

The identity of *Mygale brunnipes* C.L. Koch 1842 (Araneae, Theraphosidae), with a redescription of the species and the description of a new genus

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Abstract. We describe *Kochiana* new genus to accommodate a small Brazilian theraphosine species described originally as *Mygale brunnipes* by Koch (1842), resulting in *Kochiana brunnipes* new combination. Recently, specimens were rediscovered in northeastern Brazilian Atlantic rainforest. A preliminary cladistic analysis using equal weights parsimony and implied weights, was carried out to examine its phylogenetic placement. *Kochiana* new genus was monophyletic in all trees regardless of weighting scheme or concavity used. There is preliminary evidence for *Kochiana* new genus monophyly and weak evidence for its placement as sister group of *Plesiopelma*. *Kochiana* new genus can be characterized by the presence of a hornshaped spermatheca in females and males with a palpal bulb having prolateral accessory keels and a well developed medial crest on the embolus apex.

Keywords: Taxonomy, Aviculariinae, *Eurypelma*, cladistic analysis, Brazilian Atlantic rainforest

The family Theraphosidae so far contains 906 species (Platnick 2008). Approximately 178 species are described from Brazil (Platnick 2008). The taxonomy of the group is complex and revisionary work is needed for most genera. The result is that several species described mainly in the 19th century cannot be identified. The lack of available specimens adds to the taxonomic confusion. Most of them were collected in expeditions carried out by naturalists more than a century ago and most have not been collected again.

The genus *Avicularia* Lamarck 1818 is a typical case. There are 29 *Avicularia* species described in the 19th century that have never been studied after their description, and all are presently considered *nomina dubia* (Platnick 2008). Twenty eight of these *nomina dubia* species were described as *Mygale* Latreille 1802. One of these species is *Avicularia brunnipes* (Koch 1842). It was described as *Mygale brunnipes* by C.L. Koch (1842) and transferred to *Eurypelma* by the same author in 1850 when he erected the genus. When Koch described *Eurypelma*, he did not designate any type species; however, the first one listed in his work, which is usually taken as the type species (Raven 1985), was *Aranea avicularia* Linnaeus 1758, the type species of the genus *Avicularia* Lamarck 1818. Thus, Raven (1985) considered *Eurypelma* a junior synonym of *Avicularia* Lamarck 1818, and the species *M. brunnipes* was subsequently placed in *Avicularia*. Recent collections made by the authors in Northeastern Brazil in conjunction with the rediscovery of the holotype make it possible to redescribe the species and a new genus is erected to accommodate it.

METHODS

Abbreviations: ALE = anterior lateral eyes, AME = anterior median eyes, ap = apical, p = prolateral, PLE = posterior lateral eyes, PME = posterior median eyes, PMS =

posterior median spinnerets, PS = prolateral superior keel, r = retrolateral, STC = superior tarsal claws, v = ventral.

Material of the following institutions were examined: ICN = Instituto de Ciencias Naturales, Bogota; IBSP = Instituto Butantan, São Paulo; FCE = Facultad de Ciencias, Entomología, Montevideo; MNRJ = Museu Nacional do Rio de Janeiro, Rio de Janeiro; MNHN = Muséum National d'Histoire Naturelle, Paris; MZSP = Museu de Zoologia da Universidade de São Paulo, São Paulo; RWC = Rick C. West private collection, Victoria, British Columbia, Canada; SMF = Senckenberg Museum, Frankfurt; and ZMB = Museum für Naturkunde, Berlin (through photographs).

The measurements are in millimeters. A Nikon SMZ1500 dissecting microscope was used for illustrations (with a *camera lucida* attachment). Male palpal bulb terminology follows Bertani (2000) and spination follows Petrunkevitch (1925) with modifications proposed by Bertani (2001).

Taxa: Outgroups - species of the new genus lack type I urticating hairs, a synapomorphy for a large theraphosine clade (Pérez-Miles et al. 1996). Thus, the outgroups were sampled from outside that large clade from the “basal theraphosine” taxa in the work of Pérez-Miles et al. (1996) and Fukushima et al. (2005). We included representatives of the genera *Chromatopelma* Schmidt 1995, *Cyriocosmus* Simon 1903, *Euathlus* Ausserer 1875, *Grammostola* Simon 1892, *Hapalopus* Ausserer 1875, *Homoeomma* Ausserer 1871, *Maraca* Pérez-Miles 2006 (formerly *Iracema*), *Melloleitaoina* Gerschman & Schiapelli 1960, *Paraphysa* Simon 1892, *Plesiopelma* Pocock 1901, and *Tmesiphantes* Simon 1892. The type species of these genera were included when possible; however, representatives of the type species of *Euathlus*, *Grammostola*, *Melloleitaoina*, *Maraca*, and *Paraphysa* were unavailable. *Melloleitaoina crassifemur* Gerschman & Schia-

Table 1.—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).

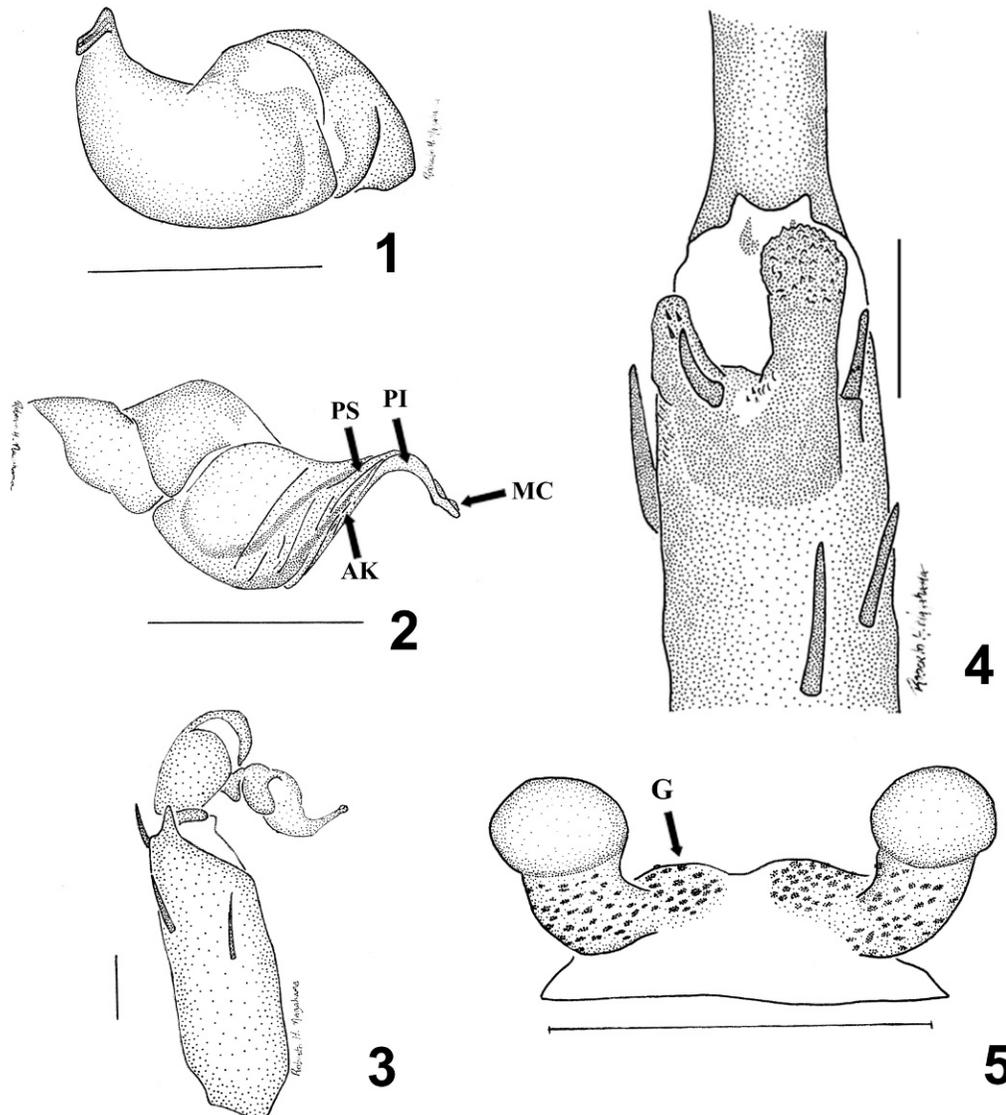
Taxa/character	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
<i>Euathlus vulpinus</i>	0	-	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	1	0	1	0
<i>Grammostola actaeon</i>	0	-	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
<i>Homoeomma montanum</i>	0	-	0	0	0	1	1	1	1	0	0	0	0	?	0	0	0	0	0	0	0	0	0
<i>Homoeomma stradlingi</i>	0	-	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Maraca horrida</i>	0	-	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
<i>Melloleitaoina crassifemur</i>	0	-	0	0	0	1	1	1	0	0	0	0	?	0	?	0	0	0	1	0	1	0	1
<i>Tmesiphantes nubilus</i>	0	-	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1
<i>Hapalopus formosus</i>	?	?	0	0	0	0	2	0	0	-	0	1	1	0	0	0	0	0	1	0	0	0	1
<i>Hapalopus</i> sp.	0	-	1	0	0	0	2	0	0	-	0	0	1	0	0	0	0	1	1	0	0	0	1
<i>Chromatopelma cyaneopubescens</i>	0	-	0	0	0	0	0	0	0	-	0	1	1	0	0	0	1	0	0	2	0	0	1
<i>Cyriocosmus elegans</i>	1	0	0	0	0	0	0	1	0	1	1	0	0	1	1	1	1	1	0	0	0	0	1
<i>Cyriocosmus nogueiranetoi</i>	1	1	0	0	0	0	0	1	0	3	1	0	0	1	0	0	0	1	0	0	0	0	1
<i>Cyriocosmus sellatus</i>	1	1	0	0	0	0	0	1	0	1	1	0	0	1	1	1	1	0	0	0	0	0	0
<i>Paraphysa scrofa</i>	0	-	0	0	0	0	0	1	0	2	0	0	0	?	0	?	0	0	0	1	0	1	0
<i>Plesiopelma longisternale</i>	0	-	0	1	0	0	1	1	0	1	0	0	0	1	0	0	1	0	0	0	1	0	0
<i>Plesiopelma insulare</i>	0	-	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
<i>Kochiana brunnipes</i>	0	-	0	0	1	1	1	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
<i>Kochiana</i> sp.	0	-	0	0	1	1	1	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0

PELLI 1960 and *Paraphysa scrofa* MOLINA 1788 data used for cladistic analysis were based on Gerschman & Schiapelli (1960), Schiapelli & Gerschman (1963), and Pérez-Miles et al. (1996). *Chromatopelma* was included due to the resemblance of genitalia with *Hapalopus*, its probable sister group.

Material examined for cladistic analysis: *Chromatopelma cyaneopubescens* (Strand 1907), VENEZUELA: without further information, 1 male SMF 39012, Ockert ded. (female's characters were collected from literature). *Cyriocosmus elegans* Simon 1889, VENEZUELA: without further information, MNHN 9863; TOBAGO ISLAND: *Speyside* (11°18'N, 60°32'W): in road cut ground burrows, 2 males RWC, 19 May 1980. *Cyriocosmus nogueiranetoi* Fukushima et al. 2005, BRAZIL: *Rio Branco* (9°58'S, 67°48'W): female holotype IBSP 9193, D. Pinz col., November 1996 and male paratype IBSP 8899 from same locality and collector. *Cyriocosmus sellatus* (Simon 1889), BRAZIL: *Upper Amazonas*: holotype female MNHN 8102; *Serra do Divisor* (9°08'S, 72°40'W): IBSP 8900, R.M. Vieira et al. col., 05–25 November 1996. *Euathlus vulpinus* (Karsch 1880), CHILE: *Osorno* (40°38'S, 72°19'W): 3 males IBSP 3817B and 1 female IBSP 3817A. *Grammostola actaeon* (Pocock 1903), BRAZIL: *Colônia Ouro Verde*: 1 male IBSP 2124, F. Haas col., 1949; *Monte Verde* (22°51'S, 46°02'W): 1 female IBSP 8725, H. Shiefferclucker col., 19 January 1999. *Hapalopus formosus* Ausserer 1875, COLOMBIA: *Sierra Nevada de Santa Marta*: 1 male ICN-AR 1981 and 1 female ICN-AR 1982, P. Sanchez col., July 2001. *Hapalopus* sp., BRAZIL: *Miracema do Tocantins* (9°34'S, 48°23'W): 1 male IBSP 10752, R. Bertani & V.L. Iost col., 11–21 September 2001 and 1 female IBSP 9749 from same locality and collectors. *Homoeomma montanum* (Mello-Leitão 1923), BRAZIL: *Petrópolis* (22°30'S, 43°10'W): 1 male MNRJ 13771, A.M. Zaccelly col., July 1975; *Parque Nacional do Itatiaia* (22°45'S, 44°50'W): MZSP 10893, Luederwaldt col., May 1906; *Lima Duarte* (21°50'S, 43°47'W): Parque Estadual de Ibitipoca, 1 female IBSP 8928, A. de Oliveira & B.M. Souza col., 08 November 1997. *Homeomma stradlingi* O. Pickard-

Cambridge 1881, BRAZIL: *Petrópolis* (22°30'S, 43°10'W): CEDEA, Bairro Rocio, 1 male MNRJ 14994, E.C.P. Pombal col., 19 August 2006; *Rio de Janeiro* (22°54'S, 43°12'W): Floresta da Tijuca, 1 female MNRJ 12937, R. Costa col., 06 July 1999. *Maraca horrida* (Schmidt 1994), BRAZIL: *Miracutu*: Parque Nacional do Jaú, 1 male and female IBSP 9377, M.E.E.S. Oliveira col., 1995. *Plesiopelma insulare* (Mello-Leitão 1923) BRAZIL: *Ilha de São Sebastião* (23°46'S, 41°21'W): 1 male MZSP 3138, H. Urban col., August 1963 and 1 female MZSP 14876, H. Urban col., 01 March 1964. *Plesiopelma longisternale* (Schiapelli & Gerschman 1942) URUGUAY: *Maldonado*: Punta Ballena (34°55'S, 55°03'W), 1 male FCE-MY 0424, C.S. Carbonell col., 19 April 1963 and *Maldonado* (34°54'S, 54°56'W): Cerro al NW de Sierra de Animas, 1 female FCE-MY 0491, F. Costa, R. Capocasale, F. Pérez-Miles & E. Gudynas col., March 1989. *Tmesiphantes nubilus* Simon 1892, BRAZIL: *Una* (15°16'S, 39°04'W): Reserva Biológica do Una, 1 male MZSP 28778 and 1 female MZSP 28780, K. Kato col., December 1999. *Kochiana* sp., BRAZIL: *Santa Luzia do Itanhy* (11°21'S, 37°26'W): Crasto, 2 males IBSP 9914 and IBSP 8548 and 2 females IBSP 9347 and IBSP 11439, A.D. Brescovit, R. Bertani, & A.B. Bonaldo col., September 1999. Specimens of this undescribed species of *Kochiana* were examined and characters scored for cladistic analysis *in loco*. However, we were not granted a loan of the specimens for a more careful study and illustration of genitalia, precluding its description here.

Cladistic analysis was based primarily on the matrix of Fukushima et al. (2005) (characters 0–3, 8, 11, 15–22 from Table I) and some characters were added (4–7, 13 and 23). Character 1 of Fukushima et al. (2005) was here split in two (characters 1 and 2, Table I). The spermathecal characters (except 10, 11, and 14) were modified from Fukushima et al. (2005). Presence of type IV urticating hair was proposed by Pérez-Miles et al. (1996) as a synapomorphy for a group of five theraphosine genera (*Plesiopelma*, *Homoeomma*, *Grammostola* [formerly *Phrixotrichus*], *Cyriocosmus*, and *Para-*

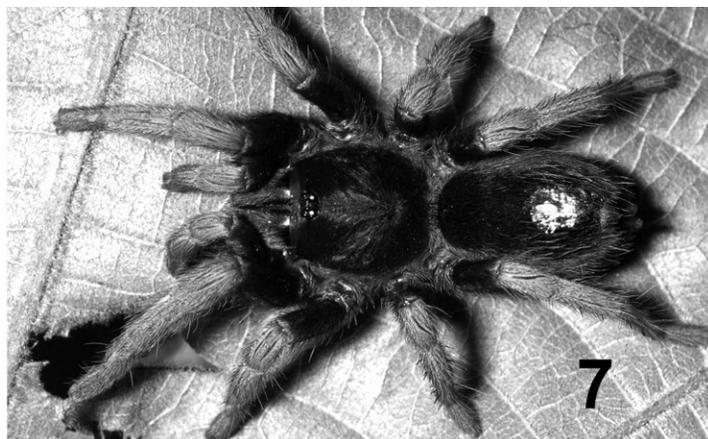
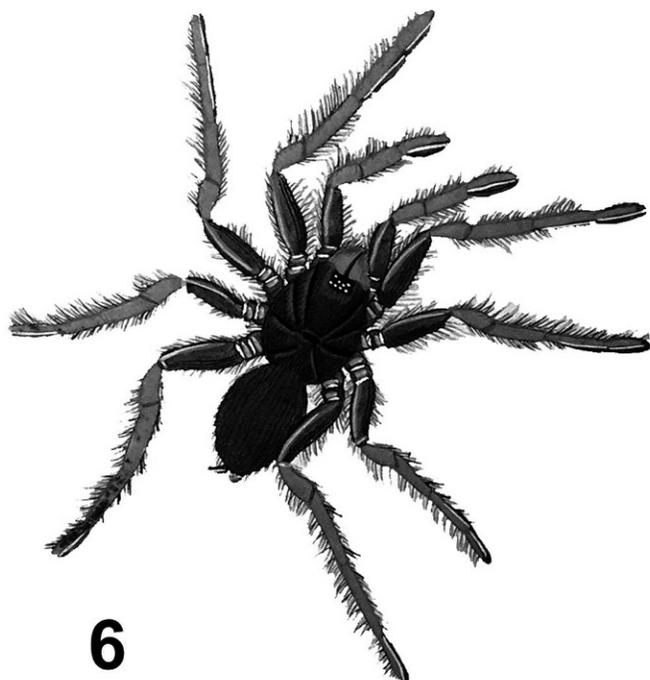


Figures 1–5.—*Kochiana brunripes* new combination. 1–4. Male (MZSP 28774), left palp; 5. Female (MZSP 28776). 1. Male palpal bulb, retrolateral; 2. Prolateral; 3. Palp, prolateral; 4. Leg I tibial apophysis, ventral; 5. Spermathecae, ventral. Scale bar = 1 mm. AK = accessory keels. MC = medial crest. G = granules. PI = prolateral inferior keel. PS = prolateral superior keel.

physa). The high degree of variation found in the morphology of urticating hairs examined did not allow us to determine satisfactorily the presence or absence of this type of urticating hair. Hence, we did not include this character in the cladistic analysis.

Characters and states as follows: (0) Paraembolic apophysis: absent = 0; present = 1 (see figs. 1–20 Fukushima et al. 2005). (1) Paraembolic apophysis: short (less than a half of embolus length) = 0 (see figs. 1–10 Fukushima et al. 2005); long (more than half of embolus length) = 1 (see figs. 11–20 Fukushima et al. 2005). (2) Prolateral inferior keel: undivided = 0; divided = 1 (see fig. 16 of Bertani 2000). (3) Prolateral inferior keel: without tooth = 0; with tooth = 1 (see fig. 4 of Schiapelli & Gerschman de Pikelin, 1979). (4) Prolateral accessory keels on male palp: absent = 0, present = 1 (Figs. 1, 2). (5) Medial crest on embolus apex: absent or weakly developed = 0, well developed = 1. (6) Embolus position: upward = 0, downward = 1, straight = 2. (7) Embolus: short (less than half of bulb

length) = 0, long (more than half of bulb length) = 1. (8) Digitiform basal apophysis in the male palpal bulb: absent = 0; present = 1 (see fig. 25 of Pérez-Miles et al. 1996). (9) Spermathecal neck: straight = 0 (fig. 37 of Pérez-Miles et al. 1996), spiraled = 1 (see figs. 35–39 of Fukushima et al. 2005), horn-shaped = 2 (Fig. 5), twisted = 3 (see fig. 34 of Fukushima et al. 2005). (10) Spermatheca: without convex basal plate = 0; with convex basal plate = 1 (see figs. 34–39 of Fukushima et al. 2005). (11) Number of spermatheca: two = 0; one = 1. (12) Spermatheca: with membranous base weakly developed = 0; with membranous base well developed = 1 (see fig. 54 of Fukushima et al. 2005). (13) Spermatheca: without large granules = 0, with several large granules = 1 (Fig. 5). (14) Spermatheca: without caliciform seminal receptacle = 0, with caliciform seminal receptacle = 1 (see figs. 35–39 of Fukushima et al. 2005). (15) Retrolateral cymbium: without a field of spines = 0, with a field of spines = 1 (Fig. 11). (16) Male retrolateral palpal tibia: without spiniform structures =



Figures 6–8.—*Kochiana brunnipes* new combination. 6. Reproduction of Koch’s 1842 original illustration of *Mygale brunnipes*; 7. Female; 8. Male. Both from Murici, state of Alagoas, Brazil. Photos: R. Bertani.

0, with spiniform structures = 1 (Fig. 11). (17) Retrolateral process on the male palpal tibia: absent = 0; present = 1 (Fig. 11). (18) Tibial apophysis of leg I: two divergent branches = 0 (see figs. 27, 28 of Fukushima et al. 2005); two convergent branches = 1 (see fig. 83 of Gerschman de Pikelin & Schiapelli 1973). (19) Flexion of male metatarsus I: between two branches = 0; on the retrolateral side of retrolateral branch = 1, on the apex of the retrolateral branch = 2. (20) Tubercle on male metatarsus I: absent = 0; present = 1 (see fig. 39 of Pérez-Miles et al. 1996). (21) Number of labial cuspules in males: more than 50 cuspules = 0, less than 30 cuspules = 1. (22) Dorsal abdominal pattern: without stripes = 0; with stripes = 1 (see figs. 42–48 and 50 of Fukushima et al. 2005).

Table 2.—*Kochiana brunnipes* new combination. Male MZSP 28774 from Murici, state of Alagoas, Brazil. Length of left legs and palpal segments.

	Palp	I	II	III	IV
Tarsi	1.91	3.71	3.50	4.46	4.21
Metatarsi	—	6.29	5.30	5.60	7.78
Tibiae	4.23	5.37	5.51	4.20	6.68
Patellae	3.14	4.35	4.11	3.54	3.88
Femora	5.64	7.70	7.36	6.45	8.37

Computer Methods: A data matrix with 23 characters and 18 taxa was analyzed. Cladistic analysis was carried out using computer programs: Nona 2.0 for Windows (Goloboff 1998) and X-Pee-Wee 1.3 for Windows (Goloboff 1997). For X-Pee-Wee 1.3 and Nona 2.0 the commands h100, h/20, amb- and mult*50 were used. For Pee-Wee the concavities from 1 to 6 were used. Characters were treated as non-additive. Bremer support values were calculated using Nona 2.0 with commands H50000, bsupport3.

TAXONOMY

Family Theraphosidae Thorell 1870
Kochiana new genus

Mygale Latreille 1802:345 (in part: *Mygale brunnipes* C.L. Koch 1842). Type species by original designation *Aranea avicularia* Linnaeus 1758, from America, no specific locality, type presumed lost (Raven 1985:146).
Eurypelma C.L. Koch 1850:74 (in part: *Eurypelma brunnipes* (C.L. Koch 1842)). Type species by original designation *Aranea avicularia* Linnaeus 1758, from America, no specific locality, type presumed lost (Raven 1985: 146).
Avicularia Lamarck 1818:107 (in part: *Avicularia brunnipes* (C.L. Koch 1842)). Type species by original designation *Aranea avicularia* Linnaeus 1758, from America, no specific locality, type presumed lost (Raven 1985:146).

Table 3.—*Kochiana brunnipes* new combination. Female MZSP 28776 from Murici, state of Alagoas, Brazil. Length of left legs and palpal segments.

	Palp	I	II	III	IV
Tarsi	2.65	2.42	2.60	2.61	3.38
Metatarsi	—	3.92	3.77	4.43	6.84
Tibiae	3.54	4.77	3.86	3.08	5.39
Patellae	3.24	4.47	3.86	3.40	3.81
Femora	5.18	6.45	5.73	5.26	6.89

Type species.—*Mygale brunnipes* C.L. Koch 1842.

Etymology.—The name is a patronym in honor of C.L. Koch, an important XIX century arachnologist who described this species and many other Brazilian theraphosids.

Diagnosis.—Males of *Kochiana* new genus resemble *Homoeomma*, *Tmesiphantes*, *Melloleitaoina*, *Plesiopelma*, and *Grammostola* by the male palpal bulb having a long and narrow embolus pointing downward. They can be distinguished by having prolateral accessory keels on the palpal bulb (Fig. 2). Additionally, they differ from *Tmesiphantes*, *Melloleitaoina*, and *Grammostola* by the metatarsus I folding between the two branches of the tibial apophysis (Fig. 4); from *Plesiopelma* by lacking the metatarsus tubercle on the male leg I and from *Homoeomma* by not presenting the digital apophysis on the male palpal bulb. Females can be distinguished by the horn-shaped spermathecae with large granules (Fig. 5).

Description.—See description of type species.

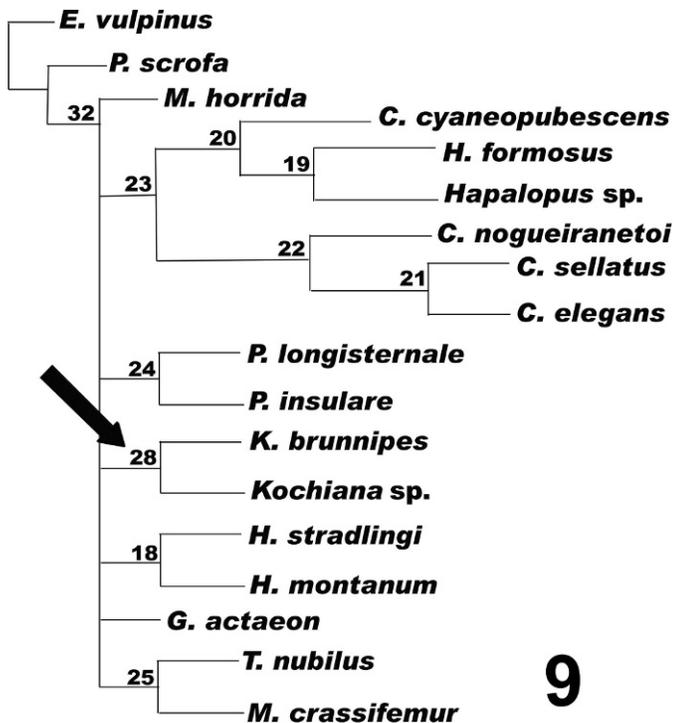


Figure 9.—Strict consensus of eight trees obtained with X-Pee-Wee 1.3 with concavity 6. Fit = 1928.57, length = 40, with clade numbers. *Kochiana* new genus is indicated by an arrow. Synapomorphies of the genus include prolateral accessory keels and well developed medial crest on embolus apex (node 28, Table IV).

Table 4.—Synapomorphies and autapomorphies for the cladogram presented in Fig. 9.

Taxa or Node	Character	Change	Taxa or Node	
			Character	Change
<i>H. montanum</i>	5	0 → 1	Node 21	14 0 → 1
<i>Hapalopus</i> sp.	2	0 → 1		15 0 → 1
	17	0 → 1		16 0 → 1
<i>C. sellatus</i>	22	1 → 0	Node 22	0 0 → 1
<i>C. elegans</i>	1	1 → 0		10 0 → 1
<i>P. longisternale</i>	16	0 → 1	Node 23	22 0 → 1
<i>C. cyaneopubescens</i>	16	0 → 1	Node 24	3 0 → 1
	19	0 → 2		20 0 → 1
Node 18	8	0 → 1	Node 25	5 0 → 1
Node 19	6	0 → 2	Node 28	4 0 → 1
	18	0 → 1		5 0 → 1
Node 20	7	1 → 0	Node 32	9 2 → 0
	12	0 → 1		

***Kochiana brunnipes* (C.L. Koch 1842) new combination**

Mygale brunnipes C.L. Koch 1842:35, pl. CCXCIX, fig. 713, 1 female holotype from Brazil, Freir. col., ZMB-2071; Petrunkevitch 1911:79 (*nomen dubium*); Roewer 1955: 1595 (*nomen dubium*)

Mygale brunea Simon 1864:68 (misidentification per Bonnet 1957:2992)

Mygale brunneipes Bonnet 1957:2992

Eurypelma brunnipes C.L. Koch 1850:74

Avicularia brunnipes Platnick 2008 (*nomen dubium*)

Figs. 1–8.

Diagnosis.—See diagnosis for the genus.

Table 5.—Character steps and fit of the cladogram presented in Fig. 9.

Character	Fit	Steps	Extra Steps
0	100	1	0
1	—	—	—
2	—	—	—
3	100	1	0
4	100	1	0
5	75	3	2
6	100	2	0
7	100	1	0
8	100	1	0
9	75	5	2
10	100	1	0
11	85.7	2	1
12	100	1	0
13	85.7	2	1
14	100	1	0
15	100	1	0
16	75	3	2
17	75	3	2
18	100	1	0
19	85.7	3	1
20	100	1	0
21	85.7	2	1
22	85.7	2	1

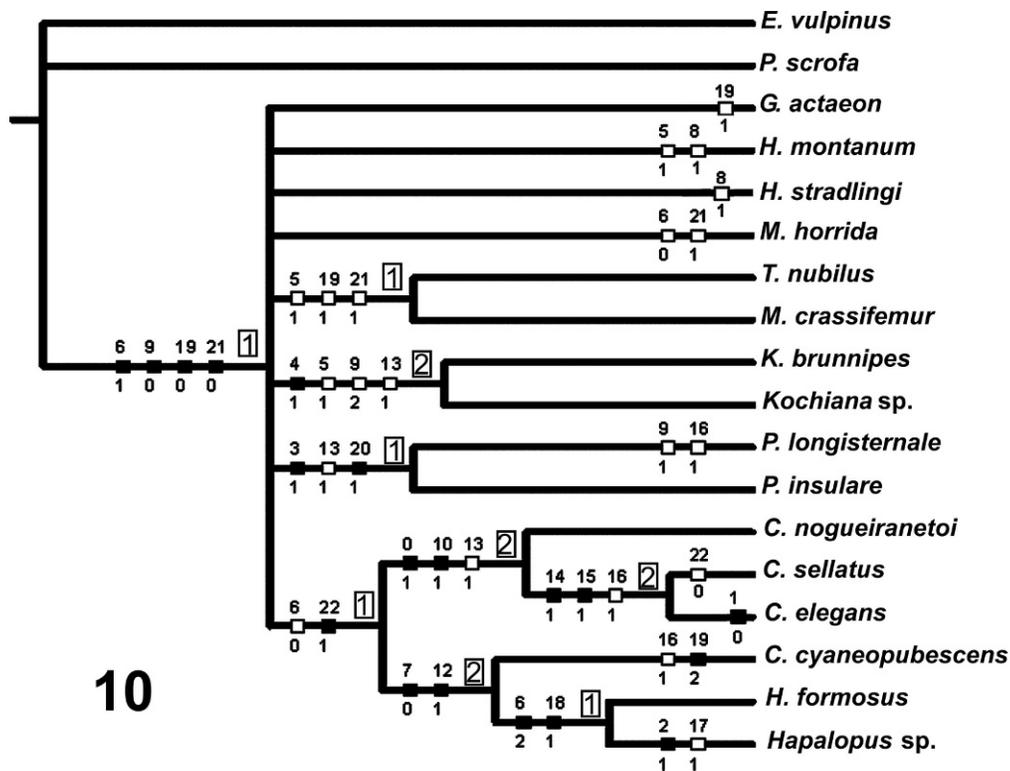


Figure 10.—Strict consensus of 16 trees obtained with Nona 2.0. Length = 46, CI = 58, RI = 65. Character support is shown with white squares indicating homoplastic characters and black squares indicated characters without any homoplasy. Numbers above and under the squares indicating the character and character states, respectively. Bremer support values appear inside a rectangle close to each internode.

Type material.—BRAZIL: holotype female, ZMB-2071 (dry pinned specimen, too fragile to mail, examined by photograph).

Note.—Although the holotype is faded, it retains its original cephalothorax and leg coloration, making it recognizable despite the poor original description. Additionally, the color plate provided by C.L. Koch (Fig. 6) shows the typical color pattern in detail, which agrees in full with the recently collected specimens. Though the author stated the type locality as only “Brazil,” many of the Brazilian species described by him came from the Northeastern Coast, the same place where the new specimens were recollected. No other Brazilian theraphosid presents this typical coloration.

Description.—Male, MZSP 28774, BRAZIL: *Alagoas*: Murici, Murici Ecological Station (9°14’S, 35°47’ W), elev. 354 m, R. Bertani, D.M.R. Ortega & R.H. Nagahama, 13 August 2006. Total length, not including chelicerae or spinnerets 24.07. Carapace: length 9.73, width 8.34. Anterior eye row slightly procurved, posterior row recurved. Eyes sizes and interdistances: AME 0.46, ALE 0.48, PME 0.24, PLE 0.38, AME–AME 0.11, AME–ALE 0.13, PME–PME 0.70, PME–PLE 0.11, ALE–PLE 0.08, AME–PME 0.03, ALE–ALE 0.68, PLE–PLE 0.87, AME–PLE 0.36. Eye tubercle: length 1.06, width 1.66, clypeus absent. Fovea: slightly procurved and shallow. Labium: length 1.05, width 0.88, with approximately 82 cuspules. Maxillae: between 100–200 cuspules in the inner corner. Sternum: length 4.83, width 3.89. Sigilla: large 1st pair; small 2nd pair, more than 1.5 diameter from margin; 3rd pair more than two diameters from margin and a larger 4th fusiform pair, more than two diameters from

margin. Left chelicera with 11 teeth on promargin and a row of small teeth on promargin. Scopulae present on 2/3 of metatarsi I, on distal half of metatarsi II, 1/3 on III and less than 1/4 distal of metatarsi IV. Tarsi I–IV densely scopulate, scopulae of tarsi III divided by narrow band of setae, tarsi IV widely divided by setae. Length of legs and palp in Table II. Spination on the left legs and palp: palpal femur r0-0-1, tibia p0-2-0; leg I: tibia v1-1-0, p0-1-1, r 1-1-1ap, metatarsus v0-0-2ap; leg II: tibia v2-2-2ap, p0-0-1, metatarsus v1-0-3ap; leg III: tibia v1-1-2ap, p0-1-0, r0-1-1, metatarsus v1-1-3ap, p1-3-1ap, r0-1-0; leg IV: tibia v1-1-2ap, p1-1-0, r0-1-1, metatarsus v2-2-3ap, p0-1-1ap, r0-1-1. Coxae I–IV without stridulatory setae. STC smooth. PLS segment lengths: apical 2.25, medial 1.84 and basal 2.70. PMS rounded and small. Urticating hairs type III. Pilose black cephalothorax; labium, sternum, coxae and femora with blackish pattern; patellae to tarsi reddish light brown. Black abdomen with golden cordiform area on central dorsal region corresponding to the urticating hair patch (Fig. 8). Male palpal bulb with prolateral superior and prolateral inferior keels (Fig. 2). PS well-developed (Fig. 2). Retrolateral and apical keels absent. (Figs. 1, 2). Presence of prolateral accessory keels between the prolateral superior and inferior keels (Fig. 2). Embolus apex with well developed medial crest (Fig. 2). Leg I tibial apophysis two-branched with retrolateral branch longer than prolateral (Fig. 4). Metatarsus I folds between the two branches of the tibial apophysis (Fig. 4).

Female. (MZSP 28776, same data as male). Total length, not including chelicerae or spinnerets 25.18. Cephalothorax length 9.60, width 7.94. Anterior eye row slightly procurved,

posterior row straight. Eyes sizes and interdistances: AME 0.11, ALE 0.44, PME 0.23, PLE 0.44, AME–AME 0.11, AME–ALE 0.14, PME–PME 0.72, PME–PLE 0.07, ALE–PLE 0.05, AME–PME 0.06, ALE–ALE 1.02, PLE–PLE 1.10, AME–PLE 0.41. Eye tubercle length 1.10, width 1.80, clypeus absent. Fovea procurved and shallow. Labium length 1.37, width 1.39 with approximately 97 cuspules. Maxillae: approximately 100 cuspules in the inner corner. Sternum length 4.55, width 3.89. Sigilla: large 1st pair; 2nd and 3rd pair not visible and a larger 4th fusiform pair, one diameter from margin. Left chelicerae with 12 teeth and a row of small teeth on promargin. Tarsi I–IV densely scopulate, scopulae of tarsus II divided by a narrow band of setae, tarsi III–IV widely divided by setae. Metatarsi I–II densely scopulate on distal half, III densely scopulate on 1/3, and IV densely scopulate less than 1/4 region. Length of legs and palp in Table III. Spination of the left legs and palp: palpal tibia v0-2-2ap; leg I: tibia v0-1-2ap, metatarsus v0-1-2ap; leg II: tibia v0-1-2ap, metatarsus v1-1-3ap; leg III: tibia v0-2-2ap, p0-1-1, r0-0-2, metatarsus v2-2-3ap, p1-1-1ap, d0-0-1; leg IV: tibia v0-2-2ap, r0-1-1, metatarsus v1-3-3ap, p0-1-1, r0-1-1ap. Coxae without stridulatory hairs. STC smooth. PLS segment lengths: apical 2.45, medial 1.66 and basal 2.56. PMS rounded and small. Urticating hairs type III. Color pattern as in male (Fig. 7). Two horn-shaped spermathecae with several large granules (Fig. 5).

Additional material examined.—BRAZIL: *Alagoas*: Murici, Murici Ecological Station (9°14'S, 35°47'W), 1 male MZSP 28775, R. Bertani, D.R.M. Ortega & R.H. Nagahama, 12 August 2006; Murici Ecological Station (9°15'S, 35°48'W), 1 female MZSP 28777, R. Bertani, D.R.M. Ortega & R.H. Nagahama, 13 August 2006.

Distribution.—Northeastern Brazil: states of Paraíba and Alagoas, in fragments of Atlantic rainforest.

Note.—Living specimens from State of Paraíba, Areia (7°15'00"S, 36°49'60"W) were collected by A.D. Brescovit, R. Bertani, & A.B. Bonaldo, September 1999.

CLADISTICS

Eight trees were obtained using implied weighting with concavities 3 to 6 in X-Pee-Wee 1.3 (fits 1815.00, 1866.66, 1902.38, 1928.57 respectively for concavities 3, 4, 5, and 6 and length 40 for all of them). In six trees *Kochiana* new genus was a monophyletic group with *Plesiopelma*. In one of the remaining two trees *Kochiana* new genus traded place in a trichotomy with *Plesiopelma* (*Cyrioscosmus* (*C. cyaneopubes-cens* + *Hapalopus*)) and in the other tree it traded place in a polytomy with all these clades plus *Homoeomma*. Eleven trees (fit = 1600.00, length 41) were found with concavity 1 and ten trees (fit = 1733.33, length 41) with concavity 2. In both *Kochiana* new genus resulted as a monophyletic group with *Plesiopelma* or was collapsed in a trichotomy with *Plesiopelma* and *Cyrioscosmus*. Figure 9 shows the consensus of the trees obtained using X-Pee-Wee and concavity 6 (Tables I, IV, and V). It was chosen as the preferred tree due to the higher fit and lower number of steps. The node 28 (Table IV) on Fig. 9 referred to the synapomorphies of *Kochiana* new genus: presence of accessory keels (character 4 in Tables I and V) and medial crest (character 5 in Tables I and V) on male palpal bulb.



Figure 11.—Retrolateral right palpal tibia of male *Cyrioscosmus elegans* (RWC). Black arrow pointing to a field of spines on cymbium; white arrow pointing to a field of spiniform hairs on tibia; grey arrow pointing to a process on tibia. Scale bar = 1 mm. Photo: R. Bertani.

Using Nona 2.0 with equal weighting and the same commands used above produced 16 trees (length = 40, ci = 67, ri = 76). The eight trees found by X-Pee-wee were also found by Nona. The other eight trees differed in the position of *H. montanum*, which appeared as a sister group of *Kochiana* new genus. The consensus tree (length = 46, ci = 58, ri = 65) of 16 trees obtained with Nona is shown in Figure 10. *Kochiana* synapomorphies include accessory keels on male palpal bulb (character 4 in Table I), and putatively a medial crest on embolus apex (character 5 in Table I), horn-shaped spermatheca (character 9 in Table I) and spermatheca with large granules (character 13 in Table I) (Fig. 10). Bremer support values are also shown in Fig. 10. The Nona consensus (Fig. 10) differed from the X-Pee-Wee consensus (Fig. 9) only by collapsing *H. montanum* and *H. stradlingi*.

Kochiana new genus was monophyletic in all analyses regardless of weighting scheme or concavity used. Thus, there is preliminary evidence for *Kochiana* monophyly and weak

evidence for its placement as sister to *Plesiopelma*. A more detailed analysis including representatives of all theraphosine genera is necessary to confirm the placement of *Kochiana* new genus.

As for *Kochiana brunnipes* new combination, many species described during the 19th century await “rediscovery” by modern taxonomists. As such taxa remain overlooked, they are not compared with the recently collected specimens and are not considered when new species are being described. This may result in the creation of junior synonyms and thus add to the taxonomic chaos. The study of these neglected species may aid in solving these problems and improving the taxonomy of theraphosids.

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