many other species described by Perty.
- **Eusarcus dubius** B. Soares 1943b: Although the material has been cited many times as having been deposited in MHNC, it could not be found there.
- **Eusarcus nigrimaculatus** Mello-Leitão 1924: The type material should have been deposited in MNRJ, but was not found.
- **Eusarcus pusillus** Sørensen 1884: The syntypes were dried and pinned. We examined detailed pictures of this material kindly sent by the curator N. Scharff and by J.P. Guadanucci.
- **Eusarcus sulcatus** (Piza 1940a): Although type material should be deposited in MZLQ or MZSP, it was not found in these institutions.
- **Eusarcus tripus** Mello-Leitão 1940: The type material should have been deposited in MZSP, but was not found there. This was already stated by Soares & Soares (1954b).
- **Metapucrolia armata** (Sørensen 1895) (originally described as *Pucrolia armata*): According to Soares & Soares (1954b) this material should (probably) have been deposited in the Museo Regionale di Scienze
Naturali di Torino (Torino, Italy). Many attempts to contact the curator were made but no answer was obtained.

**Abbreviations:** The synonymic listing is accompanied by abbreviations that characterize the citation: bion = bionomical data; by implic = by implication (in a taxonomic discussion; for example, a generic level synonymy will consequently affect the nomenclature of the species of the synonymized genus); cat = catalogue; cit = citation; com descr = complementation of original description (increment of characters for a published description); descr = description (for example, description of a female); diag = diagnosis; dist = new data on geographical distribution; lapsus = wrong orthography; misid = misidentification verified by somebody and published in an article or verified by us; nom nov = nomen novum, i.e. new name created to replace a preoccupied name; pars = part; rdesc = redescription; syn = junior synonym ; syst = systematic discussion; wr il = wrong illustration (belongs to another species).

In examined material, **ma** stands for male, **fe** for female, and **im** for immatures. As occurs in many other species of harvestmen, there is also dimorphism in males of *Eusarcus*, i.e. at least two morphologically distinct forms of male exist (see Silva & Kury 2007 and references therein). The main morphological differences between them are found in the size and armature of leg IV: one form has larger body size and a well developed armature (spines and apophyses) of leg IV, whereas the other is smaller and has a less developed armature of leg IV, sometimes resembling that of the female. Two competing hypotheses explain this dimorphism: according to Gnaspini *et al.* (2004), it is due to two different adult instars, or according to Tsurusaki & Fujikawa (2004), it is due to different reproductive strategies. We decided to refer to the larger morph (alpha) simply as **ma**, whereas the other type (with weaker armature) as **beta ma**. For discussion on intrasexual variation in Laniatores see Machado *et al.* (2009) and Ferreira & Kury (2010). We do not use the latter abbreviation when referring to holotypes or lectotypes.

Information from the labels of type material was transcribed and is between parentheses after its citation in the synonymic listing. Additional information from the labels is between brackets, such as the municipality where the material was collected.

**Descriptions:** Generic characters were not repeated in specific descriptions. Redescriptions were preferentially made on type material. When type material was damaged, we chose another specimen in a better condition. Female characters were only mentioned in the (re)descriptions when they differ from those of males. When the chosen specimen to be described did not possess certain parts of the body, we completed such information based on other specimens in the “variation in male” or “variation in female” paragraph. Measurements are in millimeters. The nomenclature of the relative position of the structures of the body and appendages follow Acosta *et al.* (2007). The area usually referred to as scutal area V is here called as the posterior margin of the dorsal scutum. In some species, such as *E. acrophthalminus*, *E. alpinus*, *E. didactylus*, *E. geometricus* and *E. nigrimaculatus*, the trochanter IV bears a morphologically complex prolateral median apophysis. To facilitate the description of this apophysis, we called it a process. The following abbreviations were repeatedly used in the descriptions: paramedian apophyses on anterior margin of prosoma, located ectally to chelicera = PAM (Fig. 2A); prodorsal apical spine on femur IV = PDS (Fig. 2G); retrodorsal apical spine on femur IV = RDS (Fig. 2G); proventral apical spine on femur IV = PVS (Fig. 2H); retroventral apical spine on femur IV = RVS (Fig. 5F); scutum length = SL; maximum scutum width = SMW.

The color of the material is that in 70% ethanol. The number of tubercles on the dorsal scutum and on the appendages was not taken into account to describe intraspecific variation. Such aspects were only (re)described in females when they differ considerably from those of the male. Descriptions of the species are based on the specified specimens. The diagnoses refer only to males since females are difficult to identify at the specific level, as will be discussed in “Remarks on females”.

**Illustrations:** The illustrations of external general morphology were made under a stereomicroscope using a camera lucida. The material was immersed in 70% ethanol to avoid desiccation and the formation of bubbles of air in the specimens. Genitalia were prepared following methods described in Pinto-da-Rocha (1997), and illustrated using a compound microscope with a camera lucida.

**Maps of distribution of the species:** We used the computer software “ESRI Arcview 3.2” to make the maps with the distribution of the species. The records of geographical distribution were taken from labels of
the examined materials or information provided by the collector/curator from books of records of the museum collections. Doubtful records were not used in the maps, but were mentioned in “examined material” and “distribution” with the adequate remark. The coordinates of geographical records were obtained from data banks of the National Geospatial - Intelligence Agency (NGA), Falling Rains Genomics, Inc., Traveljournals.net, and from IBGE (Instituto Brasileiro de Geografia e Estatística), all available on the internet. The coordinates of the caves are from Trajano (1987), Gnasini & Trajano (1994) and Pinto-da-Rocha (1995).

**Statistical analyses:** We used statistical analyses in one instance (*E. aduncus* and *E. cavernicola* sp. n.) to evaluate whether we had two morphometrically distinct species or not. The following parts of male specimens were measured: length of dorsal scutum (SL), length of pedipalps (Pdp); length of leg I (LI), leg II (LII), leg III (LIII) and leg IV (LIV); and tarsus I (TrsI). The lengths of legs were measured from the trochanter to the last tarsal segment. We used the ratio between the length of the legs (and pedipalps and tarsus I) and the length of the dorsal scutum to avoid the influence of body size in statistical analysis. Using such a procedure, we also avoided the formation of clusters of “small” or “large” specimens, as these occur in both species. We first performed a cluster analysis with the Ward method (Johnson & Wichern 1998; Hair et al. 1998) using the SPSS 17.0 computer software. Box-plot graphics were employed to describe the quartile, maximum and minimum values of the variables by grouping. We used a multivariate analysis of variance (MANOVA) to detect whether there was difference among means of the six measures between the two species and Student’s t test to identify which measures presented that difference.

**Outgroups:** The outgroups were chosen based on the hypothesis published by Pinto-da-Rocha (2002). The specimens, collection number, collecting data and depositories are in the list below. Note that species in this list are given in the nomenclature that was used before the present cladistic analysis was performed.

- **Bourguyia albiornata** Mello-Leitão 1923b (Bourguyiinae); BRAZIL; São Paulo; Santo André (Alto da Serra); without name of collector and date; 9 ma syntypes; MZSP 1513. Type species of *Bourguyia* Mello-Leitão 1923b.
- **Cobania picea** (Bertkau 1880) (Cobaniinae); BRAZIL; Minas Gerais; Itamonte (Parque Nacional Itatiaia, Vale dos Lírios); A. Kury, R. Pinto-da-Rocha & L. Mestre leg., 04.ii.1997; 1 ma & 3 fe; MZSP 21285. Type species of *Cobania* Roewer 1913.
- **Pseudopucrolia mutica** (Perty 1833) (Heteropachylinae); BRAZIL; Sergipe; Santo Amaro das Brotas (Gravatá); without name of collector; 02.ix.1979; 2 ma & 8 fe; MZSP 11328. Type species of *Pseudopucrolia* Roewer 1912.
- **Antetriceras signatus** Roewer 1949 (Pachylinae); BRAZIL; Rio de Janeiro; Municipality unknown (Terra Vermelha); without name of collector and date; ma holotype; SMFD RII 5078/12. Type species of *Antetriceras* Roewer 1949.
- **Bunoplus pachypalpis** Roewer 1927 (Pachylinae); BRAZIL; Rio de Janeiro; Mendes; M. Eugenio leg.; 1945; 1 ma & 1 fe; MZSP 1713. Type species of *Bunoplus* Roewer 1927.
- **Discocyrtus testudineus** (Holmberg 1876) (Pachylinae); ARGENTINA; Córdoba (Ramón J. Carcano); Luís Eduardo Acosta leg.; 25.x.1986; 1 ma & 1 fe; MZSP 16042. Type species of *Discocyrtus* Holmberg 1878.
- **Graphinotus ornatus** Kollar in Koch 1839a (Pachylinae); BRAZIL; Rio de Janeiro; Teresópolis; Wygodzinsky leg.; i.1948; 1 ma & 1 fe; MZSP 1112. Type species of *Graphinotus* Koch 1839a.
- **Metagraphinotus catharinensis** Mello-Leitão 1927 (Pachylinae); BRAZIL; Santa Catarina; without name of collector and date; 1 fe paratype; SMF 945/29. Type species of *Metagraphinotus* Mello-Leitão 1927.
- **Metagraphinotus berlae** (Mello-Leitão 1932) (Pachylinae); BRAZIL; Rio de Janeiro; Rio de Janeiro (Jacarepaguá); without name of collector and date; ma holotype; MNRJ 1395.
- **Metagraphinotus sooretamae** Soares & Soares 1946a (Pachylinae); BRAZIL; Espírito Santo; Linhares (Refúgio Sooretama); Schubart leg.; 14.x.1944; ma holotype; MZSP 2936.
- **Ogloblinia intermedia** B. Soares 1944a (Pachylinae); BRAZIL; São Paulo; Santo André (Alto da Serra); without name of collector; 1943; 6 ma, 3 fe & 1 im; MZSP 1772.
Pygophalangodus gemignanii gemignanii (Mello-Leitão 1931b) (Pachyliniae): ARGENTINA; Entre Ríos; Federal; C. Daguerre leg.; 3 ma & 1 fe syntypes; MACN 4577. Type species of Pygophalangodus Mello-Leitão 1931.

Pygophalangodus gemignanii uruguayensis Ringuelet 1955a (Pachyliniae): URUGUAY; Rivera; Rivera; without name of collector; 15.vii.1951; ma holotype & 1 fe paratype; FCE.

Based on Kury (1994), we decided to root the tree in Cobania picea. We kept the name O. intermedia since there are doubts regarding its synonymy with O. loretoensis Canals 1933 (R. Pinto-da-Rocha pers. obs.).

**Cladistic analysis:** An important step in a cladistic analysis is character coding, since a different coding may result in different tree topologies. This subject has been discussed in many articles (e.g. Wilkinson 1995, Hawkins et al. 1997 and Strong & Lipscomb 1999), and there is no consensus as to which is the best way to code characters. This is because proposed character codings have advantages and disadvantages (Hawkins et al. 1997 and Strong & Lipscomb 1999). We opted for reductive coding (Maddison 1993), in which the morphological trait (e.g. tail) is coded as “present” and “absent” and its color, as inapplicable (“?” or “-”), “blue” and “red”. Although reductive coding has disadvantages, such as construction of a spurious tree, because inapplicable data are considered as existing states (Strong & Lipscomb 1999), it is superior to other methods as far as respecting the principle of independence (among characters) and non-redundancy are concerned (Strong & Lipscomb 1999). The characters were not ordered and were equally weighted. Character polarization followed the method proposed by Nixon & Carpenter (1993), in which parsimony analysis using outgroups and ingroups simultaneously indicates the plesiomorphic state of a given character.

We edited the character matrix using the NDE 0.5.0 computer software (Page 2001). The computer programs used for tree construction were NONA vers. 2.0 (Goloboff 1998) with Winclada (Nixon 2002) and PAUP* vers. 4.0b10 (Swofford 2002).

When using NONA, we performed 1000 replications of tree constructions using random sequences of addition of taxa, and submitting the most parsimonious trees to a branch swapping process by TBR (“Tree Bisection and Reconnection branch swapping”, Swofford 1991) using the command mult*1000, retaining the 1000 most parsimonious trees by replication until reaching a maximum of 10,000 trees (using command “hold 10000; hold/1000), and submitting the shortest trees to another sequence of TBR (using "mult*max*"). When using PAUP*, we used similar strategies of tree search, although we retained less parsimonious trees by replication (100) and increased the number of replications (2500).

We calculated Bremer support (Bremer 1994) using PAUP* to evaluate clade support. Bremer support is the number of steps needed to collapse a certain clade in the tree. It can be calculated by PAUP* by defining the clade of interest (using command “constraint”) and then performing a (heuristic) search in which the clade is collapsed (using command “enforce converse constraint= clade of interest”). The difference in the number of steps between the tree with the clade of interest collapsed and the most parsimonious one, is the value of Bremer support for this clade.

When characters needed optimization due to ambiguity, we opted for ACCTRAN to preserve the hypothesis of primary homology (de Pinna 1991). ACCTRAN optimization is derived from “accelerated transformation optimization”, i.e. the character state change is optimized to “accelerate” the change to another state from the tip to the root of the tree, thus homoplasy is considered as reversals instead of parallelisms. On the other hand, DELTRAN optimization is derived from the expression “delayed transformation optimization”, i.e. the character state change is optimized to “delay” its change to the other state from the root to the tip of the tree, thus homoplasies are optimized as parallelisms. As de Pinna (1991) stated, ACCTRAN optimization should be chosen to “preserve the primary homology as long as possible within the constraints of parsimony”, although recently there are voices stating that there are no theoretical ground for it (Agnarsson & Miller 2008).

To facilitate presentation of the results and discussion of characters, we used the notation group+, proposed by Amorim (1982). This notation is used to refer to early branches of the dichotomy including the taxon of interest. Therefore, when we use X y+, we mean species X y plus its sister group. An advantage of this notation is that each basal branch may be referred to with precision, without the creation of new names. We also adopted the notation A:b, in which A stands for the character number and b for the character state.
**Cladistics**

This is the first attempt of a cladistic analysis of *Eusarcus*, currently placed in the probably non-monophyletic subfamily Pachyliinae (see Pinto-da-Rocha 2002). We used a matrix of 41 taxa (11 taxa belonging to the outgroup at the beginning of the analysis) and 67 characters (Tables 2 and 3). The 67 characters are distributed as follows: 13 characters of the dorsal scutum, one of the pedipalp, 38 of male legs III/IV and 15 of male genitalia.

**TABLE 2.** List of characters and character states used in cladistic analysis. All characters referring to legs and genitalia are for males.

<table>
<thead>
<tr>
<th>Character</th>
<th>States</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Paramedian apophyses (PAM) on anterior margin of prosoma, located ectally to chelicera</td>
<td>0. Absent (Fig. 8A); 1. Present (Fig. 2A).</td>
</tr>
<tr>
<td>2  Ocularium height</td>
<td>0. Low (distance between “roof” of ocularium and apical edge of eye is inferior to half of eye diameter) (Fig. 5B); 1. Medium (distance between “roof” of ocularium and apical edge of eye is slightly superior to half of eye diameter to almost the entire eye diameter) (Fig. 3B); 2. High (distance between “roof” of ocularium and apical edge of eye is superior to at least 1.1 times the eye diameter) (Fig. 2B).</td>
</tr>
<tr>
<td>3  Distance between eye and carapace surface</td>
<td>0. Very small (around half of the eye diameter below the carapace surface) (Fig. 5B); 1. Small (the ventral edge of eye just above the carapace surface) (Fig. 3B); 2. Large (the ventral edge of eye at least a quarter of the eye diameter above the carapace surface) (Fig. 2B).</td>
</tr>
<tr>
<td>4  Paired armature of ocularium</td>
<td>0. Absent; 1. Present (Fig. 2A).</td>
</tr>
<tr>
<td>5  Type of paired armature of ocularium</td>
<td>0. A pair of large tubercles (height inferior to diameter, standing out from the other tubercles covering ocularium) (Fig. 4A,B); 1. A pair of high tubercles (height superior to diameter) (Fig. 2A,B); 2. A median spine (bifid or not; see discussion of characters 4–7 in “cladistics”) (Figs. 7A,B; 52B; 53C,D).</td>
</tr>
<tr>
<td>6  Unpaired armature of ocularium</td>
<td>0. Present (Fig. 6A,B); 1. Absent.</td>
</tr>
<tr>
<td>7  Type of unpaired armature of ocularium</td>
<td>0. Large tubercle; 1. Median spine (Fig. 6A,B).</td>
</tr>
<tr>
<td>8  Unpaired armature of scutal area III</td>
<td>0. Absent; 1. Present (Fig. 2A).</td>
</tr>
<tr>
<td>9  Curvature of spine on scutal area III</td>
<td>0. Curved only subapically (Fig. 2B); 1. Curved over its entire length (Fig. 3B); 2. Straight (Fig. 6B).</td>
</tr>
<tr>
<td>10 Distance between ocularium and anterior scutal margin</td>
<td>0. Long (Fig. 3A,B); 1. Short (Fig. 2A,B)</td>
</tr>
<tr>
<td>11 Dorsal scutum length to width ratio</td>
<td>0. Wider than longer; 1. Longer than wider.</td>
</tr>
<tr>
<td>12 Thickness of opisthosomal part of dorsal scutum</td>
<td>0. Flattened (the thickest scutal area of same or inferior thickness as carapace); 1. Inflated (the thickest scutal area superior to carapace thickness) (Fig. 2B).</td>
</tr>
<tr>
<td>13 External row of tubercles on lateral margin of dorsal scutum</td>
<td>0. With low tubercles (height inferior to diameter, standing out from the other tubercles covering dorsal scutum; blunt) (Fig. 2A); 1. With high tubercles (height superior to diameter, standing out from the other tubercles), in some cases becoming pointed (Fig. 18A).</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Character</th>
<th>States</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Ventro-basal tubercle of pedipalpal femur</td>
<td>0. Present; 1. Absent.</td>
</tr>
<tr>
<td>15 Proventral row of tubercles on tibia III</td>
<td>0. Tubercles of similar-size or slightly enlarged (Fig. 5J);</td>
</tr>
<tr>
<td></td>
<td>1. With a series of tubercles increasing in size medially or subapically (Fig. 2E).</td>
</tr>
<tr>
<td>16 Retroventral row of tubercles on tibia III</td>
<td>0. Tubercles of similar-size or slightly enlarged (Fig. 5J);</td>
</tr>
<tr>
<td></td>
<td>1. With a series of tubercles increasing in size medially or subapically (Fig. 2E).</td>
</tr>
<tr>
<td>17 Length of male coxa IV (using its retrolateral margin as reference)</td>
<td>0. Coxa IV reaching beyond scutal groove IV (Fig. 2A);</td>
</tr>
<tr>
<td></td>
<td>1. Coxa IV reaching between scutal grooves III and IV (Fig. 16A).</td>
</tr>
<tr>
<td>18 Width of coxa IV (in dorsal view)</td>
<td>0. Greatly developed (visible in all extension, apically far from the body);</td>
</tr>
<tr>
<td></td>
<td>1. Developed (visible in all extension, apically next to the body)</td>
</tr>
<tr>
<td></td>
<td>2. Slightly developed (visible only apically) (Fig. 3A).</td>
</tr>
<tr>
<td>19 Insertion of prolateral apical apophysis of coxa IV (using angle between the longitudinal axis of the body and the retrolateral margin of coxa IV prolateral apophysis)</td>
<td>0. Oblique (below 60 degrees) (Fig. 2A);</td>
</tr>
<tr>
<td></td>
<td>1. Almost transversal, i.e. 90 degrees (Fig. 22A).</td>
</tr>
<tr>
<td>20 Length of prolateral apical apophysis of coxa IV</td>
<td>0. Short (up to 1/4 of coxa IV length) (Fig. 3A);</td>
</tr>
<tr>
<td></td>
<td>1. Medium (from 1/3 to circa 1/2 of coxa IV length) (Fig. 2A);</td>
</tr>
<tr>
<td></td>
<td>2. Long (more than 3/4 of coxa IV length) (Fig. 30A).</td>
</tr>
<tr>
<td>21 Prolateral apical apophysis of coxa IV</td>
<td>0. Simple (Fig. 2A,C);</td>
</tr>
<tr>
<td></td>
<td>1. Bifurcated.</td>
</tr>
<tr>
<td>22 Ventral curvature of prolateral apical apophysis of coxa IV</td>
<td>0. Slightly curved (Fig. 2C);</td>
</tr>
<tr>
<td></td>
<td>1. Very arched (Fig. 5C);</td>
</tr>
<tr>
<td></td>
<td>2. V-shaped (Fig. 6C).</td>
</tr>
<tr>
<td>23 Dorso-ventral direction of prolateral apical apophysis of coxa IV</td>
<td>0. Upwards;</td>
</tr>
<tr>
<td></td>
<td>1. Downwards;</td>
</tr>
<tr>
<td></td>
<td>2. Almost straight (not clearly pointing upwards or downwards).</td>
</tr>
<tr>
<td>24 Apical area of prolateral apical apophysis of coxa IV</td>
<td>0. Conical pointed (Fig. 3C);</td>
</tr>
<tr>
<td></td>
<td>1. Conical blunt (Fig. 7C);</td>
</tr>
<tr>
<td></td>
<td>2. Uniformly inflated in distal third (visible in dorsal view) (Fig. 2A, F);</td>
</tr>
<tr>
<td></td>
<td>3. Flattened (Fig. 6C).</td>
</tr>
<tr>
<td>25 Retrolateral apical apophysis of coxa IV</td>
<td>0. Present (Fig. 30D,E);</td>
</tr>
<tr>
<td></td>
<td>1. Absent.</td>
</tr>
<tr>
<td>26 Projections on retrolateral margin of prolateral apical apophysis of coxa IV</td>
<td>0. Absent; 1. Present (Fig. 2A,C).</td>
</tr>
<tr>
<td>27 Ventral basal projection of prolateral apical apophysis of coxa IV</td>
<td>0. Absent; 1. Present (Fig. 18C).</td>
</tr>
<tr>
<td>28 Retrolateral median apophysis of trochanter IV</td>
<td>0. Present (Fig. 30D,E);</td>
</tr>
<tr>
<td></td>
<td>1. Absent.</td>
</tr>
<tr>
<td>29 Retrolateral apical apophysis of trochanter IV</td>
<td>0. Present (Fig. 30D,E);</td>
</tr>
<tr>
<td></td>
<td>1. Absent.</td>
</tr>
<tr>
<td>30 Prolateral basal apophysis of trochanter IV</td>
<td>0. Absent; 1. Present (Fig. 7E).</td>
</tr>
<tr>
<td>31 Prolateral anterior median apophysis of trochanter IV</td>
<td>0. Present (Fig. 5A,E,F);</td>
</tr>
<tr>
<td></td>
<td>1. Absent.</td>
</tr>
<tr>
<td>32 Length of prolateral anterior median apophysis of trochanter IV</td>
<td>0. Short (length about a third of trochanter IV width);</td>
</tr>
<tr>
<td></td>
<td>1. Medium (length about half of trochanter IV width) (Fig. 9A,E,F);</td>
</tr>
<tr>
<td></td>
<td>2. Little developed (length about 1/4 of trochanter IV width) (Fig. 5A,E,F).</td>
</tr>
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<table>
<thead>
<tr>
<th>Character</th>
<th>States</th>
</tr>
</thead>
<tbody>
<tr>
<td>33 Prolateral posterior median apophysis of trochanter IV</td>
<td>0. Absent; 1. Present (Figs. 2F,3E,5E).</td>
</tr>
<tr>
<td>34 General shape of prolateral posterior median apophysis of trochanter IV</td>
<td>0. Conical (Fig. 3E); 1. Cylindrical (Figs. 2F,4E).</td>
</tr>
<tr>
<td>35 Prolateral apical apophysis of trochanter IV</td>
<td>0. Present (Fig. 5E); 1. Absent.</td>
</tr>
<tr>
<td>36 Length of prolateral apical apophysis of trochanter IV</td>
<td>0. Medium (length of apophysis about half to entire trochanter width) (Fig. 9E); 1. Short (length of apophysis about a third of trochanter width) (Fig. 7E); 2. Long (apophysis at least 1.2 times longer than entire trochanter width) (Fig. 5E).</td>
</tr>
<tr>
<td>37 Insertion of prolateral apical apophysis of trochanter IV</td>
<td>0. Dorsal (Fig. 15F); 1. Prolateral (Fig. 5E).</td>
</tr>
<tr>
<td>38 Dorso-ventral curvature of femur IV (curvature evaluated as indicated in Fig. 2H)</td>
<td>0. Very curved (more than 0.32) (Fig. 5D); 1. Moderately curved (between 0.17 and 0.3) (Fig. 3D); 2. Almost straight (Below than 0.15) (Fig. 4D).</td>
</tr>
<tr>
<td>39 Prolateral row of tubercles on femur IV</td>
<td>0. Tubercles of similar-size or slightly enlarged (Fig. 2F); 1. With high tubercles, forming a series (standing out from those which cover the dorsum of the podomere; in most cases the height is superior to tubercle width) (Figs. 19F,20F,H).</td>
</tr>
<tr>
<td>40 Retrolateral row of tubercles on femur IV</td>
<td>0. Present (Fig. 5F); 1. Absent (Fig. 30D,E).</td>
</tr>
<tr>
<td>41 Tubercle size in retrolateral row of tubercles on femur IV</td>
<td>0. Tubercles of similar-size or slightly enlarged (Fig. 2G); 1. With high tubercles forming a series (standing out from those which cover the dorsum of the podomere; in most cases height superior to tubercle width) (Fig. 7F).</td>
</tr>
<tr>
<td>42 Proventral row of tubercles on femur IV</td>
<td>0. Distally with high tubercles forming a series (standing out from those which cover the dorsum of podomere; in most cases height superior to tubercle width) (Figs. 2G,4F); 1. Tubercles of similar-size or slightly enlarged (Fig. 10F).</td>
</tr>
<tr>
<td>43 Retroventral row of tubercles on femur IV</td>
<td>0. Tubercles of similar-size or slightly enlarged (Fig. 2G); 1. With high tubercles forming a series (standing out from those which cover the podomere; height superior to tubercle width) (Fig. 30E).</td>
</tr>
<tr>
<td>44 Retroventral apical armature of femur IV</td>
<td>0. Tubercles of similar-size or slightly enlarged (Fig. 2G); 1. Spine (Fig. 4F).</td>
</tr>
<tr>
<td>45 Proventral apical armature of femur IV</td>
<td>0. Spine (Fig. 2G); 1. Tubercles of similar-size or slightly enlarged (Fig. 3F).</td>
</tr>
<tr>
<td>46 Dorsoapical median apophysis of femur IV</td>
<td>0. Absent; 1. Present (Fig. 30D).</td>
</tr>
<tr>
<td>47 Retrodorsal apical spine of femur IV</td>
<td>0. Reduced (same size as tubercles covering the podomere); 1. Medium (length superior to width; length around 1/4 of femur width) (Fig. 2F); 2. Small (twice the size of tubercles covering the podomere) (Fig. 3E); 3. Large (length more than 3/4 of podomere width) (Fig. 4E).</td>
</tr>
<tr>
<td>48 High, pointed tubercles on patella IV</td>
<td>0. Absent; 1. Present.</td>
</tr>
<tr>
<td>49 Proventral row of tubercles on tibia IV</td>
<td>0. Tubercles of similar-size or slightly enlarged (Fig. 2I); 1. Tubercles increasing in size, becoming high and pointed distally (Fig. 16I).</td>
</tr>
</tbody>
</table>

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The cladistic analyses resulted in two equally parsimonious trees (L=319; C.I.=0.26, R.I.=0.61; Fig. 1). None of them support the monophyly of *Eusarcus* as known before this review. *Eusarcus* can only be monophyletic if it also includes *Antetriceras*, *Metagraphinotus* and *Pygophalangodus* (all Pachylinae) which were formerly included as outgroups. Therefore, we regard them as junior synonyms of *Eusarcus*. Since both subspecies of *Pygophalangodus gemignanii* can be clearly identified, we propose to elevate them to species level. Henceforth we will refer to the species of those genera with the new combination.

According to these two trees, *Eusarcus* is supported by two unambiguous synapomorphies: unpaired armature present on scutal area III (character 8: state 1) and strongly curved distalmost pair of (distal) setae of ventral plate of penis (65:1). Although Bremer support was low (1), we consider this analysis as a useful attempt to propose the first comprehensive classification of the genus based on cladistic methodology. The analysis corroborates that groups based on the Roewerian system are not monophyletic, as shown by other reviews (Pinto-da-Rocha 1997; 2002). According to that system, *Pygophalangodus* spp. and *E. sergipanus* sp.
n. would clearly be placed outside *Eusarcus* because they lack the unpaired armature in scutal area III, and the genus would thus be non-monophyletic.

The two trees are almost the same (Fig. 1A, B), differing only regarding the relationships of *E. bifidus* Roewer 1929, *E. matogrossensis* sp. n., and *E. hastatus* Sørensen 1884. This clade is supported unambiguously by: The presence of a retrolateral apical apophysis on trochanter IV (29:0) and of a slightly curved distalmost pair of distal setae on the ventral plate of the penis (65:0). In one tree (Fig. 1A) *E. matogrossensis* is the sister species of *E. hastatus* and is unambiguously supported by the prolateral row of high tubercles on femur IV (39:1). In this tree (Fig. 1A) the proventral row of similar-sized tubercles on tibia IV (49:0) also supports the clade *E. bifidus, E. matogrossensis* and *E. hastatus* in ACCTRAN optimization. In the other tree (Fig. 1B) *E. bifidus* is the sister species of *E. hastatus* and is unambiguously supported by a proventral row of similar-sized tubercles on tibia IV (49:0), and in ACCTRAN optimization, also by the presence of a prolateral apical apophysis on trochanter IV (35:0). In this tree (Fig. 1B) the clade *E. bifidus, E. matogrossensis* and *E. hastatus* is also supported by a prolateral row of high tubercles on femur IV (39:1) in ACCTRAN optimization. We decided not to give preference to one of the two trees because we do not have any further data to support that.

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**FIGURE 1.** Two equally parsimonious hypothesis (A and B) of *Eusarcus* spp. relationships. Nomenclature follows the new classification here proposed. Black circle means single transformation and white circle means homoplastic transformation. The ambiguous characters are optimized in ACCTRAN and are overlined and underlined. Bremer support index are placed near the nodes. Asterisk indicates the alternative hypothesis (B), shown in the box. L=319; C.I.=0.26, R.I.=0.61. The corresponding characters and character states are given in Table 2, the data matrix in Table 3.
| Taxa | D. 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10| 11| 12| 13| 14| 15| 16| 17| 18| 19| 20| 21| 22| 23| 24| 25| 26| 27| 28| 29| 30| 31| 32| 33| 34| 35| 36| 37 |
|       |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

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<table>
<thead>
<tr>
<th>Taxa</th>
<th>Femur IV</th>
<th>Tibia IV</th>
<th>Penis</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>39</td>
<td>40</td>
<td>41</td>
</tr>
</tbody>
</table>
Eusarcus is also the sister group of the remaining Pachylinae used in the analyses. In a certain way, it corroborates the hypothesis of relationship among the subfamilies of Gonyleptidae proposed by Pinto-da-Rocha (2002). In that hypothesis, Pachylinae is a polyphyletic group, composed of three clades (according to Kury 2003a, Ampycus telifer is placed in a subfamily of its own, Ampycinae), and one of them is the sister group of Eusarcus. However, the taxa which comprise the sister group of Eusarcus are different (Discocyrtus invalidus Piza 1938a; Hypophyllonomus maculipalpi (Piza 1938b); Nanophareus palpalis Roewer 1929; Pachyloides fallax Mello-Leitão 1932). It is also noteworthy that in the present analyses Graphinotus is grouped in the same clade, which is the sister group of Eusarcus. This result is different from the hypothesis of Pinto-da-Rocha (2002), and it may be due to the different characters and taxa used in the analyses. It is known that addition or exclusion of taxa may considerably influence tree construction and that can be easily tested empirically. Besides, the analyses of a smaller group belonging to a larger one may not reflect the outcome when all taxa of the larger group are analyzed as a whole (Siddall 1995). A more detailed evaluation of the relationships of Eusarcus and other genera of Pachylinae is not possible because of the relatively low number of different taxa of Pachylinae used in the present cladistic analyses.

To evaluate the influence of inapplicable data, we combined the relevant characters (4+5; 6+7; 8+9; 31+32; 33+34; 35+36+37; 56+57+58+59) using composite coding and performed another cladistic analysis (57 characters). In that analysis, those multi-state characters were unordered and with the same weight. It resulted in six equally parsimonious trees (L=311; C.I.=0.27; R.I.=0.60) and Eusarcus monophyly is corroborated. Among those six trees, two are similar to those obtained with inapplicable data (Fig. 1A, B), but differ regarding the lack of resolution among E. caparaoensis, E. insperatus+ and E. manero+. The remaining four trees differ with regards to the sister species of E. hastatus (E. matogrossensis or E. bifidus); sister species of E. elinae (E. sergipanus+ or E. aduncus+ plus E. sergipanus+); sister species of E. fulvus (E. incus+ or the remaining Eusarcus except E. schubarti+ plus E. armatus+ plus E. catharinhensis plus E. mirabilis). These differences might be due to the undesirable effect pointed out by Strong & Lipscomb (1999) regarding composite coding. According to them, the absence state coded into the single composite (or multistate) characters might render the inapplicable data informative in determining the relationships and thus negatively having influenced in the final topologies of some taxa. We also removed characters with inapplicable states (5; 7; 9; 32; 34; 36; 37; 57; 58; 59) from the original matrix and analyzed the modified matrix (57 characters). We obtained 29 equally parsimonious trees (L=272; C.I.=0.25; R.I.=0.63). In all of those hypotheses, Eusarcus remained monophyletic and the following clades were present: E. schubarti+; E. armatus+; E. gemignanii+; E. pusillus+; E. aduncus+ with E. elinae+. These results indicate that there is considerable loss of information when characters with inapplicable states are removed but reinforce the Eusarcus monophyly.

Although there are disadvantages in reductive coding (Strong & Lipscomb 1999), we prefer the trees in figure 1, based on the matrix in tables 2 and 3 for reasons mentioned in “Material and methods”. In the alternative matrix with combined related characters (using unordered multi-states), one looses important information and characters states are sometimes counted more than once.

Some characters deserve further comments because of the difficulty to propose homologies or to justify its codifications into discrete states.

Characters 4–7: The armature of the ocularium was split into “paired” and “unpaired” to distinguish structures which are derived from paired armatures from those which are placed in the middle and thus are single. Therefore, we distinguished a bifid apophysis (resulting from the fusion of the bases of two spines) from a single apophysis placed in the middle, which has no relation to the paired armature.

Characters 8–9: Among Pachylinae, only Graphinotus also appears to have a medium spine in scutal area III but it possesses three scutal areas (because the most posterior scutal area is undivided) instead of four, as do most species of that subfamily (Eusarcus included). Examining the surface of the dorsal scutum reveals that there is no indication to which scutal area the median spine of Graphinotus belongs (scutal areas III or IV). However, examining the pigmentation pattern, there is a clear transverse line (pigmentation is clear in scutal grooves) which almost splits area III in two, and the spine would be on area IV. Additionally, the hypothesis proposed by Pinto-da-Rocha (2002) in a cladistic analysis of Pachylinae genera, as well as a more
comprehensive cladistic analysis of Gonyleptidae which is in progress, also did not corroborate such a homology. In the future, examination of immature specimens of *G. ornatus* should be performed to corroborate or disprove the homology hypothesis.

Characters 30–37: Proposing homology among the many prolateral apophyses of trochanter IV was difficult because they are placed close to each other and sometimes they have similar shapes. The main problem was to find out which median prolateral apophyses of *E. armatus* are homologous to those of *E. fulvus* and/or to *E. incus* and *E. pusillus*. Considering the position and shape, we found it reasonable to assume homology between the prolateral posterior median apophysis of *E. armatus* and *E. incus* and *E. pusillus*. However, it was not possible to decide which of the prolateral median apophyses of *E. armatus* are homologous to those of *E. fulvus*. Examining *Graphinotus ornatus* helped to propose homology among those prolateral apophyses because it has apophyses similar to those of *E. armatus*. *G. ornatus* has a median apophysis slightly placed more basally (as PAMATr in *E. armatus*) and another median apophysis placed more distally, with a shape similar to that of *E. aduncus*. Using congruence and form criteria to propose homology, it was possible to propose that the prolateral (anterior) median apophysis of *E. armatus* is not homologous to the prolateral (posterior) median apophysis found in *E. fulvus*. In turn, according to the position criterion, the prolateral (posterior) median apophysis on the trochanter IV of *E. armatus* should be homologous to that of *E. fulvus*, and thus to *E. incus* and *E. pusillus*. The prolateral basal apophysis which occurs in *E. caparaenosensis* could be misinterpreted as homologous to the prolateral (anterior) median apophysis of *E. armatus*. However, their placement on trochanter IV differs enough to regard them as non-homologous. Besides, the prolateral basal apophysis has a very conservative shape in all species of *Eusarcus* and thus it is relatively easy to identify.

**Systematics**

**Eusarcus Perty 1833**

*Eusarcus* Perty 1833: 201, 203 (cit); 206; Koch 1839a: 8 (rdesc); Erichson 1845: 6 (cit); Bertkau 1880: 106 (cit); Sørensen 1884: 623 (key), 624 (rdesc); Roewer 1913: 12 (key), 67 (rdesc); 1923: 397 (key), 418 (rdesc); Mello-Leitão 1923b: 121 (cit), 184 (key); 1924: 181 (cit); 1926: 342 (key), 371 (cit); Roewer 1927: 335 (cit); 1929: 185 (key), 196 (syst); Mello-Leitão 1931a: 120 (cit); 1932: 133 (key), 155 (rdesc); 1935b: 99 (syst, diag); 1936: 4 (cit); Piza 1940b: 313 (syst); Mello-Leitão 1940: 5 (cit); Roewer 1943: 28 (syst); B. Soares 1943a: 207 (= *Enantiocentron* Mello-Leitão 1932 = *Pareusarcus* Mello-Leitão 1935a (= *Pareusarcus* Roewer = *Goyazia* Piza 1940b); 1943b: 210 (syst); Mello-Leitão 1945: 150 (cit), 151 (= *Eusarcoides* Roewer 1913; rdesc); 1949: 15 (syst); Soares & Soares 1954b: 227 (key), 257 (= *Neopucrolia* Roewer 1913 = *Pucrolioides* Roewer 1913; rdesc, cat); Ringuelet 1957a: 17 (syst); 1957b: 18 (cit); 1959: 204 (key), 315 (diag), 318 (syst); 377 (syst); Muñoz-Cuevas 1973: 226 (cit); Soares & Soares 1985: 12 (= *Metapucrolia* Roewer 1913); Kury 2003a: 167 (= *Orguesia* Roewer 1913; cat). (Type species *Eusarcus armatus* Perty 1833, by subsequent designation, Roewer 1913).

*Eusarcus* (lapsus): Gervais 1842: 1 (cit); 1844: 96 (cit), 111 (rdesc).

*Eusarcus* Grote & Pitt 1875a: 1; 1875b: 17–18, 20 (syst) (= *Pert*) 1833. (Junior homonym of *Eusarcus* Perty 1833).

*Neopucrolia* Roewer 1913: 11 (key), 43; Mello-Leitão 1922: 329 (cit); Roewer 1923: 396 (key), 409 (rdesc); Mello-Leitão 1923b: 116 (cit); 1926: 338 (key); Roewer 1929: 184 (key); 1931: 101 (syst), 102 (key); Mello-Leitão 1932: 133 (key), 154 (rdesc); 1935b: 99 (diag); B. Soares 1943b: 210 (syst); Ringuelet 1955b: 2 (cit); 1957a: 17 (syst); 1959: 318 (syst); Muñoz-Cuevas 1973: 226 (cit). (Type species *Neopucrolia pectinigeria* Roewer 1913, by monotypy). Synonymy established by Soares & Soares (1954b).


*Pucrolioides* (lapsus): Roewer 1913: 10 (key); 1923: 396 (key), 403 (rdesc); Mello-Leitão 1923a: 519 (syst, diag); Mello-Leitão 1926: 337 (key); Roewer 1929: 183 (key); Mello-Leitão 1932: 133 (key), 154 (rdesc); 1935b: 99 (diag); 1939b: 622 (cit); B. Soares 1943b: 210 (syst); Ringuelet 1955b: 2 (cit); 1957a: 17 (syst); 1959: 318 (syst); Muñoz-Cuevas 1973: 226 (cit).

*Eusarcoides* Roewer 1913: 12 (key); 72; 1923: 397 (key), 420 (rdesc); Mello-Leitão 1923b: 122 (cit); 1926: 342 (key); Roewer 1929: 185 (key); Mello-Leitão 1932: 133 (key), 161 (rdesc); 1935b: 99 (syst); 1945: 152 (syst); Muñoz-Cuevas 1973: 226 (cit). (Type species *Eusarcus pusillus* Sørensen 1884, by monotypy). Synonymy established by Mello-Leitão (1945).
**Metapucrolia** Roewer 1913: 11 (key), 33, 1923: 396 (key), 405 (rdesc); Mello-Leitão 1926: 337 (key); Roewer 1929: 183 (key); Mello-Leitão 1932: 135 (key), 195 (rdesc); 1935b: 99 (diag); 1949: 9 (cit); Soares & Soares 1954b: 230 (key), 277 (rdesc, cat); Muñoz-Cuevas 1973: 226 (cit); Soares & Soares 1985: 12 (syst; cat). (Type species *Pucrolia armata* Sørensen 1895, by original designation). Synonymy established by Soares & Soares (1985).

**Orguesia** Roewer 1913: 168 (key), 177; 1923: 464 (key), 467 (rdesc); Mello-Leitão 1923b: 134 (cit); 1926: 349 (key); Roewer 1930: 344 (key); Mello-Leitão 1932: 231 (key), 242 (rdesc); 1935b: 102 (syst, diag); Soares & Soares 1949: 152 (key), 199 (rdesc); H. Soares 1968: 137 (cit), 138 (diag). (Type species *Orguesia armata* Roewer 1913, by monotypy). Synonymy established by Kury (2003a).

**Metagraphinotus** Mello-Leitão 1927: 411; Roewer 1929: 185 (key), 235 (diag); Mello-Leitão 1932: 133 (key), 153 (rdesc), 447 (key), 450 (cit); 1935a: 12 (cit); 1935b: 99 (syst); Piza 1940a: 54 (syst, diag); 1940b: 313 (syst); Soares & Soares 1954b: 227 (key), 274 (= *Jacarepaguana* Mello-Leitão 1932; rdesc); Kury 2003a: 175 (cat). (Type species *Metagraphinotus catharinensis* Mello-Leitão 1927, by monotypy). **Syn. n.**

**Pareusarcus** Roewer 1929: 185 (key), 236; Mello-Leitão 1932: 134 (key), 190 (rdesc); Soares & Soares 1954b: 231 (key), 289 (rdesc); Kury 2003a: 187 (cat). (Type species *Pareusarcus corniculatus* Roewer 1929, by monotypy).

**Canestrinia** Mello-Leitão 1931b: 89; Ringuelet 1955a: 294 (cit); 1959: 378 (syst). (Type species *Canestrinia canalis* Mello-Leitão 1931b, by original designation). Synonymy with *Pygophalangodus* established by Ringuelet (1955a).

**Pygophalangodus** Mello-Leitão 1931b: 84; 1932: 439 (key, rdesc); 1935b: 92 (key); Mello-Leitão 1939b: 610 (cit), 618 (cit); Ringuelet 1954: 1 (diag); Ringuelet 1955a: 294 (= *Mello-Leitaoëlla*; Strand 1932); 1957a: 19–20 (syst); 1957b: 19 (cit); 1959: 198 (syst), 204 (key), 377–378 (diag, syst), 379 (= *Bacigalupo* Mello-Leitão 1933); 1963: 48 (diag), 51 (key); Maury & Pilati 1996: 6 (bion); Kury 2003a: 189 (cat). (Type species *Pygophalangodus gemignanii gemignanii* Mello-Leitão 1931, by monotypy). **Syn. n.**

**Enantiocentron** Mello-Leitão 1932: 447 (key), 450 (rdesc), 475 (rdesc); 1935b: 99 (diag); 1936: 22 (cit), 24 (syst); B. Soares 1943a: 207 (syst); Mello-Leitão 1945: 152 (syst); 1949: 15 (syst). (Type species *Enantiocentron doriphorus* Mello-Leitão 1932, by original designation). Synonymy established by B. Soares (1943a).


**Emantiocentron** (lapsus): B. Soares 1943a: 208 (syst).


**Mello-Leitaoëlla** Strand 1932: 135 (nom nov for *Canestrinia* Mello-Leitão 1931b); 1942: 398 (= *Melloinia* Thor 1933).

**Melloleitaoëlla**: Soares & Soares 1954b: 227 (key), 272 (cat).

**Melloinia** Thor 1933: 224 (nom nov for *Canestrinia* Mello-Leitão 1931b).

**Melloleitaoëlla**: Mello-Leitão 1935b: 99 (syst); Mello-Leitão 1939b: 610 (cit); Ringuelet 1955a: 294 (syn of *Pygophalangodus* Mello-Leitão 1931b; syst); 1959: 378 (syst).

**Bacigalupo** Mello-Leitão 1933: 55; 1935b: 93 (key); 1938: 143 (cit); 1939b: 618 (cit); Ringuelet 1959: 377 (syn of *Pygophalangodus* Mello-Leitão 1931b; syst); Rambla 1978: 304 (cit). (Type species *Bacigalupo tenax* Mello-Leitão 1933, by original designation). Synonymy with *Mello-Leitaoëlla* established by Ringuelet (1954).

**Pareusarcus** Mello-Leitão 1935a: 13; 1935b: 99 (syst); Piza 1940b: 313 (syst); B. Soares 1943a: 207 (syst); Mello-Leitão 1945: 152 (syst); 1949: 15 (syst). (Type species *Pareusarcus centromelos* Mello-Leitão 1935a, by original designation). Synonymy established by B. Soares (1943a).

**Goyaza** Piza 1940a: 54; Piza 1940b: 312 (syst); B. Soares 1943a: 208 (syst); Mello-Leitão 1949: 15 (syst). (Type species *Goyaza sulcata* Piza 1940a, by original designation). Synonymy established by B. Soares (1943a).


**Pindaiha** Canals 1943: 18 (nom nov for *Pareusarcus* Mello-Leitão 1935a).

**Antetriceras** Roewer 1949: 57; Rambla 1978: 304 (cit); Kury 2003a: 156 (cat). (Type species *Antetriceras signatus* Roewer 1949, by original designation). **Syn. n.**

**Type species:** *Eusarcus armatus* Perty 1833, designated subsequently by Roewer (1913).

**Redescription:** **Male:** Dorsum: Paramedian apophyses on anterior margin of scutum, located ectally to chelica (exceptions: *E. catharinensis*, *E. sooretamae*, *E. teresincola*, *E. caparaaoensis* sp. n., *E. mirabilis* sp. n. and *E. tripectinatus* sp. n.). Oculation with several similar-sized tubercles (unarmed), or a pair of large tubercles, or a pair of spines, or a median apophysis (bifid or not). Dorsal scutum with five transversal grooves delimiting four scutal areas. Scutal area I medially divided; III with a median spine (exceptions are *E. gemignanii*, *E. uruguayensis* and *E. sergipanus* sp. n. unarmed). Body shape pyriform, wider between groove

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I and grooves IV and V (close to each other). Lateral margin of dorsal scutum with an external regular row of tubercles increasing in size posteriorly, and with one to two internal, irregular rows. Posterior margin of dorsal scutum with a row of tubercles.

Chelicera: Segment I with scattered tubercles; II with setae irregularly concentrated at base of fixed finger, a group of setae on apical mesal face, both fingers toothed.

Pedipalpus: Trochanter inflated, with sparse tubercles dorsally; ventrally with a large prolateral tubercle bearing a seta, and with a small retrolateral tubercle; femur stretched, subcylindrical, with a prolateral subapical seta; patella smooth; tibia with variable spination, usually IiIi (prolateral and retrolateral) and tarsus idem, IIIi (prolateral) and IIIii (retrolateral).

Legs: Coxa I with 1 prolateral, 1 retrolateral apophysis; II with 1 prolateral apophysis, 3 retrolateral apophyses fused at base, retrolateralmost fused at apex with prolateral apophysis of coxa III; III with 1 prolateral, 1 retrolateral apophysis fused at base; IV, irregularly tuberculate, with 1 prolateral apical apophysis more developed in male than female. Coxa IV surpassing dorsal scutum in dorsal view, being visible in all its extension or visible only apically. Trochanter IV with prolateral apophyses. Femora I–II straight, III–IV sinuous, all with tubercles arranged approximately in six longitudinal rows: a prodorsal and a retrodorsal row, a proventral and a retroventral row, a prolateral and a retrolateral row. Distitarsi I–II always 3-segmented. Metatarsi III–IV with 2 ventro-apical setae. Tarsal segmentation: 5–7(3); + 6(3); 6; 6–7.

**Female:** Mostly same as male, coxa IV shorter than in male (ending between grooves III and IV) and usually visible in dorsal view, surpassing dorsal scutum only apically; with prolateral apical apophysis shorter than in male. Trocanther IV unarmed on prolateral face.

**Remarks on females:** Females in this genus have the same general aspect as males except for apophyses and high, pointed tubercles on the legs and except for the penial morphology, which are important characters for identifying species. Thus, few morphological structures allow for correctly identifying female specimens of a given species. We have to rely on: the presence and size of the paramedian pair of apophyses on the anterior margin of the prosoma, located ectally to the chelicera; height and ornamentation of the ocularium; amount and positions of tubercles on the scutum; size of apical spines on the femora; inclination, size and shape of the spine in scutal area III; size and inclination of the prolateral apical apophysis of coxa IV. When the dorsal scuta of different species are similar, females are virtually impossible to distinguish, as is the case in *E. hastatus* and *E. dubius*. Since the females of three species are unknown and some species cannot be distinguished only by characteristics of the dorsal scutum, it is at present impossible to elaborate a precise identification key for females.

### Key to males of *Eusarcus* species

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| 32. (31) | Oculatorium close to anterior margin of dorsal scutum (Fig. 13A,B); median spine of scutal area III short, not surpassing groove IV (Fig. 13B); femur IV ventrally with 2 apical spines (Fig. 13G) ........................................................................ \textit{E. hastatus} |
| - | Oculatorium far from anterior margin of dorsal scutum (Fig. 24A,B); median spine of scutal area III of median size, surpassing groove IV (Fig. 24B); femur IV ventrally with 1 prolateral apical spine and 1 enlarged retrolateral apical spine (Fig. 24G) ................................................................................ \textit{E. matogrossensis} sp. n. |
| 33. (30) | Oculatorium with 2 pointed tubercles (Fig. 18A,B); tibia IV slightly sinuous, its distal 2/3 thickened and with pointed tubercles, a prolateral row of large and pointed tubercles in middle third, ventrally with a prolateral row of pointed tubercles increasing in size distally, 2 large apical spines (Fig. 18H) ........................................................................ \textit{E. grumani} |
| - | Oculatorium with bifid spine (Fig. 34A); tibia IV ventrally with 2 rows of tubercles increasing in size distally, prolateral ones large, pointed; 2 large apical spines; 1 retrolateral apical spine (Fig. 34H) .......... \textit{E. sulcatus} |
| 34. (26) | Femur IV with a pair of ventro-apical spines (Fig. 19G) ............................................................................................................... \textit{E. hastatus} |
| - | Femur IV with 1 proventral apical spine and 1 enlarged retrolateral apical tubercle (Fig. 16H) ........ \textit{E. gemignani} |
| 35. (34) | Oculatorium with 2 large tubercles; femur IV with enlarged dorso-median tubercles (Fig. 37F) .... \textit{E. uruguayensis} |
| - | Oculatorium with variable armorature, ranging from a pair of large, blunt or pointed tubercles, 1 pair of spines, 1 pair of spines with bases very close to each other, at same position but on a short apophysis, 1 bifid spine to 1 robust spine (Figs. 52, 53); femur IV with prolateral and retrolateral rows of large, pointed tubercles, dorsally with small tubercles of similar-size (Figs. 19F,G, 20E–I) ........................................................ \textit{E. hastatus} (rarer form) |

\textit{Eusarcus acrophthalmus} sp. n.  
(Figs. 2, 42E,F, 49A)

\textit{Eusarcus hastatus}: [misid] Roewer 1913: fig. 32; 1923: fig. 523; Mello-Leitão 1932: fig. 84.
Type material: BRAZIL. Without locality, name of collector and date, 1 fe paratype (SMF 765); Bahia: Ilhéus (Parataquicê), without name of collector and date, 1 ma, 1 fe paratypes & 2 im (MNRJ 5244); 1 ma & 1 fe paratype (MZSP 28664).

Diagnosis: *E. acrophthalmus* resembles *E. incus*, *E. pusillus*, *E. nigrimaculatus*, *E. alpinus*, *E. didactylus* and *E. geometricus* because of the cylindrical prolateral median process on the male trochanter IV and generally large body size, and it and can be distinguished by: A high ocularium; dorsal scutum densely tuberculate; irregular projections on retrolateral margin of prolateral apical apophysis of coxa IV, and by the shape of the cylindrical prolateral median process of the male trochanter IV: Distally blunt and basally with a small, blunt, conical apophysis. Unlike in *E. alpinus*+, the penis of *E. acrophthalmus* has a ventral process on its glans.

Etymology: From the Greek “acro” = high and “ophthalmos” = eye, in reference to the high ocularium. Noun in apposition.

Description: Male (holotype; MNRJ 5244): Dorsum (Fig. 2A,B): Measurements: SL 6.00; SMW 5.60; femur I 2.60; II 4.90; III 3.90; IV 4.70. Median paracheleral projection slightly smaller than PAM. Ocularium next to anterior scutal margin; high, with 2 spines, 46 tubercles. Carapace with 69 scattered tubercles. Scutal area I with 43–47 scattered tubercles on each side; II with 98; III with 113 and a median spine oblique, curved subapically, not surpassing groove V; IV with 50 tubercles. Posterior margin of dorsal scutum with an irregular row of 17 tubercles, a regular row of 28. Free tergites I–II with an irregular row of 26 and 23 tubercles, respectively; III with 34 scattered tubercles. Anal operculum with 63 tubercles. Venter: Coxa I with 43–49 tubercles, median and distal ones largest; II with 79–85, distal ones largest; III–IV irregularly tuberculate. Chelicera: Segment I with 3 tubercles. Pedipalpus: Trochanter dorsally inflated, with 4 tubercles. Femur dorsally with 4–5 aligned tubercles; ventrally with 1 large basal tubercle, 3 small aligned tubercles. Tibial setation: Prolateral and retrolateral Iii. Tarsal setation: Prolateral Iii, retrolateral Iii.

Legs (Fig. 2C–I): Coxa II with 7 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posterior and slightly ventrad, with irregular projections on retrolateral margin. Trochanters I–IV densely tuberculate; IV prolaterally with 1 cylindrical median process, distally blunt and basally with a small, blunt, conical apophysis; retrolaterally with 2 large apical tubercules. Femora I–III with small PDS, RDS; I ventrally with 2 rows of slightly enlarged tubercules; II ventrally with 2 rows of tubercules, prolateral ones slightly increasing in size distally; III sinuous; ventrally with 2 rows of tubercules slightly increasing in size distally, 1 bifid PVS; IV sinuous, with small PDS, medium RDS; ventrally with 2 rows of tubercules, prolateral ones increasing in size distally, becoming high, pointed, 1 PVS. Tibia III ventrally with 2 rows of tubercules increasing in size subapically, becoming high, pointed, retrolaterally ones enlarged, with 1 high, pointed, bifid tubercle; IV with 2 ventro-apical spines. Metatarsus I with 2 ventro-apical setae; IV with tubercules decreasing in size and number distally. Tarsal segmentation: 6, 9–10, 6, 6.

Penis (Fig. 42E,F): Stylus with medio-ventral trichomes, slightly inflated apically; with angular medio-ventral projection. Ventral process of glans wide, curved, with apex blunt. Ventral plate with concave sides; with 3 pairs of slightly curved distal setae; 1 pair of short, straight, blunt median setae; 4 pairs of straight basal setae. Coloration: Brown; legs dark brown, except for metatarsi and tarsi (light brown).

Female (paratype; MNRJ 5244): Dorsum: Measurements: SL 6.20; SMW 5.20; femur I 2.70; II 4.70; III 3.60; IV 4.50. Posterior margin of dorsal scutum and free tergites I–III with 83, 82, 75, 67 scattered tubercles, respectively. Anal operculum with 85 tubercles. Pedipalpus: Tibial setation: Prolateral Iii/Iiii, retrolateral Iii/iIii. Tarsal setation: Prolateral Iii, retrolateral Iii. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed. Trochanter IV densely tuberculate, retrolaterally with 1 large median tubercle, 1 short apical apophysis. Femur II with rows of similar-sized tubercles; III with slightly enlarged tubercules ventro-apically; IV with small PDS, RDS; ventrally with 2 rows of tubercules, prolateral ones slightly increasing in size distally, 1 short, trifid PVS. Tibiae III–IV with rows of similar-sized tubercules, without ventro-apical spines. Tarsal segmentation: 6, 8–9, 6, 6.
FIGURE 2. *Eusarcus acrophthalmus* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view (dotted line and arrows indicate the angle for calculating the state of character 32 [based on this angle sine function]); I, right tibia IV, ventral view. Abbreviations: Aop, dorsal anal operculum; Al–IV, scutal areas I–IV; FTG, free tergites; OCU, ocularium; OPS, opisthosoma; PACx, prolateral apical apophysis of coxa IV; PAM, paramedian apophyses on anterior margin of prosoma, located ectally to chelicera (circled); PAS, proventral apical spine; PDS, prodorsal apical spine; PPMATr, prolateral posterior median apophysis of trochanter IV; Pr, prolateral; PRO, prosoma (carapace is the part of the dorsal scutum that covers this part); RDS, retrodorsal apical spine; Rt, retrolateral; SPIII, spine of scutal area III. Scale bars, 1 mm.
Variation in males (n=3): Measurements: SL 5.50–6.20; SMW 4.80–5.80; femur I 2.60–3.00; II 4.90–5.20; III 3.80–3.90; IV 4.70–5.00. Femur I with reduced or small PDS, RDS; III with reduced or small PDS. The beta male shows the prolateral median process of trochanter IV as a conical structure.

Variation in females (n=2): Measurements: SL 5.80–6.20; SMW 5.10–5.20; femur I 2.60–2.70; II 4.70–4.80. Pedipalpus: Tibial setation: Prolateral IiIi/IIi, retrolateral IiIi/iIIi/iIiIi.

Type locality: Brazil, Bahia, Ilhéus (Parataquicé).

Geographical distribution (Fig. 49A): Known only from the type locality.

Eusarcus aduncus (Mello-Leitão)
(Figs. 3, 40C,D, 49B)

Enantiocentron aduncum Mello-Leitão 1942: 7, fig. 5. (ma lectotype, 2 ma, 6 fe paralectotypes, here designated; “Colatina, Espírito Santo; E. May & M. Rosa leg.; MNRJ 58207*”; examined, strongly damaged). * Not MNRJ 55093, as stated in original description.

Eusarcus aduncus: B. Soares 1943a: 206 (dist), 207 (syst); 1944c: 144 (cit.), 145 (dist); Mello-Leitão 1945: 153 (cat), 157 (key), 157 (cat); 1946: 519 (cat); Soares & Soares 1954b: 258 (cat); 1974: 609 (cit); Trajano & Gnaspini-Netto 1991: 386 (dist); Gnaspini & Trajano 1994: 551 (dist); Pinto-da-Rocha 1995: 82 (dist); Kury 2003a: 168 (cat).

Material examined: BRAZIL. Espírito Santo: Colatina, M. Rosa leg., without date, ma lectotype of Enantiocentron aduncum (MNRJ 58207a); idem, 2 ma & 6 fe paralectotypes of Enantiocentron aduncum (MNRJ 58207). Bahia: Carinhanha (Serra do Ramalho, Gruta do André), R.L.C. Baptista leg., vi.2001, 1 ma & 2 fe (MNRJ 4639); idem (Serra do Ramalho, Lapa do Boqueirão), 29.vi.2001, 4 ma, 3 fe & 2 im (MNRJ 4637); Itagibá (Fazenda Pedra Branca), J. Jim leg., 05.i.1970, 2 ma (HEMS 446); idem, 13.i.1972, 3 ma & 1 fe (HEMS 484); idem, Jim, Carvalho, Mioni & Caramaschi leg., 23.i.1975, 1 fe (MNRJ 4530); idem, U. Caramaschi, C.M. Carvalho, S.R. Mioni & J. Jim leg., 23.i.1975, 1 ma & 2 fe (MNRJ 16129); Una (Reserva Biológica do Una, 15º 10’S 39º 03’W), A.D. Brescovit et al. leg., 13–16.iv.1998, 1 ma (IBSP 2311). Goiás: Corumbá, F. Lane leg., vi.1942, 1 ma & 1 fe (MZSP 234); idem, 14.vi.1942, 3 ma (MZSP 235); Itaberá (Gruta Bela Vista 2), P. Gnaspini et al. leg., 24.ii.1998, 1 ma (MZSP 21661); Mambai (Gruta Meândrica), J. Motta leg., 31.vii.2001, 2 ma (MNRJ 11401). Distrito Federal: (R.E. IBGE, km 251), without name of collector, 12.x.1988, 1 ma & 1 fe (MNRJ 4414); idem, 19.x.1988, 1 ma & 1 fe (MNRJ 17695); Brasília, H.S. Lopes leg., xii.1961, 1 ma (HEMS 339); idem, A. Correa leg., i.1967, 1 ma (HEMS 360); idem (Fazenda Água Limpa), A.B. Kury leg., 22.v.1998, 1 ma & 1 fe (MNRJ 5616); Brazilândia (APA Cafuringa, Fazenda Pontal dos Angicos, Gruta Labirinto da Lama), without name of collector, 20.i.2003, 1 ma & 1 fe (UNB); idem, 29.i.2003, 1 fe & 1 im (UNB); idem (APA de Cafuringa, Fazenda Santa Sara, Gruta Sal Fenda), without name of collector, 20.xii.2002, 3 ma (UNB); idem, 30.i.2004, 1 fe (UNB); idem, 17.i.2005, 1 fe (UNB). Minas Gerais: Itacarambi (Gruta Olhos D’Água), without name of collector, iv.1985, 1 ma (HEMS 875); idem, E. Trajano leg., 15.ix.1994, 1 fe (MZSP 18267). Espírito Santo: Barra do São Francisco (Córrego do Itá), W. Zikán leg., 1942, 1 ma & 1 fe (MZSP 404a); idem, 1 ma (HEMS 340a); idem, 1 ma (HEMS 340b); idem, R. Soares leg., 1942, 1 ma (MZSP 552); Linhares (Refúgio Sooretama), Schubart leg., 12.x.1994, 1 fe (HEMS 1009); idem, without name of collector, i.1979, 2 ma (MNRJ 17694).

Diagnosis: E. aduncus resembles E. berlae, E. eliae, E. fulvus, E. signatus, E. sooretamae, E. cavernicola, E. mirabilis and E. sergipan us because of the conical prolateral median apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; large median spine of scutal area III; basitarsus I not elongated; prolateral apical apophysis of coxa IV without projections on retrolateral margin; femur IV not longer than 1.5 times dorsal scutum length; ocularium without median apophysis, unarmed or with a pair of large tubercles.

Redescription: Male (MZSP 234): Dorsum (Fig. 3A,B): Measurements: SL 3.85; SMW 3.40; femur I 2.25; II 4.40; III 3.30; IV 4.15. Median parachelicular projection smaller than PAM. Ocularium far from anterior scutal margin; with 10 tubercles. Carapace with 37 scattered tubercles. Scutal area I with 25–26
FIGURE 3. Eusarcus aduncus (Mello-Leitão). Male (MZSP 234): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right trochanter and femur IV, prolateral view; E, idem, dorsal view; F, idem, ventral view; G, right femur III, dorsal view; H, idem, ventral view. Scale bars, 1 mm.
scattered tubercles on each side; II with 59; III with 69 and a long median spine curved backwards, surpassing posterior margin of dorsal scutum; IV with 38 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 17, 18, 16, 11 tubercles, respectively. Anal operculum with 38 tubercles.

Venter: Coxa I with 27–36 tubercles, median and distal ones largest; II with 45–48, retrolateral ones smallest; III–IV irregularly tuberculate.

Chelicera: Segment I with 4–5 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 4–6 tubercles. Femur dorsally with scattered tubercles; ventrally with 1 large basal tubercle, 4–5 small aligned tubercles. Tibial setation: Prolateral and retrolateral Iii. Tarsal setation: Prolateral Iii, retrolateral Iii.

Legs (Fig. 3C–H): Coxa II with 6 tubercles on retrolateral margin; IV densely tuberculate, surpassing dorsal scutum in dorsal view only apically, with 1 oblique prolateral apical apophysis, this conical, short, curved posteriad and slightly ventrad. Trochanters I–IV with scattered tubercles; I–II with retrolateral ones large; I with 1 large ventro-basal tubercle; IV prolaterally with 1 median apophysis, this conical, sinuous, curved dorsad; retrolaterally with 1 large median tubercle. Femur I with reduced or small PDS, reduced RDS, ventrally with 2 rows of slightly enlarged tubercles; II with small PDS, RDS; III sinuous, reduced PDS, small RDS; ventrally with 2 rows of slightly enlarged tubercles, prolateral row with 3 large tubercles; IV sinuous, with small PDS, RDS; ventrally with slightly enlarged tubercles in distal third. Metatarsus I with 2 ventro-apical setae. Tarsal segmentation: 6, 9–10, 6, 6.

Penis (Fig. 40C,D): Stylus with medio-ventral trichomes and angular medio-ventral projection. Ventral process of glans curved, with apex blunt. Ventral plate with slightly convex sides, with 3 pairs of long, curved distal setae; 1 pair of short, straight median setae; 4 pairs of basal setae very close to each other.

Coloration: Yellowish brown; dark brown on body margin and appendages. Light brown in distal third of metatarsi and tarsi.

Female (paralectotype; MNRJ 58207): Dorsum: Measurements: SL 4.50; SMW 3.80; femur I 2.15; II 4.15; III 3.10; IV 4.15. Median parachelicer projection larger than PAM. Scutal area III with median spine curved back and upwards, reaching groove V, not surpassing posterior margin of dorsal scutum. Pedipalpus: Tibial setation: Prolateral IIii, retrolateral IIii. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, curved posteriad and slightly ventrad. Trochanter IV with scattered tubercles, retrolaterally with 1 large median tubercle and 1 apical apophysis, this conical, short, blunt. Femur III ventrally with two irregular rows of tubercles increasing in size distally, prolateral ones enlarged; small, blunt PVS; IV ventrally with two irregular rows of tubercles, retrolateral ones smaller, prolateral ones slightly increasing in size distally; 2 large apical tubercles. Coloration: Brown; dark brown on free tergites and coxae of legs. Light brown on apex of metatarsi and tarsi of legs III–IV.

Variation in males (n=6): Measurements: SL 3.85–5.50; SMW 3.40–5.20; femur I 2.25–2.80; II 4.40–6.40; III 3.30–4.60; IV 4.15–6.00. Ocularium with 1 pair of larger tubercles or unarmed. Median spine of scutal area III long, surpassing posterior margin of dorsal scutum or reaching groove V. Pedipalpus: Tibial setation: Prolateral and retrolateral Iiii/Iii. Femur II with reduced or small PDS, RDS; III with reduced or small PDS, small or medium RDS. Tarsal segmentation: 6–7, 9–12(3–4), 6, 6.

Variation in females (n=6): Measurements: SL 3.60–4.50; SMW 3.00–3.80; femur I 1.90–2.50; II 3.50–4.90; III 2.70–3.70; IV 3.50–4.90. Ocularium unarmored or with 1 pair of large tubercles. Pedipalpus: Tibial setation: Prolateral Iii/Iii/Iii, retrolateral IIii/Iii/Iii. Femur III with reduced or small PDS, RDS. Tarsal segmentation: 6, 8–10, 6, 6.

Type locality: Brazil, Espírito Santo, Colatina.

Geographical distribution (Fig. 49B): Central to SE Brazil. Bahia, Goiás, Distrito Federal, Minas Gerais, Espírito Santo.
Eusarcus alpinus sp. n.
(Figs. 4, 43A,B, 49A)

**Type material:** BRAZIL. Rio de Janeiro: Santa Maria Madalena (P.E. do Desengano), A.B. Kury, M. Baptista, A.P.L. Giupponi leg., 23–25.iii.1998, ma holotype & 2 fe paratypes (MNRJ 5719); idem, 1 ma & 1 fe paratypes (MZSP 28665); Teresópolis (Colônia Alpina), E.A. Goeldi leg., without date, 3 ma, 3 beta male, 2 fe & 2 im paratypes (ZMUC).

**Diagnosis:** E. alpinus resembles E. incus, E. pusillus, E. nigrimaculatus, E. acrophthalmus, E. didactylus and E. geometricus because of the cylindrical prolateral median process on male trochanter IV and generally large body size, and can be distinguished by: The ocularium with 2 large tubercles, the rectangular projection on the retrolateral margin of the prolateral apical apophysis of coxa IV and the shape of cylindrical prolateral median process of male trochanter IV: Prolateral edge of apex inflated, blunt; retrolateral edge of apex with blunt, upwards pointing finger-shaped projection; basally with a small, blunt, slightly conical apophysis. Penis without ventral process of glans (unusual within the genus); stylus curved ventrad, without trichomes and angular medio-ventral projection; ventral plate elliptic; trunk covering base of glans dorsoventrally.

**Etymology:** The species name, an adjective, refers to the type locality, Colônia Alpina, a Swiss colony founded by Emil August Göldi. He was a remarkable and important Swiss researcher who helped to promote natural history in Brazil.

**Description:** Male (holotype): Dorsum (Fig. 4A,B): Measurements: SL 4.80; SMW 4.30; femur I 2.15; II 4.20; III 3.20; IV 3.80. Median paracheliceral projection of similar-size as PAM. Ocularium far from anterior scutal margin; with 2 large tubercles and 12 smaller ones. Carapace with 35 scattered tubercles. Scutal area I with 43 scattered tubercles on each side; II with 91; III with 100 and a median spine directed backwards, almost straight, curved only apically, surpassing posterior margin of dorsal scutum; IV with 50 tubercles. Posterior margin of dorsal scutum with 31 scattered tubercles. Free tergites I–III with an irregular row of 22, 18, 18 tubercles, respectively. Anal operculum with 39 tubercles.

Venter: Coxa I with 33–34 tubercles, median and distal ones largest; II–III with 56–58, 60–69 tubercles increasing in size distally, respectively; IV densely and irregularly tuberculate.

Chelicera: Segment I with 2 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 4 tubercles. Femur dorsally with 4 aligned tubercles, 5 apical small ones; ventrally with 1 large pointed basal tubercule, 2 small scattered tubercules. Tibial setation: Prolateral iIi, retrolateral iIi/iIi. Tarsal setation: Prolateral iIi, retrolateral iIi/iIi.

Legs (Fig. 4C–H): Coxa II with 5–7 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and slightly ventrad, with 1 rectangular projection on retrolateral margin. Trochanters I–IV with scattered tubercules; I–III with large retrolateral tubercle; I–II with 1 large ventro-basal tubercle; IV prolaterally with 1 cylindrical and flattened median process, this prolateral edge of apex inflated, blunt; retrolateral edge of apex with blunt, upwards pointing finger-shaped projection; basally with a small, blunt, slightly conical apophysis; retrolaterally with 1 large pointed subbasal tubercle, 1 median and 1 apical large blunt tubercle; 1 large pointed ventro-apical tubercle. Femur I with reduced PDS, RDS; II–III with reduced PDS, large RDS; III sinuous, ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, pointed, 1 small, blunt prolateral apical spine; IV sinuous, with medium PDS, large RDS; a retrolateral row of enlarged, slightly pointed tubercules; ventrally with two irregular rows of tubercules increasing in size distally, prolateral ones becoming pointed (5 large), 2 apical spines. Patellae III–IV with enlarged, slightly pointed ventral tubercules. Tibia III ventrally with 2 rows of pointed tubercles increasing in size subapically, retrolateral ones largest (3–4 large); IV ventrally with 2 rows of tubercles increasing in size distally, becoming pointed, 2 apical spines. Metatarsi III–IV with tubercules decreasing in size and number distally. Tarsal segmentation: 6, 8–9, 6, 6.

Penis (Fig. 43A,B): Stylus smooth, apex swollen, curved ventrad; without trichomes and angular medio-ventral projection. Ventral process of glans absent. Ventral plate elliptic; with 3 pairs of short distal setae; 1 pair of short, straight, thick median setae; 4 pairs of long, straight basal setae, basalmost pair very close to trunk of penis. Trunk covering base of glans dorsoventrally.
FIGURE 4. *Eusarcus alpinus* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right trochanter and femur IV, prolateral view; E, idem, dorsal view; F, idem, ventral view; G, right femur III, ventral view; H, right tibia III, ventral view. Scale bars, 1 mm.
Coloration: Brown; dark brown on body margin, spines, apophyses and patellae, basal and apical areas of femora and tibiae. Light brown on metatarsi and tarsi.

**Female** (paratype; MNRJ 5719): Dorsum: Measurements: SL 4.95; SMW 3.80; femur I 2.05; II 4.00; III 3.00; IV 3.70. Free tergites I–III with rows of 15 and 22, 12 and 24, 12 and 16 tubercles, respectively. Pedipalpus: Tibial setation: Prolateral and retrolateral IiIi. Tarsal setation: Prolateral III, retrolateral IiIi. Legs: Coxa II with 1 prolateral tubercle, 4 retrolateral; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed, curved backwards, surpassing posterior margin of this segment. Trochanter IV with scattered tubercules, retrolaterally with 1 large median tubercle, 1 oblique prolateral apical apo-physis, this conical, short, pointed, curved backwards, surpassing posterior margin of this segment. Femur I ventrally with 2 rows of slightly enlarged tubercules; III ventrally with 2 rows of tubercules increasing in size distally, prolateral ones enlarged, 1 short, blunt prolateral apical spine, 1 large retrolateral apical tubercle; IV ventrally with two irregular rows of tubercules (prolateral ones enlarged) increasing in size distally, 1 blunt prolateral apical tubercle, 1 large retrolateral apical tubercle. Tibiae I, IV with two ventral rows of slightly enlarged tubercules, without spines; III with rows of similar-sized tubercules. Tarsal segmentation: 6, 8, 6, 6.

**Variation in males** (n=5): Measurements: SL 4.05–4.80; SMW 3.70–4.00; femur I 1.80–2.15; II 3.80–4.20; III 2.90–3.60; IV 3.50–3.80. Median paracheliceral projection smaller or similar-sized as PAM. Pedipalpus: Tibial setation: Prolateral IiiIi/IiIi/IIi, retrolateral IiIii/IiIi/IiIi/IIi. Tarsal setation: Prolateral Iii/IiIi/IiIi/Iii. Trochanter III with or without large ventro-basal tubercle; IV with 1–2 large retrolateral apical tubercles. Femora I–II ventrally with 2 rows of slightly enlarged or similar-sized tubercules; I with reduced or small PDS, RDS; II–III with reduced or small PDS, medium or large RDS; III with or without 1 large retrolateral ventro-apical tubercle. Tibia I with 2 rows of similar-sized tubercules or increasing in size distally; IV with or without 1 retrolateral apical spine. The beta male form has its coxa IV reaching grooves III–IV and its prolateral median apophysis of trochanter IV conical instead of cylindrical and flattened.

**Variation in females** (n=7): Measurements: SL 4.50–4.95; SMW 3.00–3.80; femur I 1.80–2.05; II 3.50–4.00; III 2.80–3.00; IV 3.50–3.70. Pedipalpus: Tibial setation: Prolateral IiiIi/IiIi/IIi, retrolateral IiIii/IiIi/Iii. Trochanter III with or without large ventro-basal tubercle; IV with 1–2 large retrolateral apical tubercles. Femora I–II ventrally with 2 rows of slightly enlarged or similar-sized tubercules; I with reduced or small PDS, RDS; II–III with reduced or small PDS, medium or large RDS; III with or without 1 large retrolateral ventro-apical tubercle. Tibia I with 2 rows of similar-sized tubercules or increasing in size distally; IV with or without 1 retrolateral apical spine. The beta male form has its coxa IV reaching grooves III–IV and its prolateral median apophysis of trochanter IV conical instead of cylindrical and flattened.

**Type locality:** Brazil, Rio de Janeiro, Santa Maria Madalena, Parque Estadual do Desengano.

**Geographical distribution** (Fig. 49A): Brazil. Rio de Janeiro.

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**Eusarcus armatus** Perty (Figs. 5, 38E,F, 49B)

*Eusarcus armatus* Perty 1833: 203; Koch 1839a: 9 (cit); 1839b: 3 (rdesc), pl. 217, figs. 541–542; Bertkau 1880: 6 (cit), 106 (com descr); Roewer 1913: 68 (key, rdesc), fig. 31; 1923: 418 (rdesc), fig. 521; Mello-Leitão 1926: 372 (diag); Roewer 1929: 197 (key, cit [pars]); Giltay 1930: 234 (cit); Mello-Leitão 1932: 155 (key), 157 (rdesc), fig. 80; 1940: 6 (key); B. Soares 1945c: 375 (cat [pars]); Soares & Soares 1954b: 259 (cat); Kury 2003a: 168 (cat); (fe type, Zoologische Staatssammlung München, lost).

*Eusarcus pumilio* Perty 1833: 203; (fe holotype, Zoologische Staatssammlung München, lost). Synonymy with *E. armatus* established by Koch (1839b).

*Eusarcus curvispinosus* Mello-Leitão 1923b: 122; Mello-Leitão 1926: 372 (diag); Roewer 1929: 197 (key), 198 (rdesc); Mello-Leitão 1932: 155 (key), 157 (rdesc), fig. 81; 1940: 6 (key); 1945: 154 (cat), 157 (key), fig. 11; B. Soares 1945c: 375 (cat); Soares & Soares 1954b: 259 (cat); Acosta 1996b: 223 (cat); Kury 2003a: 169 (cat); (ma holotype; “Petrópolis, Rio de Janeiro; MNRJ 1438”; examined; 1 ma paratype; “Petrópolis, [Rio de Janeiro], Brazil; SMF, RI/954(35);” not examined). **Syn. n.**

*Enantiocentron montis* Mello-Leitão 1936: 23, 24 (key), fig. 19; (ma holotype; “Petrópolis, Rio de Janeiro; R. Arlé leg.; MNRJ 42693”; examined), (1 fe “allotype”; “Mendes, Rio de Janeiro; M. Eugenio leg.; MZSP 1743”; examined). **Syn. n.**


Material examined: BRAZIL. Rio de Janeiro: Petrópolis, without name of collector and date, ma holotype & 1 fe of E. curvispinosus (MNRJ 1438), male here designated as neotype of E. armatus; idem, R. Arlé leg., without date, ma holotype & 1 ma of E. montis (MNRJ 42693). BRAZIL. Minas Gerais: Viçosa, without name of collector, 1958, 5 ma & 1 fe (HEMS 337). Rio de Janeiro: Angra dos Reis (Estrada Lídice-Angra, 22° 51’ 57”S 44° 14’ 50”W), A. Kury, R. Pinto-da-Rocha & L. Mestre leg., 1.ii.1997, 1 fe (MNRJ 5535); Cachoeiras do Macacu, R. Pinto-da-Rocha & A.B. Kury leg., 8.x.1988, 1 fe (MHNC 6276); idem (Reserva Estadual Guapiaçu), A. Kury, A. Giupponi & S. Brandão leg., 20–21.xi.2000, 1 ma (MNRJ 16177); Guapimirim (Estação Ecológica Estadual Paraíso), R. Pinto-da-Rocha & R. Bénils leg., 4–7.vii.1996, 1 ma (MZSP 15491); Itatiaia (Repouso Itatiaia), O. Schubart leg., 17.x.1945, 1 fe (MNRJ 16170); Macaé (APA SANA), A. Chagas Jr. & B. Segall leg., 18.vii.2002, 2 ma & 1 fe (MNRJ 11361); Maricá (APA SANA), A. Chagas Jr. & B. Segall leg., 18.vii.2002, 2 ma & 1 fe (MNRJ 11361); Nova Friburgo, Wygodzinsky leg., 1946, 1 ma (MZSP 1724); idem, K. Tanizaki leg., 4.v.1992, 1 ma & 1 fe (MNRJ 6893); idem, S. Ide leg., 11–12.x.1996, 1 ma (MNRJ 21297); idem, without name of collector, 21.i.2000, 2 ma (MZSP 19167); idem, R. Pinto-da-Rocha & R. Bérnils leg., 10.x.1988, 1 ma (MNRJ 6329); idem, Bresslau leg., 1 fe (SMF 953, No. 34); idem, D. Holboun leg., 26.viii.1984, 1 fe & 2 im (MNRJ 6053); Piraí (Pinheiro), E.de M. Mello leg., without date, 1 ma (MNRJ 1435); idem, A. Kury & R. Baptista leg., 20.xi.1988, 3 ma & 3 fe (MNRJ 6371); Rio Claro (estação repetidora da Rede Globo), A.B. Kury, R. Pinto-da-Rocha & L. Mestre leg., 1.ii.1997, 1 fe (MNRJ 5544); idem, 1 ma (MNRJ 5547); Rio de Janeiro (Marambaia), B.N. Costa leg., 27.ix.1991, 1 beta male (MNRJ 11354); idem (Santa Bárbara), without name of collector and date, 1 fe (MNRJ 11356); idem (Parque Nacional Serra dos Órgãos), A.P.L. Giupponi & R.L.C. Baptista leg., 27.i.2001, 1 fe (MNRJ 4481); idem, Izecksohn leg., 28.iv.1964, 1 fe (MNRJ 16148). São Paulo: Ilha de Búzios, CDZ leg., x.1963, 1 ma (HEMS 1007); Ilha da Vitória, CDZ leg., iii.1964, 1 ma & 1 fe (HEMS 947); São José do Barreiro (Serviço de Piscicultura da Serra da Bocaina), O. Roppa leg., 15.iv.1961, 1 ma (MNRJ 4879); idem (Serra da Bocaina), J.P. de Mattos leg., 5.x.1968, 1 ma (HEMS 704); Ubatuba (Fazenda Angelin, P.E. da Ilha Anchieta, 23°23’S 45°03’W), Eq. Biota leg., 23–30.vii.2001, 1 fe (IBSP 3334).

Diagnosis: E. armatus can be distinguished from other species of the genus by the three prolateral apophyses on male trochanter IV, each one of them with a typical size and shape.

Redescription: Male (MZSP 15491): Dorsum (Fig. 5A,B): Measurements: SL 4.30; SMW 4.00; femur I 2.10; II 4.30; III 3.30; IV 3.70. Median paracheliceral projection smaller than PAM. Ocularium far from anterior scutal margin; low, with 5 tubercles. Carapace with 20 scattered tubercles. Scutal area I with 11–12 scattered tubercles on each side; II with 23; III with 42 and a single sharp median spine, directed obliquely backwards, not surpassing posterior margin of dorsal scutum; IV with 21 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 19, 13, 13, 9 tubercles, respectively. Anal operculum with 19 tubercles.

Venter: Coxa I with 23–25 tubercles, median and distal ones largest; II with 39–42, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 4 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 3 tubercles. Femur dorsally with 4–5 aligned tubercles; ventrally with 1 large basal tubercle, 2 small scattered tubercles. Tibial setation: Prolateral and retrolateral lll. Tarsal setation: Prolateral II, retrolateral II.

Legs (Fig. 5C–J): Coxae IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, curved posteriad and ventrad. Trochanters I–IV with scattered tubercles; IV prolaterally with an anterior median apophysis, this short, blunt, conical with large base, and with a posterior median apophysis, this cylindrical and flattened, blunt, more ventrally placed; oblique apical apophysis, this largest, conical, curved posteriad and dorsad; retrolaterally with 1 median and 1 large apical tubercle. Femur I with small PDS, RDS;
developed, thus resembling the male of Eusarcus oxyacanthus. The beta male form may not show the prolateral posterior median apophysis of trochanter IV. Tarsal segmentation: 6, 7–9, 6, 6. Coloration: When alive, orange-brown; dark brown on legs, light setation: Prolateral Iii/Ii, retrolateral iI/iI. Femur I with reduced or small PDS, RDS; III with reduced or small PDS. 3.40; III 2.30–2.80; IV 2.80–3.40. Pedipalpus: Tibial setation: Prolateral Iii/Ii, retrolateral iI/iI. Tarsal segmentation: 6, 7–9, 6, 6. Coloration: When alive, orange-brown; dark brown on legs, light setation: Prolateral Iii/Ii, retrolateral iI/iI. Femur I with reduced or small PDS, RDS; II with small or medium RDS. Femur IV may show enlarged tubercles ventrally with 2 rows of slightly enlarged tubercles; II–III with small PDS, medium RDS; III sinuous, ventrally with 2 rows of tubercles slightly increasing in size distally, prolateral ones more conspicuous, 1 large prolateral apical tubercle; IV sinuous, with medium PDS, RDS; ventrally with 2 rows of tubercles increasing in size distally, 2 apical spines. Tibia III with two ventral rows of tubercles slightly increasing in size subapically, retrolateral ones enlarged. Tarsal segmentation: 6, 8, 6, 6.

Penis (Fig. 38E,F): Stylus smooth, apex inflated; with angular medio-ventral projection. Ventral process of glans curved, apex with flabelliform projection. Ventral plate with concave sides; with 3 pairs of long, curved distal setae; 1 pair of short, straight median setae; 3–4 pairs of slightly curved basal setae.

Coloration: Brown; dark brown on body edges, legs and palps.

**Female** (allotype of E. montis, MZSP 1743): Dorsum: Measurements: SL 3.60; SMW 3.05; femur I 1.80; II 3.40; III 2.60; IV 3.30. Ocularium with 2 large and 3 small tubercles. Pedipalpus: Tibial setation: Prolateral Iii/iI, retrolateral Ii/iI. Legs: Coxa II with 1 large retrolateral tubercle; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, curved backwards. Trochanter IV with scattered tubercles, retrolaterally with 1 large apical tubercle and 1 slightly small median one. Femur IV ventrally with 2 rows of tubercles, prolateral ones enlarged, 2 large apical tubercles, prolateral one moderately enlarged. Tibia III with rows of similar-sized tubercles. Tarsal segmentation: 6, 8, 6, 6. Coloration: Light brown; dark brown on middle areas of legs except matatarsi and tarsi.

**Variation in males** (n=6): Measurements: SL 3.60–4.30; SMW 3.20–4.00; femur I 1.80–2.10; II 3.60–4.30; III 2.30–3.30; IV 3.00–3.70. Ocularium unarmed or with two large tubercles. Pedipalpus: Tibial setation: Prolateral Iii/iI, retrolateral Ii/iI. Femur I with reduced or small RDS; II with small or medium RDS. Tarsal segmentation: 6, 7–9, 6, 6. Coloration: When alive, orange-brown; dark brown on legs, light brown on tarsi. The beta male form may not show the prolateral posterior median apophysis of trochanter IV developed, thus resembling the male of E. oxyacanthus. However, it is possible to distinguish both species based on the curvature of the prolateral apical apophysis of trochanter IV. Femur IV may show enlarged tubercles in mid-dorsal area and a ventral row of pointed, low tubercles.

**Variation in females** (n=6): Measurements: SL 3.60–4.10; SMW 3.00–3.60; femur I 1.60–2.00; II 3.10–3.60; III 2.30–2.80; IV 2.80–3.40. Pedipalpus: Tibial setation: Prolateral Iii/iI, retrolateral Iii/iI. Tarsal setation: Prolateral Iii/iI. Femur I with reduced or small PDS, RDS; III with reduced or small PDS. Coloration: When alive, it has the same color as the male, with light brown spots next to the ocularium.

**Taxonomical notes:** The identity of E. armatus is unclear. The lost holotype is a female, therefore its description and illustration do not allow for proper identification. Koch (1839b) was the only researcher who studied this material again, and he redescribed the species adding three more specimens (including a male) from different museums. Roewer (1913) examined the material studied by Koch except for the holotype. The holotype probably had been lost by that time, and he redescribed the species and added more specimens from Rio de Janeiro (Petrópolis) and São Paulo. Comparing descriptions by Koch and Roewer, we found conspicuous differences: In Koch (1839b), E. armatus shows a rectangular projection on coxa IV and spines on tibia IV, these being absent in the redescription by Roewer. Considering that all the type material is now lost, we can only state that E. armatus, as “redescribed” by Koch, resembles E. nigrimaculatus (or one of the three new species which belong to the clade E. alpinus+), whereas E. armatus as “redescribed” by Roewer, is similar to E. curvispinosus (or E. montis). The specimens identified as E. armatus in the collection of Roewer belong to the same species as the specimens identified as E. curvispinosus by Mello-Leitão. Considering that: (i) the original description by Perty is insufficient and the corresponding female holotype was lost; (ii) the male of this species was identified in a doubtful manner; (iii) the material examined by Koch is lost; and (iv) that the description by Koch does not allow to identify the species; we decided to accept the redescription by Roewer as valid for the identity of E. armatus in order to keep nomenclatural stability. Since it is a well-established genus name in the literature, it is important that a recognizable type species exists. Therefore, we designate the type of E. curvispinosus as the neotype of E. armatus.


**Geographical distribution** (Fig. 49B): SE Brazil. Minas Gerais, Rio de Janeiro, and São Paulo.
FIGURE 5. *Eusarcus armatus* Perty. Male (MZSP 15491): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, left trochanter and femur IV, prolateral view; E, right trochanter and femur IV, dorsal view; F, idem, ventral view; G, right femur III, dorsal view; H, idem, ventral view; I, right tibia III, dorsal view; J, idem, ventral view. Abbreviations: PAATr, prolateral apical apophysis of trochanter IV; PAMATr, prolateral anterior median apophysis of trochanter IV; PPMATr, prolateral posterior median apophysis of trochanter IV; RVS, retroventral apical apophysis of trochanter IV. Scale bars, 1 mm.
Eusarcus berlae (Mello-Leitão) comb. n.
(Figs. 6, 41C,D, 50A)

Jacarepaguana berlae Mello-Leitão 1932: 451, fig. suppl. 11; Piza 1943: 256 (diag); B. Soares 1944e: 196 (cit), 201 (descr fe), fig. 4; 1945c: 378 (cat). (ma holotype; "Jacarepaguá, [Rio de Janeiro], Rio de Janeiro; MNRJ 1395"; examined).


Material examined: BRAZIL. Rio de Janeiro: Rio de Janeiro (Jacarepaguá), without name of collector and date, ma holotype of Jacarepaguana berlae (MNRJ 1395). BRAZIL. Rio de Janeiro: Cachoeiras de Macacu (Reserva Ecológica Guapiaçu), R. Baptista leg., 11.iii.2001, 1 ma & 1 fe (MNRJ 14303); Rio de Janeiro, Arlé leg., without date, ma holotype of M. arlei (MNRJ 41569); idem (Campo Grande), A. Lemos de Castro & F. Sampaio leg., 10.vi.1950, 1 fe (MNRJ 11407); idem (Floresta da Tijuca), A. Giupponi leg., 19.xi.1999, 1 ma (MNRJ4873); idem (Grajaú), Schubart leg., without date, 1 fe (MZSP 24762); idem (Horto), C.A. Caetano leg., i.1989, 1 ma (originally in MNRJ 11404); idem (Parque Estadual Pedra Branca), D.R. Pedroso leg., 20.ix.2004, 1 ma (MNRJ 17692); idem (Praia Vermelha), A.B. Kury, A. Telles, M. Lima leg., 13.xi.1993, 1 ma (MNRJ 6886).

Diagnosis: E. berlae resembles E. aduncus, E. elinae, E. fulvus, E. signatus, E. sooretamae, E. cavernicola, E. mirabilis and E. sergipanus because of the conical prolateral median apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; median spine of scutal area III of medium size; basitarsus I not elongated; prolateral apical apophysis of coxa IV with ventro-posterior triangular projection; ocularium with a median spine; only 1 large proventral apical tubercle on femur IV.

Redescription: Male (holotype): Dorsum (Fig. 6A,B): Measurements: SL 3.40; SMW 3.00; femur I 1.80; II 3.40; III 2.50; IV 3.20. Median paracheliceral projection of similar-size as PAM. Anterior margin with 1 large tubercle on each corner. Ocularium far from anterior scutal margin; high, with a median spine, 5 tubercles on posterior face. Carapace with 28 scattered tubercles. Scutal area I with 27 scattered tubercles on each side; II with 58; III with 70 and a median spine surpassing groove IV; IV with 44 tubercles. Posterior margin of dorsal scutum and free tergites I–III with rows of 13 and 15, 4 and 16, 9 and 14, 6 and 12 tubercles, respectively. Anal operculum with 46 tubercles.

Venter: Coxa I with 24–31 tubercles, median and distal ones largest; II–III with 56–60 and 59–60, respectively, increasing in size distally; IV irregularly tuberculate.

Chelicera: Segment I with 2 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 2 tubercles. Femur dorsally with scattered, small tubercles; ventrally with 2–3 aligned tubercles. Tibial setation: Prolateral IiIi, retrolateral IiIi. Tarsal setation: Prolateral III, retrolateral Iii/Iii.

Legs (Fig. 6C–F): Coxa II with 7 tubercles on retrolateral margin; IV densely tuberculate, surpassing dorsal scutum in dorsal view only apically, with 1 transversal prolateral apical apophysis, this conical, short, blunt, with 1 ventral projection and another one, transversal, in the middle. Trochanters I–IV with scattered tubercles; I with 1 large ventro-basal tubercle; II–III with large retrolateral tubercles; IV prolaterally with 1 median apophysis, this conical, curved anteriad, with 1 large median tubercle; retrolaterally with 1 large, pointed apical tubercle. Femora I–II with reduced PDS, RDS; III slightly sinuous, with reduced PDS, small RDS; ventrally with 2 rows of tubercles slightly increasing in size distally, 1 large prolateral apical tubercle; IV slightly sinuous, with medium PDS, small RDS; ventrally with a prolateral row of tubercles slightly increasing in size distally and 1 large prolateral apical tubercle. Tibia III ventrally with 2 rows of tubercles slightly increasing in size subapically. Metatarsus I with 2 ventro-apical setae; II with 1 proventral apical seta. Tarsal segmentation: 5, 8, 6. 6.

Penis (Fig. 41C,D): Stylus with medio-ventral trichomes, apex swollen; with angular medio-ventral projection. Ventral process of glans curved, with apex blunt, thin. Ventral plate with concave sides; with 3
FIGURE 6. *Eusarcus berlae* (Mello-Leitão) **comb. n.** Male (holotype): A, habitus, dorsal view; B, dorsal scutum, left lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right trochanter and femur IV, dorsal view; E, idem, ventral view; F, right femur IV, prolateral view. Scale bars, 1 mm.
pairs of slightly curved distal setae; 1–2 pairs of short, straight median setae; 4 pairs of straight basal setae, basal pair far from others and smaller.

Coloration: Body, pedipalps and chelicera brown; tarsi light brown. Legs and free tergites dark brown.


Variation in males (n=6): Measurements: SL 3.25–3.90; SMW 2.70–3.20; femur I 1.60–2.50; II 3.30–6.10; III 2.40–3.60; IV 3.00–4.50. Pedipalpus: Tibial setation: Prolateral III/IIi, retrolateral III/IIIi. Tarsal setation: Prolateral IIIi, retrolateral IIIi/IIIi. Femur II with reduced or small RDS; IV with small or medium PDS. Tarsal segmentation: 5–6, 8–11, 6, 6.

Variation in females (n=3): Measurements: SL 3.40–3.70; SMW 2.90–3.10; femur I 1.10–2.10; II 3.15–4.10; III 2.20–2.90; IV 3.00–3.70. Pedipalpus: Tarsal setation: Prolateral IIIi. Femur III with reduced or small RDS; IV with reduced or small PDS, RDS. Tarsal segmentation: 4–6, 8–9, 6, 6.

Type locality: Brazil, Rio de Janeiro, Rio de Janeiro.

Geographical distribution (Fig. 50A): Brazil. Rio de Janeiro.

**Eusarcus bifidus** Roewer
(Figs. 7, 47E,F, 49B)

*Eusarcus bifidus* Roewer 1929: 196 (key), 199, fig. 6; Mello-Leitão 1932: 156 (key), 161 (rdesc); 1940: 6 (key); B. Soares 1944e: 201 (cit); Mello-Leitão 1945: 153 (cat), 156 (key), fig. 9; H. Soares 1945: 217 (cit); Soares & Soares 1954b: 259 (cat); H. Soares 1966b: 109 (syst, diag); Acosta 1996b: 216 (cat); Kury 2003a: 168 (cat); (ma holotype; “Brasilien, Matto Grosso; SMF RI/955.36”; examined).

*Goyazia bifida*: Piza 1940b: 313, fig. 2 (by implic).


Diagnosis: *E. bifidus* resembles *E. caparaoensis*+ and *E. manero*+, which have a conical, short, blunt prolateral basal apophysis on male trochanter IV, and can be distinguished by: The presence of PAM; ocularium with two spines or a bifid apophysis; median spine of scutal area III short; trochanter IV with prolateral apical apophysis prolaterally inserted; femur IV with a prolateral row of slightly pointed, enlarged tubercles; a retrolateral row with pointed tubercles decreasing in size distally; ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, 2 apical spines.

Redescription: Male (holotype): Dorsum (Fig. 7A,B): Measurements: SL 3.65; SMW 3.45; femur I 1.90; II 3.70; III 2.60; IV 3.35. Median paracheliceral projection of similar-size as PAM. Anterior margin of prosoma with 1 large tubercle on right corner. Ocularium next to anterior scutal margin; high, with 1 bifid apophysis, 6 tubercles. Carapace with 24 scattered tubercles. Scutal area I with 7–12 scattered tubercles on each side; II with 31; III with 21 and a median spine short, not surpassing groove IV; IV with 27 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 20, 16, 16, 12 tubercles, respectively. Anal operculum with 32 tubercles.

Venter: Cox I with 25–29 tubercles, median and distal ones largest; II with 39–40, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 3 tubercles.
FIGURE 7. *Eusarcus bifidus* Roewer. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right trochanter and femur IV, prolateral view; E, idem, dorsal view; F, idem, ventral view; G, right femur III, ventral view; H, right tibia III, retrolateral view; I, right tibia IV, ventral view; J, right tibia III, ventral view. Abbreviations: PBATr, prolateral basal apophysis of trochanter IV; RAATr, retrolateral apical apophysis of trochanter IV. Scale bars, 1 mm.
Pedipalpus: Trochanter dorsally inflated, with 3 tubercles. Femur dorsally with 7 aligned tubercles, 1 mesal; ventrally with 1 large pointed basal tubercle, 3–5 small aligned tubercles. Tibial setation: Prolateral IIi/IiI, retrolateral IiI. Tarsal setation: Prolateral Iii, retrolateral IiI.

Legs (Fig. 7C–J): Coxa II with 3 tubercles on retrolateral margin; IV densely tuberculate, with 1 almost transversal prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad, slightly swollen on median retrolateral face. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; II with 1 large retrolateral apical tubercle; IV prolaterally with 1 basal apophysis, this conical, short, blunt, dorsally angular; 1 oblique apical apophysis, this short, blunt, with 1 large tubercle on the base; retrolaterally with 1 large median tubercule, 1 oblique apical apophysis, this conical, short, blunt. Femur I with reduced PDS, RDS; ventrally with 2 rows of slightly enlarged tubercules; II–III with small PDS, RDS; III sinuous, ventrally with 2 rows of tubercules increasing in size distally, 2 apical spines, prolateral one largest; IV sinuous, with tubercles decreasing in size distally, medium PDS, RDS; prolateral row of enlarged, slightly pointed tubercules; a retrolateral row with pointed tubercules decreasing in size distally; ventrally with 2 rows of tubercules increasing in size distally, prolateral ones enlarged, 2 apical spines. Tibia I ventrally with 2 rows of slightly enlarged tubercules; III with a retrolateral row of pointed tubercules increasing in size to the middle; with 2 ventral rows of pointed tubercules, increasing in size subapically, retrolateral ones enlarged; IV ventrally with 2 rows of tubercules increasing in size distally, retrolateral ones slightly enlarged, 2 apical spines. Metatarsus I with 2 ventro-apical setae. Tarsal segmentation: 6, 8, 6, 6.

Penis (Fig. 47E,F): Stylus with medio-ventral trichomes, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved, apex with flabelliform projection. Ventral plate with concave sides; with 3 pairs of long, slightly curved distal setae; 1 pair of ventral subapical setae, this small, short, straight; 1 pair of short, straight median setae; 4–5 pairs of straight basal setae.

Coloration: Light brown on most parts of the body, distal portion of femur IV and tibia IV, patella, metatarsus and tarsus. Brown on the body edges, legs and apophyses.

**Female** (IBSP 1551): Dorsum: Measurements: SL 3.10; SMW 2.80; femur I 1.40; II 2.30; III 1.90; IV 2.30. Anterior margin of prosoma with 1 tubercle on each corner. Pedipalpus: Tibial setation: Prolateral Iii, retrolateral IiI/iIi. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed. Trochanter IV with scattered tubercules, with 1 large retrolateral subapical tubercule. Femur III ventrally with a prolateral row of tubercules increasing in size distally, 1 large apical tubercle; IV with dorsal, prolateral and retrolateral rows of similar-sized tubercules, with small RDS; ventrally with a prolateral row of tubercules increasing in size distally, 1 large pointed prolateral apical tubercle. Tibiae I, III–IV with rows of similar-sized tubercules. Tarsal segmentation: 5, 7, 6, 6.

**Variation in males** (n=4): Measurements: SL 3.45–3.65; SMW 3.00–3.45; femur I 1.50–1.90; II 2.70–3.70; III 2.15–2.60; IV 2.60–3.35. Ocularium with 2 spines or a bifid apophysis. Pedipalpus: Tibial setation: Prolateral IiI/iIi/Ii. Femur II with reduced or small PDS; III with small or medium RDS. Tarsal segmentation: 5–6, 7–8, 6, 6.

**Variation in females** (n=6): Measurements: SL 3.10–3.40; SMW 2.80–2.90; femur I 1.40–1.60; II 2.30–3.00; III 1.80–2.20; IV 2.30–2.85. Pedipalpus: Tibial setation: Retrolateral Iii/I. Femur II with reduced or small PDS, RDS; III with reduced or small PDS, small RDS; IV with small or medium PDS, RDS. Tarsal segmentation: 5–6, 7–8, 6, 6.

**Type locality:** Brazil, old Mato Grosso (when *E. bifidus* was described, this state was not yet divided into Mato Grosso and Mato Grosso do Sul).

**Geographical distribution** (Fig. 49B): Brazil. Mato Grosso or Mato Grosso do Sul.

**Eusarcus caparaoensis** sp. n.
(Figs. 8, 44C,D, 50B)

**Type material:** BRAZIL. Minas Gerais: Alto Caparáo (Parque Nacional Caparaó), Eq. Biota leg., 1–5.v.2002, ma holotype (IBSP 2904); idem, 1 fe paratype (IBSP 2895); idem, 1 fe paratype (IBSP 2903); Santa
Bárbara (EPDA PETI), M.S. Pena leg., 15.x.1991, 1 ma paratype (MNRJ 11358); Viçosa, J. Moojen leg., without date, 1 fe paratype (MNRJ 58038).

**Diagnosis:** *E. caparaoensis* resembles *E. caparaoensis*+ and *E. manero*+, which have a conical, short, blunt prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The absence of PAM; ocularium with similar-sized tubercles; median spine of scutal area III long, curved backwards, surpassing posterior margin of dorsal scutum; femur IV ventrally with a prolateral row of tubercles increasing in size distally and with 2 apical spines.

**Etymology:** The name, an adjective, refers to the locality where the species was collected.

**Description:** *Male* (holotype): Dorsum (Fig. 8A,B): Measurements: SL 3.00; SMW 2.90; femur I 1.45; II 2.80; III 2.10; IV 2.70. PAM absent. Ocularium next to anterior scutal margin; with 12 tubercles. Carapace with 55 scattered tubercles. Scutal area I with 45–47 scattered tubercles on each side; II with 58; III with 46 and a median spine long, curved backwards, surpassing posterior margin of dorsal scutum; IV with 48 tubercles. Posterior margin of dorsal scutum and free tergites I–II with a regular row of 13, 14, 11 tubercles, respectively; III with an irregular row of 13 tubercles. Anal operculum with 23 tubercles.

Venter: Coxa I with 15–18 tubercles, median and distal ones largest; II with 44–48, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 3 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 2 tubercles. Femur dorsally smooth; ventrally with 1 large basal tubercle. Tibial setation: Prolateral IIIi, retrolateral IIi/iIi. Tarsal setation: Prolateral IIi, retrolateral IIIi.

Legs (Fig. 8C–J): Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; IV with 1 prolateral basal apophysis, this conical, short, blunt; retrolaterally with 1 large pointed median tubercle, 1 short apical apophysis. Femur I with reduced PDS, RDS; II with reduced PDS, small RDS; III sinuous, with reduced PDS, medium RDS; ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, 1 large prolateral apical tubercle; IV sinuous, with medium PDS, RDS, ventrally with a prolateral row of tubercles increasing in size distally, 2 apical spines. Tibia III with a retroventral row of high, pointed tubercles; IV with 2 ventro-apical spines. Metatarsus I with 2 ventro-apical setae. Tarsal segmentation: 6, 8, 6, 6.

Penis (Fig. 44C,D): Stylus with medio-ventral trichomes, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved, with apex blunt. Ventral plate with slightly concave sides; with 3 pairs of curved distal setae; 1 pair of short, straight median setae; 1 ectal curved median seta, absent on the left side; 4 pairs of straight basalmost setae, basalmost pair situated more ventrally.

Coloration: Brown on most parts of the body; dark brown on prolateral apical apophyses of coxa IV and trochanter IV. Black reticulated pigments all over the body (except on articulations), more concentrated on patella, on metatarsi, tarsi and apex of femora.

**Female** (paratype; IBSP 2903): Dorsum: Measurements: SL 3.10; SMW 2.90; femur I 1.20; II 2.20; III 1.70; IV 2.30. Anterior margin of prosoma with 1–2 large tubercles on each corner. Scutal area III with median spine of medium size, curved backwards, surpassing groove V, but not posterior margin of dorsal scutum. Posterior margin of dorsal scutum with irregular rows of 12 and 20 tubercles; free tergite I with an irregular row of 24; II–III with rows of 5 and 20, 7 and 19 tubercles, respectively. Pedipalpus: Tibial setation: Prolateral and retrolateral IIIi. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, curved dorsad. Trochanter IV with scattered tubercles, 1 large pointed apical tubercle. Femur III ventrally with two irregular rows of tubercles slightly increasing in size distally, prolateral ones enlarged, 1 large prolateral apical tubercle; IV ventrally with 2 rows of tubercles, prolateral one slightly increasing in size distally, with 1 large prolateral apical tubercle. Tarsal segmentation: 6, 9, 6, 6.

**Variation in males** (n=2): Measurements: SL 3.00–3.20; SMW 2.90–3.00; femur I 1.45–1.60; II 2.80–3.50; III 2.10–2.40; IV 2.70–3.00. Pedipalpus: Tibial setation: Retrolateral IIIi/iIi/iII. Femur II with reduced or small PDS, small or medium RDS. Tarsal segmentation: 6, 8–10, 6, 6. Coloration alive: Dark brown in most parts of the body; with orange-brown spots on carapace and lateral margins of abdominal scutum. Light brown on tarsi.
FIGURE 8. *Eusarcus caparaoensis* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, dorsal view; E, idem, ventral view; F, right trochanter and femur IV, prolateral view; G, idem, dorsal view; H, idem, ventral view; I, right tibia IV, ventral view; J, right tibia III, ventral view. Scale bars, 1 mm.
Variation in females (n=2): Measurements: SL 3.10–3.15; SMW 2.80–2.90; femur I 1.20–1.50; II 2.20–2.90; III 1.70–2.20; IV 2.30–2.80. Femur I with reduced or small PDS. Tarsal segmentation: 6, 7–9, 6, 6.

Type locality: Brazil, Minas Gerais, Alto Caparaó, Parque Nacional do Caparaó.

Geographical distribution (Fig. 50B): Brazil. Minas Gerais.

Eusarcus catharinensis (Mello-Leitão) comb. n.
(Figs. 9, 39C,D, 50B)

Metagraphinotus catharinensis Mello-Leitão 1927: 401 (cit), 412; Roewer 1929: 235 (rdesc), fig. 23; Mello-Leitão 1932: 154 (rdesc), fig. 76; Mello-Leitão 1935a: 13 (diag); B. Soares 1945c: 379 (cat); Soares & Soares 1945b: 274 (cat); Acosta 1996b: 224 (cat); Kury 2003a: 175 (cat). (fe paratype; "Brazil, Santa Catharina; SMF 945/29"; examined).

Eusarcus pusillus Mello-Leitão 1931a: 120, fig. 2; Mello-Leitão 1945:155 (nom nov for Eusarcus pusillus Mello-Leitão 1931a nec Sørensen 1884), 158 (key), fig. 19; Soares & Soares 1946b: 224 (dist); B. Soares 1945c: 376 (cat). [junior homonym of E. pusillus Sørensen 1884]. (ma holotype; "Rodeio, Santa Catarina; Bauer leg.; MNRJ 11376"); examined.

Eusarcus perpusillus Mello-Leitão 1945:155 (nom nov for Eusarcus pusillus Mello-Leitão 1931a nec Sørensen 1884), 158 (key), fig. 19; Soares & Soares 1946b: 224 (dist); B. Soares 1945c: 374 (cat); Soares & Soares 1945b: 367 (dist); 1945b: 258 (cat); H. Soares 1966a: 92, fig. 4 (descr fe); Kury 2003a: 168 (cat). (ma holotype; "Antonina, Paraná; MNRJ 42274"; examined). Syn. n.

Eusarcus antoninae Mello-Leitão 1936: 4, fig. 2; Mello-Leitão 1940: 7 (key); 1945: 153 (cat), 158 (key), fig. 7; B. Soares 1945b: 193 (cit); 1945c: 374 (cat); Soares & Soares 1945b: 367 (dist); 1945b: 258 (cat); H. Soares 1966a: 92, fig. 4 (descr fe); Kury 2003a: 168 (cat). (ma holotype; "Antonina, Paraná; MNRJ 42274"; examined). Syn. n.

Eusarcus tripus Mello-Leitão 1940: 5, 7 (key), fig. 8; 1945: 156 (cat), 158 (key), fig. 21; Soares & Soares 1946b: 224 (dist); 1947b: 237 (syst); 1945b: 262 (cat); Kury 2003a: 170 (cat). (ma holotype; Jupuvura, São Paulo; deposited in MZSP, lost). Syn. n.

Metagraphinotus trochanterspinosus Soares & Soares 1947a: 212 (cit); 1947b: 251 (cit), 256, figs. 6–7; 1954b: 274 (cat); Kury 2003a: 175 (cat). (ma holotype; "Piraquara, Banhado, [Paraná]; C.N. Gofferjé leg., xii.1945"; deposited in the private collection of Mr. Carlos Nicolau Gofferjé, not examined). Syn. n.

Eusarcus armatus: [misid] Mello-Leitão 1923b: 121 (cat), 184 (key); Roewer 1927: 335 (cit [pars]); 1929: 197 (cit [pars]); B. Soares 1944a: 222 (cit); 1944b: 286 (dist); 1946: 519 (cat).

Eusarcus catarinesis [sic]: Bragagnolo et al. 2007: 393 (dist).

Material examined: BRAZIL. Santa Catarina: without name of collector and date, 1 fe paratype of M. catharinensis (SMF 945 N°. 29); Rodeio, Bauer leg., ma holotype of E. perpusillus (MNRJ 11376). Paraná: Antonina, F.L. de Morretes leg., ma holotype of E. antoninae (MNRJ 42274). Rio de Janeiro: Rio de Janeiro (Grajaú), Wygodzynsky leg., 11.v.1947, 1 ma & 1 fe (MNRJ 11377); Petrópolis, without name of collector and date, 1 ma (SMF 954-35). São Paulo: Cananéia (Ilha do Cardoso), G. Machado leg., 12–18.i.2000, 1 ma (MZSP 21813); Guaruja (Ilha Santo Amaro), J. Schubart leg., without date, 1 ma (MNRJ 11367); Itaparica do Serra, [Parana], C.N. Gofferjé leg., xii.1945”; deposited in the private collection of Mr. Carlos Nicolau Gofferjé, not examined). Syn. n.

Eusarcus armatus: [misid] Mello-Leitão 1923b: 121 (cat), 184 (key); Roewer 1927: 335 (cit [pars]); 1929: 197 (cit [pars]); B. Soares 1944a: 222 (cit); 1944b: 286 (dist); 1946: 519 (cat).

Eusarcus catarinesis [sic]: Bragagnolo et al. 2007: 393 (dist).

**Diagnosis:** *E. catharinensis* resembles *E. oxyacanthus* because of the presence of prolateral median and apical apophyses on the male trochanter IV, and can be distinguished by: The absence of PAM; ocularium with 1 pair of large or high tubercles or with a median spine; femur I with ventral rows of similar-sized tubercles; shape of longitudinal prolateral apical apophysis on male trochanter IV the length of which is half of the width of its podomere.

**Redescription:**

Male (MZSP 431): Dorsum (Fig. 9A,B): Measurements: SL 4.20; SMW 3.80; femur I 2.10; II 4.50; III 3.40; IV 3.70. PAM absent. Ocularium far from anterior scutal margin; with 4 large tubercles, 6 small ones. Carapace with 17 scattered tubercles. Scutal area I with 16–21 scattered tubercles on each side; II with 35; III with 43 and a median spine of medium size, oblique, reaching groove V but not surpassing posterior margin of dorsal scutum; IV with 29 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 18, 15, 12, 11 tubercles, respectively. Anal operculum with 37 tubercles.

Venter: Coxa I with 18 tubercles, median and distal ones largest; II with 26–29, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 2 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 1 tubercle. Femur dorsally smooth; ventrally with 1 large basal tubercle, 1–2 small scattered tubercles. Tibial setation: Prolateral IiIi, retrolateral IiIi/IiI. Tarsal setation: Prolateral IIi, retrolateral IiIi.

Legs (Fig. 9C–H): Coxa IV densely tuberculate, with 1 very oblique prolateral apical apophysis, this conical, long, curved posteriad and ventrad, swollen subapically. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; I with 1–2 large apical tubercles; IV prolaterally with 1 median apophysis, this conical, sinuous, blunt; 1 longitudinal conical apical apophysis; retro laterally with 1 large sub basal tubercle. Femur I with reduced PDS, RDS; ventrally with 2 rows of slightly enlarged tubercles; II–III with small PDS, medium RDS; III sinuous, ventrally with 2 rows of slightly enlarged tubercles; IV sinuous, with medium PDS, RDS; ventrally with a prolateral row of tubercles slightly increasing in size distally, a retro lateral row of small tubercles, 1 prolateral apical spine (PVS). Tarsal segmentation: 6, 9, 6, 6.

Penis (Fig. 39C,D): Stylus with medio-ventral trichomes, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved, apex with flabelliform projection. Glans with a dorsal, subapical, semi-spheric projection. Ventral plate with concave sides; with 3 pairs of long, curved distal setae; 1 pair of short, straight median setae; 3 pairs of straight basal setae.

Coloration: Reddish brown; dark brown on body edge and legs, apophyses of coxa and trochanter IV. Light brown on pedipalps, distal third of metatarsi and tarsi.

Female (subsequently and erroneously designated as “allotype” of *E. antoninae*; HEMS 241): Dorsum: Measurements: SL 3.65; SMW 3.20; femur I 1.95; II 3.55; III 2.70; IV 3.35. Anterior margin with 4 large tubercles on each corner. Ocularium with 2 pointed large tubercles, 8 small ones. Scutal area III with median spine slightly curved backwards and upwards, reaching groove IV, but not groove V. Pedipalpus: Tibial setation: Prolateral IiIi, retrolateral IIiIi. Tarsal setation: Prolateral IiIi, retrolateral IIiIi. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, curved backwards, pointed, surpassing posterior margin of that segment. Trochanter IV with scattered tubercles; retro laterally with 1 sub basal, 1 median and 1 apical (largest) large tubercles. Femur I with small PDS, RDS; II–IV with reduced
FIGURE 9. *Eusarcus catharinensis* (Mello-Leitão) **comb. n.** Male (MZSP 431): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right trochanter and femur IV, prolateral view; E, left trochanter and femur IV, dorsal view; F, right trochanter and femur IV, ventral view; G, right femur III, dorsal view; H, idem, ventral view. Scale bars, 1 mm.
PDS, RDS; III ventrally with two irregular rows, 1 large prolateral apical tubercle; IV ventrally with two irregular rows of tubercles, prolateral ones enlarged and slightly increasing in size distally, 1 large prolateral apical tubercle. Tarsal segmentation: 6, 7–8, 6, 6. Coloration: Yellowish brown; dark brown on legs and body edge.

**Variation in males** (n=6): Measurements: SL 3.20–4.20; SMW 3.00–3.80; femur I 1.70–2.10; II 3.40–4.50; III 2.60–3.40; IV 2.90–3.70. Ocularium with similar-sized tubercles, 1 pair of large tubercles, 1 pair of spines or 1 median spine. Pedipalpus: Tibial setation: Prolateral lii/ili, retrolateral ili/ili/ili/Iii. Femur I with reduced or small PDS; II with small or medium RDS; III with reduced or small PDS, small or medium RDS; IV with small or medium PDS, RDS. Tarsal segmentation: 6, 7–9, 6, 6.

**Variation in females** (n=6): Measurements: SL 3.00–3.90; SMW 2.60–3.20; femur I 1.60–1.90; II 2.90–4.00; III 2.10–2.90; IV 2.70–3.60. Pedipalpus: Tibial setation: Retrolateral III/iIi/iIi/Iii/iIi/iIi/IiI. Femur I with reduced or small PDS, RDS; II–III with reduced or small PDS, reduced to medium RDS; IV with reduced to medium PDS, RDS.

**Nomenclatural note**: The types of *Eusarcus antoninae*, *E. perpusillus* and *E. tripus* differ from each other in the armature of the ocularium (1 pair of spines, 1 pair of large and similar-sized tubercles, respectively); in the number of tubercles on the first cheliceral segment; in the proportion between apical spines of femora of the legs; and in the presence or absence of ventro-apical spines on tibia IV. After examination of specimens from several localities including the type localities, we concluded that the morphological differences among these holotypes are, in fact, due to intraspecific variation. Although the holotype of *E. tripus* is lost, specimens largely corresponding to the holotype description and collected near the type locality (Poço Grande, Jupuvura, São Paulo) were considered as representative of this “species”. Although the armature of the ocularium of these specimens does not correspond to the original description, it is not very different from the intraspecific morphological variation mentioned above, which thus justifies synonymy with *E. catharinensis*.

Although we have not examined the male holotype of *M. trochanterspinosus*, its description is precise enough and matches perfectly with the male specimen from vial MZSP 1337, collected at the type locality of *M. trochanterspinosus*. This material is important, because once we had reliable specimens of this species, we could evaluate whether it is a valid species or not. Comparing female specimens of *M. trochanterspinosus* with the female holotype of *M. catharinensis*, which is the type species of *Metagraphinotus*, we concluded that they belong to the same genus and species. It is noteworthy to mention that females of this species are among the few that can be identified to the species level.

Comparing further specimens of *M. catharinensis* and *E. perpusillus*, we verified that they are conspecific, the former differing from the latter only regarding armature of the ocularium, which is developed as a median spine. On examining male genitalia from both “species”, we verified that they also lie within the range of intraspecific variation, all possessing the dorsal glans projection, a character previously considered as autapomorphic for *E. perpusillus*. Under these circumstances, there are two options: (i) assume that there are two different species, probably sister species, or (ii) assume that there is one species, with a variation in the ocularium. Considering that these “species” are sympatric, and that *E. perpusillus* has morphological variation in the ocularium, we chose the second alternative. Therefore, we can conclude that *E. catharinensis* has a polymorphic ocularium, which can be unarmed, armed with 2 tubercles, 2 spines or with a median spine.


**Geographical distribution** (Fig. 50B): SE–S Brazil. Rio de Janeiro to Santa Catarina.

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**Eusarcus cavernicola** sp. n.  
(Figs. 10, 11, 40E,F, 50B)

**Type material**: BRAZIL. Goiás: São Domingos (Parque Estadual Terra Ronca, Lapa do Passa Três), C.A. Rheims leg., ma holotype & 1 fe paratype (MZSP 19170). Paratypes: BRAZIL. Bahia: Santana (Gruta do
Padre), P. Gnaspini et al. leg., 16.ix.2001, 1 ma (MZSP 28652); idem, 1 fe (MZSP 28651).

Goiás: Anápolis (Fazenda Formiga, Gruta Jatobacaba), Gregeo leg., 30.iv.1989, 1 ma & 2 fe (MHNC 6552); São Domingos (Lapa do Bezerra), L. Horta leg., 3.vii.1993, 2 fe (MZSP 14024); idem (Gruta complexo São Mateus Imbuia, galeria Matilde III), F. Chaimowicz leg., vii.1985, 1 ma & 1 im (HEMS 880); idem, 1 ma & 2 fe (HEMS 883); idem (Gruta São Vicente), 1 ma (HEMS 882); idem (Parque Estadual Terra Ronca, Lapa do Angélica), C.A. Rheims leg., 6.ix.2000, 1 fe (MZSP 19174); idem, 1 ma & 1 fe (IBSP 1288); idem, F.P. Franco leg., 1 fe (IBSP 1289); idem, C.A. Rheims leg., 7.ix.2000, 2 ma (IBSP 1286); idem, 9.ix.2000, 1 ma & 1 fe (MZSP 19172); idem, (MZSP 19173); idem, 2 ma & fe (IBSP 1298); idem, 1 ma & 3 fe (IBSP 1299); idem (Parque Estadual Terra Ronca, Lapa do Passa Três), E. Trajano leg., 27.vi.1988, 1 ma (MHNC 6269); idem, ix.1999, 1 fe (MZSP 28653); idem, F.P. Franco leg., 3.ix.2000, 1 fe (IB1295); idem, 4.ix.2000, 2 ma (MZSP 19175); idem, 1 ma (IBSP 1293); idem, 1 ma (IBSP 1296); idem, 1 ma & 2 fe (IBSP 1301); idem, C.A. Rheims leg., 2 ma (MZSP 19171); idem, 1 ma & 1 fe (MZSP 19176); idem, 3 ma & 1 fe (IBSP 1300); idem, 4 ma (IBSP 1302); idem, F.P. Franco leg., 5.ix.2000, 1 fe (IBSP 1287); idem, 1 ma (IBSP 1290); idem, F. Borges et al. leg., 1 fe (IBSP 1294).

Minas Gerais: Gruta Vaca Voadora, F. Chaimowicz leg., vii.1984, 1 fe (HEMS 879); Itacarambi, A. Giupponi leg., 3.ix.2002, 1 ma & 1 fe (MNRJ 11368); idem (Gruta Olhos D’Água), Amazonas & Silvia leg., 26.vi.2001, 2 ma & 3 fe (MNRJ 11363); idem, P. Gnaspini et al. leg., 14.ix.2001, 1 fe (MZSP 28654); Montes Claros (Gruta Curralinho), F. Chaimowicz leg., xii.1984, 1 ma (HEMS 881); Unai (Gruta Tamboril), Gregeo leg., without date, 1 ma & 1 fe (MHNC 6553); idem, 21.v.1989, 1 ma & 2 fe (MHNC 6739).

Diagnosis: *E. cavernicola* resembles *E. aduncus*, *E. berlae*, *E. elinae*, *E. fulvus*, *E. signatus*, *E. sooretamae*, *E. mirabilis* and *E. sergipanus* because of the conical prolateral median apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularium with similar-sized tubercles; median spine of scutal area III of medium size; basitarsus I elongated; posterior margin of prolateral apical apophysis of coxa IV without projections on retrolateral margin; femur IV longer than 1.5 times dorsal scutum length.

Etymology: The name is a noun in apposition and refers to the habitat of this species, caves.

Description: Male (holotype): Dorsum (Fig. 10A,B): Measurements: SL 3.69; SMW 3.65; femur I 3.50; II 7.30; III 5.00; IV 6.85. Median paracheliceral projection larger than PAM. Ocularium far from anterior scutal margin; with 6 tubercles. Carapace with 71 scattered tubercles. Scutal area I with 30–33 scattered tubercles on each side; II with 73; III with 71 and a median spine of medium size, curved backwards, not surpassing posterior margin of dorsal scutum; IV with 46 tubercles. Posterior margin of dorsal scutum and free tergites I, III with rows of 11 and 26, 5 and 22, 10 and 14 tubercles, respectively; II with an irregular row of 21 tubercles. Anal operculum with 58 tubercles.

Venter: Coxa I with 26–32 tubercles, median and distal ones largest; II with 52, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 5–6 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 5–7 tubercles. Femur dorsally with a prolateral row of 7–9 tubercles, a median row with 7–11, a retrolateral row with 5; ventrally with 1 large basal tubercle, 5–6 small aligned tubercles. Patella with scattered tubercles. Tibial setation: Prolateral IiiIi, retrolateral IiIi. Tarsal segmentation: Prolateral III, retrolateral Iii.

Legs (Fig. 10C–G): Coxa IV densely tuberculate, surpassing dorsal scutum in dorsal view only apically, with 1 oblique prolateral apical apophysis, this conical, short, curved posteriad and slightly ventrad. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; IV with 1 prolateral median apophysis, this conical, long, curved dorsal. Femora I–III with reduced PDS, RDS; III slightly sinuous; IV slightly sinuous, with medium PDS, small RDS. Metatarsus I with 2 ventro-apical setae. Basitarsus I elongated. Tarsal segmentation: 6, 10–11, 6, 6.

Penis (MZSP 19176; Fig. 40E,F): Stylus smooth, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved, with apex blunt, thin. Ventral plate with slightly convex sides; with 3–4 pairs of distal setae curved apicad (basalmost pair far from the remaining distal ones); 2 pairs of short, straight, median setae; 4 pairs of slightly curved basal setae.
FIGURE 10. *Eusarcus cavernicola* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right trochanter and femur IV, prolateral view; E, idem, dorsal view; F, idem, ventral view; G, right tarsus I, dorsal view. Scale bars, 1 mm.
FIGURE 11. Quantitative comparison of body measurements in males of *E. aduncus* (including “*E. aduncus*”; n=28) and *E. cavernicola* sp. n. (n=33). Box-plot graphics show medians (thick bars), quartile (gray rectangles), maximum and minimum values (lines): A, length pedipalp/dorsal scutum; B, length leg I/dorsal scutum; C, length tarsus I/dorsal scutum; D, length leg II/dorsal scutum; E, length leg III/dorsal scutum; F, length leg IV/dorsal scutum. See material and methods for abbreviations.
Coloration: Light orange-brown; dark brown on carapace, posterior margin of dorsal scutum, free tergites, and apophyses of coxa IV. Light brown on metatarsi and tarsi.

Female (paratype; MZSP 19170): Dorsum: Measurements: SL 3.96; SMW 3.80; femur I 3.40; II 7.20; III 5.10; IV 6.39. Median paracheliceral projection of similar-size as PAM. Scutal area III with median spine of medium size, curved backwards, not surpassing groove V. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, curved posteriad and slightly dorsal, smaller than in male. Trochanter III with scattered tubercles, with 1 large ventro-basal tubercle; IV with scattered tubercles, with 1 large high, blunt retrolateral apical tubercle. Femur III with small PDS, RDS; IV with medium PDS, small RDS. Tarsal segmentation: 6, 10–11, 6, 6. Coloration: Light brown; dark brown on edges of dorsal scutum, trochanters and coxae.

Variation in males (n=6): Measurements: SL 3.60–4.30; SMW 3.20–4.00; femur I 3.10–4.05; II 6.50–8.50; III 3.90–6.00; IV 5.80–7.65. Pedipalpus: Tibial setation: Prolateral IiIi/IiiIi, retrolateral IiiIii/IiIi. Femur III with reduced or small PDS, RDS; IV with small or medium PDS. Tarsal segmentation: 6, 8–11, 6, 6.

Variation in females (n=6): Measurements: SL 3.60–4.50; SMW 2.90–3.80; femur I 2.80–3.85; II 6.20–7.90; III 4.20–5.60; IV 6.00–7.20. Pedipalpus: Tibial setation: Prolateral IiiIi/IiIi, retrolateral IiiIii/IiIi/IiIi. Femur II with reduced or small PDS; IV with small or medium PDS. Tarsal segmentation: 6, 8–11, 6, 6.

Taxonomical notes: This species is similar to *E. aduncus*, differing from the latter by the relatively longer legs IV, besides being collected only inside caves. To evaluate whether these two species can be distinguished morphometrically, we used three statistical analyses. The data used are given in table 4 and results in table 5.

Cluster analysis: Only a single specimen collected in a cave was grouped in group 1 (“*E. aduncus*”). This can be due to the specimen being a beta male and not showing the characteristic proportions of alpha males. Alternatively, we can imagine that this is an “anomalous” specimen whose proportions do not reflect the group to which it belongs. Performing the same statistical analysis without this specimen, the same groupings were obtained. We also used “box-plot” graphics (Fig. 11) to describe the quartile, maximum and minimum values of the variables by grouping.

MANOVA and Student’s t test: MANOVA indicates that the means of all used measures are significantly different between the two species (Wilk’s Lambda=0.116, F_{6,54}=68.85, p<0.0001) and this is corroborated by the Student’s t test. Therefore, we concluded that *E. aduncus* and *E. cavernicola* sp. n. are two species (see table 5) which are recognizable and morphometrically different, i.e. *E. cavernicola* sp. n. has relatively longer legs.

### Table 4

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<th>Species</th>
<th>Vial</th>
<th>Pdp/SL</th>
<th>LI/SL</th>
<th>TrsI/SL</th>
<th>LII/SL</th>
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......continued on the next page
### TABLE 4. (continued)

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TABLE 5. Student’s t test results for each variable derived from the ratio between the lengths of the legs (or pedipalps or tarsus I) (LI, LII, LIII, LIV, Pdp, TrsI) and the length of the dorsal scutum (SL) in *Eusarcus aduncus* and *E. cavernicola* sp. n. males. MANOVA results with the used number of specimens (nE.aduncus and nE.cavernicola) are given below the table. See also Fig. 11.

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<th>E. cavernicola</th>
<th>t test</th>
<th>p</th>
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<td>2.63 (0.37)</td>
<td>4.00 (0.32)</td>
<td>-15.63</td>
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<td>LII/SL</td>
<td>4.92 (0.76)</td>
<td>8.08 (0.64)</td>
<td>-17.74</td>
<td>&lt; 0.001</td>
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<td>LIII/SL</td>
<td>3.38 (0.36)</td>
<td>5.07 (0.48)</td>
<td>-15.50</td>
<td>&lt; 0.001</td>
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<td>LIV/SL</td>
<td>4.57 (0.52)</td>
<td>6.76 (0.60)</td>
<td>-15.05</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Pdp/SL</td>
<td>1.06 (0.12)</td>
<td>1.50 (0.08)</td>
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<td>TrsI/SL</td>
<td>0.43 (0.50)</td>
<td>0.70 (0.77)</td>
<td>-16.04</td>
<td>&lt; 0.001</td>
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Wilk’s Lambda=0.116, F6,54=68.85, p< 0.0001; nE.aduncus=28; nE.cavernicola=33

Although *E. cavernicola* sp. n. exhibits hypertely of legs and pedipalps we cannot classify it as a troglobitic harvestman species because it inhabits karstic areas with independent geological histories (Gnaspini & Hoenen 1999). In this case, it is possible that what we know as *E. cavernicola* sp. n. is actually an assembly of species that cannot be recognized by external and genitalic features. Therefore two hypotheses need to be tested in the future: (i) *E. cavernicola* sp. n. is really a single species or (ii) *E. cavernicola* sp. n. is an assembly of troglobite species that can only be recognized by other techniques (such as molecular analysis). Only after testing these hypotheses one will be able to decide if the hypertely of the legs and pedipalps is a preadaptation or the result of a cave adaptation process.

**Type locality:** Brazil, Goiás, São Domingos, Parque Estadual de Terra Ronca, Lapa do Passa Três.

**Geographical distribution** (Fig. 50B): Caves in central Brazil. Bahia, Goiás, and Minas Gerais.

**Eusarcus didactylus** sp. n.

(Figs. 12, 43C,D, 50A)

**Type material:** BRAZIL. Rio de Janeiro: Teresópolis (Parque Nacional Serra dos Órgãos), Eq. Biota leg., viii.2001, ma holotype (IBSP 2032b); idem, 1 fe paratype (IBSP 2014); idem, 1 fe paratype (IBSP 2187).

**Diagnosis:** *E. didactylus* resembles *E. incus*, *E. pusillus*, *E. nigrimaculatus*, *E. acrophthalmus*, *E. alpinus* and *E. geometricus* because of the cylindrical prolateral median process on the male trochanter IV and because of generally large body size, and can be distinguished by: The ocularium with 2 blunt spines; a rectangular projection on the retrolateral margin of the prolateral apical apophysis of coxa IV; the shape of the cylindrical prolateral median process of male trochanter IV: Apically bifurcated in a finger-shaped projection slightly curved anteriad; basally with a small, blunt, slightly conical apophysis. Penis without ventral process of glans (unusual within the genus); stylus curved ventrad, without trichomes and angular medio-ventral projection; ventral plate trapezoidal, with a transversal median groove.

**Etymology:** From Greek “dio”, meaning two, and “daktylos”, meaning finger, in reference to the two finger-shaped projections on the apex of the trochanter IV prolateral process.

**Description:** Male (holotype): Dorsum (Fig. 12A,B): Measurements: SL 5.15; SMW 4.50; femur I 2.25; II 4.35; III 3.45; IV 4.00. Median paracheliceral projection smaller than PAM. Ocularium close to anterior scutal margin; high, with 2 blunts spines, 28 tubercles. Carapace with 51 scattered tubercles. Scutal area I with 45–50 scattered tubercles on each side; II with 87; III with 104 and a median spine long, almost straight, curved up and backwards, surpassing posterior margin of dorsal scutum; IV with 44 tubercles. Posterior margin of dorsal scutum and free tergites II–III with an irregular row of tubercles and another regular one of 12 and 21, 6 and 15, 5 and 11 tubercles, respectively; free tergite I with a row of 21 tubercles. Anal operculum with 28 tubercles.
FIGURE 12. *Eusarcus didactylus* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view; I, right tibia IV, ventral view. Scale bars, 1 mm.
Venter: Coxa I with 28–37 tubercles, median and distal ones largest; II with 40–57 tubercles increasing in size distally; III–IV densely and irregularly tuberculate.

Chelicera: Segment I smooth.

Pedipalpus: Trochanter dorsally inflated, with 1 tubercle. Femur dorsally with 3 irregular tubercles; ventrally with 1 large pointed basal tubercle, 1 small one. Tibial setation: Prolateral iiii, retrolateral iiii/iiii. Tarsal setation: Prolateral ii, retrolateral iii.

Legs (Fig. 12C–I): Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and slightly ventrad, with 1 rectangular projection on retrolateral margin. Trochanters I–IV with scattered tubercles; I–III with large retrolateral tubercles; I–II with 1 large ventro-basal tubercle; IV prolaterally with 1 cylindrical and flattened median process, this apically bifurcated into a finger-shaped projection slightly curved anteriad; basally with a small, blunt, slightly conical apophysis; retrolaterally with 1 large pointed subbasal tubercle, 1 median and 1 large apical tubercle. Femur I with reduced PDS, RDS, two ventral irregular rows of slightly enlarged tubercles; II–III with reduced PDS, large RDS; III sinuous, ventrally with two irregular rows of tubercles increasing in size distally, prolateral ones enlarged, pointed, 1 blunt prolateral apical spine, 1 large retrolateral apical tubercle; IV sinuous, with medium PDS, large RDS; a prolateral and retrolateral row of enlarged tubercles; ventrally with 2 rows of tubercles, prolateral ones enlarged, increasing in size distally, becoming pointed (3 large), 2 apical spines. Patella IV ventrally with enlarged tubercles. Tibia III ventrally with two irregular rows of pointed tubercles increasing in size subapically, retrolateral ones enlarged; IV with enlarged tubercles, increasing in size dorso-ventrally, 1 retrolateral apical spine, ventrally with two irregular rows of tubercles increasing in size distally, 2 apical spines. Metatarsus IV with tubercles decreasing in size and amount distally. Tarsal segmentation: 6, 9, 6, 6.

Penis (Fig. 43C,D): Stylus smooth, apex swollen, curved ventrad; without trichomes and angular medio-ventral projection. Ventral process of glans absent. Ventral plate trapezoidal, with a transversal median groove; with 1 ventro-distal pair of small setae, 3–4 dorsal pairs of long, straight, thin distal setae; 1 pair of short, straight median setae; 4–5 pairs of straight, thick basal setae, basalmost pair small, far from others and placed on trunk.

Coloration: Dark brown; light brown on tarsi III and IV.

Female (paratype; IBSP 2187): Dorsum: Measurements: SL 5.20; SMW 4.50; femur I 2.00; II 4.00; III 3.20; IV 3.80. Median paracheliceral projection of similar-size as PAM. Free tergite I with an irregular row of 19 tubercles, a regular row of 19; II with 5 scattered and a regular row of 17; III with an irregular row of 9, and a regular row of 16 tubercles. Pedipalpus: Tibial setation: Prolateral iii/ili, retrolateral iiili/iiii. Legs: Coxa II with 2–3 retrolateral tubercles, 1 next to prolateral apophysis; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed, curved backwards, surpassing posterior margin of this segment. Trochanter IV with scattered tubercles, retrolaterally with 1 subbasal tubercle, 1 slightly enlarged median tubercle, 1 large apical tubercle. Femur III ventrally with two irregular rows of tubercles increasing in size distally, 1 small, blunt prolateral apical spine; IV with prolateral and retrolateral rows of similar-sized tubercles, ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 1 blunt prolateral apical spine, 1 large retrolateral apical tubercle. Tibia III ventrally with two irregular rows of tubercles, retrolateral ones enlarged; IV only with rows of similar-sized tubercles. Metatarsus IV unarmed. Tarsal segmentation: 6, 8, 6, 6.

Variation in female (n=2): Measurements: SL 5.00–5.20; SMW 4.40–4.50; femur I 1.90–2.00; II 3.70–4.00; III 2.90–3.20; IV 3.70–3.80. Ocularium with 2 spines separated or fused at the base. Pedipalpus: Tibial setation: Prolateral iiili/iiii, retrolateral iiili/iiii/iiii.

Type locality: Brazil, Rio de Janeiro, Teresópolis, Parque Nacional Serra dos Órgãos.

Geographical distribution (Fig. 50A): Known only from the type locality.
Eusarcus dubius B. Soares
(Figs. 13, 47C,D, 49B)


Neopucrolia dubia: Mello-Leitão 1945: 156 (cat).

Material examined: BRAZIL. São Paulo: Avaré, V.C. de Jesus leg., 31.viii.1965, 1 ma & 3 fe (HEMS 327); Botucatu, V.C. Jesus leg., 9.v.1967, 1 ma & 2 fe (MNRJ 16171); idem (Estação Ecológica Botucatu), V.C. de Jesus leg., 19.ix.1966, 5 ma & 7 fe (MNRJ 17644); idem (next to Fazenda Lageado), V.C. de Jesus leg., 1966, 5 ma & 1 fe (HEMS 326); idem (Fazenda Morro Vermelho), V.C. de Jesus leg., 2 ma & 1 fe (MNRJ 1012); idem (Rubião Jr.), A. Kury leg., 5.v.1988, 1 fe (MNRJ 6230); idem, M. Menezes leg., 17.ix.1970, 4 ma (MNRJ 16161); idem, M.J.B. Vianna leg., 11.v.1970, 1 ma & 1 fe (MNRJ 16162); idem, A. Mantovan & V.C. de Jesus leg., 16.v.1965, 3 ma & 6 fe & 3 im (MNRJ 16169); idem, A. Mantovan leg., 8.iv.1965, 1 fe (MNRJ 16179); São Manuel (Pratânia), R. Pinto-da-Rocha & M.M.A. de Oliveira leg., 1 beta male & 1 fe (MHNC 6621); idem (Km 278 Rod. Mal. Rondon), R. Pinto-da-Rocha & M.M. Argel de Oliveira leg., 1.i.1990, 1 ma (MHNC 6704). Paraná: (“Vale do Ribeirão”), without name of collector, iv.1942, 1 ma (HEMS 965). Without locality data: 1 ma & 1 fe (MNRJ 16165).

Diagnosis: E. dubius resembles E. caparaoensis+ and E. manero+, which have a conical, short, blunt prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularium high, with 2 spines; median spine of scutal area III short; row of high, pointed tubercles on femur IV composed of proventral (in distal half) and retrolateral rows, 2 ventral apical spines.

Redescription: Male (HEMS 965): Dorsum (Fig. 13A,B): Measurements: SL 2.80; SMW 2.70; femur I 1.40; III 1.85; IV 2.30. Median paracheliceral projection of similar-size as PAM. Ocularium next to anterior scutal margin; high, with 2 spines, 17 tubercles. Carapace with 20 scattered tubercles. Scutal area I with 4–7 scattered tubercles on each side, a row of 6–8 next to groove II; II with 47 tubercles; III with 44 (median spine broken); IV with 32 tubercles. Posterior margin of dorsal scutum with 3 scattered tubercles, a row of 15 tubercles. Free tergite I with a row of 20 tubercles; II with 6 scattered, a row of 19; III with 6 scattered, a row of 12 tubercles. Anal operculum with 32 tubercles.

Venter: Cox I with 18–19 tubercles, median and distal ones largest; II with 22–30, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 2 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 3 tubercles; ventrally with 1 large tubercle, 1 prolateral and 2 retrolateral small ones. Femur dorsally with 4–5 large tubercles and 4 small apical scattered ones; ventrally with 1 large basal tubercle, 3–4 small ones. Tibia and tarsus lost.

Legs (Fig. 13C–I): Coxa II with 3 tubercles on retrolateral margin; IV densely tuberculate, with 1 almost transversal prolateral apical apophysis, this conical, long, blunt, curved posteriori and ventrad, swollen in the middle on retroventral face (only on right side). Trochanters I–IV with scattered tubercles; I with large retrolateral tubercles, 1 large ventro-basal tubercle; II (lost); IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; retrolaterally with 1 large dorso-apical tubercle and another ventral one. Femur I with small PDS, RDS; ventrally with 2 rows of tubercles, one of them with slightly enlarged tubercles (prolateral on right and retrolateral on left femur); II (lost); III sinuous, with reduced PDS, medium RDS; ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged (3 large); IV sinuous, with a prolateral row of tubercles increasing in size in basal third, a retrolateral row of high, pointed tubercles, with medium PDS, RDS; ventrally with 2 rows of tubercles, prolateral ones increasing in size in distal half, becoming high, pointed (7–9 large), 2 apical spines, prolateral one larger than retrolateral. Tibia III ventrally with 2 rows of tubercles increasing in size subapically (4 large), prolateral ones slightly small; IV ventrally with 2 rows of tubercles increasing in size distally (3–4 large), retrolateral ones enlarged, 1 retrolateral apical spine. Tarsal segmentation: 5, ?, 6, ?.
FIGURE 13. *Eusarcus dubius* B. Soares. Male (HEMS 965): A, habitus, dorsal view; B, dorsal scutum, left lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view; I, left tibia IV, ventral view. Scale bars, 1 mm.
Penis (Fig. 47C,D): Stylus smooth, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved, apex with flabelliform projection. Ventral plate with concave sides; with 3 pairs of curved distal setae; 1 pair of short, straight median seta; 3–4 pairs of straight basal setae.

Coloration: Yellowish brown. Body edges, legs and apophyses brownish. Light brown on distal parts of metatarsi and all tarsi.

**Female** (MNRJ 16171): Dorsum: Measurements: SL 3.00; SMW 2.60; femur I 1.20; II 2.00; III 1.60; IV 2.10. Posterior margin of dorsal scutum and free tergites I–III with rows of 16 and 23, 12 and 28, 17 and 22, 16 and 22 tubercles, respectively. Pedipalpus: Tibial setation: Prolateral and retrolateral IiIi. Tarsal setation: Prolateral Iii, retrolateral IiiIi. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed. Trochanter IV only with scattered tubercles. Femur I ventrally with 2 rows of slightly enlarged tubercles; III with small PDS, medium RDS, ventrally with 2 rows of tubercles, prolateral ones slightly enlarged; IV with prolateral and retrolateral rows of similar-sized tubercles; ventrally with 2 rows of tubercles, prolateral tubercles increasing in size distally, 1 large prolateral tubercle. Tibiae III–IV with rows of similar-sized tubercles. Tarsal segmentation: 5, 7, 6, 6.

**Variation in males** (n=6): Measurements: SL 2.60–3.00; SMW 2.50–2.85; femur I 1.20–1.40; II 2.05–2.20; III 1.55–1.85; IV 2.00–2.30. Median spine of scutal area III short, not surpassing groove IV. Pedipalpus: Tibial setation: Prolateral IiIi/iIiIi, retrolateral Iii/iIiIi. Tarsal setation: Prolateral Iii, retrolateral IiiIi/iIiIi. Trochanter II with scattered tubercles. Femur I with reduced or small RDS; II with reduced or small PDS, reduced to medium RDS; III with reduced or small PDS. Tibia IV ditally normal or thickened. Tarsal segmentation: 5, 7, 6, 6.

**Variation in females** (n=6): Measurements: SL 2.75–3.00; SMW 2.40–2.60; femur I 1.10–1.20; II 1.80–2.00; III 1.40–1.60; IV 1.90–2.10. Femur I with reduced or small PDS, RDS; III with reduced or small PDS.

**Type locality:** Brazil, Paraná, Adrianópolis.

**Geographical distribution** (Fig. 49B): Brazil. Interior of São Paulo and Paraná States.

**Eusarcus elinae** Kury


**Material examined:** BRAZIL. Bahia: Iraquara (Caverna Pedra Furada, Sistema Lapa Doce), Pedroso, D.R. & Bichuette, M.E. leg., 31.iii.2005, ma holotype & 1 fe paratype (MNRJ 17776).

**Diagnosis:** *E. elinae* resembles *E. aduncus, E. berlae, E. cavernicola, E. fulvus, E. signatus, E. sooretamae, E. mirabilis* and *E. sergipanus* because of the conical prolateral median apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocellarium with a pair of large tubercles; scutal area III with one median hump close to groove IV; posterior margin of prolateral apical apophysis of coxa IV without conspicuous projections; femur IV 1.5 times longer than dorsal scutum.

**Type locality:** Brazil, Bahia, Iraquara, Lapa Doce.

**Geographical distribution:** Known only from type locality.

**Note:** As Kury (2008) suggested, this species is placed close to the species which formerly were in *Metagraphinotus*.

**Eusarcus fulvus** Soares & Soares

*(Figs. 14, 40A,B, 51)*

FIGURE 14. *Eusarcus fulvus* Soares & Soares. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, dorsal view; E, idem, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view; I, right tibia III, ventral view. Scale bars, 1 mm.
Material examined: BRAZIL. Espírito Santo: Santa Teresa, O. Schubart leg., 29.x.1944, ma holotype (MZSP 28659).

Diagnosis: E. fulvus resembles E. mirabilis+ because of the conical prolateral median apophysis on the male trochanter IV, and can be distinguished by: The ocularium with two large tubercles; median depression present on the male trochanter IV prolateral median apophysis; femur IV only with 1 proventral apical spine.

Redescription: Male (holotype): Dorsum (Fig. 14A,B): Measurements: SL 4.40; SMW 3.50; femur I 2.45; II 4.45; III 3.25; IV 4.3. Median paracheliceral projection smaller than PAM. Ocularium far from anterior scutal margin; with 2 large tubercles, 7 small ones. Carapace with 20 scattered tubercles. Scutal area I with 43–46 scattered tubercles on each side; II with 98; III with 95 tubercles and a median spine oblique, pointing backwards, not surpassing groove V; IV with 59 tubercles. Posterior margin of dorsal scutum and free tergites I–III with rows of 10 and 23, 6 and 18, 6 and 20, 8 and 16 tubercles, respectively. Anal operculum with 36 tubercles.

Venter: Coxa I with 22–30 tubercles, median and distal ones largest; II with 47–53, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I smooth.

Pedipalpus: Trochanter dorsally inflated, with 1 tubercle. Femur dorsally smooth; ventrally with 1 large basal tubercule, 2–3 small aligned ones. Tibial setation: Prolateral IiIi, retrolateral IiIi/IiIii. Tarsal setation: Prolateral IIi, retrolateral IiIi.

Legs (Fig. 14C–I): Coxa II with 2–3 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, curved posteriad and slightly ventrad; swollen in the middle on retroventral face. Trochanters I–IV with scattered tubercles; IV with 1 oblique prolateral median apophysis, this conical, with a median depression. Femur I with reduced PDS, RDS; II with small PDS, RDS; III sinuous, with small PDS, medium RDS; ventrally with a prolateral row of tubercles increasing in size distally, 1 large prolateral apical tubercle; IV sinuous, with medium PDS, RDS; with a proventral row of tubercles increasing in size distally, a retroventral row of small tubercles, 1 PVS. Tibia III ventrally with a row of tubercles slightly increasing in size subapically, 4 large. Tarsal segmentation: 6, 9, 6, 6.

Penis (Fig. 40A,B): Stylus with medio-ventral trichomes, apex slightly swollen; with angular medioventral projection. Ventral process of glans curved; apex with flabelliform projection. Ventral plate with concave sides; with 3–4 pairs of long, straight distal setae; 3 pairs of straight basal setae close to each other.

Coloration: Yellowish brown; light brown on tarsi.

Female: Unknown.

Type locality: Brazil, Espírito Santo, Santa Teresa.

Geographical distribution (Fig. 51): Known only from the type locality.

Eusarcus garibaldiae sp. n.
(Figs. 15, 45C,D, 51)

Type material: BRAZIL. Santa Catarina: Itajaí, R. Pinto-da-Rocha, A.B. Kury & A. Giupponi leg., 9.iii.1999, ma holotype, 1 ma & 1 fe paratypes & 2 im (MNRJ 4488); idem, 2 ma & 4 fe paratypes (MNRJ 4489); idem, 1 ma & 1 fe paratypes (MZSP 28666).

Diagnosis: E. garibaldiae resembles E. caparaoensis+ and E. manero+, which have a conical, short, blunt prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularium high, with similar-sized tubercles; median spine of scutal area III of medium size, not surpassing groove V; trochanter IV with short prolateral apical apophysis dorsally inserted; femur IV with 2 ventro-apical spines and without rows of high, pointed tubercles.

Etymology: The name honors an important revolutionary, Anita Garibaldi, who was born in the same state where this species was collected.

Description: Male (holotype): Dorsum (Fig. 15A,B): Measurements: SL 4.20; SMW 3.80; femur I 1.90; II 3.70; III 2.80; IV 3.50. Median paracheliceral projection smaller than PAM. Ocularium far from anterior scutal margin; high, with 15 tubercles. Carapace with 23 scattered tubercles. Scutal area I with 14–20
FIGURE 15. *Eusarcus garibaldiae* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view; I, right tibia IV, ventral view. Scale bars, 1 mm.
scattered tubercles on each side; II with 46; III with 40 and a median spine of medium size, not surpassing groove V; IV with 29 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 12, 15, 16, 16 tubercles, respectively. Anal operculum with 31 tubercles.

Venter: Coxa I with 13–19 tubercles, median and distal ones largest; II with 34–35, distal ones largest; III–IV irregularly tuberculare.

Chelicera: Segment I with 3 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 6–7 tubercles. Femur dorsally with 3 aligned tubercles; ventrally with 1 large basal tubercle, 2 small scattered ones. Tibial setation: Prolateral IIi, retrolateral IIii/IiIi. Tarsal setation: Prolateral IIi, retrolateral IIii/IiIi.

Legs (Fig. 15C–I): Coxa IV densely tuberculare, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad, swollen ventro-basally and slightly subapically. Trochanters I–IV with scattered tubercles; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; 1 conical, short apical apophysis dorsally inserted; retrolaterally with 1 large blunt median tubercle. Femur I with small PDS, RDS, ventrally with 2 rows of slightly enlarged tubercles; II–III with small PDS, medium RDS; II ventrally with 2 rows of tubercles slightly increasing in size distally; III sinuous, ventrally with 2 rows of tubercles increasing in size distally, 1 large pointed prolateral apical tubercule; IV sinuous, with medium PDS, RDS, prolateral one smaller; ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 2 apical spines. Tibia III ventrally with 2 rows of tubercles increasing in size subapically, retrolateral ones becoming high, pointed; IV with 2 ventro-apical spines, prolateral one larger. Metatarsus I with 1 retroventral apical seta. Tarsal segmentation: 6, 7, 6, 6.

Penis (Fig. 45C,D): Stylus smooth, apex slightly swollen; without medio-ventral trichomes and angular medio-ventral projection. Ventral process of glans curved; apex blunt, thin. Ventral plate with concave sides; with 3 pairs of curved distal setae; 2 ventral pairs of distal tubercles; 1 pair of short, straight median setae; 4 pairs of straight basal setae.

Coloration: Brown; dark brown on legs. Light brown on tarsi.

Female (paratype; MNRJ 4488): Dorsum: Measurements: SL 4.00; SMW 3.40; femur I 1.70; II 3.20; III 2.40; IV 3.00. Posterior margin of dorsal scutum and free tergites II–III with rows of 10 and 22, 8 and 19, 7 and 15 tubercles, respectively; I with an irregular row of 25 tubercules. Pedipalpus: Tibial setation: Prolateral and retrolateral IIii/IiIi. Legs: Coxa II with 1 tubercle on prolateral margin, 3 on retrolateral; IV densely tuberculare, with 1 oblique prolateral apical apophysis, this conical, short, pointed. Trochanter IV with scattered tubercles, with 1 large retrolateral apical tubercle. Femur II with rows of similar-sized tubercles; III ventrally with 2 rows of tubercles slightly increasing in size distally, 2 large apical tubercles; IV ventrally with 2 rows of tubercles slightly increasing in size distally, 1 short prolateral apical spine, 1 large retrolateral apical tubercle. Tibia III ventrally with 2 rows of tubercles slightly increasing in size subapically. Metatarsus I with 2 ventro-apical setae. Tarsal segmentation: 6, 7, 6, 6.

Variation in males (n=4): Measurements: SL 4.10–4.20; SMW 3.65–3.80; femur I 1.80–1.90; II 3.50–3.70; III 2.60–2.80; IV 3.20–3.50. Pedipalpus: Tibial setation: Retrolateral IIii/IiIi/IiIi/IiIi. Tarsal setation: Prolateral IIi/iIiIi/IiIi/IiIi/IiIi. Femur I with reduced or small PDS, RDS. Tarsal segmentation: 6, 7–8, 6, 6.

Variation in females (n=6): Measurements: SL 3.80–4.00; SMW 3.20–3.50; femur I 1.60–1.80; II 2.90–3.30; III 2.30–2.50; IV 2.90–3.15. Pedipalpus: Tibial setation: Retrolateral IIii/IiIi/IiIi/IiIi/IiIi/IiIi. Tarsal setation: Prolateral IIi/IiIi/IiIi/IiIi/IiIi/IiIi/IiIi. Tarsal segmentation: 6, 7–8, 6, 6.

Type locality: Brazil, Santa Catarina, Itajaí.

Geographical distribution (Fig. 51): Known only from the type locality.

Eusarcus gemignanii (Mello-Leitão) comb. n., stat.n.
(Figs. 16, 46C,D, 51)

Pygophalangodus gemignanii Mello-Leitão 1931b: 83 (cit), 85, fig. 4; Ringuelet 1954: 1 (syst); 1955a: 294 (syst); 1959: 381 (rdes); fig. 56; 1963: 49 (key); Galiano & Maury 1979: 322 (cat); Acosta et al. 1993: 29 (cit); Acosta 1993: 14 (cit). (ma holotype, 1 ma & 1 fe paratypes, “Entre Rí os; Federal; C. Daguerre leg.; ii.1931; MACN 4755”; examined).
Pygophalangodus gemignanii gemignanii: Ringuelet 1955a: 294 (diag); 1957a: 20 (cat); 1959: 197 (cat), 380 (key), lam. XVII, figs. 2, 4; 1963: 49 (key); Acosta 1996a: 77 (cit); Maury & Pilati 1996: 2 (cit).


FIGURE 16. Eusarcus gemignanii (Mello-Leitão) comb. n., stat. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, left lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, dorsal view; E, idem, ventral view; F, right trochanter and femur IV, prolateral view; G, idem, dorsal view; H, idem, ventral view; I, right tibia IV, ventral view; J, right tibia III, ventral view. Scale bars, 1 mm.
Material examined: ARGENTINA. Entre Ríos: Federal, C. Daguerre leg., ii.1931, ma holotype, 1 ma & 1 fe paratypes (MACN 4755).

Diagnosis: E. gemignanii resembles E. caparaoensis+ and E. manero+, which have a conical, short, blunt prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularium next to anterior scutal margin; high, with two large tubercles; median spine of scutal area III absent; femur IV with a retrolateral row of enlarged, blunt tubercles; ventrally with a prolateral row of tubercles increasing in size distally, becoming high, pointed, 1 PVS, 1 large retrolateral apical tubercle.

Redescription: Male (holotype): Dorsum (Fig. 16A,B): Measurements: SL 3.90; SMW 3.20; femur I 1.70; II 2.75; III 2.10; IV 2.80. Median paracheliceral projection smaller than PAM. Ocularium next to anterior scutal margin; high, with 2 large tubercles, 26 small ones. Carapace with 77 scattered tubercles. Scutal area I with 19–20 scattered tubercles on each side; II with 39; III with 40 and the median spine absent; IV with 44 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 21, 18, 17, 18 tubercles, respectively. Anal operculum with 36 tubercles.

Venter: Coxa I with 24 tubercles, median and distal ones largest; II with 33–35, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 1–2 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 2 tubercles. Femur dorsally with 5 aligned tubercles; ventrally with 1 large pointed basal tubercle, 5 small aligned ones. Tibial setation: Prolateral IiIi/IiIi, retrolateral IiI. Tarsal setation: Prolateral IiI, retrolateral IiI/iIi.

Legs (Fig. 16C–J): Coxa II with 2 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad, swollen ventro-apically. Trochanters I–IV with scattered tubercles; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle. Femur I with small PDS, reduced RDS; ventrally with 2 rows of slightly enlarged tubercles; II with small PDS, RDS; III sinuous, with small PDS, RDS; ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged; 1 large prolateral apical tubercle; IV sinuous, with medium PDS, small RDS; with a retrolateral row of enlarged, blunt tubercles; ventrally with a prolateral row of tubercles increasing in size distally, becoming high, pointed, 1 PVS, 1 large retrolateral apical tubercle. Tibia III ventrally with 2 rows of tubercles increasing in size subapically, becoming high, pointed; IV ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, 2 apical spines. Tarsal segmentation: 5, 6, 6, 6.

Penis (MACN 4755; Fig. 46C,D): Stylus smooth, apex slightly inflated and with angular medio-ventral projection. Ventral process of glans curved; apex blunt. Ventral plate with concave sides; with 3 pairs of curved distal setae; 1 pair of short, straight median setae; 4 pairs of straight basal setae.

Coloration: Brown; dark brown on prolateral apical apophysis of coxa IV and from distal part of trochanter IV to basal half of metatarsus IV, distal half of metatarsus IV light brown. Light brown on distal portions of all podomeres.

Female (paratype; MACN 4755): Dorsum: Measurements: SL 3.75; SMW 3.10; femur I 1.60; II 2.60; III 1.95; IV 2.50. Median paracheliceral projection moderately enlarged than PAM. Posterior margin of dorsal scutum with 10 scattered tubercles and a row of 24 tubercles. Pedipalpus: Tibial setation: Prolateral and retrolateral IiiI. Tarsal setation: Prolateral IiiI, retrolateral IiiIi. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short (shorter than in male), pointed. Trochanter I with a large ventro-basal tubercle; IV with 1 large retrolateral apical tubercle. Femur I ventrally with 2 rows of similar-sized tubercles; II with small PDS, reduced RDS; III; ventrally with a prolateral row of tubercles increasing in size distally, 1 large prolateral apical tubercle; IV with a retrolateral row of similar-sized tubercles; ventrally with a prolateral row of tubercles increasing in size distally, 1 small, blunt PVS. Tibia III with 2 ventral rows of tubercles slightly increasing in size subapically; IV with 2 ventral rows of similar-sized tubercles, without apical spines. Tarsal segmentation: 5, 6, 6, 6. Coloration: Brown; light brown on apex of metatarsi and tarsi.

Variation in males (n=2): Dorsum: Measurements: SL 3.60–3.90; SMW 2.95–3.20; femur I 1.50–1.70; II 2.45–2.75; III 1.90–2.10; IV 2.60–2.80. Median paracheliceral projection smaller to larger than PAM.
Pedipalpus: Tibial setation: Prolateral Iii/Ili. Tarsal setation: Retrolateral Iii/Ili. Trochanter I with or without 1 large ventro-basal tubercle; IV with or without 1 large retrolateral apical tubercle; femur I with reduced or small PDS; II with reduced or small PDS, RDS; tibia IV with 2 ventral rows of tubercles increasing in size distally, prolateral ones slightly enlarged.

**Type locality:** Argentina, Entre Ríos, Federal.

**Geographical distribution** (Fig. 51): Known only from the type locality.

*Eusarcus geometricus* sp. n. (Figs. 17, 44A,B, 51)

**Type material:** BRAZIL. Rio de Janeiro: Teresópolis (Parque Nacional Serra dos Órgãos), A.P.L. Giupponi & R.L.C. Baptista leg., 27.i.2001, ma holotype, 1 ma, 2 fe & 1 im paratypes (MNRJ 4480); idem, 1 ma & 2 fe paratypes (MZSP); idem, R. Pinto-da-Rocha & A.B. Kury leg., 5.viii.1989, 1 ma & 1 fe paratypes (MHNC 6589); idem, A.P.L. Giupponi & A. Pires leg., 1–2.xi.1998, 1 ma & 1 fe paratypes (MNRJ 5736).

**Diagnosis:** *E. geometricus* resembles *E. incus*, *E. pusillus*, *E. nigrimaculatus*, *E. acrophthalmus*, *E. alpinus* e *E. didactylus* because of the cylindrical prolateral median process on male trochanter IV and because forms of the generally large body size, and can be distinguished by: The ocularium with similar-sized tubercles; rectangular projection on the retrolateral margin of the prolateral apical apophysis of coxa IV and the shape of the cylindrical prolateral median process of male trochanter IV: Prolateral distal edge of apex with cylindrical projection, retrolateral distal edge of apex with conical blunt projection; basally with a small pyramidal apophysis. Penis without ventral process of glans (unusual within the genus) and similar to that of *E. nigrimaculatus*.

**Etymology:** The name, an adjective, refers to the prolateral apophyses on the male trochanter IV that resemble geometrical forms, such as pyramids, cylinders and cones.

**Description:** Male (holotype; MNRJ 4480): Dorsum (Fig. 17A,B): Measurements: SL 5.10; SMW 4.30; femur I 2.25; II 4.55; III 3.55; IV 4.45. Median paracheliceral projection larger than PAM. Ocularium far from anterior scutal margin; with 15 tubercles. Carapace with 20 scattered tubercles. Scutal area I with 24–25 scattered tubercles on each side; II with 42; III with 57 and a median spine long, almost straight, strongly pointing backwards, surpassing posterior margin of dorsal scutum; IV with 28 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 20, 16, 13, 11 tubercles, respectively. Anal operculum with 17 tubercles.

Venter: Coxa I with 25–26 tubercles, median and distal ones largest; II with 36–38, increasing in size distally; III–IV densely and irregularly tuberculate.

Chelicera: Segment I with 3 tubercles.


Legs (Fig. 17C–I): Coxa II with 3 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posterior and slightly ventrad, with 1 rectangular projection on retrolateral margin. Trochanters I–IV with scattered tubercles; I–III with large retrolateral tubercles; I–II with 1 large ventro-basal tubercle; IV prolaterally with 1 cylindrical and flattened median process, prolateral edge of its apex with cylindrical projection; retrolateral edge of apex with conical, blunt projection; basally with 1 small pyramidal apophysis; prolaterally with 1 large pointed median tubercle, 1 large apical tubercle. Femur I with reduced PDS, RDS, two ventral irregular rows of slightly enlarged tubercles; II–III with reduced PDS, large RDS; II with two ventral rows of tubercles increasing in size distally; III sinuous, ventrally with two irregular rows of tubercles increasing in size distally, prolateral ones enlarged, 1 blunt prolateral apical spine, 1 large retrolateral apical tubercle; IV sinuous, with medium PDS, large RDS; prolateral and retrolateral rows of enlarged, pointed tubercles; ventrally with 2 rows of tubercles, prolateral ones enlarged and increasing in size distally, 2 apical spines. Tibia III with 2 irregular ventral rows
FIGURE 17. *Eusarcus geometricus* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view; I, right tibia IV, ventral view. Scale bars, 1 mm.
of pointed tubercles increasing in size subapically (3 large); IV with 2 lateral apical spines, prolateral one smaller, ventrally with 2 rows of enlarged tubercles increasing in size distally, 2 apical spines. Metatarsi III–IV with tubercles decreasing in size and amount distally. Tarsal segmentation: 6, 8–9, 6, 6.

Penis (Fig. 44A,B): Stylus smooth, apex swollen, curved ventrad; without medio-ventral trichomes and angular medio-ventral projection. Ventral process of glans absent. Ventral plate covering only basal third of glans; with 2 pairs of short, straight distal setae, 1 dorsal pair of small distal setae, 1 pair of short, straight median setae, 2 pairs of ventral subapical tubercles; 3–4 pairs of long, straight basal setae, basalmost pair far from others and placed on trunk of penis.

Coloration: Generally dark brown; brown on grooves, pedipalps, chelicerae, median portions of femora, tibiae, metatarsi. Light brown on tarsi.

**Female** (paratype; MNRJ 4480): Dorsum: Measurements: SL 4.75; SMW 3.60; femur I 1.85; II 3.95; III 3.10; IV 3.90. Posterior margin of dorsal scutum with 10 scattered tubercles and an irregular row of 21 tubercles. Free tergites I–III with an irregular row of 20, 13, 14 tubercles, respectively. Pedipalpus: Tibial setation: Prolateral IIIi, retrolateral ili. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, blunt, curved backwards, surpassing posterior margin of this segment. Trochanter III with scattered tubercles, retrolateral ones enlarged, 1 retrolateral apical standing out; IV with scattered tubercles, with 1 large pointed retrolateral apical tubercle. Femur I ventrally with rows of similar-sized tubercles; III ventrally with two irregular rows of tubercles slightly increasing in size distally, prolateral ones enlarged, 1 small, blunt prolateral apical spine, 1 large retrolateral apical tubercle; IV with prolateral and retrolateral rows of similar-sized tubercles; ventrally with 2 rows of tubercles, prolateral ones enlarged and increasing in size distally, 2 small blunt apical spines. Patella IV ventrally with enlarged tubercles; tibia III only with rows of similar-sized tubercles; IV with 2 irregular rows of enlarged tubercles slightly increasing in size distally, 2 large apical tubercles. Metatarsus III unarmed. Tarsal segmentation: 6, 7–8, 6, 6.

**Variation in males** (n=5): Measurements: SL 4.30–5.20; SMW 3.50–4.40; femur I 1.90–2.25; II 4.00–4.55; III 3.00–3.55; IV 3.90–4.45. Pedipalpus: Tibial setation: Retrolateral IIIi/Ii/Ii/Ii. Femur I reduced or small RDS; II–III with reduced or small PDS.


**Type locality:** Brazil, Rio de Janeiro, Teresópolis, Parque Nacional Serra dos Órgãos.

**Geographical distribution** (Fig. 51): Known only from the type locality.

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**Eusarcus grumani** H. Soares (Figs. 18, 47A,B, 49B)


**Material examined:** BRAZIL. Rio Grande do Sul: Porto Alegre (Morro da Polícia), without name of collector, 15.viii.1951, ma holotype (HEMS 1008); idem (Morro Teresópolis), without name of collector, 8.iii.1949, 1 fe “allotype” (HEMS 999); Arroio do Tigre (Itaúba), H. Bischoff leg., 8.iv.1978, 1 ma (MCNZ 486); Canela, A.A. Lise leg., 5.iii.1977, 1 ma (MCNZ 283); Porto Alegre, A.A. Lise leg., 02.iv.1977, 1 ma (MCNZ 289).

**Diagnosis:** E. grumani resembles *E. caparaoensis+* and *E. manero+*, which have a short, blunt conical prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularium high, with 2 pointed tubercles; median spine of scutal area III short; lateral margin of dorsal scutum with external row of high, pointed tubercles; unique tibia IV: Slightly sinuous, its distal 2/3 thickened and carrying pointed tubercles, a retrolateral row of enlarged, pointed tubercles in middle third, ventrally with prolateral row of pointed tubercles increasing in size distally, 2 apical spines.
FIGURE 18. *Eusarcus grumani* H. Soares. Male (MCNZ 289): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur IV, prolateral view; E, right trochanter and femur IV, dorsal view; F, idem, ventral view; G, right tibia IV, dorsal view; H, idem, ventral view. Arrow indicates the prolateral row. Scale bars, 1 mm.
**Note:** The type material is in a bad state of preservation, but there are two vials containing identified specimens of this species in other collections. Those specimens were compared with the remaining parts of the type material and they also correspond perfectly with the description provided by H. Soares (1966c).

**Redescription:** *Male* (MCNZ 289): Dorsum (Fig. 18A,B): Measurements: SL 3.95; SMW 3.40; femur I 1.75; II 2.95; III 2.35; IV 2.65. Median paracheliceral projection of similar-size as PAM. Anterior margin with an irregular row of 13 tubercles, 1–2 enlarged tubercules on each corner. Ocularium next to anterior scutal margin; high, with 2 pointed tubercles, 9 small tubercules. Carapace with 42 scattered tubercles. Scutal area I with 15–17 scattered tubercles on each side; II with an anterior row of 9 tubercles, 8 scattered, 1 row of 14 next to groove III; III with 37 tubercules and an median spine short, not surpassing groove IV; IV with 37 tubercules. Lateral margin of dorsal scutum with an external regular row of enlarged tubercles increasing in size posteriorly and ending in 1–2 pointed tubercules. Posterior margin of dorsal scutum with 3 scattered tubercles and a row of 13 tubercles. Free tergites I–III with a row of 15, 14, 16 tubercules, respectively. Anal operculum with 38 tubercules.

Venter: Coxa I with 24 tubercules, median and distal ones largest; II with 34–37, distal ones largest; III with 29–31 tubercules, retrolateral apical ones largest; IV irregularly tuberculate.

Chelicera: Segment I with 2–3 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 3 tubercles; ventrally with 1 large pointed prolateral tubercle, 1–2 small retrolateral ones. Femur dorsally with 4 aligned tubercles; ventrally with 1 large basal tubercle, 3–4 small aligned ones. Tibial setation: Prolateral IiiIii, retrolateral Iiii. Tarsal setation: Prolateral Iii, retrolateral Iii.

Legs (Fig. 18C–H): Coxa II with 2–4 tubercules on retrolateral margin and 1 large apical one; IV densely tuberculate, with 1 transversal prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad, swollen in the middle and subapically. Trochanters I–IV with scattered tubercules; I–II with 1 large ventro-basal tubercle; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; retrolaterally with 1 large pointed apical tubercle. Femora I–II with small PDS, RDS; I ventrally with 2 rows of slightly enlarged tubercules; III sinuous, with reduced PDS, small RDS; ventrally with a prolateral row of pointed tubercles increasing in size distally (5 large), a retrolateral row of slightly pointed tubercles, 1 prolateral apical spine; IV sinuous, with medium PDS, RDS; prolateral and retrolateral row of enlarged tubercules; ventrally with 2 rows of tubercules, prolateral ones pointed and increasing in size distally (4 large), 2 apical spines, retrolateral one blunt, smaller. Tibia I ventrally with 2 rows of slightly enlarged tubercules; III ventrally with 2 rows of pointed tubercles increasing in size subapically (3–4 large); IV slightly sinuous, its distal 2/3 thickened and carrying pointed tubercles, a retrolateral row of enlarged, pointed tubercles in middle third, ventrally with a prolateral row of pointed tubercles increasing in size distally (7 large), 2 apical spines, prolateral one smaller. Metatarsi I–II with 2 ventro-apical setae. Tarsal segmentation: 5, 6, 6, 6.

Penis (Fig. 47A,B): Stylus with medio-ventral trichomes, apex slightly swollen subapically; with angular medio-ventral projection. Ventral process of glans curved; apex blunt, thin. Ventral plate with concave sides; with 3 pairs of apically curved distal setae; 1 pair of short, straight median setae; 4 pairs of straight basal setae.

Coloration: Slightly orange-brown, more conspicuous on body edges, legs and apophyses. Light brown on distal portions of femora, basal and distal portions of tibiae, metatarsi and tarsi.

**Female** (allotype; HEMS 999): Dorsum: Measurements: SL 3.50; SMW 2.80; femur I 1.50; II 2.45; III 1.90; IV 2.30. Median paracheliceral projection smaller than PAM. Posterior margin of dorsal scutum and free tergites I–III with an irregular row and a regular row of 12 and 21, 14 and 20, 6 and 22, 9 and 19 tubercules, respectively. Legs: Coxa IV densely and irregularly tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, blunt, curved posteriad and dorsad. Trochanter IV with scattered tubercules, retrolaterally with 1 large median tubercle, 1 small blunt apical apophysis. Femur II with 2 rows of slightly enlarged tubercules; III ventrally with 2 irregular rows of tubercules increasing in size distally, prolateral ones enlarged, 1 large blunt prolateral apical tubercle; IV with prolateral and retrolateral rows of similar-sized tubercules; ventrally with an irregular prolateral row of tubercles increasing in size distally, 1 blunt prolateral apical spine. Tibiae III–IV with rows of similar-sized tubercles. Tarsal segmentation: 5–6, 6, 6, ?.
Variation in males (n=3): Measurements: SL 3.10–3.95; SMW 2.70–3.40; femur I 1.40–1.75; II 2.30–2.95; III 1.80–2.35; IV 2.20–2.65. Pedipalpus: Tibial setation: Retrolateral IiiII/IIi. Femora I–II with reduced or small PDS, RDS.

**Type locality:** Brazil, Rio Grande do Sul, Porto Alegre, Morro da Polícia.

**Geographical distribution** (Fig. 49B): Brazil. Rio Grande do Sul.

**Eusarcus hastatus** Sørensen

(Figs. 19, 20, 48C–F, 52, 53)

Eusarcus hastatus Sørensen 1884: 624 (key, descr); Roever 1913: 68 (key); 71 (rdesc); 1923: 418 (key), 420 (rdesc); Mello-Leitão 1923b: 122 (cit), 184 (key); 1926: 372 (diag); Roever 1929: 197 (key); Mello-Leitão 1932: 156 (key), 160 (rdesc); 1940: 6 (key); 1945: 154 (cat), 158 (key); Soares & Soares 1954b: 260 (cat); H. Soares 1966b: 108 (cit); Pinto-da-Rocha 1995: 83 (cat); Kury 2003a: 169 (cat). (ma lectotype, 1 ma & 1 fe paralectotype, here designated; “Lapa Vermelha, Lagoa Santa, [Minas Gerais]; Reinhardt leg.; ZMUC”; examined; lectotype with genitalia damaged by fungi, ma paralectotype with genitalia incompletely developed).

**Pucroloides argentina** Roever 1913: 28, fig. 8; Acosta 1996b: 222 (cat). (2 ma syntypes; “Paraguay; SMF RI/791”; examined). **Syn. n.**

Pucroloides argentina (lapsus): Roever 1923: 403 (rdesc), fig. 495; B. Soares 1944e: 201 (cit); Mello-Leitão 1939b: 622 (cit); Ringuelet 1957a: 17 (=Neopucrolia pectinigera Roever 1913).


Eusarcus argentinus argentus: Roever 1957a: 19 (= N. pectinigera Roever 1913); 1957b: 21 (dist), 22 (dist); Ringuelet 1959: 317 (rdest), 319 (syst), pl. 3, figs. 1 (wr il: Eusarcus sp.), 2 (wr il: Eusarcus sp.), 5, 6, pl. 20, fig. 6 (probably female); Soares & Soares 1985: 12 (syst), figs. 13–17; Kury 2003a: 168 (cat).

Neopucrolia pectinigera Roever 1913: 44; Roever 1923: 409 (rdest); Mello-Leitão 1923b: 116 (cit); Acosta 1996b: 219 (cat). (2 ma & 1 fe syntypes; “Paraguay, Puerto Berti; SMF RI/806”; examined). Synonymy with P. argentina established by Ringuelet (1957a).

Eusarcus pectinigerus: Soares & Soares 1954b: 261 (cat); Ringuelet 1957a: 19 (syst); 1959: 319 (syst).

Neopucrolia pectinera (lapsus): Ringuelet 1957a: 17 (syst).


**Syn. n.**


Eusarcus biserratus Mello-Leitão 1945: 150, 153 (cat), 156 (key), figs. 3, 4, 10. (1 ma & 1 fe syntypes; “Perdões, Minas Gerais; Labouriau leg.; MNRI 5253”; examined). Synonymy with E. guimaraensi established by Soares & Soares (1946b).

Canestrinia canalsi Mello-Leitão 1931b: 84 (cit), 89; Ringuelet 1959: 384 (syst). (2 ma & 2 fe syntypes; “Buenos Aires, Argentina; Canals leg.; MNRI 1403”; examined).

**Syn. n.**


**Melolinia canalsi**: Thor 1933: 224 (by implic, nom nov for Canestrinia Mello-Leitão 1931b).


Melloleitaella canalsi: Mello-Leitão 1939b: 622 (cit); B. Soares 1945c: 379 (cat); Ringuelet 1954: 1 (= Bacigalupo tenax Mello-Leitão 1933); 1955a: 294 (syst); 1959: 378 (syst), 384 (cit).


Pygophilangodas canalsi: Ringuelet 1957a: 20 (syst); 1957b: 22 (dist), 23 (dist); 1959: 382 (rdest), 384 (= Bacigalupo tenax Mello-Leitão 1933), figs. 5, 55, XIX-3, 384 (syst); Capocasale 1973: 437 (dist), 443 (desc), figs. 2, 4; Maury & Pilati 1996: 2 (bion); Kury 1997a: 189 (cat).

Bacigalupo tenax Mello-Leitão 1933: 55, fig. 1; 1939b: 618 (cit); B. Soares 1945c: 384 (cat); Ringuelet 1954: 1 (syst); 1959: 384 (syst); Galiano & Maury 1979: 318 (cat); Kury 1993a: 130 (cit). (ma holotype, “MACN 4753”; 2 fe paratypes “MACN 4754”; not examined). Synonymy with M. canalsi established by Ringuelet (1954).

**Jacarepaguana pectinifemur** Piza 1943: 255, fig. 1; B. Soares 1944e: 196 (cit), 201 (cit); 1945a: 11 (cit), 12 (descr “allootype” fe, misid: it is a beta male of E. argentinus), fig. 2 (wr il: it is a beta male of E. argentinus); Soares & Soares 1945a: 224 (cit); Paschoal & Barros 1983: 78 (cat). (ma holotype; “Pirassununga, Fazenda Firmino, [São Paulo]; MZLQ A0045”; fe “allootype”; “Mata de Procópio, Porto Ferreira, [São Paulo]; Schubart leg.; 2.iii.1944; MZSP without n”; examined). **Syn. n.**


**FIGURE 19.** *Eusarcus hastatus* Sørensen. Male (lectotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view. Scale bars, 1 mm.
Material examined: BRAZIL. Minas Gerais: Lagoa Santa (Lapa Vermelha), Reinhardt leg., ma lectotype, 1 ma & 1 fe paralectotypes of *E. hasatus* (ZMUC); Cordisburgo (Caverna Maquiné), J. Schubart leg., 25.x.1947, ma holotype of *E. maquinensis* (MZSP 28656); Perdões, Labouriau leg., without date, 1 ma & 1 fe syntypes of *E. biserratus* (MNJR 5253).

São Paulo: Colômbia, J. & O. Schubart leg., 4.ix.1944, fe holotype of *E. guimaraensi* (MZSP 28660); Pirassununga (Fazenda Firmino), Schubart leg., without date, ma holotype of *Jacarepaguana pectinifemur* (MZLQ A0045). ARGENTINA. Buenos Aires: Canals leg., without date, 2 ma & 2 fe syntypes of *Canestrinia canalis* (MNJR 1403). PARAGUAY. (Puerto Bertoni), without name of collector and date, 2 ma & 1 fe syntypes of *Neopucrolia pectinigerana* (SMF RI/806); Without locality, name of collector and date, 2 ma syntypes of *Pucroloides argentina* (SMF RI/791). BRAZIL. Ihering leg., 1 ma & 1 fe (ZMUC).

Minas Gerais: Lavras, P.J. Mattos leg., 15.xi.1947, 1 ma & 4 fe (MNRJ 16147); Pedro Leopoldo (Gruta Lapa Vermelha), S.L. Horta leg., 29.x.1995, 1 ma & 2 fe (MZSP 21596); Poços de Caldas (Morro do Ferro), J. Becker leg., 20.xii.1963, 1 fe (HEMS 291); idem, J. Becker & O. Roppa leg., 4.iii.1964, 1 ma (HEMS 1011); idem, J. Becker leg., 31.vii.1967, 1 ma & 1 fe (MNRJ 11398); idem (Fonte dos Amores), J. Becker leg., 20.xii.1963, 1 fe (HEMS 291); idem, J. Becker & O. Roppa leg., 24.x.1963, 1 fe (HEMS 273); idem (São Domingos), J. Becker leg., 19.xii.1967, 1 ma (HEMS 1011); São Paulo: Altinópolis (Caverna Olho de Cabra), P. Gnaspini et al. leg., 28.iii.1999, 1 ma (MZSP 21658); idem, 1 ma & 1 fe (MZSP 21659); Colômbia, O. Dias leg., 31.viii.1945, 1 ma (MZSP 954); idem, 28.vi.1945, 2 ma & 1 fe (MZSP 1733); Pirassununga (Baguassú), Schubart leg., 7.vii.1948, 1 ma & 2 fe (HEMS 46); idem, 1 ma & 1 fe (HEMS 964); Paraná: Capitão Leônidas Marques (Usina Hidrelétrica Salto Caxias), J. Jim, U. Camaraschi & J. Rodrigues leg., 15.x.1978, 1 ma (MCNZ 587); idem, H. Bischoff leg., 10.v.1981, 1 fe (MCNZ 742); idem (Parque Estadual Delta do Jacuí, Ilha da Pintada), H. Bischoff leg., 29.ix.1976, 1 ma & 2 fe (MCNZ 226); Porto Alegre (Morro Santana), A.B. Bonaldo leg., 15.vi.1999, 1 ma & 1 fe (MCNZ 1412); Guaíba, C.P. Silva leg., 16.iv.1978, 3 ma & 2 fe (MCNZ 484); idem (Granja Carola), M. Rosenau leg., 23.vii.1986, 1 fe (MCNZ 929); Itaguí (Km 82, BR 472), J. Jim, U. Camaraschi & Souza leg., 19.vii.1980, 1 ma (HEMS 723); Montenegro, A.A. Lise leg., 7.vii.1977, 2 ma & 3 fe (MCNZ 325); idem, H.L. Tavares leg., 7.vii.1977, 4 ma & 5 fe (MCNZ 327); idem, H. Bischoff leg., 7.vii.1977, 1 ma & 1 fe (HEMS 714); idem, 12 ma & 8 fe (MCNZ 328); idem, 1 ma & 1 fe (HEMS 715); idem, 31.viii.1977, 2 ma & 1 fe (MCNZ 351); idem, 6.x.1977, V. Pitoni leg., 1 fe (MCNZ 375); idem (Chaleira Preta), H. Bischoff leg., 05.v.1977, 2 ma (MCNZ 291); Nova Hamburgo, T. de Lema leg., 27.iv.1979, 1 fe (MCNZ 603); Nova Santa Rita (Parque Estadual Delta do Jacuí, margin of Cáí river), I. Heydrich leg., 19.x.1999, 1 ma (MCNZ 1465); Porto Alegre (Morro Santana), A.A. Lise leg., 5.iv.1969, 1 ma (MCNZ 548); idem (Parque Estadual Delta do Jacuí, Ilha da Cipriano), L.A. Moura leg., 19.iii.1999, 1 fe (MCNZ 1407); idem (Parque Estadual Delta do Jacuí, Ilha Grande dos Marinheiros), A.B. Bonaldo leg., 10.viii.1999, 1 ma (MCNZ 1449); idem (Parque Estadual Delta do Jacuí, Ilha dos Marinheiros), T. de Lema leg., 22.x.1977, 1 ma (MCNZ 389); idem (Parque Estadual Delta do Jacuí, Ilha do Pavão), A.B. Bonaldo leg., 24.x.1999, 2 ma (MCNZ 1453); idem (Parque Estadual Delta do Jacuí, Ilha da Pintada), H. Bischoff leg., 29.ix.1976, 1 ma & 2 fe (MCNZ 226); Santa Maria, D. Link leg., 20.ii.1980, 2 ma & 2 fe (MCNZ 722); idem, 26.v.1977, 1 ma (MCNZ 346); São Borja (Rio Icamaquã), V. Py-Daniel leg., 18.iv.1989, 1 ma & 1 fe (MCNZ 1035); São Jerônimo (Fazenda Capão), M. Rosenau leg., 24.v.1982, 1 ma (MCNZ 755); Tenente Portela (Parque do Turvo), A.A. Lise leg., 2.ii.1980, 1 fe (MCNZ 643); Triunfo, J. Rodrigues leg., 15.x.1978, 1 ma (MCNZ 587); idem, H. Bischoff leg., 4.ii.1977, 1 fe (MCNZ 278); idem, E.H. Buckup leg., 12.v.1981, 1 ma (MCNZ 742); idem (Parque Estadual Delta do Jacuí, Fazenda Pimenta), A.B. Bonaldo leg., 22.vi.1999, 1 fe (MCNZ 1416); idem (Parque Estadual Delta do Jacuí, Ilha do Cravo), A.B. Bonaldo leg., 29.vii.1999, 5 ma & 8 fe (MCNZ 1435); idem (Parque
Estadual Delta do Jacuí, Ilha Cabeçuda), A.B. Bonaldo leg., 23.vii.1999, 2 ma & 2 fe (MCNZ 1440); idem, 29.vii.1999, 3 ma & 6 fe (MCNZ 1441); idem, A. Franceschini leg., 2 ma & 3 fe (MCNZ 1444).

**Diagnosis:** *E. hastatus* resembles *E. caparaoensis*+ and *E. manero*+, which have a conical, short, blunt prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularium high, with a pair of large, blunt or pointed tubercles, 1 pair of spines, 1 pair of spines with bases very close to each other, idem but on a short apophysis, 1 bifid spine, 1 robust spine; femur IV with prolateral and retrolateral rows of high tubercules increasing in size on and 2 ventro-apical spines.

**Redescription:** Male (lectotype; ZMUC): Dorsum (Fig. 19A,B): Measurements: SL 4.20; SMW 3.50; femur I 2.05; II 3.95; III 3.00; IV 3.75. Median paracheliceral projection larger than PAM. Ocularium next to anterior scutal margin; high, with 2 spines, 34 tubercles. Carapace with 44 scattered tubercles. Scutal area I with 32–33 scattered tubercules on each side; II with 48; III with 56 and a median spine short and slightly curved backwards, not surpassing groove IV; IV with 47 tubercules. Posterior margin of dorsal scutum and free tergites I–III with an irregular row of 17, 22, 18, 14 tubercles, respectively. Anal operculum with 32 tubercles.

Venter: Coxa I with 23 tubercules, median and distal ones largest; II with 44–49, distal and retroalteral ones largest; III with 44–46, distal ones largest; IV irregularly tuberculate.

Chelicera: Segment I with 2 tubercules.

Pedipalpus: Trochanter dorsally inflated, with 3–4 tubercules. Femur dorsally with 4 aligned tubercules; ventrally with 1 large pointed basal tubercle, 1 large and 1 small scattered ones. Tibial setation: Prolateral IiIi/ Iii, retrolateral IiIi. Tarsal setation: Prolateral III, retrolateral III.

Legs (Fig. 19C–H): Coxa IV short, reaching only until groove III, densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posterior and ventrad. Trochanters I–IV with scattered tubercules; I–II with 1 large ventro-basal tubercle; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; 1 large apical tubercle; retrolaterally with 1 conical short apical apophysis. Femora I–II with small PDS, RDS; I ventrally with 2 rows of enlarged tubercules; III sinuous, with small PDS, medium RDS; ventrally with 2 rows of tubercules increasing in size distally, 1 large prolateral apical tubercle; IV sinuous, with a prolateral row of tubercules slightly high and pointed, far from each other, a retrolateral row of high, pointed tubercules, basal and median ones largest, with medium PDS, RDS; ventrally with 2 rows of tubercules, more conspicuous in distal third, prolateral ones increasing in size distally, 2 apical spines. Tibia III ventrally with 2 rows of tubercules increasing in size in distal third. Metatarsi I–II with 1 proventral apical seta. Tarsal segmentation: 6, 9, 6, 6.

Penis (Fig. 48C,D): Stylus with apex slightly swollen. Ventral process of glans curved, apex with flabelliform projection. Ventral plate with concave sides; with 3 pairs of apically curved distal setae; 1 pair of short, straight median setae; 3 pairs of straight basal setae.

Coloration: Body, trochanter and femur IV dark brown; brown on remaining legs and pedipalps. Light brown on metatarsi and tarsi.

Female (paralectotype; ZMUC): Dorsum: Measurements: SL 4.15; SMW 3.50; femur I 2.00; II 3.90; III 2.90; IV 3.65. Posterior margin of dorsal scutum with a row of 15 tubercles, another of 26. Pedipalpus: Tibial setation: Prolateral and retrolateral IiIi. Legs: Coxa II with 7 retrolateral tubercules; IV densely and irregularly tuberculate, with 1 large prolateral apical tubercle. Trochanter IV retrolaterally with 1 large median tubercle, 1 apical apophysis, this conical, short, blunt. Femur II ventrally with 2 rows of slightly enlarged tubercules; III with reduced PDS, RDS; I ventrally with 2 rows of enlarged tubercules; III sinuous, with a prolateral row of tubercules slightly high and pointed, far from each other, a retrolateral row of high, pointed tubercules, basal and median ones largest, with medium PDS, RDS; ventrally with 2 rows of tubercules, more conspicuous in distal third, prolateral ones increasing in size distally, 2 apical spines. Tibia III ventrally with 2 rows of tubercules increasing in size in distal third. Metatarsi I–II with 1 proventral apical seta. Tarsal segmentation: 6, 9, 6, 6.

Variation in males (n=9): Measurements: SL 3.50–5.10; SMW 3.15–4.80; femur I 1.50–2.20; II 2.60–3.70; III 2.10–3.30; IV 2.70–4.00. Median paracheliceral projection similar-sized to larger than PAM. Pedipalpus: Trochanter with 1–2 small ventral tubercles. Tibial setation: Prolateral and retrolateral IiIi/Iii/Iii. Trochanters I–IV with or without ventro-basal tubercle; IV with or without 1 large retrolateral median tubercle; femur I with reduced or small PDS, RDS; II–III with reduced or small PDS, small or medium RDS;
III ventrally with both rows or only prolateral row of tubercles increasing in size distally, 1 (VPS) or 2 apical spines; with or without 1 large retrolateral apical tubercle; IV with small or medium PDS, RDS; ventrally with prolateral irregular rows of tubercles increasing in size in distal third, becoming high, pointed or not pointed; tibia III with two ventral rows of tubercles increasing in size distally, retrolateral ones enlarged in some specimens. Tarsal segmentation: 5–6, 7–10, 6, 6. Penis: Stylus smooth or with medio-ventral trichomes, apex slightly swollen; with angular medio-ventral projection; distal setae of ventral plate slightly or strongly curved apically; 1–2 pairs of median setae; 3–4 pairs of basal setae (Fig. 48C–F). Coloration: Brown to reddish brown on most parts of body and legs; dark brown on leg IV from prolateral apical apophysis of coxa IV to metatarsus; light brown on chelicerae, pedipalps and tarsi.

**Variation in females (n=11):** Measurements: SL 3.30–4.45; SMW 2.80–3.80; femur I 1.50–1.90; II 2.40–3.60; III 1.80–2.70; femur IV 2.40–3.40. Median paracheliceral projection smaller to larger than PAM. Posterior margin of dorsal scutum and free tergites I–III each with two (an irregular and a regular) rows of tubercles. Pedipalp: Trochanter ventrally with 1 large prolateral tubercle, 0–2 retrolateral small ones. Tibial setation: Prolateral iili/iili, retrolateral iiiiiii/iili/iili/iili/iili/iili. Tarsal setation: Prolateral ii/iili, retrolateral iii/iili/iili/iili/iili/iili. Tibia I ventrally with 2 rows of similar-sized to slightly enlarged tubercles. Coxa IV prolaterally with 1 apical tubercle or oblique apical apophysis, this conical, short, curved backwards, surpassing posterior margin of this segment. Trochanter IV with or without large retrolateral median tubercle. Femur II reduced to medium RDS; III with or without 1 large proventral tubercle; IV retrolaterally with or without a row of slightly enlarged tubercles; ventrally with 1 or 2 rows of tubercles (if 2 rows, prolateral one or retrolateral one increasing in size distally), retrolateral row with enlarged tubercles in some specimens; 1 PVS or 1 large prolateral apical tubercle, with or without large retrolateral apical tubercle. Metatarsus I with or without 2 ventro-apical setae. Tarsal segmentation: 5–6, 7–8, 6, 6. Coloration: Yellowish, dark brown on free tergites and anterior margin of dorsal scutum; light brown on chelicerae, pedipalps, legs I–II, metatarsi and tarsi III–IV.

**Taxonomical notes:** When we examined type material of *E. argentinus*, *E. hastatus* and *E. maquinensis* at the beginning of the review, we thought they belong to three easily distinguishable species. However, further examinations, including more material from many localities, indicated that they actually belong to the same species with a high degree of polymorphism in many features, such as armature of ocularium (Fig. 20A,B), spine of scutal area III, apophyses and tubercles on leg IV (Fig. 20C–I). The variation among various populations of this species is summarized in Figures 52 and 53. Considering that: (i) these variable characters show intermediate forms between two extremes and (ii) the impossibility to establish a combination of these characters to distinguish two or more species, besides lack of autapomorphy to characterize those species, we concluded that this is a single species with strong morphological variation. This is: Ocularium with a pair of large, blunt or pointed tubercles, 1 pair of spines, 1 pair of clearly separated spines which bases are very close to each other, idem but sitting on a short apophysis, 1 bifid spine, 1 robust spine; median spine of scutal area III ranging from medium (not surpassing groove V) to short (not surpassing groove IV) in size and completely absent only in few specimens; tarsal I segmentation 5 or 6; coxa IV ending between grooves III and IV or near groove V; trochanter IV with or without conical prolateral apical apophysis; amount, size and space between the high tubercles in pro and retrolateral rows on femur IV; presence or absence of two ventral rows of tubercles increasing in size and ending in 2 apical spines on tibia IV. Soares & Soares (1985) synonymized *Metapucrolia armata* with *E. argentinus* based on penis morphology and great variation of armature on femur IV. However, this synonymy is doubtful because these authors relied heavily on a proposal by Ringuelet (1959) regarding polymorphism of the armature of leg IV. This author recorded great variation in the armature of femur IV in *E. argentinus*, which was verified in specimens from southern and southeastern Brazil and type material of *Eusarcus* deposited in other collections. However, we were not able to verify the forms shown in figures 1 and 2 of Ringuelet (1959), which considerably differ from the original description of *E. argentinus* by the absence of a retrolateral apical apophysis of trochanter IV and of a prolateral row of pointed tubercles on femur IV. Therefore, it is probable that *Metapucrolia armata* belongs to *Eusarcus*, but it may not be identical to *E. argentinus*.  

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FIGURE 20. *Eusarcus hastatus* Sørensen. Male (MZSP 1733): A, habitus, dorsal view; C, right trochanter and femur III, dorsal view; D, idem, ventral view; E, right trochanter and femur IV, prolateral view; F, idem, dorsal view; G, idem, ventral view. Male (holotype of *E. maquinensis*): B, habitus, dorsal view; H, right trochanter and femur IV, dorsal view; I, idem, ventral view. Scale bars, 1 mm.

Geographical distribution (Fig. 52): Paraguay, Argentina (Buenos Aires), and SE to S Brazil (from Minas Gerais to Rio Grande do Sul).

**Eusarcus incus** Soares & Soares

(Figs. 21, 42A,B, 50A)

*Eusarcus incus* Soares & Soares 1946a: 201, figs. 4, 5; 1954b: 260 (cat); Kury 2003a: 169 (cat); (ma holotype & 1 fe paratype; “Refúgio Sooretama, Linhares, Espírito Santo; Schubart leg.; 14.x.1944; MZSP 24763”; examined), (1 fe paratype; “Lagoa do Macuco, São Mateus, Espírito Santo; col. Otto Schubart n° 241”; lost), (1 fe paratype; “Linhares, Espírito Santo; Schubart leg.; x.1944; MZSP 1727; examined).

Material examined: BRAZIL. Espírito Santo: Linhares (Refúgio Sooretama), Schubart leg., 14.x.1944, ma holotype & 1 fe paratype (MZSP 24763). Bahia: Ilhéus (Parataquicé), without name of collector and date, 2 ma & 2 fe (originally in MNRJ 5244). Espírito Santo: Colatina, M. Rosa leg., without date, 1 beta male (MNRJ 5118); Soares leg., 1942, 1 ma (MZSP 552); Linhares, Schubart leg., x.1944, 1 fe paratype (MZSP 1727); idem (Chapadão do Cupido), J. & O. Schubart leg., 3.x.1944, 1 fe (MZSP 24764); idem (Fazenda Goitacazes), M. Rosa leg., without date, 6 ma & 2 fe (MNRJ 38208); idem (Reserva Florestal de Linhares), M.M. Argel de Oliveira leg., vii.1992, 3 ma, 1 fe & 2 im (MZSP 14036); São Mateus (Lagoa do Macuco), Schubart leg., 6.x.1944, 1 ma (MZSP 1727) ; idem (Reserva Florestal Vale do Rio Doce), without name of collector, vii.1997, 1 ma (IBSP 3156); idem, G. Machado & A.J. Santos leg., vii.1989, 1 ma (IBSP 3300).

Diagnosis: *E. incus* resembles *E. pusillus*, *E. nigrimaculatus*, *E. acrophthalmus*, *E. alpinus*, *E. didactylus* and *E. geometricus* because of the cylindrical prolateral median process on male trochanter IV and because of generally large body size, and can be distinguished by: The high ocularium with 2 large tubercles; without projections on the retrolateral margin of prolateral apical apophysis of coxa IV and the shape of cylindrical prolateral median process of male trochanter IV: Distally anvil-shaped, i.e. prolateral and retrolateral edges of apex have a pointed projection. Unlike in *E. alpinus*+, the penis of *E. incus* has a short ventral process of the glans.

Redescription: Male (MNRJ 38208): Dorsum (Fig. 21A,B): Measurements: SL 3.50; SMW 3.20; femur I 1.65; II 3.30; III 2.40; IV 3.00. Median paracheliceral projection smaller than PAM. Anterior margin with 0–2 large tubercles. Ocularium far from anterior scutal margin; high, with 2 large tubercles and 20 small ones. Carapace with 14 tubercles distributed mainly behind ocularium. Scutal area I with 20–22 scattered tubercles on each side; II with 43; III with 48 and a median spine curved backwards, reaching groove V; IV with 38 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 16, 14, 16, 12 tubercles, respectively. Anal operculum with 31 tubercles.

Venter: Coxa I with 27–29 tubercles, median and distal ones largest; II–III with 43–45, 33–44, respectively, distal ones largest; IV irregularly tuberculate.

Chelicera: Segment I with 1 tubercle.

Pedipalpus: Trochanter dorsally inflated, with 1–2 tubercles; ventrally with 1 large pointed prolateral tubercle and 3 small retrolateral ones. Femur dorsally with 4 large irregular tubercles, and 3–4 small subapical ones; ventrally with 1 large pointed basal tubercle and 2 small scattered ones. Tibial setation: Prolateral and retrolateral IIIi. Tarsal setation: Prolateral IIIi, retrolateral IIIi.
FIGURE 21. *Eusarcus incus* Soares & Soares. Male (MNRJ 38208): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view; I, right tibia IV, ventral view. Scale bars, 1 mm.
Legs (Fig. 21C–I): Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, distal portion curved posteriad and ventrad, slightly swollen in the middle. Trochanters I–IV with scattered tubercles; I with 1 large ventro-basal tubercle; IV prolaterally with 1 cylindrical and flattened median process, this distally with anvil-shaped projections, basally with 1 large tubercle; 2 large apical tubercles; retrolaterally with 1 median, 1 subapical, 2 large apical tubercles. Femur I with small PDS, RDS; II with reduced PDS, small RDS; III sinuous, with small PDS, medium RDS; ventrally with 2 rows of tubercles, prolateral one increasing in size distally; IV sinuous, with medium PDS, RDS; ventrally with 2 rows of tubercles, prolateral ones enlarged, increasing in size in distal third, 1 prolateral apical spine. Tibia III ventrally with 2 rows of tubercles slightly increasing in size subapically, prolateral ones enlarged; IV ventrally with 2 rows of tubercles, prolateral ones slightly enlarged, increasing in size subapically, 1 prolateral apical spine. Tarsal segmentation: 6, 8, 6, 6.

Penis (Fig. 42A,B): Stylus smooth, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans short, almost straight; apex blunt, thin. Ventral plate with concave sides; with 3 pairs of long, curved distal setae; 1 pair of short, straight median setae; 3–4 pairs of straight basal setae.

Coloration: Brown; dark brown on body edges and legs, trochanter IV and apophyses. Light brown on distal portions of metatarsi and tarsi. Black spine in scutal area III.

Female (paratype; MZSP 1727): Dorsum: Measurements: SL 3.65; SMW 3.20; femur I 1.60; II 3.20; III 2.40; IV 3.00. Median paracheliceral projection of similar-size as PAM. Carapace with 34 tubercles distributed mainly at the sides and behind ocularium. Posterior margin of dorsal scutum and free tergites I–III with an irregular row of 31, 22, 20, 22 tubercles, respectively. Pedipalpus: Tibial setation: Prolateral II/i, retrolateral III. Tarsal setation: Prolateral III, retrolateral iii/iII/iII. Legs: Coxa II with 1 large retrolateral tubercle; IV densely and irregularly tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed, curved backwards. Trochanter IV with scattered tubercles, with 2–3 large prolateral apical apophyses; retrolaterally with 1 subbasal and 1 large median tubercule, 1 apical apophysis, this conical, short, blunt. Femur I ventrally with 2 rows of slightly enlarged tubercles; III ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 1 small blunt prolateral apical spine; IV ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 1 small blunt prolateral apical spine. Tibia I ventrally with 2 rows of slightly enlarged tubercles; III with rows of similar-sized tubercles. Tarsal segmentation: 5, 8, 6, 6. Coloration: Brown; spine on scutal area III, patellae, tibiae, trochanters and femora IV black. Light brown on distal portions of metatarsi and tarsi.


Type locality: Brazil, Espírito Santo, Linhares, Refúgio Sooretama.

Geographical distribution (Fig. 50A): Brazil. S Bahia and Espírito Santo.

**Eusarcus insperatus** B. Soares
(Figs. 22, 44,E,F, 50A)

**Eusarcus insperatus** B. Soares 1944a: 222 (cit), 228, fig. 4; 1944b: 286 (cit); Mello-Leitão 1945: 154 (cat), 157 (key), fig. 15; B. Soares 1946: 519 (cat); Soares & Soares 1954b: 260 (cat); Kury 2003a: 169 (cat); (ma holotype; “Alto da Serra, [Santo André], São Paulo; F. Lane & B.M. Soares leg.; 18.iii.1943; MZSP 430”; examined).

Material examined: BRAZIL. S. Paulo: Santo André (Alto da Serra), F. Lane & B.A.M. Soares leg., 18.iii.1943, ma holotype (MZSP 430); Salesópolis (Estação Biológica de Boracéia), A.D. Brescovit et al. leg., ix.2000, 1 ma (IBSP 1509); idem, Eq. Biota leg., 18–24.v.2001, I fe (IBSP 4283); idem, 1 ma (IBSP 4285).
FIGURE 22. *Eusarcus insperatus* B. Soares. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, right femur IV, prolateral view; I, right tibia IV, ventral view. Scale bars, 1 mm.
**Diagnosis:** *E. insperatus* resembles *E. caparaoensis*+ and *E. manero*+, which have a conical, short, blunt prolateral basal apophysis on male trochanter IV, and can be distinguished by: The presence of PAM; ocularium with similar-sized tubercles; median spine of scutal area III of medium size, not surpassing posterior margin of dorsal scutum; femur IV with blunt retrolateral subapical apophysis, 2 ventro-apical spines.

**Redescription:** *Male* (holotype): Dorsum (Fig. 22A,B): Measurements: SL 5.30; SMW 4.60; femur I 2.25; II 4.25; III 3.70; IV 4.35. Median parachelicer projection larger than PAM. Ocularium far from anterior scutal margin; with 17 tubercles. Carapace with 58 scattered tubercles. Scutal area I with 27–30 scattered tubercles on each side; II with 69; III with 67 and a median spine of medium size, pointing obliquely backwards, not surpassing posterior margin of dorsal scutum; IV with 28 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 19, 16, 13, 8 tubercles, respectively. Anal operculum with 30 tubercles.

Venter: Coxa I with 17–19 tubercles, median and distal ones largest; II with 30–37, distal ones largest; III with 31–39; IV irregularly tuberculate.

Chelicera: Segment I with 2 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 3–4 tubercles. Femur dorsally smooth; ventrally with 1 large pointed basal tubercle, 2–3 small aligned ones. Tibial setation: Prolateral Iii, retrolateral IiiIi. Tarsal setation: Prolateral IIi, retrolateral IiiIi.

Legs (Fig. 22C–I): Coxa II with a retrolateral row of 3 tubercles; IV densely tuberculate, with 1 transversal prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad. Trochanters I–IV with scattered tubercles; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; retrolaterally with 1 subbasal and 1 large apical tubercle. Femora I–III with small PDS, RDS; I ventrally with 2 rows of slightly enlarged tubercles; III sinuous, ventrally with a prolateral row of tubercles increasing in size distally, with PVS larger than RVS; IV sinuous, with medium PDS, RDS; 1 small prolateral apical spine; 1 blunt retrolateral subapical apophysis; ventrally with 2 rows of tubercles, prolateral ones enlarged, increasing in size distally, with PVS larger than RVS. Tibia III with two ventral rows of pointed tubercles increasing in size subapically (4 large); IV with 1–2 small retrolateral spines; ventrally with 2 rows of pointed tubercles increasing in size distally, 2 apical spines. Tarsal segmentation: ?, 9, ?, 6.

Penis (Fig. 44E,F): Stylus smooth, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved; apex with flabelliform projection. Ventral plate with concave sides; with 2–3 pairs of straight distal setae; 4 pairs of straight basal setae, basalmost pair slightly smaller than other basal ones.

Coloration: Yellowish brown; brown on dorsal scutum edges. Dark brown on edges of legs and its apophyses.

*Female* (IBSP 4283): Dorsum: Measurements: SL 4.60; SMW 3.80; femur I 2.00; II 3.70; III 2.80; IV 3.70. Posterior margin of dorsal scutum and free tergites I–III with rows of 19 and 24, 19 and 21, 16 and 16, 15 and 15 tubercles, respectively. Pedipalpus: Tibial setation: Prolateral IiiIi/IiiiIi, retrolateral IiiIi. Legs: Coxa IV densely and irregularly tuberculate, with 1 oblique prolateral apical apophysis, this conical, short. Trochanters I–II with 1 large ventro-basal tubercle; IV retrolaterally with 1 apical apophysis, this conical, short, blunt. Femur I with rows of similar-sized tubercles; II with reduced or small PDS, small RDS; III with small PDS, medium RDS; ventrally with rows of similar-sized tubercles, with 1 large prolateral apical tubercle; IV dorsal, prolateral and retrolateral rows with similar-sized tubercles, ventrally with 2 rows of tubercles, 2 small apical spines. Tibia III only with rows of similar-sized tubercles; IV without retrolateral spines, ventrally with 2 rows of similar-sized tubercles, 2 large pointed apical spines. Metatarsus I with 2 ventro-apical setae. Tarsal segmentation: 6, 8–9, 6, 6.

**Variation in males** (n=3): Measurements: SL 4.65–5.30; SMW 4.00–4.60; femur I 2.20–2.25; II 4.10–4.25; III 3.10–3.70; IV 4.10–4.35. Pedipalpus: Tibial setation: Prolateral Iiii/Iiii, retrolateral Iiii/Iiii. Femur I with reduced or small RDS; IV with small or medium PDS. Tarsal segmentation: 6, 8–9, 6, 6.

**Type locality:** Brazil, São Paulo, Santo André, Alto da Serra.

**Geographical distribution** (Fig. 50A): Brazil. Serra do Mar in São Paulo State.
**Eusarcus manero sp. n.**
(Figs. 23, 45E,F, 49A)

**Type material:** BRAZIL. Rio de Janeiro: Maricá (Itaipuacu), A. Giupponi leg., 15.i.2000, ma holotype & 2 ma & 1 fe paratypes (MNRJ 11367); Maricá, C. Ostrowsky leg., 8.viii.1977, 2 ma paratypes (MNRJ 6050); idem (Ponta Negra), P. Junberg, L.C.F. Alvarenga, H.M. Barros, C.N. Ricci, L.A.L. Gomes leg., 19.x.1975, 7 ma & 9 fe paratypes & 1 im (MNRJ 11357); idem, 3 ma & 3 fe paratypes (MZSP 28661).

**Diagnosis:** *E. manero* resembles *E. caparaoensis*+ and *E. manero*+, which have a conical, short, blunt prolateral basal apophysis on male trochanter IV, and can be distinguished by: The presence of PAM; ocularium with 2 large tubercles; median spine of scutal area III of medium size, reaching groove V; trochanter IV only with prolateral basal apophysis; femur IV with only 1 proventral apical spine (PVS).

**Etymology:** The name, a noun in apposition, refers to a common slang word (meaning “cool”) used by people living in the state where the species was collected.

**Description:** *Male* (holotype): Dorsum (Fig. 23A,B): Measurements: SL 4.10; SMW 3.80; femur I 2.00; II 4.15; III 3.10; IV 3.90. Median paracheliceral projection of similar-size as PAM. Ocularium far from anterior scutal margin; with 2 moderately enlarged tubercles, 10 small ones. Carapace with 31 scattered tubercles. Scutal area I with 17–19 tubercles on each side next to grooves I, median and II; II with 33; III with 26 and a median spine of medium size, reaching groove V; IV with 15 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 18, 14, 14, 8 tubercles, respectively. Anal operculum with 16 tubercles.

Venter: Coxa I with 17–18 tubercles, median and distal ones largest; II with 28–32, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 4 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 2 tubercles. Femur dorsally with 2 tubercles; ventrally with 1 large basal tubercle, 2 small scattered ones. Tibial setation: Prolateral IiI, retrolateral IiIi. Tarsal setation: Prolateral Iii, retrolateral Iii.

Legs (Fig. 23C–H): Coxa II with 1 tubercle on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad, swollen subasally and subapically. Trochanters I–IV with scattered tubercles; I with 1 large ventro-basal tubercle; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; retrolaterally with 1 large median tubercle. Femur I with reduced PDS, small RDS, ventrally with 2 rows of slightly enlarged tubercles; II–IV with small PDS, medium RDS; III sinuous, ventrally with 2 rows of tubercles, prolateral slightly increasing in size distally, with 1 short prolateral apical spine; IV sinuous, ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, becoming high, pointed, 1 prolateral apical spine, 1 large retrolateral apical tubercle. Tibia III ventrally with 2 rows of tubercles increasing in size subapically, becoming high, pointed. Tarsal segmentation: 5, 8, 6, 6.

Penis (Fig. 45E,F): Stylus with medio-ventral trichomes, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved; apex blunt. Ventral plate with concave sides; with 3 pairs of apically curved distal setae; 2 ventral pairs of small distal tubercles; 1 pair of short, straight median setae; 4 pairs of straight basal setae.

Coloration: Brown; dark brown on prolateral apical apophysis of Coxa IV, trochanter IV and femur IV. Light brown on tarsi.

**Female** (paratype; MNRJ 11357): Measurements: SL 4.10; SMW 3.80; femur I 2.00; II 4.15; III 3.10; IV 3.90. Pedipalpus: Tibial setation: Prolateral and retrolateral Iii. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; IV retrolaterally with 1 short apical apophysis. Femur I with small PDS, RDS, ventrally with 2 rows of slightly enlarged tubercles; III with reduced PDS, medium RDS; ventrally with 2 rows of tubercles, prolateral slightly increasing in size distally, with 2 large apical tubercles, prolateral one largest; IV ventrally with 2 rows of tubercles, prolateral one increasing in size distally, 1 prolateral apical spine, 1 large retrolateral apical tubercle. Tibia III with rows of similar-sized tubercles. Metatarsus I with 2
FIGURE 23. *Eusarcus manero* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, left trochanter and femur IV, dorsal view; G, idem, ventral view; H, right trochanter and femur IV, prolateral view. Scale bars, 1 mm.
ventro-apical setae. Tarsal segmentation: 5, 7, 6, 6. Coloration: Same as in male, but dark brown on anterior margin of prosoma and free tergites.


Variation in females (n=6): Measurements: SL 3.50–4.10; SMW 3.20–3.80; femur I 1.70–2.00; II 3.50–4.15; III 2.70–3.10; IV 3.60–3.90. Femur I with small or medium RDS; III with reduced or small PDS, medium or large RDS. Tarsal segmentation: 5, 7–8, 6, 6.

Type locality: Brazil, Rio de Janeiro, Maricá, Itaipuçu.

Geographical distribution (Fig. 49A): Known only from the type locality.

Eusarcus matogrossensis sp. n.
(Figs. 24, 48A,B, 49B)

Type material: BRAZIL. Mato Grosso: Chapada dos Guimarães, A. Giupponi leg., 21.i.2000, ma holotype (MNRJ 4343); without locality, E. Froelich leg., 22.ii.1983, 1 ma & 1 fe paratypes (MNRJ 17690); idem, 1 ma paratype (MZSP 28667).

Diagnosis: E. matogrossensis resembles E. caparaoensis+ and E. manero+, which have a conical, short, blunt prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularial high, with 2 spines; median spine of scutal area III of medium size, not surpassing groove V; femur IV with prolateral (tubercles far from each other), proventral (only distally) and retroventral rows of high, pointed tubercles; only 1 ventro-apical spine.

Etymology: The name, an adjective, refers to the state where the species was collected.

Description: Male (holotype): Dorsum (Fig. 24A,B): Measurements: SL 4.30; SMW 3.80; femur I 2.35; II 4.20; III 3.00; IV 3.80. Median paracheliceral projection of similar-size as PAM. Ocularium high from anterior scutal margin; high, with 2 spines, 9 tubercles. Carapace with 20 scattered tubercles. Scutal area I with 21–26 scattered tubercles on each side; II with 53; III with 51 and a median spine of medium size, not surpassing groove V; IV with 45 tubercles. Posterior margin of dorsal scutum and free tergites I–III with rows of 11 and 16, 8 and 17, 6 and 16, 12 and 14 tubercles, respectively. Anal operculum with 42 tubercles.

Venter: Coxa I with 30–34 tubercles, median and distal ones largest; II with 50–52, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 4 tubercules.

Pedipalpus: Trochanter dorsally inflated, with 3 tubercules. Femur dorsally with 3–4 aligned tubercules; ventrally with 1 large basal tubercle, 5–6 small aligned ones, 2 prolateral subapical setae. Tibial setation: Prolateral and retroventral Iii/Iii. Tarsal setation: Prolateral and retroventral Iii/Iii.

Legs (Fig. 24C–I): Coxa II with 5–6 tubercles on retroventral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad. Trochanters I–IV with scattered tubercules; I–II with 1 large ventro-basal tubercle; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; retroventrally with 1 apical apophysis, this conical, short, blunt. Femur I with small PDS, reduced RDS; II–III with small PDS, RDS; III sinuous, ventrally with 2 rows of tubercules, prolateral one increasing in size distally, becoming high, pointed, with 1 large prolateral apical tubercle; IV sinuous, with a prolateral row of short, pointed tubercules increasing in size to the middle portion, some becoming high; a retrolateral row of high, pointed tubercles; medium PDS, RDS, retrolateral one blunt, slightly smaller; ventrally with 2 rows of tubercules, prolateral ones increasing in size distally, becoming high, pointed, 1 prolateral apical spine, 1 large retrolateral apical tubercle. Tibia III ventrally with 2 rows of tubercules increasing in size subapically, a retrolateral row of enlarged tubercles; IV ventrally with 2 rows of tubercules increasing in size distally, prolateral ones enlarged, 2 apical spines, prolateral one largest. Tarsal segmentation: 6, 8, 6, 6.
FIGURE 24. *Eusarcus matogrossensis* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view; I, right tibia IV, ventral view. Scale bars, 1 mm.
Penis (Fig. 48A, B): Stylus with ventro-median trichomes, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved, apex with flabelliform projection. Ventral plate with concave sides; with 3 pairs of slightly curved distal setae; 2 pairs of small ventro-distal setae; 1 pair of short, straight median setae; 4 pairs of straight basal setae.

Coloration: Brown; light brown on tarsi.

Female (paratype; MNRJ 17690): Dorsum: Measurements: SL 3.70; SMW 3.20; femur I 2.00; II 3.60; III 2.70; IV 3.50. Median paracheliceral projection larger than PAM. Pedipalpus: Femur ventrally with 1 large basal tubercle, 3–5 small aligned ones, 1 prolateral subapical seta. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short. Trochanter IV with scattered tubercles; retrolaterally with 1 conical short apical apophysis. Femora I–II with reduced PDS, RDS; III reduced PDS, small RDS; ventrally with 2 rows of tubercles slightly increasing in size distally, prolateral ones enlarged, with 1 large prolateral apical tubercle; IV with prolateral and retrolateral rows of similar-sized tubercles; ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 1 large pointed prolateral apical tubercle. Tibiae III–IV with rows of similar-sized tubercles, without spines. Metatarsus I with 1 retroventral apical seta. Tarsal segmentation: 6, 8, 6, 6.

Variation in males (n=3): Measurements: SL 3.90–4.30; SMW 3.50–3.80; femur I 2.10–2.40; II 3.80–4.20; III 2.60–3.00; IV 3.30–3.80. Pedipalpus: Femur with 1–2 prolateral subapical setae; Tibial setation: Prolateral iiii/i, retrolateral iiii. Femora I, III with reduced or small PDS; II with reduced or small RDS. Tarsal segmentation: 5–6, 8–10, 6, 6.

Type locality: Brazil, Mato Grosso, Chapada dos Guimarães.

Geographical distribution (Fig. 49B): Known only from the type locality.

**Eusarcus mirabilis** sp. n.
(Figs. 25, 39E,F, 50A)

*Eusarcus hastatus*: [misid] B. Soares 1945c: 375 (cat [pars]).

**Type material:** BRAZIL. Minas Gerais: Marliéria (Parque Estadual Rio Doce), W.R. Lourenço leg., 1998, ma holotype & 2 fe paratypes (MNRJ 5772); idem, 1 ma & 1 fe (MZSP 28662); Viçosa, J. Moojen leg., without date, 1 ma paratype (MNRJ 58044).

**Diagnosis:** *E. mirabilis* resembles *E. aduncus, E. berlæ, E. elinae, E. fulvus, E. signatus, E. sooretamae, E. cavernicola* and *E. sergipanus* because of the conical prolateral median apophysis on the male trochanter IV, and can be distinguished by: The absence of PAM; ocularium with similar-sized tubercles; median spine of scutal area III of medium size; basitarsus I not elongated; tibia III with two ventral rows of tubercles increasing in size distally, becoming high, pointed; prolateral apical apophysis of coxa IV without projections on retrolateral margin and curved upwards; conical prolateral median apophysis on the male trochanter IV oblique, long, curved back and upwards, basally swollen; femur IV not more than 1.5 times longer than dorsal scutum.

**Etymology:** The Latin adjective “mirabilis” is in reference to the remarkable prolateral apophysis of trochanter IV.

**Description:** Male (holotype): Dorsum (Fig. 25A, B): Measurements: SL 4.35; SMW 3.90; femur I 2.00; II 3.90; III 3.10; IV 3.85. PAM absent. Anterior margin with 3–4 pointed tubercles on each corner. Ocularium far from anterior scutal margin; with 5 pointed tubercles. Carapace with 12 scattered tubercles. Scutal area I with 24–28 scattered tubercles on each side; II with 43; III with 61 and a median spine of medium size, curved backwards, more abruptly so subapically, reaching groove V; IV with 32 tubercles. Posterior margin of dorsal scutum with an irregular row of 22 tubercles. Free tergite I with a row of 18 tubercles; II–III with an irregular row of 17, 14 tubercles, respectively. Anal operculum with 33 tubercles.

Venter: Coxa I with 24–33 tubercles, median and distal ones largest; II–III with 45–47, 45–53, respectively, increasing in size distally; IV densely and irregularly tuberculate.

Chelicera: Segment I with 5–6 tubercles.
FIGURE 25. *Eusarcus mirabilis* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, dorsal view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view; I, right tibia IV, ventral view. Scale bars, 1 mm.

Legs (Fig. 25C–I): Coxa IV densely tuberculate, with 1 very oblique prolateral apical apophysis, this conical, long, blunt, slightly curved up and backwards. Trochanters I–IV with scattered tubercles; I–III with large retrolateral tubercles; I–II with 1 large ventro-basal tubercle; III with 1–2 large pointed retrolateral apical tubercles; IV prolaterally with 1 oblique median apophysis, this conical, long, pointed, curved up and backwards, swollen basally; retrolaterally with 1 large apical tubercle. Femur I–II with reduced PDS, RDS; I ventrally with 2 irregular rows of slightly enlarged tubercles; III slightly sinuous, reduced PDS, small RDS, ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, 1 blunt prolateral apical spine; IV slightly sinuous, with small PDS, RDS; ventrally with 2 irregular rows of tubercles. Tibia III ventrally with 2 irregular rows of pointed tubercles increasing in size distally, retrolateral ones enlarged, 2 apical spines; IV with enlarged pointed apical tubercles. Metatarsus I without pair of ventro-apical setae on one side and with 2 ventro-apical setae on the other; IV thickened, with tubercles decreasing in size and number distally. Tarsal segmentation: 6, 9–11, 6, 6.

Penis (Fig. 39E,F): Stylus with medio-ventral trichomes, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved; apex with flabelliform projection. Ventral plate with concave sides; with 4 pairs of long, slightly curved distal setae; 2 pairs of short, straight median setae (basalmost pair smallest); 4 pairs of straight basal setae.

Coloration: Brown on body, chelicera and pedipalps; dark brown on legs. Light brown on metatarsi and tarsi I–II and tarsi III–IV.

Female (paratype; MNRJ 5772): Dorsum: Measurements: SL 3.15; SMW 3.05; femur I 1.40; II 2.90; III 2.15; IV 2.70. Posterior margin of dorsal scutum and free tergites I–III with rows of 20 and 26, 14 and 28, 5 and 26, 9 and 19 tubercles, respectively. Pedipalpus: Tibial setation: Prolateral and retrolateral lIl. Legs: Coxa II with 1–2 prolateral tubercles, 4–5 retrolateral ones; IV densely tuberculate, with 1 very oblique prolateral apical apophysis, this conical, pointed, curved backwards, surpassing posterior margin of this segment. Trochanter III with scattered tubercles, retrolateral ones largest; IV with scattered tubercles, retrolaterally with 1 median, 1 subapical, 1 large apical tubercle. Femur I ventrally with rows of similar-sized tubercles; III ventrally with 2 rows of tubercles slightly increasing in size distally, prolateral ones enlarged, 1 large prolateral apical tubercle; IV with 1 large proventral tubercle. Metatarsus I without ventro-apical setae. Tarsal segmentation: 6, 8, 6, 6. Coloration: Brown on body, chelicera, pedipalps, most part of legs and tarsi; dark brown on trochanters, base and apex of femora and tibiae, patellae and metatarsi.


Variation in females (n=3): Measurements: SL 2.90–3.15; SMW 2.60–3.05; femur I 1.30–1.40; II 2.70–2.90; III 2.00–2.15; IV 2.60–2.70. Femur II with reduced or small PDS, reduced or medium RDS; III with reduced or small PDS, small or medium RDS; IV with small or medium PDS, RDS.

Type locality: Brazil, Minas Gerais, Marliéria, Parque Estadual Rio Doce.

Geographical distribution (Fig. 50A): Brazil. Minas Gerais.

_Eusarcus nigrimaculatus_ Mello-Leitão
(Figs. 26, 27, 43E,F, 49A)

_Eusarcus nigrimaculatus_ Mello-Leitão 1924: 181; 1926: 371 [wr cit as _sp. n._] (rdesc, diag); Roewer 1929: 197 (key); 198 (rdesc); 1931: 102 (cit); Mello-Leitão 1932: 155 (key), 156 (rdesc), fig. 79; 1940: 7 (key); 1945: 154 (= _Eusarcus minensis_ Mello-Leitão 1932; cat), 157 (key), fig. 16; B. Soares 1945c: 376 (cat); Soares & Soares 1954a: 496 (dist, syst); Soares & Soares 1954b: 261 (cat); B. Soares 1972: 58 (dist); Kury 2003a: 169 (cat); (ma holotype MNRJ, lost).

_Orguesia armata_ Roewer 1913: 177, fig. 75; 1923: 467 (rdesc), fig. 586; Mello-Leitão 1932: 242 (rdesc), fig. 130; Soares & Soares 1949: 199 (cat); (ma holotype; “Berge von Orgues [Serra dos Órgãos, Rio de Janeiro], Brasiliien; SMF 902”; examined). _Syn. n._
Eusarcus organensis Kury 2003a: 169 (cat; nom nov for Orguesia armata; Roewer 1913 to avoid secondary homonymy with E. armatus Perty 1833).

Eusarcus furcatus Roewer 1929: 197 (key); 200, fig. 7; Mello-Leitão 1932: 155 (key), 160 (rdesc); 1940: 6 (key); 1945: 154 (cat), 157 (key), fig. 13; Soares & Soares 1945a: 224 (dist; dubious identification); 1948: 3 (dist), 11 (syst); 1954b: 260 (cat); Acosta 1996b: 216 (cat); Kury 2003a: 169 (cat); (ma holotype; “Brasilien: Matto Grosso, SMF RII/955(37)”); examined. Syn. n.

Pareusarcus corniculatus Roewer 1929: 237, fig. 24; Mello-Leitão 1932: 190 (rdesc); Soares & Soares 1954b: 289 (cat); Acosta 1996b: 222 (cat); Kury 2003a: 187 (cat); (ma holotype; “Porto Allegre, [Rio Grande do Sul], Brasilien; SMF 992/49”); examined. Syn. n.

Eusarcus minensis Mello-Leitão 1932: 155 (key), 158, fig. 82; 1940: 7 (key); B. Soares 1945c: 375 (cat); (ma holotype; “Ouro Preto, Minas Gerais; MN RJ 1436”; examined). Synonymy with E. nigrimaculatus established by Mello-Leitão (1945).


Eusarcus centromelos: B. Soares 1944d: 174 (= Enantiocentron geniculatus Mello-Leitão 1936; syst); 1944e: 196 (cit); Mello-Leitão 1945: 154 (cat), 156 (cit); B. Soares 1945c: 375 (cat); Soares & Soares 1948: 11 (syst); Soares & Soares 1954b: 259 (cat); Kury 2003a: 169 (cat).

Papageia geniculatus Mello-Leitão 1936: 22, fig. 18; (fe holotype; “Petrópolis, Rio de Janeiro, R. Arlé leg.; MN RJ 42690”); examined). Synonymy with E. centromelos established by B. Soares (1944d).

Eusarcus geniculatus: B. Soares 1943a: 207 (syst); 1944d: 174 (syst).

Eusarcus arnatus: [missid] Roewer 1927: 335 (cit [pars]); 1929: 197 (cit [pars]).

Eusarcus oxyacanthus: [missid] B. Soares 1945c: 376 (cat [pars]).

Material examined: BRAZIL. Minas Gerais: Ouro Preto, C.de M. Gomes leg., without date, ma holotype of Eusarcus minensis (MN RJ 1436). Rio de Janeiro: Petrópolis, R. Arlé leg., without date, fe holotype of Enantiocentron geniculatus (MN RJ 42690); Rio de Janeiro (Bico do Papagaio), R. Arlé leg., without date, 1 fe holotype of Pareusarcus centromelos (MN RJ 41832); Teresópolis (Serra dos Órgãos), without name of collector and date, ma holotype of Orguesia armata (SMF 902). Mato Grosso: Without locality, name of collector and date, ma holotype of Eusarcus furcatus (SMF RII 956/37). Rio Grande do Sul: Porto Alegre, without name of collector and date, ma holotype of Pareusarcus corniculatus (SMF RII 922/49).

Rio de Janeiro: Bresslau leg., 1 fe (SMF 1441); idem (SMF 1442); Angra dos Reis, P. Wygodzinsky leg., ii.1949, 1 fe (MZSP 1726); Barra Mansa (Mata da Cicuta), Eq. Biota leg., 11–18.vi.2001, 1 ma (IBSP 4659); idem (IBSP 4677); Nova Iguacu (Tinguá), without name of collector and date, 1 ma (originally in MN RJ 6797); idem, Lamartine leg., viii.1954, 1 ma (MN RJ 16142); idem, A. Izecksohn & J. Jim leg., 21.vii.1965, 3 ma & 6 fe & 1 im (MN RJ 16137); idem, E. Izecksohn leg., 3.xii.1965, 1 ma (MN RJ 4901); idem, 15.xii.1965 (MN RJ 16140); Parati (Pedra Branca), H. Berla leg., without date, 3 ma & 2 fe (MN RJ 5231); idem, H.N. Cunha leg., xi.1967, 1 ma & 1 fe (MN RJ 11359); Petrópolis, C.F. de Mello-Leitão leg., without date, 1 fe (MN RJ 1437); idem, Bresslau leg., 1 fe (SMF), Pirai (Pinheiral), E.de M. Mello leg., without date, 1 fe (MN RJ 1439a); idem, 1 fe (MN RJ 1439b); idem, A. Kury & R. Baptista leg. 20.xi.1988, 5 ma & 11 fe (MN RJ 6368); Rio de Janeiro, without name of collector and date, 1 ma & 3 fe (MN RJ 243); idem, Wygodzinsky leg., 10.iv.1944, 1 ma (MZSP 1759); idem (Corcovado), P. Wygodzinsky leg., 20.viii.1947, 1 ma (MZSP 1174); idem (Floresta da Tijuca), E. de Moraes Mello leg., without date, 1 fe (MN RJ 1434); idem, E. Izecksohn leg., 19.v.1978, 1 fe (MN RJ); idem, A. Giupponi leg., 30.i.2000, 1 ma (MN RJ 4694); idem, R.L.C. Baptista & L.E. Goes e Silva leg., 15.vi.2001, 1 ma & 1 fe (MN RJ 4795); idem, A. Giupponi leg., 19.x.1999, 1 fe (MN RJ 4874); idem, R. Baptista leg., 1.vii.1985, 1 ma (MN RJ 6123); idem, A. Giupponi & Pedroso leg., 1.x.1999, 1 ma (MN RJ 8949); idem (Gávea), P. Wygodzinsky leg., 13.ix.1944, 1 ma (MZSP 1740); idem, iv.1944, 1 ma (MZSP 1759); idem (Grajaú), H. Lopes leg., without date, 1 ma & 1 fe (MN RJ 16130); idem, O. Schubart leg., without date, 1 fe (HEMS 1013); idem (Horto), A.B. Kury leg., 18.xi.1988, 1 ma & 1 fe (MNHC 6649); idem, C.A. Caetano leg., 1989, 2 ma & 1 fe (MN RJ 11404); idem (Itaguaí), J.P. Mattos leg., 24.vi.1948, 1 ma & 6 fe (HEMS 88); idem (Jucarapaguará), without name of collector and date, 3 ma & 1 fe (MN RJ 451); idem, R. Arlé leg., without date, 1 ma & 1 fe (MN RJ 5823); idem, C.J. Becker leg., 30.x.1975, 1 fe (MCNZ 65); idem (Marambaia), B.N. Costa leg., vii.1991, 1 ma (MN RJ 11402); idem (Parque da Lage), I. & M. Kury leg., 13.ix.1997, 1 ma (MN RJ 5500); idem (Parque Estadual Pedra Branca, Floresta do Engenho de Dentro), A.
Kury, A. Giupponi, A. Bustamante, P. Ramalho & R. Carvalho Jr. leg., 6.v.1999, 1 ma & 1 im (MNRJ 5755); idem (Parque Estadual Pedra Branca, Pau da Fome), A.B. Kury, A. Giupponi, A. Nogueira, S. Romponi, A. Tourinho leg., 7.i.2000, 6 ma & 6 fe (MNRJ 4662); idem, 4.xi.1962, 1 fe (HEMS 427); idem, P. Wygodzinsky leg., 13.ix.1944, 1 ma (MZSP 1740); idem, 4.iv.1943, 3 fe (MZSP 1742); idem, without name of collector, i.2001, 1 ma (MNRJ 16180); idem, 4.xi.1962, 1 fe (HEMS 1005); idem (Parque Estadual Pedra Branca, Pau da Fome), A.B. Kury, A. Giupponi, A. Nogueira, S. Romponi, A. Tourinho leg., 7.i.2000, 6 ma & 6 fe (MNRJ 4662); idem (Pedra da Gávea), J. Becker leg., 25.ix.1955, 1 ma & 1 im (HEMS 1006); idem, J. Becker leg., 4.iii.1956, 1 ma (HEMS 1006); Queimados (Km 37 rodovia Presidente Dutra, rio Guandu), O. Fraga leg., 25.x.1960, 1 ma (HEMS 230); idem (Tijuca), E. Izecksohn leg., 1954, 2 fe (MNRJ 16176); idem, vii.1954, 1 fe & 5 im (MNRJ 16164); idem, 3.vii.1954, 4 fe & 3 im (MNRJ 16141); idem, 29.viii.1954, 1 fe (MNRJ 16151); Teresópolis, M. Chaves leg., 6.xi.1983, 2 ma & 3 fe (MNRJ 6146). Without locality and date, 3 ma & 3 fe (HEMS 998); idem, 1 fe (MNRJ 11405).

Diagnosis: *E. nigrimaculatus* resembles *E. incus*, *E. pusillus*, *E. acrophthalmus*, *E. alpinus*, *E. didactylus* and *E. geometricus* because of the cylindrical prolateral median process on the male trochanter IV and because of the generally large body size, and can be distinguished by: The ocularium with 2 large tubercles; rectangular projection present on the retrolateral margin of the prolateral apical apophysis of coxa IV and the shape of the cylindrical prolateral median process of the male trochanter IV: Distally bifurcated, blunt; basally with a small, blunt, slightly conical apophysis. Penis without ventral process of glans (unusual within the genus), similar to *E. geometricus*: Stylus curved ventrad, without medio-ventral trichomes and angular medio-ventral projection; ventral plate not much developed.

Redescription: Male (MZSP 1759): Dorsum (Fig. 26A,B): Measurements: SL 5.60; SMW 5.00; femur I 2.30; II 4.80; III 3.60; IV 4.20. Median paracheliceral projection of similar-size as PAM. Ocularium far from anterior scutal margin; with 2 large tubercles, 18 small ones. Carapace with 30 scattered tubercles. Scutal area I with 27–33 scattered tubercles on each side; II with 63; III with 53 and a median spine of medium size, oblique, surpassing groove V but not posterior margin of dorsal scutum; IV with 36 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 17, 12, 12, 9 tubercles, respectively. Anal operculum with 28 tubercles.

Venter: Coxa I with 27–29 tubercles, median and distal ones largest; II with 44–50, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I smooth.

Pedipalpus: Trochanter dorsally inflated, with 1–2 tubercles. Femur dorsally with 2–3 aligned tubercles, apically with 3–5 small scattered ones; ventrally with 1 large basal tubercle, 2 small scattered ones. Tibial setation: Prolateral III, retrolateral III/III. Tarsal setation: Prolateral III, retrolateral III.

Legs (Figs. 26C–H, 27B–E): Coxa II with 3–5 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, curved posterior and slightly ventral, with 1 rectangular projection on retrolateral margin. Trochanters I–IV with scattered tubercles; IV prolaterally with 1 cylindrical and flattened median process, this distally bifurcated, blunt; basally with a small, blunt, slightly conical apophysis; retrolaterally with 1 large pointed subbasal tubercle. Femur I with small PDS, RDS; II–III with reduced PDS, large RDS; III sinuous, ventrally with a prolateral row of tubercles slightly increasing in size distally, with 1 prolateral apical spine; IV sinuous, medium PDS, large RDS; ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 2 apical spines. Tibia III ventrally with 2 rows of tubercles increasing in size subapically, becoming high, pointed; IV with large tubercles, ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, 2 apical spines, 1 small retrolateral apical spine. Tarsal segmentation: 6, 8, 6, 6.

Penis (Fig. 43E,F): Stylus smooth, becoming thin at apex, curved ventrad; without medio-ventral trichomes and angular medio-ventral projection. Ventral process of glans absent. Ventral plate covering only about half of glans; with 2 pairs of straight distal setae; 1 pair of short, straight median setae; 4 pairs of straight basal setae, basalmost pair far from others and placed on trunk of penis.

Coloration: Brown; dark brown on prosoma, from prolateral apical apophysis of coxa IV to metatarsus IV. Light brown on pedipalps, metatarsi I–III and tarsi I–IV.
FIGURE 26. *Eusarcus nigrimaculatus* Mello-Leitão. Male (MZSP 1759): A, habitus, dorsal view; B, dorsal scutum, left lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur IV, prolateral view; E, right trochanter and femur IV, dorsal view; F, idem, ventral view; G, right tibia IV, dorsal view; H, idem, ventral view. Scale bars, 1 mm.
FIGURE 27. *Eusarcus nigrimaculatus* Mello-Leitão. Male, rare variant (Male holotype of *Pareusarcus corniculatus* Roewer): A, habitus, dorsal view. Male (MZSP 1759): B, right trochanter and femur III, dorsal view; C, idem, ventral view; D, right patella and tibia III, dorsal view; E, idem, ventral view. Scale bars, 1 mm.
Female (lectotype of *E. nigrimaculatus*; MNRJ 1439): Dorsum: Measurements: SL 5.25; SMW 4.50; femur I 1.90; II 3.95; III 3.15; IV 3.90. Median parachelicular projection larger than PAM. Chelicera: Segment I with 3–4 tubercles. Pedipalpus: Tarsal setation: Prolateral III, retrolateral III/III. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed, curved backwards. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; III with large retrolateral tubercles; IV retrolaterally with 1 large median tubercle, 1 conical blunt apical apophysis. Femur I ventrally with 2 rows of enlarged tubercles; III ventrally with two irregular rows of slightly enlarged tubercles, prolateral ones increasing in size distally, 1 small, blunt prolateral apical spine; IV ventrally with two irregular rows of tubercles, prolateral ones enlarged, increasing in size distally, small PVS, RVS, prolateral one larger. Tibiae I, III ventrally with 2 rows of slightly enlarged tubercles; IV with rows of similar-sized tubercles, without spines. Tarsal segmentation: 6, 8, 6, 6. Coloration: Brown; dark brown on proximal segments of legs. Light brown on metatarsi and tarsi.

Variation in males (n=6): Measurements: SL 5.30–5.60; SMW 4.70–5.00; femur I 2.30–2.50; II 4.60–4.90; III 3.50–3.80; IV 4.20–4.40. Pedipalpus: Tibial setation: Prolateral and retrolateral III/III. Femur I with reduced or small PDS, RDS; II–III with reduced or small PDS; IV with small or medium PDS. Tarsal segmentation: 6, 8–9, 6, 6.

Variation in females (n=6): Measurements: SL 5.25–5.55; SMW 4.50–4.80; femur I 1.90–2.00; II 3.95–4.20; III 3.10–3.40; IV 3.90–4.10. Pedipalpus: Tibial setation: Retrolateral III/III. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed, curved backwards. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; III with large retrolateral tubercles; IV retrolaterally with 1 large median tubercle, 1 conical blunt apical apophysis. Femur I ventrally with 2 rows of enlarged tubercles; III ventrally with two irregular rows of slightly enlarged tubercles, prolateral ones increasing in size distally, 1 small, blunt prolateral apical spine; IV ventrally with two irregular rows of tubercles, prolateral ones enlarged, increasing in size distally, small PVS, RVS, prolateral one larger. Tibiae I, III ventrally with 2 rows of slightly enlarged tubercles; IV with rows of similar-sized tubercles, without spines. Tarsal segmentation: 6, 8, 6, 6. Coloration: Brown; dark brown on proximal segments of legs. Light brown on metatarsi and tarsi.

Taxonomical notes: The type material of *E. nigrimaculatus* is probably lost. In the original description Mello-Leitão mentioned that the male holotype was deposited in his private collection, and that at least one paratype was deposited in the W.S. Bristowe collection (depository unknown, maybe in the British Museum of Natural History), all of them having been collected in Minas Gerais, Diamantina, by W.S. Bristowe. In the redescriptions that followed there were only references to males. However, in the redescription of 1932 Mello-Leitão mentioned and illustrated this species using a female. Since no reference was made to a female until that moment, we can deduce that the female specimen was added after the original description. Therefore, the female cannot be considered as belonging to the type material.

B. Soares (1945c), in his catalogue of Opiliones deposited in the collection of the MNRJ, stated that there were three vials labeled as *E. nigrimaculatus*, two of them with two specimens each with the same number (#1439), and one (#58329) with five specimens from Rio de Janeiro collected by R. Arlé. He also stated that one of the #1439 vials has a label indicating that the material was also collected in Rio de Janeiro by R. Arlé, the other having no label. Although no material in the collection from MNRJ could be recognized with certainty as type material of *E. nigrimaculatus*, Soares & Soares (1954b) stated that the specimens of vial #1439 should be the type material. They also stated that the same material (#1439) should be the type material of *E. minensis*. The assumption that vial #1439 could contain the type material of *E. nigrimaculatus* also seems to have passed unnoticed by Kury (2003a). When we examined vial #1439, there were only two females instead of four specimens, differing from the statement of B. Soares (1945c). To worsen the confusion, it has been registered in the MNRJ records that E. de Moraes Mello collected the material instead of R. Arlé.

Considering the problems above and that these specimens are the oldest ones of *E. nigrimaculatus*, we assumed that this is the material used by Mello-Leitão (1932) for his redescription of *E. nigrimaculatus*, although we do not consider them as type material.

It was not possible to verify the synonymy of *E. minensis* with *E. nigrimaculatus* because the male holotype of the latter has been lost. The first redescription of *E. nigrimaculatus* is not very informative, but we could deduce that it differs from *E. minensis* in apophyses of trochanter IV and armature of legs II and IV. Removing *E. minensis* from the synonymy of *E. nigrimaculatus* would leave us with a species that cannot be identified at this moment, and therefore we decided to maintain the status quo.

In turn, *E. minensis* is similar to *E. furcatus*, and the observed differences in the respective holotypes (such as the size of the anterior lobe of the bifurcated apex of the apophysis of trochanter IV, and the size of the small apophysis placed at the base of its apophysis) fit perfectly into the range of intraspecific variation. Thus, we decided to synonymize *E. furcatus* under *E. nigrimaculatus*. 
The holotype of *O. armata* is a specimen that perfectly corresponds to *E. nigrimaculatus*, and the different number of scutal areas on the dorsal scutum given in Roewer’s description is a mistake. Thus, *E. nigrimaculatus* can be considered as a senior synonym of *O. armata*, which received the replacement name *E. organensis* by Kury (2003a) to avoid secondary homonymy with the type species of *Eusarcus* Perty 1833.

The holotype of *P. corniculatus* Roewer 1929 is similar to specimens of *E. nigrimaculatus*, except for an atypical variation in area IV (Fig. 27A). All the other characteristics, including those of the genitalia, are the same.

**Type localities:** Brazil. Of *E. nigrimaculatus*: Minas Gerais, Diamantina. Of *E. minensis*: Minas Gerais, Ouro Preto. Of *E. furcatus*: Mato Grosso. Of *P. corniculatus*: Rio Grande do Sul, Porto Alegre. Of *O. armata*: Rio de Janeiro, Teresópolis, Serra dos Órgãos. Of *P. centromelos*: Rio de Janeiro, Rio de Janeiro, Bico do Papagaio. Of *E. genticulatus*: Rio de Janeiro, Petrópolis. In Mello-Leitão 1932, the type locality of *E. minensis* is given as Caixambu, but we consider the locality given on the label as the type locality. The type localities of *E. furcatus* and *P. corniculatus* are considered as incorrect because they are very far from the other localities. Besides, it is known that some locality data provided by Roewer are not trustworthy (Pinto-da-Rocha 2002).

**Geographical distribution** (Fig. 49A): Brazil. Minas Gerais and Rio de Janeiro.

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**Eusarcus oxyacanthus** Kollar

(Figs. 28, 39A,B, 51)

*Eusarcus oxyacanthus* Kollar in Koch 1839a: 9; 1839b: 7 (rdesc), pl.218, figs. 543–544; Berktau 1880: 6 (cit), 106 (com descr); Roewer 1913: 68 (key), 70 (rdesc, dist: dubious provenance); 1923: 418 (key), 419 (rdesc), fig. 522; Mello-Leitão 1923b: 122 (cat); 1926: 372 (diag); Strand 1926: 43 (cit); Roewer 1929: 197 (key), 198 (dist: dubious distribution record); Mello-Leitão 1932: 155 (key), 156 (rdesc), fig. 78; 1940: 7 (key); 1945: 155 (cat), 157 (key), fig. 18; B. Soares 1945c: 376 (cat [pars]); Soares & Soares 1954b: 261 (cat); Moritz 1971: 206 (cat); Acosta 1996b: 224 (cat); Kury 2003a: 169 (cat). (ma lectotype, ma & fe paralectotypes, here designated; "Brasilien, Olfers leg., ZMB 891", pinned, examined; 1 ma paralectotype; "Brasilien, SMF RI 1272", examined).

**Enantiocentron doriphorus** Mello-Leitão 1932: 450, fig. 10; Mello-Leitão 1936: 24 (key). (ma holotype; “Jacaarepaguá, [Rio de Janeiro, Rio de Janeiro], Berla leg., MNRJ 1391”, examined). **Syn. n.**

*Eusarcus doriphorus* Mello-Leitão 1945: 154 (cat), 158 (key), fig. 12; B. Soares 1945c: 375 (cat); Soares & Soares 1954a: 497 (dist, syst); 1954b: 259 (cat); Kury 2003a: 169 (cat).

*Eusarcus spinimanu* Mello-Leitão 1932: 156 (key), 159, fig. 83; 1940: 6 (key); 1945: 155 (cat), 158 (key), fig. 20; B. Soares 1945c: 376 (cat); Soares & Soares 1954a: 497 (cat); 1954b: 256 (cat); Kury 2003a: 170 (cat). (ma lectotype; “Niterói, Rio de Janeiro; MNRJ 1428”; examined; idem, 1 ma paralectotype; “MNRJ 1428b”; examined). **Syn. n.**


**Material examined:** BRAZIL. Without locality, Olfers leg., without date, ma lectotype, 1 ma & 1 fe paralectotypes of *E. oxyacanthus* (ZMB 891), here designated; idem, without name of collector and date, 1 ma paralectotype of *E. oxyacanthus* (SMF RI, 1272). **Rio de Janeiro**: Niterói, without name of collector and date, ma lectotype of *Eusarcus spinimanu* (MNRJ 1428); idem, 1 ma paralectotype of *E. spinimanu* (MNRJ 1428b); Rio de Janeiro (Jacaarepaguá), Berla leg., without date, ma holotype of *E. doriphorus* (MNRJ 1391). **Rio de Janeiro**: E. de Moraes Mello leg., without date, 1 fe (MNRJ 1433); Casimiro de Abreu (Barra de São João), Exp. Arachné leg., 21–24.i.2003, 1 fe (MNRJ); Maricá (Itaiúbaçu), A. Giupponi & Pedroso leg., 12.x.1999, 1 ma & 4 fe (MNRJ 4835); Nova Friburgo, M. Rosa leg., 1 fe (MNRJ 42349); Nova Iguaçu (Tingüá), without date and collector, 2 fe (MNRJ 6797); idem, E. Izecksohn & J. Jim leg., 21.viii.1965, 1 ma (MNRJ 16138); idem, E. Izecksohn & Peracchi leg., 9.ix.1966, 1 ma (MNRJ 17366); idem, A.B. Kury leg., 22.xi.1990, 1 ma (MNRJ 6798); Pinheiral, without name of collector and date, 1 ma (MZSP 1578); Queimados (Km 37 rodovia Presidente Dutra), Peracchi leg., 9.x.1959, 1 ma & 1 fe (MNRJ 1654); idem (Km 37 rodovia Presidente Dutra, rio Guandu), O. Fraga leg., 25.x.1960, 3 ma (HEMS 231); idem, 2 fe (HEMS 232); Rio de Janeiro, J. Moojen leg., without date, 1 fe (MNRJ 1540); idem, R.G. Klossal leg., 1.ix.1957, 1 fe (MNRJ 16145); idem (Corcovado), P. Wygodzinsky leg., 1.vi.1947, 1 ma (MZSP 1045); idem (Floresta da Tijuca), Mondin leg., without date, 1 ma (MNRJ 6080); idem, E. Izecksohn leg., 19.v.1978, 1 ma (MNRJ 16146); idem, A. Giupponi & E. Folly leg., 6.i.2000, 1 beta male (MNRJ 4340); idem (Parque Estadual da...
Pedra Branca, Floresta do Engenho de Dentro), A.B. Kury, A. Giupponi, A. Bustamante, P. Ramalho & R. Carvalho Jr. leg., 6.v.1999, 2 ma & 1 fe (MNRJ 5756); idem (Pedra da Gávea), J. Becker leg., 25.xi.1955, 1 ma (HEMS 423); idem (Jacarepaguá), Arlé leg., without date, 1 ma (MNRJ 11352; old number: MNRJ 58236); idem, 2 ma & 3 fe (MNRJ 58326); idem, C. Couceiro leg., 12.ix.1962, 1 ma & 2 fe (MNRJ 5392); idem, A.B. Kury leg., 12.vii.1989, 1 ma & 1 fe (MNRJ 6489); idem (São Conrado), R. Sachsse & S. Potsch leg., 16.vii.1987, 1 ma & 2 fe (MNRJ 17369); idem (Teresópolis (Fazenda Alpina), Wygodzinsky leg., 11.i.1945, 1 ma (MNRJ 6144); idem (Seropédica, Universidade Federal Rural do RJ, Km 47), E. Izecksohn leg., 14.iii.1962, 1 ma & 2 fe (MNRJ 1010); Silvestre, 28.viii.1977, C.S. Becker leg., 2 fe (MCNZ 441); Teresópolis (Fazenda Alpina), Wygodzinsky leg., 28.viii.1977. São Paulo: Ubatuba (Picinguaba), H. El Zaher leg., without date, 1 fe (MNRJ 11355).

**Diagnosis:** *E. oxyacanthus* resembles *E. catharinensis* because of the presence of prolateral median and apical apophyses on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularium unarmed or with a pair of large tubercles; shape of prolateral apophyses on male trochanter IV: The conical median apophysis with a large base, short, blunt and the conical apical apophysis being long, sinuous, curved posteriad and dorsad (length similar to or longer than the width of its podomere).

**Redescription:**

*Male* (MZSP 1175): Dorsum (Fig. 28A,B): Measurements: SL 4.60; SMW 4.40; femur I 2.50; II 4.80; III 3.80; IV 4.90. Median paracheliceral projection smaller than PAM. Ocularium far from anterior scutal margin; low, with 2 large tubercles and 3 small ones. Carapace with 21 scattered tubercles. Scutal area I with 10 tubercles on each side next to median and groove II; II with 20; III with 13 and a median spine of medium size, oblique, surpassing groove V but not posterior margin of dorsal scutum; IV with 12 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 15, 18, 19, 11 tubercles, respectively. Anal operculum with 27 tubercles.

Venter: Coxa I with 22 tubercles, median and distal ones largest; II with 39, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 5 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 4 tubercles; ventrally with 1 large prolateral tubercle, 2 small retrolateral ones. Femur dorsally with 4–6 large aligned tubercles, 3 small scattered ones; ventrally with 1 large basal tubercle, 3–4 small aligned ones. Tibial setation: Prolateral IiI, retrolateral IiI/iIiI. Tarsal setation: Prolateral III, retrolateral IIIi.

Legs (Fig. 28C–J): Coxa II with 3–5 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, curved posteriad and slightly ventrad. Trochanters I–IV with scattered tubercles; IV prolaterally with 1 median apophysis, this conical, with a large base, short, blunt; 1 oblique apical apophysis, this conical, long, sinuous, curved posteriad and dorsad; retrolaterally with 1 large pointed median tubercle. Femur I with small PDS, RDS; ventrally with 2 rows of tubercles increasing in size distally, becoming pointed, retrolateral ones enlarged; II–III with small PDS, medium RDS; ventrally with 2 rows of tubercles, retrolateral ones slightly enlarged; III sinuous, ventrally with 2 rows of tubercles increasing in size distally, retrolateral ones enlarged, with 2 large pointed apical tubercles; IV sinuous, medium PDS, RDS; ventrally with 2 rows of tubercles increasing in size distally, 1 PVS, 1 large retrolateral apical tubercle. Tibia I ventrally with 2 rows of tubercles slightly increasing in size toward the middle; III ventrally with 2 rows of tubercles slightly increasing in size subapically, retrolateral ones enlarged. Tarsal segmentation: 6, 7–8, 6, 6.

Penis (MNRJ 1428; Fig. 39A,B): Stylus smooth, apex swollen; with angular medio-ventral projection. Ventral process of glans curved; apex with flabelliform projection. Ventral plate with concave sides; with 3 pairs of long, curved distal setae; 1 pair of short, straight median setae; 4 pairs of slightly curved basal setae.

Coloration: Light brown.

*Female* (MNRJ 58326): Dorsum: Measurements: SL 4.10; SMW 3.50; femur I 2.10; II 4.05; III 3.00; IV 3.85. Scutal area III with median spine of medium size, reaching groove IV. Legs: Coxa II with 3–6 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, curved backwards. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; III with
FIGURE 28. *Eusarcus oxyacanthus* Kollar in Koch. Male (MZSP 1175): A, habitus, dorsal view; B, dorsal scutum, left lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur I, dorsal view; E, idem, ventral view; F, right trochanter and femur IV, prolateral view; G, idem, dorsal view; H, idem, ventral view; I, right femur III, dorsal view; J, idem, ventral view. Scale bars, 1 mm.
large retrolateral tubercles; IV retrolaterally with 1 median, 1 large apical tubercles. Femur I with reduced
PDS, RDS; ventrally with 2 rows of enlarged tubercles; II ventrally with 2 rows of slightly enlarged tubercles;
III ventrally with 2 rows of enlarged tubercles, 1 large prolateral apical tubercle; IV ventrally with 2 rows of
enlarged tubercles slightly increasing in size distally, 2 blunt apical spines. Tibiae I, III with rows of similar-
dark brown on body edges. Light brown on distal parts of metatarsi I–IV and tarsi I–IV.

Variation in males (n=6): Measurements: SL 4.30–4.75; SMW 3.80–4.40; femur I 2.20–2.50; II 4.50–
5.30; III 3.30–4.00; IV 4.40–5.30. Ocularium unarmed or with 2 large tubercles. Pedipalpus: Tibial setation:
ProL II/III, RetL I/II. Femur I with reduced or small RDS. Tarsal segmentation: 6, 7, 6, 6.

Variation in females (n=6): Measurements: SL 3.70–4.40; SMW 3.25–3.80; femur I 1.70–2.10; II 3.50–
4.20; III 2.70–3.20; IV 3.70–4.20. Femur I with reduced or small PDS, reduced to medium RDS; II with
reduced to medium PDS, small or medium RDS; III with small or medium RDS. Tarsal segmentation: 6, 7–9,
6, 6.

Type localities: Brazil. Of *E. oxyacanthus*: without further data. Of *E. doriphorus*: Rio de Janeiro, Rio de
Janeiro: Jacarepaguá. Of *E. spinimanu*: Rio de Janeiro, Niterói, and not Minas Gerais as stated in the original
description.

Geographical distribution (Fig. 51): Brazil, Rio de Janeiro and north coast of São Paulo.

*Eusarcus pusillus* Sørensen (Figs. 29, 42C,D, 50B)

*Eusarcus pusillus* Sørensen 1884: 624 (key), 625; Mello-Leitão 1945: 155 (cat), 156 (cit); Soares & Soares 1954b: 261
(cat); Kury 2003a: 170 (cat); (2 fe syntypes; “Rio de Janeiro; Reinhardt leg.; ZMUC”; examined from pictures).

*Eusarcoides pusillus*: Roewer 1913: 73 (rdes); 1923: 420 (rdes); Mello-Leitão 1923b: 122 (cat); 1932: 162 (rdes).

*Eusarcus vervloeti* B. Soares 1944c: 145 (cit), 152, figs. 7, 8; Mello-Leitão 1945: 156 (cat), 157 (key), fig. 22; B. Soares
1946: 520 (cat); Soares & Soares 1946a: 202 (syst); 1954a: 496 (syst, diag); 1954b: 262 (cat); Kury 2003a: 170
(cat); (ma holotype & 1 fe “allotype”; “Chaves, Santa Leopoldina, Espírito Santo, Brazil; B.A.M. Soares leg.;
28.viii.1942; MZSP 286”; examined). Syn. n.


Material examined: BRAZIL. Rio de Janeiro: Reinhardt leg., without date, 2 fe syntypes (ZMUC); examined
from pictures. *Espírito Santo*: Santa Leopoldina (Fazenda Chaves), B.A.M. Soares leg., 28.viii.1942, ma
1 fe (IBSP 2293). *Espírito Santo*: without name of collector and date, 1 ma & 2 fe (MNRJ 102); Colatina, M.
Rosa leg., 1 fe (MNRJ); Linhares, Schubart leg., 20.x.1944, 1 fe (MZSP 1741); idem (Reserva Florestal Vale
do Rio Doce), A. & M. Peracchi & B.O. Fraga leg., 6.xii.1978, 2 fe (MNRJ 4554); idem (Fazenda
Goitacazes), M. Rosa leg., without date, 1 ma (MNRJ 58215); Santa Leopoldina, 1942, 4 ma (MZSP 287);
idei, 3 ma & 4 fe (MZSP 288); idem, 3 ma & 2 fe & 2 im (MZSP 557); idem, 29.viii.1942, 2 ma, 3 fe & 6 im
(MZSP 548); idem, ix.x.1942, 1 ma (MZSP 559); idem, F.J. Vervloet leg., 10.iii.1945, 2 ma & 2 fe (MZSP
1736); idem, F.J. Vervloet & R.H. Vervloet leg., 1945, 2 ma & 2 fe (MZSP 1737); idem, Vervloet leg., 1944–
1945, 3 fe (MZSP 1718); idem, B.A.M. Soares leg., 29.viii.1942, 1 ma & 2 fe (MZSP 554); Santa Teresa, J.
Schubart leg., 2.xi.1944, 1 ma (MZSP 1744); idem (Cachoeira São Lourenço), J. Schubart leg., 2.xi.1944, 1 fe
(HEMS 1003); idem, J. Schubart leg., 2.xi.1944, 1 ma & 1 im (HEMS 1002); idem (Penha), Schubart leg.,
30.x.1944, 1 ma (HEMS 1001); idem, without name of collector, vii.1951, 1 ma & 1 fe (HEMS 269); Vitória
(Convento da Penha), A. Ruschi leg., 12.vi.1965, 1 fe (MNRJ 6046). Rio de Janeiro: Araruama (Juturamaiba),
C. Alvarenga et al. leg., xi.1978, 1 ma & 1 fe (MNRJ 5879); Cachoeiras de Macacu, A.B. Kury & R. Pinto-
da-Rocha leg., 8.x.1988, 1 ma & 1 fe (MNRJ 6308); idem, (Reserva Estadual Guapiáçu), R. Baptista et al.
leg., 11.iii.2001, 4 ma & 4 fe (MNRJ 14302); Casimiro de Abreu (Barra de São João), Exp. Arachné leg., 21–
Diagnosis: E. pusillus resembles E. incus, E. nigrimaculatus, E. acrophthalmus, E. alpinus, E. didactylus and E. geometricus because of the cylindrical prolateral median process on the male trochanter IV, and can be distinguished by: The ocularium with 2 spines; irregular projection on the retrolateral margin of the prolateral apical apophysis of coxa IV and the shape of cylindrical prolateral median process of male trochanter IV: Apically blunt and basally with a small, blunt, slightly conical apophysis. Unlike E. alpinus+, the penis of E. pusillus has a ventral process of the glans.

Redescription: Male (MZSP 1736): Dorsum (Fig. 29A,B): Measurements: SL 4.00; SMW 3.70; femur I 1.80; II 3.70; III 2.20; IV 3.50. Median parachelical projection of similar-size as PAM. Ocularium far from anterior scutal margin; with 2 spines and 13 tubercles. Carapace with 30 scattered tubercles. Scutal area I with 29–30 scattered tubercles on each side; II with 58; III with 54 and a median spine of medium size, slightly oblique, abruptly curved subapically, not surpassing groove V; IV with 40 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 12, 15, 12, 10 tubercles, respectively. Anal operculum with 31 tubercles.

Venter: Coxa I with 16–21 tubercles, median and distal ones largest; II with 28–35, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 2 tubercles.

Pedipalpus: Trochanter dorsally inflated, smooth. Femur dorsally with 3 aligned tubercles; ventrally with 1 large basal tubercle, 1 small one. Tibial setation: Prolateral iii, retrolateral IiIi/IIi. Tarsal setation: Prolateral iIi, retrolateral IiIi.

Legs (Fig. 29C–J): Coxa II with 1 tubercle on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and slightly ventrad, with irregular projections on retrolateral margin. Trochanters I–IV with scattered tubercles; IV prolaterally with 1 cylindrical and flattened median process, this apically blunt; basally with a small, blunt, slightly conical apophysis; retrolaterally with 1 large pointed median tubercle, 1 large apical tubercle. Femur I with small PDS, RDS; ventrally with 2 rows of slightly enlarged tubercles; II–IV with medium PDS, RDS; III sinuous, ventrally with 2 rows of moderately enlarged tubercles, increasing in size distally, prolateral ones enlarged; IV sinuous, ventrally with 2 rows of tubercles, prolateral ones enlarged, increasing in size distally, 1 PVS; 1 retrolateral apical spine. Tibia III ventrally with 2 rows of tubercles increasing in size subapically, becoming high, pointed; IV with 2 ventro-apical spines. Metatarsus IV with tubercles decreasing in size and amount distally. Tarsal segmentation: 6, 10–11, 6, 6.

Penis (Fig. 42C,D): Stylus with medio-ventral trichomes, apex slightly flattened; with angular medio-ventral projection. Ventral process of glans curved, apex blunt, slightly swollen. Ventral plate with concave sides; with 3 pairs of curved distal setae; 1 pair of short, straight, blunt, median setae; 4 pairs of straight basal setae.

Coloration: Brown; anterior part of coxa IV dark brown on background, with light brown spots; light brown on tarsi. Dark brown on legs I–III, on leg IV from prolateral apical apophysis of coxa IV to distal part of metatarsus.

Female (allotype of E. vervloeti; MZSP 286): Dorsum: Measurements: SL 4.05; SMW 3.50; femur I 1.85; II 3.60; III 2.65; IV 3.45. Posterior margin of dorsal scutum with 11 scattered tubercles, 1 row of 22. Free tergite I with 7 scattered tubercles, 1 row of 23; II with 9 scattered, 1 row of 22; III with 30 scattered. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, blunt, curved backwards. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; III with enlarged retrolateral tubercles; IV retrolaterally with 1 median, 1 large apical tubercle. Femur II ventrally with
FIGURE 29. Eusarcus pusillus Sorensen. Male (MZSP 1736): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, dorsal view; E, idem, ventral view; F, right trochanter and femur IV, prolateral view; G, idem, dorsal view; H, idem, ventral view; I, right tibia III, ventral view; J, right tibia IV, ventral view. Scale bars, 1 mm.
2 rows of slightly enlarged tubercles; III ventrally with 2 rows of large tubercles, increasing in size distally, prolateral ones enlarged, 1 large prolateral apical tubercle; IV ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 1 large prolateral apical tubercle. Tibiae I, III ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 1 large prolateral apical tubercle. IV ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 1 large prolateral apical tubercle. Tibiae I, III ventrally with 2 rows of slightly enlarged tubercles. Tarsal segmentation: 6, 9, 6, 6. Coloration: Brown; light brown on metatarsi and tarsi I and IV, on tibia and tarsi II, apex of tibia, metatarsi and tarsi III. Dark brown on anterior margin of dorsal scutum, coxae I–IV, trochanter IV and patellae III–IV.

**Variation in males** (n=6): Measurements: SL 4.00–4.10; SMW 3.60–3.80; femur I 1.80–2.00; II 3.70–4.00; III 2.20–3.00; IV 3.50–3.70. Pedipalpus: Femur with 1–2 prolateral subapical setae. Tibial setation: Prolateral IIi/iii, retrolateral IiIi/IIi/II. Tarsal setation: Prolateral ii/iI. Femur I with reduced or small PDS, RDS; II with reduced to medium PDS; III with small or medium PDS. Tarsal segmentation: 6, 8–11, 6, 6. Some beta males show the prolateral median process of trochanter IV developed as a conical, slightly flattened structure.

**Variation in females** (n=6): Measurements: SL 3.60–4.20; SMW 3.20–3.60; femur I 1.60–1.90; II 3.20–3.60; III 2.40–2.70; IV 3.00–3.45. Pedipalpus: Tibial setation: Prolateral IiIi/IIi/iii, retrolateral IiIi/IIi/Ii. Tarsal setation: Retrolateral IiIi/Iiii. Tarsal segmentation: 6, 8–10, 6, 6.

**Taxonomical notes:** We could relate *E. pusillus* with *E. vervloeti* on the basis of pictures of syntypes kindly sent by Prof. Dr. Nicolaj Scharff, curator at the Zoologisk Museum Universitet, København, and by Dr. J.P.L. Guadanucci, professor at Universidade Federal do Vale do Jequitinhonha e Mucuri, Diamantina. We conclude that these are, in fact, the same species, because of similarities in the ocularium, apical spines of femora, density of tubercles on the dorsal scutum, shape, size and inclination of the median spine in area III and body size. The original description by Sørensen refers to two prolateral subapical setae on the femur of the pedipalpus, which led to the creation of a new genus (*Eusarcoides* Roewer 1913). However, this characteristic, which occurs in only one of the syntypes, is a rare morphological variation that can be found also in other specimens of the population, and is not restricted to *E. pusillus*. The new synonymy is proposed although females of some species are similar to each other and difficult to identify with certainty. In others, such as *E. alpinus*, *E. didactylus*, *E. geometricus*, *E. nigrimaculatus* and *E. catharinensis*, females can be clearly distinguished from each other.

**Type localities:** Brazil. Of *E. pusillus*: Rio de Janeiro. Of *E. vervloeti*: Espírito Santo, Santa Leopoldina, Chaves.

**Geographical distribution** (Fig. 50B): Brazil. S Bahia to Rio de Janeiro States.

*Eusarcus schubarti* Soares & Soares (Figs. 30, 38A,B, 49A)

*Eusarcus schubarti* Soares & Soares 1946a: 203, figs. 6–8; 1954b: 262 (cat); Kury 2003a: 170 (cat); (ma holotype: “Refúgio Sooretama, Linhares, Espírito Santo, Brazil; 17.x.1944; O. Schubart leg.; MZSP 28657”; examined), (1 ma paratype: “Refúgio Sooretama, Linhares, Espírito Santo, Brazil; O. Schubart leg.; 17.x.1944; MZSP 1725”; examined), (1 ma “allotype”: “Refúgio Sooretama, Linhares, Espírito Santo; O. Schubart leg.; 20.x.1944; MZSP 28658”; examined). The “female” paratype described by Soares & Soares (1946a) actually is a beta male.

**Material examined:** BRAZIL. *Espírito Santo*: Linhares (Refúgio Sooretama), O. Schubart leg., 17.x.1944, ma holotype (MZSP 28657); idem, 20.x.1944, 1 ma paratype (MZSP 28658); idem, 2.x.1944, 1 ma paratype (MZSP 1725); São Mateus, Schubart leg., x.1944, 1 ma paratype (MZSP 1720); idem (R.F.C.V.R.D.), A.J. Santos leg., vii.1947, 1 ma & 1 fe (IBSP 2547); idem, 1 ma (IBSP 2548).

**Diagnosis:** *E. schubarti* and *E. teresincola* can be distinguished from most species of *Eusarcus* by the retrolateral apical apophysis of coxa IV and by the overall small size (e.g. dorsal scutum with circa 2 mm). *E. schubarti* can be distinguished from *E. teresincola* by: The presence of bifid PAM; femur IV with 1 bifid dorso-basal apophysis, a prolateral row of high, pointed tubercles decreasing in size distally.

**Redescription:** Male (holotype): Dorsum (Fig. 30A,B): Measurements: SL 1.90; SMW 1.70; femur I 1.04; II 1.95; III 1.20; IV 1.80. Median paracheliceral projection smaller than bifid PAM. Anterior margin
FIGURE 30. Eusarcus schubarti Soares & Soares. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right trochanter and femur IV, dorsal view; E, idem, ventral view; F, idem, prolateral view; G, right femur III, ventral view. Abbreviation: RMATr, retrolateral median apophysis of trochanter IV. Arrow indicates the dorso apical median apophysis of femur IV. Scale bars, 1 mm.
with 1 small spine on each corner. Ocularium far from anterior scutal margin; low, with 2 spines. Carapace smooth. Scutal area I with 1–3 scattered tubercles on each side; II–IV with a transversal median row of 5, 8, 7 tubercles, respectively; median spine of scutal area III directed upward, slightly curved (apex broken). Lateral margin of dorsal scutum with an irregular row of 2–4 small tubercles, 3 large, pointed. Posterior margin of dorsal scutum and free tergites I–III with a row of 8, 9, 7, 7 pointed tubercles, respectively. Anal operculum with 12 tubercles.

Venter: Coxa I with 11–12 tubercles, median and distal ones largest; II with 11–13 tubercles increasing in size distally, retrolateral distal ones largest; III with 12–15; IV irregularly tuberculate.

Chelicera: Segment I with 2 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 2 tubercles. Femur dorsally smooth; with 1 ventral tubercle. Tibial setation: Prolateral IIIi, retrolateral IIIi. Tarsal setation: Prolateral and retrolateral IIIi.

Legs (Fig. 30C–G): Coxa IV sparsely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, curved posteriad and ventrad, 1 retrolateral apical apophysis, this conical, short, straight. Trochanters I–III with scattered tubercles; IV prolaterally with 1 median apophysis, this conical with large base, blunt, swollen in the middle; 1 oblique apical apophysis, this conical, blunt, with 1 subapical tubercle; retrolaterally with 1 median apophysis, this conical, long, blunt; 1 oblique apical apophysis, this conical, long. Femora I–III with small tubercles; I–III with reduced PDS, RDS; III sinuous; ventrally with 2 large apical tubercles; IV sinuous, with 1 bifid dorso-basal apophysis, 1 prolateral row of high, pointed tubercles decreasing in size distally, 1 dorsal row of high, pointed tubercles increasing in size from subasal portion to the middle, medium PDS, reduced RDS, 1 dorso-apical median spine; ventrally with 2 rows of high, pointed tubercles increasing in size subapically, retrolateral ones enlarged, 2 apical spines. Tarsal segmentation: 5, 7, 6, 6.

Penis (Fig. 38A,B): Stylus with medio-ventral trichomes, apex not inflated; without angular medio-ventral projection. Ventral process of glans curved; apex with flabelliform projection. Ventral plate with slightly concave sides; with 3 pairs of curved distal setae; 1 pair of short, straight median setae; 4 pairs of straight, thick basal setae.

Coloration: Reddish brown; dark brown on body edges and legs. Light brown on tarsi.

Female (IBSP 2547): Dorsum: Measurements: SL 1.90; SMW 1.60; femur I 0.95; II 1.70; III 1.30; IV 1.80. Median paracheliceral projection larger than PAM. Anterior margin with 2 small spines on each corner. Carapace with 8 tubercles scattered. Scutal area III with median spine of medium size, slightly curved, not surpassing groove V. Pedipalpus: Tibial setation: Prolateral IIIi, retrolateral IIIi. Legs: Coxa IV surpassing dorsal scutum in dorsal view only apically, with 1 oblique prolateral apical apophysis, this conical, shorter than in male, pointed; without retrolateral apical apophysis. Trochanter IV retrolaterally with 1 conical, short apical apophysis. Femur III ventrally only with rows of similar-sized tubercles; IV without dorso-basal apophysis, with dorsal and prolateral rows of similar-sized tubercles, small PDS, medium RDS; ventrally covered with small tubercles. Tarsal segmentation: 5, 7, 6, 5–6. Coloration: Brownish on mesotergum; dark brown on prosoma and trochanter. Parts of dorsal scutum and legs (except trochanter) with marble-like color pattern.

Variation in males (n=4): Measurements: SL 1.65–2.00; SMW 1.35–1.80; femur I 0.90–1.10; II 1.70–1.95; III 1.20–1.60; IV 1.70–1.90. Median paracheliceral projection smaller or larger than PAM. Median spine of scutal area III with medium size, slightly curved, not surpassing groove V. Pedipalpus: Tarsal setation: Prolateral IIIi/IIIi. Tarsal segmentation: 5, 7–8, 6, 6.

Type locality: Brazil, Espírito Santo, Linhares, Refúgio Sooretama.

Geographical distribution (Fig. 49A): Brazil. Espírito Santo.

**Eusarcus sergipanus** sp. n.
(Figs. 31, 41A,B, 50B)

**Type material:** BRAZIL. Sergipe: Itabaiana (Parque Nacional de Itabaiana; 10º 00’S 37º25’W), A.D. Brescovit *et al.* leg., 14–20.ix.1999, ma holotype (IBSP 1750); idem, 1 ma paratype (MZSP 28947).
FIGURE 31. *Eusarcus sergipanus* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, dorsal view; E, idem, ventral view; F, right trochanter and femur IV, prolateral view; G, idem, dorsal view; H, idem, ventral view. Scale bars, 1 mm.
**Diagnosis:** *E. sergipanus* resembles *E. aduncus*, *E. berlae*, *E. elinae*, *E. fulvus*, *E. signatus*, *E. sooretamae*, *E. cavernicola* and *E. mirabilis* because of the conical prolateral median apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; absence of a median spine on area III; basitarsus I not elongated; prolateral apical apophysis of male coxa IV with a triangular ventral projection; femur IV not longer than 1.5 times dorsal scutum length; ocularium with a pair of spines.

**Etymology:** The name, an adjective, refers to the state where the species was collected.

**Description:** Male (holotype): Dorsum (Fig. 31A,B): Measurements: SL 4.00; SMW 3.60; femur I 2.20; II 4.50; III 3.30; IV 4.00. Median paracheliceral projection smaller than PAM. Anterior margin with 3 tubercles on each corner. Ocularium far from anterior scutal margin; high, with 2 spines, 10 tubercles. Carapace with 34 scattered tubercles. Scutal area I with 15–16 scattered tubercles on each side; II with 25; III with 31 and without median spine; IV with 25 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 20, 17, 14, 11 tubercles, respectively. Anal operculum with 28 tubercles.

Venter: Coxa I with 19–20 tubercles, median and distal ones largest; II with 45–54 tubercles, increasing in size distally; III–IV irregularly tuberculate.

Chelicera: Segment I with 3 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 3 tubercles. Femur dorsally smooth; ventrally with 1 large basal tubercle, 2–3 small aligned ones. Tibial setation: Prolateral and retrolateral IIiIi. Tarsal setation: Prolateral IIIi, retrolateral IIIi.

Legs (Fig. 31C–H): Coxa IV densely tuberculate, surpassing dorsal scutum in dorsal view only apically, with 1 transversal prolateral apical apophysis, this conical, short, blunt, with 1 ventral triangular projection in the middle. Trochanters I–IV with scattered tubercles; IV prolaterally with 1 median apophysis, this conical, curved anteriad; retrolaterally with 1 large apical tubercle. Femora I–II with reduced PDS, RDS; II ventrally with 2 rows of tubercles, prolateral ones slightly increasing in size distally, 1 large prolateral apical tubercle; III slightly sinuous, with reduced PDS, small RDS; ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, 1 PVS; IV slightly sinuous, with small PDS, RDS; ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, 1 PVS. Metatarsus I with 2 ventro-apical setae. Tarsal segmentation: 5–6, 8, 6, 6.

Penis (Fig. 41A,B): Stylus with medio-ventral trichomes, apex swollen; with angular medio-ventral projection. Ventral process of glans curved; apex thin, with flabelliform projection. Ventral plate with concave sides; with 3 pairs of apically curved distal setae; 2 ventral pairs of distal tubercles; 1 pair of short, straight median setae; 4 pairs of straight basal setae.

Coloration: Dark brown; brown on grooves of dorsal scutum.

Female: Unknown.


**Type locality:** Brazil, Sergipe, Itabaiana, Estação Ecológica de Itabaiana.

**Geographical distribution** (Fig. 50B): Known only from the type locality.

**Eusarcus signatus** (Roewer) comb. n.

(Fig. 32)

*Antetriceras signatus* Roewer 1949: 57, fig. 111a–d; Kury 2003a: 156 (cat); 2003b: 6 (syst); (ma holotype; "Terra Vermelha, Rio de Janeiro; SMF RII 5078/12"; examined, without genitalia, spine of ocularium broken).

**Material examined:** BRAZIL. Rio de Janeiro: Rio de Janeiro? (Terra Vermelha), without name of collector and date, ma holotype (SMF RII 5078/12).

**Diagnosis:** *E. signatus* resembles *E. aduncus*, *E. berlae*, *E. elinae*, *E. fulvus*, *E. sooretamae*, *E. cavernicola*, *E. mirabilis* and *E. sergipanus* because of the conical prolateral median apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; median spine of scutal area III of medium size; basitarsus I not elongated; prolateral apical apophysis of the male coxa IV with triangular ventral
projection; femur IV not longer than 1.5 times dorsal scutum length, with 1 PVS and a large retrolateral apical
tubercle; ocularium with a median spine.

FIGURE 32. *Eusarcus signatus* (Roewer) comb. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right
lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right trochanter and femur IV, dorsal view; E,
idem, ventral view; F, idem, prolateral view. Scale bars, 1 mm.
Redescription: Male (holotype): Dorsum (Fig. 32A,B): Measurements: SL 2.80; SMW 2.50; femur I 1.50; II 3.00; III 2.20; IV 2.70. Median paracheliceral projection of similar size as PAM. Ocularium far from anterior scutal margin; with a median spine, 6 tubercles. Carapace with 23 scattered tubercles. Scutal area I with 13–14 scattered tubercles on each side; II with 28; III with 27 and a median spine of medium size, reaching groove V; IV with 21 tubercles. Posterior margin of dorsal scutum with 7 scattered tubercles and a row of 13 tubercles. Free tergites I–III with a row of 9, 8, 9 tubercles, respectively. Anal operculum with 14 tubercles.

Venter: Coxa I with 20 tubercles, medium and distal ones largest; II–III with 31–37 and 26–36, respectively, increasing in size distally; IV irregularly tuberculate.

Chelicera: Segment I smooth.

Pedipalpus: Trochanter dorsally inflated, with 2 tubercles. Femur dorsally with small, scattered tubercles; ventrally with 2 scattered tubercles. Tibial setation: Prolateral and retrolateral IiIi. Tarsal setation: Prolateral iiIi/iIi, retrolateral IiIi.

Legs (Fig. 32C–F): Coxa II with 1–2 tubercles on retrolateral margin; IV densely tuberculate, ending between grooves III and IV of dorsal scutum, surpassing dorsal scutum in dorsal view only apically, with 1 transversal prolateral apical apophysis, this conical, short, blunt, with 1 triangular ventral projection and another one, transversal, in the middle. Trochanters I–IV with scattered tubercles; I with 1 large ventro-basal tubercle; III with 1 large retrolateral apical tubercle; IV prolaterally with 1 median apophysis, this conical, curved anteriad; retrolaterally with 1 short, pointed apical apophysis. Femur I with reduced PDS, RDS; II–III with reduced PDS, medium RDS; III sinuous, ventrally with a prolateral row of tubercles slightly increasing in size distally, 1 large prolateral apical tubercle; IV sinuous, with medium PDS, RDS; ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, 1 prolateral apical apophysis, 1 large retrolateral apical tubercle. Tarsal segmentation: 6, 8–9, 6, 6.

Coloration: Brown; dark brown on prosoma and leg IV.

Female: Unknown.

Taxonomical note: Kury (2003b) suggested an affinity between the genera Antetriceras Roewer 1949 (here placed in the synonymy of Eusarcus) and Pherania Strand 1942 on the basis of descriptions and illustrations of A. signatus. Unfortunately, illustrations of apophyses as well as the width of coxa IV provided by Roewer were inaccurate. Thus Kury (2003b) was misled to propose an unlikely association. Although no member of Pherania was included in any cladistic analysis, it is improbable that this genus is closely related to Antetriceras, since the former does not have the synapomorphies of Eusarcus, such as a median spine in scutal area III or a paramedian pair of apophyses placed ectally to the chelicera on the anterior margin of the dorsal scutum.

Type locality: Brazil, Rio de Janeiro, Rio de Janeiro (?). Precising the exact type locality of this species is a difficult task. When Roewer described the species, he only stated “Terra Vermelha”, a very common name that occurs in many places of Brazil. On the basis of the localities and information from the collector, Kury (2003a) gave “Santa Catarina, Seara, Terra Vermelha” as the type locality. However, we verified that it is clearly written “Rio de Janeiro” on the label of the holotype. Although risky, considering the distribution of species closely related to A. signatus, we suggest the city of Rio de Janeiro as the probable exact locality.

Geographical distribution: Known only from the type locality.

Eusarcus sooretamae (Soares & Soares) comb. n.
(Figs. 33, 41E,F, 49A)
FIGURE 33. *Eusarcus sooretamae* (Soares & Soares) comb. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right trochanter and femur IV, dorsal view; F, idem, ventral view; G, idem, prolateral view; H, right tibia IV, ventral view. Scale bars, 1 mm.

Diagnosis: E. sooretamae resembles E. aduncus, E. berlae, E. elinae, E. fulvus, E. signatus, E. cavernicola, E. mirabilis and E. sergipanus because of the conical prolateral median apophysis on the male trochanter IV, and can be distinguished by: The absence of PAM; median spine of scutal area III of medium size; basitarsus I not elongated; prolateral apical apophysis of the male coxa IV with a bifid ventro-posterior projection; femur IV not longer than 1.5 times dorsal scutum length, with dorsal and prolateral rows of enlarged tubercles, increasing in size in distal third, with large PDS, 1 PVS and a large retrolateral apical tubercle; ocularium with a median spine.

Redescription: Male (holotype): Dorsum (Fig. 33A,B): Measurements: SL 3.80; SMW 3.35; femur I 2.20; II 4.40; III 3.00; IV 3.40. PAM absent. Anterior margin with 8 scattered tubercles, with 3 large tubercles on each corner. Ocularium far from anterior scutal margin; high, with a median spine, 5 tubercles. Carapace with 24 scattered tubercles. Scutal area I with 33–42 scattered tubercles on each side; II with 59; III with 64 and a median spine of medium size, not surpassing groove V; IV with 40 tubercles. Posterior margin of dorsal scutum with an irregular row of 9 tubercles, a regular row of 21. Free tergites I–II with an irregular row of 16 tubercles; III with a row of 7, another of 11. Anal operculum with 29 tubercles.

Venter: Coxa I with 22–28 tubercles, median and distal ones largest; II–III with 53–60 and 45–49, respectively, increasing in size distally; IV irregularly tuberculate.

Chelicera: Segment I smooth.


Legs (Fig. 33C–H): Coxa IV densely tuberculate, surpassing dorsal scutum in dorsal view only apically, with 1 transversal prolateral apical apophysis, this conical, short, blunt, with 1 bifid projection pointing backwards. Trochanters I–IV with scattered tubercles; I–II with 1 large ventro-basal tubercle; II with retrolateral large tubercles; III with 1 large pointed retrolateral apical tubercle; IV prolaterally with 1 median apophysis, this conical, long, curved anteriad, with 1 large apical tubercle; retrolaterally with 1 large median tubercle, 1 conical short apical apophysis. Femora I–II with reduced PDS, RDS; III sinuous, small PDS, reduced RDS; ventrally with 2 rows of tubercles slightly increasing in size distally, 2 large apical tubercles; IV sinuous, with dorsal and prolateral rows of enlarged tubercles increasing in size in distal third, long PDS, this transversal, curved dorsad, reduced RDS; ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, pointed, with 1 PVS, 1 large retrolateral tubercle. Tibia III ventrally with 2 rows of slightly enlarged tubercles; IV ventrally with 2 rows of tubercles increasing in size distally, becoming pointed, prolateral ones enlarged, with 1 prolateral apical spine, 1 large retrolateral tubercle. Tarsal segmentation: 6, 12, 6, 6.

Penis (Fig. 41E,F): Stylus with medio-ventral trichomes, apex not swollen; with angular medio-ventral projection. Ventral process of glans curved; apex blunt. Ventral plate with concave sides; with 3 pairs of apically curved distal setae; 1 pair of short, straight median setae; 4 pairs of straight, thick basal setae.

Coloration: Brown on body, pedipalps, chelicerae, legs I–III and basal part of femur, patella, tibia and metatarsus of leg IV; light brown on tarsi. Dark brown on apophysis of coxa IV, trochanter IV and distal third of femur IV.

Female (MZSP 1731): Dorsum: Measurements: SL 4.40; SMW 3.40; femur I 2.40; II 4.90; III 3.40; IV 4.80. Ocularium high, with a bifid median spine, 14 tubercles. Carapace with about 100 scattered tubercles. Free tergites I–III with 55, 66, 46 scattered tubercles, respectively. Chelicera: Segment I with 3 tubercles.

Pedipalpus: Tibial setation: Prolateral III/i/i, retrolateral ii/i. Tarsal setation: Prolateral III/i, retrolateral i/i. Legs: Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short, pointed. Trochanters I–IV with scattered tubercles; I–III with large retrolateral tubercles; I with 1 large ventro-basal tubercle; IV retrolaterally with 1 large, slightly pointed subapical tubercle. Femur III with reduced PDS, RDS, ventrally only with rows of similar-sized tubercles; IV with dorsal and prolateral rows of similar-sized
tubercles, small PDS, reduced RDS; ventrally only with 2 rows of tubercles slightly increasing in size distally. Tibiae III–IV with rows of similar-sized tubercles. Metatarsus I with 2 ventro-apical setae. Tarsal segmentation: 6, 9, 6, 7. Coloration: Brown.

Variation in males (n=4): Measurements: SL 3.50–3.80; SMW 3.00–3.35; femur I 1.80–2.20; II 3.50–4.40; III 2.60–3.00; IV 3.10–3.40. Pedipalpus: Tibial setation: Prolateral III/iIII/i(iii). Tarsal setation: Retrolateral i(iii). Femur I with reduced or small PDS; III with reduced or small PDS, RDS; IV with medium or large PDS. Tarsal segmentation: 6, 10–12, 6, 6.

Type locality: Brazil, Espírito Santo, Linhares.

Geographical distribution (Fig. 49A): Brazil. SE Minas Gerais and Espírito Santo.

Eusarcus sulcatus (Piza)  
(Figs. 34, 46E, F, 51)

Goyazia sulcata Piza 1940a: 54, fig. 2; 1940b: 312 (syst), fig. 1; (ma holotype; “Anápolis, Goiás, Brazil; 1938; F. Lane leg.; MZSP 57”, lost), (3 ma & 7 fe “allotypes”; “Três Lagos, Jupiá, Mato Grosso [do Sul], Brazil; xii.1946; A. Zamith & A. Correa leg.; MZLQ, examined).  

Material examined: BRAZIL. Mato Grosso do Sul: Três Lagos (Jupiá), A. Zamith & A. Correa leg., xii.1946, 3 ma & 7 fe (MZLQ). Tocantins: Palmas (Usina Hidrelétrica Lageado), D. Pecinini & Miriam leg., 05.i.2002, 2 ma & 1 fe (IBSP 2342); idem, 1 ma (MZSP 28946); Peixe, M.E.V. Calletto leg., 1–14.ii.2002, 1 fe (IBSP 2371). Without further data, 1 ma (MNRJ 16136).

Diagnosis: E. sulcatus resembles E. caparaoensis+ and E. manero+, which have a conical, short, blunt prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularium high, with 2 spines or a bifid median spine; median spine of scutal area III short; external row of tubercles on lateral margin of dorsal scutum increasing in size posteriually, ending in 1–2 large pointed tubercles; trochanter IV only with 1 retrolateral apical apophysis besides prolateral basal apophysis; femur IV with 2 ventro-apical spines.

Note: The “allotypes” (in vial MZLQ) were not among the material used in the original description of the species, i.e. they are not “allotypes” according to the current edition of the International Code for Zoological Nomenclature. These specimens were added seven years later in the description of the female. This material, as well as several vials in MZLQ collection containing identified specimens of this species perfectly fit the description provided by Piza (1940a). Therefore, we consider E. sulcatus as a valid species.

Redescription: Male (MZLQ): Dorsum (Fig. 34A, B): Measurements: SL 3.20; SMW 3.10; femur I 1.50; II 2.60; III 2.00; IV 2.60. Median paracheliceral projection of similar-size as PAM. Anterior margin of prosoma with a row of 8 tubercles, 1 large one on each corner. Ocularium next to anterior scutal margin; high, with bifid median spine, 7 tubercles. Carapace with 22 scattered tubercles. Scutal area I with 14–16 scattered tubercles on each side; II with 21; III with 28 and a median spine short, curved backwards, not surpassing groove IV; IV with 25 tubercles. Lateral margin of dorsal scutum with an external regular row of enlarged tubercles increasing in size posteriually, ending in 1 pointed tubercle. Posterior margin of dorsal scutum and free tergite I with an irregular row of 21, 16 tubercles, respectively; II–III with a regular row of 14, 11 tubercles, respectively. Anal operculum with 19 tubercles.

Venter: Coxa I with 21–22 tubercles, median and distal ones largest; II with 30–35, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 3–4 tubercles.

FIGURE 34. Eusarcus sulcatus (Piza). Male (MZLQ): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa IV, posterior view (in part); D, right tibia III, ventral view; E, right trochanter and femur IV, dorsal view; F, idem, ventral view; G, idem, prolateral view; H, right tibia IV, ventral view. Scale bars, 1 mm.
Legs (Fig. 34C–H): Coxa IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, curved posterior and ventrad. Trochanters I–IV with scattered tubercles; I with 1 large ventro-basal tubercle; II with large retrolateral tubercles; III with enlarged pointed retrolateral apical tubercles; 1 high, pointed retrolateral apical tubercle; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; retrolaterally with 1 conical, short apical apophysis. Femur I with small PDS, RDS, ventrally with 2 rows of slightly enlarged tubercles; II–III with small PDS, medium RDS; III sinuous, ventrally with 2 rows of tubercles increasing in size distally, 2 large apical tubercles, prolateral one pointed, retrolateral one blunt; IV sinuous, tubercles of basal third enlarged, medium PDS, RDS; ventrally with 2 rows of tubercles increasing in size distally, prolateral ones becoming pointed, 1 pair of apical spines, prolateral one largest. Tibia III with a retrolateral row of enlarged tubercles; ventrally with 2 rows of tubercles increasing in size subapically, becoming pointed; IV ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, becoming pointed, 2 apical spines, prolateral one largest; 1 retrolateral spine. Tarsal segmentation: 6, 7–8, 6, 6.

Penis (Fig. 46E,F): Stylus with medio-ventral trichomes, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved; apex blunt, thin. Ventral plate with concave sides; with 3 pairs of apically curved distal setae; 1 pair of short, straight median setae; 4 pairs of slightly curved basal setae.

Coloration: Brown; dark brown on prosoma, coxa IV, trochanter IV, femora, patella and distal parts of tibiae III–IV. Light brown on patellae of legs I–III, and on all tarsi.

Female (MZLQ): Dorsum: Measurements: SL 3.20; SMW 2.90; femur I 1.50; II 2.45; III 1.90; IV 2.40. Median paracheliceral projection smaller than PAM. Pedipalpus: Tibial setation: Prolateral Ii/i/III, retrolateral Ii/i/i/i. Tarsal setation: Prolateral III, retrolateral i/i/i/i. Legs: Coxa II with 2–3 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, short. Trochanter IV with scattered tubercles, retrolaterally with 1 short conical apical apophysis. Femur I with reduced PDS, RDS, with rows of similar-sized tubercles; II with reduced PDS, small RDS; III with reduced PDS, medium RDS; ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, a large blunt prolateral apical tubercle; IV ventrally with 2 rows of tubercles increasing in size distally, prolateral ones enlarged, 1 prolateral apical spine, 1 large retrolateral tubercle. Tibiae III–IV only with rows of similar-sized tubercles. Tarsal segmentation: 6, 7, 6, 6. Coloration: Yellowish brown; dark brown on dorsal scutum edge and free tergites. Light brown on metatarsi and tarsi of legs.

Variation in males (n=5): Measurements: SL 3.20–3.40; SMW 2.90–3.30; femur I 1.40–1.50; II 2.50–2.60; III 1.90–2.00; IV 2.40–2.60. Ocularium with 2 spines or a bifid median spine. Pedipalpus: Tibial setation: Prolateral Ii/i/III, retrolateral Ii/i/i/i. Tarsal setation: Retrolateral Ii/i/III, Femur I with reduced or small RDS; II with small or medium RDS. Tarsal segmentation: 5–6, 7–8, 6, 6.

Variation in females (n=6): Measurements: SL 2.90–3.40; SMW 2.80–3.20; femur I 1.30–1.50; II 2.30–2.45; III 1.80–1.90; IV 2.30–2.40. Pedipalpus: Tibial setation: Retrolateral Ii/i/i/i. Femur I with reduced or small PDS, RDS; II with reduced or small PDS, small or medium RDS; III with reduced or small PDS. Tarsal segmentation: 5–6, 7–8, 6, 6.

Type locality: Brazil, Goiás, Anápolis.

Geographical distribution (Fig. 51): Central Brazil. Mato Grosso do Sul, Goiás and Tocantins.

**Eusarcus teresincola** Soares & Soares
(Figs. 35, 38C,D, 50B)

*Eusarcus teresincola* Soares & Soares 1946a: 205, fig. 9; 1954b: 262 (cat); Kury 2003a: 170 (cat). (fe holotype; “Santa Teresa, Penha, Espírito Santo; Schubart leg.; 30.x.1944; MZSP 28650”; examined, in bad state of preservation).

Material examined: BRAZIL. Espírito Santo: Santa Teresa (Penha), Schubart leg.; 30.x.1944; fe holotype (MZSP 28650); São Mateus (Reserva Florestal Vale do Rio Doce), A.J. Santos leg., vii.1997, 1 ma (IBSP 2545); idem without name of collector, i.1998, 1 fe (IBSP 3152); idem, vii.1997, 1 ma & 1 fe (IBSP 3154).
FIGURE 35. Eusarcus teresincola Soares & Soares. Male (IBSP 3154): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right trochanter and femur IV, dorsal view; F, idem, ventral view; G, idem, prolateral view. Scale bars, 1 mm.
**Diagnosis:** *E. teresincola* resembles *E. schubarti* because of the retrolateral apical apophysis of coxa IV and overall small size (e.g. dorsal scutum circa 2 mm long), and can be distinguished by: The absence of PAM; femur IV with 2 high, pointed dorso-median tubercles and a dark brown reticulated pattern clearly marked on dorsal scutum.

**Description:** Male (IBSP 3154): Dorsum (Fig. 35A,B): Measurements: SL 2.20; SMW 2.00; femur I 1.10; II 1.75; III 1.40; IV 1.70. PAM absent. Anterior margin with 2 large tubercles on each corner. Ocularium far from anterior scutal margin; low, with 2 large pointed tubercles, 2 small ones. Carapace with 4 scattered tubercles. Scutal area I with 3–4 scattered tubercles on each side; II–IV with a transversal median row of 10, 10, 9 tubercles, respectively; median spine of scutal area III of medium size, curved, not surpassing groove V. Lateral margin of dorsal scutum with an irregular row of 2–4 small tubercles and 1–3 large pointed ones. Posterior margin of dorsal scutum and free tergites I–III with a row of 10, 10, 9, 10 pointed tubercles, respectively. Anal operculum with 12 tubercles.

Venter: Coxae I–II with 19–20, 26–27 tubercles, respectively, median and distal ones largest; III with 21–23; IV irregularly tuberculate.

Chelicera: Segment I with 3 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 2 tubercles. Femur dorsally with scattered tubercules; ventrally with a small basal tubercle. Tibial setation: Prolateral Iii, retrolateral IIi/iIi. Tarsal setation: Prolateral and retrolateral Iii.

Legs (Fig. 35C–G): Coxa II with 1–2 tubercles on retrolateral margin; IV sparsely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, curved posteriad and ventrad, 1 retrolateral apical apophysis, this conical, short, straight. Trochanters I–IV with scattered tubercles; IV prolaterally with 1 median apophysis, this conical with large base, blunt, swollen in the middle; 1 oblique apical apophysis, this conical, blunt; retrolaterally with 1 median apophysis, this conical, blunt; 1 oblique conical apical apophysis. Femora I–III with small tubercles; I–II with reduced PDS, RDS; I ventrally with 2 rows of moderately enlarged tubercles, retrolateral ones enlarged; III sinuous, with reduced PDS, small RDS; ventrally with 2 rows of tubercles increasing in size distally, 2 large apical tubercles; IV sinuous, with 2 high, pointed, dorso-median tubercles, prolateral and dorsal rows of enlarged tubercles, reduced PDS, RDS, 1 median dorso-apical spine; ventrally with 2 rows of high, pointed tubercles increasing in size distally, retrolateral ones enlarged, 2 apical spines. Tarsal segmentation: 6, 7, 6, 6.

Penis (Fig. 38C,D): Stylus with medio-ventral trichomes, apex not inflated; without angular medio-ventral projection. Ventral process of glans curved; apex with flabelliform projection. Ventral plate with slightly concave sides; with 3 pairs of apically curved distal setae; 1 pair of short, straight, blunt median setae; 4 pairs of straight, thick setae.

Coloration: Brown, with clearly marked dark brown reticulated pattern on dorsal scutum. Light brown on metatarsi and tarsi.

**Female** (holotype): Measurements: SL 2.00; SMW 1.85; femur I 1.00; II 1.75; III 1.35; IV 1.85. Legs: Coxa IV with 1 oblique prolateral apical apophysis, this conical, short, pointed, curved backwards, surpassing posterior margin of this segment; without retrolateral apical apophysis. Trochanter IV with few small scattered tubercules, retrolaterally with 1 large subapical tubercle. Femur I with rows of similar-sized tubercles; III ventrally only with 1–3 enlarged scattered tubercles (none on apex); IV only with rows of similar-sized tubercles. Tarsal segmentation: 4–5(2–3), 7, 6, ?. Coloration: Brown; dark reddish brown on edges of dorsal scutum and on patellae II–IV.

**Variation in males** (n=2): Measurements: SL 2.05–2.20; SMW 1.80–2.00; femur I 1.00–1.10; IV 1.60–1.70. Femur IV with reduced to medium PDS. Tarsal segmentation: 6, 7–8, 6, 6.

**Variation in females** (n=3): Measurements: SL 2.00–2.30; SMW 1.85–2.10; femur I 1.00–1.10; II 1.60–1.75; III 1.35–1.40; IV 1.80–1.85. Tarsal segmentation: 4–6(2–3), 7, 6, 6.

**Type locality:** Brazil, Espírito Santo, Santa Teresa: Penha.

**Geographical distribution** (Fig. 50B): Brazil. Espírito Santo.
Eusarcus tripectinatus sp. n.
(Figs. 36, 45A,B, 49A)

Type material: BRAZIL. Minas Gerais: Rio Preto, Exp. Arachné leg., 14–20.v.2002, ma holotype, 6 ma & 4 fe paratypes (MNRJ 8927); idem, 3 ma & 3 fe paratypes (MZSP 28663); idem, 3 fe (MNRJ 11360).

Diagnosis: E. tripectinatus resembles E. caparaoensis+ and E. manero+, which have a conical, short, blunt prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The absence of PAM; ocularium low, with 2 moderately enlarged tubercles; median spine of scutal area III of medium size, reaching groove V; trochanter IV with a short prolateral apical apophysis inserted dorsally; femur IV with prodorsal, prolateral (only basal third) and retrolateral rows of high, pointed tubercles, 2 ventro-apical spines.

Etymology: From the Greek “tria” (=three) and from the Latin “pectinatus” (=with a comb), in reference to the three rows of high, pointed tubercles on femur IV.

Description: Male (holotype): Dorsum (Fig. 36A,B): Measurements: SL 3.10; SMW 2.60; femur I 1.40; II 2.80; III 2.10; IV 2.60. PAM absent. Anterior margin of prosoma with 3 tubercles on each corner. Ocularium far from anterior scutal margin; low, with 2 moderately enlarged tubercles, 4 small ones. Carapace with 23 scattered tubercles. Scutal area I with 19–20 scattered tubercles on each side; II with 30; III with 34 and a median spine of medium size reaching groove V; IV with 26 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 14, 12, 9, 11 tubercles, respectively. Anal operculum with 23 tubercles.

Venter: Coxa I with 18–19 tubercles, median and distal ones largest; II with 29–33 tubercles, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I with 3 tubercles.

Pedipalpus: Trochanter dorsally inflated, with 2 tubercles. Femur dorsally smooth; ventrally with 1 large basal tubercle, 2 small scattered ones. Tibial setation: Prolateral and retrolateral IlIi. Tarsal setation: Prolateral IlIi, retrolateral IlIi.

Legs (Fig. 36C–I): Coxa II with 1 tubercle on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad, ventrally swollen in the middle. Trochanters I–IV with scattered tubercles; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; 1 apical apophysis, this conical, short, blunt. Femur I with small PDS, RDS; II–III with small PDS, large RDS; III sinuous, ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, with 1 large prolateral apical tubercle; IV sinuous, with prodorsal and prolateral rows of high, slightly pointed tubercles in basal half; retrolateral row of high, pointed tubercles decreasing in size distally; medium PDS, large RDS; ventrally with 2 rows of tubercles, prolateral ones increasing in size distally, becoming high, pointed, retrolateral row disappearing in distal half, 2 apical spines. Tibia III ventrally with 2 rows of tubercles increasing in size subapically, becoming high, pointed, retrolateral ones enlarged; IV with 2 apical spines. Metatarsus I with 1 proventral apical seta. Tarsal segmentation: 5, 7, 6, 6.

Penis (Fig. 45A,B): Stylus smooth, apex slightly swollen; with angular medio-ventral projection. Ventral process of glans curved; apex blunt. Ventral plate with concave sides; with 3 pairs of apically curved distal setae; 1 pair of short, straight median setae; 4 pairs of straight basal setae.

Coloration: Brown; dark brown on prolateral apical apophysis of coxa IV and legs. Light brown on tarsi.

Female (paratype; MNRJ 8927): Measurements: SL 3.10; SMW 2.40; femur I 1.20; II 2.40; III 1.80; IV 2.30. Pedipalpus: Tibial setation: Prolateral IlIi, retrolateral ilIi/iiIi. Legs: Coxa IV with 1 oblique prolateral apical apophysis, this conical, short, pointed. Trochanter IV with scattered tubercles, prolaterally with 1 large apical tubercle. Femur III ventrally with 2 rows of tubercles slightly increasing in size distally, prolateral ones enlarged, with 1 large prolateral apical tubercle; IV with dorsal, prolateral and retrolateral rows of similar-sized tubercles; ventrally with 2 rows of tubercles, prolateral ones slightly increasing in size distally, 1 large prolateral apical tubercle. Tibiae III–IV with rows of similar-sized tubercles, without apical spines. Tarsal segmentation: 5, 7, 6, 6.

Variation in males (n=6): Measurements: SL 3.05–3.30; SMW 2.50–2.65; femur I 1.30–1.40; II 2.60–2.80; III 2.00–2.10; IV 2.40–2.60. Pedipalpus: Tibial setation: Prolateral ilIi/IiI, retrolateral ilIi/iiIi. Tarsal setation: Retrolateral ilIi/IiI. Femora I–II with reduced or small PDS.
FIGURE 36. *Eusarcus tripectinatus* sp. n. Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, right tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, idem, prolateral view; I, right tibia IV, ventral view. Scale bars, 1 mm.
**Variation in females** (n=6): Measurements: SL 3.10–3.35; SMW 2.40–2.70; femur I 1.20–1.40; II 2.40–2.60; III 1.80–2.00; IV 2.30–2.50. Pedipalpus: Tibial setation: Retrolateral IiIi/iIi/iIi. Tarsal setation: Retrolateral Ili/iIi. Femur I with reduced or small PDS, RDS.

**Type locality:** Brazil, Minas Gerais, Rio Preto.

**Geographical distribution** (Fig. 49A): Known only from the type locality.

_Eusarcus uruguayensis_ (Ringuelet) comb. n., stat. n.  
(Figs. 37, 46A,B, 51)

_Pygophalangodus gemignani uruguayensis_ Ringuelet 1955a: 292, figs. 2, 3, 295 (diag); 1963: 48 (cat), 49 (key); Capocasale 1966: 632 (cit), 636 (descr fe mistakenly designated as “allotype”), fig. 2; 1968: 70 (distr); Maury & Pilati 1996: 1 (cit); Kury 2003a: 189 (cat); (ma holotype & 1 ma paratype, “Rivera, Rivera, Uruguai; 15.vi.1951; FCE”; examined).

**Material examined:** URUGUAY. _Rivera_: Rivera, without name of collector, 15.vii.1951, ma holotype & 1 ma paratype (FCE). _Arapej_: Salto, without name of collector, 13.iii.1972, 1 fe (URMU); _Artigas_: Arroyo Cuaró, B.L. de Ximénez leg., ii.1960, 1 ma (FCE); Sepulturas, C.S. Carbonell leg., 19.xii.1957, 1 fe mistakenly designated as “allotype” (FCE); idem (Rio Cuarem, Picada del Negro Muerto), P. San Martin et al. leg., 2.iii.1969, 1 ma & 1 fe (MZSP 16056); _Tres Cruces_, without name of collector, 26.xii.1954, 2 fe (FCE).

**Diagnosis:** _E. uruguayensis_ resembles _E. caparaoensis_+ and _E. manero_+, which have a conical, short, blunt prolateral basal apophysis on the male trochanter IV, and can be distinguished by: The presence of PAM; ocularium high, with 2 large tubercles; without median spine on scutal area III; femur IV with dorso-median enlarged tubercles; prolateral row of enlarged, slightly high tubercles increasing in size to the middle; retrolateral row with a series of high, pointed tubercles in distal third, another with high, blunt tubercles in remaining two third, besides 2 ventro-apical spines.

**Redescription:** _Male_ (holotype): Dorsum (Fig. 37A,B): Measurements: SL 3.80; SMW 3.35; femur I 1.70; II 2.70; III 2.10; IV 2.80. Median paracheliceral projection of similar-size as PAM. Anterior margin of prosoma with 1 large tubercle on each corner. Ocularium near to anterior scutal margin; high, with 2 large tubercles and 12 small ones. Carapace with 42 scattered tubercles. Scutal area I with 11–12 scattered tubercles on each side; II with 20; III with 16; IV with 21 tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of 16, 15, 15, 11 tubercles, respectively. Anal operculum with 27 tubercles.

Venter: Coxa I with 17–18 tubercles, median and distal ones largest; II with 26–28 tubercles, distal ones largest; III–IV irregularly tuberculate.

Chelicera: Segment I smooth.

Pedipalpus: Trochanter dorsally inflated, with 2–3 tubercles. Femur dorsally with 3–4 aligned tubercles; ventrally with 1 large basal tubercle, 2–3 small pointed aligned ones. Tibial setation: Prolateral IiIi/iIi, retrolateral Ili/iIi. Tarsal setation: Prolateral Iii, retrolateral Iii.

Legs (Fig. 37C–I): Coxa II with 2–3 tubercles on retrolateral margin; IV densely tuberculate, with 1 oblique prolateral apical apophysis, this conical, long, blunt, curved posteriad and ventrad, ventrally swollen in the middle and subapically (less conspicuous). Trochanters I–IV with scattered tubercles; I with 1 large ventro-basal tubercle; III with 1 large retrolateral apical tubercle; IV prolaterally with 1 basal apophysis, this conical, short, blunt, swollen in the middle; retrolaterally with 1 large apical tubercle. Femora I–II with reduced PDS, RDS; ventrally with 2 rows of slightly enlarged tubercles; III sinuous, with reduced PDS, small RDS; ventrally with a prolateral row of tubercles increasing in size distally, 1 PVS; IV sinuous, with enlarged dorso-median tubercles; prolateral row of enlarged, slightly high tubercles increasing in size to the middle; retrolateral row with a series of high, pointed tubercles in distal third, another with high, blunt tubercles in remaining two thirds; medium PDS, small RDS; ventrally with a prolateral row of enlarged tubercles increasing in size in distal third, becoming high, pointed, 2 apical spines. Tibia I ventrally with 2 rows of slightly enlarged tubercles; III ventrally with 2 rows of high, pointed tubercules increasing in size subapically;
FIGURE 37. *Eusarcus uruguayensis* (Ringuelet) **comb. n., stat. n.** Male (holotype): A, habitus, dorsal view; B, dorsal scutum, right lateral view; C, right coxa and trochanter IV, posterior view (in part); D, right femur III, ventral view; E, left tibia III, ventral view; F, right trochanter and femur IV, dorsal view; G, idem, ventral view; H, left trochanter and femur IV, prolateral view; I, right tibia IV, ventral view. Scale bars, 1 mm.
FIGURE 38. Distal part of penis in dorsal and lateral view: A–B, Eusarcus schubarti; C–D, E. teresincola; E–F, E. armatus. Abbreviations: GL, glans; ST, stylus; TR, trunk; VPL, ventral plate; VPR, ventral process. Arrow in F indicates the angular medio-ventral projection of the stylus. Arrows in B, D indicate the medio-ventral trichomes. Scale bars, 0.1 mm.

IV retrolaterally with a row of enlarged tubercles, with 1 apical spine; ventrally with 2 rows of tubercles increasing in size distally, 2 apical spines. Tarsal segmentation: 4–5(2–3), 6, 6, 6.

Penis (MZSP 16056; Fig. 46A,B): Stylus with medio-ventral trichomes, apex fairly thin; with angular medio-ventral projection. Ventral process of glans curved; apex blunt. Ventral plate with concave sides; with 3 pairs of curved distal setae; 1 pair of short, straight median setae; 4 pairs of straight basal setae.

Coloration: Brown; dark brown on apical apophysis of coxa IV, leg IV and most part of metatarsus IV. Light brown in distal third of metatarsus IV, on remaining metatarsi and tarsi.

Female (specimen mistakenly designated as “allotype” of P. gemignanii uruguayensis; FCE): Dorsum: Measurements: SL 3.65; SMW 3.10; femur I 1.60; II 2.60; III 2.00; IV 2.60. Median paracheliceral projection smaller than PAM. Chelicera: Segment I with 3 tubercles. Pedipalpus: Tibial setation: Prolateral and retrolateral illi. Legs: Coxa IV with 1 oblique prolateral apical apophysis, this conical, short. Trochanter II with scattered tubercles, 1 large ventro-basal tubercle; IV with scattered tubercles, retrolaterally with 1 large
apical tubercle. Femur II with rows of similar-sized tubercles; III ventrally with 2 rows of tubercles increasing in size distally, 1 large prolateral apical tubercle; IV with rows of similar-sized tubercles; ventrally with a prolateral row of tubercles slightly increasing in size distally, 1 large prolateral apical tubercle. Tibiae I, III with rows of similar-sized tubercles; IV with retrolateral row of similar-sized tubercles, ventrally with 2 rows of tubercles slightly increasing in size distally. Tarsal segmentation: 5, 6, 6, 6. Coloration: Brown; dark brown on free tergites and edges of dorsal scutum.

**FIGURE 39.** Distal part of penis in dorsal and lateral view: A–B, *Eusarcus oxyacanthus*; C–D, *E. catharinensis*; E–F, *E. mirabilis* sp. n. Arrow indicates the angular medio-ventral projection of the stylus. Scale bars, 0.1 mm.

Variation in males (n=3): Measurements: SL 3.80–4.00; SMW 3.35–3.60; femur II 2.60–2.90; III 2.10–2.15; IV 2.70–2.80.

Variation in females (n=5): Measurements: SL 3.60–4.10; SMW 3.00–3.20; femur I 1.50–1.70; II 2.30–2.70; III 1.90–2.10; IV 2.40–2.70. Pedipalpus: Tibial setation: Prolateral Iii/Iiii, retrolateral Iii/Iili. Femora I–II with reduced or small PDS; III with reduced or small PDS, RDS.

**Type locality:** Uruguay, Rivera, Rivera.

**Geographical distribution** (Fig. 51): Uruguay.
**Eusarcus aberrans** Mello-Leitão species inquirenda

*Eusarcus aberrans* Mello-Leitão 1939a: 294, fig. 18; 1940: 7 (key); 1945: 153 (cat), 157 (key), fig. 5; Soares & Soares 1954b: 258 (cat); Kury 2003a: 168 (cat); (ma holotype lost).

This species is considered as a species inquirenda because the type material is lost and no material matching the description was later found. A remarkable feature of this species is the presence of a retrolateral apical apophysis on coxa IV, as otherwise within *Eusarcus* only known in *E. schubarti* and *E. teresincola*.

**Type locality:** Brazil, Mato Grosso do Sul, Salobra.

**Eusarcus metapucrolia** nom. n., species inquirenda

*Pucrolia armata* Sørensen 1895: 4 (types in MZT, not examined). Although Kury (2003a) mentioned the existence of a paratype in the SMF, such material could not be found in this institution upon our request.
Metapucrolia armata: Roewer 1913: 33, fig. 10; 1923: 406 (rdesc), fig. 498; Mello-Leitão 1932: 195, fig. 105; Soares & Soares 1954b: 277 (cat); 1985: 12 (syst), figs. 13–17.

Metapucrolia armata was synonymized with E. argentinus by Soares & Soares (1985) under dubious circumstances: (i) they assumed M. armata shows variation in armature of ocularium, femur IV and male genitalia; (ii) they did not examine any type material. The redescription provided by Roewer (1913) is not precise enough to conclude whether it is a valid species or not. The only way to decide it, is to carefully examine the type material, with an emphasis on fine details of tubercles and spines on the dorsal scutum and of apophyses on trochanter IV; apical spines of femora (especially prolateral, retrolateral and proventral rows of tubercles) and male genitalia. A replacement name is proposed to avoid secondary homonymy with E. armatus Perty 1833.

FIGURE 41. Distal part of penis in dorsal and lateral view: A–B, Eusarcus sergipanus sp. n.; C–D, E. berlae; E–F, E. sooretamae comb. n. Scale bars, 0.1 mm.
**Biogeography**

_Eusarcus_ occurs from northeastern to southern Brazil, including the center-west region, besides in eastern Paraguay, Uruguay and northeastern Argentina. In general, species of Neotropical harvestmen rarely have widespread distribution areas (Kury 2003a) and are restricted to “a few hundreds of square kilometers” (Pinto-da-Rocha 1999). However some species of _Eusarcus_ have wide distribution areas, covering four medium-sized Brazilian states. The species with the widest distribution is _E. hastatus_, which occurs from southwestern Minas Gerais State to northeastern Argentina, including eastern Paraguay. _Eusarcus catherinensis_ has the second widest distribution and occurs from southern Rio de Janeiro to Santa Catarina States. Other species with wide distribution areas are _E. aduncus_ and _E. cavernicola_, which occur from Bahia State to eastern Goiás State, including northern and northwestern Minas Gerais State; and _E. sulcatus_ which occurs in Tocantins, Goiás and Mato Grosso do Sul States. The remaining species have more restricted distribution areas, especially in southeastern Brazil, in coastal mountain chains and along the coast. A better sampling tends to widen the distribution of many species, since there are few and sparse collections in some
areas, such as Minas Gerais and Mato Grosso do Sul States (Pinto-da-Rocha 2002). Nine species are only known from their type localities and do not allow further inferences about their distribution (*E. acrophthalmus, E. fulvus, E. garibaldiae, E. manero, E. matogrossensis, E. sergipanus and E. tripectinatus*).

**FIGURE 43.** Distal part of penis in dorsal and lateral view: A–B, *Eusarcus alpinus* sp. n.; C–D, *E. didactylus* sp. n.; E–F, *E. nigrimaculatus*. Scale bars, 0.1 mm.

Pinto-da-Rocha et al. (2005) proposed eleven areas of endemism in southern and southeastern Brazil based on the distribution of 84 species of four revised subfamilies of Gonyleptidae (Caelopyginae, Goniosomatinae, Progonyleptidellinae and Sodreaninae). While some species of *Eusarcus*, such as *E. alpinus, E. berlae, E. didactylus* and *E. geometricus*, fit well in just one area of endemism (in this case, Serra dos Órgãos area - Org), around one third of the species of *Eusarcus* do not. Eleven species of *Eusarcus* (*E. aduncus, E. armatus, E. catharinensis, E. hastatus, E. incus, E. mirabilis, E. nigrimaculatus, E. oxyacanthus, E. pusillus, E. sooretamae* and *E. teresincola*) occur in more than one of those areas. This quite high number indicates that *Eusarcus* species may not have a degree of endemism as high as most members of the four revised subfamilies (only 17 out of these 84 species occur in more than two areas of endemism). Other species (*E. aduncus, E. mirabilis* and *E. teresincola*) have distribution areas wider than the proposed areas of
endemism. There are seven species (*E. cavernicola*, *E. matogrossensis*, *E. sergipanus*, *E. tripectinatus*, *E. bifidus* and *E. grumani*) which occur in regions where no areas of endemism were proposed. To better understand biogeographical aspects, more sampling is needed in Brazil, especially in the eastern and central areas. In doing so, certainly more areas of endemism will be found and their relationships with those already proposed should be made clear.

![FIGURE 44. Distal part of penis in dorsal and lateral view: A–B, *Eusarcus geometricus* sp. n.; C–D, *E. caparaoensis* sp. n.; E–F, *E. insperatus*. Arrow indicates the angular medio-ventral projection of the stylus. Scale bars, 0.1 mm.](image)

Considering the distributional data at hand, we can conclude that the central area of the Coastal Atlantic Rain Forest sensu stricto harbors the largest richness of *Eusarcus* (17 out of 34 species). This richness can be explained mainly by the many geographical barriers on the southeastern Brazilian coast in the past, and also by many events of forest fragmentation due to climatic changes (Pinto-da-Rocha *et al.* 2005). Both factors caused isolation of populations, which ultimately led to speciation.
Other species of *Eusarcus* occur in drier areas, such as the Atlantic Semi-deciduous Forest and even in the Brazilian savanna (cerrado) and/or pampas. In those biomes, these opilionids are usually associated with nests of termites and/or forest patches, including riparian woodlands. This aspect, in association with the fact that many species of *Eusarcus* have a wider distribution than the areas of endemism proposed by Pinto-da-Rocha et al. (2005), indicate that *Eusarcus* might be more tolerant to changes in humidity. Therefore, the distribution of *Eusarcus* can be explained by dispersal from the Coastal Atlantic Forest to the interior of Brazil through a network of forest patches (Oliveira-Filho & Ratter 1995) in combination with higher tolerances towards changes in humidity. On the other hand, it is possible that the current distribution, especially in drier areas, is evidence for a former larger forest cover. According to this hypothesis, these species used to occur in a larger area with a different and more humid forest cover than the current one. Then, due to climatic changes followed by modifications in the physiognomy of the vegetation, these species became restricted to fragments of the former forest or to places with similar conditions, such as riparian woodlands and caves (*E. aduncus* and *E. cavernicola*).
FIGURE 46. Distal part of penis in dorsal and lateral view: A–B, Eusarcus uruguayensis; C–D, E. gemignanii; E–F, E. sulcatus. Scale bars, 0.1 mm.

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FIGURE 48. Distal part of penis in dorsal and lateral view: A–B, *Eusarcus matogrossensis*; C–F, *E. hastatus* (C–D, lectotype; E–F, holotype of *E. maquinensis*). Scale bars, 0.1 mm.
FIGURE 49. A, B: Localities of *Eusarcus* spp. in eastern Brazil.
FIGURE 50. A, B: Localities of *Eusarcus* spp. in eastern Brazil.
FIGURE 51. Localities of *Eusarcus* spp. in eastern Brazil, Uruguay, and northeastern Argentina.

FIGURE 52. Localities of *Eusarcus hastatus* in eastern Brazil, Paraguay and northeastern Argentina and main polymorphic features per locality. Letters next to features correspond to locations in the map. Abbreviations: OC, ocularium (anterior view); FM, right femur IV (dorsal view); TB, right tibia IV (ventral view); TR, right trochanter IV (dorsal view). Scale bars, 1 mm.
FIGURE 53. Main polymorphic features of *Eusarcus hastatus* per locality (letters correspond to localities given in the map in Fig. 52, abbreviations as in Fig. 52).

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