CONTEÚDO

BERTANI, ROGÉRIO. REVISION, CLADISTIC ANALYSIS, AND ZOOGEOGRAPHY OF VITALIUS, NHANDU, AND PROSHAPALOPUS; WITH NOTES ON OTHER THERAPHOSINE GENERA (ARANEAE, THERAPHOSIDAE) ........................................................................................................265
REVISION, CLADISTIC ANALYSIS, AND ZOOGEOGRAPHY OF VITALIUS, NHANDU, AND PROSHAPALOPUS; WITH NOTES ON OTHER THERAPHOSINE GENERA (ARANEEAE, THERAPHOSIDAE)

ROGÉRIO BERTANI

The 16 species of the South American theraphosine genera Vitalius Lucas, Silva Junior & Bertani, 1993; Nhandu Lucas, 1981; and Proshapalopus Mello-Leitão, 1923 are described, keyed, illustrated, diagnosed, and a cladistic analysis using 30 terminals and 35 characters is provided. Vitalius comprises nine species of which 4 are newly described: Vitalius paranaensis, V. longisternalis, V. buecherli, and V. lucasae. Pterinopeuma dubium Mello-Leitão, 1923 and P. vellutinum Mello-Leitão, 1923 are removed from the synonymy of P. wacketi and these three species are transferred to Vitalius. Pamphobeteus communis Piza, 1939 is removed from the synonymy of Vitalius sorocabae Mello-Leitão, 1923 and placed in the synonymy of Vitalius dubius (Mello-Leitão, 1923); Pamphobeteus insularis Mello-Leitão, 1923, Pamphobeteus masculus Piza, 1939 and Pamphobeteus litoralis Piza, 1976 are removed from the synonymy of Vitalius platymma (Mello-Leitão, 1923) and placed in the synonymy of Vitalius wacketi (Mello-Leitão, 1923); Pamphobeteus cucullatus Mello-Leitão, 1923, Pamphobeteus urbaniculus Soares, 1941, Pamphobeteus ypirangensis Soares, 1941, Pamphobeteus mus Piza, 1944, and Pamphobeteus cesteri (Mello-Leitão, 1923) are placed in the synonymy of Vitalius dubius (Mello-Leitão, 1923); Pamphobeteus cephalopheus Piza, 1944 is removed from the synonymy of Vitalius roseus (Mello-Leitão, 1923) and placed in the synonymy of Vitalius vellutinus (Mello-Leitão, 1923). Pamphobeteus rondoniensis Mello-Leitão, 1923; Pamphobeteus tetracanthus Mello-Leitão, 1923; Pamphobeteus exul Mello-Leitão, 1923; and Pamphobeteus platymma Mello-Leitão, 1923 are considered “nomina dubia”. The male of V. roseus Mello-Leitão, 1923 is described for first time.

The genus Nhandu comprises 4 species of which one is newly described: Nhandu cerradensis. Nhandu vulpinus (Schmidt, 1998) is transferred from Vitalius and the monotypic genus Braziliopeuma Schmidt is synonymised with Nhandu; thus the new combination Nhandu coloratovillosus (Schmidt, 1998) is established. Nhandu tripartitus Schmidt, 1997 is considered “nomen dubium”.

The genus Proshapalopus Mello-Leitão, 1923 comprises 3 species. Proshapalopus multicuspidatus (Mello-Leitão, 1929) is transferred from Cyclosternum Axserer; and Proshapalopus amazonicus, nomen novum for Pamphobeteus anomalus Mello-Leitão, 1923, is transferred from Eupalaestrus. Proshapalopus variegatus Caporiacco, 1935 is transferred to Metriopelma variegatum. The females of P. anomalus, P. multicuspidatus, and P. amazonicus are described for the first time.

Other new combinations are proposed: Lasiodora benedetti Bertkau, 1880, from Pamphobeteus; Lasiodora cristata (Mello-Leitão, 1923) from Pamphobeteus. Eupalaestrus spinosissimus Mello-Leitão, 1923, previously considered a “nomen dubium”, is considered a senior synonym of Eupalaestrus tarsicrassus Büchel, 1947 and Pamphobeteus holophaeus Mello-Leitão, 1923. Pseudotheraphosa Tinter is synonymised with Theraphosa Thorell.

Urticating hair types were found to be segregated into distinct areas on the spiders’ abdomen;
and, relation between the different regions where urticating hairs were sampled and their length, was found. Sexual dimorphism was found in some species, where the males have urticating hair of the types I and III, while the females have only the type I. Hairs with intermediate morphology between the types I and III were found in some males.

Two cases of structural anomalies involving eyes and thoracic fovea are reported. Locality records, distribution maps and area cladograms are presented. Twelve areas of endemism were found for forest environments and four for open environments.

Keywords: Cladistic analysis; systematics; zoogeography; neotropics; araneae; theraphosidae; theraphosinae; Vitalius; Nhandu; Proshapalopus; Lasiodora; Eupalaestrus; Theraphosa; urticating hair; area cladogram; endemism; structural anomaly.

1 - INTRODUCTION

Theraphosidae is a large spider family with 800 described species, comprising more than one third of the mygalomorph species (Coddington & Levi, 1991). It is distributed throughout all tropical and many subtropical areas in all continents and includes many of the largest spider species. Though some groups of arboreal species are well known, the majority are terrestrial, living inside burrows or under rocks or logs. Very little is known on the biology of Theraphosidae, and its taxonomy is in a chaotic state (Raven, 1990). The morphological monotony of this group, the traditional small number of researchers working on it, and its wide geographic distribution, are some factors responsible for this taxonomic chaos. Taxonomic revisions are imperative to solve this problem (Raven, 1990), but, unfortunately, revisionary papers on Theraphosidae are very rare. Furthermore, some of these few available papers were neither based on type material analysis, nor in the examination of a representative number of specimens housed in scientific collections, nor in a detailed comparative morphological analysis that could introduce reliable characters into the taxonomy and systematics. Besides the taxonomic problem, the geographical distribution of the species and genera of Theraphosidae are restricted to only a few records and there is almost nothing in the literature concerning its zoogeography.

It was the former goal of this work to revise the genus Vitalius Lucas, Silva Junior & Bertani, and to test its monophyly, since it lacks a clear synonymy. Furthermore, its phylogenetic relationship is dubious, because it appeared in a polytomy with Lasiodora C. L. Koch, Nhandu Lucas, and a branch with twelve genera, in the cladistic analysis of theraphosine genera carried out by Pérez-Miles et al. (1996). Then, some representative species of these closely related genera were also included in the cladistic analysis, as well as some species that did not fit in any of the previous diagnosis for the genera Vitalius, Nhandu, Eupalaestrus, and Lasiodora, though undoubtedly related to them. Thus, this work was considerably amplified and deals also with species of the genera Nhandu, Lasiodora, Eupalaestrus Pocock, Proshapalopus Mello-Leitão, and Theraphosa Thorell.

Some new characters are introduced as a result of comparative morphological studies carried out on these species and their morphological variability was studied in 3,500 specimens. Distribution records and biological area cladograms are presented.


The genus Vitalius

Pocock (1901) described the genus Pamphobeteus selecting Lasiodora nigricolar Ausserer, 1875 as type species. This author diagnosed this genus by the absence of striulating hairs on the prolateral side of the coxa I and on the retro lateral side of the coxa of the palp; absence of scopula on the retro lateral side of the femor I; metatarsus I in males closing between the male spur branches; femur III not thickened; and patella + tibia IV only slightly longer than the first, which, at least in the female, falls short of the fourth by only about the length of the tarsus of the latter. The geographic distribution was cited as Colombia, Ecuador, and Bolivia.

Three other species were described by Pocock (1903) in Pamphobeteus, P. antinous, P. insignis, and P. ornatus. He also transferred Lasiodora ferox Ausserer, 1875, Lasiodora fortis Ausserer 1875, Lasiodora Augusti Simon, 1888 and L. vespertinum Simon, 1888 to Pamphobeteus. The transference of L. augusti and L. vespertinum were also corroborated by Simon (1903). The inclusion of these species did not change the geographical distribution previously assigned to the genus.

Mello-Leitão (1923) described twelve new species of Pamphobeteus from Brazil: P.
platyomma, P. melanocephalus, P. cesteri, P. rondoniensis, P. roseus, P. sorocaba, P. cucculatus, P. tetracanthus, P. exul, P. holophaeus, P. insularis and P. anomalus. He also transferred Cryptsidomus isabellinus Asruer, 1875 and Lasiodora benedentii Bertkau 1880, to Pamphobeteus. The original geographic distribution of the genus was considerably changed, because of the inclusion of Brazilian species.

Piza (1933) described P. piracicabensis; in 1939, P. masculus and P. comminis; and in 1944, P. cephalophaeus and P. mus. Soares (1941) described two more species, P. urbanicolus and P. ypiranguensis. All seven species are from Brazil.

Bücherl (1947; 1949) revised the species described by Mello-Leitão, Piza, and Soares and synonymized many of them. He considered as valid P. roseus, P. cesteri, P. sorocaba, P. platyomma, P. rondoniensis, P. anomalus and P. tetracanthus. Bücherl (1947a) also suggested that P. cesteri was a junior synonym of P. isabellinus and cited that P. benedentii (Bertkau, 1880), “seems to be a Lasiodora species”, as originally described; but, since he did not examine the types, he did not make the transference, keeping them in Pamphobeteus in agreement with Mello-Leitão (1923).

Bonnet (1956) did not consider the dubious transference of Cryptsidomus isabellinus to Pamphobeteus made by Mello-Leitão (1923) because this is the type species of Cryptsidomus and this genus has priority over Pamphobeteus.

Bücherl (1957) illustrated the male bulbs and spurs of the species P. sorocaba, P. cesteri, P. isabellinus, P. platyomma, P. roseus and P. tetracanthus which were known formerly only by females. However, he did not describe any of the males of the species above.

Schiapelli & Gerschman de Pikelin (1964) revised the genus Acanthocurria and transferred Acanthocurria cristata Mello-Leitão, 1923, from Ceará, Brazil, to Pamphobeteus.

Piza (1976) described one more species, P. litoralis, from Brazil.

Schiapelli & Gerschman de Pikelin (1979) redescribed Pamphobeteus nigricolor after examining the types and presented illustrations of the male palpal bulbs and spermathecae.

Lucas et al. (1993) transferred the Brazilian species of Pamphobeteus to the new genus Vitalius. They diagnosed it by the male palpal bulb and spermathecae shape and by the way the metatarsus closes over the spur branches. They also transferred P. anomalus to Euspalaestris and synonymized V. litoralis (Piza, 1976) with V. platyomma.

Pérez-Miles et al. (1996) revised and presented a cladogram for the relationship of the theraphosine genera. In this analysis Vitalius appears in a polytomy with Lasiodora, Nhandu, and a branch with twelve other theraphosine genera. The holotype of Cryptsidromus isabellinus was examined and this species transferred to the genus Lasiodora.

Schmidt (1998b) described one more species, Vitalius vulpinus, from Northern Brazil.

The genus Nhandu

Lucas (1981) described the genus Nhandu and its only species N. carapoensis from Caarapó, Mato Grosso do Sul, Brazil. It was diagnosed by the absence of stridulatory hairs; extension of the scopula on metatarsus, that reaches the basis in the metatarsus I and II, 4/5 of apical length in metatarsus III and 1/3 of apical length on metatarsus IV; absence of male spurs; male palpal bulb with short embolus; and shape of spermathecae.


Schmidt (1989) suggested that Nhandu was a valid genus.

In the cladistic analysis of Pérez-Miles et al. (1996), Nhandu was shown to be distinct from Sericopelma.

Platnick (1997) considered Nhandu a junior synonym of Sericopelma. However, his catalog does not deal with papers published after 1995, thus the Pérez-Miles et al. (1996) paper was not considered.

The genus Proshapalopus

The genus Proshapalopus and its only species P. anomalus were described based only on the male from Pinheiro (now Pinheiral), Rio de Janeiro, Brazil by Mello-Leitão (1923). It was included in Ischnocnolinae because the holotype has the scopula of tarsi IV divided by a longitudinal band of setae. This character was considered diagnostic for Ischnocnolinae until being dismissed in Raven’s (1985) and Pérez-Miles ‘(1994) papers. Mello-Leitão (1923) thought Proshapalopus to be closer to Hapalopus Assuer, 1875; and, the main differences between them were the presence, in Proshapalopus, of a recurved fovea, sternal sigillae located a little apart from the margin, and the male palpal tibia with the rastellum located on the internal side.
Caporiacco (1955) described one more species, *P. variegatus*, from Venezuela.

Raven (1985) considered *Proshapalopus* a junior synonym of *Stichoplatus* Simon, 1889, because of the similarities in shape of the male bulb, male spur and tarsal scopulae. However, Pérez-Miles (1992a) transferred *Stichoplatus* to the subfamily Ischnocoleinae after examining the holotype of the type species, *S. ravidus* Simon, 1889, which did not have the theraphosine synapomorphies. Rudloff (1997) also examined the holotype of *S. ravidus* and revalidated *Proshapalopus* because of the presence of a retrolateral scopula on femur IV in *Proshapalopus*, a character found only in some Theraphosine genera. In the same paper *P. variegatus* was considered *nomem dubium*.

2 - Material and Methods

2.1 - Material

Almost 3,500 specimens were examined, the majority from the Instituto Butantan mygalomorph collection. The abbreviation of the collections, cities and curators are listed below.

**ESALQ**
Escola Superior de Agricultura “Luiz de Queiroz”, Piracicaba (A. D. Paschoal).

**IBSP**
Instituto Butantan, São Paulo (R. Bertani).

**MCN**

**MNRJ**

**MUCV**
Museu de Biologia, Universidade Central de Venezuela, Caracas (R. Candia).

**MZSP**

**MCTP**
Museu de Ciência e Tecnologia da Pontifícia Universidade Católica, Porto Alegre (A. A. Lise).

**RCW**
R. C. West private collection, Victoria.

**SMNK**
Staatsliches Museum für Naturkunde Karlsruhe, Karlsruhe (H. Höfer).

2.2 - Abbreviations - morphology – follows Bertani (in press) for male palp bulb; Coyle, (1995) for spermatheca; and Raven (1985) for somatic characters: A, male palp bulb apical keel; AC, male palp bulb prolateral accessory keel of *Proshapalopus*; ALE, anterior lateral eyes; AME, anterior median eyes; D, male palp bulb ventral median depression; PI, male palp bulb prolateral inferior keel; PLE, posterior lateral eyes; PLS, posterior lateral spinnerets; PME, posterior median eyes; PMS, posterior median spinnerets; PS, male palp bulb prolateral superior keel; R, male palp bulb retrolateral keel; SA, male palp bulb subapical keel; SB, spermatheca bulb; SS, spermatheca stalk; STC, superior tarsal claws.

2.3 - Measurements – All measurements are presented in millimeters. The lengths of the articles of legs, carapace and the total length were obtained with a caliper. All appendage articles were measured from the left appendages and the measurements were performed between the dorsal points of articulation. The carapace was measured from the clypeal margin to the posterior margin, which is slightly concave. Total length includes the chelicerae. The lengths of eye tubercle, labium and sternum were obtained with a Wild M-8 stereomicroscope with 10 x eyepiece lenses and an eyepiece micrometer scale, recording the maximum diameter of these structures, with the exception of the sternum, measured from its anterior margin, which is slightly concave.

2.4 - Leg spination – The terminology of spines is based on Petrunkevitch (1925), with modifications. The total number of spines were expressed for basal, median and distal regions on each article side. In descriptions, spines on edges of distal sides are identified as "ap" to differentiate these spines, commonly concentrated on the distal article edges, from other spread over the distal area. The patella spines were expressed in total numbers for each face, due the small dimension of the article. Spines on ventral metatarsus IV were also expressed in their total number, because of the high quantity of spines present, which do not allow of a careful definition of the planes Petrunkevitch (I. e.).

2.5 - Scanning electron microscopy – The material was examined in a scanning electron microscope JEOL JSM840A from the “Laboratório de Microscopia Eletrônica do Departamento de Física Geral, do Instituto de Física da Universidade de São Paulo”.

2.6 - Urticating hairs - The classification of urticating hair types follows Cooke *et al.*, 1972. They were taken from specimens preserved in alcohol 80% with the aid of a small forceps and put in a vial with 1 ml of alcohol 80%. Through vigorous hand movements the liquid was homogenized and one drop was collected and mounted on slides. Afterwards they were examined and measurements were obtained with a microscope, using an eyepiece micrometer scale. Four hairs from six distinct abdominal areas were measured (Fig. 1): median region, comprising an anterior, median, and posterior areas; and, left l-
teral region, comprising an anterior, median, and posterior areas.

Material examined for urticating hairs:

_Acanthocurria geniculata_ (C. L. Koch, 1842) - 1♂ IBSP 7022 and 7023, both from U. H. E. Tucuruí, Tucuruí, Pará, Brazil; _Acanthocurria sertanilis_ Pocock, 1903 - 1♀ MNRI, Juji, Argentina; _Aphonopelma semani_ (F. O. P.-Cambridge, 1897) - 1♂ IBSP 7019, both from Central America; _Brachypelma emilia_ (White, 1856) - 1♀ 1♂ IBSP 7028; 7027, both from Mexico; _Cystopholis portoricae_ Chamberlin, 1917 - 1♂ RCW, NW Guayama, Puerto Rico; _Eupalaestra campestris_ (Simon, 1891) - 1♀ IBSP 2346, 1♂ Palmeiras; 1♂ IBSP 2830, Brilhante, Mato Grosso do Sul, Brazil; 1♂ IBSP 6149, Buxim; 1♂ IBSP 4302, Nova Andradina; all in Mato Grosso do Sul, Brazil; _Eupalaestra spinosissimus_ Mello-Leitão, 1923 - 1♀ IBSP 593, São José dos Campos, São Paulo, Brazil; _Eupalaestra weijenberghi_ (Thorell, 1894) - 1♂ IBSP 7979 and IBSP 7980, Montevede, Uruguay; _Lasiodora_ sp. - 1♀ IBSP 6357, Salvador, Bahia, Brazil; 1♀ IBSP 6417, Guararema, São Paulo, Brazil; 1♂ IBSP 6451, Vitória, Espírito Santo, Brazil; 1♂ IBSP 6422, Janboiro, São Paulo, Brazil; 1♂ IBSP 6416, Caruará, Pernambuco, Brazil; 1♂ IBSP 7034, Centralina, Minas Gerais, Brazil; _Nhandu carapeoaensis_ Lucas, 1981 - 1♀ IBSP 1434, Aquidauana, Mato Grosso do Sul, Brazil; 1♂ IBSP 2780, Campo Grande, Mato Grosso do Sul, Brazil; 1♂ IBSP 4553, Carapao, Mato Grosso do Sul, Brazil; 1♂ IBSP 6555, Piraputanga, Mato Grosso do Sul, Brazil; 1♂ IBSP 6559, Araras, São Paulo, Brazil; 1♂ IBSP 6566, Dourados, Mato Grosso do Sul, Brazil; _Nhandu vulpinus_ - 1♂ IBSP 6566 and IBSP 6577, both from U. H. E. Tucuruí, Tucuruí, Pará, Brazil; 1♂ IBSP 4245, Belém, Pará, Brazil; _Nhandu coloratovillosus_ - 1♂ IBSP 512, Agachi, Mato Grosso do Sul, Brazil; 1♂ IBSP 2959, same locality; 1♂ IBSP 4078, Barra do Garças, Mato Grosso, Brazil; 1♂ IBSP 2748, Between Rivers Culuene and Sete de Setembro, Mato Grosso, Brazil; _Nhandu cerradensis_ - 1♂ IBSP 2716, Bahia, Brazil; 1♂ IBSP 4108, Formoso, Goiás, Brazil; 1♂ IBSP 3809, Porangatu, Goiás, Brazil; _Pamphobeteus_ sp. - 1♂ IBSP 7025, U. H. E. Samuel, Porto Velho, Rondônia, Brazil; 1♂ IBSP 7024, Medellín, Colombia; _Phormictopus cancerides_ (Latreille, 1806) - 1♂ IBSP 7021, Haiti; 1♂ RCW, República Dominicana; _Proshapalopus anomalous_ Mello-Leitão, 1923 - 1♂ IBSP 6858, Domingos Martins, Espírito Santo, Brazil; 1♂ IBSP 6857, same locality; _Proshapalopus multicuspidatus_ (Mello-Leitão, 1929) - 1♂ IBSP 6846, Porto Seguro, Bahia, Brazil; 1♂ IBSP 6848, same locality; _Proshapalopus amazonicus_ - 1♂ IBSP 6915, Alta Floresta, Mato Grosso, Brazil; 1♂ IBSP 6944, Santa Bárbara d’Oeste, São Paulo, Brazil; 1♂ IBSP 5590, Aguaí, São Paulo, Brazil; 1♀ IBSP 5589, São Paulo, Brazil; 1♂ IBSP 5907, Pirassununga, São Paulo, Brazil; 1♂ IBSP 5898, São Roque, São Paulo, Brazil; _Vitalius roseus_ (Mello-Leitão, 1923) - 1♂ IBSP 6729, Tuparendi, Rio Grande do Sul, Brazil; 1♂ IBSP 6730, same locality; 1♀ IBSP 6726, same locality; 1♂ IBSP 6727, same locality; 1♂ IBSP 6728, same locality, 1♂ IBSP 6743, same locality; _Vitalius sorocaba_ (Mello-Leitão, 1923) - 1♂ IBSP 6926, Sorocaba, São Paulo, Brazil; 1♂ IBSP 6943, São Manuel, São Paulo, Brazil; 1♂ IBSP 4978, Cunha, São Paulo, Brazil; 1♂ IBSP 5073, Ibiúna, São Paulo, Brazil; _Vitalius vellutinus_ (Mello-Leitão, 1923) - 1♂ IBSP 5687, Cândido Mota, São Paulo, Brazil; 1♀ IBSP 6767, Assis, São Paulo, Brazil; 1♂ IBSP 6894, Assis, São Paulo, Brazil; 1♂ IBSP 6342, Palmital, São Paulo, Brazil; 1♂ IBSP Teodoro Sampaio, São Paulo, Brazil; 1♂ IBSP 6346, Assis, São Paulo, Brazil; _Vitalius wackei_ (Mello-Leitão, 1923) - 1♂ IBSP 6955, Itanheim, São Paulo, Brazil; 1♀ IBSP 6957, Serra de Santos, São Paulo, Brazil; 1♀ IBSP 6958, Praia Grande, São Paulo, Brazil; 1♂ IBSP 6833, Angra dos Reis, Rio de Janeiro, Brazil; _Vitalius longisternalis_ - 1♂ IBSP 6754, U. H. E. Segredo, Candói, Paraná, Brazil; 1♀ IBSP 6764, same locality; 1♀ IBSP 6776, same locality; 1♂ IBSP 6771, same locality; 1♂ IBSP 6776, same locality; 1♂ IBSP 3939, Guaraupuva, Paraná, Brazil; _Vitalius lucassae_ - 1♂ IBSP 4392, Curitiba, Paraná, Brazil; 1♂ IBSP 6829, Irauçuba, Bahia, Brazil; 1♂ IBSP 3939, Paraná, Brazil; _Vitalius lucassae_ - 1♂ IBSP 6647, Pindade, São Paulo, Brazil; 1♂ IBSP 6630, Juquitiba, São Paulo, Brazil; 1♂ IBSP 6646, same locality; 1♂ IBSP 6586, same locality; 1♂ IBSP 6594, same locality; 1♂ IBSP 6600, São Paulo, São Paulo, Brazil; _Vitalius paranaensis_ - 1♂ IBSP 6663, Rolândia, Paraná, Brazil; 1♂ IBSP 6672, U.H.E. Itapu, Foz do Iguaçu, Paraná, Brazil; 1♂ IBSP 6672, same locality; 1♂ IBSP 6678, same locality; 1♂ jovem IBSP 4327, Rolândia, Paraná, Brazil; 1♂ IBSP 1359, Arapongas, Paraná, Brazil; _Xenesthis immanis_ (Aussérer, 1875) - 1♂ IBSP 4267, Venezuela; 1♂ IBSP 7026, no locality.

2. 7 – Cladistic analysis – The cladistic analysis was carried out using three phylogenetic packages using equal, successive, and implied character weighting: Hennig 86 version 1.5 (Farris, 1988), Nonet version 1.6 (Goloboff, 1993), and Pee-Wee version 2.6 (Goloboff, 1997). For Hennig 86 it was used the combination of the approximate
algorithms mh* and bb* since it was not possible to use the exact algorithm "implicite enumeration, ie" which allows to find the most parsimonious cladogram. For Nona and Pee-Wee it was used multi*15 and when recommended by the program the trees were swapped using max* branch-swapping algorithm. Searches were done using both amb* and amb- options and for Pee-Wee it the K value (constant of concavity) from 1 to 6. The data matrix with 30 taxa and 35 characters was analyzed both with all characters unordered and with some characters ordered, depending if there was indication of connection among different character states or not. The outgroups and sister groups were chosen based on the cladogram presented by Pérez-Miles et al. (1996) for Theraphosinae. As proposed by Nixon & Carpenter (1993), the outgroups were considered as terminals, as a way of testing the ingroup monophyly. Branch support indices (Bremer, 1994) were calculated with Nona using h100, find*, bsupport14 (for cladogram with characters 2, 4, 8, 17 ordered) or bsupport4 (for cladogram with characters unordered).

Outgroup material examined:

*Aphonopelma seemani* (F. O. P.-Cambridge, 1897) 1 ♂ IBSP 7019, Central America, 1 ♀ IBSP 7020, no locality; *Sphaerobothria hoffmani* Karsch, 1879 - 1 ♂, RCW, Moraña, San José, Costa Rica; *Phormictopus cancerides* (Latreille, 1806) - 1 ♂ RCW, Barahona, Republica Dominicana; *Phormictopus cubensis* Chamberlin, 1917 - 1 ♂ MNRI 13264, Cuba; *Acanthoscurria sternalis* Pocock, 1903 - 3 ♂, 1 ♀ MNRI, Jujui, Argentina; *Acanthoscurria geniculata* (C. L. Koch, 1842) - 1 ♂ IBSP 7022, U. H. E. Tucurui, Pará, Brazil; 1 ♀ IBSP 7023, same locality.

Sister group material examined:

*Pamphobeteus* sp. - 1 ♂ IBSP 7024, Medellin, Colombia; 1 ♀ IBSP 7025, U. H. E. Samuel, Porto Velho, Rondônia, Brazil; *Brachypelma emilia* (White, 1856) - 1 ♂ IBSP 7027, México; 1 ♂ IBSP 7028, Mexico; *Theraphosa blondi* (Latreille, 1804) - 1 ♂ IBSP 7029, U. H. E. Tucurui, Pará, Brazil; 1 ♂ IBSP 7030, same locality; *Theraphosa apophysis* (Tinter, 1991) - 1 ♂, IBSP 7049, Brazil/Venezuela boundary area; *Yenesis immanis* (Ausserer, 1875) - 1 ♂ IBSP 7026, no locality; 1 ♀ IBSP 4267, Venezuela.

3. RESULTS AND DISCUSSION

3.1 - Morphology

Most of the characters traditionally used in theraphosid systematics were studied here, such as fovea shape, differences in the proportions between leg articles and other body parts, number of cheliceral teeth, size and disposition of the eyes and scopula, color patterns, striulatory hairs, spine patterns, male spur (Simon, 1892; Pocock, 1903; Mello-Leitão, 1923; Büchler, 1947a; Schiapelli & Gerschman de Pikelin, 1979; Raven, 1985; Smith, 1995; Prentice, 1997); spermathecae shape (Schiapelli and Gerschman de Pikelin, 1962b); urticating hair type (Cooke et al. 1972; Pérez-Miles et al. 1996); and male palpal bulb keels (Bertani, in press).

The characters fovea shape, number of cheliceral teeth, size and disposition of the eyes and of the scopula on legs; showed only small variations, which are found among almost all species studied and thus they can rarely be used either to characterize species or in the cladistic analysis. Genitalia characters are more widely used here than before. This is in part due to a new approach carried out on male palpal bulb structures (Bertani, in press) which yielded some characters never previously used.

A more detailed discussion concerning urticating hair morphology and spine patterns is given below.

3.1.1 - Urticating hairs

Cooke et al. (1972) described four morphological urticating hair types for Theraphosinae and proposed their utilization in taxonomy. After this paper, the citation of urticating hair type in descriptions of new theraphosine species became usual, as well as their utilization in cladistic analysis (Pérez-Miles et al. 1996). Type II urticating hair is exclusive for some avicularine genera (Lucas, Silva Junior & Bertani, 1991; Bertani & Marques, 1996). Types I, III and IV occur only in Theraphosinae (Cooke et al. 1972) and the presence of type III is considered a synapomorphy of this group (Pérez-Miles et al. 1996). Marshall & Uetz (1990) described for the genus *Ephebopus* (Aviculariinae) the type V urticating hair which is located on the prolateral apex of the palpal femur, differing from other species that have urticating hairs only on the abdomen dorsum. Pérez-Miles (1998) described the type VI which is apparently exclusive of the theraphosine species *Hemirhagius cervinus* Simon, 1903.

In Theraphosinae, urticating hair types I and III or III and IV can occur simultaneously in the same individual (Cooke et al. 1972). These authors proposed that they are segregated into distinct areas on the spiders abdomen. Figs. 1-5 present the results of a comparative study dealing with the relation between type of urticating hair and the area on
Spider abdomen. These results confirm Cooke et al. (1972) segregation hypotheses, i.e., type I urticating hair (Fig. 3) is always present on the lateral regions, as well as in median-anterior and median regions, while type III (Fig. 2) is always present on median and median-posterior regions (Fig. 1). These results are particularly important for specimen analysis in taxonomical studies. It is necessary to pick up at least two urticating hair samples from two different abdominal areas, and, one of them should obligatorily include the median-posterior region. The absence of urticating hair in this region is frequent because the hairs on this region are the first to be throw by the spider during its defensive behavior. If this area is found to be bald, it will be impossible to obtain information about the presence of type III urticating hair.

Cooke et al. (1972) also suggested that variation in type I urticating hair morphology could be specific, and thus this could be used as characters in theraphosid taxonomy. Type I urticating hair has four distinct regions (Fig. 3) which they named “A” the distal region, which presents no barbs; “main barbs” the next region presenting barbs which are directed to the basal region; “B” another region without barbs; and, “C” or “reversed bars” the basal hair region, shorter than the “main barbs” region and presenting barbs directed to the opposite direction of the “main barbs”. They suggested that hair length and proportions between the different hair regions are constant for each species, but it was not performed any study to confirm this hypothesis. However, the results obtained in this study do not confirm their proposal (Fig. 4). In all studied specimens there is a great variation in total hair length according to the region where they were picked up. There is always an increase in total length towards the antero-posterior direction and latero-median direction, i.e., hairs from the median-posterior region are always the longest, sometimes three times longer than the hairs from the median-anterior or region. Thus, the utilization of urticating hair detailed morphology in taxonomy can be done only after a careful analysis of these variations on each species and taking into account the region from where the hairs were picked-up. In the cladist analysis carried out here, type I urticating hair morphology was used only once, because of the great morphological differences found, when comparing to the hairs from other related species (Fig. 3). This hair presents the “A” region very short and the “B” region long, the opposite of other analyzed hairs.

Another feature to be considered in taxonomical studies involving urticating hairs is sexual dimorphism. Cooke et al. (1972) concluded that both sexes have the same urticating hair type, though some slight morphological differences between males and females could be found. However, this study found differences concerning the urticating hair type presented in males and females of the same species. In this case, males have type I and III urticating hairs and females only type I. One hair having an intermediate morphology between types I and III was found for some males (Fig. 5). This hair does not have the “B” region, which, together with the presence of many short barbs, gives it a type III resemblance. However, there is a distal reversed barb region which occurs only in type I urticating hair.

3.1.2 – Leg spines

In Theraphosinae, leg spines are present on femora, patellae, tibiae, and metatarsi. They show high variation in number and disposition and, even in the same individual, there is variation between the spines of the legs of right and left sides (Bücherl, 1947a). This author also stated that the number of leg spines increase towards the rear and become numerous (more than 20) on the metatarsus IV. Table II shows the minimum and maximum spine numbers found on the tibiae and metatarsi in species of the genera Nhandu, Lasiodora, Proshapalopus, and Eupalaestrus. These data confirm the proposition of Bücherl (1. c) and show the existence of sexual dimorphism in this group, since the number of spines found in males is always higher than in females.

Despite the found variation on the quantity of spines, some patterns are apparent. It is possible to propose basic positions for this group as follows:

Femur - I apical prolateral spine – they range from 0 to 2 (one specimen with 5).

Apical retrolateral spines – they are less frequent than the anterior ones, being more common on posterior legs. They range from 0 to 2.

Patella – The majority of the species examined do not have patella spines, mainly on the palpus and legs I and II. Sometimes, they can present 1 or 2 prolateral spines. The legs III and IV can have from 0 to 3 prolateral spines and 0 to 2 retrolaterals. Vitalius sorocabae females have from 2 to 5 retrolaterals and are common specimens with 3 retrolateral spines. This could be an apomorphy of this species. Some males of Nhandu carapoenis and N. cerradensis have from 0 to 4 ventral spines.

Tibia – There is a great variation in the number and disposition of palpal spines. Some species have one apical prolateral group of spines (fig. 25) and others a row of dorsal apical spines (fig. 24), constituting apomorphies for some taxa.

In legs, mainly the III and IV, there is normally one prolateral and one retrolateral spaced row of spines, almost dorsal, constituted by one basal spine, one median spine, and one apical spine. The variation found here concerns the number of
spines on each position, but the pattern is constant in all studied specimens.

Ventrally, the variation is great in the number and position. However, the presence of at least one apical marginal spine in all tibiae is constant. Some specimens showed 8 apical marginal spines on the tibia.

Metatarsus – The same pattern found on the tibia can be recognized for the prolateral and retrolateral metatarsal spines. The same is true for the great variation found on the ventral tibia, mainly for the metatarsus IV which is long and has many spines. The ventral apical marginal spines are also present on the metatarsi of all legs.

3.2 - Cladistic Analysis

List of characters used in cladistic analysis. Multistate characters were both treated as unordered and as ordered, in this case when there was an indication of morphological contingency between the states. Ordered characters are indicated in each item. Discussions refer to the best resolved tree (fig. 164) obtained with ordered characters. L = character steps on tree; CI = consistency index; RI = retention index; Wt= weight (Hennig86); and Fit= Fit (Pee-Wee, concavity 3); the first number refers to fig. 164, the second to fig. 165. A “+” means that the referred group of taxa is monophyletic.

1 – Embolus length (L = 4/4; CI = 0.25/0.25; RI = 0.76/0.76; Wt= 1/1; Fit=5.0/5.0); 0, long, embolus 2.5 times longer than its width (Figs. 85-86).
   1. short, embolus length less than 2.5 times its width (Figs. 131-132).

This character has interspecific variation in many theraphosine genera. For example, some Acanthoscurria species have a long and narrow embolus (A. sernalis Figs. 43-44) while others have the embolus short and thickened (A. geniculata Figs. 46-47); other examples are Pamphobeteus (P. nigricolor and P. antinous Pockol, 1903) and Vitalius (V. wacketi (Figs. 85-86) and V. dubius (Figs. 91-96)). Some parallel transformation series seem to occur among species of distinct theraphosine genera leading to an increase in the embolus diameter and a reduction of the embolus length from the primitive condition long/narrow. This character is a synapomorphy of Nhandu + Vitalius with a reversion in the clade V. wacketi + V. longisternalis and parallelism in P. anomalous + P. multicuspidatus and in A. geniculata.

2 – Apical keel (A) (L = 2/2; CI = 1.0/1.0; RI = 1.0/1.0; Wt= 10/10; Fit= 10.0/10.0); 0, small, restricted to the embolus apex (Figs. 52-53).

1, intermediate, extending slightly backwards (Figs. 76-77), reaching or not the subapical keel.
2, very long, extending backwards by almost all ventral embolus edge (Figs. 147-148).

The apical keel is always small, restricted to the embolus apex in the outgroups. The development backward is considered here as a synapomorphy of the clade Nhandu + Vitalius + its sister-group, represented by the genera Pamphobeteus, Xenesthis, Brachypelma, and Theraphosa. The state 2 is a synapomorphy of the sister-group of Nhandu + Vitalius. Ordered.

3 – Embolus apex diameter (L = 2/2; CI = 0.5/0.5; RI = 0.8/0.8; Wt= 4/4; Fit= 7.5/7.5); 0, slender (Figs. 76-77).
   1, thick (Figs. 93-94).

Synapomorphy of Nhandu with parallelism in the clade V. dubius + V. buecherli. In these groups, the embolus apex, above the retrolateral keel, has a diameter increase due to the size of the prolateral superior keel which surpasses the embolus plan.

4 – Retrolateral keel (R) (L = 4/3; CI = 0.5/0.66; RI = 0.9/0.91; Wt= 4/6; Fit= 6.0/7.5); 0, absent.
   1, present, not pronounced, slightly rounded (Figs. 8-9, 50).
   2, present, pronounced, sharp (Figs. 10-13, 76).

The state 1 is a synapomorphy of Eupalaestra + Proshapalopus + Lasiodora + Nhandu + Vitalius + the sister group of Nhandu + Vitalius. The state 2 is a synapomorphy of Lasiodora + Nhandu + Vitalius + the sister group of Nhandu + Vitalius. A reversion to the plesiomorphic state occurs in some genera of the sister group of Nhandu + Vitalius, like Brachypelma + Theraphosa and other genera not included in the analysis, but belonging to this group, like Megaphobema and Sericopelma. Ordered.

5 – Subapical keel (SA) (L = 2/1; CI = 0.5/1.0; RI = 0.91/1.0; Wt= 4/10; Fit= 7.5/10.0); 0, absent.
   1, present (Figs. 60-61).

Synapomorphy of the clade Proshapalopus + Lasiodora + Nhandu + Vitalius + the sister group of Vitalius + Nhandu, with reversion to state 0 in the sister group of Nhandu + Vitalius.

6 – Prolateral accessory keel, under the prolateral inferior keel (AC) (L = 1/1; CI = 1.0/1.0; RI = 1.0/1.0; Wt= 10/10; Fit= 10.0/10.0); 0, absent.
   1, present (Fig. 73).
Autapomorphy of Proshapalopus.

7 – Denticulate row in the prolateral inferior keel (L = 1/1; Cl = 1.0/1.0; RI = 1.0/1.0; Wt= 10/10; Fit= 10.0/10.0): 0, absent. 1, present (Figs. 30-31).

Sphaerobothria hoffmani and some Aphonopelma species, like A. seemani, have a denticulate row in the basal half of prolateral inferior keel. This was not considered here as homologous to the denticulate row present in Eupalaesthesia, Phormictopus and A. sternalis (character 11) because they are located in distinct regions on the male palpal bulb (Berti, in press).

8 – Distal embolus shape (L = 2/2; Cl = 1.0/1.0; RI = 1.0/1.0; Wt= 10/10; Fit= 10.0/10.0): 0, embolus apex with a conical shape, retralateral region slightly convex (Figs. 6-7). 1, embolus apex slightly laterally flattened, the retralateral region is slightly concave under and above the retralateral keel (Figs. 8-9). 2, embolus apex very flattened laterally, giving it a concave/convex general appearance; retralateral side very concave under and above the retralateral keel (Figs. 10-13), or only one concave region when the retralateral keel is absent (Figs. 14-15).

Theraphosinae has pleisiomorphically the embolus conical. In the clade Eupalaesthesia + Proshapalopus + Lasiodora + Nhandu + Vitalius the embolus apex is slightly laterally flattened, characterized by concave areas above and under the retralateral keel. In the sister-group of Nhandu + Vitalius this region becomes flatter, resulting in a concave/convex, spoon-like shape. Ordered.

9 – Prolateral inferior keel (L = 1/1; Cl = 1.0/1.0; RI = 1.0/1.0; Wt= 10/10; Fit= 10.0/10.0): 0, present (Fig. 75). 1, absent (Fig. 159).

Prolateral keels are present in all theraphosine genera, with the exception of Euathlus (Berti, in press). The prolateral superior keel is normally well developed, constituting the superior embolus edge. In contrast, the prolateral inferior keel is normally dimunute and, in Theraphosa, it is completely absent (Berti, in press).

10 – Male palpal bulb ventral median area (L = 3/3; Cl = 0.33/0.33; RI = 0/0; Wt= 0/0; Fit= 6.0/6.0): 0, normal, or with a slight depression at ventral median area. 1, male palpal bulb with a pronounced depression at the ventral median area (D) (Figs. 68-69).

This character is considered here a synapomorphy of Proshapalopus with a reversion in P. anomalus and an homoplasly in Vitalius lucasae, instead of independent gains in P. amazonicus, P. multicuspidatus, and Vitalius lucasae, a similar parsimonious possibility. Thus, it was considered a ACCTRAN (procedure that ACCELERATES the evolutionary TRANSformation of a character, Swoford & Maddison, 1987), optimization which prioritizes an anterior appearance of the apomorphic condition and reversions to the pleisiomorphic condition. It occurs also out of the group of study, as for example, in Thrrixopelma pruriens Schmidt 1998.

11 – Male palpal bulb with long subapical row of denticles (SA), reaching more than half of the bulb embolus length (L = 3/3; Cl = 0.33/0.33; RI = 0.33/ 0.33; Wt= 1/1; Fit= 6.0/6.0): 0, absent. 1, present (Fig. 50-51).

This denticulate row has the same position of the subapical row of the keel, and was considered its primary homologous (Berti, in press). However, because of the morphological differences between them, they were codified separately as a way of testing its secondary homology. According to the results, the most parsimonious option is to consider it as a synapomorphy of the species of Eupalaesthesia and of the clade Phormictopus + Acanthoscruria, with reversion in Acanthoscruria geniculata. It could be considered also an independent acquisition in Phormictopus cancerides and in Acanthoscruria sternalis. However, the majority of Acanthoscruria species has a very modified male palpal bulb, suggesting a basal position of A. sternalis in relation to the other Acanthoscruria species and thus the denticulate row absence is probably a derived character of other Acanthoscruria species.

12 - Male palpal bulb with prolateral superior keel and apical keel apically fused. (L=1/1; Cl=1.0/1.0; RI=1.0/1.0; Wt=10/10; Fit=10.0/10.0): 0, Prolateral superior keel and apical keel not completely fused. 1, Prolateral superior keel and apical keel completely fused (Figs. 158-159).

Synapomorphy of Theraphosa.

13 – Male spur shape (L = 4/4; Cl = 0.75/0.75; RI = 0.88/0.88; Wt= 6/6; Fit= 7.5/7.5): 0, Two straight branches originate from a common base, the retralateral branch is slightly narrow in its median region (Fig. 141). 1, Two convergent branches originate from a common base, tapering distally, the prolateral branch is thickened (Fig. 97). 2, Two straight branches originate from a common base, the retralateral lacks a median narrowing (Fig. 153). 3, Two convergent branches which do not originate
from a common base, the retrolateral having a median narrowing (Fig. 38).

Extremely homoplasious character. State 1 is a synapomorphy of the clade with all Vitalius species except V. lucasae, occurring also as a homoplasy in Proshapalopus multicuspidatus. State 2 is a synapomorphy of the sister group of Nhandu + Vitalius. State 3 is an autapomorphy of Cyrtopholis portoricae. In the species N. carapoenis, V. vellutinus, V. roseus, and Theraphosa blondi the spurs are absent or reduced and thus this character was codified as “non-comparable”.

14 – Male spur (L = 3/3; CI = 0.66/0.66; RI = 0.50/0.50; Wt= 3/3; Fit= 7.5/7.5): 0, present, normal size (Fig. 97), 1, present, very reduced (Fig. 108-111), 2, absent (Fig. 129).

In Theraphosinae the condition “males with a well-developed two branch spur” seems to be primitive, because it is present in all basal theraphosine genera according to the cladogram of Pérez-Miles et al. 1996. They are absent in some species such as Theraphosa blondi, Nhandu carapoenis, Sericopelma spp. and, only one branch is present in other species such as Acanthoscurria spp. and Schizopelma bicarinatum F. O. P. -Cambridge, 1897.

In V. vellutinus and V. roseus these spurs suffer variation, from weakly developed to vestigial (Figs. 108-111). They are always small and normally are not easily seen for they are covered by long tibial hairs which project themselves over the spurs. Surely it was this reduced size that led Büchler (1957) to identify specimens of these species as pertaining to Sericopelma, genus which does not have male spurs. He identified other specimens, showing slightly larger spurs, as Pamphobeteus roseus (sensu Büchler, 1947a). Many specimens of Vitalius vellutinus with vestigial spurs housed in the IBSP collection were identified by Büchler as “Sericopelma sp.”.

Because of the “generic value” assigned to this structure by some authors such as Büchler (1957), many species were considered distinct from some close forms and included in distinct genera. Thus, the genera Theraphosa and Nhandu were diagnosed mainly because of the absence of spurs. However, as a result of the present analysis it is clear that the absence of spurs are only autapomorphies of the species N. carapoenis and T. blondi.

15 – Flexion of metatarsus I of males (L = 7/7; CI = 0.28/0.28; RI = 0.28/0.28; Wt= 0/0; Fit= 3.7/3.7): 0, touching the side of the retrolateral branch (Fig. 83), 1, touching the apex of the retrolateral branch (Fig. 58), 2, closing between the two branches, thus contacting the inner face of both branches (Fig. 145).

This character shows variation in almost all analyzed groups. The state 0 is a plesiomorphy of the studied group and the state 1 is a synapomorphy of the clade Proshapalopus + Lasiodora + Nhandu + Vitalius + sister group of Nhandu + Vitalius. There is parallelism in S. hoffmani and a reversion, constituting a synapomorphy of Vitalius with parallelism in Proshapalopus multicuspidatus, Nhandu vulpinus, and Theraphosa apopsis. State 2 is a synapomorphy of Pamphobeteus + Xenesthis, as previously shown by Pérez-Miles et al. (1996), with some parallelisms in other groups not included in this study, as Homoeomma Ausserer, 1871 and Plesiopelma Pocock, 1901. For the species lacking spur, with reduced spur, or with one-branched spur, this character was codified as “non-comparable”.

16 – Number of male spur branches (L = 1/1; CI = 1.0/1.0; RI = 1.0/1.0; Wt= 10/10; Fit= 10.0/10.0): 0, two branches (Fig. 34), 1, one branch (Fig. 41).

Synapomorphy of Acanthoscurria, with homoplasies in other genera not included in the analysis, as Schizopelma. For species lacking spur it was codified as “non-comparable”.

17 – Fusion of the spermatics (L = 3/3; CI = 1.0/1.0; RI = 1.0/1.0; Wt= 10/10; Fit= 10.0/10.0): 0, spermatics separated (Fig. 54), 1, spermatics fused in a small area (Fig. 59), 2, spermatics widely fused, but still presenting vestiges of the two spermatics in the distal region (Fig. 146), 3, spermatics completely fused, there is no vestige of the two spermatics (Fig. 154).

The semicircular spermatics of Brachypelma was considered to be primitive (Smith, 1995), perhaps, due to its “simplicity”. However, the semicircular spermatics is clearly a result of fusion, as can be seen in Pérez-Miles et al. 1996 cladistic analysis of Theraphosinae. In this paper it was showed that a transformation series occurs from the primitive condition of two separated spermatics, to widely fused spermatics, to single semicircular spermatics, to single oval spermatics. This was followed here with some modifications. Distinctions were made between species presenting fused spermatics in a small area and widely fused spermatics.

State 1 is a synapomorphy of the clade Lasiodora ((Nhandu + Vitalius ((Pamphobeteus + Xenesthis) (Brachypelma + Theraphosa))). State 2 is a synapomorphy of the clade ((Pamphobeteus + Xenesthis) (Brachypelma + Theraphosa)) and state 3 is a synapomorphy of Brachypelma + Theraphosa. Ordered.
18 – Spermatheca shape (L = 1/1; CI = 1.0/1.0; RI = 1.0/1.0; Wt = 10/10; Fit = 10.0/10.0): 0, not subspHERic. 1, subspHERic (Fig. 42).

The subspHERic spermatheca shape seems to be a synapomorphy of Acanthoscurria (Pérez-Miles et al. 1996), with some possible reversions, such as in A. gomesiana (pers. obs.).

19 – Spermatheca length (L = 1/1; CI = 1.0/1.0; RI = 1.0/1.0; Wt = 10/10; Fit = 10.0/10.0): 0, short. 1, long, at least twice as long as the heavily sclerotized area (Fig. 138).

State 1 is a synapomorphy of the species N. vulpinus and N. coloratovillosus. In other theraphosine species there is some variation in the spermatheca length but they never reach the dimensions found in the derived condition.

20 – Spermatheca stalk (L = 1/1; CI = 1.0/1.0; RI = 1.0/1.0; Wt = 10/10; Fit = 10.0/10.0): 0, stalk narrower than spermatheca bulb (Fig. 134). 1, stalk as wide as spermatheca bulb (Fig. 130).

Synapomorphy of Nhandu carapoesiensis + N. vulpinus + N. coloratovillosus.

21 – Trochanteral stridulatory hairs (L = 1/2; CI = 1.0/0.5; RI = 1.0/0.66; Wt = 10/10; Fit = 10.0/10.0): 0, absent. 1, present (Fig. 26).

Synapomorphy of the genera Cyrtophilus + Phormictopus + Acanthoscurria.

22 – Coxal stridulatory hairs (L = 3/3; CI = 0.33/0.33; RI = 0.33/0.33; Wt = 1/1; Fit = 6.0/6.0): 0, absent. 1, present (Fig. 27).

Stridulatory hairs on the prolarateral side of coxa are present in species of theraphosine genera Lasiodora, Grammostola, Phormictopus, and Theraphosa. However, based on Pérez-Miles et al. (1996) cladogram, this presence is an independent acquisition. In Lasiodora these hairs are present on the prolarateral face of the coxae, in the area of the converging sutures, being more visible on the coxae I and II. The hairs are reddish and surpass other short, slender, and more numerous hairs (fig. 27). In the other taxa examined, other hairs were found in the same position, which are, however, shorter and less numerous. Another more elaborated morphological analysis between these two kinds of hairs should be necessary to confirm the homology between them. The great hair development is considered in this study as a derived character, as occurs in species of Lasiodora, Grammostola, Theraphosa, and Phormictopus.

23 – Type III urticating hair in females (L = 4/4; CI = 0.25/0.25; RI = 0.75/0.75; Wt = 1/1; Fit = 5.0/5.0): 0, present (Fig. 2). 1, absent.

The presence of type III urticating hair was considered by Pérez-Miles et al. (1996) one of the theraphosine synapomorphies. It is present in the majority of theraphosine genera, including the basal ones, like Euathlus Ausserer 1875, Plesiopelma Pocock 1901, Homoeomma Ausserer 1871, Grammostola Simon, 1892, Paraphysa Simon, 1892, and Tmesiphantes Simon 1892.

In the analysis carried out here, type III urticating hair is considered a synapomorphy of the clade with all analyzed genera, except for Aphonopelma and Sphaerobothria. However, the genus used to root the tree was Aphonopelma, that does not have this hair type, causing an inversion in the character polarity. The absence of type III urticating hair in females of Vitalius species is a synapomorphy of this genus, with parallelisms in Nhandu carapoesensis and Proshapalopus amazonicus.

24 – Type I urticating hair morphology (L = 1/1; CI = 1.0/1.0; RI = 1.0/1.0; Wt = 10/10; Fit = 10.0/10.0): 0, “A” region longer or as long as the “B” region (Fig. 4). 1, “A” region shorter than “B” region (Fig. 3).

Synapomorphy of Proshapalopus anomalus and P. multicuspidatus. Codified as “non-comparable” for Theraphosa because it lacks type I urticating hair.

25 – Type I urticating hair (L = 1/1; CI = 1.0/1.0; RI = 1.0/1.0; Wt = 10/10; Fit = 10.0/10.0): 0, present (Fig. 3). 1, absent.

The presence of type I urticating hair is a plesiomorphy for the studied group and its absence is a synapomorphy of Theraphosa.

26 – Tibiae IV (L = 3/3; CI = 0.33/0.33; RI = 0.33/0.33; Wt = 1/1; Fit = 6.0/6.0): 0, normal. 1, thickened (Fig. 20).

Character traditionally considered a synapomorphy of Eupalaestrus (Pocock, 1901). Some homoplacies occur in other non-related taxa from other theraphosid subfamilies (Pérez-Miles, 1992b).

It was considered here a synapomorphy of Eupalaestrus with parallelisms in Proshapalopus amazonicus and Vitalius lucasae.
27 – Color pattern (L = 2/2; CI = 0.5/0.5; RI = 0.66/0.66; Wt= 3/3; Fit= 7.5/7.5): 0, variable, commonly a homogeneous black or dark brown. 
1, carapace dark brown with the thoracic region gradually lighter, femure black, patellae, tibiae, and metatarsi I and II laterally pinkish (Fig. 184, 185).

Synapomorphy of *Vitalius paranaensis* + *V. roseus* + *V. vellutinus* with parallelism in *P. multicuspidatus*.

28 – Male leg length and diameter (L = 3/3; CI = 0.33/0.33; RI = 0.33/0.33; Wt= 1/1; Fit= 6.0/6.0): 0, normal legs (Fig. 23). 1, long and narrow legs (Fig. 22).

Synapomorphy of *Proshapalopus anomalus* + *P. multicuspidatus* with parallelism in *V. buecherli* and *Cyrtopholis portoricae*.

29 – Female carapace marginal hairs (L = 2/2; CI = 0.5/0.5; RI = 0.75/0.75; Wt= 3/3; Fit= 7.5/7.5): 0, covered with short marginal stiff hairs, pointing out (Fig. 16). 1, covered by long marginal soft hairs, many pointing to the inner carapace region (Fig. 17).

Synapomorphy of *Nhando*, with parallelism in *V. sorocabae*.

30 – Female carapace hair covering (L = 2/2; CI = 0.5/0.5; RI = 0.75/0.75; Wt= 3/3; Fit= 7.5/7.5): 0, short hairs, mainly on the cephalic region (Fig. 16). 1, very long, curly, scattered hairs, mainly on the cephalic region (Fig. 18).

The morphologies of hairs covering theraphosid body have not been extensively studied yet and thus they have been poorly used in taxonomy and systematics. The carapace of the studied species is covered by hairs that exhibit distinct morphology and which are, probably, non-homologous. On the cephalic region many short hairs were found in almost all studied species. Females of some species, however, have some long, scattered, curly hairs sometimes reaching more than 5 mm in length. The great development of these hairs in females is considered a synapomorphy of *Nhando* with parallelism in *P. amazonicus*.

31 – Male palpal tibia retrolateral process (L = 1/1; CI = 1.0/1.0; RI = 1.0/1.0; Wt= 10/10; Fit= 10.0/10.0): 0, absent. 1, present.

Synapomorphy of *Acanthoscurria* + *Phormictopus*. Considered a synapomorphy of *Cyrtopholis* + *Phormictopus* + *Acanthoscurria* by Pérez-Miles *et al.* (1996), this retrolateral process was not found on the examined specimen of *Cyrtopholis portoricae*. Because only one species was examined it is possible that a interspecific variation on this character occurs among other *Cyrtopholis* species.

32 – Spine row on the male dorsal palpal tibia apex (L = 1/1; CI = 1.0/1.0; RI = 1.0/1.0; Wt= 10/10; Fit= 10.0/10.0): 0, male dorsal palpal tibia apex without a row of spines. 1, male dorsal palpal tibia apex with a row of 5 or more spines (Fig. 24).

Synapomorphy of *Proshapalopus anomalus* + *Proshapalopus multicuspidatus*.

33 – Spines on the male palpal tibia apex (L = 6/6; CI = 0.16/0.16; RI = 0.28/0.28; Wt= 0/0; Fit= 3.7/3.7): 0, 1 to 3 scattered apical prolateral spines. 1, 5 or more apical prolateral closely positioned spines (Fig. 25).

Homoplasicous character, it is a synapomorphy of *Eupalaestra* and *Nhando vulpinus* + *Nhando coloratovillosus*, with a parallelism in *Acanthoscurria sternalis*, *Proshapalopus amazonicus*, *Vitalius roseus*, and *Vitalius longisternalis*.

34 – Male metatarsus I (L = 6/6; CI = 0.16/0.16; RI = 0.28/0.28; Wt= 0/0; Fit= 3.7/3.7): 0, straight. 1, curved.

Male metatarsus I curved is a synapomorphy of the clade *Lasiodora* + *Nhando* + *Vitalius* + sister group of *Vitalius + Nhando*, with parallelism in *Phormictopus cancerides* and reversions in *Nhando parapoenisis*, *Pamphobeteus* sp. and *Theraphosa*. The reversion to the plesiomorphic state is a synapomorphy of the clade *Vitalius* except for *Vitalius lucasae*.

35 - Scopulae on the retrolateral femora IV face (L=3/3; CI=0.33/0.33; RI= 0.33/0.33; Wt= 1/1; Fit= 6.0/6.0): 0, absent. 1, present.

This character is considered here a synapomorphy of the clade with all analyzed genera except for *Aphonopelma* and *Sphaerobothria*, with reversions in *Cyrtopholis* and *Brachypelma*. Another equally parsimonious option is independent gains in *Phormictopus* + *Acanthoscurria* and in the clade *Eupalaestra* + *Proshapalopus* + *Lasiodora* + *Vitalius* + *Nhando*.
+ the sister group of Vitalius + Nhando and reversion in Brachypelma (ACCTRAN optimization, Swofford & Maddison, 1987).

Discussion

Searches having characters 2, 4, 8, and 17 ordered yielded 2 trees under equal weights (Hennig 86 and Nona), 1 tree under successive weights (Hennig 86) and 1 tree under implied weights (Pee-Wee, concavities 3 to 6); for Nona and Pee-Wee it was used both Amb= and Amb-options. The tree showed in fig. 164 (length 87, ci 50, ri 76) was found as one of the options by Hennig86 and Nona as well as the only tree found by Pee-Wee (length 86, fits 275.6 for k=3, 286.8 for k=4, 295.2 for k=5, and 301.4 for k=6). The only tree found under successive weights in Hennig86 (length 306, ci 83, ri 94) differs only in the resolution of the clade having the “spoon-like” embolus species, where Xenesthis and Pamphobeteus collapsed in a 3-tomy with a clade having Brachypelma + Theraphosa. The other two trees found by Nona and Hennig86 show Cyrtopholis as the sister group of all taxa except Aphonopelma + Sphaerobothria in Nona, or collapsed in a 3-tomy with the clade with Phormictopus + Acanthoscurria and the clade with all other genera in Hennig86. Pee-Wee at concavity functions of 1 and 2 found 24 trees with amb= option (length 89, fits 230.3 and 258.1) and 41 trees with amb= option (length 89, fits 230.3 and 258.1). The strict consensus tree is equal to the tree showed in fig. 164, except by the clade having Vitalius + Nhando species. This clade resulted totally collapsed except by the clade N. cerradensis (N. carapoenis (N. vulpinus + N. coloratovillosus)) and the clade V. paraanensis (V. roseus + V. vellutinus). In all resolutions Vitalius was shown as paraphyletic.

For all characters unordered 18 trees were found using Hennig 86 under equal weights (length 85, ci 51, ri 75), 7 trees in Hennig 86 under successive weights (length 310, ci 85, ri 95) and 4 trees in Nona under equal weights (length 85, ci 51, ri 75). Pee-Wee at concavity functions from 3 to 6 found 1 tree under “amb=” setting and 6 trees under “amb=” setting (length 84, fits 279.6 for k=3, 290.2 for k=4, 298.1 for k=5, and 303.9 for k=6). At concavity functions 1 and 2, 24 trees were found under “amb=” setting (length 87, fits 263.1 to k=2 and 237.0 to k=1). Under “amb=” setting and concavity function 1, more than 139 trees were found; and, at concavity function 2, more than 179 trees were found (length 87, fits 263.1 for k=2 and 237.0 for k=1). Differences in tree topologies found under equal weights (Hennig86 and Nona), successive weights (Hennig86) and implied weights (Pee-Wee at concavity functions 3 to 6) involved the position of Cyrtopholis, the Phormictopus + Acanthoscurria clade, and the “spoon-like” embolus clade. In some trees Cyrtopholis appeared as sister group of all taxa except Aphonopelma + Sphaerobothria (Hennig86, Nona) or as sister group of Phormictopus + Acanthoscurria (Hennig86, Nona), swapping this position with the “spoon-like embolus” group. Other resolutions refers to different rearrangements inside the “spoon-like” embolus group clade. The strict consensus of the trees differed only in the position of Cyrtopholis which appear either in a monophyletic group together with Phormictopus and Acanthoscurria when using successive or implied weights or collapsed in a 4-tomy when using equal weights (fig.165).

The Pee-Wee at concavity functions 1 and 2 had a similar effect as to the ordered analysis, i.e., Nhando and Vitalius appeared as paraphyletic in an almost totally collapsed clade. Otherwise the topology is the same as the one found with concavity functions from 3 to 6.

Thus, the main differences found in the present analysis are those concerning ordering or not the characters 2, 4, 8 and 17. If considering them as ordered, the clade with Theraphosa, Brachypelma, Pamphobeteus and Xenesthis appear as sister group of Nhando + Vitalius (fig. 164), otherwise it is collapsed in a 4-tomy with Cyrtopholis and the clades having Phormictopus + Acanthoscurria and the one having Eupalaeastus, Proshapalopus, Lasiodora, Vitalius and Nhando (fig. 165).

Decisions in ordering or not a multistate character has not reached yet a consensus among cladists. In one of these approaches Hauser & Presch (1991) analyzed the effect of ordering or not the characters in 27 published cladograms for different organisms, from plants to turtles, then concluding: “It has been suggested that hypotheses of character state order are more informative than hypotheses of unordered and may restrict the number of equally parsimonious trees as well as increase resolution. Our results indicate that ordered characters can produce more, equal or less equally parsimonious trees and can increase, decrease or have no effect on tree resolution”. However, these authors made their study on multistate characters considering them either totally ordered or unordered without taking into account indication of connection among the different states or not. In so doing, they ordered characters that probably have no indication of connection between the different states, perhaps even characters with weak evidence of primary homology (sensu Pinna, 1991). The analysis carried out here resulted in a more resolved cladogram when considering multistate characters as ordered than when considering them as unordered, because more information, based on
evidences of homologies, are available and compatible with the trees topologies. Discarding that information would be as unjustified as would be discarding any other kind of evidence, including discarding the evidence about the homology of all the states included in that multistate characters (N. I. Platnick, pers. comm.).

Anyway, to make things clear, the trees with ordered and unordered multistate characters are presented in figs. 164 and 165, though the discussion about relationship and zoogeography below is made based on the more resolved cladogram presented in fig. 164.

The genus Vitalius is considered monophyletic based on the following synapomorphies: absence of type III urticating hair on the dorsum of the abdomen in females; and metatarsus I, in males, laterally touching the retrolateral branch of the male spur when flexed. These characters show parallelism with species in other close genera, and it was clear from the beginning of the analysis a conflict involving the clade with Nhandu and the one with Vitalius species. There is a parallelism of the character 3 (synapomorphy of Nhandu) with the clade V. dubius + V. buecherlii, of the character 29, also a synapomorphy of Nhandu, with V. sorocabae; and, a reversion of the character 1 (synapomorphy of Vitalius + Nhandu) in the branch V. wacketi + V. longisternalis.

Vitalius species are morphologically very homogeneous. The lack of available characters to be used in the cladistic analysis resulted in an unresolved internal 4-tomy. The only species which distinguishes easily from the others, Vitalius lucasae, is the sister group of all other species in this genus. It shares some homoplasies with species of other genera, as for example, an accentuated ventral median depression on the male palpal bulb and thickened tibia IV. The species V. roseus, V. vellutinus and V. paraenaensis were considered formerly to be one species (V. roseus, Büchner, 1947a). It is separated here into three species, based on differences in male genitalia and geographic distribution. Females are virtually identical. Ironically, the only synapomorphy supporting the clade (V. paraenaensis (V. vellutinus + V. roseus)) is the color pattern, that is, while the basal species V. paraenaensis suffered only small morphological changes, the species V. vellutinus and V. roseus had more conspicuous changes in male spur and male palpal bulb morphology. The relationship between these two species, however, is weakly supported since they only share the character “male spur very reduced”.

Nhandu, the sister group of Vitalius, has, as synapomorphies, the male palpal bulb embolus tip thickened and the hair type covering the female carapace. The two genera share the shortened embolus and a well-developed subapical keel.

The sister group of Vitalius + Nhandu comprises species very distinct morphologically and geographically. This group, represented here by four genera, Brachypelma, Theraphosa, Pamphobeteus, and Xenesthis, is distributed from México to the north of South America and has great morphological modifications, mainly in genitalia, such as the loss of subapical keel, the laterally very flattened embolus, the well-developed apical keel, and the spermathecae receptacles widely fused. This clade shares with Nhandu + Vitalius a well-developed apical keel.

The sister group of this clade is Lasiodora, which has as synapomorphy the presence of stridulatory hairs on the prolateral side of coxae I and II. Lasiodora shares with the previous clade the characters receptacles fused in a narrow area and the retrolateral keel well-developed, sharp.

The monophyly of Proshapalopus is based on the presence of a prolateral accessory keel and, probably, in the presence of an accentuated ventral median depression on the male palpal bulb, with reversion in the species P. anomalus. Proshapalopus is the sister group of the clade Lasiodora + Vitalius + Nhandu + sister group of Vitalius + Nhandu, sharing the synapomorphies presence of a small subapical keel having triangular shape and metatarsus I touching the apex of the retrolateral branch when flexed.

The monophyly of Eupalaestrus is based on the presence of a thickened tibia IV (with homoplasies in P. anomalus and V. lucasae); and presence of a denticulated row on male palpal bulb (with homoplasies in Acanthoscurria and Pharmacopus). Eupalaestrus shares with its sister group the presence of retrolateral keel and an embolus slightly flattened distally.

3.3 - Zoogeography

Large series of theraphosids housed in scientific collections are rare, perhaps because of the difficulty in collecting cryptic animals that live mainly inside burrows or under rocks or logs, and only under special conditions it is possible to collect more than a few individuals. Thus, reports on geographic distribution of theraphosid species have only very fragmented information and in the majority of papers only the type localities were recorded. On the other hand, some wide distributions cited for some species or genera are in general based on the examination of a few misidentified individuals or on erroneous published
records. Thus, the high number of specimens examined in this work, comprising mainly areas of southeastern Brazil which were thoroughly sampled, can furnish valuable data for understanding theraphosid zoogeography. The species studied here show high endemicity, and geographic distributional overlapping or geographic paralogous distribution Nelson & Ladiges, 1996) occurred only in species of Euopalaestraus and Proshapalopus with Lasiodora, Vitalius, and Nhandu (compare Figs. 172 and 174). In the clade Lasiodora + Vitalius + Nhandu + sister group of Vitalius + Nhandu, here represented by Pamphobeteus + Xenesthis + Brachypelma + Theraphosa, there was overlapping only on marginal distribution of the areas (Fig. 174).

The following areas of endemism were found (Figs. 166-174):

Forest environments: Amazon Forest - extreme northeast of State of Pará together with the northwest of the State Maranhão (N. vulpinus) (Fig. 168); river Araguaia Valley, from State of Mato Grosso do Sul to south of State of Pará (N. coloratovillosus) (Fig. 168); north of State of Mato Grosso together with south of State of Pará (P. amazonicus) (Figs. 166, 172). Atlantic Forest - south of State of Bahia to State of Paraiba (P. multicuspidatus) (Figs. 166, 172); mountain range, from south of State of Rio de Janeiro to Rio Doce area, in State of Espirito Santo, including extreme east of State of Minas Gerais (P. anomalous) (Figs. 166, 172); “planalto occidental” of State of São Paulo (V. vellutinus) (Figs. 171, 173); “Serra da Mantiqueira” (V. dubius) (Figs. 170, 173); “Serra da Paranapiacaba” (V. buecherli) (Figs. 170, 173); coastal range, from south of State of Rio de Janeiro to south and center of State of Paraná together with center and south of State of Santa Catarina (V. wacketi) (Figs. 169, 173); center and west of State of Rio Grande do Sul (V. roseus) (Figs. 171, 173).

Open environments (corresponding to the savanna-like environment “cerrado” and open field “campo”): north of State of Goiás (N. cerradensis) (Fig. 168); peripheric depression in east boundary of Paraná basin (V. sorocaba) (Figs. 169, 173); Uruguai, together with extreme southwest of State of Rio Grande do Sul in Brazil and northeast of Argentina (E. weijenberghi) (Figs. 166, 172). The distribution of N. carapoensis (Fig. 168) and E. campestratus (Figs. 166, 172) overlaps in Paraguay, and in the Brazilian State of Mato Grosso do Sul, extreme south of State of Mato Grosso, and State of São Paulo. E. campestratus has a wider distribution through northeast of Argentina and Brazilian States of Paraná, Santa Catarina, and Rio Grande do Sul.

Some biogeographical patterns found here are in agreement with published data found for other neotropical faunal elements, as for example, a clear disjunction separating a larger northwestern track versus a southeastern track (Amorim & Pires, 1996). The northern track is a region including Central America, the northwestern portion of South America, and the east of the Amazon east of Amazonas River in State of Pará, Brazil (Fig. 174) (Amorim & Pires, l. c.). This agrees with the geographical distribution of the sister group of Vitalius + Nhandu, represented here by the genera Theraphosa, Pamphobeteus, Xenesthis, and Brachypelma but also including Megaphobema and Sericopelma. Surprisingly, none of the species included in this group seem to occur in the southeastern track including the Atlantic Forest as well as the Amazon Forest of east of Rondônia to the east following the right margin of the Amazon River to the south of the State of Pará, which agrees with Amorim & Pires (1996). The vicariation event responsible for such a separation seems to have been the division of Amazon by a lake along the Amazonas/Madeira/Mamoré Rivers in Late Cretaceous (Amorim & Pires, 1996).

The southeastern track comprises the clade Vitalius + Nhandu which are distributed on the Atlantic Forest from the southeastern Brazil (Vitalius) or on Amazonian Forest of southeastern State of Pará together with western State of Maranhão and to the south following the ciliary vegetation along the Araguaia River valley (Nhandu). Besides these, there are two other Nhandu species from open areas of central western Brazil and Paraguay.

Lasiodora, the sister group of the clade ((Vitalius + Nhandu) ((Xenesthis + Pamphobeteus) (Brachypelma + Theraphosa))) is also found only in the Atlantic Forest of northeast and part of southeast and central western Brazil, or if in open areas, following ciliary vegetation along rivers (pers. obs.) (Fig. 174). This pattern is also shared with other faunal elements, but there is no agreement about the event responsible for such division (Amorim & Pires, 1996).

The Vitalius species distribution (Fig. 173) seems to be related with historical geological events which took place in Brazilian south and southeastern regions in the past, i.e. the formation of the Serra do Mar and Serra da Mantiqueira mountain systems through tectonic activity from the Oligocene to the Pleistocene and the formation of the “peripheric depression in east boundary of Paraná basin” along the Terciary and Quaternary (Ross, 1996). Fig. 173 shows a west-east view of the State of São Paulo where geomorphology, vegetation and geographic distribution of Vitalius species are superimposed and is congruent with this hypothesis. Some slight dispersal events seem to have occurred posteriorly because of presence of marginal sympathy occurring between these species.
The genera *Proshapalopus* and *Eupalaestrus* have a similar distribution to the genera *Vitalius*, *Nhandu* and *Lasiodora* because they also only occur on the southeastern track (Fig. 172). *P. amazonicus* shows a very discontinuous distribution from the sister group formed by *P. anomalus* + *P. multicuspidatus*. The area between these two disjoint distributions is presently covered by a corridor of open vegetation. There is some agreement that this area suffered climatic oscillations between xeric and mesic climates associated to glacial and interglacial periods during the Quaternary (Abé Sáber, 1977; Vivo, 1997) and thus the Atlantic Forest was sometimes connected with the Amazon. Then, it is possible that the absence of specimens of *Proshapalopus* in this area is due to extinction which resulted from environmental changes in the present open environment.

*Eupalaestrus campestratus* and *E. weijenberghi* have overlapping distributions with *N. carapoensis* in some open areas of Paraguay and of States of Mato Grosso do Sul and São Paulo, Brazil (Figs. 172; 174). There is overlapping also with *Vitalius longisternalis*, *Vitalius roseus*, and *V. paraanaensis* (compare Figs. 172 and 174) in southern Brazil. However, southern Brazil is a mosaic of open and forested areas (IBGE, 1977), and *Eupalaestrus* species seem to be restricted to open areas, while the three *Vitalius* species above live in forested regions. It is possible that, during the climatic oscillations of Quaternary described above, an ancestral *Eupalaestrus* species dispersed through this region during drier periods. The posterior expansion of the Atlantic Forest in more recent periods could have been followed by an ancestral *Vitalius* species dispersion, and thus, the species from these genera had different evolutionary stories and live, nowadays, in very close distinct regions.

4 - Systematics

**Eupalaestrus Pockock**


**Phormictopus**: Smith, 1986:165 (in part).

**Diagnosis** - Males and females of *Eupalaestrus* can be distinguished from species of other theraphosine genera except *Proshapalopus amazonicus* and *Vitalius lucasae* by the presence of thickened tibiae IV (Fig. 20). Males can be distinguished from *P. amazonicus* and *V. lucasae* by the presence of a denticulate row on the male palpal bulb (Figs. 50-51) instead of a subapical triangular keel (Figs. 60-61); females can be distinguished from these species by the presence of type III urticating hair (Fig. 2) (*Eupalaestrus campestratus* and *Eupalaestrus weijenberghi*) or by the presence of thickened metatarsus IV dorsally covered by many stiff setae (Fig. 19) (*Eupalaestrus spinosissimus*).

**Description** - The genus was redescribed by Pérez-Miles (1992a).

**Constitution**: three South-American species.

**Eupalaestrus campestratus** (Simon)

Figs. 48, 50-51, and 34


**Lasiodora campestrata**; Simon, 1897:1.


**Eupalaestrus tenuitarsus** Büchler, 1947b:301, figs. 1-3 (holotype female IBSP 612, paratypes females IBSP 86, 90, 91, 110, 653 and males IBSP 502 and 607 from Taunay, Mato Gros-


**Diagnosis** - Males and females can be distinguished from other species by the dorsoventrally thickened femur III (Pérez-Miles, 1992a).

**Description** - Male (IBSP 1911) - Total length: 44.7 Carapace: length 26.5, width 15.5. Eye tubercle: length 2.40, width 2.65. Labium: length 2.65, width 3.57. Sternum: length 10.62, width 8.46. Fovea short, deep, recurved. Cheliceral basal segments with 11-13 teeth. Legs 1: femur 15.7 / patella 8.2 / tibia 11.7 / metatarsus 11.1 / tarsus 7.5 / total 54.2 / II: 14.2 / 7.9 / 10.0 / 11.2 / 7.3 / 50.6 / III: 13.3 / 7.3 / 9.2 / 12.9 / 7.9 / 50.0 / IV: 16.5 / 8.1 / 13.3 / 19.5 / 9.9 / 66.7. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 2, tibia v1-2-2, ap1-2-1, r0-1-2; legs I femur 0-0-2, patella 0, tibia v1-2-1, p1-1-1, r1-2-0, metatarsus v1-0-3ap, p0-1-0, r0-1-0; II femur p0-0-2, patella 0, tibia v1-2-2ap, p1-1-1, metatarsus v2-3-2ap, p0-1-0, r0-1-0; III femur p0-0-1, r0-0-1, patella 0, tibia v1-3-3ap, p0-2-1, r0-3-0, metatarsus v3-2-4ap, p1-1-2, r0-1-1; IV femur r0-0-1, patella 0, tibia v0-2-2ap, p1-1-1, r1-1-1, metatarsus v18, p0-1-0, r1-1-0. Male spur branches straight, originating from a common base, the retrolateral constricted in the middle (Fig. 48). Metatarsus I straight, when flexed touches the retrolateral branch laterally. Male palpal bulb pyriform, embolus long, slightly flattened laterally at the distal region. Prolateral keels present, the PS forming the embolus edge distally. Prolateral accessory keel absent. Present, not pronounced. A small. SA represented by a denticle row extending by more than half of the embolus length (Figs. 50-51). Types I and III urticating hairs present (Figs. 2.4). Tibia IV thickened (Fig. 20). Carapace laevigated by short slender hairs; bordered by short hairs pointing out (Fig. 16). Sternum, coxae, and legs ventrally covered by many long hairs. Carapace and legs black, with many whitish hairs. Sternum and coxae grayish. Leg rings very distinct on the apex of femora, patellae and tibiae. Longitudinal stripes on the patellae and tibiae very distinct.

**Female (IBSP 1863)** - Total length: 50.7. Carapace: length 19.4, width 16.4. Eye tubercle: length 2.07, width 2.98. Labium: length 2.65, width 3.32. Sternum: length 11.28, width 9.13. Fovea short, deep, slightly recurved. Cheliceral basal segments with 10-10 teeth. Legs 1: femur 13.5 / patella 8.2 / tibia 9.2 / metatarsus 8.4 / tarsus 5.6 / total 44.9 / II: 12.3 / 7.2 / 7.5 / 7.5 / 4.5 / 39.0 / III: 11.4 / 7.1 / 7.3 / 9.0 / 5.6 / 40.4 / IV: 14.9 / 8.1 / 10.9 / 14.6 / 6.5 / 55.0. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-3ap, p0-2-2; legs I femur p0-0-1, patella 0, tibia v0-0-2ap, metatarsus v0-0-3ap; II femur p0-0-1, patella 0, tibia v0-0-2ap, p1-1-0, metatarsus v1-0-3ap, p0-0-1; III femur p0-0-1, r0-0-1, patella 2, r1, tibia v4-1-2ap, p1-2-1, r0-1-1, metatarsus v4-1-3ap, p1-2-1, r0-1-1; IV femur r0-0-1, patella 1, tibia v0-2-3ap, p0-1-1, r1-1-1, metatarsus v19, p0-1-1, r0-1-1. Spermatotheca short, separated by a weakly sclerotized area. SS narrower than SB (Fig. 54). Type I and III urticating hairs present (Figs. 2.4). Tibiae IV strongly thickened (Fig. 20). Color and hair pattern as in male.

**Distribution** - Brazil: Brazilian “pantanal matogrossense” and Brazilian “campos” and “cerrados” from the States of Mato Grosso, Mato Grosso do Sul, São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul. Paraguay: Chaco; and probably northeastern Argentina (Fig. 160, 172).

**Records:**

*Mato Grosso:

Rondonópolis, 1♀ (IBSP 6890); *Mato Grosso do Sul:

Coxim, 1♂ (IBSP 4149), 1♂ (IBSP 6539);

Albuquerque, 1♂ (IBSP 6541); Agachi, 2♀ (IBSP 201); 3♀ (IBSP 225), 4♀ (IBSP 292), 4♂ (IBSP 357), 4♀ (IBSP 360), 4♀ (IBSP 391), 3♀ (IBSP 401), 4♀ *9IBSP 407*, 2♀ (IBSP 1063A), 1♀ 1♂ (IBSP 1203), 1♂ (IBSP 2939), 1♂ (IBSP 2941), 1♀ (IBSP 2942), 1♀ (IBSP 2943), 1♀ (IBSP 2944), 1♂ (IBSP 2945), 1♂ (IBSP 2946), 1♂ (IBSP 2947), 1♂ (IBSP 2948), 1♀ (IBSP 2949), 1♂ (IBSP 2950), 1♂ (IBSP 2951), 1♀ (IBSP 2952), 1♀ (IBSP 2953), 1♀ (IBSP 2954), 1♀ (IBSP 2955), 2♀ (IBSP 2964), 2♀ (IBSP 2967), 1♂ 3♂ (IBSP 2969), 2♀ (IBSP 2970), 1♀ (IBSP 2971), 4♀ (IBSP 2978), 1♀ (IBSP 2984), 3♀ (IBSP 2979), 1♀ (IBSP 2981), 1♀ (IBSP 2985), 1♀ (IBSP 2986), 1♀ (IBSP 2987), 1♀ (IBSP 2993), 1♀ (IBSP 2994), 4♀ (IBSP 2999), 2♀ (IBSP 3000), 1♂ (IBSP 3026); Miranda, Duque Estrada, 1♀ (IBSP 2977); Taunay, 1♀ (IBSP 90), 1♂ (IBSP 139), 1♀ (IBSP 653), 1♀ (IBSP 1862), 1♀ (IBSP 1863), 1♂ (IBSP 1864), 1♂ (IBSP 1865), 1♂ (IBSP 1911), 1♀ (IBSP 1912), 1♂ (IBSP 1913), 1♀ (IBSP 2271), 1♂ (IBSP 2982); Aquidauana, 1♀ (IBSP 1172), 1♂ (IBSP 2462), 1♂ (IBSP 6540); Palmeiras, 1♀ (IBSP 2062), 1♀ (IBSP 2063), 1♀ (IBSP 2064), 1♀ (IBSP 2065), 1♀ (IBSP 2252), 1♂ (IBSP 2255), 1♀ (IBSP 2346), 1♂ (IBSP 2347), 1♂ (IBSP 3165), 1♂ (IBSP 3166); Campo Grande, 1♀ (IBSP 1675), 4♂ (IBSP 4037A), 1♂ (IBSP 4037B), 1♂ (IBSP 4094), 1♂ (IBSP 4111), 1♂ (IBSP 4578), 1♂ (IBSP 4816), Campo Grande, IndúBrazo, 1♀ (IBSP 2933), 1♀ (IBSP 2934); Bodoquena, 1♀ (IBSP 2650); Bonito, 3♀ (IBSP 115); Nioaque, 1♂ (IBSP 2540), 2♂ (IBSP 4761), 1♂ (IBSP 4777); Bela Vista, 1♂ (IBSP 3810); Rio Brilhante, 1♀ (IBSP 2824), 1♀ (IBSP 2825), 1♀ (IBSP 2826), 1♀ (IBSP 2830), 1♂ (IBSP 2831), 1♀ (IBSP
Eupalaestrus weijenberghi (Thorell!)

*Euliodora weijenberghi* Thorell, 1894:31

*Pteriterpinella weijenberghi*; Gerschman de Pikelin & Schiapelli, 1978:86.


*Euypalaeus saltator*; Roewer, 1942:241.


**Diagnosis** - Can be distinguished from *E. campestratus* by the non-thickened femur III and from *E. spinosissimus* by the slender metatarsus IV (Pérez-Miles, 1992a).


12.7, *patella* 6.9, *tibia* 9.4, *metatarsus* 9.3; *tarsus* 5.7, 43.1, 11.5, 5.5, 8.0, 9.2, 5.4, 39.6, III: 10.8, 5.3, 6.9, 10.4, 5.8, 39.2, IV: 13.3, 5.8, 11.8, 16.0, 6.7, 40.3. Spines: tarsi lacking spines. Palpal femur p0-0,1, patella p1, tibia v2-1-0, p4-7.5, r0-1-3-1(ap); legs I femur p0-0,1, patella 0, tibia v1-1-3-1, p0-1-0, metatarsus v1-0-4-ap, p0-1-1, r0-1-0; II femur p0-0,1, patella 0, tibia v1-3-2-ap, p1-1-1, metatarsus v1-1-3-ap, p0-0-0-2, r0-1-1; III femur p0-0,1, r0-1-0, patella 1, tibia v4-2-4-2-ap, p1-1-2, r0-3-1-1, metatarsus v4-4-5-5-ap, p1-1-1, r0-1-1; IV femur r0-0-1, patella 1, tibia v8-2-4-2-ap, p1-1-1, r1-1-1, metatarsus v3-1, p0-1-1, r0-1-1. Male spur branches straight, originating from a common base, the retrolateral constricted in the middle (Fig. 49). Metatarsus I straight, when flexed touches the retrolateral branch laterally. Male palp bulb pyriform, embolus long, slightly flattened laterally at the distal region. Prolateral keels present, the PS forming the embolus edge distally. Prolateral accessory keel absent. R present, not pronounced. A small, SA represented by a denticulate row extending for more than half of the embolus length (Figs. 52-53). Types I and III urticating hairs present (Figs. 2.4). Tibia IV slightly thickened. Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs covered by many red short hairs. Carapace and legs dark brown, trochanters light brown. Sternum and coxae grayish. Leg rings distinct on the apex of femora, patellae and tibiae. Longitudinal stripes on the patellae and tibiae hardly distinct.

Female (IBSP 7980) - Total length: 37.1. Carapace: length 12.7, width 10.5. Eye tubercle: length 1.32, width 1.82. Labium: length 1.90, width 3.32. Sternum: length 7.2, width 5.6. Fovea short, deep, recurved. Cheliceral basal segments with 13-13 teeth. Legs I: femur 9.6, *patella* 5.9, *tibia* 6.8, *metatarsus* 6.0, *tarsus* 3.7; total: 32,0. II: 8.6, 6.8, 5.6, 5.5, 5.7, 28.4; III: 7.6, 4.6, 6.2, 3.9, 26.9, 4. IV: 10.3, 5.5, 8.2, 10.6, 4.3, 38.9. Spines: tarsi lacking spines. Palpal femur p0-0,1, patella 0, tibia v0-0-2-ap, p1-2-0; legs I femur 0, patella 0, tibia 0, metatarsus v0-0-1-ap; II femur 0, patella 0, tibia 0, metatarsus v0-0-3-ap; III femur 0, patella r1, tibia v0-0-1-ap, p1-1-1, r0-1-0, metatarsus v0-2-2-ap, p1-2-1, r0-1-1, IV femur 0, patella 0, tibia v0-1-1, r0-2-1, metatarsus v2-1, p0-1-1, r0-1-2. Spermatic sacs short, separated by a weakly sclerotized area. SS narrower than SB (Fig. 55). Type I and III urticating hairs present (Figs. 2, 4). Tibiae IV slightly thickened. Color and hair pattern as in male.

**Distribution** - Brazil: Brazilian “campos” from the extreme southwestern State of Rio Grande do Sul; Uruguay; central and eastern Argentina (Figs. 166, 172).

**Records** - Brazil, Rio Grande do Sul: Bororé,
Eupalaestrus spinosisimus Mello-Leitão
Figs. 19, 56-57


**Diagnosis** - Females can be distinguished from other species by lacking type III urticating hair; by the presence of thickened tibia and metatarsus IV which is covered dorsally by many stiff setae (Fig. 19); and, by the presence of many black spines on the prolateral coxa IV and retrolateral coxae II and III.

**Male unknown.**

_Female (IBSP 593) - Total length: 51.2. Carapace: length 17.4, width 13.8. Eye tubercle: length 2.49, width 3.07. Labium: length 2.24, width 3.40. Sternum: length 7.88, width 6.89. Fovea short, deep, slightly recurved. Cheliceral basal segments with 11-11 teeth. Legs I: femur 10.4 / patella 6.1 / tibia 7.7 / metatarsus 7.3 / tarsus 4.8 / total 36.3 / II: 10.4 / 6.3 / 7.4 / 7.8 / 5.0 / 36.9 / III: 9.8 / 6.2 / 7.0 / 7.7 / 4.8 / 35.5 / IV: 12.8 / 6.6 / 10.8 / 12.1 / 5.1 / 47.4. Spines: tarsi lacking spines. Palpal femur 0, patella 0, tibia v0-0-4ap, p0-0-1; legs I femur p0-0-1, patella 0, tibia v0-0-3ap, metatarsus 6; II femur p0-0-2, patella 0, tibia v0-0-2ap, p0-0-1, metatarsus v0-0-1ap; III femur r0-0-1, patella 0, tibia v0-0-2ap, p1-1-0, r1-1-1, metatarsus v2-0-2ap, p0-1-1, r1-1-1; IV femur r0-0-1, patella 0, tibia v1-1-3ap, p1-1-1, r1-1-1, metatarsus v19(3ap), p1-0-1, r1-0-1. Spermathecae short, separated by a weakly sclerotized area. SS narrower than SB (Fig. 56-57). Type I urticating hair present (Figs. 2, 4). Many black spines on prolateral coxa IV and retrolateral coxae II and III. Distal tibia IV and metatarsus IV thickened (Fig. 19). Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs covered by many long hairs dorsal and ventrally, mainly the dorsal face of the tibia and metatarsus IV. Coxae and sternum covered by many short hairs. Carapace and legs dark brown, trochanters light brown. Sternum and coxae grayish. Leg rings hardly distinct on the apex of femora, patellae and tibiae. Longitudinal leg stripes on the patellae and tibiae hardly distinct.

Remarks - Pérez-Miles (1992a) considered _Eupalaestrus spinosisimus_ a _nomen dubium_ due to Mello-Leitão's brief description and also because the type is probably lost. This species is revalidated here based on specimens collected near the type locality of _E. spinosisimus_ that agrees with the original description regarding the many conspicuous black spines present on the prolateral coxa IV and retrolateral coxae II and III; presence of thickened metatarsus IV; and tibia and metatarsus IV dorsally covered by many stiff setae (Fig. 19). These conspicuous characters were emphasized by the author and are absent in other species with similar geographic distribution. Contrary to Pérez-Miles (1992a), the examined specimens have only type I urticating hair. This species was not included in the cladistic analysis because only the female is known and the analysis was carried out mainly on male characters.

**Distribution** - Brazil: southeastern State of Minas Gerais, southern State of Rio de Janeiro, central and eastern State of São Paulo (Fig. 166).


_Lasiodora_ C. L. Koch
Figs 59-61

_Mycale_ C. L. Koch, 1842:25 (in part _M. klugii_).

Eurytelma Ausserer, 1871:212 (in part only E. striatipes).


Diagnosis – Males can be distinguished from species of other theraphosine genera by the presence of stridulatory hairs on the superior region of the prosternal coxae I and II (Fig. 27) together with the presence of a subapical triangular keel in the male palpal bulb (Fig. 60-61). Females can be distinguished by the presence of stridulatory hairs in the same position as in males together with the spermathecae separated by a weakly sclerotized area (Fig. 59).

Distribution (Figs. 167, 174): Brazil: Atlantic Forest from the northeastern, southeastern, and central-western Brazil.

Records: Brazil, Pará: Irituia, 1♂ (IBSP 2604); Ceará: 1♀ (IBSP 6358), 1♂, holotype of A. crista (L. crista), MNJX s/n.; Serra do Baturité, 1♀ (IBSP 910), 1♂ (IBSP 911); Paraíba: João Pessoa, 1♂ (IBSP 4675), 1♀ (IBSP 6359), 1♂ (IBSP 6457); Areia, 1♀ (IBSP 6455); Pernambuco: Olinda, 1♂ (IBSP 6385); Caruaru, 1♂ (IBSP 6416), 1♂ (IBSP 7013); Alagoas: Maceió, 1♂ (IBSP 4663); Mato Grosso: Sinop, 1♀ (IBSP 4378-A); Barra do Garças, 1♀ (IBSP 2586); Goiás: São Domingos, Gruta do Córrego/Malhada, 1♀ (IBSP 4865-A); Minuacu, U. H. É. Serra da Mesa, 1♀ (IBSP 6444); Alvorada do Norte, 2♂ (IBSP 4194); Goiás, 1♀ (IBSP 4133-A); Corumbá de Goiás, 1♀ (IBSP 4865-D); Brasília, 1♀ (IBSP 3796); Planaltina, Rio Preto, 2♂ (IBSP 4884); Bela Vista de Goiás, 1♀ (IBSP 4865-C); Caldas Novas, 1♀ (IBSP 6430); Ipameri, 1♀ (IBSP 4865-B); Itumbiana, 1♀ (IBSP 6356); Bahia: Bahia, 1♂ (IBSP 4001), 1♀ (IBSP 4703), 1♀ (IBSP 6357); Juazeiro, 2♂ (IBSP 4866); Paulo Afonso, 1♀ 1♂ (IBSP 4458); Morro do Chapéu, 1♂ (IBSP 4377); Morro do Chapéu, Gruta dos Brejões - 1♀ (IBSP 2828); São Sebastião do Passé, 1♂ (IBSP 6367); Itaberaba, 1♀ (IBSP 4464); Castro Alves, 1♀ (IBSP 4552); São Félix, U. H. E. Pedra do Cavalo, 1♂ (IBSP 4559); Salvador, Ipati, 1J (IBSP 2362); Jequié, 1♀ (IBSP 6442); Caetité, 1♂ (IBSP 6901); Brumado, 2♂ (IBSP 4127A), 1♂ (IBSP 4127B); Manoel Vitorino, 1♂ (IBSP 4383); Vitória da Conquista, 1♀ (IBSP 3813); Macaetiba/Vitória da Conquista, 1♀ (IBSP 6402); Itabuna, 1♂ (IBSP 6439); Ilhéus, 1♀ (IBSP 6403), 1♀ (IBSP 6419); Buena, 1♀ (IBSP 4513); Porto Seguro, 1♀ (IBSP 4621), 1♂ (IBSP 6361), 1♂ (IBSP 6362); Porto Seguro, Arraial d'Água, 1♀ (IBSP 4769); Alcabaca, 1♀ (IBSP 46415), 1♂ (IBSP 4616), 1♂ (IBSP 4617), 1♂ (IBSP 4618); Caravelas, 1♀ (IBSP 4785), 1♂ (IBSP 6401), 1♀ (IBSP 7035); Abrolhos, Arquipélagos, Ilha de Santa Bárbara - 1♂ (IBSP 6356), 1♂ (IBSP 6357); Teixeira de Freitas, 1♀ (IBSP 6360), 1♀ (IBSP 6366), 1♀ (IBSP 6368), 1♀ (IBSP 6370); Mata Grosso do Sul: Terenos, 1♂ (IBSP 1697); Boa Vista, 1♀ (IBSP 1698), 1♀ (IBSP 3086); Bodóquera, 1♀ (IBSP 2675); Minas Gerais: 1♂ (IBSP 3221); Unai, 1♀ (IBSP 4927); São Roque, 1♂ (IBSP 4153); Jequitia, 1♂ (IBSP 6374); Montes Claros - 2♂ (IBSP 4815); Grão Mogol, 1♀ (IBSP 6447); Itinga, 1♂ (IBSP 4786); Itabimirim, 1♂ (IBSP 4340); João Pinheiro, 1♂ (IBSP 4862); Várzea da Palma, 1♀ (IBSP 6369); Lassance (Porto Faria), 1♂ (IBSP 1899); Centralina, 1♂ (IBSP 7034); Casalinho Ribeiro, 1♀ (IBSP 2163B); Corinto, 2♂ (IBSP 4236); Uberlândia, 1♂ (IBSP 6378); 1♂ (IBSP 6423), 1♂ (IBSP 6424); Santana do Rianho (Serra do Cipó), 1♂ (IBSP 6453); Uberaba, 3♀ (IBSP 4161); Uberaba, U. H. E. Água Emendada, 1♂ (IBSP 4122); Vargem Alegre, 2♂ (IBSP 3967); Inhapi, 3♀ (IBSP 6436), 1♀ (IBSP 4347), 1♀ (IBSP 6438); Santo Antonio do Monte, 1♂ (IBSP 6405), 1♂ (IBSP 6406), 1♂ (IBSP 6412); Belo Horizonte, 1♀ (IBSP 6354); Bom Jesus do Galho, 1♀ 1♂ (IBSP 4294); Caratinga, 1♂ (IBSP 4197); Ouro Preto, 1♂ (IBSP 2525); Manhumirim, 1♀ (IBSP 4057); Passos, 1♂ (IBSP 6362); Furnas, 1♂ (IBSP 4276), 1♂ (IBSP 6432); São João Del Rey, 1♀ (IBSP 4026); Viçosa, 1♀ (IBSP 1296), 1♀ (IBSP 1312), 1♀ (IBSP 1394), 1♂ (IBSP 1340); Dona Euzébia, 1♀ (IBSP 2995); Pedra do Sino, 1♀ (IBSP 349), 1♀ (IBSP 350), 1♂ (IBSP 351), 1♂ (IBSP 1401), 1♂ (IBSP 1922); Sereno, 1♀ (IBSP 2004), 1♂ (IBSP 2476), 1♂ (IBSP 2477); Juiz de Fora, 1♀ (IBSP 3991), 2♀ (IBSP 4365A), 2♀ (IBSP 4365B), 2♀ (IBSP 4365C), 2♀ (IBSP 4574A), 2♀ (IBSP 4574B), 1♀ (IBSP 4588), 1♂ 1♀ (IBSP 4595), 2♂ 1♀ (IBSP 4599A), 2♀ (IBSP 4633A), 1♂ (IBSP 4859), 1♀ (IBSP 6365), 1♀ (IBSP 6369), 1♀ (IBSP 6409); Caiana, 1♀ (IBSP 3062); Santana do Deserto, 1♂ (IBSP 4773); Santana do Deserto, Soesse, 1♀ (IBSP 1046), 1♀ (IBSP 2230), 1♂ (IBSP 2231), 1♀ (IBSP 2515), 1♂ (IBSP 3190), 1♀ (IBSP 3207), 1♂ (IBSP 3225); Três Corações, 1♀ (IBSP 4397); Três Ilhas, 1♀ (IBSP 294), 1J (IBSP 1893), 1♀ (IBSP 1894), 1♂ (IBSP 1895), 1♀ (IBSP 1997), 1♂ (IBSP 2207).
Lasiodora cristata (Mello-Leitão) comb. n.


Pamphobeteus cristatus; Schiapelli & Gerschman de Pikelin, 1964:393, T. III, fig. 22. - Platnick, 1993:111.

Vitalius cristatus; Baumgarten, 1998:1-8, figs. 1-3 (descr. male; misidentification).

Remarks: After examining the holotype of Acanthoscurria cristata, Schiapelli & Gerschman de Pikelin (1964) concluded that this species should be transferred to the genus Pamphobeteus (= Vitalius). They argued that the holotype did not have stridulatory hairs on the retrolateral side of trochanter, character that is present in Acanthoscurria species, and the spermaticheal shape was very similar to that of Vitalius species. However, they failed to note the presence of stridulatory hairs on the prolateral face of the anterior coxae of the holotype, which is a synapomorphy of the genus Lasiodora. Furthermore, the spermaticheal shape could not be used alone to assign this species into the genus Vitalius, because of the very similar spermaticheal shape of some Lasiodora and Vitalius species, as can be seen in figs. 59 and 81. Besides, Vitalius species have not been recorded yet from the type locality, the State of Ceará, Brazil, which, however, is part of the geographical distribution of species of Lasiodora.

The male described by Baumgarten (1998) is a undescribed species of a probable new genus.

Lasiodora benedeni Bertkau comb. rev.

Lasiodora benedenii Bertkau, 1880:34, Figs. 10, 10a, b (holotype female from Chapuém d’Uvas, Brazil, not examined).

Remarks - The holotype of L. benedenii is probably lost, as the majority of the non-european types of Bertkau (Levi, 1991:203). However, based on the author’s description, this seems to be a Lasiodora species as formerly described. The spermathecae shape, which was well-illustrated by the author, indicates it is either a Lasiodora or Vitalius species. By the type locality, Chapêu d’Uvas, State of Minas Gerais, Brazil, the only possible Vitalius species occurring in this area is K. dubius which has a very distinct spermatheca shape (Figs. 98-100). Thus, the species is transferred back to Lasiodora.

Proshapalopus Mello-Leitão


Diagnosis - Males can be distinguished from species of other theraphosine genera by the presence of an AC under the PI, on the male palpal bulb (Fig. 65). Females can be distinguished by having a thickened tibiae IV together with the absence of type III uricating hair (P. amazonicus); or by having type I uricating hair (Fig. 3) with the region “a” shorter than the region “b” (P. anomalous and P. multicuspidatus).

Description - Cephalothorax longer than wide, cephalic region slightly raised, convex. Cephalic and thoracic striae distinct. Fovea short; deep; straight, slightly recurved or procurred. Chelicerae without rastellum, basal segments with 10 to 13 teeth. Eye tubercle distinct, wider than long. Clypeus absent. Anterior eye row procurred, posterior recurved. AME rounded, the same size as ALE and PLE that have an oval shape. PME small, oval. Labium subquadrate, slightly wider than long, with numerous (more than 100) cupules on its anterior half. Maxilla subrectangular, anterior or lobe distinctly produced into conical process, inner angle bearing numerous cupules (more than 100). Sternum longer than wide, anterior sigilla in the sternum/labium edge. Other sigilla submarginal, the second pair smaller than the third that is smaller than the fourth. PMS one-segmented, short; PLS three-segmented, basal segment longer than the apical, both longer than the median. Apical segment digitiform. Leg tarsi without spines, claw tufts present; STC with a median row of few small teeth. Tarsal I-IV and metatarsi I-II scopolated, metatarsus III scopolated along half its length, metatarsus IV apically scopolated. Femur IV with retrolateral scopula. Prolateral leg coxae and retrolateral palpus trochanter without striulidary hairs. Male spur with converging branches originating from a common base, tapering distally, the prolateral branch thickened (P. multicuspidatus; Fig. 66) or with straight branches originating from a common base, the retrolateral constricted in the middle (other species, Figs. 62; 70). Metatarsus I straight, when flexed touches the retrolateral branch of the male spur laterally (P. multicuspidatus) or the apex of the retrolateral branch (other species). Male palp bulb pyriform, embolus slightly flattened distally. Embolus long (P. amazonicus)(Figs. 64, 65) or short (other species, Figs. 68-69, 72-73). Prolateral keels present, the PS forming the embolus edge distally. AC present, under the PI. R present, not pronounced. A small, SA small, triangular, bordered by small denticles. Male palp bulb with accentuated (P. multicuspidatus and P. amazonicus) or slightly (P. anomalous) D. Spermathecae short, separated by a weakly sclerotized area. SS narrower than SB (Fig. 63). Type I and III uricating hair (Figs. 2, 3) present in males and females (P. anomalous and P. multicuspidatus) or type III uricating hair absent in females (P. amazonicus); Type I uricating hair (Fig. 3) with the region “a” shorter than the region “b” (P. anomalous and P. multicuspidatus) or with the region “a” longer or equal to region “b” (Fig. 4) (P. amazonicus). Carapace covered only by short slender hairs (P. anomalous and P. multicuspidatus), or also with some long scattered hairs (female P. amazonicus), bordered by numerous short hairs pointing out. Slender legs, covered dorsally and ventrally by few long hairs (P. anomalous and P. multicuspidatus), or thickened legs (mainly tibia IV) with abundant long hairs dorsally and ventrally (P. amazonicus). Coxae and sternum covered by long hairs (P. amazonicus female) or short hairs (other species).

Constitution: three species known only from Brazil.

Misplaced Species - The female holotype of Proshapalopus variegatus Caporiacco, 1955 from Sant’ Ana, Falcón State, Venezuela, deposited in MUCV, examined, lacks type I uricating hair and retrolateral femur scopula, and has a fused spermatheca. Because these features are not found in Proshapalopus, but are present in species of the genus Metriopelma, this species is transferred to Metriopelma variegatum (Caporiacco) comb. n.
Key to *Proshapalopus* Species

**Males**

1. Male palpal bulb with an accentuated ventral median depression (Figs. 64-65 and 68-69) ........................................... 2
   - Male palpal bulb with a slight ventral median depression (Figs. 72-73) .............. *P. anomalus*

2(1). Tibia IV thickened (Fig. 20); metatarsus I touches the apex of the retrorsal branch of male spur when flexed; retrorsal branch of the male spur straight, medially constricted; prolateral branch not thickened (Fig. 62) ........................................... *P. amazonicus*
   - Tibia IV normal; metatarsus I touches the retrorsal branch of the male spur laterally when flexed; male spur branches converging from a common base, tapering distally; prolateral branch thickened (Figs. 66) ........................................... *P. multicuspidatus*

**Females**

1. Tibia IV thickened (Fig. 20); general color pattern grayish ........................................... *P. amazonicus*
   - Tibia IV normal; general color pattern brownish or black with pinkish regions on the legs ........................................... 2

2(1). General color pattern brown; ventral face of the coxae, abdomen and sternum, light-brown ........................................... *P. anomalus*
   - General color pattern darkish with pinkish regions on the patellae, tibiae and metatarsi of legs I and II, sternum and coxae black ........................................... *P. multicuspidatus*

*Proshapalopus amazonicus* nom. nov. comb. n.  
Figs. 62-65, 175


Diagnosis - Males and females can be distinguished from other species by the thickened tibiae IV (Fig. 20). Males can also be distinguished from *P. multicuspidatus* by the metatarsus I touching the apex of the retrorsal spur branch when flexed (Fig. 62) and from *P. anomalus* by the presence of an accentuated D (Fig. 64-65). Females can also be distinguished by the absence of type III urticating hair (Fig. 2).

Description - Male (IBSP 6913) - Total length: 48.0. Carapace: length 19.6, width 16.9. Eye tubercle: length 2.05, width 2.70. Labium: length 2.37, width 3.11. Sternum: length 8.2, width 7.62. Fovea short, deep, slightly recurved. Cheliceral basal segments with 11-10 teeth. Legs I: femur 17.8 / patella 9.0 / tibia 13.7 / metatarsus 14.4 / tarsus 8.7 / total 63.6 / II: 16.0 / 8.2 / 11.9 / 13.7 / 7.6 / 57.4 / III: 14.7 / 7.6 / 10.9 / 15.8 / 7.1 / 56.1 / IV: 18.6 / 8.5 / 15.0 / 23.9 / 8.7 / 74.7. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella p1, tibia v0-2-0, p2-4-3, d0-0-8ap; legs I femur p0-0-1, patella 0, tibia v2-3-1, p1-1-1, metatarsus v0-0-3ap; II femur p0-0-1, patella 0, tibia v2-3-3ap, p1-1-1, metatarsus v0-0-4ap, p0-1-0; III femur p0-0-2, r0-1-1, patella r1, tibia v3-5-3ap, p1-1-1, r1-1-1, metatarsus v16, p1-1-1, r0-2-1; IV femur 0, patella r1, tibia 15, p0-1-1, r1-1-1, metatarsus v35, p1-1-1, r0-1-1. Male spur branches straight, originating from a common base, the retrorsal branch constricted in the middle (Fig. 62). Metatarsus I straight, touches the apex of the retrorsal branch of the male spur when flexed. Male palpal bulb pyriform, embolus long, slightly flattened laterally at the distal region. Prolateral keels present, the PS forming the embolus edge distally. AC present, under the PI, R present, not pronounced. A small, SA small, triangular, bordered by small denticles. D very accentuated (Figs. 64-65). Types I and III urticating hairs present, type I with the region "a" longer than the region "b" (Fig. 4). Carapace covered only by short slender hairs; bordered by short hairs pointing out. Legs covered by many long hairs dorsal and ventrally. Tibia IV thickened (Fig. 20). Coxae and sternum covered by short slender hairs. Carapace and legs black, legs covered by long reddish hairs. Sternum, coxae and abdomen grayish ventrally. Leg rings and longitudinal stripes on femora, patellae, and tibiae hardly distinct.

Female (IBSP 6915) - Total length: 62.5. Carapace: length 28.1, width 23.3. Eye tubercle: length 2.37, width 3.28. Labium: length 3.85, width 4.92. Sternum: length 12.00, width: 11.25. Fovea short, deep, recurved. Cheliceral basal segments with 11-12 teeth. Legs I: femur 16.9 / patella 10.4 / tibia 11.8 / metatarsus 11.4 / tarsus 6.7 / total 57.2 / II: 15.1 / 9.9 / 10.2 / 11.2 / 6.1 / 52.5 / III: 14.4 / 9.6 / 10.3 / 13.6 / 5.5 / 53.4 / IV: 19.7 / 10.4 / 15.0 / 20.8 / 6.9 / 72.8. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-1ap, p0-2-1ap; legs I femur p0-0-1, patella 0, tibia v0-1-1ap, metatarsus v0-0-2ap; II femur p0-0-1, patella 0, tibia v0-1-3ap, p0-2-0, metatarsus v0-1-2ap, p0-1-0; III femur r0-0-1, patella 0, tibia v1-2-3(2ap), p1-2-2, r1-1-1, metatarsus v4-1-2ap, p2-2-1, r0-2-0; IV femur r0-0-1, patella r1, tibia v2-4-4(2ap), p0-1-0, r0-3-0, metatarsus v22(3ap), r1-0-0. Spermathecae short,
separated by a weakly sclerotized area. SS narrower than SB (Fig. 63). Type I urticating hair present, with the region "a" longer than the region "b" (Fig. 4). Tibia IV thickened (Fig. 20). Color and body hair pattern as in the male.

Distribution: Brazil: Amazon Forest, from northern State of Mato Grosso to south of State of Pará (Fig. 166, 172).

Records: Brazil, Pará: Santo Christo, Rio Tapajós, 4° (MZUSP 555, lectotype and paralectotypes of Panphobeta anomalous Mello-Leitão, 1923), Mato Grosso: Apiacás, 3° (IBSP 6910), 3° (IBSP 6911), 3° (IBSP 6912), 3° (IBSP 6913); Alta Floresta / Aripuanã, 3° (IBSP 4357); Alta Floresta, 1 muzho (IBSP 4474), 1° (IBSP 4494), 1° (IBSP 4549), 2° (IBSP 4747), 1° (IBSP 6915); Parque Nacional do Xingu, 1° (IBSP 33), 1° (MZSP 3916), 1° (MZSP 3917); Sinop - 1° (IBSP 6914), 1° (IBSP 6915), 1° (IBSP 6916); São Paulo: Iguapé, 1° (IBSP 4704).

Proshapalopus multiscupidatus
(Mello-Leitão) comb. n.
Figs. 66-69, 176


Diagnosis - Males can be distinguished from other species by the metatarsus I touching the retrolateral spur branch laterally when flexed. They can also be distinguished from P. anomalus by the presence of an accentuated D (Figs. 68-69) and from P. amazonicus by the absence of a thickened tibia IV. Females can be distinguished from P. amazonicus by the absence of a thickened tibia IV, and from P. anomalus by the color pattern and distinct geographical distribution.

Description - Male (IBSP 6844) - Total length: 39.5, Carapace: length 16.1, width 13.7, Eye tubercle: length 1.88, width 2.37, Labium: length 2.13, width 2.46, Sternum: length 7.13, width 6.31, Fovea short, deep, straight. Cheliceral basal segments with 11-12 teeth. Legs I: femur 14.9, patella 7.8, tibia 11.2, metatarsus 12.4, tarsus 8.1, total 54.4 / II: 13.6, 6.7, 10.2, 11.2, 7.5, 49.2 / III: 11.7, 6.0, 8.7, 12.0, 6.8, 45.2 / IV: 14.1, 6.8, 11.6, 15.8, 6.9, 55.2. Sines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia p1-3-1, d0-0-9ap; legs I femur 0, patella 0, tibia v1-1-1, metatarsus v0-0-1; II femur p0-0-1, patella 0, tibia v1-3-3ap, p1-1-1, metatarsus v1-0-3ap; III femur p0-0-1, r0-0-1, patella 0, tibia v0-3-2ap, p0-1-1, r1-1-1, metatarsus v1-2-3ap, p1-1-1, r0-1-1, IV femur r0-0-1, patella 0, tibia v0-3-2, p1-1-1, r1-1-0, metatarsus v=14, p0-1-1, r0-1-1. Male spur branches converging, originating from a common base, tapers distally, prolaral branch thickened (Fig. 66). Metatarsus I straight, when flexed touches the retrolateral branch of the male spur laterally. Male palpal bulb pyriform, embolus short, slightly flattened laterally at the distal region. Prolaral keels present, the PS forming the embolus edge distally. AC present, under the PI. D very accentuated. R present, not pronounced. A small, SA very small, triangular, bordered by small denticles (Figs. 68-69). Types I and III urticating hairs present, type I with the region "a" shorter than the region "b" (Fig. 3). Carapace covered only by short slender hairs; bordered by short hairs pointing out. Legs slender, dorsally and ventrally covered by few long hairs. Coxae and sternum covered by short slender hairs. Carapace and legs dark-brown, almost black; sternum, coxae and ventral abdominal region black. White rings at the apex of the femora, patellae and tibiae conspicuous. Longitudinal stripes on the patellae and tibiae hardly distinct.

Female (IBSP 7012) - Total length: 50.0. Carapace: length 19.1, width 17.0. Eye tubercle: length 2.10, width 2.80. Labium: length 2.40, width 3.40. Sternum: length 8.40, width: 7.60. Fovea short, deep, slightly procure. Cheliceral basal segments with 13-13 teeth. Legs I: femur 15.6 / patella 8.8 / tibia 11.8 / metatarsus 10.7 / tarsus 6.4 / total 53.3 / II: 14.1, 8.0, 10.1, 10.0, 6.0, 48.2 / III: 12.7, 7.0, 8.4, 10.2, 5.7, 44.0, IV: 15.9, 7.3, 11.9, 15.6, 6.2, 56.9. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-3-2ap, p1-2-2, r0-1-0; legs I femur p0-0-1, patella 0, tibia v1-1-3ap, p0-0-1, metatarsus v0-0-1ap; II femur p0-0-1, patella 0, tibia v1-2-4ap, p1-1-1, metatarsus v1-0-3ap; III femur p0-0-1, r0-0-1, patella r1, tibia v0-3-2ap, p1-1-1, r0-1-1, metatarsus v3-0-4ap, p1-0-1, r0-1-0; IV femur r0-0-1, patella 0, tibia v2-2-3(Zap), r1-1-1, metatarsus v17(4ap), p0-1-1, r0-2-1. Spermathecae short, separated by a weakly sclerotized area. SS narrower than SB (Fig. 67). Types I and III urticating hairs present, type I with the region "a" shorter than the region "b" (Fig. 3). Hair pattern as in the male. Slender legs. Carapace dark brown, margin pinkish. Femora black. Patellae, tibiae, metatarsi and tarsi slightly pinkish-brown, pinkish more accentuated in patellae and tibiae I and II. Coxae, sternum, and abdomen ventrally black. Leg rings and longitudinal stripes on the patellae and tibiae distinct.

Distribution - Brazil: Atlantic Forest, from the State of Paraíba to south of the State of Bahia (Figs. 166, 172).
Records: Brazil, Paraíba: Mamanguape, 1♂, 22.VI.93, C. Arzabe col. (MCN-RS 24.481); 1♂, 11.VI.93, C. Arzabe col. (MCN-RS 24.486); Galante, 1♂ (IBSP 6844); Pernambuco: Tapera, 1♂ (MRJ), holotype of Phormicotopus multicuspidatus; Mello-Leitão, 1929); Atagosa: São Miguel dos Campos, Faz. Prata, Usina Sinimbú, 1♂, V.84, D. F. de Morais col. (MRNJ 13.261); Sergipe: São Cristóvão, 1♀ (IBSP 6853); Crasto, 1♀ (IBSP 6847); Bahia: Ipiãú, 1♂ (IBSP 6850), 1♂ (IBSP 6851); Ilhéus, 1♂ (IBSP 6845), 1♂ (IBSP 6849), 1♀ (IBSP 70012); Porto Seguro, 1♀ (IBSP 6846), 1♂ (IBSP 6848), 1♀ (IBSP 6852); Teixeira de Freitas, 1♂ (IBSP 4614).

Proshapalopus anomalus Mello-Leitão
Figs. 70-73, 177

Proshapalopus anomalus; Rudloff, 1997:2 (comb. rev.).

Diagnosis - Males can be distinguished from other species by the absence of an accentuated D (Figs. 72-73). They can also be distinguished from P. multicuspidatus by the metatarsus I touching the apex of the retrolateral spur branch when flexed (Fig. 70) and from P. amazonicus by having slender tibiae IV. Females can be distinguished from P. amazonicus by having slender legs, mainly the tibiae IV and from P. multicuspidatus, by the distinct color pattern and geographical distribution.

Description - Male (IBSP 6857) - Total length: 40.0. Carapace: length 16.2, width 14.8. Eye tubercle: length 1.64, width 2.54. Labium: length 1.88, width 3.28. Sternum: length 7.38, width 6.56. Fovea short, deep, straight. Cheliceral basal segments with 10-12 teeth. Legs I: femur 16.3 / patella 8.7 / tibia 13.8 / metatarsus 14.5 / tarsi 9.1 / total 62.4 / II: 15.4 / 7.4 / 12.2 / 13.7 / 8.2 / 56.9 / III: 13.5 / 6.7 / 10.7 / 14.1 / 7.0 / 52.0 / IV: 16.4 / 17.0 / 14.4 / 20.2 / 8.5 / 76.5. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia p1-2-3, d0-0-7ap: legs I femur p0-0-1, patella 0, tibia v1-1-1, metatarsus v0-0-1ap, p1-0-0; II femur p0-0-1, patella 0, tibia v2-2-3ap, p1-1-1, metatarsus v1-0-2ap, p1-1-0; III femur p0-0-1, r0-0-1, patella 0, tibia v1-2-2ap, p2-1-1, r1-1-1, metatarsus v1-2-2ap, p1-2-1, r0-1-1; IV femur r0-0-1, patella 0, tibia v8 (2 ap), p1-1-1, r1-1-1, metatarsus v1-1-1, r0-1-1. Male spur branches straight originating from a common base, the retrolateral constricted in the middle (Fig. 70). Metatarsus I straight, touching the apex of the retrolateral branch of the male spur when flexed. Male palpal bulb pyriform, embolus short, slightly flattened laterally at the distal region. Prolateral keels present, the PS forming the embolus edge distally. AC present, under the PI. R present, not pronounced. A small. SA small, triangular, bordered by small denticles. D not pronounced (Figs. 72-73). Types I and III urticating hairs present, type I with the region "a" shorter than the region "b" (Fig. 3). Carapace covered only by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs slender, covered by few long hairs dorsally and ventrally. Coxae and sternum covered by short slender hairs. Carapace and legs light brown, femora slightly darker; sternum, coxae, and abdomen ventrally grayish, covered by short orange hairs. Leg rings distinctly different on the femora, patellae and tibiae apex. Longitudinal stripes on the patellae and tibiae not pronounced.

Female (IBSP 6858) - Total length: 58.9. Carapace: length 22.0, width 18.5. Eye tubercle: length 2.21, width 3.28. Labium: length 3.03, width 3.93. Sternum: length 9.60, width 8.25. Fovea short, deep, straight. Cheliceral basal segment with 11-12 teeth. Legs I: femur 16.0 / patella 9.5 / tibia 12.0 / metatarsus 10.8 / tarsus 6.8 / total 55.1 / II: 14.3 / 8.5 / 10.2 / 10.4 / 6.7 / 50.1 / III: 12.9 / 7.9 / 9.0 / 11.9 / 6.8 / 48.5 / IV: 16.2 / 8.4 / 12.0 / 17.1 / 7.3 / 61.0. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-1-3ap, p0-2-2ap; legs I femur p0-0-1, patella 0, tibia v0-0-2ap, p1-1-0, metatarsus v0-0-1ap; II femur p0-0-1, patella 0, tibia v0-1-2ap, p1-1-1, metatarsus v1-0-2ap, p1-1-0; III femur p0-0-1, r0-0-1, patella 0, tibia v1-2-2ap, p1-1-0, r1-1-1, metatarsus v1-2-2ap, p1-2-1, r0-1-1; IV femur r0-0-1, patella 0, tibia v1-3-1ap, p1-1-1, r1-1-1, metatarsus v16, p0-2-1, r0-1-1. Spermathecae short, separated by a weakly sclerotized area. SS narrower than SB (Fig. 71). Types I and III urticating hairs present, type I with the region "a" shorter than the region "b" (Fig. 3). Color and hair patterns like in male, except for the absence of orange hairs on the sternum, coxae and ventral abdominal area.

Distribution - Brazil: Atlantic Forest, from extreme southeast of the State of Minas Gerais to the States of Rio de Janeiro and Espírito Santo, south of Rio Doce River (Figs. 166, 172).

Records: Brazil, Minas Gerais: Ouro Preto, 1♀ (IBSP 1097); Lima Duarte, 1♀ (IBSP 3466); Juiz de Fora, 1♂ (IBSP 4599-B); Espírito Santo: Santa Teresa, 1♂ (IBSP 6854); Aracruz, 1♂ (MZSP
Vitalius Lucas, Silva Junior & Bertani

Pamphobeteus Pocock, 1901:545 (in part).


Pterinopelma Pocock, 1901:551 (in part).

Rhechostica Simon, 1892:162 (in part).

Aphonopelma Pocock, 1901:553 (in part).
- Platnick, 1993:100.

Diagnosis - Males can be distinguished from species of other theraphosine genera except Proshapalopus, Lasiodora, and Nhandu, by the presence of a triangular SA on the male palp bulb (Figs. 74-75). From Lasiodora they can be distinguished by the absence of stridulatory hairs on the superior region of the prolateral coxae I and II; from Proshapalopus by the absence of an AC in the male palp bulb; and from Nhandu, except for V. lucasae, they can be distinguished either by the male spur with converging branches originating from a common base, tapering distally, the prolateral branch thickened (Fig. 83); or by small, almost vestigial, male spurs (Figs. 108-111, V. roseus and V. vellutinus). V. lucasae can be distinguished by the presence of an accentuated D (Figs. 127-128) and thickened tibiae IV. Females can be distinguished from species of other theraphosine genera, except Lasiodora and Nhandu, by the presence of spermathecae separated by a heavily sclerotized short area (Fig. 81); and, with the exception of N. carapoenis, by the absence of type III urticating hair. They can also be distinguished from all Nhandu species by the absence of many long, curly, scattered hairs over the carapace.

Description - Cephalothorax longer than wide, cephalic region slightly raised, convex. Cephalic and thoracic striae distinct (most species) or hardly distinct (V. sorocaeae). Fovea short; deep; straight, slightly recurved or procurred. Chelicerae without rastellum, basal segments with 10 to 15 teeth. Eye tubercle distinct, wider than long. Clypeus absent. Anterior eye row procurred, posterior recurved. AME rounded, the same size as ALE and PLE which have an oval shape. PME small, oval. Labium subquadrate, slightly wider than long, with numerous (more than 100) cupsules on its anterior half. Maxila subrectangular, anterior lobe distinctly produced into a conical process, inner angle bearing numerous cupsules (more than 100). Sternum longer than wide. Anterior sigilla on the sternum/labium edge. Other sigilla submarginal, the second pair smaller than the third that is smaller than the fourth. PMS one-segmented, short; PLS three-segmented, basal segment longer than the apical, both longer than the median. Apical segment digitiform. Leg tarsi without spines, claw tufts present; STC with a median row of few small teeth. Tarsi I-IV and metatarsi I-II scopulated, metatarsus III scopulated along half its length, metatarsus IV apically scopulated. Femur IV with retrolateral scopula. Prolateral leg coxae and retrolateral palpal trochanter without stridulatory hairs. Male spur with converging branches originating from a common base, tapering distally, the prolateral branch thickened (most species) (Fig. 83); straight branches originating from a common base, the retrolateral constricted in the middle (V. lucasae) (Fig. 125); or, male spur vestigial (V. roseus and V. vellutinus) (Figs. 108-111). Metatarsus I curved (V. lucasae) or straight (other species), when flexed touches the retrolateral branch laterally. Male palp bulb pyriform, embolus slightly flattened distally. Embolus long (V. wackei and V. longisternalis) or short (most species). Prolateral keels present, the PS forming the embolus edge distally, pronounced in V. dubius and V. buecherli (Fig. 93-94). AC absent. R present, pronounced, sharp. A present, medially developed. SA well-developed, bordered by small denticles, or vestigial (V. vellutinus) (Figs. 101-106). Male palp bulb with accentuated (V. lucasae) (Figs. 127-128) or slightly (other species) D. Spermatothecae short, separated by a heavily sclerotized short area. SS narrower than SB. Type I urticating hair present in males and females with the region “a” longer or equal to region “b”. Type III vestigial in females, restricted to small areas in males. Carapace covered by short slender hairs; bordered by some longer hairs ponting to the carapace center (V. sorocaeae female) (Fig. 17) or bordered by short hairs pointing out (V. sorocaeae male and other species) (Fig. 16). Tibiae IV slightly thickened in male and female (V. lucasae) or tibiae IV not thickened (other species). Legs dorsally and ventrally covered by few long hairs (females of V. vellutinus, V. roseus, and V. paranaensis) or covered by many long hairs, mainly on the ventral face (other species). Coxae and sternum covered by long hairs (V. buecherli female) or short (other species).

Constitution: nine South-American species.
Key to *Vitalius* Species

**Males**

1. Male palpal bulb with an accentuated median ventral depression (Figs. 127-128); tibia IV slightly thickened; male spur with branches originating from a common base, almost straight, the retrolateral with a depression in the middle, the prolateral not thickened (Fig. 125) ............................................................................ *V. lucasaec*

   - Male palpal bulb without a median ventral depression; tibia IV not thickened; male spur with converging branches originating from a common base, the retrolateral tapering distally, the prolateral thickened (Fig. 83) ............................................................................ 2

2(1). Sternum much longer than wide (Fig. 21), male palpal bulb with long embolus (Figs. 89-90) ................................................................. *V. longisternalis*

   - Sternum slightly longer than wide; male palpal bulb with long or short embolus .......................... 3

3(2). Male palpal bulb with long embolus (Figs. 85-86) ................................................................. *V. wacketi*

   - Male palpal bulb with short embolus .......................... 4

4(3). Male spur very small (Figs. 108-111) .............. 5

   - Male spur not small .................................................. 6

5(4). Male palpal bulb with the subapical keel hardly developed, bulb tapering slightly distally (Figs. 101-106), palpal tibia with 1 or 2 prolateral apical spines ................................................................. *V. vellutinus*

   - Male palpal bulb with the subapical keel well-developed, bulb tapering abruptly on its median region (Figs. 115-116); palpal tibia with five or more apical prolateral spines (Fig. 25) ................................................................. *V. roseus*

6(4). Male palpal bulb tip thickened (Figs. 93-94); general dorsal color pattern brownish, leg rings on the patellae and tibiae hardly distinct .................................................. 7

   - Male palpal bulb tip slender (Figs. 76-77); general dorsal color pattern blackish, leg rings on the patellae and tibiae distinct .................................................. 8

7(6). Slender legs (Fig. 22) .............................................. *V. buecherli*

   - Not slender legs (Fig. 23) .............................................. *V. dubius*

8(6). Sternum, coxae, and abdomen ventrally black ................................................................. *V. paraanaensis*

   - Sternum, coxae and abdomen ventrally grayish ................................................................. *V. sorocabaec*

**Females**

1. Sternum much longer than wide (Fig. 21) ............................................................................ *V. longisternalis*

   - Sternum slightly longer than wide .............................................. 2

2(1). Carapace bordered by long hairs pointing to the carapace center (Fig. 17); general color pattern blackish, leg rings on the patellae and tibiae distinct, sternum and coxae grayish ................................................................. *V. sorocabaec*

   - Carapace bordered by short hairs pointing out (Fig. 16); general color pattern variable .......................... 3

3(2). Tibia IV slightly thickened; general dorsal color pattern blackish .............................................. *V. lucasaec*

   - Tibia IV normal; general dorsal color pattern variable .................................................. 4

4(3). Spermathecae bulbs enlarged (Figs. 98-100) ................................................................. *V. dubius*

   - Spermathecae bulbs not enlarged (Fig. 122) ................................................................. 5

5(4). Ventral femora face with few long hairs; carapace dark-brown on the anterior region, becoming gradually lighter backwards; legs pinkish laterally on the anterior patellae, tibiae, and metatarsi; leg rings on the patellae and tibiae distinct; sternum, coxae, and abdomen ventrally black .................................................. 6

   - Ventral femora face with many long hairs; general color pattern homogeneous, blackish or brownish; leg rings on the patellae and tibiae variables; sternum, coxae and abdomen ventrally black or brown .................................................. 8

6(5). Coxae ventrally with long hairs; distribution: western State of Rio Grande do Sul, Brazil ................................................................. *V. roseus*

   - Coxae ventrally with short hairs; distribution: States of Paraná, São Paulo, Minas Gerais, and Mato Grosso do Sul, Brazil; and Argentina .................................................. 7

7(6). Distribution: western and central State of São Paulo, southern Minas Gerais and eastern Mato Grosso do Sul, Brazil ................................................................. *V. vellutinus*

   - Distribution: northwestern State of Paraná, Brazil; and Missiones, Argentina .................................................. *V. paraanaensis*

8(5). Sternum and coxae covered by short hairs; sternum, coxae, and abdomen ventrally black ................................................................. *V. wacketi*

   - Sternum covered by long hairs; sternum, coxae, and abdomen ventrally brownish gray ................................................................. *V. buecherli*
Vitalius sorocaba (Mello-Leitão)
Figs. 74-82, 178


Pamphobeteus sorocabensis; Benett, 1958:3315 (unjustified emendation).


Diagnosis - Males can be distinguished from all species, except V. paraenaeis, by having metatarsus I straight, embolus short, non-s lens, legs, PS not pronounced, and male spur well-developed. Males can additionally be distinguished from V. paraenaeis by the sternum and coxae grayish color pattern. Females can be distinguished by the carapace bordered by long hairs pointing to the carapace center (Fig. 17).

Description - Male (IBSP 4942) - Total length: 45,8 Carapace: length 18,5, width 17,3. Eye tubercle: length 2,13, width 2,54. Labium: length 2,37, width 3,11. Sternum: length 8,70, width: 7,95. Fovea short, deep, slightly procured. Cheliceral basal segments with 12-12 teeth. Legs I: femur 16,3 / patella 8,8 / tibia 11,4 / metatarsus 10,7 / tarsus 7,3 / total 54,5 / II: 15,0 / 8,1 / 10,5 / 10,1 / 7,0 / 50,7 / III: 13,6 / 7,8 / 19,6 / 11,4 / 6,8 / 35,6 / IV: 16,6 / 7,7 / 13,2 / 18,2 / 7,8 / 63,5. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia p3-1-2ap; legs I femur p0-0-1, patella 0, tibia v2-2-1ap, p1-1-0, metatarsus v0-0-1ap; II femur p0-0-1, patella 1, tibia v3-4-3ap, p1-1-1, metatarsus v2-0-2ap, r0-1-0; III femur p0-1-1, r0-0-1, patella 1, tibia v10(2ap), p1-1-1, r1-1-1, metatarsus v4-1-3ap, p1-1-1, r0-1-1; IV femur r0-0-1, patella 2, tibia 12(3ap), p0-1-1, r1-1-1, metatarsus v20(2ap), p1-1-1, r1-1-1. Male spur branches originating from a common base, tapering distally, the prolateral branch thickened (Fig. 80). Metatarsus I straight, when flexed touches the retrolateral branch laterally. Male palp bulb pyriform, embolus short, slightly flattened laterally at the distal region. Prolateral keels present, the PS forming the embolus edge distally. R presents, pronounced, sharp. A present, medially developed. SA well-developed, bordered by small denticles (Figs. 74-79). Types I and III urticating hairs (Figs. 2, 4) present, type III restricted to a small area of the abdomen. Carapace covered by short slender hairs; bordered by short hairs pointing out. Legs covered by many long hairs ventrally. Coxae and sternum covered by short hairs. Carapace black, with the margin light brown. Legs black, except trochanters, which are light brown dorsally. Sternum, coxae, and abdomen ventrally grayish. Leg rings very distinct on the femora, patellae and tibiae apex. Longitudinal stripes on legs distinct.

Female (IBSP 5436) - Total length: 56,8. Carapace: length 20,3, width 17,7. Eye tubercle: length 2,54, width 2,87. Labium: length 2,87, width 3,60. Sternum: length 8,55, width: 7,80. Fovea short, deep, procured. Cheliceral basal segments with 13-12 teeth. Legs I: femur 14,4 / patella 9,0 / tibia 10,1 / metatarsus 8,4 / tarsus 5,5 / total 47,4 / II: 13,0 / 7,5 / 8,1 / 7,9 / 5,3 / 41,8 / III: 11,8 / 6,9 / 8,0 / 8,9 / 6,2 / 41,8 / IV: 14,7 / 7,5 / 10,7 / 13,5 / 5,7 / 52,1. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-4ap, p1-2-2; legs I femur p0-0-1, patella 0, tibia v0-0-2ap, metatarsus v0-0-1ap, p1-0-0; II femur p0-0-1, patella 0, tibia v0-1-1ap, p1-1-1, metatarsus v0-0-3ap, III femur p0-0-1, r0-0-1, patella 1, r1, tibia v0-2-2ap, p1-1-1, r1-1-1, metatarsus v2-3(2ap), p1-1-1, r1-2-1, metatarsus v17(2ap), p0-1-1, r0-1-1. Spermastheca short, separated by a heavily sclerotized short area. SS narrower than SB (Figs. 81-82). Type I urticating hair present (type III vestigial). Color and hair pattern as in the male, except for the presence of long hairs bordering the carapace pointing out and to the center of carapace (Fig. 17). Also, the longitudinal stripes on the patellae and tibiae are more conspicuous than in male.

Distribution: Brazil: Brazilian "campos" and "cerrados" of southern Minas Gerais, State of São Paulo, and northern Paraná, following the "peripheral depression of the eastern border of Paraná Basin" in the States of São Paulo and Paraná (Figs. 169, 173).

Records: Brazil, Mato Grosso do Sul: Paranaiba, 1 ♀ (IBSP 5396); Taunay, 1 ♀ (IBSP 118); Minas Gerais: Ibiaí, 1 ♂ (IBSP 2512); Serrano, 1 ♀ (IBSP 2241); Juiz de Fora, 1 ♂ (IBSP 4633B); Poços de Caldas, 1 ♀ (IBSP 1509); Andradas, 1 ♀ (IBSP 1029); Toledo, 1 ♂ (IBSP 6881); Rio de Janeiro: Itatiaia, 1 ♀ (IBSP 5334); São Paulo: 1 ♀ (MZUSP 153, holotype of Pamphobeteus melanoecephalus Mello-Leitão, 1923), Restinga, 1 ♂ (IBSP 2884); Piradouro, 1 ♂ (IBSP 1253); Altinópolis, 1 ♂ (IBSP 180); 1 ♂ (IBSP 675); Vista Alegre do Alto (Vista Alegre), 1 ♀ (IBSP 161); Guarapapes, 1 ♂ (IBSP 1449); Panorama - 1 ♀ (IBSP 4444); Nove Horizonte, 1 ♂ (IBSP 3146); Toriba - 1 ♀ J (IBSP 1446); Santa Lúcia, 1 ♀ (IBSP 477); Araras, 1 ♂ (IBSP 477);
Vitalius wacketti (Mello-Leitão), comb. n.
Figs. 83-86, 179-180


Euryzelma wacketti; Roewer, 1942:242.
Rheochista wacketti; Raven, 1985:158.

Pamphobetus platymamma; Bücheler, 1949:117-135, figs 1-3, T. 1-3 (misidentification).


Diagnosis - Males can be distinguished from all Vitalius species, except P. longisternals, by its long embolus (Figs. 85-86). They can be distinguished from V. longisternals by the not much longer than wide sternum. Females can be distinguished together by having: tibiae IV not thickened; sternum not much longer than wide; carapace not bordered by long hairs pointing to the carapace center; SB not enlarged; femora with many long ventral hairs; and sternum and coxae black, covered by short hairs.

Description - Male (IBSP 6160) - Total length: 47.5, Carapace: length 18.7, width 17.1. Eye tubercle: length 2.37, width 2.87. Labium: length 2.62, width 3.03. Sternum: length 7.95, width: 7.65. Fovea short, deep, slightly procured. Cheliceral basal segments with 11-13 teeth. Legs I: femur 17.9, patella 9.3, tibia 13.6, metatarsus 13.0/tarsus 8.5, total 62.3, II: 16.5, 8.2, 12.5, 12.5, /8.0, 57.7, III: 14.8, 7.3, 11.5, 13.5, 7.3, 54.4, IV: 17.7, 7.9, 15.8, 20.9, 8.4, 70.7. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 1, tibia p3-3-3; legs I femur p0-0-1, patella 0, tibia v0-2-1ap, metatarsus v0-0-1ap; II femur p0-0-1, patella 0, tibia v1-2-3ap, p0-1-1, metatarsus v2-0-3ap, p0-1-0; III femur r0-0-1; patella 0; tibia v4-3-3ap, p1-1-1, r1-1-1, metatarsus v5-0-4ap, p1-1-2, r0-1-0; IV femur r0-0-1, patella 0, tibia v2-2-3(2ap), p1-0-1, r1-1-1, metatarsus v21(2ap), p1-1-1, r0-1-1. Male spur branches originating from a common base, tapering distally, the prolateral branch thickened (Fig. 83). Metatarsus I straight, when flexed touches the retrolateral branch laterally. Male palpal bulb pyriform, embolus long, slightly flattened laterally at the distal region. Prolateral keels present, the PS forming the embolus edge distally. R present, pronounced, sharp. A present, medially developed. SA well-developed, bordered by small denticles (Figs. 85-86). Types I and III urticating hairs (Figs. 2, 4) present, the type III restricted to a small area of the abdomen. Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs ventrally covered by many long hairs. Coxae and sternum covered by short hairs. Carapace and legs black, except trochanters, which are light brown dorsally.
Sternum, coxae, and abdomen ventrally black. Leg rings and longitudinal leg stripes hardly distinct.

Female (IBSP 6084) - Total length: 57.9. Carapace: length 22.6, width 19.4. Eye tubercle: length 2.37, width 3.36. Labium: length 3.03, width 4.26. Sternum: length 10.35, width: 9.00. Fovea short, deep, slightly procurred. Cheliceral basal segments with 11-12 teeth. Legs I: femur 17.3 / patella 10.2 / tibia 11.9 / metatarsus 10.7 / tarsus 6.0 / total 56.1; II: 15.3 / 9.2 / 10.2 / 10.0 / 6.2 / 50.9; III: 14.0 / 8.5 / 9.7 / 11.6 / 5.9 / 49.7; IV: 17.2 / 8.9 / 13.2 / 17.6 / 6.9 / 63.8. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-4ap, p1-2-2; legs I femur p0-0-1, patella 0, tibia v0-0-2ap, metatarsus v0-0-1ap, p1-0-0; II femur p0-0-1, patella 0, tibia v0-1-1ap, p1-1-1, metatarsus v0-0-3ap; III femur p0-0-1, r0-0-1, patella p1, r1; tibia v0-2-2ap, p1-1-1, r1-1-1, metatarsus v2-0-3ap, p1-1-1, r0-1-1; IV femur r0-0-1, patella r2, tibia v1-2-3(2ap), p1-1-1, r1-2-1, metatarsus v17(3ap), p0-1-1, r0-1-1. Spermathecae short, separated by a heavily sclerotized area. SS narrower than SB (Figs. 84). Type I urticating hair present (type III vestigial). Color and hair pattern as in the male, except for the leg rings and longitudinal stripes being more distinct.

Variation: males from the northern coast of the State of São Paulo and southern of the State of Rio de Janeiro have many white hairs on the dorsal and ventral leg faces. Juveniles from all regions show a contrasting leg color pattern with wide whitish bands and the longitudinal stripes very distinct as well as the tibiae apex and the whitish basal and lateral metatarsi. These white areas and the longitudinal leg stripes become less evident in larger individuals, almost disappearing in adults.

Remarks - Bücherl (1949) synonymyzed the species described for the coast and islands of the State of São Paulo and south of Rio de Janeiro in Brazil, P. masculus and P. insularis, with P. platymamma, based on proportions between leg articles and carapace, color pattern and geographic distribution. The holotype of P. platymama, however, is a juvenile male which has the carapace bordered by long hairs pointing to the carapace center, character not found in the Vitalius species from the coast, but present in V. sorocabae and all Nhando species, that do not occur in the type locality, Ilha de São Sebastião (presently Ilhabela), São Paulo, Brazil. This could be due to locality misidentification or a labelling mistake. However, the specimen has the measurements given in the original description and surely is the holotype Mello-Leitão used to describe this species. Because Mello-Leitão described this species two years after the specimen was collected, it is possible that an earlier change of specimens or labels occurred, thus Vitalius platymamma does not correspond to the species found in the coastal area with which this name has been used from the 1949's Bücherl revision. Because it is impossible to identify the juvenile male holotype of P. platymamma, this species is considered here "nomen dubium".

Distribution: Brazil: tropical latifoliated forest of “Serra do Mar” and coastal region, including many islands, from south of the State of Rio de Janeiro, southwards to States of São Paulo, Paraná, and Santa Catarina (Figs. 169, 173).

Records: Brazil, Minas Gerais: Januária, 1 ♂ (IBSP 1924); Rio de Janeiro: Angra dos Reis, 1 ♂ (IBSP 1918), 3 ♂ (IBSP 2523), 3 ♂ (IBSP 4155A), 1 ♂ (IBSP 4155B), 1 ♂ (IBSP 41719), 1 ♂ (IBSP 6140), 1 ♂ (IBSP 6223), 1 ♂ (IBSP 6514), 1 ♂ (IBSP 6830), 1 ♂ (IBSP 6833), 1 ♂ (IBSP 6842), 1 ♂ (IBSP 6960), 1 ♂ juvenile (MZSP 14916), 2 ♂ (MZSP 14932), 1 juvenile (MZSP 14959), 1 ♀ (MZSP 14964), 1 ♀ (MZSP 14971), 1 juvenile (MZSP 14976); Ilha Grande, 1 ♂ (IBSP 3987); Ilha Grande, Abraão, praiia Brava, 1 ♂ (IBSP 4631); Paratil, 1 ♀ (IBSP 6831), 1 ♂ ♀ (IBSP 6832), 1 ♂ (IBSP 6834), 1 ♂ (IBSP 6836); São Paulo: “Raiz da Serra”, 1 ♂ (MZUSP 147, holotype of Pterinopinella wackelli, Mello-Leitão, 1923), Serra de Santos, 1 ♂ (IBSP 6957); Serra do Mar, 1 ♂ (IBSP 6486); Estrada Rio-Santos; 1 ♀ (IBSP 6093), 1 ♀ (IBSP 6099); Estrada Rio-Santos Indaiá, 1 ♂ (IBSP 6516); Santo Anastácio, 1 ♂ (IBSP 2820); São Carlos, 1 ♂ (IBSP 363B); Piracicaba, 1 ♂ (IBSP 4450); Bragança Paulista, 1 ♂ (IBSP 4510); Santo Antonio do Pinhal, 1 ♂ (IBSP 2519); Atibaia, 1 ♂ (IBSP 4689); São José dos Campos, 1 ♂ (IBSP 4251A); Tatuí, 2 ♂ (IBSP 4342B); Itu, 1 ♂ (IBSP 4468); Partau, 1 ♂ (IBSP 22258A); Osasco, 1 ♂ (IBSP 481B), 1 ♂ (IBSP 6166A); Ubatuba, 2 ♂ (IBSP 4317A), 1 ♂ (IBSP 4317B), 2 ♂ (IBSP 4343A), 1 ♀ (IBSP 6034), 1 ♀ (IBSP 6048), 1 ♀ (IBSP 6055), 1 ♀ (IBSP 6059), 1 ♀ (IBSP 6086), 1 ♀ (IBSP 6091), 1 ♀ (IBSP 6103), 1 ♀ (IBSP 6111), 1 ♂ (IBSP 6131), 1 ♂ (IBSP 6143), 1 ♂ (IBSP 6225), 1 ♂ (IBSP 6232), 1 ♂ (IBSP 6235), 1 ♂ (IBSP 6253), 1 ♂ (IBSP 6278), 1 ♂ (IBSP 6280), 1 ♂ (IBSP 6289), 1 ♂ (IBSP 6294), 1 ♂ (IBSP 6478), 1 ♂ (IBSP 6482), 1 ♂ (IBSP 6490), 1 ♂ (IBSP 6511), 1 ♂ (IBSP 6532), 1 ♂ (IBSP 6535), 1 ♀ (IBSP 6961); Ubatuba, praia do Lázaro, 1 ♂ ♀ (IBSP 4123); São Paulo - 1 ♂ (IBSP 1458B), 1 ♀ (IBSP 1664), 1 ♂ (IBSP 2921), 1 ♂ (IBSP 3158), 1 ♀ (IBSP 3747), 1 ♀ (IBSP 3887), 1 ♀ (IBSP 4217B), 1 ♀ (IBSP 6045), 1 ♀ (IBSP 6077), 1 ♀ (IBSP 6081), 1 ♀ (IBSP 6106), 1 ♀ (IBSP 6123), 1 ♂ (IBSP 6129), 1 ♂ (IBSP 6139), 1 ♂ (IBSP 6237), 1 ♂ (IBSP 6275), 1 ♂ (IBSP 6507), 1 ♂ (IBSP 6521), 1 ♀ (IBSP 6529), 1 ♂ (IBSP 5280), 1 ♂ (IBSP 6123), 1 ♂ (IBSP 6501), 1 ♀ (MZSP 14898); Taboão da Serra, 1 ♂ (IBSP 6298); Caraguatatuba, 3 ♂ (IBSP
Vitalius longisternalis sp. n.
Figs. 87-90, 181


Etymology - The specific name refers to the very long sternum of this species.

Diagnosis - Males and females can be distinguished from the other Vitalius species by the presence of a much longer than wide sternum (Fig. 21).

Description - Male (Holotype) - Total length: 32.4 Carapace: length 13.9, width 12.1. Eye tubercle: length 1.39, width 1.96. Labium: length 1.80, width 2.87. Sternum: length 7.70, width: 5.33. Fovea short, deep, straight. Chelicer basal segments with 11-11 teeth. Legs I: femur 13.0 / patella 6.6 / tibia 9.9 / metatarsus 9.5 / tarsus 6.0 / total 45.0 / II: 11.7 / 6.0 / 8.6 / 8.5 / 5.5 / 4.0 / III: 9.9 / 5.3 / 7.3 / 9.2 / 5.4 / 37.1 / IV: 12.2 / 5.7 / 10.7 / 14.1 / 6.2 / 48.9. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella p1, tibia p1-2-4ap; legs I femur p0-0-1, patella 0, tibia v2-1-1ap, p0-1-0, metatarsus v0-0-2ap, p0-1-0; II femur p0-0-1, patella 0, tibia v3-3-3ap, p1-1-1, metatarsus v2-0-2(1ap), p0-1-0; III femur 0, r0-0-1, patella 0, tibia v(2ap), p1-1-1, r1-1-1, metatarsus v12(4ap), p0-2-1, r0-1-1; IV femur r0-1-1, patella 0, tibia v11(2ap), p0-1-0, r1-1-1, metatarsus v21(2ap), p0-1-1, r0-1-1. Male spur branches originating from a
common base, tapering distally, the prolateral branch thickened (Fig. 87). Metatarsus I straight, when flexed touches the retrolateral branch laterally. Male palpal bulb pyriform, embolus long, laterally flattened at the distal region. Prolateral keels present, the PS forming the embolus edge distally. R present, pronounced, sharp. A present, medially developed. SA well-developed, bordered by small denticules (Figs. 89-90). Sternum much more longer than wide (Fig. 21). Types I and III urticating hairs present (Figs. 2, 4), the type III restricted to a small area of the abdomen. Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs ventrally covered by many long hairs. Coxae and sternum covered by short hairs. Carapace dark, margin lighter. Legs dark. Sternum, coxae and abdomen ventrally dark. Leg rings on the apex of the femora, patellae and tibiae hardly distinct. Longitudinal leg stripes hardly distinct.

Female (Paratype) - Total length: 44.7. Carapace: length 17.1, width 14.1. Eye tubercle: length 1.72, width 2.46. Labium: length 2.13, width 3.60. Sternum: length 9.60, width: 7.05. Fovea short, deep, slightly recurved. Cheliceral basal segments with 15-14 teeth. Legs I: femur 11.7 / patella 7.4 / tibia 8.5 / metatarsus 6.6 / tarsus 4.5 / total 38.7 / II: 10.5 / 6.4 / 7.1 / 6.6 / 4.0 / 34.6 / III: 9.2 / 5.9 / 6.3 / 7.6 / 4.4 / 33.4 / IV: 11.7 / 6.6 / 8.4 / 11.6 / 4.4 / 42.7. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-2ap, p0-2-2ap; legs I femur p0-0-1, patella 0, tibia v0-0-2ap, metatarsus v0-0-1ap; II femur p0-0-1, patella 0, tibia v0-0-2ap, p0-1-0, metatarsus v0-0-2ap; III femur p0-0-1, patella 1, tibia v0-0-2ap, p1-1-1, r0-1-0, metatarsus v1-3-4ap, p0-1-1, r0-1-1; IV femur r0-0-1, patella 1, tibia v0-0-2ap, p1-1-0, r0-1-0, metatarsus v19(4)ap, p0-1-1, r0-1-1. Spermathecae small, separated by a heavily sclerotized short area, SS narrower than SB (Fig. 88). Sternum much more longer than wide (Fig. 21). Type I urticating hair present (type III vestigial). Color and hair patterns as in male.

Distribution: Brazil: subtropical subadcidulous forest of States of Paraná and Santa Catarina, west of “Serra do Mar” (Figs. 169, 173).

Records: Brazil: São Paulo: Mogi-Guaçu, 1 σ (IBSP 6824); Piracicaba, 1 Φ (IBSP 876); Paraná: 1 Φ (IBSP 6810); Rio Iguaçu, 2 σ (IBSP 334); Itajaí, 1 Φ (IBSP 4488); Pitanga, 1 σ (IBSP 6809); Castro, 1 σ (IBSP 6814); Braganey/Cascavel, 1 Φ (IBSP 6811); Ponta Grossa, 1 Φ (IBSP 6817); Foz do Iguaçu, 1 Φ (IBSP 6813); Southern Brazil: 1 Φ (IBSP 6822); Foz do Iguaçu (U. H. E. Itapú), 1 Φ (IBSP 6806), 1 σ (IBSP 6820), 2 Φ (IBSP 6823); Foz do Iguaçu, Reserva do Iguaçu, 2 Φ (MZSP 15786); Guarapuava, 1 Φ (IBSP 3939); Itajai, 1 Φ (IBSP 1692), 1 Φ (IBSP 1693), 1 Φ (IBSP 6815); Itajai/Teixeira Soares, 3 σ (IBSP 6812); Curitiba, 1 σ (IBSP 6803), 1 Φ (IBSP 6804); Candói/ Manguinhina (U. H. E. Segredo/Rio Jordão), 1 Φ (IBSP 6748), 1 Φ (IBSP 6749), 1 Φ (IBSP 6750), 1 Φ (IBSP 6751), 1 Φ (IBSP 6752), 1 Φ (IBSP 6753), 1 Φ (IBSP 6754), 1 Φ (IBSP 6755), 1 Φ (IBSP 6756), 1 Φ (IBSP 6757), 1 Φ (IBSP 6758), 1 Φ (IBSP 6759), 1 Φ (IBSP 6760), 1 Φ (IBSP 6761), 1 Φ (IBSP 6762), 1 Φ (IBSP 6763), 1 Φ (IBSP 6764), 1 Φ (IBSP 6765), 1 Φ (IBSP 6766), 1 Φ (IBSP 6767), 1 Φ (IBSP 6768), 1 Φ (IBSP 6769), 1 Φ (IBSP 6770), 1 Φ (IBSP 6771), 1 Φ (IBSP 6772), 1 Φ (IBSP 6773), 1 Φ (IBSP 6774), 1 Φ (IBSP 6775), 1 Φ (IBSP 6776), 1 Φ (IBSP 6777), 1 Φ (IBSP 6778), 1 Φ (IBSP 6779), 1 Φ (IBSP 6780), 1 Φ (IBSP 6781), 1 Φ (IBSP 6782), 1 Φ (IBSP 6783), 1 Φ (IBSP 6784), 1 Φ (IBSP 6785), 1 Φ (IBSP 6786), 1 Φ (IBSP 6787), 1 Φ (IBSP 6788), 1 Φ (IBSP 6789), 1 Φ (IBSP 6790), 1 Φ (IBSP 6791), 1 Φ (IBSP 6792), 1 Φ (IBSP 6793), 1 Φ (IBSP 6794), 1 Φ (IBSP 6795), 1 Φ (IBSP 6796), 1 Φ (IBSP 6797), 1 Φ (IBSP 6798), 1 Φ (IBSP 6799), 1 Φ (IBSP 6800), 1 Φ (IBSP 6801), 1 Φ (IBSP 6802), 1 Φ (IBSP 6808), 1 Φ (IBSP 6809), 1 Φ (IBSP 6909); U.H.E. Foz do Areia, Rio Iguaçu, 3 σ 2 Φ (IBSP 6818), 1 J (IBSP 6819), 2 Φ 1 J (IBSP 6821); Pato Branco, 1 Φ (IBSP 6825); Santa Catarina: Lages, 1 Φ (IBSP 6807); São Joaquim, 1 Φ (IBSP 6805), 1 Φ (IBSP 6816).

Vitalius dubius (Mello-Leitão) sp. rev., comb. n. Figs. 91-100, 182-183


Pampobetus ypirangensis Soares, 1941:269 (holotype male from Ipiranga, São Pau-


*Pampobethes tetracanthus* Bücheler, 1947a:257 (misidentification).


Diagnosis - Males can be distinguished from all *Vitalis* species, except *V. bucecheri*, by the male palp bulb having the PS pronounced (Figs. 91-96). They can be distinguished from *V. bucecheri* by not having slender legs (Fig. 23). Females can be distinguished by having enlarged SB (Figs. 98-100).

Description - Male (IBSP 5830) - Total length: 30.9. Carapace: length 13.8, width 13.2. Eye tubercle: length 1.80, width 2.05. Labium: length 1.88, width 2.46. Sternum: length 6.31, width 6.23. Fovea short, deep, slightly recurved. Cheliceral basal segments with 10-10 teeth. Legs I: femur 12.9 / patella 7.0 / tibia 9.4 / metatarsus 8.7 / tarsus 6.9 / total 44.9 / II: 11.5 / 6.1 / 8.2 / 8.2 / 5.8 / 39.8 / III: 9.9 / 5.3 / 7.3 / 9.0 / 5.4 / 36.9 / IV: 12.2 / 5.8 / 10.2 / 13.4 / 6.2 / 47.8. Spines: tarsal lacking spines. Palpal femur p0-0-1, patella p1, tibia v2-3-1ap, p0-1-1, r0-1-0, metatarsus v0-0-1ap, p0-1-0; II femur p0-0-1, patella 0, tibia v3-3-3ap, p2-1-1, metatarsus v0-0-3ap, p0-1-0, r0-1-0; III femur p1-1-1, r0-0-1, patella p1, tibia v13(3)ap, p1-1-2, r1-1-1, metatarsus v8-0-2ap, p2-1-1, r1-1-1; IV femur p0-0-1, r0-0-1; patella vi, r1, tibia v18(3)ap, p2-1-1, r1-1-1, metatarsus v25(3)ap, p1-1-1, r1-1-1. Male spur branches originating from a common base, tapering distally, the prolateral branch thickened (Fig. 97). Metatarsus I straight, when flexed touches the retrolateral branch laterally. Male palp bulb pyriform, embolus short, slightly flattened laterally at the distal region. Prolateral keels present, the PS pronounced, it forms the embolus edge distally. R present, pronounced, sharp. A present, medially developed. SA well-developed, bordered by small denticles (Figs. 91-96). Types I and III urticating hairs (Figs. 2, 4) present, the type III restricted to a small area of the abdomen. Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs ventrally covered by many long hairs. Coxae and sternum covered by short hairs. Carapace dark brown, margined by light brown. Legs dark brown, except trochanters, which are dorsally light brown. Sternum, coxae and abdomen ventrally grayish, sternum and coxae I and II slightly darker. Leg rings and longitudinal leg stripes hardly distinct.

Female (IBSP 5651) - Total length: 56.2. Carapace: length 19.7, width 17.4. Eye tubercle: length 2.21, width 2.78. Labium: length 2.87, width 3.85. Sternum: length 9.30, width: 8.25. Fovea short, deep, slightly procurred. Cheliceral basal segments with 11-12 teeth. Legs I: femur 14.2 / patella 9.1 / tibia 10.1 / metatarsus 8.5 / tarsus 5.4 / total 47.3 / II: 12.8 / 8.0 / 8.5 / 8.0 / 5.4 / 42.7 / III: 11.7 / 7.4 / 7.8 / 9.1 / 4.9 / 40.9 / IV: 14.6 / 7.9 / 10.6 / 13.9 / 5.3 / 52.3. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-2ap, p1-2-2; legs I femur p0-0-1, patella 0, tibia v0-0-2ap, p0-1-0; metatarsus v0-0-1ap; II femur p0-0-1, patella 0, tibia v0-1-2ap, p1-1-1, metatarsus v0-0-2ap, III femur p0-0-1, r0-0-1, patella r1; tibia v2-3-2ap, p1-1-1, r1-1-1, metatarsus v3-0-4ap, p1-1-1, r0-1-1; IV femur r0-0-1, patella r1, tibia v2-3-2ap, p1-1-1, r1-1-1, metatarsus v22(3)ap, p1-2-1ap, r1-2-1ap. Spermatheca short, separated by a heavily sclerotized short area. SS narrower than SB, which is enlarged (Figs. 98-100). Type I urticating hair present (type III vestigial). Color and hair pattern as in male, except for the leg rings and longitudinal stripes being slightly more distinct.

Remarks - Bücheler (1947a) synonymized some species that Mello-Leitão, Soares, and Piza described in *Pampobethes*, with *P. tetracanthus*, based on proportions between leg articles and carapace, and color pattern. After his revision this name has been used constantly in the literature but there are many doubts about this species' identity, since the holotype is apparently lost and Mello-Leitão's description is insufficient. However, the holotype of *Pterinopelma dubium* corresponds to the species Bücheler (*l. c.* identified as *P. tetracanthus* which has page priority over all species described by Mello-Leitão (1923) in *Pampobethes*. Thus, the species *P. dubium* is removed from the synonymy of *P. wackerti* and considered valid.

Distribution: Brazil: tropical latifoliated forest of the south of the State of Minas Gerais, southwestern Rio de Janeiro and northern São Paulo (*Serra da
Vitalius vellutinus (Mello-Leitão),
sp. rev., comb. n.
Figs. 101-111, 184


Pamphobeteus roseus; Bücherl, 1947a:233-281 (in part), specimens from State of São Paulo, Minas Gerais and Mato Grosso do Sul, Brazil.

Vitalius roseus; Lucas, Silva Junior & Bertani, 1993:241-245 (comb. n.).

Diagnosis - Males can be distinguished from all Vitalius species, except V. roseus, by the presence of a small, almost vestigial, male spur (Figs. 108-111). From V. roseus they can be
distinguished by the absence of more than five spines closely arranged on the prolateral palpal tibia tip; by the small SA; and by the male palpal bulb (Figs. 101-106) tapering slightly forward. Females can be distinguished from all Ditelus species, except V. paraeae, by the absence of many long hairs on the ventral face of femora and coxae. Females from this species and that of V. paraeae can be distinguished only by the distinct geographic distribution, V. vellutinus occurring in the west of the State of São Paulo, and States of Minas Gerais and Mato Grosso do Sul.

Description - Male (IBSP 6313) - Total length: 37.9. Carapace: length 16.1, width 14.3. Eye tubercle: length 1.64, width 2.29. Labium: length 2.37, width 2.64. Sternum: length 7.05, width 6.75. Fovea short, deep, straight. Cheliceral basal segments with 11-12 teeth. Legs I: femur 14.0 / patella 7.7 / tibia 10.7 / metatarsus 9.5 / tarsus 6.4 / total 48.3 / II: 12.8 / 7.1 / 9.4 / 9.1 / 6.2 / 44.6 / III: 11.2 / 6.0 / 7.9 / 9.8 / 6.0 / 40.9 / IV: 15.3 / 6.7 / 11.1 / 14.5 / 6.6 / 52.2. Spines: tarsi lacking spines. Prolateral femur p0-0-1, patella p1, tibia v0-1-1ap, p1-2-2, legs I femur p0-0-2, patella p1, tibia v0-1-3ap, p3-1-1, metatarsus v3-0-1ap, r0-1-1; II femur p0-0-1, patella v1, tibia v1-3-3ap, p1-1-1, metatarsus v2-0-3ap, p0-1-0, r0-1-0; III femur p0-1-2, r0-0-2, patella p3, r1, tibia v2-3-2ap, p1-1-1, r1-1-1; metatarsus v4-1-5ap, p1-1-1, r0-1-1; IV femur p1, r1, patella r1, tibia v9(2ap), p1-1-1, r0-2-1, metatarsus v9(4ap), p1-1-1, r0-2-0. Male spur branches very small, originating from a common base, or vestigial in some individuals (Figs. 108-111). Metatarsus I straight, when flexed passes by prolateral branch laterally without touching it. Male palpal bulb pyriform, embolus short, tapering gradually, flattened laterally at the distal region. Proximal keels present, the PS forming the embolus edge distally. R present, pronounced, sharp. A present, medially developed. SA small, vestigial in some individuals (Figs. 101-106). Types I and III urticating hairs (Figs. 2, 4) present, the type III restricted to a small area of the abdomen. Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs covered by many long hairs ventrally. Coxae and sternum covered by short hairs. Carapace dark, marginated by light brown. Legs dark, except trochanters, which are dorsally light brown. Sternum, coxae and abdomen ventrally dark. Leg rings on the apex of the femora, patellae and tibiae very distinct. Longitudinal leg stripes very distinct except for the tibiae stripes.

Female (IBSP 5656) - Total length: 62.0. Carapace: length 21.9, width 19.2. Eye tubercle: length 2.46, width 2.78. Labium: length 3.19, width 4.26. Sternum: length 9.45, width 9.00. Fovea short, deep, procurred. Cheliceral basal segments with 14-14 teeth. Legs I: femur 16.0 / patella 10.0 / tibia 10.9 / metatarsus 10.1 / tarsus 6.7 / total 53.7 / II: 14.1 / 8.9 / 9.4 / 9.6 / 6.5 / 48.5 / III: 12.7 / 7.9 / 8.3 / 10.4 / 5.8 / 45.1 / IV: 15.6 / 8.7 / 11.3 / 14.7 / 6.5 / 56.8. Spines: tarsi lacking spines. Prolateral femur p0-0-1, patella 0, tibia v0-0-4ap, p0-2-1; legs I femur p0-0-2, patella 0, tibia v0-1-3ap, p1-1-1; metatarsus v0-0-1ap; II femur p0-0-1, patella 0, tibia v0-2-3ap, p1-2-1, metatarsus v1-0-3ap, p2-0-0; III femur 0, patella 1, r1; tibia v0-2-2ap, p1-1-1, r1-0-0, metatarsus v4-1-4ap, p1-1-1, r0-1-1; IV femur 0, patella 0, tibia v0-2-3(2ap), p1-1-0, r0-0-1, metatarsus v19(5ap), p0-1-1, r0-0-1. Spermathecae short, separated by a heavily sclerotized short area. SS narrower than SB (Fig. 107). Type I urticating hair present (type III vestigial). Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs having few long hairs ventrally. Coxae and sternum covered by short hairs. Carapace brown becoming darker on the cephalic region, marginated by light brown. Trochanters dorsally light brown. Femora black, patellae, tibiae and metatarsi of the legs I and II laterally pinkish. Sternum, coxae and abdomen ventrally black. Leg rings very distinct on the apex of the femora, patellae, and tibiae. Longitudinal leg stripes distinct, pinkish.

Variation - Juveniles have the patellae, tibiae, and metatarsi of the legs I and II almost completely pinkish. When they become larger this coloration is restricted to the lateral face of articles and are almost absent in older females and males.

Distribution: Brazil: tropical subcaducifolious forest of central-west State of São Paulo (Planalto Ocidental) (Figs. 171, 173).

Records: Brazil, Mato Grosso do Sul: Taunay, 1 1 (IBSP 96); Campo Grande, 1 1 (IBSP 4662-2B); Minas Gerais: Araçatiba, 1 1 (IBSP 74); São Paulo: 1 1 (MNRJ 39), holotype of Pterinosopelea vellutinum, Mello-Leitão, 1923), Guarani D’Oeste (U. H. E. Água Vermelha), 2 1 (IBSP 4184), 1 1 (IBSP 4371A), 1 1 (IBSP 6947); Votuporanga, 1 1 (IBSP 6982); Ilha Solteira, 1 1 (IBSP 2442); Pontal, 1 1 (IBSP 1254), 1 1 (IBSP 1255), 1 1 (IBSP 2173); Altinópolis, 1 1 (IBSP 660), 1 1 (IBSP 1216); Itacema, 2 1 (IBSP 2114); Mirandópolis, 1 1 (IBSP 4021), 1 1 (IBSP 6327); Lavinia, 1 1 (IBSP 2917); Valparaíso, 1 1 (IBSP 4321); Rubiácea, 1 1 (IBSP 3135); Guararapes, 1 1 (IBSP 1276), 1 1 (IBSP 1450), 2 1 (IBSP 2510), 1 1 (IBSP 2602), 1 1 (IBSP 2851), 1 1 (IBSP 3179); Araçatuba, 1 1 (IBSP 365), 1 1 (IBSP 1022), 1 1 (IBSP 1187), 1 1 (IBSP 1204), 1 1 (IBSP 1205), 1 1 (IBSP 1266), 1 1 (IBSP 1380), 1 1 (IBSP 1616), 1 1 (IBSP 1617), 1 1 (IBSP 4656), 1 1 (IBSP 6328), 1 1 (IBSP 6329), 1 1 (IBSP 6330), 1 1 (IBSP 6340), 1 1 (IBSP 6350); Birigui, 1 1 (IBSP 160), 1 1 (IBSP 3144); Cândido Rodrigues, 1 1 (IBSP 1560), 1 1 (IBSP 2813); Taquaritinga, 1 1 (IBSP 6907); São João do Pau D’Alho, 1 1 (IBSP 2173).
Vitalius roseus (Mello-Leitão)
Figs. 112-116, 185


Diagnosis - Males can be distinguished from all Vitalius species, except V. vellutinus, by the presence of a small, almost vestigial, male spur (Fig. 112). From V. vellutinus they can be distinguished by the presence of more than five spines closely arranged on the proteral palpal tibia tip (Fig. 25) and by the male palpal bulb shape that narrows abruptly from its median region forward (Figs. 115-116). Females can be distinguished by the small quantity of long hairs ventrally on femora together with presence of many long hairs on the coxae and the color pattern on sternum, coxae and abdomen being black ventrally and patellae and metatarsi dorso-laterally slightly pinkish.

Description - Male (IBSP 6883.) - Total length: 38.9. Carapace: length 15.4, width 13.7. Eye tubercle: length 1.72, width 2.29. Labium: length 2.05, width 2.62. Sternum: length 7.54, width 6.64. Fovea short, deep, straight. Cheliceral basal segments with 11-12 dentes. Legs I: femur 14.3, patella 7.5, tibia 10.5, metatarsus 10.1, tarsus 7.0 /total 49.4 II: 12.9, 6.8, 9.2, 9.5, 6.6, 45.0 III: 11.4, 6.0, 8.3, 10.4, 6.2, 42.3 /IV: 13.8, 6.4, 11.7, 15.2, 6.8, 53.9. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella p1, tibia p2-3-5(3ap); legs I femur p0-0-1, patella p1, tibia p2-1-3ap, p1-1, r0-1-0, metatarsus v0-0-1ap, p1-0-0, r0-1-0; II femur p0-0-2, patella 0, tibia v2-2-4ap, p1-1-1, r1-2-1; metatarsus v1-0-3ap, p1-0-0, r0-1-0; III femur r0-0-1, patella 0, tibia v2-2-2ap, p1-1-1, r1-0-0, metatarsus v5-0-4ap, p1-1-1, r1-1-1; IV femur r0-0-1, patella 0, tibia v1-2-5(3ap), p0-1-0, r1-1-1, metatarsus v14(4ap), p0-1-1, r1-1-1. Male spur branches very small, originating from a common base (Fig. 112). Metatarsus I straight, when flexed passes by the retroentral branch laterally without touching it. Male palpal bulb pyriform, embolus short, slightly flattened laterally at the distal region, tapering abruptly. Prolateral keels present, the PS forming the embolus edge distally. R present, pronounced, sharp. A present, medially developed.

SA well-developed, bordered by small denticles (Figs. 115-116). Types I and III urticating hairs (Figs. 2, 4) present, the type III restricted to a small area on the abdomen. Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs ventrally covered by many long hairs. Coxae and sternum covered by short hairs. Carapace dark, margin light brown. Legs dark, except trochanters, that are dorsally light brown. Sternum, coxae and abdomen ventrally dark. Leg rings on the apex of the femora, patellae and tibiae very distinct. Longitudinal leg stripes very distinct except for the tibiae stripes.

Female (IBSP 6723) - Total length: 35.4. Carapace: length 15.6, width 13.0. Eye tubercle: length 1.84, width 2.16. Labium: length 2.32, width 2.80. Sternum: length 7.60, width: 6.40. Fovea short, deep, procurred. Cheliceral basal segments with 13-11 teeth. Legs I: femur 12.3 /patella 7.0 /tibia 8.5, metatarsus 7.2, tarsus 4.8, total 48.1 II: 10.8, 6.5, 6.3, 6.7, 4.4, 43.3 /III: 9.6, 5.8, 6.4, 7.8, 4.3, 41.6 /IV: 12.0, 6.0, 9.2, 11.8, 4.2, 53.3. Spines: tarsi lacking spines. Palpal femur p0-0-0, patella 0, tibia v0-0-3ap, p0-1-1; legs I femur p0-0-1, patella 0, tibia v0-0-1ap, metatarsus v0-0-1ap; II femur p0-0-1, patella 0, tibia v0-0-2ap, p0-1-1, metatarsus v1-0-3ap; III femur p0-0-1, patella 0, tibia v0-0-2ap, p0-1-1, r0-1-1, metatarsus v2-0-4ap, p0-1-1, r0-1-1; IV femur r0-0-1, patella 0, tibia v0-0-2ap, p0-1-0, r1-1-1, metatarsus v16(4ap), p0-1-1, r0-1-1. Spermathecae short, separated by a heavily sclerotized short area. SS narrower than SB (Figs. 113-114). Type I urticating hair present (type III vestigial). Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs having few long hairs ventrally. Coxae and sternum covered by short hairs. Carapace brown becoming darker on the cephalic region, marginated by light brown. Trochanters dorsally light brown. Femora black. Patellae, tibiae and metatarsi of the legs I and II laterally pinkish. Sternum, coxae and abdomen ventrally black. Leg rings very distinct on the apex of the femora, patellae, and tibiae. Longitudinal leg stripes distinct, pinkish.

Variation - Juveniles have the patellae, tibiae, and metatarsi of the legs I and II almost completely pinkish. When they get older this coloration is restricted to the lateral segments and are almost absent in old females and in males.

Remarks - The former species V. roseus is separated in three. The herein refined species V. roseus is distributed only in the State of Rio Grande do Sul, Brazil.

Structural Anomaly - Among the studied material one specimen was found having the fovea inverted, protruded, from Santo Angelo, Rio Grande do Sul, Brazil.
Distribution: Brazil: subtropical subcaducifolious forest of northwest and central State of Rio Grande do Sul (Figs. 171, 173).

Records: Brazil, Rio Grande do Sul: Tenente Portela, 1 Q 10.IX.76, S. Scherer col. (MCN-RS 4524); Tuparendi, 1 Q (IBSP 5509), 1 Q (IBSP 5996), 7 Q3 3 Q (IBSP 6706), 11 J (IBSP 6707), 6 Q (IBSP 6708), 6 Q (IBSP 6709), 1 Q (IBSP 6710), 1 Q (IBSP 6711), 2 Q 3 Q (IBSP 6712), 1 Q (IBSP 6713), 2 Q (IBSP 6714), 11 J (IBSP 6715), 1 Q (IBSP 6716), 4 Q (IBSP 6717), 3 Q (IBSP 6718), 1 Q (IBSP 6719), 1 Q (IBSP 6720), 1 Q (IBSP 6721), 1 Q (IBSP 6722), 1 Q (IBSP 6723), 1 Q (IBSP 6724), 1 Q (IBSP 6725), 1 Q (IBSP 6726), 1 Q (IBSP 6727), 1 Q (IBSP 6728), 1 Q (IBSP 6729), 1 Q (IBSP 6730), 1 Q (IBSP 6731), 1 Q (IBSP 6732), 1 Q (IBSP 6733), 1 Q (IBSP 6734), 1 Q (IBSP 6735), 1 Q (IBSP 6736), 1 Q (IBSP 6737), 1 Q (IBSP 6738), 2 Q 2 J (IBSP 6740), 2 Q 1 J (IBSP 6741), 5 Q (IBSP 6742), 5 Q (IBSP 6743), 5 Q (IBSP 6744), 5 Q (IBSP 6745), 5 Q (IBSP 6746), 3 Q (IBSP 6747), 1 Q (IBSP 6900), 1 Q (IBSP 6904), 1 Q, II.VII.91, E. Lückemeyer col. (MCN-RS 21.232); 1 Q, 30.IV.91, E. Lückemeyer col. (MCN-RS 21.031); Ijuí, 1 Q, 12.V.91, C. Schutz col. (PUC-RS 1317); Bossoroca, 1 Q, 14.VII.73, A. Lise col. (MCN-RS 1741); Itaqui, 1 Q (MZUSP 143, holotype of Pamphobetous roseus, Mello-Leitão, 1923), 1 Q (IBSP 2937), 1 Q (IBSP 6883); Itaúba, Arroio do Tigre, 1 Q, 11.VII.78, A. A. Lise col. (MCN-RS 17.732); Caxias do Sul, 1 Q, 18.XII.91, F. Becker col. (MCN-RS 22102); São Vicente do Sul, 1 Q (IBSP 6878); Santa Maria, 1 Q (IBSP 6884), 1 Q (IBSP 6885), 1 Q (IBSP 6886), 1 Q, 18.IV.80, D. Link col. (MCN-RS 9549); São Gabriel, 1 Q (IBSP 1963).

Vitalius paranaensis sp. n.
Figs. 117-120, 186


Etymology - The specific name refers to the State where the type locality is located.

Diagnosis - Males can be distinguished from all Vitalius species, except V. sorocabae, by having metatarsus I straight; embo1us short; non-slender legs; PS not pronounced; and male spur well-developed. They can be distinguished from V. sorocabae by having the sternum, coxae and abdomen ventrally black. Females can be distinguished from all Vitalius species, except V. vellinus, by the absence of many long hairs ventrally on the femora and coxae. The distinction between females of this species and V. vellinus can only be done through the distinct geographic distributions, V. paranaensis occurring in the States of Paraná, Brazil, and Missions, Argentina.

Description - Male (Holotype) - Total length: 36.1. Carapace: length 16.5, width 15.5. Eye tubercle: length 1.80, width 2.29. Labium: length 2.29, width 2.78. Sternum: length 7.79, width 6.36. Fovea short, deep, slightly procurred. Cheliceral basal segments with 11-12 teeth. Legs I: femur 15.3/pate1la 8.5/tibia 12.0/metatarsus 11.1/tarsus 6.8/total 53.7/II: 14.3/7.3/10.5/10.5/6.6/49.2/III: 12.3/6.6/9.2/11.5/6.5/46.1/IV: 15.0/6.9/12.5/16.2/7.8/58.4. Spines: tarsi 2 lacking spines. Palpal femur p0-0-1, patella p1, tibia p2-1-1; legs I femur p0-0-1, patella 0, tibia v1-0-1, p0-0-1, metatarsus v0-0-1ap; II femur p0-0-1, patella 0, tib1a v0-1-1ap, p1-1-0, metatarsus v2-2-2ap, p2-0-0-3ap; III femur p0-0-1, r0-1-1, patella 0, tibia v3-3-3ap, p1-1-0, r1-0-1, metatarsus v4-1-3ap, p2-1-1, r0-1-1; IV femur 0, patella 0, tibia v11(4ap), p1-0-0, r1-1-1, metatarsus v24(4ap), p0-2-1, r0-1-1. Male spur branches originating from a common base, tapering distally, the prolateral branch thickened (Fig. 117). Metatarsus I straight, when flexed touches the retrolateral branch laterally. Male palpal bulb pyriform, embo1us short, flattened laterally at the distal region. Prolateral keels present, the PS forming the embo1us edge distally. R present, pronounced, sharp. A present, mediately developed. SA well developed, bordered by small denticles (Figs. 119-120). Types I and III urticating hairs (Figs. 2, 4) present, the type III restricted to a small area of the abdomen. Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs covered by very long hairs ventrally. Coxa and sternum covered by short hairs. Carapace dark, marginated by light brown. Legs dark, except trochanters, that are dorsally light brown. Sternum, coxae and abdomen ventrally dark. Leg rings on the apex of the femora, patellae and tibiae very distinct. Longitudinal leg stripes very distinct except for the tibiae stripes.

4ap, p0-2-1; legs I femur p0-0-1, patella 0, tibia v0-0-3ap, p0-1-0, metatarsus v0-0-1ap; II femur p0-1-0, patella 0, tibia v0-1-3ap, p1-1-1, metatarsus v1-0-3ap; III femur r0-0-1, patella r1, tibia v1-0-2ap, p1-1-0, r0-1-0, metatarsus v2-0-3ap, p1-1-1, r0-1-1; IV femur 0, patella 0, tibia v0-2-2ap, p0-1-0, r1-1-0, metatarsus v17(4ap), p0-1-1, r0-2-1. Spermathecae short, separated by a heavily sclerotized short area. SS narrower than SB (Fig. 118). Type I urticating hair present (type III vestigial). Carapace covered by short slender hairs; bordered by short hairs pointing out. Legs having few long hairs ventrally. Coxae and sternum covered by short hairs. Carapace brown becoming darker on the cephalic region, margined by light brown. Trochanters dorsally light brown. Femora black, patellae, tibiae and metatarsi of the legs I and II laterally pinkish. Sternum, coxae and abdomen ventrally black. Leg rings very distinct on the apex of the femora, patellae, and tibiae. Longitudinal leg stripes distinct, pinkish.

Variation - Juveniles have the patellae, tibiae, and metatarsi of the legs I and II almost completely pinkish. When they become larger this coloration becomes restricted to the lateral segments and are almost absent in old females and males.

Distribution: Brazil: tropical subcaducifolious forest of center, north, and west in the State of Paraná. Argentina: Missões (Figs. 171, 173).

Records: Brazil, Paraná: 1 (IBSP 3003), 1 (IBSP 6668); Paranavaí, 2 (IBSP 4883), 1 (IBSP 6660), 1 (IBSP 6666), 1 (IBSP 6683); Maringá, 1 (IBSP 4467), 1 (IBSP 6658), 1 (IBSP 6665), 1 J (IBSP 6670); Iguaçu, 1 (IBSP 4041); Marialva, 7 (IBSP 88), 3 J (IBSP 93), 1 J (IBSP 109), 4 (IBSP 116); Rolândia, 1 (IBSP 1611), 1 (IBSP 3314), 2 (IBSP 3934-A), 2 (IBSP 3934-B), 1 (IBSP 4327), 1 (IBSP 6663); Arapongas, 1 (IBSP 21), 1 (IBSP 307), 1 (IBSP 1190), 1 (IBSP 1354), 1 (IBSP 1358); Apucarana, 1 (IBSP 2105); Cambé, 1 (IBSP 6662); Londrina, 1 (IBSP 1366), 1 (IBSP 1690), 1 (IBSP 6667); Ipomorô, 1 (IBSP 167); Uraí, 1 (IBSP 2673), 1 (IBSP 2697), 1 (IBSP 2698), 1 (IBSP 2699), 1 (IBSP 2700), 1 (IBSP 2701), 1 (IBSP 3676), 1 (IBSP 2707), 1 (IBSP 2758); Sertaneja, 1 (IBSP 6684); Cornélio Procópio, 1 (IBSP 2019), 1 (IBSP 2343), 1 (IBSP 2344); Bandeirantes, 1 (IBSP 220), 1 (IBSP 243), 1 (IBSP 296), 1 (IBSP 1073), 1 (IBSP 1412), 1 (IBSP 1414), 1 (IBSP 1494), 1 (IBSP 1576), 1 (IBSP 2622); 1 (IBSP 2511); Andirá, 1 (IBSP 6661); Cambará, 1 (IBSP 3939); Engenhoca Beltrão, 1 (IBSP 6664); Grandes Rios, 1 (IBSP 4715); Curíúva, 2 (IBSP 2168); Jaguariaíva, 1 (IBSP 2768), 1 (IBSP 2769), 1 (IBSP 4411); Foz do Iguaçu - U. H. Itaipú - 1 (IBSP 4904), 1 (IBSP 6671), 2 (IBSP 6672), 1 (IBSP 6673), 1 (IBSP 6674), 1 (IBSP 6675), 1 (IBSP 6676), 1 (IBSP 6677), 1 (IBSP 6678), 1 (IBSP 6679), 1 (IBSP 6680), 1 (IBSP 6681), 1 (IBSP 6682), 1 (IBSP 6686), 1 (IBSP 6687), 1 (IBSP 6688), 2 (IBSP 6689), 1 (IBSP 6690), 1 (IBSP 6691), 1 (IBSP 6692), 1 (IBSP 6693), 1 (IBSP 6694), 1 (IBSP 6695), 5 (IBSP 6696), 5 (IBSP 6697), 4 (IBSP 6698), 2 (IBSP 6699), 1 (IBSP 6700), 1 (IBSP 6701), 1 (IBSP 6702), 1 (IBSP 6703), 1 (IBSP 6704), 1 (IBSP 6705), 1 (IBSP 6706), 1 (IBSP 6709), 1 (IBSP 6908); Guaraupuva, 1 (IBSP 6659); Prudentópolis, 1 (IBSP 3601); Ponta Grossa PR - 1 (IBSP 959), 1 (IBSP 15.VIII.82), 2 (IBSP 22.547); Balsal Nova (João Eugênio), 1 (IBSP 2776); Curitiba, 1 (IBSP 6669); Argentina, Porto Iguazu, 1 (IBSP 6685).

**Vitalius bucecheri** sp. n.

Figs. 121-124, 186-187


Etymology - The specific name is a patronym in recognition of the contribution to taxonomy of Brazilian mygalomorphs, mainly theraphosids, of Wolfgang Bächerl.

Diagnosis - Males can be distinguished from all *Vitalius* species, except *V. dubius*, by the presence of a pronounced PS (Figs. 123-124). They can be distinguished from *V. dubius* by the presence of slender legs (Fig. 22). Females can be distinguished by having non-thickened tibiae IV, sternum slightly longer than wide, carapace without long hairs on the margin pointing to the carapace center, SB not enlarged, many long hairs on the femora ventrally, and sternum and coxae grayish covered by long hairs.

/15,3/6,4/53.0. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia, p1-3-2; legs I femur 0, patella 0, tibia v0-0-1ap, p0-1-0, metatarsus v0-0-1ap, p0-1-0; II femur 0, patella 0, tibia v0-2-1ap, p0-0-1, metatarsus v3-0-2ap; III femur 0, patella 0, tibia v1-2-3(ap), p0-1-0, r0-1-1, metatarsus v0-4-3ap, p0-1-1, r0-1-1; IV femur 0, patella 0, tibia v0-5-3(ap), r1-1-1, metatarsus v213(ap), p1-1-1, r0-1-1. Male spur branches originating from a common base, tapering distally, the prolateral branch thickened (Fig. 121). Metatarsus I straight, when flexed touches the retralateral branch laterally. Male palpal bulb pyriform, embolus short, slightly flattened laterally at the distal region. Prolateral keels present, the PS pronounced, forming the embolus edge distally. R present, pronounced, sharp. A present, medially developed. SA well-developed, bordered by small denticles (Figs. 123-124). Types I and III urticating hairs (Figs. 2, 4) present, the type III, retrolateral to a small area of the abdomen. Carapace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs slender (Fig. 22), ventrally covered by many long hairs. Coxae and sternum covered by medially developed hairs. Carapace brown, margined by light brown. Legs dark brown, except trochanters, that are dorsally light brown, covered by long reddish hairs. Sternum, coxae and abdomen ventrally grayish, covered by long reddish hairs. Leg rings and longitudinal leg stripes hardly distinct.

Female (Paratype) - Total length: 49.7. Carapace: length 16.4, width 14.4. Eye tubercle: length 2.13, width 2.70. Labium: length 2.54, width 3.44. Sternum: length 7.80, width: 7.05. Fovea short, deep, slightly procured. Cheliceral basal segments with 11-13 teeth. Legs I: femur 12.9 / patella 7.9 / tibia 9.8 / metatarsus 8.4 / tarsus 5.6 / total 44.6/II: 11.8/7.1/8.2/7.8/5.5/40.4/Ill: 10.4/12.5/7.5/8.2/14.8/37.4/IV: 12.7/7.0/10.5/12.5/4.7/47.7. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-3ap, p0-2-1; legs I femur p0-0-1, patella 0, tibia v0-0-1ap, metatarsus v0-0-1; II femur 0, patella 0, tibia v0-0-2ap, metatarsus v1-0-3ap; III femur 0, patella 0, tibia v0-3-2ap, p0-1-0, r0-1-1, metatarsus v0-3-4ap, p0-1-1, r0-1-1; IV femur 0, patella 0, tibia v0-3-3(ap), r0-1-1, metatarsus v23(ap), p0-1-1, r0-1-1. Spermatic sheaths, separated by a heavily sclerotized short area. SS narrower than SB (Figs. 122). Type I urticating hair present (type III vestigial). Color and hair pattern as in male.

Remarks - Bücherl (1947a) misidentified this undescribed species as *Pamphobetus cestus* (= *Vitalius dubius*).

Distribution: Brazil: tropical latifoliated forest of the Planalto Atlântico, "Serra da Paranapiacaba", and vicinity in State of São Paulo (Figs. 170, 173).

Records: Brazil, São Paulo: Monte Alegre do Sul, 1♂ (IBSP 676), 1♀ (IBSP 677); Mairiporã, 1♂ (IBSP 6603), 1♀ (IBSP 6623); Santa Isabel, 1♀ (IBSP 6625); São Luís do Paraitinga, 1♀ (IBSP 6636), Guaré, 1♀ (IBSP 6649); Araçariguama - 1♀ (IBSP 6654); Caiçaras, 1♀ (IBSP 8808B); Itapevi, 1♂ (IBSP 4526); Embú, 1♂ (IBSP 6614), 1♀ (IBSP 6620); Osasco / Carapicuíba, 1♀ (IBSP 6629); Paredeiros, 1♀ (IBSP 6604), 1♀ (IBSP 6617); São Paulo, 1♀ (IBSP 1566), 2♂ (IBSP 4353A), 1♀ (IBSP 4370), 1♂ (IBSP 6600), 1♂ (IBSP 6601), 1♂ (IBSP 6602), 1♂ (IBSP 6605), 1♂ (IBSP 6607), 1♂ (IBSP 6608), 1♀ (IBSP 6619), 1♀ (IBSP 6627), 1♀ (IBSP 6638), 1♀ (IBSP 6643), 1♀ (IBSP 6651), 1♀ (MZSP 14917), Salesópolis, 1♀ (MZSP 5283), 1♀ (MZSP 6541); Boracéia (E. Ecológica), 1♀ (IBSP 6615); Embú-Guacuí, 1♀ (IBSP 4237); Cubatão (alto da serra), 1♂ (IBSP 6609); São Bernardo do Campo, 1♀ (IBSP 6628); Santo André, 1♀ (IBSP 2485B), 1♀ (IBSP 6633); Piedade, 2♂ (IBSP 4442), 1♂ (IBSP 6616), 1♀ (IBSP 6647), 1♀ (IBSP 6652), 1♀ (IBSP 6655), 1♀ (IBSP 6656), 1♀ (IBSP 6657), 1♂ (IBSP 6687), 1♂ (IBSP 6597), 1♀ (IBSP 6626); Itaquericera da Serra, 1♀ (IBSP 6589), 1♂ (IBSP 6892); Tapiraí, 2♂ (IBSP 4428), 1♀ (IBSP 6640); São Lourenço da Serra, 1♂ (IBSP 6598), 1♀ (IBSP 6641); Juquitiba, 1♀ (IBSP 6685), 1♂ (IBSP 6856), 1♂ (IBSP 6688), 2♂ (IBSP 6590), 1♂ (IBSP 6591), 1♂ (IBSP 6592), 1♂ (IBSP 6593), 1♂ (IBSP 6594), 1♂ (IBSP 6595), 1♂ (IBSP 6596), 1♂ (IBSP 6599), 1♀ (IBSP 6621), 1♀ (IBSP 6624), 1♀ (IBSP 6630), 1♀ (IBSP 6637), 1♀ (IBSP 6642), 1♀ (IBSP 6644), 1♀ (IBSP 6646), 1♀ (IBSP 6657); Guapiaçu, 1♀ (IBSP 6634); Itanhaém, 1♀ (IBSP 6606), 1♀ (IBSP 6610), 1♀ (IBSP 6631); Sete Barras, 1♀ (IBSP 6618), 1♀ (IBSP 6622), 1♀ (IBSP 6645); Juquiá, 1♀ (IBSP 4209), 2♂ (IBSP 4379), 1♀ (IBSP 5996), 1♂ (IBSP 6612), 1♀ (IBSP 6635), 1♀ (IBSP 6639), 1♀ (IBSP 6648), 1♀ (IBSP 6650); Miracatu, 2♀ (IBSP 4452), 1♂ (IBSP 6613); Pedro Barros, 1♂ (IBSP 6611); Iporanga, 1♀ (MZSP 4003); Registro, 1♂ (IBSP 4232C), 1♂ (IBSP 2562); Vale do Ribeira, 1♀(IBSP 6633); Cajati / Jacupiranga - 1♀ (IBSP 6632).

Vitalius lucasae sp. n.
Figs. 125-128

Holotype. Male, IBSP 6828, Curitiba, Paraná, Brazil, 23.V.1993, M. T. Pereira col.
Paratype: Female, IBSP 6827, Curitiba, Paraná, Brazil, IX/1996, R. de Aquino col.

Etymology - The specific name is a patronym in recognition to the contribution to the taxonomy of Brazilian mygalomorphs, mainly theraphosids, by Sylvia Lucas.
Diagnosis - Males can be distinguished from all *Vitalius* species by the presence of an accentuated D (Figs. 127–128). Females can be distinguished by the presence of thickened tibiae IV.


Male spur branches straight (Fig. 125) originating from a common base, the retrolateral constricted in the middle. Metatarsus I curved, when flexed touches the retrolateral branch laterally. Male palpal bulb pyriform, embolus short, tapering gradually, flattened laterally at the distal region. Prolateral keels present, the PS forming the embolus edge distally. R pronounced, sharp. A present, medially developed. SA well-developed, bordered by small denticles. Male palpal bulb with an accentuated D (Figs. 127-128). Types I and III urticating hairs (Figs. 2, 4) present, the type III restricted to a small area of the abdomen. Tibiae IV slightly thickened. Carpace covered by short slender hairs; bordered by short hairs pointing out (Fig. 16). Legs ventrally covered by many long hairs. Coxae and sternum covered by short hairs. Carpace and legs black. Sternum, coxae and abdomen ventrally granish. Leg rings on the apex of the femora, patellae and tibiae hardly distinct. Longitudinal leg stripes hardly distinct.

Female (Paratype) - Total length: 56.1 Carapace: length 16.1, width 14.4. Eye tubercle: length 1.88, width 2.21. Labium: length 2.46, width 3.44. Sternum: length 8.25, width: 7.50. Fovea short, deep, straight. Cheliceral basal segments with 12-12 teeth. Legs I: femur 11.8/patella 7.4/tibia 7.8/metatarsus 6.3/tarsus 4.6/total 37.9/II: 10.3/6.7/6.7/5.9/4.2/33.8/III: 10.0/6.5/6.2/6.2/4.2/33.1/IV: 12.5/7.3/9.6/11.8/4.5/45.7. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-2ap, p1-2-2; legs I femur p0-0-1, patella 0, tibia v0-0-1ap, metatarsus v0-0-2ap; II femur p0-0-1, patella 0, tibia v0-1-0, metatarsus v0-1-3ap; III femur p0-0-1, r0-0-1, patella 0, tibia v0-1-2ap, p0-2-0, r1-1-1, metatarsus v2-3-3ap, p1-2-1, r0-1-1; IV femur r0-0-1, patella r1, tibia v0-1-1ap, r1-1-1, metatarsus v14(4ap), p0-1-1, r0-1-1. Spermatheca short, separated by a heavily sclerotized short area. SS narrower than SB (Fig. 126). Type I urticating hair present (type III vestigial). Tibiae IV slightly thickened. Color and hair patterns as in the male.

Distribution. Brazil: Apparently limited to the vicinity of the City of Curitiba, State of Paraná (Figs. 170, 173).

Records: Brazil: *São Paulo*: Jundiaí, 1♂ [IBSP 2278-B]; Paraná: 2♂ [IBSP 3939]; Irati, 1♂ [IBSP 6829]; Curitiba, 1♂ [IBSP 6826], 1♀ [IBSP 6827], 1♂ [IBSP 6828], 2♀ [IBSP 4392], 1♂ [IBSP 6898]; Morretes, Serra da Prata, 1♀, 1946, Goffgeré col. (MNJR s/nr.); Aracuária, 1♂ [IBSP 2927].

**Nomina Dubia**

*Pamphobeteus platyomma* Mello-Leitão


Remarks - See remarks under *Vitalius wacketti*.

*Pamphobeteus rondoniensis* Mello-Leitão


Because the holotype of *Pamphobeteus rondoniensis* is probably lost and its description is insufficient, this species is considered *nomen dubium*.

*Pamphobeteus tetracanthus* Mello-Leitão

Remarks - See remarks under Vitalius dubius.

Pamphobeteus exsul Mello-Leitão


Remarks - Because the holotype of Pamphobeteus exsul is probably lost and its description is insufficient this species is considered nomen dubium.

Nhandu Lucas


Diagnosis - Males can be distinguished from species of other theraphosine genera except Proshapalopus, Lasiodora, and Vitalius by the presence of a triangular SA (Figs. 131-132). From Lasiodora they can be distinguished by the absence of stridulatory hairs on the superior region of the prolatral coxae I and II (Fig. 27); from Proshapalopus by the absence of a SA (Fig. 65); and from Vitalius except V. lucasae, by the absence of male spur or, if present, by the straight spur branches originating from a common base, the retro lateral constricted in the middle (Fig. 133). From V. lucasae they can be distinguished by lacking an accentuated D. Females can be distinguished by having the presence of retro lateral scopulae on the femur IV; absence of stridulatory hairs on the superior region of the prolatral coxae I and II (Fig. 27); spermathecae separated by a heavily sclerotized short area; and many long, curvy, scattered hairs, over the carapace (Fig. 18).

Description - Cephalothorax longer than wide, cephalic region slightly raised, convex. Cephalic and thoracic striae distinct. Fovea short; deep; straight, slightly recurved or procurred. Chelicerae without rastellum, basal segments with 10 to 13 teeth. Eye tubercle distinct, wider than long. Clypeus absent. Anterior eye row procurred, posterior recurved. AME rounded, the same size as ALE and PLE that have an oval shape. PME small, oval. Labium subquadrate, slightly wider than long, with numerous (more than 100) cupsules on its anterior half. Maxilla subretangular, anterior lobe distinctly produced into conical process, inner angle bearing numerous cupsules (more than 100). Sternum longer than wide, anterior sigilla on the sternum/labium edge. Other sigilla submarginal, the second pair smaller than the third that is smaller than the fourth. PMS one-segmented, short; PLS three-segmented, basal segment longer than the apical, both longer than the median. Apical segment digitiform. Leg tarsi without spines, claw tufts present; STC with a median row of few small teeth. Tarsi I-IV and metatarsi I-II scopulated, metatarsus III scopulated along half its length, metatarsus IV apically scopulated. Femur IV with retro lateral scopula. Prolateral leg coxae and retro lateral palpal trochanter without stridulatory hairs. Male spur with straight branches originating from a common base, the retro lateral constricted in the middle (N. vulpinus, N. coloratovillosus, and N. cerradensis) (Fig. 133), or male spur absent (N. carapoisensis) (Fig. 129). Metatarsi I straight (N. carapoisensis) or curved (other species), when flexed touches the apex of the retro lateral branch (N. coloratovillosus and N. cerradensis) (Fig. 133) or the retro lateral branch laterally (N. vulpinus) (Fig. 137). Male palpal bulb pyriform, embolus short, slightly flattened distally. Prolateral keels present, the PS forming the embolus edge distally. AC absent. R present, pronounced, sharp. A present, medially developed. SA well-developed, bordered by small denticles (Fig. 131-132). Spermathecae long (N. vulpinus and N. coloratovillosus, Fig. 138) or short (other species, Fig. 130), separated by a heavily sclerotized short area. SS narrower than SB (N. cerradensis, Fig. 134) or SS indistinct, as wide as SB (other species, Fig. 130). Types I and III urticating hairs (Figs. 2, 4) present in males and females (N. vulpinus, N. coloratovillosus, and N. cerradensis) or type III vestigial in females (N. carapoisensis). Type I urticating hair with the region “a” longer or equal to the region “b”. Female carapace covered by short slender hairs and some very long, curvy, scattered hairs; bordered by some long hairs ponting out and other pointing to the center of the carapace (Fig. 18). Tibiae IV not thickened. Legs dorsally and ventrally covered by many long hairs.

Constitution: four species.

Key to Nhandu Species

Males

1. Male spur absent (Fig. 129) .... N. carapoisensis
   - Male spur present

2
2(1). Metatarsus I touching the retrolateral male spur branch apex when flexed (Fig. 133). .................................................... N. vulpinus

- Metatarsus I touching the retrolateral male spur branch laterally when flexed (Fig. 137) ........................................... N. cerradensis

3(2). General dorsal color pattern blackish with white rings on the patellae and tibiae ........................................... N. cerradensis

- General dorsal color pattern blackish with wide whitish bands on the patellae and tibiae ................................... N. coloratovillosus

Females

1. Long spermathecae (Fig. 138); legs with wide whitish bands on the patellae and tibiae ................................. N. coloratovillosus

- Short spermathecae (Fig. 130); leg with rings present on the patellae and tibiae ........................................... N. coloratovillosus

2(1). Dark legs with wide whitish bands on the tibiae and patellae (Fig. 191) ........................................... N. coloratovillosus

2(1). Spermathecae stalk indistinct, as long as spermatheca bulb (Fig. 130); general color pattern brown, with leg rings on the patellae and tibiae hardly distinct (Fig. 189); type III urticating hair (Fig. 2) absent .......................................................... N. carapoensis

- Spermathecae stalk narrower than spermatheca bulb (Fig. 134); general color pattern blackish, with very conspicuous white rings on the patellae and tibiae (Fig. 190); type III urticating hair present ........................................... N. cerradensis

Nhandu carapoensis Lucas
Figs. 129-132, 188


Diagnosis - Males can be distinguished from other Nhandu species by the absence of a male tibial spur on leg I (Fig. 129). Females can be distinguished by short spermathecae lacking constriction in the middle (Fig. 130).

Description - Male (Paratype, IBSP 4661) - Total length: 54,7. Carapace: length 21.0, width 19.5. Eye tubercle: length 2,13, width 2;70. Labium: length 2,87, width 3,52. Sternum: length 9,00, width: 8,55. Fovea short, deep, slightly recurved. Cheliceral basal segments with 11-10 teeth. Legs I: femur 17,3/patella 9,5/tibia 12,0/metatarsus 13,1/tarsus 8,3/total 60,2/II: 15,8/8,5/11,2/12,7/7,8/56,0/III: 14,5/7,9/10,6/13,8/7,5/54,3/IV: 17,6/8,8/14,1/20,4/8,6/69,5. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella p1, tibia p0-2-1; legs I femur p0-0-1, patella v1, p2, tibia v24(7ap), p2-1-1, metatarsus v7-0-2ap; II femur p0-0-2, patella v1, p3, tibia v14(4ap), p1-1-2, metatarsus v5-0-3ap, p1-1-1; III femur p0-0-1, r0-0-1, patella p1, r1, tibia v9(2ap), p1-1-1, r1-1-1, metatarsus v16(6ap), p1-2-1, r0-1-1; IV femur r0-0-1, patella 0, tibia 10(4ap), p0-1-1, r1-1-1, metatarsus v=25(3ap), p0-1-1, r0-1-1. Male tibial spur absent on leg I (Fig. 129). Metatarsus I straight. Male palp bulb pyriform, embolus short, slightly flattened laterally at the distal region. Prolateral keels present, the PS forming the embolus edge distally. R present, pronounced, sharp. A present, medially developed. SA well-developed, triangular, bordered by small denticles (Figs. 131-132). Type I and III urticating hairs present (Figs. 2, 4), type I with the region “a” longer than region “b”. Carapace covered by short slender hairs; bordered by short hairs pointing out. Legs with femora distally thickened, dorsally and ventrally covered by many long hairs. Coxae and sternum covered by short slender hairs. Carapace, legs, sternum, coxae and abdomen ventrally reddish brown, legs covered by long reddish hairs. Leg rings and longitudinal stripes hardly distinct.

Female (Paratype, IBSP 4553) - Total length: 50,0. Carapace: length 21,2, width 20,2; Eye tubercle: length 2,21, width 2,78. Labium: length 3,36, width 4,10. Sternum: length 9,75, width 9,00. Fovea short, deep, slightly recurved. Cheliceral basal segments with 13-12 teeth. Legs I: femur 15,2/patella 9,1/tibia 10,5/metatarsus 9,7/tarsus 6,0/total 50,5/II: 13,9/8,5/9,4/9,4/6,2/47,4/III: 12,5/7,9/8,7/10,9/6,6/46,6/IV: 15,3/8,2/12,1/13,6/5,2/54,4. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella p1, tibia v0-0-3ap, p0-2-1; legs I femur p0-0-2, patella 0, tibia 0, metatarsus v0-0-1ap; II femur p0-0-2, patella 0, tibia v0-1-2ap, p1-1-1, metatarsus v1-0-3ap; III femur p0-0-1, r0-0-1, patella 0, tibia v0-3-1ap, p1-1-1, r0-1-1, metatarsus v1-2-12ap, p0-1-0, r0-1-1; IV femur r0-0-2, patella 0, tibia v1-5-1ap, p0-1-0, r1-1-1, metatarsus v=12. Spermathecae short, separated by a heavily sclerotized short area. SS indistinct, as wide as SB (Fig. 130). Type I urticating hair (Fig. 4) present with the region “a” longer than the region “b”. Color and hair pattern
as in male except for the presence of very long curly hairs scattered over the carapace and on the border, some pointing out and others pointing to the carapace center (Fig. 18).

Distribution: Brazil: Brazilian “Pantanal matogrossense” and Brazilian “campos” and “cerrados” from the States of Mato Grosso do Sul and São Paulo; Paraguay: Chaco (Fig. 168).

Records: Brazil, Mato Grosso do Sul: Pedro Gomes, 1 œ (IBSP 4707); Agachi, 1 œ (IBSP 3049), 1 œ J (IBSP 4266), 1 œ (IBSP 3019), 1 œ (IBSP 2981), 1 œ (IBSP 3005), 1 œ (IBSP 3047); Miranda, 1 œ (IBSP 6551), 1 œ (MZSP 14892), 1 œ (MZSP 14893); Aquidauana, 1 œ (IBSP 213), 1 œ (IBSP 1434); Piraputanga, 2 œ (IBSP 6555); Cachoeirão, 1 œ (IBSP 3142); Campo Grande, 1 œ J (IBSP 3812), 1 œ (IBSP 4647), 1 œ (IBSP 2780), 1 œ (IBSP 3125), 1 œ (IBSP 6554); Campo Grande, Candelfária, 1 œ J (IBSP 1541); Água Clara, 1 œ (IBSP 3058); Bonito, 1 œ (IBSP 6553); Nioaque, 1 œ (IBSP 4346), 1 œ (IBSP 6552); Sidrolândia, 1 œ (MZSP 10868); Maracaju, 1 œ (IBSP 3766); Dourados, 1 œ (IBSP 6556); Caarapó, 1 œ (IBSP 4611), holotype of *Nhandu carapoensis*, Lucas 1981, 1 œ (IBSP 4661, paratype of *N. carapoensis*), 1 œ (IBSP 4553, paratype of *N. carapoensis*); São Paulo: Franca, 1 œ (IBSP 597), 1 œ (IBSP 1192); Sertãozinho, 1 œ (IBSP 6560); Lins, 1 œ (IBSP 245); Araras, 1 œ (IBSP 6559); Arcadas, 1 œ (IBSP 3178); Baurú, 1 œ (IBSP 2232), 1 œ (IBSP 2253), 1 œ (IBSP 2269-A), 1 œ J (IBSP 1810-18); Rio Claro, 1 œ (IBSP 1032); Capivari, 1 œ (IBSP 3417); Cardéia, 1 œ (IBSP 3083); Paraguai, Assunção, 1 œ J (IBSP 2366).

*Nhandu cerradensis* sp. n.

Figs. 133-136, 190


Etymology - The specific name is a noun in apposition taken from the “cerrado”, a savanna-like Brazilian vegetation type occurring in the regions where this species inhabits.

Diagnosis - Males can be distinguished from *N. carapoensis* by the presence of a male tibial spur (Fig. 133); from *N. vulpinus* by the metatarsus I touching the apex of the retrolateral male spur branch, when flexed; and, from *N. coloratovillosus* by the color pattern showing white conspicuous leg rings over a dark background. Females can be distinguished from *N. vulpinus* and *N. coloratovillosus* by the short spermathecae (Fig. 134), and from *N. carapoensis* by the SS narrower than SB and also by the presence of very conspicuous white leg rings over a dark background on the legs.

Description - Male (holotype) - Total length: 43.8. Carapace: length 18.1, width 16.3. Eye tubercle: length 1.88, width 2.46. Labium: length 2.29, width 2.95. Sternum: length 7.65, width: 7.20. Fovea short, deep, slightly recurved. Cheliceral basal segments with 12-10 teeth. Legs I: femur 15.9 / patella 8.6 / tibia 11.6 / metatarsus 11.8 / tarsus 7.1 / total 55.0 / II: 14.4 / 7.7 / 10.8 / 11.1 / 7.0 / 51.0 / III: 13.0 / 6.7 / 10.0 / 12.2 / 6.6 / 48.5 / IV: 16.0 / 7.4 / 13.1 / 17.7 / 12.6 / 41.8. Spines: tarsi lacking spines. Palpal femur p0-0-2, patella v1a-p, p1, tibia v0-4-3, p4-2-1; legs I femur p0-0-1, patella v3, tibia v13(3ap), p1-0-1, r1-1-1; metatarsus v0-0-1ap, p1-0-0; II femur p0-0-1, patella v1, p1, tibia v13(3ap), p0-2-1, r1-1-1, metatarsus v2-3-3ap, p1-1-1, r1-1-1; IV femur r0-0-1, patella 0, tibia v12(4ap), p1-1-1, r1-1-1, metatarsus v24(4ap), p1-1-1, r0-1-1. Male spur branches straight (Fig. 133) originating from a common base, the retrolateral constricted in the middle. Metatarsus I curved, when flexed touches the retrolateral branch apex. Male palpal bulb pyriform, embolus short, slightly flattened laterally at the distal region. Prolateral keels present, the PS forming the embolus edge distally. R present, pronounced, sharp. A present, medially developed. SA well-developed, triangular, bordered by small denticles (Figs. 135-136). Type I and III uricating hairs (Figs. 2, 4) present, type I with the region “a” longer than region “b”. Carapace covered by short slender hairs, bordered by short hairs pointing out. Legs ventrally covered by many long hairs. Coxae and sternum covered by short slender hairs. Carapace and legs black. Sternum, coxae, and abdomen ventrally grayish. Leg rings very distinct on the femora, patellae, and tibiae anterior. Longitudinal leg stripes hardly distinct.

short, separated by a heavily scleritized short area.  SS narrower than SB (Fig. 134). Urticating hair of the type I and III (Figs. 2, 4) present, the type I with the region "a" longer than the region "b". Color and hair pattern as in the male except for the presence of very long curly hairs scattered over the carapace and on the margin, some pointing out and others to the carapace center (Fig. 18). All legs with many very long curly hairs on the ventral and dorsal sides, giving them a very hirsute aspect. Leg rings white, more conspicuous than in males.

Distribution: Brazil: Brazilian "cerrados" from central and northern State of Goiás (Fig. 168).

Records: Brazil, Amazonas: Presidente Figueiredo, U. H. E. Balbina, 1 ♂, X/1987, L. F. Alvarenga & J. A. F. Costa col. (MNRJ 12.259); Goiás: Pontangüi, 1 ♂ (IBSP 3809); Formoso, 1 ♀ (IBSP 4188); Minuacu, U. H. E. Serra da Mesa, 1♂, 21.1.48, D. F. de Moraes col. (MNRJ s/n), 3 ♂ 1 ♀ 1 juvenile (MZSP 18313), 1 ♂ (MZSP 18317), 1 ♀ (MZSP 18318), 2 ♂ (MZSP 18319); Alto Paraíso de Goiás, 1 ♂ (IBSP 6889); Goiás, 1 ♂ (IBSP 6888); Bahia: 1 ♂ (IBSP 2716).

*Nhandu vulpinus* (Schmidt) comb. n. Figs. 137-140, 191

*Vitalius vulpinus* Schmidt, 1998b: 1, figs. 1-3 (holotype, exuvia of a female from Pará, Northern Brazil, M. Baumgarten col. 1997, in the Senckenberg Museum, Frankfurt/Main, not examined. - Schmidt & Samm, 1999b:2-6, figs. 1-3 (desc. ♂).  

Diagnosis - Males can be distinguished from *N. carapoensis* by the presence of a male tibial spur, and from *N. coloratovillosus* and *N. cerreadensis* by the metatarsus I touching the retrolateral male spur branch laterally, when flexed (Fig. 137). Females can be distinguished from *N. carapoensis* and *N. cerreadensis* by the presence of long spermathecae (Fig. 138) and from *N. coloratovillosus* by the color pattern being less contrasting, with leg bands hardly distinct.

Description - Male (IBSP 4779) - Total length: 50.9 Carapace: length 23.2, width 21.3. Eye tubercle: length 2.46, width 3.28. Labium: length 3.28, width 3.36. Sternum: length 10.05, width: 9.00. Fovea short, deep, slightly recurved. Cheliceral basal segments with 12-10 teeth. Legs 1: femur 22.5 / patella 11.3 / tibia 17.9 / metatarsus 17.2 / tarsus 9.4 / total 78.3 / II: 20.5 / 10.3 / 16.2 / 16.8 / 9.3 / 73.1 / III: 18.8 / 9 / 14.9 / 18.8 / 8.5 / 70.3 / IV: 22.4 / 10.1 / 19.1 / 26.0 / 9.8 / 87.4. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-3, p1-4-4, d0-0-1; legs I femur p0-0-1, patella 0, tibia v1-3-1ap, p0-1-0, r0-1-1, metatarsus v0-0-1ap; II femur p0-0-1, patella 0, tibia v2-2-4ap, p1-1-1, metatarsus v1-0-3ap; III femur p0-0-1, r0-0-1, patella 1, tibia v15(3ap), p1-1-1, r1-1-1, metatarsus v1-3-3ap, p1-1-1, r1-1-1; IV femur r0-0-1, patella 1, tibia v14(5ap), p1-1-1, r1-1-2, metatarsus v29(4ap), p1-1-1, r1-1-1. Male spur branches straight (Fig. 137) originating from a common base, the retrolateral constricted in the middle. Metatarsus I curved, touching laterally the retrolateral branch when flexed. Male palpal bulb pyriform, embolus short, slightly flattened laterally at the distal region. Protral keels present, the PS forming the embolus edge distally. R present, pronounced, sharp. A present, medially developed. SA well-developed, triangular, bordered by small denticles (Figs. 139-140). Types I and III urticating hairs present (Figs. 2, 4), type I with the region "a" longer than region "b". Carapace covered by short slender hairs and some very long curly hairs; bordered by short hairs pointing out. Legs covered by many long hairs dorsally and ventrally. Coxae and sternum covered by short slender hairs. Carapace and legs brown, covered by long reddish hairs, femora darker. Sternum, coxae and abdomen ventrally brown. Legs lacking rings, with large whitish bands hardly distinct instead. Longitudinal leg stripes hardly distinct.

Female (IBSP 7036) - Total length: 81.0. Carapace: length 26.5, width 22.7. Eye tubercle: length 2.87, width 2.52. Labium: length 4.34, width 4.51. Sternum: length 11.7, width: 10.05. Fovea short, deep, straight. Cheliceral basal segments with 11-11 teeth. Legs I: femur 19.0 / patella 11.2 / tibia 14.7 / metatarsus 13.8 / tarsus 7.5 / total 66.2 / II: 17.4 / 10.3 / 12.3 / 13.2 / 7.1 / 60.3 / III: 15.5 / 9.8 / 11.6 / 15.0 / 6.8 / 58.7 / IV: 18.4 / 10.0 / 15.8 / 20.3 / 7.3 / 71.8. Spines: tarsi lacking spines. Palpal femur p0-0-1, patella 0, tibia v0-0-2ap, p1-1-1; legs I femur 0, patella 0, tibia v0-0-2ap, p0-1-0, metatarsus v0-0-1ap; II femur 0, patella 0, tibia v0-1-1, p1-1-1, metatarsus v1-0-2ap; III femur r0-0-1, patella 1, tibia v1-2-3(2ap), r1-1-1-1, metatarsus v4-0-4ap, p1-1-1, r0-1-1, IV femur 0, patella 0, tibia v0-2-6(4ap), p0-0-1, r0-1-1, metatarsus v20(3ap), p0-1-1, r0-2-1. Spermatheca long, separated by a heavily sclerotized short area. SS indistinct, as wide as SB (Fig. 138). Type I and III urticating hair (Figs. 2, 4) present, the type I with the region "a" longer than the region "b". Color and hair pattern as in the male except for the number of very long curly hairs scattered over the carapace being higher as well as on the carapace border (Fig. 18).

Remarks - Schmidt (1998b) described the female and diagnosed this species based on color pattern and the unusual spermathecae shape. He also called attention to the absence of type III urticating hair, which was present in his newly
described genus *Braziliopelma*. Schmidt & Samm (1998b) described the male and introduced in the diagnosis the presence of one adjacent thick thorn on the retrolateral face of the prolateral branch of the male spur; the metatarsus I touching laterally the retrolateral branch of the male spur when flexed; and, the presence of a modified type I urticating hair, similar to the one he found on the male of *Braziliopelma coloratovillosus* ( = *Nhandu coloratovillosus*).

This species is transferred here to the genus *Nhandu* because it shares with *Vitalius* only the characteristic “metatarsus I touching the retrolateral branch of the male spur laterally”, a homoplasy, as suggested by the cladistic analysis carried out in this paper. Otherwise, this species shares with other *Nhandu* species the morphology of male spur, the palp bulb shape, the spermatheca shape, and the presence of long hairs over the carapace in females. Other character presented by Schmidt & Samm (1998b), “presence of one adjacent thick thorn on the retrolateral face of the prolateral branch of the male spur”, is a plesiomorphy. All species examined in this work have one or more spines in this region of the male spur, as can be seen in fig. 62. They also have one or more apical spines on the retrolateral spur branch.

Schmidt (1998b) and Schmidt & Samm (1998b) also failed to find type III urticating hair in the specimens they examined, thus approximating this species to *Vitalius*. As shown in “Results and Discussion”, the type III urticating hair is restricted to the posterior superior abdominal region. Thus, if the specimen has this region bald, due to the defensive behavior of shedding urticating hairs, it is impossible to know with certainty if the species has it or not. The absence of type III urticating hair found by Schmidt (1998b) and Schmidt & Samm (1998b) was probably due to the small number of specimens examined, a male, and a female exuvia (holotype). Adult males do not molt anymore, thus, hardly have that hair field intact. Exuviae constantly break and wrap during the molting process resulting in an enormous difficulty in identifying the different hair field, and should not be considered as holotype, as they can present misinformation for some characters.

Schmidt & Samm (1998b) also found a modified type I urticating hair in males of *N. vulpinus* and *N. coloratovillosus*. It was found in this study that this is just a variation exhibited by males, as discussed before under “urticating hairs” in “Results and Discussion”, i.e. urticating hairs with intermediate morphology between the types I and III (Fig. 5).

The main diagnostic character presented by Schmidt (1998b) for his new species, the spermatheca shape, is discussed under *Nhandu coloratovillosus*.

Structural Anomaly - In VIII/1995 the Instituto Butantan received four female specimens from Açailândia, State of Maranhão, Brazil. One of these specimens completely lacks eyes and eye tubercle. Its predatory and defensive behaviors are apparently normal. The specimen molted three times in three years and did not regenerate these structures.

Distribution: Brazil: Amazon Forest, from northeast of State of Pará to northwest State of Maranhão (Fig. 168).

Records: Brazil, Pará: 1 σ (IBSP 6575); Belém, 1 σ (IBSP 3573), 1 σ (IBSP 3767), 1 σ 2 Ψ (IBSP 4245), 1 σ (IBSP 4779), 1 Ψ (IBSP 6561); Jacundá, 1 Ψ (IBSP 4698); Dom Eliseu, 1 Ψ (IBSP 6666), 1 Ψ (IBSP 6567); Tucurui (U. H. E. Tucurui, Acamp. Canoã), 1 Ψ (IBSP 6562); Tucurui (U. H. E. Tucurui, Vale do Carapé), 1 σ (IBSP 6564); Tucurui (U. H. E. Tucurui, Remansão), 1 Ψ (IBSP 6565); Tucurui (U. H. E. Tucurui, Vila Bravo), 1 Ψ (IBSP 6568), 1 σ (IBSP 6569), 1 Ψ (IBSP 6573), 1 σ (IBSP 6574), 1 Ψ (IBSP 6577); Tucurui (U. H. E. Tucurui, Breu Branco), 1 Ψ (IBSP 6571); Tucurui (U. H. E. Tucurui), 1 σ (IBSP 6576), 1 Ψ (IBSP 6578), 1 Ψ (IBSP 7036); Maranhão: 1 σ (IBSP 3761); Peri-Mirim, Fazenda Canaã, 1 σ (IBSP 3620).

*Nhandu coloratovillosus* (Schmidt) comb. n.

Figs. 141-144, 192

*Braziliopelma coloratovillosum* Schmidt, 1998a:1, fig. 1 (3 exuviae of the female holotype from Northern Brazil deposited in the Senckenberg Museum, Frankfurt/Main, M. Baumgarten col.); not examined. - Schmidt & Samm, 1998a:7-12, figs. 1-3 (descr. σ).

Diagnosis - Males can be distinguished from *N. carapoensis* by the presence of male spur (Fig. 141); from *N. vulpinus* by the metatarsus I touching the apex of the retrolateral male spur branch, when flexed; and, from *N. cerradensis* by the color pattern presenting wide bands on the legs instead of leg rings. Females can be distinguished from *N. carapoensis* and *N. cerradensis* by having long spermathecae (Fig. 142) and from *N. vulpinus* by the contrasting color pattern, showing distinct wide white bands over dark background on the legs.

Remarks — Schmidt (1998a) described the female of *B. coloratovillosum* based on three female exuviae. His diagnosis was based on the typical spermathecae shape, the absence of stridulatory hairs, a retrolateral scopula on femur IV and the presence of type I and III urticating hairs. Schmidt & Samm (1998a) described the male and joined to the diagnosis; color pattern, a long median process on the prolateral male spur branch, the metatarsus I touching the middle of the retrolateral male spur branch, and modifications of the type I urticating hair.

Absence of stridulatory hairs and presence of type I and III urticating hairs as well as the presence of a retrolateral scopula on femur IV are plesiomorphic characters found in many theraphosine genera. The character of metatarsus I touching the apex of the retrolateral male spur branch when flexed is shared also by at least some species in the closer genera *Proshapalopus*, *Lasiodora*, and *Nhandu* (see character 15). The modifications of the type I urticating hair found by Schmidt & Samm (1998b) have been discussed under *Nhandu vulgaris*.

Thus, the only character which could give support to the genus *Brazilolopema* is the spermathecae shape. However, the spermathecae of *Nhandu vulgaris* and *Nhandu coloratovillosus* are very similar, almost indistinguishable (Figs. 138, 142), and seems to have been overlooked by Schmidt (1998b), who compared the spermathecae shape of his new genus with some *Vitalius* species, but not with the species he described a month later.

*Nhandu coloratovillosus* resulted after the cladistic analysis as sister species of *Nhandu vulgaris* sharing such apomorphies as the spermathecae shape and five or more spines positioned apically on the palpal tibia prolateral face in males. Thus, this species is transferred to *Nhandu* and consequently the genus *Brazilolopema* is considered a junior synonym of *Nhandu*.

Distribution: Brazil: Amazon Forest, from southern State of Pará to State of Tocantins, and east States of Mato Grosso and Mato Grosso do Sul, following the River Araguaia Valley (Fig. 168).

Records: Brazil, Pará: 1♂ (IBSP 4239-B); Marabá, Rod Transamazônica, 1♀ (IBSP 3984), 2♂ (IBSP 4239-A), 5♂ (IBSP 4240); 1♂ | J,
IV/V.80, Paulo col. (MNJR s/nr); Carajás, 2 ♂ (IBSP 6580); Redenção / Conceição do Araguaia, 1 ♀ J (IBSP 6579); Santana do Araguaia, 1 ♀ (IBSP 4899); Tocantins: Palmas, 1 ♀ (IBSP 6583); Porto Nacional, 1 ♀ (IBSP 6581); Araguaçu - 1 ♀ (IBSP 6584); Mato Grosso: São Félix do Araguaia, 1 ♀ (IBSP 3734); Parque Nacional do Xingu, 1 ♀ (IBSP 2517); Santa Terezinha, Barra do Tapirapé, 1 ♀ (MZSP 3344); Faz. Betânia, between Rio Culuene e 7 de Setembro, 1 ♀ (IBSP 2748); Paratinga, 1 ♀ (IBSP 6582); Barra do Garças, 1 macaio (IBSP 4078), 2 ♀ (IBSP 4241), 1 ♀ (IBSP 4403); Mato Grosso do Sul: Agachi, 1 ♀ (IBSP 512), 1 ♀ (IBSP 2958), 1 ♀ (IBSP 2959), 2 ♀ J (IBSP 2960); Rio Branco, 1 J (IBSP 3131).

**Nomen dubium**

**Nhandu tripartitus** Schmidt

*Nhandu tripartitus* Schmidt, 1997:1, fig. 1 (holotype and paratype: two exuviae of females, type locality and collectors unknown, institution of deposition not specified by the author).

Remarks - This species was described based on exuviae of two female specimens. The main diagnostic feature is the presence of three spermathecae, a character which is not found in other theraphosid species. The inclusion of this species in the genus *Nhandu* was done by the author on the premise that the unknown male should lack male spurs. However, the three spermathecae seem to be just a structural genitalic anomaly. Although rare, duplication of female external genitalia, where the two organs are side by side, were reported for other spiders, such as *Lycosa carolinensis* Walckenaer (Munra, 1943) and *Pardosa sageri* Gertsch & Wallace (Kaston, 1965). The lack of information regarding structural abnormalities in Theraphosidae seems to be due to the lack of reporting them, not the lack of the abnormalities themselves. For example, other structural anomalies such as an inverted, protruding fovea (see *Vitalius roseus*) and absence of eyes and eye tubercles (see *Nhandu vulpinus*) were found among the material examined for this paper. Thus, in the impossibility of knowing if this is a case of structural abnormality or not, and, until the male and the type locality of the type specimens are known thus allowing collection of further specimens, this species is considered nomen dubium.

**Theraphosa** Thorell

*Mygale* Latreille 1804:159 (in part *M. leblondi*).


Diagnosis: Species of *Theraphosa* can be distinguished from species of all other theraphosine genera by the presence of striudulatory hairs on prolateral coxae I and II together with the presence of a single fused spermatheca in females (figs. 157, 161) or, if male, by the palpal bulb having the apical keel completely fused anteriorly with the prolateral superior keel (figs. 158, 159, 162, 163).

Constitution: two South American species.

Remarks: The genus *Pseudotheraphosa* and the only species *P. apophysis* were described by Tinter (1991) based on male and female specimens from the Venezuelan/Brazilian boundary area. His newly described species resembles *Theraphosa blondi* by the large size that can be reached; the single fused spermathecae (figs. 157, 161); the presence of striudulatory hairs on prolateral coxae I; and, the very similar male palpal bulb shape (Tinter, 1991) (figs. 158, 159, 162, 163). The differences between these two species are a metallic pinkish sheen presented by *P. apophysis* males on the carapace and dorsally on legs, (absent in *T. blondi*); the presence of striudulatory hairs also on the coxae II in *P. apophysis* (*T. blondi* was said to have striudulatory hairs only on coxae I); and, mainly, the presence of male spur in *P. apophysis* (absent in *T. blondi*) (Tinter, 1991) (fig. 160). The presence of male spur seems to have been fundamental to the decision of creating a new genus, since, as discussed previously for *Nhandu carapoensis*, this character was traditionally considered of "generic value" for theraphosid taxonomy. However, *P. apophysis* and *T. blondi* share other characters, like a very modified male palpal bulb (figs. 158, 159, 162, 163), striudulatory hairs present in coxae I and II (*T. blondi* also has striudulatory hairs in coxae II as I found in specimens males and females examined), and presence of only type III urticating hair on the dorsum of abdomen. Thus, the absence of male spur in *T. blondi* seems to be an autapomorphy of this species, because the presence of a male spur is pleisiomorphic for the branch *Pseudotheraphosa + Theraphosa* if considering the genus *Megaphobema* as an outgroup, as found in the cladistic analysis of Theraphosinae carried out by Pérez-Miles et al. (1996). Because these two species are undoubtedly closely related, and are probably sister species (Figs. 164, 165), this study considers *Pseudotheraphosa* a junior synonym of *Theraphosa*. 
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Table I. Data matrix showing the distribution of character states used in the cladistic analysis. (?) = unknown, - = non-applicable, both treated as missing data in the cladistic analysis.
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Table II. Maximum and minimum number of spines according to leg region and sex. * For metatarsus IV the number of spines on the ventral face was considered as total.
Figs. 1-5. Urticating hairs. 1 - Abdomen of a theraphosine having types I and III urticating hairs, showing the area where urticating hairs were picked up and hair types found. 2 - Type III urticating hair. 3 - Type I urticating hair having the region "a" shorter than "b". 4 - Variation in urticating hair length, showing a great increase in the hair length towards medium-posterior region. Note that the species represented has only type I urticating hair. 5 - Urticating hair having an intermediate morphology between types I and III, found in some males of *Vitalius* species.
Figs. 6-18. (6-15) Transversal view of left male palpal bulbs of some theraphosines. (6-7) - *Aphonopelma seemani* (E. O. P. - Cambridge, 1897); (8-9) - *Eupalaestrus campestratus* (Simon, 1891); (10-11) - *Vitalius dubius* (Mello-Leitão, 1923); (12-13) - *Pamphobeteus sp.*; (14-15) - *Theraphosa blondi* (Latreille, 1804). Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. (16-18) Hairs covering female carapace. 16 - *Vitalius wackei* (Mello-Leitão, 1923), carapace bordered by short stiff hairs pointing out; 17 - *Vitalius sorocabae* (Mello-Leitão, 1923), carapace bordered by long soft hairs pointing out and to the carapace center; 18 - *Nhandu coloratovillosus* (Schmidt, 1998), carapace bordered by long hairs pointing out and to the carapace center together with many long, scattered, curly hairs over all its surface. Scale line: 1 mm.
Figs. 28-33. (28-31) Aphonopelma seemani (F. O. P. -Cambridge, 1897), IBSP 7019. Male. Male spur, left leg (fig. 28). Right male palpal bulb, retrolateral (fig. 30) and prolateral (fig. 31) faces. IBSP 7020. Female. Spermathecae, ventral face (fig. 29). (32-33) Sphaerobothria hoffmani Karsch, 1879, RCW, Moráná, San José, Costa Rica. Male. Right male palpal bulb, retrolateral (fig. 32) and prolateral (fig. 33) views. Keels: A = apical; PI = prolateral inferior; PS = prolateral superior. Hatched area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1 mm.
Figs. 34-40. (34) *Phormictopus cubensis* Chamberlin, 1917 MNRI, Cuba. Male. Left male spur. (35) *Phormictopus cancerides* (Latreille, 1806) IBSP 7021. Female. Spermaduct, ventral face. (36-37) *Phormictopus cancerides*, RCW, Republica Dominicana. Male. Right male palp bulb, retrolateral (fig. 36) and prolateral (fig. 37) faces. (38-40) *Cyrtopholis portoricensis* Chamberlin, 1917, RCW, Puerto Rico. Male. Left male spur (fig. 38). Right male palp bulb, retrolateral (fig. 39) and prolateral (fig. 40) faces. Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1 mm.
Figs. 41-47. (41-44) *Acanthoscurria sternalis* Pocock, 1903, MNRI, Jujui, Argentina. Male. Left male spur (fig. 41). Right male palpal bulb, retrolateral (fig. 43) and prolateral (fig. 44) faces. Female. Spermathecae, ventral face (fig. 42). (45-47) *Acanthoscurria geniculata* (C. L. Koch, 1842). Female. IBSP 7023. Spermathecae, ventral face (fig. 45). Male. IBSP 7022. Right male palpal bulb, retrolateral (fig. 46) and prolateral (fig. 47) faces. Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; SA = subapical. Scale line: 1mm.
Figs. 48-57. (48, 50-51 and 54) *Eupalaestraeus campestratus* (Simon, 1891) Male. IBSP 502. Left male spur (fig. 48). Right male palpal bulb, retrolateral (fig. 50) and prolateral (fig. 51) faces. Female. IBSP 612, holotype of *E. teniusurus* Bücherl, 1947. Spermathecae, ventral face (fig. 54). (49, 52-53, and 55) *Eupalaestraeus weifenberghi* (Thorell, 1894). Male. IBSP 7979. Left male spur (fig. 49). Right male palpal bulb, retrolateral (fig. 52) and prolateral (fig. 53) faces. Female. IBSP 7980. Spermathecae, ventral face (fig. 55). (56-57) *Eupalaestraeus spinosissimus* Mello-Leitão, 1923. Females. Spermathecae, ventral face, IBSP 593, holotype of *E. tarsticrassus* Bücherl, 1947 (fig. 56); MZSP 130, holotype of *Pamphobeteus holophaeus* Mello-Leitão, 1923 (fig. 57). Keels: A = apical; P = prolateral inferior; P2 = prolateral superior; R = retrolateral; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1mm.
Figs. 58-65. (58-61) *Lasiodora* sp. Male. IBSP 7013. Left male spur (fig. 58). Right male palpal bulb, retrolateral (fig. 60) and prolateral (fig. 61) faces. Female. IBSP 7035. Spermathecae, ventral face (fig. 59). (62-65) *Proshapalopus amazonicus*. Male. MZSP 555, lectotype. Left male spur (fig. 62). Right male palpal bulb, retrolateral (fig. 64) and prolateral (fig. 65) faces. Female. IBSP 6915. Spermathecae, ventral face (fig. 63). Keels: A = apical; AC = accessory; PI = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1mm.
Figs. 66-73. (66-69) Proshapalopus multicuspidatus (Mello-Leitão, 1929). Male. MNRI, holotype. Left male spur (fig. 66). Right male palpal bulb, retrolateral (fig. 68) and prolateral (fig. 69) faces. Female. IBSP 7012. Spermathecae, ventral face (fig. 67). (70-73) Proshapalopus anomalus Mello-Leitão, 1923. Male. MNRI, holotype. Left male spur (fig. 70). Right male palpal bulb, retrolateral (fig. 72) and prolateral (fig. 73) faces. Female. IBSP 6858. Spermathecae, ventral face (fig. 71). Keels: A = apical; AC = accessory; PI = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1mm.
Figs. 74-82. Vialius somocaba (Mello-Leitão, 1923). Males. (74-79) Variation in male palps bulbs. (74-75) Allotype, Sorocaba, São Paulo, retrolateral (fig. 74) and prolateral (fig. 75) faces; (76-77) IBSP 5023, Ibitiúna, São Paulo, retrolateral (fig. 76) and prolateral (fig. 77) faces; (78-79) IBSP 5032, Aguas de Santa Bárbara, São Paulo, retrolateral (fig. 78) and prolateral (fig. 79) faces. (80) Left male spur, allotype. Females. Variation in spermathecae. MZSP 123, holotype (fig. 81); MZSP 153 (fig. 82), holotype of Pamphobeteus melanocephalus Mello-Leitão, 1923; ventral face. Keels: A = apical; P1 = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. Hatched area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1 mm.
Figs. 83-90. (83-86) *Hitalius wocketi* (Mello-Leitão, 1923). Male. Holotype. Left male spur (fig. 83). Right male palpal bulb, retrolateral (fig. 85) and prolateral (fig. 86) faces. Female. IBSP 6084. Spermathecae, ventral face (fig. 84). (87-90). *Vitalius longisternalis*. Male. Holotype. Left male spur (fig. 87). Right male palpal bulb, retrolateral (fig. 89) and prolateral (fig. 90) faces. Female. Paratype. Spermathecae, ventral face (fig. 88). Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. Hatchured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1mm.
Figs. 91-100. *Hitalus dubius* (Mello-Leitão, 1923). Males. (91-96) Variation in male palpal bulbs. (91-92) Holotype, retrolateral (fig. 91) and prolateral (fig. 92) faces; (93-94) IBSP 5876, Poços de Caldas, Minas Gerais, retrolateral (fig. 93) and prolateral (fig. 94) faces; (95-96) IBSP 5830, Jundial, São Paulo, retrolateral (fig. 95) and prolateral (fig. 96) faces. (97) Left male spur, holotype. (98-100). Females. Variation in spermathecae. MZSP C69, holotype of *Pamphobeteus urbinicolor* Soares, 1941 (fig. 98); MZSP 127, holotype of *Pamphobeteus cestleri* Mello-Leitão, 1923 (fig. 99); MZSP 144, holotype of *Pamphobeteus cucullatus* Mello-Leitão, 1923 (fig. 100); ventral faces. Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1mm.
Figs. 101-111. *Vitalius vellutinus* (Mello-Leitão, 1923). Males.(101-106) Variation in male palpal bulbs. (101-102) IBSP 6313, Assis, São Paulo, retrolateral (fig. 101) and prolateral (fig. 102) faces; (103-104) IBSP 6325, Teodoro Sampaio, São Paulo, retrolateral (fig. 103) and prolateral (fig. 104) faces; (105-106) IBSP 6327, Mirandópolis, São Paulo, retrolateral (fig. 105) and prolateral (fig. 106) faces. (107-111). Variation in male spurs, left legs. (108) IBSP 6324, Assis/Ouirinhos, São Paulo; (109) IBSP 6327, Mirandópolis, São Paulo; (110) IBSP 6325, Teodoro Sampaio, São Paulo; (111) IBSP 6313, Assis, São Paulo. Female. IBSP 5656. Spermathecae, ventral face (fig. 107). Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1mm.
Figs. 112-120. (112-116) *Potilus roseus* (Mello-Leitão, 1923). Male. IBSP 6883. Left male spur (fig. 112). Right male palpal bulb, retrolateral (fig. 115) and prolateral (fig. 116) faces. Female. Holotype. Spermathecae, ventral face (fig. 113). IBSP 6723. Spermathecae, variation, ventral face (fig. 114). (117-120) *Potilus paranensis*. Male. Holotype. Male spur, left leg (fig. 117). Right male palpal bulb, retrolateral (fig. 119) and prolateral (fig. 120) faces. Female. Paratype. Spermathecae, ventral face (fig. 118). Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1 mm.
Figs. 121–128. (121–124) Hitalius buecherli. Male. Holotype. Left male spur (fig. 121). Right male palpal bulb, retrolateral (fig. 123) and prolateral (fig. 124) faces. Female. Paratype. Spermathecae, ventral face (fig. 122). (125–128). Hitalius lucatae. Male. Holotype. Left male spur (fig. 125). Right male palpal bulb, retrolateral (fig. 127) and prolateral (fig. 128) faces. Female. Paratype. Spermathecae, ventral face (fig. 126). Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1 mm.
Figs. 129-136. (129-132) *Nhandu corapoenisis* Lucas, 1981. Male. Paratype. Left leg ventral face (fig. 129). Right male palpal bulb, retralateral (fig. 131) and prolateral (fig. 132) faces. Female. Paratype. Spermathecae, ventral face (fig. 130). (133-136). *Nhandu cerradensis*. Male. Holotype. Left male spur (fig. 133). Right male palpal bulb, retralateral (fig. 135) and prolateral (fig. 136) faces. Female. Paratype. Spermathecae, ventral face (fig. 134). Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; R = retralateral; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1mm.
Figs. 137-144. (137-140) *Nhandu vulpinus*. Male. IBSP 4779. Left male spur (fig. 137). Right male palpal bulb, retrolateral (fig. 139) and prolateral (fig. 140) faces. Female. IBSP 7036. Spermathoeae, ventral face (fig. 138). (141-144). *Nhandu coloratovillosus*. Male. IBSP 6581. Left male spur (fig. 141). Right male palpal bulb, retrolateral (fig. 143) and prolateral (fig. 144) faces. Female. IBSP 7018. Spermathoeae, ventral face (fig. 142). Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; R = retrolateral; SA = subapical. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1 mm.
Figs. 145-152. (145-148) *Pamphobeteus* sp. Male. IBSP 7024. Left male spur (fig. 145). Right male palpal bulb, retrolateral (fig. 147) and prolateral (fig. 148) faces. Female. IBSP 7025. Spermathecae, ventral face (fig. 146). (149-152). *Xenesthis inmanis* (Ausserré, 1875). Male. IBSP 7026. Left male spur (fig. 149). Right male palpal bulb, retrolateral (fig. 151) and prolateral (fig. 152) faces. Female. IBSP 4267. Spermathecae, ventral face (fig. 150). Keels: A = apical; PI = prolateral inferior; PS = prolateral superior; R = retrolateral. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1 mm.
Figs. 153-159. (153-156) *Brachypeima emilia* (White, 1856). Male. IBSP 7027. Left male spur (fig. 153). Right male palpal bulb, retrolateral (fig. 155) and prolateral (fig. 156) faces. Female. IBSP 7028. Spermathecae, ventral face (fig. 154). (157-159) *Theraphosa blondi* (Latreille, 1804). Male. IBSP 7029. Right male palpal bulb, retrolateral (fig. 158) and prolateral (fig. 159) faces. Female. IBSP 7030. Spermathecae, ventral face (fig. 157). Keels: A = apical; PI = prolateral inferior; PS = prolateral superior. Hachured area indicates the region of contact of metatarsus I with male spur, when flexed. Scale line: 1mm.
Fig. 166. Distribution of species of Proshapalopus and Eupalaestrus.
Fig. 167. Distribution of species of *Lastiodora*.
Fig. 168. Distribution of species of *Nhandu.*
Fig. 169. Distribution of *Vitalius sorocaba*, *Vitalius wacketi*, and *Vitalius longisternalis*.
Fig. 170. Distribution of *Vitalius dubius*, *Vitalius bucherli* and *Vitalius lucasae*.
Fig. 171. Distribution of *Vitalius vellutinus*, *Vitalius paraensis* and *Vitalius roseus*.
Fig. 172. Area cladogram of species of *Eupalaestra* and *Proshapalopus*. The triangle represents the clade *Lasiodora* + *Vitalius* + *Nhandu* + sister group of *Vitalius* + *Nhandu*, represented by *Theraphosa,* *Pamphobeteus,* *Xenesthis,* and *Brachypelma.*
Fig. 173. Area cladogram of species of *Vitalius*; and, east to west cross section of State of São Paulo, Brazil, showing relation between geomorphology, vegetation and distribution of *Vitalius* species. State of São Paulo cross section drawing after Ab’Saber, (1977), modified.
Fig. 174. Area cladogram of species of Lasiodora, Vitalius, Nhandu, and the sister group of Vitalius + Nhandu, represented by Pamphobeteus, Xenesthis, Theraphosa, and Brachypelma.
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REFERENCES


