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Cladistic analysis and biogeography of the genus *Oligoxystre* Vellard 1924 (Araneae: Mygalomorphae: Theraphosidae)

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Abstract. The genus *Oligoxystre* was originally established in 1924 for *O. auratum* Vellard 1924 from southern state of Goiás, Central Brazil. Today, the genus includes seven species: *O. auratum*, *O. caatinga* Guadanucci 2007, *O. bolivianum* (Vol 2001), *O. tucuruiense* Guadanucci 2007, *O. rufoniger* Guadanucci 2007, *O. dominguense* Guadanucci 2007, and *O. diamantinensis* Bertani et al. 2009. *Oligoxystre mineirum* new species, from the Atlantic forest domain is described here. The cladistic analysis resulted in a single tree: (*O.caatinga* (*O.mineirum* ((*O.tucuruiense*+*O.rufoniger*) (*O.diamantinensis* (*O.bolivianum* +*O.dominguense*))))). According to the area cladogram obtained, it is possible to draw the following conclusions: the origin of the Cerrado fauna is monophyletic; the occurrence of two sympatric species in Caatinga is due to different events; and the diversity of *Oligoxystre* in Serra do Espinhaço (*O. rufoniger*, *O. diamantinensis* and *O. mineirum*) is probably the result of the contact of the typical fauna of each bioma (Cerrado, Caatinga and Atlantic Forest).

Keywords: Spider, phylogeny, Serra do Espinhaço, Ischnocolinae

The genus *Oligoxystre* was originally established in 1924 by Vellard for *O. auratum* Vellard 1924 from southern state of Goiás, Central Brazil. It was originally monotypic and diagnosed as having the labium much wider than long, with few cuspules. *Oligoxystre* was considered the senior synonym of the genus *Cenobiopelma* Mello-Leitão & Arlé 1941 by Raven (1985) and subsequently comprised three species, including *O. mimeticum* (Mello Leitão & Arlé 1934) and *O. argentinense* (Mello Leitão 1941). In a recent taxonomic revision, Guadanucci (2007) removed the latter two species from *Oligoxystre* and recognized six species in the genus: *O. auratum*, the type species, *O. caatinga* Guadanucci 2007, *O. bolivianum* (Vol 2001), *O. tucuruiense* Guadanucci 2007, *O. rufoniger* Guadanucci 2007, and *O. dominguense* Guadanucci 2007. More recently, another new species was described from Diamantina, Serra do Espinhaço, namely *O. diamantinensis* Bertani et al. 2009. There, *O. diamantinensis* was included in the cladogram proposed originally by Guadanucci (2005) and placed in a basal trichotomy.

The examination of extensive material of Instituto Butantan and collecting field trips at different localities of the Serra do Espinhaço Meridional revealed one more new species, and the first species known from the Atlantic forest domain. In this paper, I present the description of this new species, a cladistic analysis including all seven species of the genus, and an area cladogram with discussion concerning the origin of the main groups of *Oligoxystre*.

METHODS

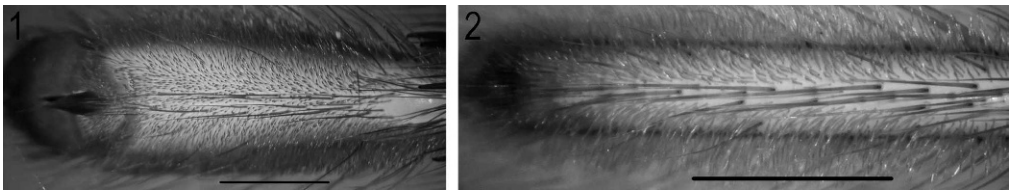
Specimens from the following institutions (giving acronym, city, and curator) were examined: CAD, Coleção Aracnológica Diamantina, Brazil (J.P.L. Guadanucci); DW, Dirk Weinmann private collection, Sttutgart, Germany (D. Weinmann); IBSP, Instituto Butantan, São Paulo, Brazil (A.D. Brescovit); MPEG, Museu Paraense Emilio Goeldi, Universidade Federal do Pará, Belém, Brazil (A. Bonaldo); MZSP, Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (R. Pinto-da-Rocha).

All measurements are in mm and were taken with an ocular micrometer. The length of leg segments was measured between joints in dorsal view. Length and width of carapace, eye tubercle, labium, and sternum are maximum values obtained. Total body length includes chelicerae and abdomen, but not spinnerets. Terminology for number and disposition of spines follows that of Petrunkevitch (1925), with modifications proposed by Bertani (2001). All pictures were taken with a Nikon 5 Mpixel digital camera adapted to an Olympus SZ40 ocular lens. Spermathecae were cleared with clove oil and photographed in dorsal view. Male palpal bulbs from the left side were removed from the cymbium and photographed in prolateral, retrolateral, and dorsal views. Setae of male tibia I were removed in order to better illustrate the tibial spur.

The matrix for the cladistic analysis was done using the Nexus Data Editor (NDE) 0.5.0 software (Page 2001). The characters were polarized using outgroup comparison (Nixon & Carpenter 1993), and the taxa used were *Holothele rondoni* (Lucas & Bücherl 1972) and *Guyruita cerrado* Guadanucci et al. 2007. The matrix was analyzed with TNT 1.0 (Goloboff, Farris & Nixon 2003). The multistate character (character 6) was treated as unordered. The tree was obtained using a heuristic search (TBR) with 500 replications and using equal weights. The option 'collapse tree after search' was used; the collapsing method was rule 1 (zero length branches in at least one of the trees found were collapsed). For character optimization I used Winclada 1.00.08 (Nixon 1999). The area cladogram was obtained by replacing the terminal taxa by its geographical area distribution. The map for geographical distribution was produced using Microsoft Encarta 16.0.0.117.

Below is a list with all specimens used in the cladistic analysis:

-*Guyruita cerrado* Guadanucci et al. 2007: 1m holotype (MZSP 27098), Serra da Mesa, Colinas do Sul, Goiás, Brazil. 1f paratype (MZSP 22766), Serra da Mesa, Colinas do Sul, Goiás, Brazil.



Figures 1, 2.—Tarsus, ventral view. 1. Scopula undivided with longitudinal band of setae; 2. Scopula divided with band of setae. Scale = 1mm.

-*Holothele rondoni* (Lucas & Bücherl 1972): 1m (MZSP 18046), Apiacás, Mato Grosso, Brazil. 1f (MZSP 21504), Tucuruí, Pará, Brazil.
-*Oligoxystre bolivianum* (Vol 2001): 1m (MZSP 26082), Samaipata, Santa Cruz, Bolivia. 1f (MZSP 26085), San Buenaventura, Beni, Bolivia.
-*Oligoxystre caatinga* Guadanucci 2007: 1m holotype (IBSP 9487), Central, Bahia, Brazil. 1f paratype (IBSP 8549), Toca da Esperança, Jussara, Bahia, Brazil.
-*Oligoxystre dominguense* Guadanucci 2007: 1m holotype (IBSP 8625), São Domingos, Goiás, Brazil. 1f paratype (IBSP 9467), Serra da Mesa, Minaçú, Goiás, Brazil.
-*Oligoxystre rufoniger* Guadanucci 2007: 1m holotype (MZSP 20570), Estação Ecológica Uruçuí-una, Piauí, Brazil. 1f paratype (IBSP 8553), Toca da Esperança, Central, Bahia, Brazil.
-*Oligoxystre tucuruiense* Guadanucci 2007: 1m holotype (IBSP 9459) and 1f paratype (IBSP 7936), Tucuruí, Pará, Brazil.
-*Oligoxystre diamantinensis* Bertani et al. 2009: 1m (CAD 138), Diamantina, Minas Gerais, Brazil. 1f (CAD 141), Diamantina, Minas Gerais, Brazil.
-*Oligoxystre mineirum* sp. nov.: 1m (IBSP 9501), Itabuna, Bahia, Brazil; R. Bertani *leg*. 1f (IBSP 9452), Itabuna, Bahia, Brazil.

TAXONOMY

Family Theraphosidae Thorell 1869
Genus *Oligoxystre* Vellard 1924

Oligoxystre Vellard 1924:151, pl. 10, fig. 38.
Pseudoligoxystre Vol 2001:4–6, 7 figs. (type-species *Pseudoligoxystre bolivianum* Vol 2001); *Oligoxystre* Guadanucci 2007:4, f. 1–12.

Type species.—*Oligoxystre auratum* Vellard 1924, by original designation.

Diagnosis.—It differs from other ischnocoline genera and resembles *Catumiri* by the labium much wider than long, bearing a reduced number of cuspules (fewer than 10). It differs from *Catumiri* by the undivided tarsal scopula on I–III and scopula on tarsi IV undivided but with a longitudinal band of setae (Figs. 1, 2), the metatarsus I having scopula ventrally for all its length, the spermathecae with numerous termini, the well-developed retrolateral branch of the tibial spur, and by the tarsal claws of males without teeth.

Composition.—*Oligoxystre auratum* Vellard 1924, *O. bolivianum* (Vol 2001), *O. caatinga* Guadanucci 2007, *O. dominguense* Guadanucci 2007, *O. tucuruiense* Guadanucci 2007, *O. rufoniger* Guadanucci 2007, *O. diamantinensis* Bertani et al., 2009 and *O. mineirum* sp. nov.

Note.—The type species of the genus, *O. auratum*, described from the city of Catalão, southern state of Goiás, Brazil, has not been collected since the original description, which dates from 1924. The type specimen is thought to be lost (Guadanucci 2007). Several attempts have been made to collect *O. auratum* in the type locality and surroundings, without success. The only species present in the type locality is *O. bolivianum*, whose color pattern agrees with that of *O. auratum* in the original description. However, the illustration of the male palpal bulb in the original description of *O. auratum*, although unsatisfactorily detailed, is different from that of *O. bolivianum*. As *O. auratum* is insufficiently known, this species is not included in the present analysis.

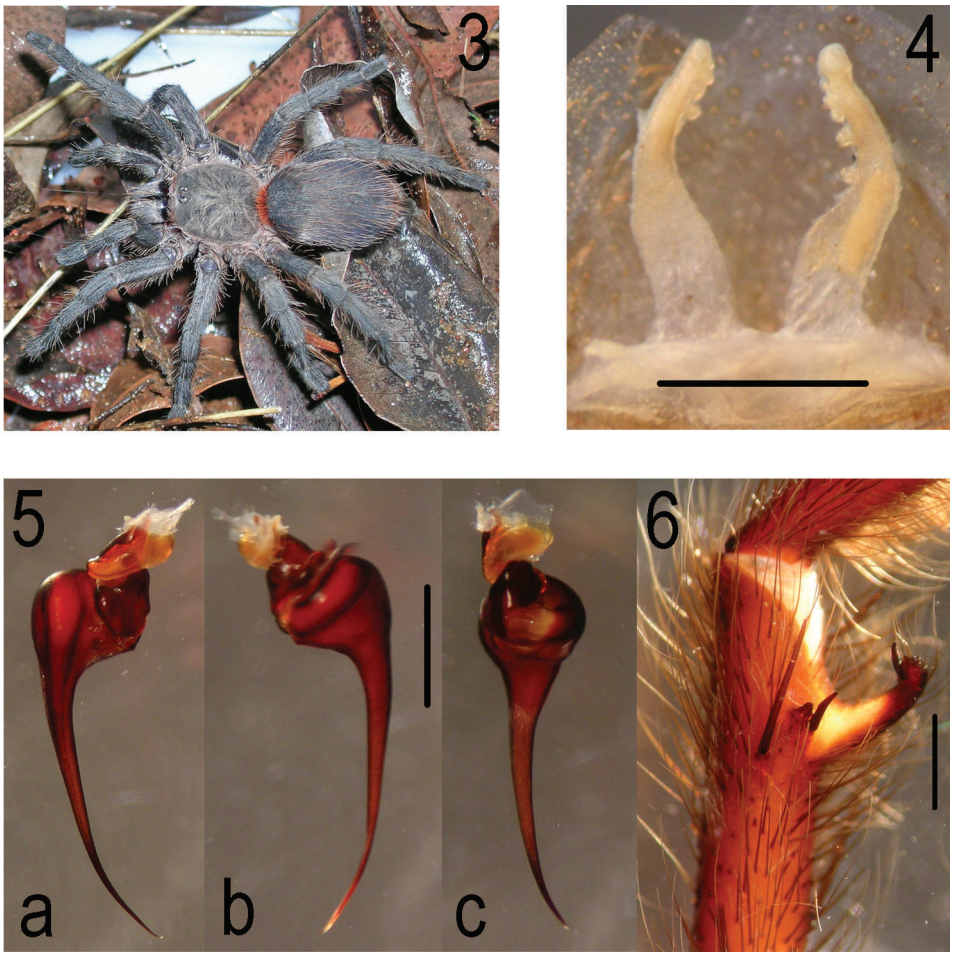
Oligoxystre mineirum new species.
Figs. 3–6, Tables 1, 2

Type material.—Holotype: male (IBSP 9501), Itabuna (14°47′S, 39°16′W), Bahia, Brazil; R. Bertani. Paratypes: female (IBSP 9452), Itabuna, Bahia, Brazil; female (IBSP 9464), Ilhéus (14°47′S, 39°02′W), Bahia, Brazil, A.D. Brescovit & R. Bertani leg., 24 April 1998; female (IBSP 9463), Ilhéus, Bahia, Brazil, R. Bertani, D. Pinz & R. Faria leg.; male (IBSP 9492), Santa Bárbara (19°58′S, 43°24′W), Minas Gerais, Brazil, R. Bertani leg., 24 July 1995; male (CAD 228), Diamantina (18°14′S, 43°36′W), Minas Gerais, Brazil, J.P.L. Guadanucci leg., Occtober 2008.

Other material examined.—BRAZIL: *Ceará*: Crasto, 1m (IBSP 9142), Bertani leg., 1m (IBSP 9142), Bertani leg., 1f. *Sergipe*: Santa Luzia do Itanhy (11°21′S, 37°27′W), 1f (IBSP8626) A.D. Brescovit et al. leg., September 1999. *Bahia*: Porto Seguro (16°26′S 39°04′W), 1m (DW), Itabuna, 1f (IBSP 9466), Bertani leg., 1f (IBSP 9465), Bertani leg. *Minas Gerais*: Ouro Preto (20°23′S, 43°30′W), 1f (IBSP 2526), A. Bittencourt leg., 1f (IBSP 2554), A. Ulhoa leg., 1f (IBSP 3437), W. Bittencourt leg., 5 May 1951, 1f (IBSP 1098), A. Bittencourt leg., 22 December1947, 1f (IBSP 3475). Edgar de Melo (19°13′S, 41°55′W), 1f (IBSP 9450), S.A. Silva leg., 2 August 1989. Diamantina, 1f (CAD 229), J. P. L. Guadanucci leg., November 2008.

Etymology.—Named after the type locality in the state of Minas Gerais, Brazil. The term 'mineiro' is a patronymic of Minas Gerais.

Diagnosis.—Representatives of this species differ from the remaining *Oligoxystre* by the presence of gray setae on the carapace and legs and by the orange patch of setae at the anterior dorsal portion of abdomen (Fig. 3). Males share with *O. caatinga* and *O. rufoniger* the slender and elongated embolus without keels (Figs. 5A–C), but can be distinguished from *O. caatinga* by the tibial apophysis far from metatarsus, and from *O. rufoniger* by the well developed retrolateral branch of tibial apophysis (Fig. 6). Females may be distin-



Figures 3–6.—*Oligoxystre mineirum* sp. nov. 3. Female, dorsal habitus, arrow shows the location of orange patch; 4. Female, spermathecae, dorsal view; 5. Male, palpal bulb, a. Prolateral view, b. Retrolateral view, c. Dorsal view; 6. Male, tibial apophysis, prolateral view. Scale = 1mm.

guished by the long receptacula, each with numerous lobes on the apex and on the inner surface (Fig. 4).

Description.—*Male (holotype):* Total length: 18.3. Carapace: length 6.5; width 5.3. Eye tubercle: length 1.7; width 1.2. Labium: length 0.7; width 1.2. Sternum: length 4.0; width 3.2. Basal segment of chelicerae with 10–11 teeth. Labium with four cuspules. Maxillae with 28 cuspules. Sternum oval. Thoracic fovea straight. Spines: Palp: femur (d) 0-0-p1, patella 0, tibia (p) v1-2-1; Legs: I: femur (d) 0-p1-p1, patella 0, tibia (v) 0-1-1, (p) 0-1-1, (v) 0-1-1, metatarsus (v) 1-0-0; II: femur (d) 0-0-p1, patella 0, tibia (v) 1-1-ap2, (p) 0-1-1, metatarsus (v) 1-0-0; III: femur (d) 2-2-2, patella 0, tibia (r) 0-1-1, (v) 1-1-ap2, (p) 1-1-1, metatarsus (r) 0-1-1, (v) 1-1-ap3, (p) 1-1-1; IV: femur (d) 0-3-2, patella 0, tibia (r) 0-1-1, (v) 2-2-ap2, (p) 0-1-1, metatarsus (v) 1-1-ap3, (p) 0-1-1, (r) 0-1-1. Retrolateral lobe of cymbium slightly larger than prolateral lobe. Palpal bulb long, thin, without keels, slightly curved (Figs. 5A–C). Retrolateral branch of tibial spur with spine inserted at its apical portion, prolateral branch shorter than the contiguous spine (Fig. 6). Tibial spur far from metatarsus articulation. Metatarsus I bends retrolaterally to tibial spur. Ventral surface of cephalothorax brown; dorsally with many gray setae, orange setae at the anterior dorsal portion of abdomen (Fig. 3).

Female (paratype IBSP 9452): Total length: 30.7. Carapace: length 10.1; width 8.6. Eye tubercle: length 1.4; width 2.1. Labium: length 1; width 1.7. Sternum: length 4.6; width 4.1. Basal segment of chelicerae with 9–11 teeth. Labium with three cuspules. Maxilla with 21–22 cuspules. Thoracic fovea recurved. Spines: Palp: femur (d) 0-0-p1, patella 0, tibia (v) 0-2-ap2, (p) 0-1-0, metatarsus 0; Legs: I: femur (d) 0-0-p1, patella

Table 1.—*Oligoxystre mineirum* new species, male holotype. Length of leg and palp articles.

Segment	Palp	Leg I	Leg II	Leg III	Leg IV
Femur	4.9	8.6	7.7	6.3	8
Patella	4.3	5.6	4.4	3.5	4.1
Tibia	4.5	6.8	6.1	5.3	7.4
Metatarsus	-	7.6	6.0	5.8	8.2
Tarsus	1.4	3.9	3.7	3.5	3.9
TOTAL	15.1	32.5	27.9	24.4	31.6

Table 2.—*Oligoxystre mineirum* new species, female paratype. Length of leg and palp articles.

Segment	Palp	Leg I	Leg II	Leg III	Leg IV
Femur	5.5	7.2	7.2	6.1	7.5
Patella	3.5	5.1	4.6	3.6	4.2
Tibia	3.8	5.3	5.2	4.5	6.4
Metatarsus	-	4.7	4.6	4.6	7
Tarsus	4	3	2.9	3.1	3.2
TOTAL	16.8	25.3	24.5	21.9	28.3

0, tibia (v) 0-1-ap1, (p) 0-1-0, metatarsus (v) 1-0-0; II: femur (d) 0-0-p1, patella 0, tibia (v) 0-1-ap1, (p) 0-1-0, metatarsus (v) 1-0-0; III: femur (d) 0-1-2, patella 0, tibia (r) 1-1-0, (v) 1-2-ap2, (p) 1-1-0, metatarsus (r) 0-1-1, (v) 0-2-ap3, (p) 0-1-1; IV: femur (d) 0-0-p1, patella 0, tibia (r) 0-1-1, (v) 1-2-ap2, metatarsus (r) 0-1-1, (v) 0-2-ap3, (p) 0-1-1. Spermathecae paired, receptacula much longer than wide, with numerous lobes on apex and inner surface of each receptacula (Fig. 4). Coloration as in male.

Variation.—Some males have longer embolus and a darker coloration.

Distribution.—States of Minas Gerais, Bahia, Ceará and Sergipe, Brazil (Fig. 8).

CLADISTICS

Characters (see Table 3): 1. Tibial apophysis insertion: 0. Close to metatarsus, touching the apophysis when flexed (fig. 21 in Guadanucci 2007); 1. Distant from metatarsus, not touching the apophysis when flexed (fig. 1 in Guadanucci 2007). 2. Apex of retrolateral branch of tibial apophysis: 0. Normal, as thin as the base (fig. 21 in Guadanucci 2007); 1. Swollen (fig. 25 in Guadanucci 2007). 3. Size of prolateral branch of tibial apophysis: 0. Longer than the contiguous spine (fig. 21 in Guadanucci 2007); 1. Shorter than the contiguous spine (fig. 25 in Guadanucci 2007). 4. Metatarsus I of male: 0. Straight; 1. Curved. 5. Male palpal bulb: 0. Embolus without distal excavation; 1. Embolus with conspicuous distal excavation (figs. 5, 21 in Guadanucci 2007). 6. Shape of male palpal bulb embolus: 0. Long and slightly curved (figs. 22, 23 in Guadanucci 2007); 1. Short and strongly bent (fig. 4 in Guadanucci 2007); 2. Long, with a strong distal bent (figs. 31, 32 in Guadanucci 2007). 7. Lobes on spermathecae: 0. Present; 1. Absent. 8. Spermathecae external lateral lobe: 0. Absent; 1. Present. 9. Number of cuspules on maxillae: 0. More than 60; 1. Fewer than 50. 10. Number of cuspules on labium: 0. More than 15; 1. Fewer than 10. 11. Shape of labium: 0. As wide as long; 1. Much wider than long. 12. Location of sternal sigillae: 0. Set far from sternum margin; 1. Contiguous to sternum margin. 13. Clypeus: 0. Absent; 1. Present, short. 14. Metatarsal swollen trichobothrium: 0. Absent; 1. Present.

The phylogenetic analysis resulted in a single tree (Fig. 7) with 16 steps (CI = 0.87, RI = 0.89). Bremer support values are given above each node in the cladogram.

The genus *Oligoxystre* is monophyletic, supported by the following synapomorphies: few cuspules (fewer than 50) on maxillae; few cuspules (fewer than 10) on labium; labium much wider than long; sigillae contiguous to sternum margin; presence of swollen trichobothrium on metatarsi. Observations of web building behavior in nature and captivity for the species *O. rufoniger*, *O. diamantinensis* and *O. mineirum* sp. nov. showed that the spider incorporates soil grains into the silk, making it well camouflaged, as also described for *O. bolivianum* in Guadanucci (2007). This behavior of web building is a putative synapomorphy for the genus. However, this character was not included in the matrix, since it has been studied for few species. In agreement with a previous analysis (Guadanucci 2005), the species *O. bolivianum* and *O. dominguense* are sister groups, supported by the excavation on the embolus. The newly included *O. diamantinensis* is sister to *O. bolivianum*+*O. dominguense*. The previous analysis of Guadanucci (2005) also showed the monophyletic group *O. tucuruiense*+*O. rufoniger*.

The monophyletic group ((*O.tucuruiense*+*O.rufoniger*)(*O.-diamantinensis*(*O.bolivianum*+*O.dominguense*))) has the new species described herein *O. mineirum* as its sister group. This relation is supported by a single synapomorphy: tibial apophysis located distant from metatarsus in a way that it does not touch the article when flexed. The species *O. caatinga* is the sister group of all remaining species of *Oligoxystre*.

BIOGEOGRAPHY

The geographic distribution records were obtained from the recent revision of the genus (Guadanucci 2007), the description of *O. diamantinensis* (Bertani et al. 2009), the examination of collection material at Instituto Butantan and Museu Paraense Emilio Goeldi, and also from recent field trip collections in the surroundings of the city Diamantina and at Parque Estadual do Rio Preto, at the city of São Gonçalo do Rio Preto, state of Minas Gerais. The geographic distribution of the species are as follows (Fig. 8): *O. tucuruiense* with single record for Tucuruí, state of Pará, Eastern Amazonia; *O. caatinga* in Northeastern Brazil, at Caatinga, partially sympatric with *O. rufoniger*, but the latter extending to

Table 3.—Character matrix of *Oligoxystre* species.

Terminal taxa	1	2	3	4	5	6	7	8	9	0	1	2	3	4
Holothele rondoni	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Guyruita cerrado	0	0	0	0	0	0	1	0	0	0	0	0	0	0
O. caatinga	0	0	0	0	0	0	1	0	1	1	1	1	1	1
O. mineirum sp. nov.	1	0	0	0	0	0	1	0	1	1	1	1	0	1
O. tucuruiense	1	0	1	0	0	2	1	1	1	1	1	1	0	1
O. rufoniger	0	0	1	0	0	0	1	1	1	1	1	1	0	1
O. diamantinensis	1	0	1	1	0	0	1	0	1	1	1	1	0	1
O. bolivianum	1	1	1	1	1	1	1	0	1	1	1	1	1	1
O. dominguense	1	1	1	1	1	0	1	0	1	1	1	1	1	1

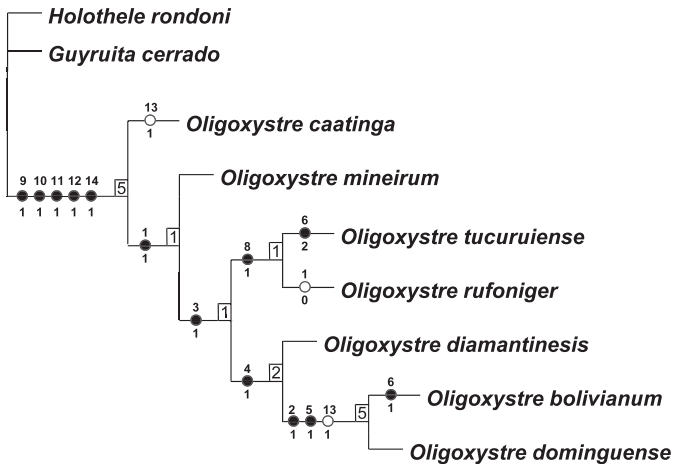


Figure 7.—Relationship hypothesis for the species of the genus *Oligoxystre*. L = 16 steps, CI = 0.87, RI = 0.89. Black circles = changes in non-homoplasious characters; white circles = homoplasies. Bremer support values inside squares above nodes.

Meridional Serra do Espinhaço; *O. bolivianum* extends from Brazilian central Cerrado to southern Bolivia; *O. dominguense* in northern Cerrado at northern state of Goiás; *O. diamantinensis* with three records at Meridional Serra do Espinhaço; and *O. mineirum* from the Atlantic forest and records at Meridional Serra do Espinhaço.

The area cladogram (Fig. 9) shows the biomes where the species are found (Amazonia, Caatinga, Cerrado, Atlantic Forest). The Serra do Espinhaço mountain range is considered to present a typical fitofisionomy called Campo Rupestre, which means "rocky fields," that belongs to the Cerrado domain and is characterized mainly by the presence of specimens of plants of the families Asteraceae, Melastomataceae, Gramineae, Cyperaceae, Cactaceae, Eicaceae, Leguminosaceae, Velloziaceae, Eriocaulaceae, and Xyridaceae (Silva et al. 2005).

According to the area cladogram, I present the following biogeographic hypothesis, based on the assumption of a vicariance model. The monophyly of the Cerrado group (*O. bolivianum*, *O. dominguense,* and *O. diamantinensis*) suggests a single diversification within the area. According to Ferrarezzi et al. (2005), based on phylogenetic relationships of Colubridae snakes of the genus *Apostolepis*, the northeastern region of Cerrado is more closely related to Caatinga than to the southwestern portion of Cerrado. This is partially congruent with the data presented herein, which show the close relationship among the species from Cerrado with Caatinga and Amazonia. However, since there are no records of *Oligoxystre* from southwestern Cerrado, it is not possible to fully test the hypothesis proposed by Ferrarezzi et al. (2005).

The occurrence of the two sympatric, but not closely related, species in Caatinga suggests allopatric speciation and secondary sympatry. The close relation between the fauna of Caatinga and Eastern Amazonia has also been verified for

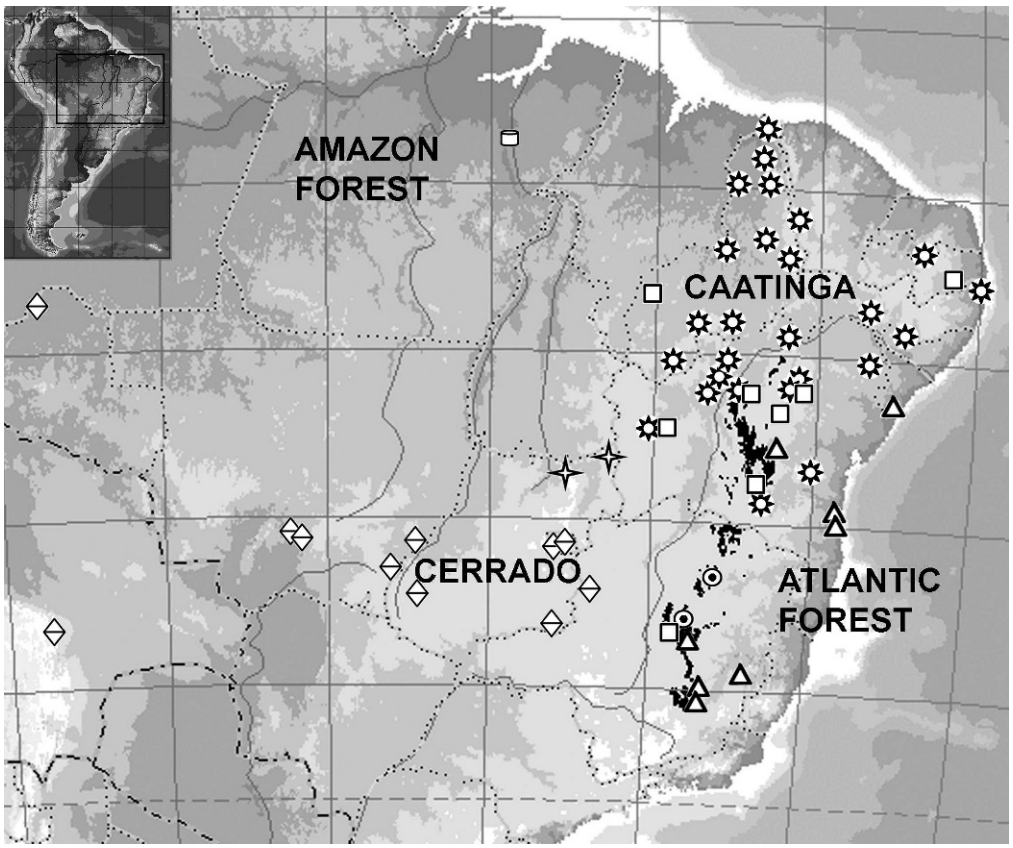


Figure 8.—Map of central region of South America showing geographic distribution records of *Oligoxystre* species: ▭ - *O. tucuruiense*; ✿ - *O. caatinga*; ◈ - *O. bolivianum*; ◉ - *O. diamantinensis*; □ - *O. rufoniger*; ✧ - *O. dominguense*; △ - *O. mineirum* sp. nov. The black shadings on the map represent the Serra do Espinhaço mountain range.

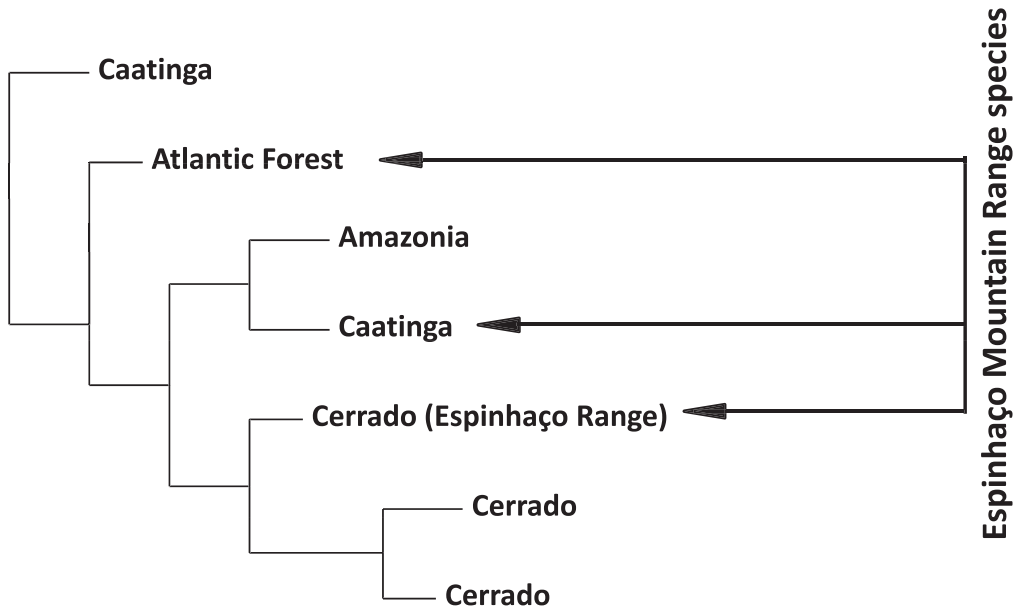


Figure 9.—Area cladogram based on the relationship of *Oligoxystre* species. Arrows showing the species that occur at Serra do Espinhaço.

bees (Zanella & Martins 2003). This sympatric occurrence of *O. caatinga* and *O. rufoniger* suggests that either species might have dispersed after its origin.

The Serra do Espinhaço (Fig. 8) plays an important role on the distribution patterns found for the genus *Oligoxystre*. This mountain range represents the longest pre-Cambrian orogenic belt of Brazilian territory, extending for approximately 1200 km (Almeida-Abreu & Renger 2002). It is composed of a series of hills and tablelands, varying between 900–2000 m a.s.l., in the countryside of the states of Minas Gerais and Bahia. It separates three major river basins (Bacia do Rio São Francisco, Rio Jequitinhonha, and Rio Doce), and it also represents the limit for the three major biomes in Brazil (Caatinga, Cerrado and Atlantic Forest). Recent studies have shown a considerable degree of endemism for plants (Costa et al. 2008; Viana & Filgueiras 2008; Versieux 2008; Zappi & Taylor 2008; Dutra et al. 2008) and animals (Leite et al. 2008; Vasconcelos et al. 2008). According to the geographic distribution shown on the map (Fig. 8), *O. diamantinensis* represents an endemic species of Serra do Espinhaço, with records from the cities of Diamantina, São Gonçalo do Rio Preto, and Grão Mogol, all in the state of Minas Gerais. Depending on the side and latitude of Serra do Espinhaço, the biota is influenced by one of the three biomes. Serra do Espinhaço shows the highest diversity of species for the genus *Oligoxystre*, with four species recorded for its domain (*O. caatinga*, *O. rufoniger*, *O. diamantinensis,* and *O. mineirum*). Each of these species seems to be typical of different biomes, and they all occur at Serra do Espinhaço due to the distinct influence that this region receives from the three biomes. Three species occur sympatrically in Diamantina, Minas Gerais: *O. rufoniger* (typical of Caatinga), *O. diamantinensis* (endemic at Serra do Espinhaço) and *O. mineirum* (from Atlantic Forest). It is possible that the sympatric area extends to northward regions of Serra do Espinhaço, considering that there is a gap of records in the northern region of the state of Minas Gerais. It is important to note that the origin of this mountain range did not represent a vicariant event, since it dates from the Mesoproterozoic (Almeida-Abreu & Renger 2002), more than 1 billion years ago when there are no fossil records of animals.

According to the Diversity Atlas of Minas Gerais (Drummond et al. 2005), different spots at Serra do Espinhaço are considered of great relevance for scientific studies and conservation action. The results presented herein reinforce the need for more diversity studies at Serra do Espinhaço, especially those of invertebrate fauna, for which there is still very little information. New data show that for mygalomorph spiders Serra do Espinhaço promises considerable diversity, including three species of the genus *Tmesiphantes* (Theraphosinae) and five species of *Actinopus* (Actinopodidae) (pers. obs.). The accumulation of diversity studies involving species that occur at Serra do Espinhaço will shed light on the biogeographical relevance of this region.

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