

***LIOLAEMUS KOLENGH* (SAURIA: LIOLAEMIDAE),  
IN LAGO JEINIMENI NATIONAL RESERVE, A NEW LIZARD FOR CHILE**

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ABSTRACT

Herein we demonstrate that *Liolaemus kolengh*, a lizard species described formerly for Argentina, inhabits the Lago Jeinimeni National Reserve in Chilean territory. We compared the sample of lizards from the reserve with the original description given by Abdala and Lobo in 2006.

**Key words:** Lizard, species report, comparisons.

RESUMEN

***Liolaemus kolengh*, (Sauria, Liolaemidae) en la Reserva Nacional Lago Jeinimeni, una nueva especie de lagartija para Chile.** En este trabajo demostramos que *Liolaemus kolengh*, una especie de lagartija descrita previamente para Argentina, está presente en la Reserva Nacional Lago Jeinimeni en territorio chileno. Comparamos una muestra de lagartijas de la reserva con la descripción original de Abdala y Lobo del 2006.

**Palabras clave:** Lagartijas, documentación, comparación.

INTRODUCTION

The genus *Liolaemus* is speciose, dominant in the lizard faunas of southern South America, and inhabits a variety of environments, including cold areas of Patagonia. Among those species from the latter area is *Liolaemus kolengh*, which was originally described for Argentina by Abdala and Lobo (2006) and indicated for Chile by Pincheira-Donoso y Scolaro (2007) based on comments by H. Núñez, but such inclusion was not considered in the list by Vidal *et al.* (2013), since there is not a published scientific report on the subject.

In the original description, Abdala and Lobo (2006) said *L. kolengh* belongs to the *lineomaculatus* group and inside, (indented in Etheridge 1995: 33), together with *L. silvanae* and *L. periglacialis*, assigned to the subgroup *silvanae*. Today, *L. periglacialis* is considered a synonymy of *L. hatcheri* Stejneger, 1909 (see Etheridge 1998). The *lineomaculatus* group comprises 21 species, but Breitman *et al.* (2013) proposed to refer all these species to the *L. kingi* group, since the body of evidence, either morphological or molecular, is unsupported, and these authors split the original *lineomaculatus* section into three groups: *L. lineomaculatus*, *L. magellanicus* and *L. kingi*. *Liolaemus kolengh* belongs to the first group, together with five other species: *L. avilae*, *L. hatcheri*, *L. lineomaculatus*, *L. morandae* and *L. silvanae*.

During an expedition to the Lago Jeinimeni National Reserve, Chile Chico County, Aysén Region, 46°42'30"S; 71°42'46"W, on November 20, 2004, Herman Núñez, Juan Carlos Torres-Mura and Gloria Rojas collected nine specimens of a lizard species new to Chile, which they considered pertinent to document. The animals inhabit an extreme environment: cold and windy, with scarce vegetation (less than 10% of the surface is covered by vegetation) and dominated by the cushion shrub *Mulinum spinosum* and bunchgrasses like *Festuca palllescens*, *Stipa chrysophylla*, and *Poa ligularis*. In the lizards' feces were found remains of plant matter and insects, and in captivity they ate mealworms (*Tenebrio molitor*).

Preliminarily these animals were assigned to *Liolaemus kolengh* and the goal of this paper is to present the evidence for the existence of this species of lizard in Chilean territory.

## MATERIAL AND METHODS

We compared these nine specimens collected in Chile with the original description and the details given by Abdala y Lobo (2006) for the referred species from Ceballos Hill, near Ceballos river, Buenos Aires Department, Santa Cruz Province, Argentina, 47°01.542'S; 71°48.475'', 1485 masl. Details follow the sequence given by those authors (*Ibid.*).

According to Abdala and Lobo (2006), the species is related to *Liolaemus silvanae*, so the series was also compared with three specimens of *L. silvanae* (Donoso-Barros and Cei, 1971) MNHNCL-4257, 4258 and 4259, collected in Puerto Lebrum, Meseta Lago Buenos Aires, by J.M. Cei y J.A. Scolaro on December 6<sup>th</sup>, 1979. MNHNCL is the acronym for Museo Nacional de Historia Natural, Santiago de Chile.

Measurements were taken with a digital caliper (0.01 mm precision), details of shape and number of scales were revealed under a stereomicroscope at different zooms.

## RESULTS AND DISCUSSION

The animals are pictured in Figures 1 and 2. Measurements are given in Table 1.

Etheridge (1995) formalized the *lineomaculatus* group because its members do not have preloacal



FIGURE 1. Adult (MNHNCL-3841) of *Liolaemus kolengh.*, from Jeinimeni National Reserve



FIGURE 2. The three adults of *Liolaemus kolengh* captured in Lago Jeinimeni National Reserve.

pores neither in males or females, and they have some dorsal trifold scales, but not many. These features are present in all nine animals (“the series”) we captured at Lago Jeinimeni National Reserve; therefore, the series belongs to the lineomaculatus group (*sensu* Etheridge), which currently comprises *Liolaemus lineomaculatus*, *L. hatcheri*, *L. kolengh*, *L. silvanae*, *L. avilae*, and *L. morandae* (see Breitman *et al.* 2011, also Minoli *et al.* ND).

*Liolaemus kolengh* from Argentina (henceforth Lk) has 61-76 midbody scales ( $\bar{x} = 52.7$ ), the series has 45-52 ( $\bar{x} = 48.22$ ). Lk has 61-76 ventral scales ( $\bar{x} = 69.8$ ), the series exhibits 69-74 ( $\bar{x} = 72.1$ ). Lk has 6-8 temporal scales ( $\bar{x} = 7.1$ ), the series has 7-10 ( $\bar{x} = 7.7$ ).

Both Lk and the series, present strongly keeled scales on the dorsum, in both cases bristling, and some of these scales are trifold. Both Lk and the series also have in common a black ventral surface (Figure 2). Also in common are keeled and imbricate nuchal scales. Femoral scales are subimbricated; in the series those scales are strongly imbricate.

According to Abdala y Lobo (2006), Lk has temporal scales slightly keeled like in the series. The





FIGURE 3. Same animals of Figure 2, showing the black belly.

antegular pocket is covered with granular scales; the series has the same features. These characters are the diagnostics given by the authors for Lk.

In the holotype description, Abdala y Lobo (2006) report that the specimen has the head 1.1 times longer than wide; the series presents the head 1.09 times longer than wide. Lk and the series have smooth scales on the dorsum of the head. We can add that in the series they are swollen.

The type of Lk has a rostral scale 2.8 times wider than tall, surrounded by six scales. In the series it is 2.1 times wider than tall, surrounded by 6-8 scales ( $\bar{x} = 6.2$ ). Labial scale is wider than rostral, trapezoidal in shape, it is wider because it has lateral expansions; the series shows the same features.

Nasal scales are not contacted with rostral in the holotype; in the series the animals are similar, but MNHNCL-3841 has both nasals contacting the rostral.

There are five scales between rostral and superciliaries in Lk, the series has 4-6 ( $\bar{x} = 4.9$ ). There are six scales between the rostral and the frontal in Lk, the series has 5-7 ( $\bar{x} = 5.7$ ).

The type of Lk presents the frontal scale fragmented into four pieces. In the series the frontal scale can be a simple medial scale (azygous) or fragmented into two or even three irregular pieces.

Postrostral scales in Lk and in the series have sensorial organs in variable numbers ranging from two to seven.

Interparietal scale in Lk is surrounded by seven scales; in the series this interparietal is surrounded by 7-9 scales ( $\bar{x} = 7.4$ ). The interparietal and parietal scales are of similar size in both Lk and the series.

Temporal scales in Lk are detailed in the original description as seven horizontal and nine vertical



FIGURE 4. Two juveniles assigned to *Liolaemus kolengh*.

scales. The series exhibits 7-9 horizontal temporal scales ( $\bar{x} = 7.4$ ) and 6-9 vertical temporal ones ( $\bar{x} = 7.5$ ).

In Lk the subocular is white with a black border and contacted by five loreolabial scales; in the series the subocular is pale yellow with a black or dark border, except in juveniles, who completely lack a black border. In specimens MNHNCL-3838 and 3844, the subocular is composed of two units and is contacted with five and four loreolabial scales, respectively. In the series, the subocular scale is contacted by 3-4 loreolabial scales.

Supraocular scales in Lk are 3-4 (left-right); in the series they are: 4-3, 3-4, 4-6, 4-4, 3-3 (assymetrical), 4-4, 4-4, 4-4 and 4-4 (left-right). Supraorbital scales in a semicircle, with some irregular arrangement, in Lk as in the series.

The holotype exhibits six supralabial scales and four infralabials; all specimens in the series have six supralabials and 5-7 infralabials ( $\bar{x} = 5.5$ ). In Lk, the fourth supralabial is upturned, and all animals in the series show this character. There are eight lorilabials in Lk; the series has 6-10 ( $\bar{x} = 7.6$ ).

The preocular scale in the holotype is separated from the lorilabial scales by one scale, just as in the series. Nasal scale in Lk is surrounded by seven scales, like in the series, which shows no variation.

There are four internasals in the type specimen, similarly in the series. Superciliary scales are identical in number: six flat, strongly imbricate scales, those in the anterior part are swollen.

Holotype has 33 lines of lanceolate, imbricate, strongly keeled scales on the dorsum; the series has 24-30 scales ( $\bar{x} = 26.8$ ).

Ventral scales are bigger than dorsal ones in the holotype; nevertheless, in the series they are similar in size, and in both cases the ventral scales are smooth, laminar, and imbricated.

TABLE 1. Body measurements of *Liolaemus kolench* housed at the National Museum of Natural History, the column MNHNCL is museum number, SVL is snout vent length, AGL is axilla -groin length, FLL is fore-leg length, HLL is hind-leg length, TL I tail length, HL is head length, HW, is head width, and HH is head height, all the measurements are expressed in millimeters.

MNHNCL	SEX	SVL	AGL	FLL	HLL	TL	HL	WH	HH
3838	?	45,2	22,9	18,8	26,2	48,1	10,7	7,5	8,8
3839	Female	62,3	33,5	19,0	30,1	reg	12,4	7,4	11,2
3840	?	49,5	23,7	19,1	24,1	37,6	10,6	6,0	9,9
3841	Male	65,1	31,9	24,0	33,6	reg	13,0	7,8	12,3
3842	Female	51,7	25,4	20,1	29,4	57,0	11,4	6,8	9,4
3843	Female	66,2	36,6	22,5	31,6	60,0	12,8	7,8	11,5
3844	Female	57,4	31,2	22,5	30,4	55,0	11,4	7,1	10,5
3845	?	41,3	20,0	17,6	25,0	cort	9,8	5,7	8,4
3846	?	47,6	20,3	17,7	26,7	reg	10,9	6,0	9,8

There are 45 scales from the occiput to the legs in Lk; the series has 45-48 ( $\bar{x} = 46$ ). Hellmich index 14 in Lk; the series shows 11-15 ( $\bar{x} = 13.4$ ). Hellmich's Index is described by Quinteros (2013): "Number of scales in dorsal head (Hellmich's Index), from rostral scale to occiput." According to the original definition (Muller and Hellmich 1939) the Hellmich's index is "Number of dorsal scales that fit or are included in a distance equal to the length of the head, measured on the middle of the body."

There are 79 (however, see below) ventral scales in Lk, the series has 61-76 ( $\bar{x} = 72.1$ ). Nuchal scales in Lk are thirty, 29 in the series.

Antehumeral scales are described by Abdala and Lobo (2006) as (sic) "larger an easily distinguishable from the rest." We can agree with this statement. They add (sic) "postauricular, rictal, longitudinal and antehumeral well pronounced." We suppose they are referring to those folds, and again, the series conforms with that description.

There are 20 scales before the antehumeral fold in Lk, the series has 18-22 ( $\bar{x} = 18.8$ ). The longitudinal fold is covered with smooth scales.

In the original description of the species, Abdala and Lobo documented 39 gulars. In our series we recorded 24-32 ( $\bar{x} = 26.4$ ).

Lk has 16 scales on the fourth finger, and 18 Lk on the fourth toe; the series has 13-18 ( $\bar{x} = 16.3$ ) and 16-20 ( $\bar{x} = 18.7$ ), respectively.

Auricular scale absent in Lk, but we can recognize an auricular scale, "an enlarged scale located on the anterior-superior edge of the auditory meatus," as stated by Quinteros (2013) in his morphological analysis.

Abdala and Lobo (2006) also reported the character variation among the paratypes of *Liolaemus kolench*; the range of almost all characters overlapped the range of the series and the original description (see below).

In our comparisons we found three strikingly different aspects. There are 33 rows of scales on the dorsum in Lk, but our series has only 24-30 ( $\bar{x} = 26.8$ ). Unfortunately, there is not a range of rows on the dorsum for Lk. This difference can be due to different criteria for counting these rows; we counted the rows of scales down the middle of the back, considering all the rows of keeled scales.

Another difference is in the number of ventral scales. In Lk there are 79 according to Abdala and Lobo (2006: 5), but in their Table 1 these authors say the holotype has 69 ventral scales and the range given



for this character is 61-76. Probably the difference is a typographical error in the manuscript (79 should be 69). The range of our series falls within that of the original description.

Abdala and Lobo say that there are 39 gular scales. In our series we counted 24-32 ( $\bar{x} = 26.4$ ), using the definition of Quinteros (2013): “Number of gulars, from lower edge of left auditory meatus to lower edge of right auditory meatus, along gular region of head...” Actually, we cannot explain this difference; the description of Quinteros is clear to exclude those granular scales that penetrate the auditory meatus.

The series is different from *L. silvanae*, and the differences we found are in agreement with those given by Abdala and Lobo. We can add that the scales in *L. silvanae* are squashed and do not exhibit the bristled aspect given by swollen scales. These singular features of these animals led Donoso-Barros and Cei (1971) to create the genus *Vilcunia*, but Etheridge (1995) concluded that this genus can be considered a synonymy of *Liolaemus*.

### CONCLUSION

We can definitively report the presence of *Liolaemus kolengh* as part of the Chilean fauna in Patagonian areas.

The areas that *L. kolengh* inhabits are flat, open patches with metamorphic rocks fragmented into pieces; these animals live among those rocks. The dorsal pattern and coloration, despite being vibrant, conceal them very well against the background color of short grasses. We could not find any other reptile in the high hills surrounding the Lago Jeinimeni National Reserve. In the lowlands, it is possible to find *Liolaemus scolaroi*, *L. zullyae*, and *Diplolaemus bibroni*.

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