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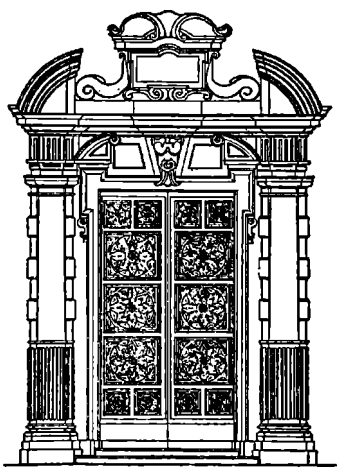

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The true systematic status of *Liolaemus ruisleali* Donoso Barros and Cei, 1971, from Northern Patagonia, Argentina (Reptilia, Iguanidae)

ABSTRACT

The taxonomic status of the poorly known Patagonian Lizard *Liolaemus ruizleali* has been revised according to its only extant holotype and paratypes. It is a composite species: the holotype and two paratypes belong to *Liolaemus rothi* Koslowsky, 1898, the other four paratypes to *Liolaemus kingi somuncurae* Cei and Scolaro, 1981. The synonymic list of these latter species is readjusted.

INTRODUCTION

Several reptiles were collected in the distant and poorly known localities of meseta Somuncurá, Rio Negro, and other Patagonian volcanic tablelands, by the senior author during field work devoted primarily to the taxonomic and ecological research on the recently discovered leptodactylid frogs of the genus *Atelognathus* (Cei, 1969). The late Prof. R.Donoso Barros (University of Concepción, Chile), expert of South American lizards, agreed to collaborate in a study of this herpetological material. Prof. Donoso Barros tentatively identified some new *taxa* and submitted as senior author a systematic paper to the J. of Herpetology (1971), where the following new species were described: *Vilcunia silvanae*, *Liolaemus ruisleali*, *Liolaemus archeforus*, and *Liolaemus elongatus petrophilus*. Unfortunately, neither the manuscript nor the galley proofs of this paper were seen or revised by the co-author, J.M.Cei, occasionally far away from the South American continent. While no questions have arisen so far on the taxonomic status and validity of *Vilcunia silvanae*, *Liolaemus archeforus* and *Liolaemus elongatus petrophilus*, in the last decade several doubts have been expressed about the specific identity of *Liolaemus ruizleali* from

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the meseta de Somuncurá (Cerro Corona, 1600 m a.s.l.). This lizard was described from 7 specimens, originally deposited in the herpetological collections of the Instituto Biologia Animal-Universidad Nacional de Cuyo, Mendoza (IBA-UNC), as well as in the Donoso Barros's personal collection (RODOBA), now Collection of the Museo Zoologia, Universidad de Concepción, Chile (MZUC). In fact, further research in the terra typica of *Liolaemus ruizleali* (Cerro Corona and its neighbors) has always failed to provide additional specimens able to fit the original description, which is poorly illustrated in two dark, insignificant photographs in Donoso Barros and Cei's paper (1971). Moreover, in Laurent's recent phylogenetic discussion of the genus *Liolaemus*, the ambiguity of *Liolaemus ruizleali* is repeatedly emphasized (Laurent: pers.comm.). Its "morphometric relationships" with *Liolaemus* species of the *kingi, archeforus* and *rothi* groups are also pointed out (Laurent, 1984, 1985). The precarious status of this form required a critical revision of the *Liolaemus ruizleali* holotype and paratypes, most likely described too hastily in the past on a small number of specimens, and then only vaguely referred to some "morph" of the widespread northern Patagonian lizard *Liolaemus rothi* Koslowsky (Cei, 1986).

MATERIAL AND METHODS

All the original types, from both the IBA-UNC and MZUC collections, were carefully examined, measured with precision calipers and compared with sympatric species of the genus. Luckily, color slides of five of the seven types of *Liolaemus ruizleali* taken of the live specimens at the moment of the capture (February, 16, 1968), have been made available. They correspond to the original numbers of the description: IBA-UNC 483 (male, holotype), 484-3 (female, "allotype"), 482-1, 484-2 (females, paratypes) and RODOBA 001327 (male, paratype). The metric measurements of the seven types are reported in table I. Further discriminant analysis to assess the reciprocal position of the above mentioned "types" was also carried out, using Foucart's method (1982). Ten continuous variables were used, all corresponding to the whole metric characters reported in Table I. In order to associate the variables to two main discriminant canonic axes, population samples of three other sympatric *taxa* from the Somuncurá plateau (Rio Negro) were also analysed and compared. These were *Liolaemus rothi* (n = 20), *Liolaemus kingi somuncurae* (n = 14) and *Liolaemus boulengeri* (n = 14), all obtained in the terra typica of *L.ruizleali* and its environs. Their comparative mensurable characters (mean and Standard Deviation, or SD) are reported in table II. All morphometric measurements were taken on adult specimens whose maturity was macroscopically controlled. When the groups were tested, the means of each variable were tested in accordance with their type distribution (F Snedecor test). In the case of normal, Gaussian distribution, the t Student test was used; in the case of no Gaussian distribution the U Mann-Whitney test was applied.

	IBA.UNC 483 Holotype	IBA.UNC 482.1	IBA.UNC 482.2	IBA.UNC 484.3	IBA.UNC 484.2	MZUC.1327	MZUC.1328
Body length	95.50	93.40	84.10	81.80	74.00	73.94	72.40
Head lenght	21.00	19.20	16.40	16.50	15.10	15.88	14.90
Head width	18.40.	16.10	15.50	12.60	12.00	12.86	12.04
Hind limb lenght	54.40	51.10	48.80	36.30	33.60	29.92	29.40
Fore limb lenght	29.80	31.00	28.80	24.00	25.00	24.38	20.50
Axilla-groin distance	42.50	41.00	34.20	37.00	35.40	27.00	32.70
Fourth finger lamellae	20	20	20	19	20	17	16
Scale number around body	77	78	82	78	78	84	85
Supralabial scale number	8	9	8	9	7	6	5
Infralabial scale number	6	6	7	6	6	7	6
Femoral patches	present	present	present	–	–	–	–
Marbled ventral pattern	–	–	–	present	present	present	present

TABLE I – Metric measurements (mm) and other morphological characters in the "types" of *Liolaemus ruizleali* (used as variables in the discriminant analysis).

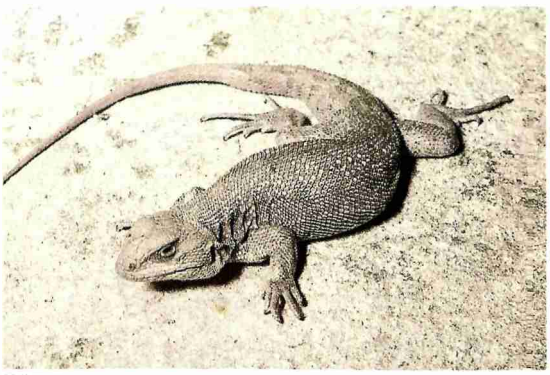
Variables	*Liolaemus rothi* (N = 20)	*Liolaemus kingi somuncurae* (N = 14)	*Liolaemus boulengeri* (N = 14)
Body length (mm)	86.97 (7.24)	76.31 (5.67)	63.42 (4.28)
Head length (mm)	17.05 (1.78)	14.98 (1.04)	11.75 (1.04)
Head width (mm)	15.76 (1.50)	13.21 (1.09)	10.77 (0.65)
Hind limb length (mm)	49.22 (4.00)	39.06 (2.56)	35.16 (2.70)
Fore limb length (mm)	28.53 (2.01)	24.38 (2.02)	21.28 (1.50)
Axilla-groin length (mm)	39.37 (2.94)	38.01 (4.52)	29.82 (2.86)
Fourth finger lamellae number	18.55 (1.36)	19.78 (1.42)	18.42 (1.27)
Scale number around midbody	73.60 (4.61)	79.14 (3.02)	77.78 (4.12)
Supralabial scale number	8.45 (0.86)	8.50 (0.50)	7.86 (0.74)
Infralabial scale number	6.10 (0.62)	5.78 (0.41)	5.50 (0.50)

TABLE II – Comparative mensurable characters in sympatric *Liolaemus* species from Somuncurà plateau. Values represent mean and Standard deviation (SD).

RESULTS AND CONCLUSIONS

General Morphological Remarks

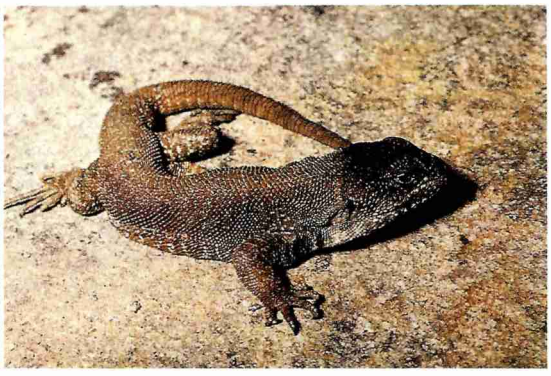
It is evident from our careful screening that *Liolaemus ruizleali* Donoso Barros and Cei, 1971 is a composite species, lacking a real taxonomic identity. The holotype is a synonym of *Liolaemus rothi* Koslowsky, 1898 (cf.color plate 1, *1-2*), while the paratypes IBA-UNC 482-2 (male), 482-1 (female) also belong to this taxon (cf. color plate 1, *3*). These specimens present the femoral "patches" shown by *Liolaemus rothi*, together with the black pigmentary mass on the mandible muscles observed only in *L.rothi* by Etheridge (pers.comm.). Instead, the paratypes IBA-UNC 484-3 (female, "allotype") and 484-2 (female), RODOBA 001327 (male, MZUC 8793) and RODOBA 001328 (female, MZUC 12060) belong to *Liolaemus kingi somuncurae* Cei and Scolaro, 1981 (cf. color plate 1,*4, 5, 6*), an unknown and undescribed species at the time of the Donoso Barros and Cei's paper (1971). No femoral patches are recognizable in these paratypes, as well as



1 b

2 b

3 b



4 b

5 b

6 b

Slides taken of the live holotype and paratypes of *Liolaemus ruizleali* (phot. 1, 3, 4, 5). Their true identity can be pointed out when compared to characteristic specimens of *Liolaemus rothi* (phot. 2) and *Liolaemus kingi somuncurae* (phot. 6) from their terra typica.
1- Holotype IBA-UNC 483: its typical characters are referable to
2- (*Liolaemus rothi* from Cerro Corona, Somuncurá plateau, March 2,1980);
3- Paratype IBA-UNC 482-1, also referable to *Liolaemus rothi*;
4- Paratype IBA-UNC 484-3, and 5- Paratype IBA-UNC 484-2: both unquestionably referable to 6- (*Liolaemus kingi somuncurae*, from Cerro Corona, Somuncurá plateau, March 1986).

in *L.kingi somuncurae* and any other *taxon* of the *kingi* group. Also their ventral pigmentation is unquestionably referable to the ventral pigmentary pattern of *L.kingi somuncurae* from the same locality.

Results of the discriminant analysis

The correct classification of the seven specimens belonging to the so-called "types" of *Liolaemus ruizleali,* and their individual relationship with other *Liolaemus* population from the Somuncurá plateau, were the purpose of the present numerical research. The discriminant analysis provided two significant canonic axes for the three groups considered. Canonic axis I absorbs 55% of the total variance, and canonic axis II the remaining 45%. Canonic axis I allows the separation of *L. rothi* from the remaining groups, associating in its positive sector most of the variables having a major expression in *L.rothi* in comparison to the remaining *taxa,* such as body length ($p < 0.001$, U Mann-Whitney test), head length ($p < 0.001$, t Student test), head width ($p < 0.001$, U Mann-Whitney test), hind limb length ($p < 0.001$, t Student test) and fore limb length ($p < 0.001$, U Mann-Whitney test). Comparing the major body length of *L. rothi* and the body length of *L.boulengeri,* the axilla-groin distance shows a significant value ($p < 0.001$, t Student test). In its negative sector, the variable number of scales around the body is associated: this variable exhibits its major values in *L. kingi somuncurae* ($p < 0.001$, t Student test).

Canonic axis II associates in the positive sector the variable fourth finger lamellae. This variable exhibits major values in *L.kingi somuncurae* ($p < 0.05$, t Student test), which allow its separation from *L. boulengeri.* Moreover, the minor body length of this latter, when compared with the other *taxa,* points out its minor values for the variables lying in the quadrant defined by the positive sectors of both the canonic axes. Consequently, the centroid referred to the *taxon L. boulengeri* lies in the quadrant delimited by both the negative sectors of the canonic axes, opposite to the anterior (Fig 1).

The distance between the centroids of each taxon is relatively equal in the three species. These centroids are nearner in *L. rothi* and *L. kingi somuncurae,* according to the selected variables. Ellipses of equiprobability ($p < 0.01$: Sokal and Rohlf, 1979) for all specimens revealed no overlap between the groups (Fig 1).

Discriminant analysis of individual specimens resulted in a very high percentage of correct classification (100%). Using the same classification equations, the identification of each of the seven specimens still recognized as *L. ruizleali* was made. The result was that the following "types" belong to *L. rothi*: IBA-UNC 483 (holotype), IBA-UNC 482-l and IBA-

UNC 482-2: while the following "types" belong to *L. kingi somuncurae*: IBA-UNC 484-2, IBA.UNC 484-3 and MZUC 12060 and 8793. Autovalues and space distribution for all these cases support the bidimensional representation shown in the Fig. 1, joined to the ellipses of equiprobability for the three groups analysed.

The specimen IBA-UNC 483 (holotype of *L.ruizleali*) is evidently a *L. rothi* specimen which does not reach the normal species mean in some of its morphometric parameters (Fig. 1). It could be a somewhat atypical individual, lying outside the equiprobability ellipse at a rather doubtless level ($p < 0.01$); thus, its classification could fall with in an error range of 1%. Similar remarks, although to a lesser extent, could be made for the specimen MZUC 12060, identified as a *Liolaemus kingi somuncurae* female.

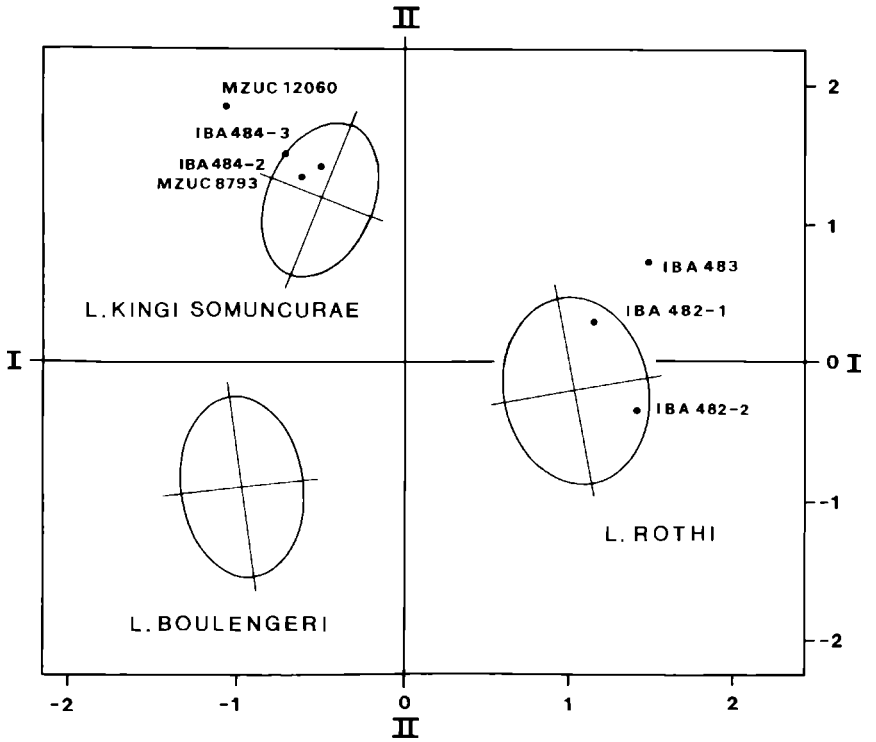


Fig. 1 – Ellipses of equiprobability for all the cases ($p < 0.01$). Black dots indicate all individual records of *Liolaemus ruizleali* up to date. (Type specimens: MZUC– Museo Zoologia Universidad Concepción; IBA – Instituto Biologia Animal-Universidad Nacional Cuyo, o IBA-UNC).

CONCLUSION

In appendix to the generic and species revision of the revision of the reptilian fauna from Central and Southern Argentina (Cei, 1986), the following modification should be noted.

Synonyms of **Liolaemus rothi** Koslowsky, 1898:

1898 *Liolaemus rothi* Koslowsky. Revta Mus. La Plata 8:177, lam.4. Terra typica: "Territorio del Neuquén".
1970 *Liolaemus rothi* Peters and Donoso Barros. U S natn Mus. Bull. 297,*2*: 193.
1971 *Liolaemus ruizleali* Donoso Barros and Cei (*partim*: IBA-UNC 483, holotype; 482-1, 482-2). J. of Herpetol. 5 (3-4): 93.
1986 *Liolaemus rothi* Cei. Reptiles del Centro, Centro-Oeste y Sur de Argentina, Monogr. 7, Mus.reg.Sc.nat. Torino: 214.

Synonyms of **Liolaemus kingi somuncurae** Cei and Scolaro, 1981:

1971 *Liolaemus ruizleali* Donoso Barros and Cei (partim: IBA-UNC 484-3,484-2; MZUC 8793, 12060) J.of Herpetol.5 (3-4):93.
1981 *Liolaemus kingi somuncurae* Cei and Scolaro. J.of Herpetol. 15 (2):207. Terra typica: Meseta Somuncurá, near Laguna Raimundo, 1400 m s.l.m., Rio Negro, Argentina.
1986 *Liolaemus kingi somuncurae* Cei, Reptiles del Centro, Centro-Oeste y Sur de Argentina, Monogr. 7, Mus. reg.Sc.nat.Torino: 234.

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