Copeia, 2002(3), pp. 792–797

New Two-Pored *Amphisbaena* (Squamata: Amphisbaenidae) from Argentina

RICARDO MONTERO AND JORGE CÉSPEDEZ

A new two-pored *Amphisbaena* is described from Formosa and Corrientes provinces of Argentina. The new species has a faint autotomy *annulus* (with a fracture plane) and two cicatricial precloacal pores separated medially by a pair of nonpored segments. It differs from *Amphisbaena dubia*, which has a pair of pores on adjacent segments and a fracture plane on the tail, and from *Amphisbaena darwini heterozonata*, which differs in pore number, coloration, and shape of the autotomy *annulus*.

Se describe una nueva especie de *Amphisbaena* con dos poros de las provincias argentinas de Formosa y Corrientes. La nueva especie tiene un anillo autotómico (con plano de fractura) poco marcado y dos poros precloacales cicatriciales separados medialmente por un par de segmentos sin poros. La nueva especie difiere de *Amphisbaena dubia*, que tiene un par de poros en segmentos adjacentes y plano autotómico en la cola, y de *Amphisbaena darwini heterozonata*, que tiene distinto número de poros y diferente coloración y forma del anillo autotómico.

YANOSKY et al. (1992, 1993a,b) cited a two-pored amphisbaenid as new for Argentina based on a unique specimen; they identified it as *Amphisbaena dubia* Müller, 1924, a Brazilian species, following the identification key of Gans and Diefenbach (1970). We questioned this identification because *A. dubia* is known from the coast of Brazil, and a 900 km gap separates it from the Argentinean locality of "El Bagual" (Fig. 1). Based on a new series from Argentina, we realized that they belong to a new species, and describe it here.

We follow the scale terminology established by Gans and Alexander (1962). The museum abbreviations used below are UNNEC (Herpetological Collection of the Universidad Nacional del Nordeste, Corrientes), FML (Herpetological Collection of the Fundación Miguel Lillo, Tucumán), and REB.AM (Private collection of Reserva Ecológica El Bagual, Laishi, Formosa).

Amphisbaena hiata nov. sp.
Figures 2–5

Cresonymy

Amphisbaena dubia Yanosky et al., 1992, 1993a,b.
Amphisbaena dubia Montero, 1994, 1996.
Amphisbaena dubia Montero and Terol, 1999.
Amphisbaena dubia Avila et al., 2000.

Holotype.—UNNEC 1043: Laguna Brava (27°30′S 58°43′W), Capital Department, Corrientes Province, Argentina. Álvarez y Tedesco Col. 3 March 1982.

Paratypes.—FML 10217; UNNEC 888; 1035; 1036; 1047; 6964: City of Corrientes, Capital Department, (27°28′S 58°50′W), Corrientes Province. FML 10218; UNNEC 1038; 1040; 1042: Laguna Brava (27°30′S 58°43′W), Capital Department, Corrientes Province. REB.AM 001: Reserva Ecológica "El Bagual" (26°10′58″S 58°56′39″W), Laishi Department, Formosa Province.

Standardized diagnosis (following Gans and Alexander, 1962).—A small form of *Amphisbaena* without major fusion of head shields; with one pair of large parietals and enlarged occipitals; a blunt-tipped cylindrical tail with a faint autotomy annulus at the eighth caudal *annulus*; two cicatricial precloacal pores separated by a pair of nonpored medial scales (*hiatus*), or without pores. Specimens have 202 to 213 body *annuli*; 18 to 19 caudal *annuli*; 16 to 17 dorsal and 18 to 22 ventral segments to the midbody annulus; one or two rows of postgenials and a postmalar row. The color of preserved specimens is light brown with the ventral region crème white, similar to that of live specimens.

Description.—This is a medium- to small-sized species of *Amphisbaena*. Meristic characters are summarized in Table 1. The general dorsal coloration of the living specimens is light brown, being darker in the largest specimen while the smaller ones are lighter and with a reddish ventral coloration on the first third of the body. The preserved specimens have a light brown coloration with slight ventral countershading. The pigment of each segment is concentrated as a series of stripes dorsally and as a thin band

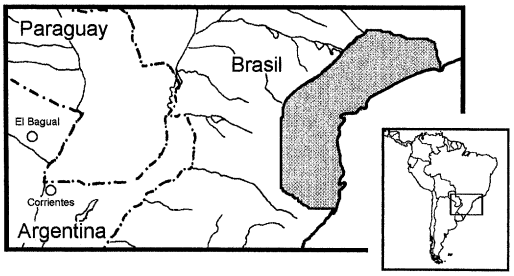

Fig. 1. Map showing the collection sites of *Amphisbaena hiata* (open circles) and the approximate distribution of *Amphisbaena dubia* (shaded, after Gans, 1964).

along the edge of each segment ventrally (Fig. 2). The head and the first eight *annuli* show denser pigmentation.

The head is relatively blunt and slightly depressed (Fig. 3). The temporal muscle masses are bulky in the larger specimens, causing a sagital depression at the nape (Fig. 3). The head segmentation is typical of the genus although some proportions and shapes of scales may differ. The azygous rostral has a labial border of the same extent as the opposite mental of the lower jaw. The triangular rostral is hardly seen from dorsal view. The nasals are large and form most of the tip of the snout; the external nares are anterolaterally placed. Posteriorly, the prefrontals meet at the midline and laterally they contact the second supralabials and oculars; the prefrontals are the largest scales of the head. The frontals are semicircular and contact the oculars. The pentagonal parietals are as wide as the frontals, with their posterior border straight and parallel to the second body *annulus*; the parietals form part of the first body *annulus*. Posterior to the parietals is a pair of occipital scales, as wide as the parietals and equivalent to two segments of the second body *annulus*.

Three supralabials, all of similar length, border the mouth (Fig. 3). There are three infralabials, the second being much larger than the others and the third being elongated with the *angulus oris* ventral to it. The ocular scale is rhomboid; it contacts ventrally with the third supralabial and dorsally with the frontals and parietals.

The mental scale (= symphysial of Vanzolini, 1991) is larger than the first infralabial (Fig. 3). The wide postmental has seven sides; its posterior tip inserts between the two postgenials. There may be a second row of three postgenials. The trapezoidal malars are wide and contact laterally with the third infralabials; anteriorly they have a point of contact with the postmental.

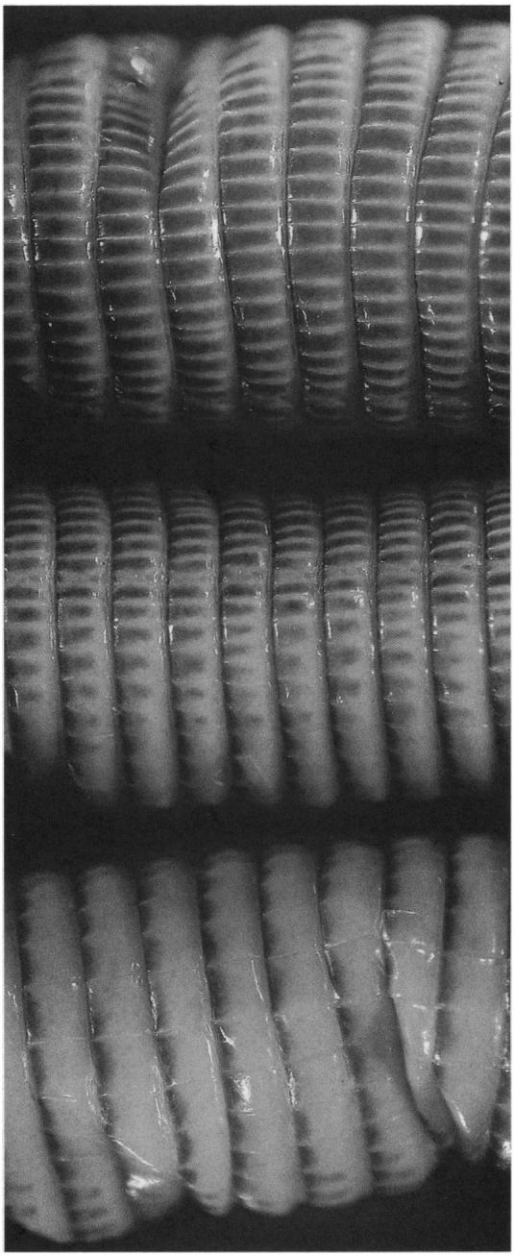

Fig. 2. Dorsal, lateral, and ventral views of the midbody segments of *Amphisbaena hiata* (FML 10217). Anterior is to the left.

Posterior to the malars there is a row of eight to 10 (usually 10) postmalar scales [terminology of Gans and Alexander (1962)], the lateral-most of which contact the posterior half of the third infralabials.

The first five or six body *annuli* are narrower than the rest, mostly in their ventral aspect, causing a flexion at the base of the neck. In this

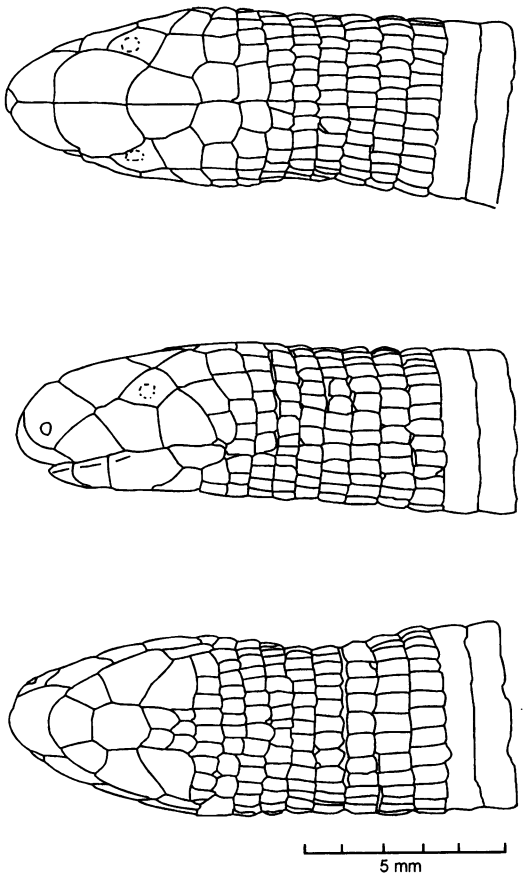

Fig. 3. Outline of the head lepidosis of the holotype of *Amphisbaena hiata* (UNNEC 1043) in dorsal, lateral and ventral views.

region four specimens have intercalated *annuli,* whereas the other eight have none. There are 202 to 213 body *annuli* from the one posterior to the third infralabial to the one bearing the precloacal pores. There are 16 to 17 rectangular dorsal segments per midbody *annulus*; these segments have similar lengths but vary in width, being wider at the anterior third part of the body (about half of length) but being very narrow at the posterior third (about one quarter of length). There are 18 to 22 ventral segments per midbody *annulus*; all ventral segments are quadrangular and the medial ones are larger than the lateral ones. There are no intercalated *annuli* along the body, although most specimens have one at the third to fifth precloacal *annulus* (four specimens show no precloacal intercalated *annulus*). The lateral *sulci* are marked behind the 12th to 14th body annulus. There are no ventral or dorsal *sulci.*

On the precloacal *annulus,* the midventral

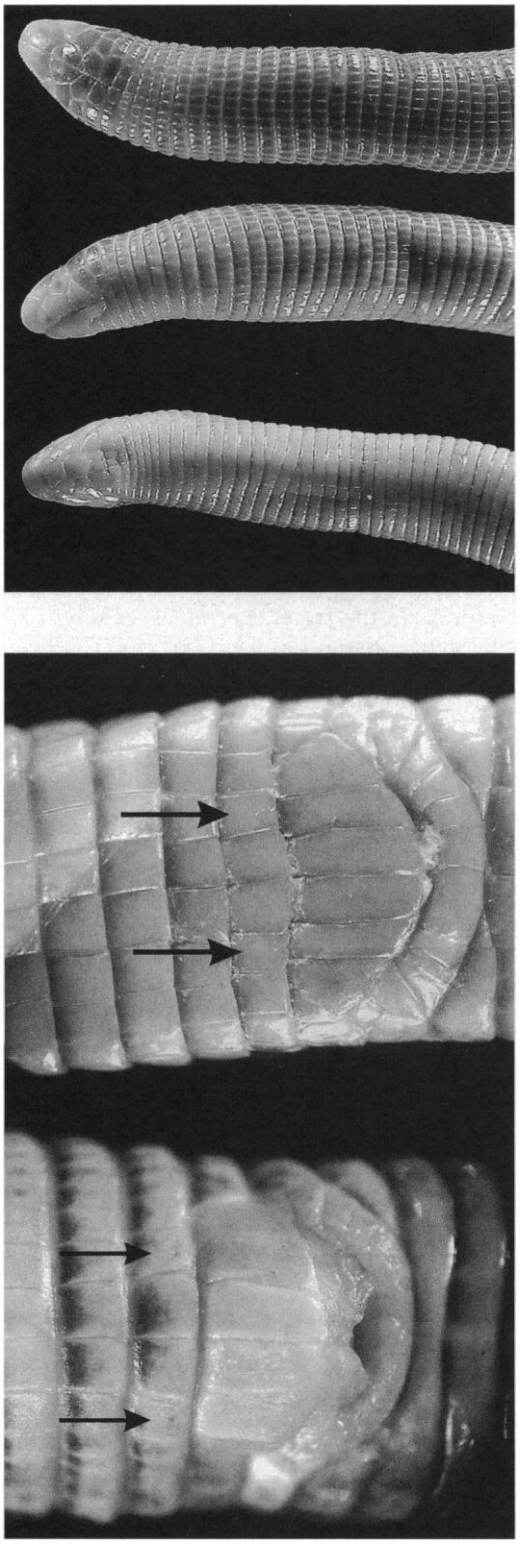

Fig. 4. Ventral view of the cloaca of *Amphisbaena hiata* (top UNNEC 1043; bottom UNNEC 888). Note the cicatricial pores (arrows). Anterior to the left.

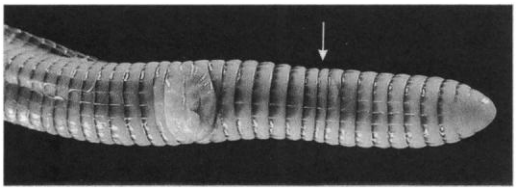

Fig. 5. Ventral view of the tail of *Amphisbaena hiata* (FML 10217). The arrow indicates the autotomy annulus. Anterior is to the left.

scales do not have pores; the two scales immediately lateral have cicatricial pores, placed on the posterior half of the scale; none of the specimens has a conspicuous secretion plug, and therefore the pores are difficult to see (Fig. 4); one specimen (UNNEC 1035) does not have pores at all. There are 18 to 19 caudal *annuli*. The autotomic site falls behind the eighth caudal *annulus*. The autotomy annulus is slightly narrower than the other caudal *annuli* and sometimes it is difficult to see (Fig. 5). None of the specimens has a tail that is broken from natural causes, but postmortem handling partially broke the tail of two specimens behind the autotomic *annulus*. The tail is depressed anteriorly and slightly compressed behind the autotomy *annulus*. The tip of the tail is rounded and has a cap of fused scales; some of the lateral sutures of the fused scales are visible.

Identification.—From other two-pored species of *Amphisbaena* (*A. dubia*, *A. neglecta*, *A. silvestrii*, *A. mitchelli*, *A. lesseri*, *A. miringoera*, *A. anemariae*, *A. crisare*, and occasionally *A. darwini* and *A. lumbricalis*), the new species differs by having pores separated by a medial gap formed by two poreless scales. In particular, *A. hiata* differs from *A. dubia* by a lower number of body *annuli* (202–209 vs 213–231, respectively), a higher number of dorsal (16–17 vs 13–16, respectively) and ventral segments (18–22 vs 16–19, respectively), and the presence of a postmalar row and tail autotomy (both absent in *A. dubia*).

From other species having a similar number of body *annuli* (including the sympatric *A. darwini*) the new species is identified by usually having two cicatricial precloacal pores separated from each other by two annular segments (although one specimen has no visible pores), and a very faint autotomy *annulus*. The new species also differs from *A. darwini* in coloration (the pigment reaches the anterior portion of in each annular segment in *A. hiata*, whereas in *A. darwini* the pigment is usually concentrated in a central dense spot). A few specimens of *A. darwini heterozonata* have two pores (Gans, 1966), but these are always in contiguous segments and with a conspicuous secretion plug.

Amphisbaena hiata is readily distinguishable from all other species with neighboring distributions (*A. bolivica*, *A. angustifrons*, *A. mertensii*).

To allow proper identification of Argentinean Amphisbaenids the key of Montero (1996) should be modified as follows:

10a. 2 poros separados por dos escamas intermedias o sin poros, pigmentación más concentrada en el borde anterior de las escamas dorsales ..... *A. hiata*
10b. Generalmente con 4 poros en escamas contiguas (raramente de 2 a 6), y pigmentación no como la anterior 11
11a. Patrón de coloración en forma de tablero de ajedréz (con alternancia de escamas o zonas oscuras y claras) ..... *A. prunicolor prunicolor*
11b. Escamas con una zona central más pigmentada, a veces dando la apariencia de punteada ... *A. darwini* 12
12a. Cola tuberculada, 15 a 22 anillos caudales ..... *A. darwini trachura*
12a. Cola no tuberculada, 13 a 17 anillos caudales ..... *A. darwini heterozonata*

Habitat and distribution.—*Amphisbaena hiata* is found in soft sand and lime soils or in mud removed from gardens (very common in the periphery of the city of Corrientes); it is also found under logs or debris and in the air chamber of domed termite nests (*Cortaritermes fulviceps*).

The species is known from Formosa (El Bagual, Yanosky et al., 1993a) and Corrientes (Capital and Laguna Brava; Fig. 1). Both localities belong to the Oriental (wet) Chaco (Cabrera and Willink, 1973), seasonally flooded grasslands with "monte de espinillo" (*Prosopis alba* and *Prosopis algarrobilla*: Leguminosae), "palmares" (*Copernicia* sp.: Palmaceae), and "caraguatales" (*Aechmea disthichanta*: Bromeliaceae). Considering the distributions of this type of habitat, it is likely that *A. hiata* is present in the Argentinean province of Chaco and adjacent Paraguay. The new species is found in sympatry with *Amphisbaena mertensii*, *A. darwini heterozonata*, *Anops kingii*, and *Leposternon microcephalum* (Montero, 1996).

Etymology.—The specific name comes from the Latin word *hiatus*, meaning gap, in reference to

TABLE 1. MERISTIC CHARACTERS OF *Amphisbaena hiata* (FOLLOWING GANS AND ALEXANDER, 1962). For lengths, ± indicates that the specimens is partially broken, and the measurement is approximated.

	Annuli body + lat. + (autot.) tail	Segments dors./vent.	Labials	Chin segments	Cloaca pores + precl. + postcl.	Snout–vent length + tail length (cm)
UNNEC 1043*	202 + 3 + (8) 19	16/18	3/3	2 + 3 + 9	2 + 6 + 12	17 + 1.7
FML 10217	207 + 2 + (8) 18	16/20	3/3	2 + 10	2 + 6 + 11	17.5 + 1.7
FML 10218	208 + 2 + (8) 18	17/22	3/3	2 + 10	2 + 6 + 11	16.3 + 1.6
REB.AM 001	213 + 2 + (8?) 18	16/19	3/3	2 + 3 + 8	2F + 8 + 13	±17.3 + 1.9
UNNEC 1035	206 + 2 + (8) 18	16–18/19–22	3/3	2 + 10	0 + 8 + 12	15.2 + 1.6
UNNEC 1036	206 + 2 + (8) 19	17/20	3/3	2 + 3 + 8	2 + 8 + 14	16.9 + 1.6
UNNEC 1038	208 + 2 + (8) 17	16–17/19	3/3	2 + 7	1 + 6 + 11	14.6 + 1.4
UNNEC 1040	209 + 3 + (8) 17	16/19–20	3/3	2 + 8	2 + 6 + 13	±17.5 + 2.0
UNNEC 1042	209 + 2 + (8) 18	16/22	3/3	2 + 10	2 + 8 + 12	19.6 + 1.9
UNNEC 1047	208 + 2 + (8) 19	17/21	3/3	2 + 3 + 10	2 + 6 + 12	±17.2 + 1.8
UNNEC 6964	209 + 2 + (8) 18	17/20	3/3	2 + 10	2 + 6 + 12	20.4 + 1.9
UNNEC 888	208 + 3 + (8) 18	16/19–21	3/3	2 + 10	2 + 6 + 12	18 + 1.6

* Holotype.

the gap between the precloacal pores, which is a distinctive characteristic of this species.

DISCUSSION

The new species is most similar to *A. darwini heterozonata*. Both share similar meristic characteristics, head scutellation (supralabial proportions, presence of enlarged parietals and occipitals), organization of the first body *annulus*, neck constriction, and tail conformation. Therefore, they might be related, although this is a matter that should be tested within a phylogenetic analysis.

The separation of pores is a characteristic that is uncommon among amphisbaenids. The only other species sharing this character is *A. arenaria* (Vanzolini, 1991), but the configuration differs from that seen in *A. hiata*. Species of *Cadea*, *Cercolophia* (*C. steindachneri*, *C. borelli*) have two series of pores, but they not separated by segments lacking pores. The genera *Aulura*, *Mesobaena*, *Bronia*, and *Anops bilabialatus* have laterally placed precloacal pores separated by several poreless segments, but these are not close relatives of *Amphisbaena hiata*. Because of a lack of information about population biology of *A. hiata*, this species should be classified for conservation purposes as "not enough known" in the sense of the Avila et al. (2000).

ACKNOWLEDGMENTS

We thank to C. Godoy for identifying the Isoptera species. S. Moro made useful corrections on the manuscript. This research was supported by a grant from the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), PIP 4966.

LITERATURE CITED

AVILA, L., R. MONTERO, AND M. MORANDO. 2000. Categorización de las lagartijas y anfisbaenas de Argentina, p. 51–74. *In:* Categorización de los Anfibios y Reptiles de la República Argentina. E. O. Lavilla, E. Richard and G. J. Scrocchi (eds.). Asociación Herpetológica Argentina, Tucumán, Argentina.

CABRERA, A. L., AND A. WILLINK. 1973. Biogeografía de América Latina. OEA, Serie Biología, 13, Washington, DC.

GANS, C. 1964. Redescription of *Amphisbaena dubia* Muller (Amphisbaenia: Reptilia). Breviora 205:1–11.

———. 1966. Studies on Amphisbaenids (Amphisbaenia: Reptilia) 3. The small species from southern South America commonly identified as *Amphisbaena darwini*. Bull. Am. Mus. Nat. Hist. 134:185–260.

———, AND A. A. ALEXANDER. 1962. Studies on the amphisbaenids (Amphisbaenia; Reptilia). 2. On the amphisbaenids of the Antilles. Bull. Mus. Comp. Zool. 128:65–158.

———, AND C. O. DIEFENBACH. 1970. *Amphisbaena*, p. 26–38. *In:* Catalog of the Neotropical Squamata. Part II. Lizards—Amphisbaena. J. A. Peters and R Donoso—Barros (eds.). U.S. Nat. Mus. Bull. no. 297, Washington, DC.

MONTERO, R. 1994. Distribución de los Amphisbaenidae en la República Argentina. Bol. Assoc. Herpetol. Arg. 10:43–46.

———. 1996. Lista de localidades de Amphisbaenia de la República Argentina. Cuad. Herpetol. 10:25–45.

———, AND G. J. TEROL. 1999. Los Amphisbaenidae en Paraguay, listado geográfico. Cuad. Herpetol. 13:89–95.

YANOSKY, A., J. R. DIXON, AND C. MERCOLLI. 1992. *Am-*

phisbaena dubia: una nueva especie para la fauna Argentina. Abstracts of the II Congreso Argentino de Herpetología, November de 1992, La Plata, Argentina.

———, ———, AND ———. 1993a. First record of *Amphisbaena dubia* Muller (Reptilia: Amphisbaenia) in Argentina. Bull. Md. Herpetol. Soc. 29:47–50.

———, ———, AND ———. 1993b. The herpetofauna of El Bagual Ecological Reserve (Formosa, Argentina) with comments on its herpetological collection. *Ibid.* 29:160–171.

VANZOLINI, P. E. 1991. Two further new species of *Amphisbaena* from the semi-arid northeast of Brazil (Reptilia, Amphisbaenia). Pap. Avulsos Zool. 37: 347–361.

(RM) INSTITUTO DE HERPETOLOGÍA (CONICET-FUNDACIÓN MIGUEL LILLO) AND FACULTAD DE CIENCIAS NATURALES, UNIVERSIDAD NACIONAL DE TUCUMÁN. MIGUEL LILLO 251, 4000 TUCUMÁN, ARGENTINA; AND (JC) CÁTEDRA DE ANATOMÍA COMPARADA, DEPARTAMENTO DE BIOLOGÍA, FACULTAD DE CIENCIAS EXACTAS Y NATURALES Y AGRIMENSURA, UNIVERSIDAD NACIONAL DEL NORDESTE, AV. LIBERTAD 5470, 3400 CORRIENTES, ARGENTINA. E-mail: (RM) ueso@unt.edu.ar; and (JC) cespedez@hotmail.com. Send reprint requests to RM. Submitted: 20 Aug. 2001. Accepted: 21 March 2002. Section editor: C. Guyer.