

***BOTHRIURUS JESUITA*, A NEW SCORPION SPECIES FROM NORTHEASTERN ARGENTINA (SCORPIONES, BOTHRIURIDAE)**

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ABSTRACT. The new species *Bothriurus jesuita* is described. This species belongs to the *bonariensis* species group and is closely related to *Bothriurus chacoensis* Maury & Acosta 1993 from which it can be distinguished by its thicker and taller chela and because of it is almost 30% larger. It can be distinguished from *Bothriurus bonariensis* (C.L. Koch 1842) because it has an apical filament on the basal lobe of the right hemispermatophore and because the frontal ridge reaches the frontal fold. *Bothriurus jesuita* has been collected in the northern region of Corrientes Province and in Misiones Province in an area that belongs to the “Paranaense” Phytogeographic Province.

RESUMEN. En el presente trabajo se describe a *Bothriurus jesuita* sp. nov., esta especie pertenece al grupo *bonariensis* y se encuentra muy relacionada con *Bothriurus chacoensis* Maury y Acosta 1993; puede diferenciarse de ésta por poseer una pinza más alta y robusta, y por ser casi un 30% más grande. Puede diferenciarse de *Bothriurus bonariensis* (C.L. Koch 1842) por poseer un filamento en el lóbulo basal del hemispermatóforo derecho, y porque la cresta frontal de la lámina distal llega hasta el repliegue frontal. *Bothriurus jesuita* sólo ha sido colectada en el norte de la provincia de Corrientes y en la provincia de Misiones, en un área correspondiente con la provincia fitogeográfica Paranaense.

Keywords: *Bothriurus*, Neotropics, scorpion, taxonomy.

The genus *Bothriurus* is the most diverse in the family Bothriuridae. To facilitate identification of species in the genus, it was divided into species groups (Maury 1973, 1979, 1984), one of which is the *bonariensis* species group (Maury 1979). The distinctive characteristics of this group are as follows: chela trichobothrium esb forms a triangle with eb 2 and eb 3, hemispermatophore lamina very well developed, straight with a frontal ridge, chelicerae with a single subdistal tooth, ventrolateral and transverse carinae forming an arc in the distal third of the fifth metasomal segment, males metasomal gland placed in a very conspicuous depression on the dorsal face of the telson (Maury & Acosta 1993; Acosta & Maury 1998).

Currently the *bonariensis* group contains only two species: *B. bonariensis* (C.L. Koch 1842) and *B. chacoensis* Maury & Acosta 1993. *Bothriurus jesuita*, a new species from the *bonariensis* group, is herein described. This species was first recognized as distinct by Dr. San Martín; all the specimens examined for this paper were labelled by him as a

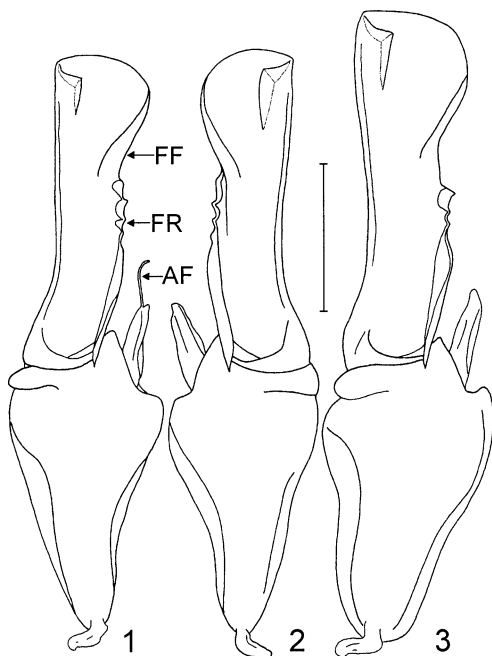
new species: *Bothriurus vianai* (nomen nudum, in schedula). Maury & Acosta (1993) mention the presence of this new species from the Argentinian Mesopotamia, but they never attempted to describe it.

Bothriurus jesuita is the fourth species recorded for the Misiones scorpological area (Acosta & Maury 1998), the other species are: *Tityus bahiensis* (Perty 1833), *Bothriurus moojeni* Mello Leitão 1945 and *Ananteris balzanii* Thorell 1891, although the presence of the last species in the area has to be confirmed (Mello Leitão 1945; Lourenço 1993; Ojanguren Affilastro & Vezzani 2001).

A map of the distribution of the species of the *bonariensis* group in Argentina is provided. All the localities given in this map belong to the bibliography cited in this paper, except for the new records of *Bothriurus jesuita*.

METHODS

Terminology of the structures of the hemispermatophore follows Maury (1973) and Maury



Figures 1–3.—*Bothriurus jesuita* new species. 1. Right hemispermatophore, dorsal aspect; 2. Left hemispermatophore, dorsal aspect; 3. *Bothriurus bonariensis*, right hemispermatophore, dorsal aspect. Abbreviations: AF = apical filament; FR = frontal ridge; FF = frontal fold. Scale bar = 1 mm.

& Acosta (1993). Trichobothrial terminology follows Vachon (1974). Terminology of the telson gland follows Maury & Acosta (1993). Terminology of the Phylogeographic Provinces follows Cabrera & Willink (1980). Terminology of the Scorpiological Areas follows Acosta & Maury (1998). Terminology of the metasomal carinae follows Stahnke (1970). Abbreviations for collections are as follows: MACN-Ar = Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, National Arachnological Collection (Cristina Scioscia). All measurements are in mm, and were taken using an ocular micrometer. Illustrations were produced using a stereomicroscope and camera lucida. The hemispermatophores were dissected from surrounding tissues and observed in 80% ethanol.

***Bothriurus jesuita*, new species**

Figs. 1, 2, 5–10, 12–16

Bothriurus vianai: San Martín (nomen nudum, in schedula).

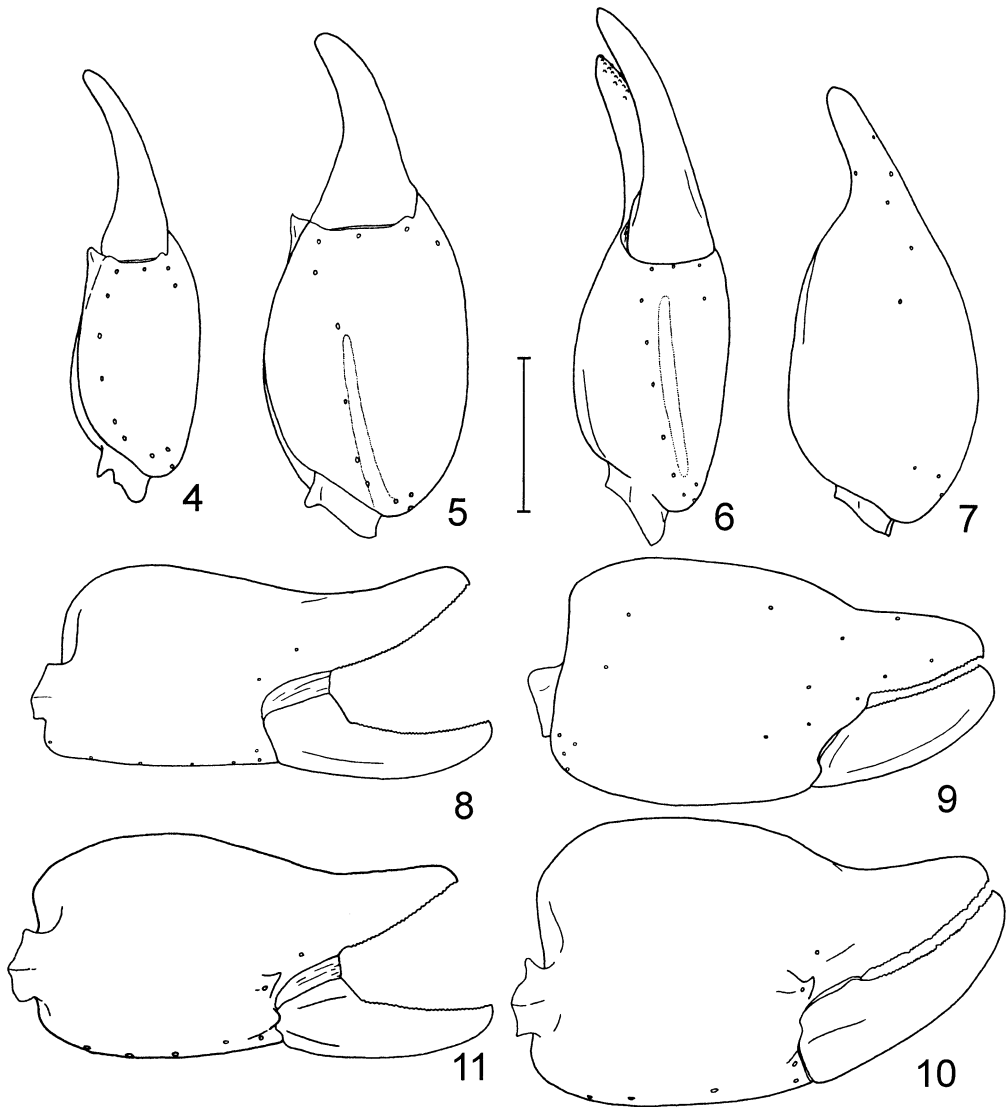
Bothriurus bonariensis (C.L. Koch): Maury 1973:

368, 369, map (in part.); Maury 1979: 708, 715, fig. 5 (in part).

Bothriurus sp: Maury & Acosta 1993: 114, 118.

Type data.—Holotype male, ARGENTINA: *Misiones Province*, Loreto (27°19'S, 55°31'W), 1936, Ogloblin coll. (MACN-Ar 10048). Paratypes: *Misiones Province*: San Ignacio (27°16'S, 55°31'W), 1 ♂, December 1948, Biraben coll. (MACN-Ar 10049); 1 ♂, December 1948, Biraben coll. (MACN-Ar 10052); San Javier (27°52'S, 55°7'W), 2 juveniles, December 1948, Biraben coll. (MACN-Ar 10050); Santo Pipó (27°7'S, 55°31'W), 1 ♂, 1 ♀, December 1951, Foenter coll. (MACN-Ar 10051); Santa Ana (27°22'S, 55°34'W), 1 ♂, Llamas coll. (MACN-Ar 10053); 1 juvenile, Llamas coll. (MACN-Ar 10071); 1 ♂, March 1901, Llamas coll. (MACN-Ar 10057); San Juan (27°46'S, 55°30'W), 1 ♂, 3 August 1924, Gómez coll. (MACN-Ar 10054); Loreto (27°19'S, 55°31'W), 2 juveniles, 15–20 December 1932, Ogloblin coll. (MACN-Ar 10055); 1 ♂, February 1956, Sánchez de Bustamante coll. (MACN-Ar 10063); 1 ♂, 8 January 1933, (MACN-Ar 10059); 1 ♂, 10 February 1937, (MACN-Ar 10060); Puerto Bemberg (Uruguay, 25°55'S, 54°36'W), 1 ♀, 1 juvenile, 25 November 1948, (MACN-Ar 10056); San José (27°46'S, 55°46'W), 3 juveniles, December 1948, Biraben coll. (MACN-Ar 10058); Apóstoles (27°53'S, 55°46'W), 1 ♂, 1 juvenile, March 1935, Castelli coll. (MACN-Ar 10061); Pindapoy (San Jose, 27°46'S, 55°46'W), 1 ♂, 1 juvenile, 12 January 1942, Williner coll. (MACN-Ar 10070); Santa María (27°55'S, 55°22'W), 3 ♂, December 1943, Viana coll. (MACN-Ar 10062); 1 ♂, November 1952, Viana coll. (MACN-Ar 10064); 1 ♂, January 1964, Viana coll. (MACN-Ar 10065); 1 ♂, March 1945, Viana coll. (MACN-Ar 10066); 1 ♂, December 1948, Viana coll. (MACN-Ar 10067). *Province of Corrientes*: Manantiales (27°56'S, 58°7'W), 1 ♂, May 1947, Apostol coll. (MACN-Ar 10068); Apipé (27°31'S, 56°43'W), 1 ♂, December 1945, Hanke coll. (MACN-Ar 10069).

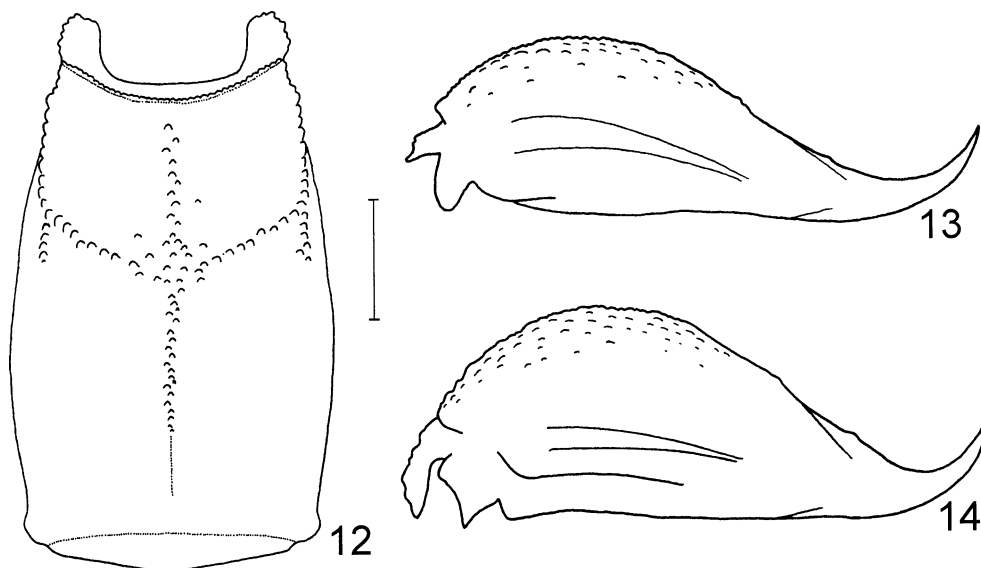
Etymology.—The specific epithet comes from the Spanish name of the Jesuit catholic order. This species has been mainly collected near the ruins of the missions that the Jesuit order constructed in the XVII and XVIII centuries.



Figures 4–11.—*Bothriurus jesuita* new species, 5. Left chela, male, ventral aspect; 6. Left chela, female, ventral aspect; 7. Right chela, male, dorsal aspect; 8. Left chela, female, prolateral aspect; 9. Right chela, male, retrolateral aspect; 10. Left chela, male, prolateral aspect. 4, 11: *Bothriurus chacoensis*, 4. Left chela, male, ventral aspect; 11. left chela, male, prolateral aspect. Scale bar = 1 mm.

Diagnosis.—*Bothriurus jesuita* can be distinguished from *B. bonariensis* by having an apical filament on the basal lobe of the right hemispermatophore (Fig. 1), that is lacking in the left one (Fig. 2), and by the frontal ridge reaching the frontal fold, whereas in *B. bonariensis* it does not (Fig. 3). *Bothriurus jesuita* is morphologically most similar to *B. chacoensis*; both species share the particular shape of their he-

mispermatophores, but *Bothriurus jesuita* has a wider and higher pedipalp chela (Figs. 4–11); chela length/chela width: 2.6–3.02 ($n = 25$; mean = 2.74) in *B. chacoensis* males, 3.12–3.36 ($n = 25$; mean = 3.24) in females; 2.25–2.56 ($n = 18$; mean = 2.47) in *B. jesuita* males, 2.89–3.01 ($n = 3$; mean = 2.93) in females; chela length/chela height: 1.84–2.22 ($n = 25$; mean = 1.97) in *B. chacoensis* males,



Figures 12–14.—*Bothriurus jesuita* new species, 12. Fifth caudal segment, ventral aspect; 13. Telson, male, lateral aspect; 14. Telson, female, lateral aspect. Scale bar = 1 mm.

2.33–2.52 ($n = 25$; mean = 2.4) in females; 1.68–1.8 ($n = 18$; mean = 1.76) in *B. jesuita* males, 2.15–2.24 ($n = 3$; mean = 2.21) in females. Although in the extremes of variation the ratios may overlap, no specimens have been found where both ratios overlap (Fig. 15), so to be certain of the identification of the species both ratios must be used. *Bothriurus bonariensis* ratios are similar to those of *B. jesuita*, but in some specimens they overlap with those of *B. chacoensis* (Fig. 15); *B. bonariensis* chela length/chela height ratio: males 1.68–1.85 ($n = 20$; mean = 1.76), females 1.80–1.98 ($n = 20$; mean = 1.96); length/width ratio: males 2.36–2.66 ($n = 20$; mean = 2.50), females 2.97–3.20 ($n = 20$; mean = 3.06). *Bothriurus jesuita* is approximately 30% longer than *B. chacoensis*; *B. jesuita*: males 39–47 mm ($n = 18$; mean = 44.7), females 52–59 mm ($n = 3$; mean = 55.3); *B. chacoensis*: males 28–35 mm ($n = 25$; mean = 31.5), females 30–36 mm ($n = 25$; mean = 33.8). *Bothriurus jesuita* has a darker and more uniform color pattern than *B. chacoensis*.

Description.—*Coloration*: Carapace, pedipalps, tergites and metasoma: base color dusky brown with moderately dense variegated darker pattern; chelicerae and pectines brown-yellow with underlying dusky pattern;

sternites dark brown with some yellow spots; legs dark brown with some yellow spots in coxa and trochanter; telson dark brown except the metasomal gland in males that is light yellow.

Morphology: Measurements of male holotype and a female paratype (MACN-Ar 10051) in table 1. Prosoma: carapace: tegument finely granular, front border with a slight notch, median ocular tubercle located in the center of the carapace, eyes one diameter apart, postocular furrow and lateral sulcus moderately deep; chelicerae with a single subdistal tooth. Mesosoma: tergites I to VI finely granular, VII finely granular with two posterolateral carinae; sternites smooth. Metasoma: segment I: dorsosubmedian carina represented only by 4 or 5 coarse granules in the second half of the segment, dorsolateral carinae present only in the second part of the segment, median lateral carinae present only in the distal third of the segment; segment II and III: dorsosubmedian and dorsolateral carinae like in segment I, median lateral carina represented by some tiny granules at the end of the segment; segment IV: dorsosubmedian carina like segment I, dorsolateral and median lateral carinae absent; segment V: ventrolateral carinae in the distal third, forming an arc with the transverse carinae which surrounds some scat-

Table 1.—*Bothriurus jesuita*, measurements (mm) and number of pectinal teeth of the holotype male and a female paratype.

	Male holotype	Female paratype
Total length	42.76	52.28
Prosoma, length	4.85	5.66
Prosoma, anterior width	3.31	4.53
Prosoma, posterior width	5.82	7.11
Mesosoma, total length	11.41	18.58
Metasoma, total length	26.5	28.04
Metasomal segment I, length	2.51	3.39
Metasomal segment I, width	3.96	4.28
Metasomal segment I, height	2.83	3.56
Metasomal segment II, length	3.10	3.56
Metasomal segment II, width	3.88	4.12
Metasomal segment II, height	2.99	3.47
Metasomal segment III, length	3.47	3.88
Metasomal segment III, width	3.88	4.04
Metasomal segment III, height	3.23	3.39
Metasomal segment IV, length	4.36	3.64
Metasomal segment IV, width	3.79	4.04
Metasomal segment IV, height	3.31	3.72
Metasomal segment V, length	6.06	6.71
Metasomal segment V, width	3.72	4.04
Metasomal segment V, height	2.99	3.39
Telson, length	7.00	6.86
Vesicle, length	4.12	5.17
Vesicle, width	2.99	3.39
Vesicle, height	2.18	2.51
Aculeus, length	2.18	1.69
Pedipalp, total length	14.54	17.69
Femur, length	3.56	4.20
Femur, width	1.69	1.86
Patella, length	3.79	4.20
Patella, width	1.62	1.94
Chela, length	7.19	9.29
Chela, width	2.91	2.75
Chela, height	4.12	3.79
Movable finger, length	3.79	4.44
Number of pectinal teeth	22–22	18–18

tered granules, ventromedian carina occupies the whole segment except a small area near the front border (Fig. 12). Telson: tegument finely granular, vesicle dorsoventrally compressed (Fig. 13), aculeus short, in females the vesicle is more globose and the aculeus is shorter (Fig. 14), in males the metasomal gland is placed dorsally in a very conspicuous pit. Pedipalps: femur granulated, ventrointernal and dorsointernal carinae poorly developed, patella smooth, chela high and thick, with a ventroexternal carina, apophysis of males scarcely developed, short fingers, trichobothrial pattern typical of the bonariensis

group: neobothriotoxic major type C: femur with 3 trichobothria: 1 d, 1 i and 1 e; patella with 3 v trichobothria and 13 trichobothria on its external face: 3 et, 1 est, 2 em, 2 esb and 5 eb; chela with 12 trichobothria on its pro-lateral face: 1 est, 2 et, 5 v, 1 esb and 3 eb; no intraspecific variation has been observed in this character; chela trichobothrium esb forms a triangle with eb 2 and eb 3. Legs: smooth tegument; ventrosubmedian spiniform setae of the telotarsi: telotarsus I: 1+1, telotarsus II: 2+2, telotarsi III & IV: 3+3; no intraspecific variation has been observed in this character. Hemispermaphore: distal lamina very well

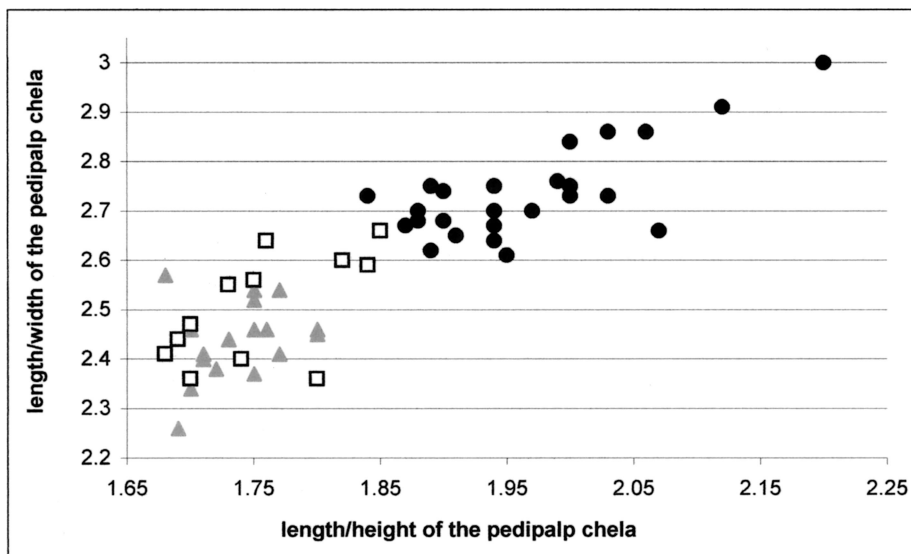


Figure 15.—Length/height ratio of the pedipalp chela, against length/width ratio of the pedipalp chela; males of *Bothriurus jesuita* (grey triangles), males of *Bothriurus chacoensis* (black circles), and males of *Bothriurus bonariensis* (white squares).

developed, straight with a frontal ridge that reaches the frontal fold; there is an apical filament on the basal lobe of the right hemispermatophore that is lacking in the left (Figs. 1 & 2).

Variation.—Total length in males, 39–47 mm ($n = 18$; mean = 44.7), in females 52–59 mm ($n = 3$; mean = 55.3). Number of pectinal teeth, in males: 20–23 ($n = 18$; median = 21), and in the 3 females examined 18. Chela length/chela width: 2.25–2.56 ($n = 18$; mean = 2.47) in males, 2.89–3.01 ($n = 3$; mean = 2.93) in females; chela length/chela height: 1.68–1.8 in males ($n = 18$; mean = 1.76), 2.15–2.24 ($n = 3$; mean = 2.21) in females.

Distribution.—*Bothriurus jesuita* has been collected in Argentina, in the northern part of Corrientes Province and in Misiones Province (Fig. 16). This area belongs to the “Paranaense” Phytogeographic Province, and to the Misiones Scorpiological Area.

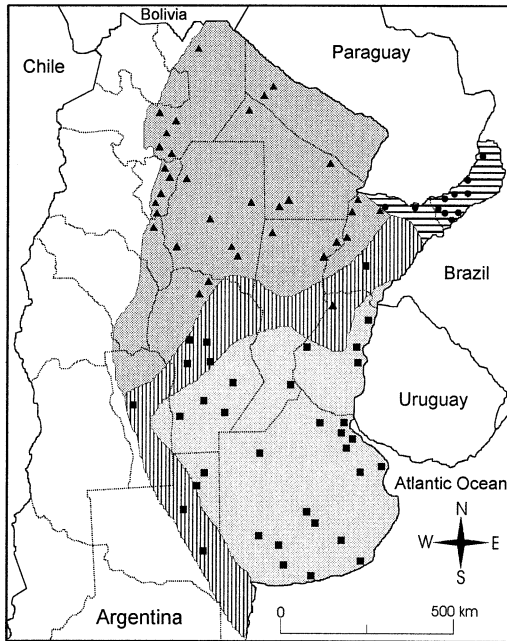
It is interesting to note that the distribution of the species of the bonariensis group matches almost exactly three different Phytogeographic Provinces; *B. chacoensis* is found almost exclusively in the “Chaqueña” Province with a very slight extension into the “Espinal” Province (Maury & Acosta 1993; Acosta

& Maury 1998); *B. bonariensis* is found in the “Pampeana” Province, although it has also been found in the “Espinal” (Maury 1973; Maury 1979, 1986; Acosta & Rosso de Ferradás 1996; Acosta & Maury 1998); and *B. jesuita*, the most restricted species, has been found so far only in the “Paranaense” Province.

In Manantiales, in the northern region of Corrientes Province, several specimens of *B. chacoensis* have been found, together with a specimen of *B. jesuita*. Since this locality lies at the border of the “Paranaense” and “Chaqueña” Phytogeographic Provinces, it is not strange to find both species in sympatry. It is very probable that *B. jesuita* is also present in southern Brazil and eastern Paraguay, although we have not had access to any specimen that confirms this distribution.

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Figure 16.—Distribution of the species of the *bonariensis* group in Argentina, and the Phytogeographic Provinces where they have been collected. Black circles: *Bothriurus jesuita*, black triangles: *Bothriurus chacoensis*, black squares: *Bothriurus bonariensis*, hatched horizontal: “Paranaense” Phytogeographic Province; hatched vertical: “Espinal” Phytogeographic Province; dark grey: “Chaqueña” Phytogeographic Province; light grey: “Pampeana” Phytogeographic Province.

LITERATURE CITED

- Acosta, L.E. & B. Rosso de Ferradás. 1996. Arácnidos de la provincia de Córdoba. In: di Tada, I.E. & E.H. Bucher (eds.), Biodiversidad de la Provincia de Córdoba, Fauna, 1:71–99.
- Acosta, L.E. & E.A. Maury. 1998. Scorpiones, pp. 545–559. In Morrone, J.J. & S. Coscarón (eds.), Biodiversidad de Artrópodos Argentinos. Ediciones Sur. La Plata, Argentina.
- Cabrera, A.L. & A. Willink. 1980. Biogeografía de América Latina. Monografía 13. Serie Biología. Organización de los Estados Americanos, Washington, DC. 122 pp.
- Lourenço, W.R. 1993. A review of the geographical distribution of the genus *Ananteris* Thorell (Scorpiones: Buthidae), with the description of a new species. *Revista de Biología Tropical* 41:697–701.
- Maury, E.A. 1973. Los escorpiones de los sistemas serranos de la provincia de Buenos Aires. *Physis*, Buenos Aires, C 32(85):351–371.
- Maury, E.A. 1979. Apuntes para una zoogeografía de la escorpiofauna argentina. *Acta Zoológica Lilloana* 35:703–719.
- Maury, E.A. 1984. Redescrición de *Bothriurus bocki* Kraepelin 1911 (Scorpiones, Bothriuridae). *Journal of Arachnology* 12:351–356.
- Maury, E.A. 1986. Guía para la identificación de los escorpiones de la provincia de Buenos Aires. Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Suplemento I. Aracnología, Supl. 6:1–10.
- Maury, E.A. & L.E. Acosta. 1993. Un nuevo *Bothriurus* del grupo *bonariensis* (Scorpiones, Bothriuridae). *Boletín de la Sociedad Biológica de Concepción* 64:113–119.
- Mello Leitão, C. de. 1945. Escorpiões Sul-Americanos. *Arquivos do Museu Nacional* 40:7–468.
- Ojanguren Affilastro, A.A. & D. Vezzani. 2001. Nuevo registro de *Ananteris balzani* (Scorpiones, Buthidae) para la Argentina y ampliación de la distribución geográfica de *Bothriurus cordubensis* (Scorpiones, Bothriuridae). *Physis*, Buenos Aires, C 58(134–135):13–14.
- Stahnke, H.L. 1970. Scorpion nomenclature and mensuration. *Entomological News* 83:121–133.
- Vachon M. 1973 (1974). Étude des caractères pour classer les familles et les genres de scorpions (Arachnides). 1. La trichobothriotaxie en Aracnologie. Sigles trichobothrioux et types de trichobothriotaxie chez les scorpions. *Bulletin du Muséum National d’Histoire Naturelle*, 3e sér., 140, Zool. 104:857–958.

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