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Taxonomic History of the Iguanian Lizard *Liolaemus pictus major* Boulenger, with a Revalidation of *Liolaemus capillitas* Hulse

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ABSTRACT.—Núñez (2004) examined the syntypes of *Liolaemus pictus major* Boulenger in the British Museum of Natural History and concluded, without supporting data, that this taxon is a senior synonym of *Liolaemus capillitas* Hulse. We show that the evidence does not support Núñez's (2004) proposal. We first document the complex taxonomic history of *L. p. major*, the lack of a precise or even definitive type locality, and the implications of the latter on subsequent checklists and research. Second, we note differences between Boulenger's (1885) type description of *L. p. major* and Hulse's (1979) type description of *L. capillitas*. Third, we show that the syntypes of *L. p. major* photographed by Núñez (2004) do not exhibit the character states of *L. capillitas*. We conclude that *L. capillitas* is not a synonym of *L. p. major*. Based on the available evidence, the syntypes of *L. p. major* are probably assignable to *Liolaemus elongatus* from populations occurring in Patagonia (southern Argentina or adjacent Chile). However, the precise identity of the syntypes requires additional study and perhaps a type locality restriction or redefinition of *L. elongatus*, which is itself in a state of flux.

RESUMEN.—Núñez (2004) examinó los sintipos de *Liolaemus pictus major* Boulenger en el Museo Británico de Historia Natural y concluyó, sin datos que lo sostengan, que este taxón es un sinónimo senior de *Liolaemus capillitas* Hulse. Nosotros mostramos que la evidencia disponible no apoya la propuesta de Núñez (2004). Primero documentamos la compleja historia de *L. p. major*, la carencia de una localidad tipo o la restricción de una, y las implicancias de esto último en subsecuentes checklists e investigaciones. Segundo, notamos diferencias entre la descripción tipo de Boulenger (1885) de *L. p. major* y la descripción tipo de *L. capillitas* de Hulse (1979). Tercero, mostramos que los sintipos de *L. p. major* fotografiados por Núñez (2004) no exhiben los caracteres presentes en *L. capillitas*. Concluimos que *L. capillitas* no es un sinónimo *L. p. major*. Basados en la evidencia disponible, los sintipos de *L. p. major* son aparentemente asignables a *Liolaemus elongatus* de poblaciones que se encuentran en la Patagonia (sur de Argentina o adyacentes en Chile). De todos modos, la identidad precisa de los sintipos requerirá de estudio adicional y quizás la restricción de una localidad o la redefinición de *L. elongatus*, especie que por sí misma se encuentra pobremente definida.

Liolaemus is a genus of small-bodied (40–110 mm), ecologically diverse lizards from arid and semiarid southern South America (Donoso-Barros, 1966; Cei, 1986, 1993; Etheridge, 1995; Espinoza et al., 2004). Approximately 230 species of *Liolaemus* are currently recognized, which represents an increase of >80 species since 1995 (Etheridge, 1995; Etheridge and Espinoza, 2000; Lobo et al., 2010). Indeed, at more than five species per year, the current rate of new species descriptions in the past decade (1998–2007) is faster than at any time in the history of the genus (Abdala et al., 2008). The tempo of species description also has been complemented by recent advances in our understanding of the phylogenetic relationships among members of the genus (e.g., Etheridge, 1995, 2000; Schulte et al., 2000; Lobo, 2001, 2005; Morando et al., 2003, 2004, 2007; Avila et al., 2004, 2006, 2009; Espinoza et al., 2004; Abdala, 2007; Lobo et al., 2010). However, many taxonomic problems remain to be resolved. One fundamental concern is the identities of the types of species that were synonymized many decades ago. Some of these species may prove to be valid as a result of recent redelimitations of *Liolaemus* species. Determining the status of these types requires reexamining and comparing the material held in collections around the world. Among these collections, those in Western Europe, most of which have not been examined by *Liolaemus* experts for >30 years, should receive highest priority.

Núñez (2004) examined liolaemid lizards, including many types, in the British Museum of Natural History (BMNH) and provided valuable determinations for many specimens, several of which were previously misidentified. Among the specimens examined by Núñez (2004) were the syntypes of *Liolaemus pictus major* Boulenger (1885). Based on his prior knowledge of the variation within mainland and insular populations of *L.*

pictus from southern Chile, Núñez (2004) elevated *L. p. major* to full species (without further justification) and considered *L. major* to be a senior synonym of *Liolaemus capillitas*. This latter proposal warrants further consideration, first because of the complicated taxonomic history of *L. p. major*, whose type locality was given only as “Chili,” and second because *L. capillitas* is known only from the vicinity of the type locality in northwestern Argentina—approximately 2,125 km (straight line) from the region historically regarded as the type locality of *L. p. major* (but see below). Here, we review the taxonomic history of these two species, comment on their morphological differences, and discuss these findings in light of Núñez's (2004) proposal. The preponderance of evidence leads us to conclude that *L. capillitas* is not a junior synonym of *L. p. major*. We discuss the taxonomic implications of this finding.

MATERIALS AND METHODS

Our findings are based on our review and interpretation of the historical literature and study of digital photos (e.g., dorsal, ventral, detail of head) of the two BMNH syntypes of *L. p. major*. We examined what will prove to be the pivotal specimen in the history of *L. p. major* (AMNH 38074), as referred to by Burt and Burt (1931; see below). We also examined *L. capillitas* held in collections (including the type series and additional topotypes; Appendix 1) and in nature. Since 1995, we have made three visits to the type locality of *L. capillitas*, where we collected specimens, ascertained the distributional limits, and recorded ecological data.

RESULTS AND DISCUSSION

Taxonomic History of L. p. major.—The taxonomic history of *L. p. major* is not without its ambiguities. This subspecies was

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originally described as a variety of *L. pictus* from specimens held in the BMNH. Boulenger's (1885:152) description is brief: "Much larger than the typical form. Sixty-six to seventy scales round the middle of the body. Two or three projecting pointed scales in front of the ear in the adult. Black or bluish-black, with a few small irregular lighter spots on the upper surfaces." Although Boulenger (1885) provides no illustrations of this new variety, he gives mensural data for one adult: head length, 24 mm; body length, 80 mm (=104 mm snout-vent length), and "tail (reproduced)," 140 mm. Boulenger (1885) lists three specimens "a-b, c. ♂ & hgr. [=half grown]," but only the two adults are considered syntypes by the BMNH: 76.10.2.8 (RR 1946.8.2.40) and xxii.8bjk (RR 1946.9.8.47). The locality given for this series is "Chili," but no collector is indicated. Boulenger (1885) also lists "*Leiolaemus tenuis*, part., Gray, Cat. p. 214" as a synonym of his *L. pictus* var. *major*.

In Gray's (1845:214) account of "*Leiolaemus tenuis*," eight of the 10 specimens referred to (a, b, c, d-f, g, h) were reportedly taken from Valparaiso, Chile. This provenance, and Gray's (1845) description of these eight individuals, "Olive, green and black dotted ..." correspond well with *L. tenuis* (Donoso-Barros, 1966; pers. obs.). However, two additional adults (i, j) are described by Gray (1845:214) as "Very large, discoloured, blackish. Chili. From Mr. Cuming's collection." Given the parity in color descriptions by Boulenger (1885) and Gray (1845), it seems likely that Boulenger used these two specimens (i, j) for his description of *L. p. major*.

The next noteworthy entry in the history of *L. p. major* is Burt and Burt's (1931) review of the South American lizards held in the American Museum of Natural History. Burt and Burt (1931:278) briefly describe a specimen that they considered assignable to *L. p. major*.

A specimen of *Liolaemus* taken on a small island 10 miles from Aucud [sic], Chile (A. M. N. H. No. 38074, R. H. Beck, collector), is apparently assignable to this subspecies. The ground color of the back is black, but it is broken by several irregular light markings. Traces of dorsolateral stripes are present only anteriorly, the head is covered by small white spots, and the undersurfaces are blue-gray. There are "two small azygous frontals," and the general scutellation is fine as in typical *pictus*.

This is the first indication that *L. p. major* occurs on an island. Aucud is a small town on the north central coast of Isla Grande de Chiloé, which lies off Chile's southern coast. The small island referred to off Chiloé is most likely Isla Doña Sebastiana (41°41'S, 73°47'W), the only island in the Canal de Chacao between Chiloé and the mainland to the north, and approximately 15 km north of Aucud. Curiously, 2 years later in their systematic list of South American lizards, Burt and Burt (1933:36) cite only "Chile" as the range of *L. p. major*.

Our examination of AMNH 38074 (Fig. 1) indicates that it is an adult female (gravid) *Liolaemus pictus chiloeensis* Müller and Hellmich (1939). In support of this assertion, we show broadly overlapping character states among AMNH 38074, the type description of *L. p. chiloeensis*, a recent redescription of this subspecies (Pincheira-Donoso and Núñez, 2005), and data we have gathered from additional specimens, as well as differences between this specimen and the type description of *L. p. major* (Table 1).

The next mention of *L. p. major* is in Goetsch and Hellmich (1932:70), who briefly note, "Auch hier lassen sich Variationsreihen in bezug auf Färbung wie Zeichnung aufstellen. Eine als '*pictus major*' beschriebene, etwas größere Form mit dunkelrotem Bauche, lebt an der Küste sowie auf den kleinen Inseln der nördlichen patagonischen Kanäle." ["Here too, we can see sets of variations with respect to color pattern. Denoted as a somewhat larger form with a dark red belly, '*pictus major*' lives



FIG. 1. Dorsal and ventral views of AMNH 38074, the specimen Burt and Burt (1931) assigned to *Liolaemus pictus major*. The specimen, a gravid female with a snout-vent length of 55.6 mm, is actually referable to *L. p. chiloeensis* (see text).

on the coast and on the small islands of the northern Patagonian channels." Thus, Goetsch and Hellmich (1932) recognize, as did their predecessors, that *L. p. major* is somewhat larger than the nominant form, but they are the first to characterize them as having dark red bellies (contra Burt and Burt, 1931:278; see above). The latter characteristic also is shared by *L. p. pictus*, *Liolaemus pictus argentinus*, and *L. p. chiloeensis* (Müller and Hellmich, 1939; Donoso-Barros, 1966:218, 221; pers. obs.). Here also, Goetsch and Hellmich (1932) delimit the distribution of *L. p. major* to the coast and small islands of the northern Patagonian channels, but they do not indicate the source of their information and no specimens are listed as being examined. Soon thereafter, Hellmich (1934:80), citing Burt and Burt (1931), restricted the type locality to "Inseln Südchiles," ["islands of southern Chile"], but he did not specify the locality further. Müller and Hellmich (1939:13) considered *L. p. major* to be distinct from *L. p. pictus*, again without examining the former, and they noted that studying more material was required to differentiate the two forms properly. They also commented on the similarity between *L. p. major* and *L. p. chiloeensis* in their type description of the latter, which was collected on rocks along the beach of Aucud, Isla Chiloé (Müller and Hellmich, 1939:13): "*Liolaemus*

TABLE 1. Comparison of character states from the type description of *Liolaemus pictus major* (Boulenger, 1885), Burt and Burt's (1931) "*L. pictus major*" (AMNH 38074), and *Liolaemus pictus chiloeensis* from several sources. The broadly overlapping ranges (also see Fig. 1) show that AMNH 38074 is assignable to *L. p. chiloeensis*, rather than *L. p. major*, as originally designated. SVL = snout-vent length.

Character	<i>L. p. major</i> type description (Boulenger, 1885)	" <i>L. p. major</i> " AMNH 38074 (Burt and Burt, 1931)	<i>L. p. chiloeensis</i> type description (Müller and Hellmich, 1939)	<i>L. p. chiloeensis</i> (Pincheira-Donoso and Núñez, 2005)	<i>L. p. chiloeensis</i> (this study, N = 24)
SVL (mm)	104	55.6	Not specified	58.0–60.8	46.7–64.2
Scales around midbody	66–70	53	59	54–71 ^a	52–63
Scales projecting over auditory meatus	2–3	1	Not specified	0–1	0

^a Pincheira-Donoso and Núñez (2005) provide two ranges for the scales around midbody for *L. p. chiloeensis*: "74–72" in their key to species in the *pictus* group (p. 53) and "54–71" in their diagnosis (p. 356) and description (p. 359) sections for this taxon.

pictus major Boulenger (1885) scheint nur eine Weiterentwicklung der Form von Ancud zu sein (Burt 1931 [sic])." ["*Liolaemus pictus major* Boulenger (1885) seems only to be a further evolved form from Ancud (Burt 1931 [sic])."] Hellmich (1950:159–160) essentially reiterated former descriptions and localities: "Endlich scheint *L. pictus* auf kleinen, dem chilenischen Festland vorgelagerten Inseln eine große melanotische Form ausgebildet zu haben, die den Namen *Liolaemus pictus major* trägt. Burt und Burt gaben als Fundort eine kleine Insel an, die zehn Meilen von Ancud entfernt liegt." ["Finally, *L. pictus* seems to have formed a large melanotic form with the name of *Liolaemus pictus major* on a small island off the Chilean mainland. Burt and Burt reported the location to be a small island ten miles away from Ancud."].

Subsequent studies generally followed Hellmich's (1934) restriction of the provenance of *L. p. major*, but further distributional restrictions appeared as well. For example, in *Reptiles de Chile*, Donoso-Barros (1966:222) gives the type locality of *L. p. major* as "pequeñas islas vecinas a Chiloé," ["small islands neighboring Chiloé"] but the hatch marks on his distribution map (p. 223) indicate, apparently in error, that this taxon occurs solely on unspecified islands in the channel between the west central coast of Chiloé and the mainland and islands off of Chiloé's southwestern coast. His map does not show *L. p. major* occurring north of Chiloé (e.g., Isla Doña Sebastiana) as proposed by Burt and Burt (1931), and Donoso-Barros (1966) does not comment on this distributional discrepancy. No specimens of *L. p. major* were available to Donoso-Barros (1966) for study, so he repeats the descriptions of Boulenger (1885) and Burt and Burt (1931). In their key to the subspecies of *L. pictus*, Peters and Donoso-Barros (1970:192) also follow Boulenger's (1885) original description to distinguish *L. p. major*: fewer than 77 scales around midbody and ground color melanistic. Peters and Donoso-Barros (1970:193) apparently follow Donoso-Barros (1966) for the distribution of this subspecies: "Islands adjacent to Chiloé, Island, Chile," but they do not mention the specific hatched localities on Donoso-Barros's (1966) map.

The next generation of lists of Chilean reptile species perpetuates the emended localities cited by their predecessors. For example, Veloso and Navarro (1988:510) give the type locality as "Islas Archipiélago de Chiloé (Chile)" and up to 250 m for the elevational distribution, yet they do not cite a source. Núñez and Jaksic (1992:75) suggest that the subspecies of *L. pictus* be studied comprehensively, offer the common name "Lagartija pintada grande" ["Large Painted Lizard"] for *L. p. major*, and consider *Liolaemus pictus talcanensis* Urbina and Zuñiga (1977) to be a junior synonym of *L. p. major*. They provide no support for this proposal other than the two forms "... no parecen diferentes ..." ["...does not look different ..."] and cite no subspecies of *L. pictus* in their list of material examined (pp. 81–83). Contrary to their recommendation, if the holotype of *L. p. major* was not collected on Isla Chiloé or its satellite islands, then *L. p. talcanensis* cannot be a junior synonym of *L. p. major*. Until contrary data are presented, *L. p. talcanensis* should be considered a valid taxon (also see Lobo, 2005; Pincheira-Donoso and Núñez, 2005).

Overall, the historical literature indicates that researchers based their notions of the identity of *L. p. major* not on a critical examination of the syntypes, but on the scant description and imprecise locality information provided by Boulenger (1885) and the well-intentioned but misapplied characterizations of subsequent reviewers. In fact, to our knowledge, the syntypes of *L. p. major* have never been directly compared with specimens of insular or mainland populations of *L. pictus* from Chile.

Revalidation of L. capillitas.—After examining the syntypes of *L. p. major* in the BMNH, Núñez (2004) suggested that *L. capillitas* Hulse is a junior synonym of "*L. major*." Positing that *L. capillitas* is a synonym of *L. p. major* is hard to accept for several reasons. First, Núñez (2004) did not examine the types of *L. capillitas*; in fact, his proposal is not based on an examination of any *L. capillitas* specimens. Instead, his conclusion follows from his reading of the type description (Hulse, 1979) and a redescription (Ceí, 1993) of the species. Núñez (2004:31–32) claims that the patterns between the two syntypes of *L. p. major* and the descriptions of *L. capillitas* are almost identical. But other than the similarity he noted in pattern and unspecified "otras características" ["other characteristics"] (see below) between the syntypes of *L. p. major* and *L. capillitas*, Núñez (2004:31–32) offers no specific evidence in support of his proposal to synonymize these taxa.

Los especímenes corresponden a la actual especie conocida como *Liolaemus* [sic] *capillitas* Hulse, 1979. Véase la figura 3. Distribuida en el noroccidente de Argentina, en tanto que lo actualmente se conoce como *L. p. major* se distribuiría en la zona insular de Chiloé.

El examen permite concluir razonablemente que estas lagartijas no corresponden a ninguna de las formas conocidas actualmente como *Liolaemus pictus*, ya sea continental, en la Isla Grande de Chiloé, o de las islas más pequeñas del Archipiélago de Chiloé, las que se han señalado como el topotipo de *Liolaemus pictus major*. Estos son animales más grandes, con el patrón casi idéntico al documentado por Ceí (1993), más todas las otras características señaladas para *L. capillitas* (Hulse, 1979).

Por lo tanto *Liolaemus capillitas* Hulse, 1979, se incorpora bajo la sinonimia de *Liolaemus major* Boulenger, 1885 (nov. comb.).

[The specimens belong to the species known currently as *Liolaemus* [sic] *capillitas* Hulse, 1979. See Figure 3. This species is distributed in northwestern Argentina, as it is now known as *L. p. major* distributed in the area of the island of Chiloé.

This examination allows me to reasonably conclude that these lizards do not correspond to any currently known forms such as *Liolaemus pictus* from either the mainland, the main island of Chiloé, or the smaller isles of the Archipelago of Chiloé, which have been identified as the topotype of *Liolaemus pictus major*. These are larger animals, with the pattern almost identical to that reported by Ceí (1993), plus all the other characteristics identified for *L. capillitas* (Hulse 1979).

Therefore *Liolaemus capillitas* Hulse, 1979, is incorporated under the synonymy of *Liolaemus major* Boulenger, 1885 (nov. comb.).]

However, there are differences in the color between the syntypes of *L. p. major* (based on digital photos of the syntypes and fig. 3 of Núñez, 2004) and *L. capillitas*. The most obvious difference is *L. capillitas* have black heads and brown-black bodies (Hulse, 1979; Espinoza et al., 2000; Espinoza and Lobo, 2003), whereas the syntypes of *L. p. major* are uniformly brown dorsally. Also, in Boulenger's (1885) description of *L. p. major*, he states there are 66–70 scales around the midbody, whereas Hulse (1979) provides a range of 58–67 for *L. capillitas* (also see Espinoza and Lobo, 2003). Likewise, the single adult (male) specimen of *L. p. major* that Boulenger (1885) provides mensural data for is 104 mm SVL, whereas Hulse (1979) indicates a maximum size of 93 mm SVL for *L. capillitas* (a female). We have not encountered any *L. capillitas* larger than 93 mm SVL among the 55 specimens (including the type series) that we have examined from or near the type locality (Appendix 1).

The distribution of *L. capillitas* also makes this species an unlikely synonym of *L. p. major*. *Liolaemus capillitas* was described from the steep and rugged Nevados de Aconquija of western Catamarca province, Argentina, where it is known only from the vicinity of the type locality, Mina Capillitas (2,500–3,900 m; Hulse, 1979; Espinoza et al., 2000, 2004; Espinoza and Lobo, 2003). Very few naturalists were exploring the mountains of northwestern Argentina during the late 19th century, and even fewer collected samples of reptiles. In fact, the first description of an unequivocally Argentine, high-elevation (>2,000-m) species of *Liolaemus* is *L. dorbignyi* (Koslowky, 1898). By contrast, several *Liolaemus* species had been described from Chile (see Etheridge and Espinoza, 2000) before Boulenger's (1885) description of *L. p. major*. Núñez (2004) apparently suspected an Argentine origin for the type of *L. p. major*, but he gives no supporting evidence for this notion. Although it is not clear what *L. p. major* is (see below), one thing is certain: the evidence first used (i.e., Burt and Burt, 1931) to ally this taxon with insular populations of *Liolaemus* from southern Chile is weak at best, and as subsequently perpetuated, does not hold up to critical review.

Resolving the Identity of L. p. major.—Given the gross morphological similarity between the syntypes of *L. p. major* and southern populations of *L. elongatus*, it is worth considering this potential relationship further. There are many morphologically similar species in the *elongatus* group, which collectively occupy a broad geographic area in southwestern Argentina and adjacent southeastern Chile (Quatrini et al., 2001; Espinoza and Lobo, 2003; Avila et al., 2004; Abdala et al., 2010). Because these species are widespread, and the southern populations occur at low-to-moderate elevation (to ~1,800 m), it follows that they were also accessible to natural history collectors more than a century ago. Hence, a member of the *elongatus* group is more likely to be the source population for the syntypes of *L. p. major* (at least when compared with *L. capillitas*, which has a limited distribution). Currently, there are many undescribed species in the *elongatus* group whose genetic, taxonomic, and geographic species boundaries have yet to be delimited (Espinoza and Lobo, 2003; Morando et al., 2003; Avila et al., 2004; Espinoza et al., 2004; Abdala et al., 2010). Thus, the ongoing revision of the *elongatus* group (including identifying or restricting the type locality of the true *L. elongatus* Koslowky 1896) may temporarily impede efforts to identify Boulenger's (1885) syntypes of *L. p. major*. Despite this challenge, future investigators could gather evidence from one of two (or both) sources that could bring resolution to this issue. First, we recommend that the syntypes of *L. p. major* be thoroughly redescribed using contemporary character descriptions. Based on this information, it is likely

that the provenance of the syntypes could be determined, particularly if they are similar to one of the other southern populations of *L. elongatus* that have been previously characterized morphologically (e.g., Quatrini et al., 2001; Abdala et al., 2010). Second, because the syntypes were apparently collected in the mid-19th century, they were probably preserved directly in spirits (some form of ethanol) rather than first fixed in formalin, because the latter method of preservation was not practiced until the 1890s (Simmons, 2002). Consequently, DNA could be extracted from small tissue samples (e.g., tail or toe tips) from one or both specimens and used in molecular phylogenetic analyses to determine the provenance of the syntypes. One advantage of this approach is that many populations of "*L. elongatus*" and several of *L. pictus* have been sequenced previously (e.g., Schulte et al., 2000; Morando et al., 2003; Avila et al., 2004; Espinoza et al., 2004), which will facilitate identifying the source population of Boulenger's (1885) syntypes. However, because the specimens in question are 19th century types, obtaining permission for what is normally characterized as "destructive sampling" may prove problematic. If *L. p. major* Boulenger (1885) is determined to be conspecific with *L. elongatus* Koslowky (1896), the former (as *L. major*) would become a senior synonym of the latter. Because of ongoing research focused on delimiting species within the *elongatus* group, it is crucial that this matter be resolved promptly.

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APPENDIX 1

Specimens Examined

Institutional abbreviations follow Leviton et al. (1985). Some FML specimen numbers represent lots of two or more individuals that were cataloged originally under a single number. Later, these specimens were given secondary numbers to identify each individually. In such cases, the secondary specimen numbers of those individuals examined from the lot are indicated in brackets following the primary specimen number.

Liolaemus capillitas ($N = 55$): CM 70114 (holotype), CM 70115–47 (paratopotypes), Argentina: Provincia de Catamarca: Departamento de Andalgalá: 5 km S of Minas [sic] Capillitas, approximately 3,900 m; SDSU 3481–84 22 km S Mina Capillitas on Ruta Provincia 47 (27°26'51.6"S; 66°24'40.5"W; 2,825 m); FML 1229 [1, 2, 4, 6, 7, 11, 12, 16, 18–21], SDSU 1818 Mina Capillitas (3,000–3,600 m); FML 2029 [1–4] Morro El Arenal (El Ingenio) (3,100 m).

Liolaemus pictus chiloeensis ($N = 25$): AMNH R38074 [The specimen erroneously assigned to *L. p. major* by Burt and Burt (1931)] Chile: Provincia de la Décima Región: Isla Grande de Chiloé: islet near Aucud [=Ancud], 10 miles out of Aucud [=Ancud]; FML 1338 [1–2] (received via exchange with Universidad de Concepción, Chile; ex-MZUC 49: adult male, ex-MZUC 69: adult female) no data; FMNH 213281–84 Puruquina; FMNH 213287, 213289–90 3 km south Puente Botalcura; FMNH 213291–92 8 km S Chacao; MCZ 121220–21 near Castro; MCZ 164325–26 Lago Huillincó; MCZ 165465 Mocopulle; MZUC 4754 Quenchi Tubildad; MZUC 12506 Ancud (Fundo El Carmelo); SDSU 1916–18 Río Chepu.