HERPETOZOA 6 (3/4): 129 - 140
Wien, 30. Dezember 1993

Intraspecific variability of *Lacerta (Archaeolacerta) bonnali* LANTZ, 1927 (Squamata: Sauria: Lacertidae)

Zur innerartlichen Variabilität von *Lacerta (Archaeolacerta) bonnali* LANTZ, 1927 (Squamata: Sauria: Lacertidae)

OSCAR J. ARRIBAS

KURZFASSUNG

Aufgrund der Untersuchungsergebnisse zur geographischen Variabilität (Pholidose und Biometrie) der in den Pyrenäen endemischen *Lacerta bonnali* LANTZ, 1927 wird eine neue Unterart dieser Eidechse mit Vorkommen in Vall d'Aràn und Pallars beschrieben.

ABSTRACT

Based on the study of geographic variability (pholidosis and biometry) of the Pyrenean endemite *Lacerta bonnali* LANTZ, 1927, a new subspecies of this lizard is described from Vall d'Aràn and Pallars.

KEYWORDS

Lacerta bonnali; intraspecific variability, new subspecies; Pyrenees, Spain

INTRODUCTION

Lacerta bonnali LANTZ, 1927 is a little known *Archaeolacerta* recently raised to specific level (ARRIBAS 1993; PEREZ MELLADO & al. 1993). It inhabits the Pyrenees from 1800 m to approximately 3000 m by forming isolated colonies in the alpine environment on the tops of the mountains.

Within this area, the range of *L. bonnali* extends from the Arriel Mountains in the west, to the Montvallier Mountains in the east (ARRIBAS 1993; ARRIBAS in press).

Until now, morphological studies on this lizard have been based only on populations of two localities: the type locality Lac Bleu de Bigorre (LANTZ 1927; LANZA 1963) and various points in Ordesa National Park (MARTINEZ RICA 1977, [some specimens from St. Maurici-Aigüestortes National Park included]; PEREZ MELLADO & al. 1993). Global comments on the aforementioned localities, and a new one (Serra de Guarbes) are given in ARRIBAS (1993).

Lack of detailed morphological and biometric studies based on a wide-range sample is evident. The aim of this paper is to fill in this gap which led to the description of the strongly divergent populations of the easternmost part of the range as a new subspecies.

MATERIAL AND METHODS

The study is based on biometric and pholidotic comparisons of 161 adults (76 males, 85 females) of *L. bonnali* which belong to the following samples (OTUs):

1: 15 males and 12 females from Bigorre, [Hautes Pyrénées], (Lac Bleu).
2: 13 males and 14 females from Arriel - Monte Perdido, [Huesca, Hautes Pyrénées and Basses Pyrénées], (Monte Perdido, Ordesa, Refugio de Goriz, Faja de Pelay, Circo de Cotatuero, Llanos de Millaris, Puerto de Bujaruelo, Circo de Pineta, La Estiba, Ibón de Arriel, Lac d'Artouste).
3: 8 males and 3 females from Macizo de Posets, [Huesca], (Vall del Clot).
4: 3 males and 2 females from Macizo de la Maladeta, [Huesca], (Estany de Llauset, Coll de Vallibierna).
5: 5 males and 2 females from St. Maurici-Aigüestortes National Park, [Lleida], (Bony Blanc, Bony Negre, Muntanyó de Llacs, Gran Encantat).
6: 32 males and 52 females from North Aran Valley Mountains and Pallars, [Lleida], (Serra de Guarbes, Serra d'Armeros, Coll de Barradós, Estany de Liat, Gran Tuc de Mauberme, Tuc de la Pica, Port d'Urets, Port d'Orlà, Pic de Barlonguère, Massif de Montvallier).

Specimens studied are deposited in the author's scientific collection, except the paratypes indicated below which are in Naturhistorisches Museum Wien (Vienna).

Characters studied are: Snout-vent length (SVL); number of temporal scales between Masseteric and Tympanic (M-T); Tympanic diameter (dT); Masseteric diameter (dM); supraciliar granules (Sprc. Gr.); numbers of Gularia, Collaria, Dorsalia, Femoralia, Ventralia (VEN) and Circumanalia; number of lamellae underneath 4th toe (L. 4th toe), and the following indexes: Snout-vent length x 100 / Tail length (SVL/TL); Forelimb length x 100 / Snout-vent length (FLL/SVL); Hindlimb length x 100 / Snout-vent length (HLL/SVL); Pileus length x 100 / Pileus width (PILL/PILW); Masseteric diameter x 100 / Parietal length (dM/PARL); Tympanic diameter x 100 / Parietal length (dT/PARL); Anal plate length x 100 / Anal plate width (ANALL/ ANALW).

Three methods were used to analyse the morphological differences and the degree of differenciation between the samples (populations):

Analysis of Variance (ANOVA) was computed with the NCSS 5X (Number Cruncher Statistical System). Samples 4 and 5 (Maladeta and Aigüestortes) were pooled in the same OTU. Biometric and pholidotic values were calculated irrespective of sex, except for the ventral scale counts that show clear sexual dimorphism. In cases where differences were significant, multiple comparisons between samples were carried out by the Student-Newman-Keuls test.

Degree of differentiation among samples was evaluated by means of a graph along the axes with maximum discriminating power (CUADRAS 1981) by means of a canonical analysis of populations (CANP 075S program, by CUADRAS, FORTIANA & ARENAS, Dept. Statistics, Univ. Barcelona).

Multivariation test (MVT) was used to calculate differences between population averages. The difference in a character is expressed by per cent (%) of the whole range of variation of the very character. Thus, the "global difference" between two populations is defined as the average of these percentages (see SCHMIDTLER 1983, 1986a, 1986b, 1986c; EISELT & SCHMIDTLER 1986). Populations (samples) 4 and 5 were pooled for this analysis.

RESULTS AND DISCUSSION

Statistical comparisons

For each sample descriptive statistics of the analysed variables are shown in table 1, comparisons of the average values (ANOVA) of each parameter are listed in table 2.

Distinctive characters in interpopulational discrimination are the numbers of Ventralia (in males), M-T, and Dorsalia, as well as the morphometric indexes SVL/TL, FLL/SVL and HLL/SVL (F values > 10) (table 2).

23 out of 27 highly significant ($p < 0.01$) differences among the samples, are differences between the Aran-Pallars population and any of the rest.

There is a sharp discontinuity between the central Pyrenean and the easternmost populations with their *"L. vivipara*-like" habitus (short head, limbs and tail) which is probably related to their more

Table 1: Descriptive statistics of 17 characters studied in 5 samples of *Lacerta bonnali*. For abbreviations of characters see "Material and Methods". $\bar{x}$ - arithmetic mean; StdD - standard deviation; Max - maximum value; Min - minimum value; m - male; f - female.

Tab. 1: Beschreibende Statistiken der 17 untersuchten Merkmale von 5 Stichproben von *Lacerta bonnali*. Merkmalsabkürzungen siehe "Material and Methods". $\bar{x}$ - arithmetisches Mittel; StdD - Standardabweichung; Max - Maximum; Min - Minimum; m - Männchen; f - Weibchen.

Locality/Fundort	Bigorre				M. Perdido-Arriel				Posets				Maladeta-A. Tortes				Aran-Pallars			
Number/Anzahl	n = 27				n = 27				n = 11				n = 12				n = 84			
Character/Merkmal	$\bar{x}$	StdD	Max	Min	$\bar{x}$	StdD	Max	Min	$\bar{x}$	StdD	Max	Min	$\bar{x}$	StdD	Max	Min	$\bar{x}$	StdD	Max	Min
SVL m	50.35	3.11	54.1	43.1	53	2.9	57	47.8	48.31	3.84	54.4	44.7	51.13	2.8	55.9	46.6	53.32	4.33	61.8	43.9
SVL f	53.27	5.71	58.9	42	54.47	2.54	58.9	42	48.43	7.43	57	43.6	59.65	6.097	64.9	50.9	54.89	5.57	66.2	36.1
VEN m	26.14	0.66	27	25	26.07	0.95	28	25	26.14	0.69	27	25	26.25	0.46	27	26	24.53	0.98	26	22
VEN f	28.75	0.86	30	27	27.92	1.07	29	26	28.33	0.57	29	28	27.5	1.29	29	26	27.36	1.01	30	25
M-T	1.75	0.43	2	1	1.62	0.48	2	1	1.8	0.74	3	1	1.58	0.64	2	0	1.03	0.19	2	1
dM	1.44	0.28	2.4	0.8	1.6	0.2	2	1.3	1.51	0.28	1.8	0.8	1.35	0.33	1.9	0.6	1.64	0.27	2.3	0.8
Sprc. Gr.	4.66	2.05	8	0	4.71	1.98	7	0	5.6	2.33	10	1	3.83	2.57	7	0	3.68	1.96	9	0
Gularia	22.4	1.61	25	18	21.44	1.94	25	17	21.2	1.72	24	18	21.55	0.86	23	20	21.15	1.54	25	18
Collaria	9.11	2.11	13	5	9.88	1.68	14	5	10.6	1.8	13	7	11.58	1.7	14	8	10.63	1.34	14	7
Dorsalia	42.62	2.32	47	37	43.33	2.26	47	40	41.3	2.23	46	38	41.5	2.5	45	36	40.12	2.6	48	35
Femoralia	14.14	1.81	17	11	13	1.18	15	11	12.8	1.16	15	11	13.16	1.14	16	11	12.43	1.16	16	10
L. 4th toe	26.03	1.29	29	23	24.96	1.2	27	21	25.3	1.67	27	21	27	2.3	31	22	25.9	1.61	30	19
Circumanalia	9.81	1.61	13	7	8.48	1.06	10	7	9.3	0.9	11	8	7.91	0.64	9	7	7.91	1.06	12	6
SVL/TL	58.42	3.61	65.65	54.31	60.59	3.61	67.05	55.54	57.28	2.31	59.07	53.02	57.63	4.79	64.67	51.28	68.94	6.83	84.92	56.63
FLL/SVL	34.74	2.32	38.32	29.68	34.89	2.22	39.53	30.46	35.05	2.24	38.7	30.87	34.8	2.53	37.95	29.42	32.15	2.47	38.41	22.36
HLL/SVL	48.61	3.29	53.24	42.56	47.94	3.42	54.76	43.54	47.23	3.84	52.55	38.78	47.82	3.59	51.5	39.59	43.95	3.19	53.47	37.18
PILL/PILW	196.14	7.43	212.3	183.6	201.17	6.01	213.6	188.5	200.11	5.36	207.8	192.2	205.13	6.96	215.3	195	195.63	10.09	224.6	131.8
dM/PARL	37.96	7.16	63.15	21.62	42	5.53	52.63	33.33	41.29	9.44	53.12	18.6	36.39	7.96	52.77	17.64	44.07	5.93	57.5	25
ANALL/ANALW	61.65	4.85	73.17	52	54.05	8.11	71.15	39.62	60.86	11.22	87.5	46	60.54	5.43	69.56	53.33	62.48	8.33	83.33	40.42

Table 2: Statistical comparison among samples (B - Bigorre; MP - M. Perdido-Arriel; P - Posets, M - Maladeta - A. Tortes; A - Aràn - Pallars). Significances of difference (F - F values; p - p values): * - $p<0.05$; ** - $p<0.01$.

Tab. 2: Statistischer Vergleich der Stichproben (B - Bigorre; MP - M. Perdido-Arriel; P - Posets, M - Maladeta - A. Tortes; A - Aràn - Pallars). Unterschiedssignifikanzen (F - F-Werte; p - p-Werte): * - $p<0.05$; ** - $p<0.01$.

	B-MP	B-P	B-M	B-A	MP-P	MP-M	MP-A	P-M	P-A	M-A	F	p
SVL m					*				*		3.83	0.0071
SVL f								*			2.15	0.0823
VEN m				**			**		**	**	16.02	0
VEN f											5.23	0.0009
M-T				*			**		**	**	12.19	0
dM						*				*	4.72	0.0013
Sprc. Gr.									*		2.91	0.0085
Gularia											3.18	0.0152
Collaria		*	**	**		*					6.54	0.0001
Dorsalia				**			**				11.09	0
Femoralia	**	*	*	**							8.99	0
L. 4th toe						*		*			3.92	0.0046
Circumanalia	**		**	**	*			*	*		15.08	0
SVL/TL				**			**		**	**	11.08	0
FLL/SVL				**			**		*	*	12.31	0
HLL/SVL				**			**		*	*	15.01	0
PILL/PILW			*							*	4.91	0.0009
dM/PARL				**						**	6.58	0.0001
ANALL/ANALW	*				*	*	**				5.72	0.0003

ground-dwelling habits. Furthermore, the Aran-Pallars populations have low numbers of Dorsalia, Ventralia (especially in males), Gularia and Femoralia.

On the contrary, the biometric and pholidotic differences among the central Pyrenean samples west to Garona River (Bigorre, Monte Perdido - Arriel, Posets and Maladeta - Aigues Tortes) are minor, revealing significant ($p < 0.01$) differences only in the numbers of Collaria, Femoralia and Circumanalia. The Bigorre population is somewhat isolated from the central Pyrenean axis. Its members show higher numbers of femoral pores and circumanal plates (associated with a big preanal scale) than the neighbouring central Pyrenean populations, especially those of the Monte Perdido area.

Multivariate analysis

Canonical analysis of the populations was executed separately for males and females.

The eigenvalues of the matrices of covariances between populations in respect to the matrices of covariances within the populations, as well as the percentage of variability accumulated for each canonical axis are:

Males	Eigenvalues	16.94	4.42	2.16
	Acc. percentage	71.99	90.79	100
Females	Eigenvalues	02.88	2.23	1.04
	Acc. percentage	46.75	83.09	100

This analysis was made separately for males (A) and females (B) (fig. 1); for the canonical coordinates of the centroid and the radius of the confidential region (coefficient of reliability = 90%) of each sample see table 3.

In general, the males of the samples discriminate better than the females. This may be caused by lack of interpopulational differences in body proportion due to the presence of other kinds of sexual dimorphisms (males have their secondary sexual characters developed differently depending on the population they belong to, whereas females are more uniform).

In males, the first two canonical axes (V1, V2) absorb more than 90 % of variability providing a good graphic display of the relationship among populations. The relation between observed and canonical variables are shown in table 4. Looking at the first canonical axis (V1), body pro-

Table 3: Canonical coordinates (axes V1, V2, V3) of the centroid and radius (Rad.) of the confidential regions in the *Lacerta bonnali* samples analysed (B - Bigorre; P - Posets; M - Maladeta - A. Tortes; A - Aràn - Pallars).

Tab. 3: Kanonische Koordinaten (Achsen V1, V2, V3) des Zentroids und Radius (Rad.) des Vertrauensbereiches für die untersuchten *Lacerta bonnali* Stichproben (B - Bigorre; P - Posets; M - Maladeta - A. Tortes; A - Aràn - Pallars).

Sample	n	V1	V2	V3	Rad.
Males					
B	15	-1.91	1.43	-0.38	1.33
P	13	-1.46	-1.52	-0.45	1.43
M	7	0.04	-0.06	1.27	1.95
A	32	3.33	0.15	-0.43	0.91
Females					
B	12	1.36	-0.36	-0.22	1.43
P	14	-0.8	-1.04	0.19	1.33
M	7	0.05	0.78	0.7	1.88
A	51	-0.61	0.62	-0.67	0.69

portions (PILL/PILW, FLL/SVL and HLL /SVL) and pholidotic characters (Dorsalia, Ventralia, and Femoralia) display the greatest interpopulational discrimination power. All these characters have negative loads for the first canonical axis (V1), indicating that OTU 4 (Aran-Pallars population) which is seated in the positive part of this axis has lower values for these discriminating characters than the central Pyrenean ones (OTUs 1, 2 & 3). This fits well with the results of the statistical analysis above.

In females, there is less differentiation in body proportions between populations. Only pholidotic characters cause important loadings at the canonical axes (table 4) but do not permit clear differentiation among samples.

Table 5: Morphological distances among four populations of *Lacerta bonnali* (MVT test).

Tab. 5: Morphologische Distanzen zwischen vier Populationen von *Lacerta bonnali* (MVT Test).

	Bigor.	M.Per.-Arr.	Posets	Mal.-A.T.
M.Per.-Arr.	7.74			
Posets	7.86	7.72		
Mal.-A.T.	9.24	8.65	7.21	
Arán-Pall.	16.45	16.56	20.98	18.18

Morphological distances

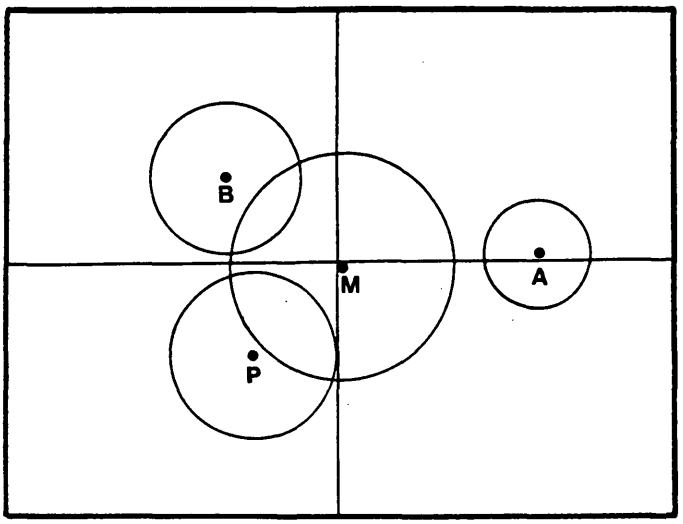
Morphological distances among populations are shown in table 5. The results (standardized for males and females) are grouped by the UPGMA method (SNEATH & SOKAL 1973) (fig. 2).

The four samples from the central Pyrenees show strikingly similar morphological distances, ranging from 7.21 to 9.24, independently of the presence or absence of geographical intermediate samples. This fact could be interpreted as an almost synchronized onset of differentiation among these populations, starting from the model of continuous distribution with a certain degree of genetic flow between populations, to the model of isolated

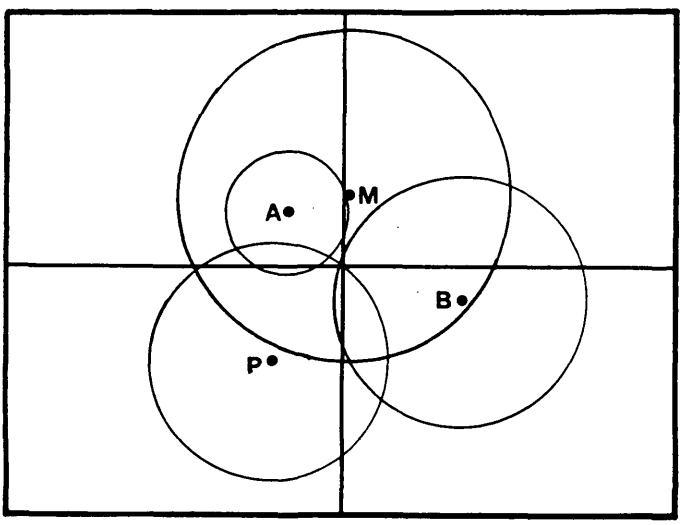
Table 4: Correlation between observed and canonical variables in male and female *Lacerta bonnali* examined.

Tab. 4: Die Zuordnung von beobachteten und kanonischen Variablen bei den untersuchten männlichen und weiblichen *Lacerta bonnali*.

	Males			Females		
Variables	V1	V2	V3	V1	V2	V3
Gularia	-0.16	0.06	-0.26	0.43	0.07	0.69
Collaria	0.13	-0.15	0.12	-0.3	0.52	0.41
Dorsalia	-0.34	-0.17	-0.19	0.06	-0.43	0.29
Ventralia	-0.34	-0.17	-0.19	0.51	-0.32	0.16
Femoralia	-0.35	-0.04	0.38	0.55	-0.08	0.5
L. 4th toe	-0.2	0.43	-0.19	0.25	0.42	0.05
Circumanalia	0.03	0.19	-0.31	0.52	-0.14	-0.15
FLL/SVL	-0.33	0.3	0.26	0.005	-0.35	0.31
HLL/SVL	-0.3	-0.08	0.18	0.15	-0.26	0.28
PILL/PILW	-0.43	-0.006	-0.25	-0.11	0.04	0.58
dM/PARL	-0.08	-0.29	0.19	-0.42	-0.1	0.02
dT/PARL	0.25	-0.05	-0.1	-0.21	-0.1	-0.45
ANALL/ANALW	-0.06	0.18	0.24	0.18	0.37	-0.17



A



B

Fig. 1: Graphic representation of the canonical analysis of morphological data of four populations (A - Aràn-Pallars; B - Bigorre; M - Maladeta - A. Tortes; P - Posets) of *Lacerta bonnali* executed separately for males (A, above), and females (B, below).

Abb. 1: Graphische Darstellung der kanonischen Analyse morphologischer Merkmale bei vier Populationen (A - Aràn-Pallars; B - Bigorre; M - Maladeta - A. Tortes; P - Posets) von *Lacerta bonnali*, nach Männchen (A, oben) und Weibchen (B, unten) getrennt.

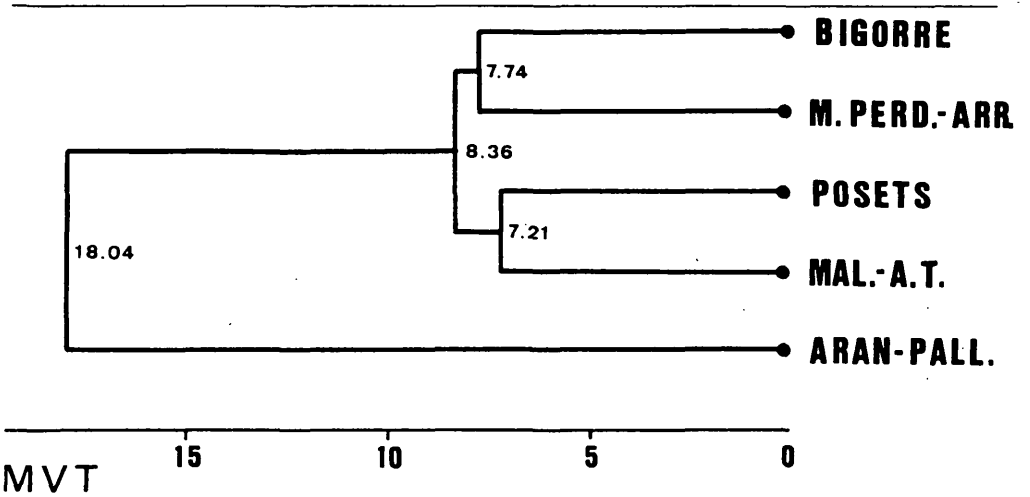


Fig. 2: Five populations of *Lacerta bonnali* clustered by morphological distances (UPGMA method).
Abb. 2: Dendrogramm von fünf Populationen von *Lacerta bonnali* (UPGMA - Methode).

populations in the central Pyrenean mountain areas. This differentiation could result from a feasible scenario of the post-pleistocene climatic conditions (climatic amelioration and subsequent displacement of vegetational belts and their associated faunas in the mountains).

The strong differentiation of the Aràn-Pallars populations could be interpreted as an ancient isolation from the central Pyrenean ones.

Despite this high degree of differentiation (nearest "central Pyrenean populations" separated by the Garona River - 24 km distance - morphological distance = 18.18), I prefer to treat these easternmost populations just as a subspecies of *L. bonnali*, because the two forms share too many significant characters (open clavicles, presence of an anterodistal process of the postfrontal bone, spiny hemipenial microornamentation) to be regarded as different species.

Detailed osteological studies are in process now, and more investigations are needed in order to ascertain the relationship within the strongly divergent *Archaeolacerta* of the Pyrenees.

TAXONOMIC CONCLUSIONS

Lacerta bonnali aranica ssp. nov.

D i a g n o s i s: A *L. bonnali* with short head, limbs and tail. Dorsum with two paravertebral stripes (80 % of males, 60 % of females), belly usually spotted in males (90%), frequently in females (30%). Rarely blue spots in the outermost ventral scales.

Low values of Dorsalia, Ventralia and Femoralia. Almost always a peculiar disposition of three big scales (Masseteric, Tympanic and a wedge-shaped intermediate scale) in the temporal area (analogue to *L. mixta*). For different disposition of the scales of the temporal region in *L. b. bonnali* and *L. b. aranica* see figures 4 - 7.

H o l o t y p e: Male. OA 92081007. Coll de Barradós, Viella, Vall d'Aràn. Lleida, Spain. 10-8-1992. 2300 m. O. ARRIBAS leg. (fig. 3).

P a r a t y p e s: [M = male, F = female] (6 M, 2 F, 1 pull.) OA 890701-10, Coll de Barradós, Vall d'Aràn, Lleida, Spain, 1-7-1989, 2200-2300 m, O. ARRIBAS leg.; (10 M, 3 F, 1 pull.) OA 89091801-14, Serra de Guarbes, Vall d'Aràn, Lleida, Spain, 18-9-1989, 2100-2400 m, O. ARRIBAS leg.; (3 M, 3 F, 3 pull.) OA 91062901-09, Serra de Guarbes, Vall d'Aràn, Lleida, Spain, 29-6-91, 2200 m, O. ARRIBAS leg.; (4 M, 3 F) OA

Fig. 3: *Lacerta bonnali aranica* ssp. nov., Holotype.
Abb. 3: *Lacerta bonnali aranica* ssp. nov., Holotypus.

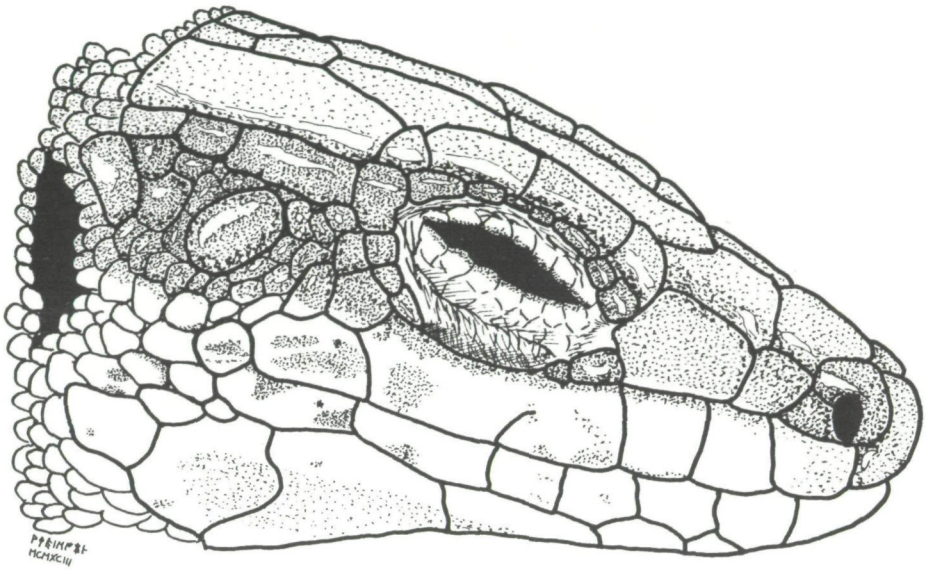


Fig. 4: *Lacerta bonnali bonnali* LANTZ, 1927. Male from Lac Bleu de Bigorre (Hautes Pyrénées). Lateral view of head.

Abb. 4: *Lacerta bonnali bonnali* LANTZ, 1927. Männchen von Lac Bleu de Bigorre (Hautes Pyrénées). Lateralansicht des Kopfes.

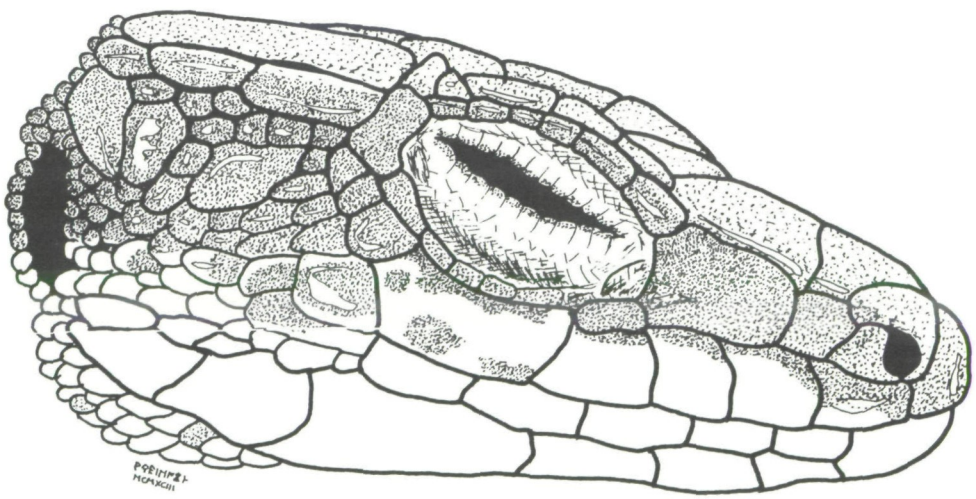


Fig. 5: *Lacerta bonnali bonnali* LANTZ, 1927. Male from Vall del Clot (Posets, Huesca). Lateral view of head.

Abb. 5: *Lacerta bonnali bonnali* LANTZ, 1927. Männchen von Vall del Clot (Posets, Huesca). Lateralansicht des Kopfes.

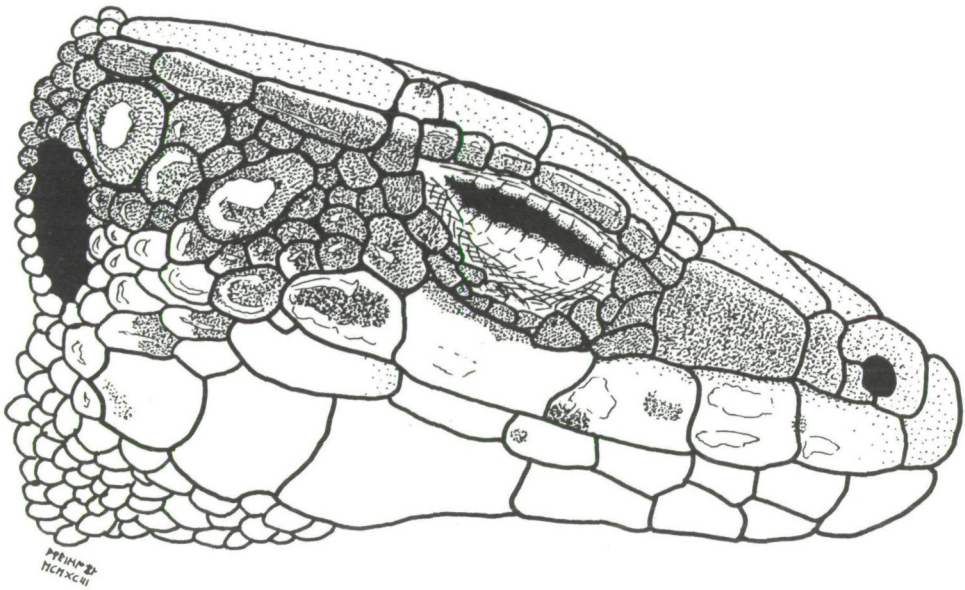


Fig. 6: *Lacerta bonnali bonnali* LANTZ, 1927. Female from Gran Encantat (St. Maurici-Aigüestortes National Park, Lleida). Lateral view of head.

Abb. 6: *Lacerta bonnali bonnali* LANTZ, 1927. Weibchen von Gran Encantat (St. Maurici-Aigüestortes Nationalpark, Lleida). Lateralansicht des Kopfes.

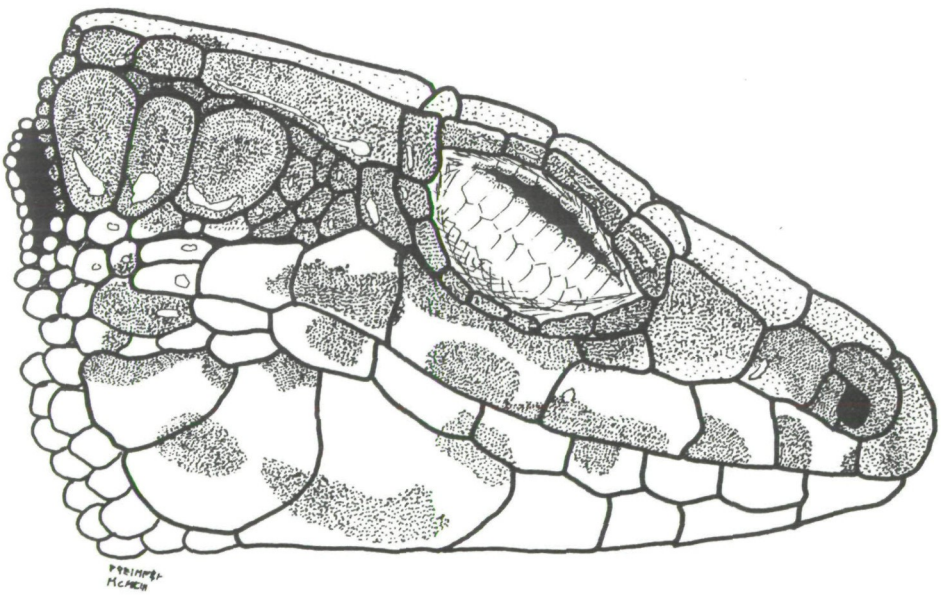


Fig. 7: *Lacerta bonnali aranica* ssp. nov. Male from Coll de Barradós (Vall d'Aràn, Lleida). Paratype (Inv. no. OA 89091814). Lateral view of head.

Abb. 7: *Lacerta bonnali aranica* ssp. nov. Männchen von Coll de Barradós (Vall d'Aràn, Lleida). Paratypus (Inv. Nr. OA 89091814). Lateralansicht des Kopfes.

91081201-07, Serra d'Armeros, Vall d'Aràn, Lleida, Spain, 12-8-1991, 2200-2300 m, O. ARRIBAS leg.; (7 M, 6 F, 3 pull.) OA 92062901-16, Serra de Guarbes, Vall d'Aràn, Lleida, Spain, 29-5-1992, 2300-2400 m, O. ARRIBAS leg.; (3 M, 7 F) OA 92070101-10, Serra de Guarbes, Vall d'Aràn, Lleida, Spain, 1-7-1992, 2200-2300 m, O. ARRIBAS leg.; (4 M, 11 F, 5 pull.) OA 92081001-20, Coll de Barradós, Vall d'Aràn, Lleida, Spain, 10-8-1992, 2100-2300 m, O. ARRIBAS leg.; (4 M, 5 F, 4 pull.) OA 92091101-13, Serra de Guarbes, Vall d'Aràn, Lleida, Spain, 11-9-1992, 2000-2300 m, O. ARRIBAS leg.; (1 M, 6 F, 6 pull.) OA 92091201-13, Port d'Orlà, Lleida-Ariège, Spain-France, 12-9-1992, 2200-2350 m, O. ARRIBAS leg.; (9 F, 3 pull.) OA 93062601-12, Serra d'Armeros, Vall d'Aràn, Lleida, Spain, 26-6-1993, 2200-2300 m, O. ARRIBAS leg.; (2 M, 1 F) OA 93080801-03, Gran Tuc de Maubermé, Lleida, Spain, 8-8-1993, O. ARRIBAS leg.

Holotype and paratypes are in the author's scientific collection. Additional paratypes, all collected by O. ARRIBAS (1 M, 1 F - Coll de Barradós, 11-9-1992; 1 M, 1 F - Serra de Guarbes, 29-5-1992; 6 pull. born in captivity, from parents of Serra de Guarbes) are deposited in the Naturhistorisches Museum Wien (Vienna) (NMW 33171: 1-10).

Description of the Holotype: Snout-Vent length: 57.2 mm. Forelimb length: 19.4 mm. Hindlimb length: 30.6 mm. Length of 4th digit: 8.5 mm. Length of unregenerated tail: 101 mm. Height of head: 6.3 mm. Head length: 13.3 mm. Pileus length: 12.9 mm. Pileus width: 6.8 mm. Parietal length: 4 mm. Length of first Supratemporal: 1.9 mm. 3/3 Supratemporals. 1/1 Masseteric. 1/1 big wedge-shaped scale between Masseteric and Tympanic. Masseteric diameter: 2.3 mm. Tympanic diameter: 1.5x0.9 mm. Length of anal plate: 2.8 mm. Width of anal plate: 5 mm. Supraocularia: 4/5. Supraciliar granulae: 4/4. Supraciliar scales: 6/6. Postnasalia: 1/1. Loreal scales: 2/2. Supralabials before the Subocular: 4/4. Supralabials after Subocular: 2/2. Sublabials: 5/5. Submaxillars: 5/5. Gularia: 21. Collaria: 10. Longitudinal rows of Dorsalia: 40. Transversal rows of Ventralia: 22. Femoral pores: 13/13. Lamellae underneath 4th toe: 25. Number of scales around 6th caudal ring: 20. Interfemoralia: 5. Praeanalia: 2. Circumanalia: 7. Full contact between Rostral and Internasal, first Postocular and Parietal as well as Supranasal and Loreal, respectively.

Colour and pattern: Two well developed paravertebral rows of dots. Background colour brownish-gray, dark. Clear dorsolateral stripes slightly marked in the first half of the body. Temporal bands very dark brown, almost black. Isolated black dots in the dark subtemporal stripe. Pileus with medium sized black dots. Belly and breast white (in life), with moderately developed black dots in the six rows of ventrals (in the two medial rows only in the belly region, in the external rows along all of their length).

Derivatio nominis: "*aranica*" refers to an inhabitant of Aràn, an Occitane valley that constitutes the only Spanish territory in the northern slopes of the Pyrenees.

Paratype variability: See Aràn-Pallars population (table 1). Usually with paravertebral rows of dots (80% of males, 60% of females) (rarer in *L. bonnali bonnali*, especially in females). Dorsum grayish-brown, rarely (12%) malaquite green coloured. Belly and breast white, usually spotted (84% of males, 30% of females) (spots are less developed in *L. bonnali bonnali*, almost absent in females). Males show rarely little blue spots in the outer ventrals (10%) (absent in *L. bonnali bonnali*).

Distribution: From the north Aràn mountains to the Mont Vallier Massif.

ACKNOWLEDGEMENTS

I want to express my thanks to J. GARCIA and S. PLA for field support, and to Mr. & Mrs. J. RUIZ and V. GUISANDE for help in manuscript preparation.

The studies of Pyrenean lizards have been performed under support of the Generalitat de Catalunya and Diputación General de Aragón which gave the permissions for scientific capture.

REFERENCES

ARRIBAS, O. J. (1993): Estatus específico para *Lacerta (Archaeolacerta) monticola bonnali* LANTZ, 1927.- Bol. R. Soc. Esp. Hist. Nat. (Secc. Biol.), Madrid; 90 (1-4): 101-112.

ARRIBAS, O. (in press): Una nueva especie de lagurtijade los Pirineos Orientales: *Lacerta (Archaeolacerta) aurelioi* sp. nov. (Reptilia, Lacertidae).- Boll. Mus. reg. Sci. Nat. Torino.

CUADRAS, C. M. (1981): Métodos de Análisis Multivariante. Barcelona (Ed. Eunibar).

EISELT, J. & SCHMIDTLER, J. F. (1986): Der *Lacerta danfordi* - Komplex (Reptilia: Lacertidae).- Spixiana, München; 3 (3): 289-328.

LANTZ, L. A. (1927): Quelques observations nouvelles sur l'herpétologie des Pyrénées centrales.- Rev. Hist. Nat. Appl., París; 8: 54-61.

LANZA, B. (1963): Note erpetologiche sulla zona del Lac Bleu di Bagnères de Bigorre (Hautes-Pyrénées).- Vie et Milieu, Paris; 14 (3): 629-639.

MARTINEZ RICA, J. P. (1977): Observaciones ecológicas de *Lacerta monticola bonnali* LANTZ en el Pirineo español.- Publ. Centr. Biol. Exp., Jaca; 8: 103-122.

PEREZ MELLADO, V. & BARBADILLO, L. J. & BARAHONA, F. & BROWN, R. P. & CORTI, C. & GUERRERO, F. & LANZA, B. (1993): A systematic survey of the Iberian rock lizard *Lacerta monticola* BOULENGER, 1905. In: VALAKOS, E. & BÖHME, W. & PEREZ MELLADO, V. & MARAGOU, P. (eds.): Lacertids of the Mediterranean Region: pp. 85-105.

SCHMIDTLER, J. F. (1983): Verbreitung, Ökologie und innerartliche Gliederung von *Triturus vulgaris* in den adriatischen Küstengebieten (Amphibia, Salamandridae). Spixiana, München; 6: 229-249.

SCHMIDTLER, J. F. (1986a): Orientalische Smaragdeidechsen: 1. Zur Systematik und Verbreitung von *Lacerta viridis* in der Türkei (Sauria, Lacertidae).- Salamandra, Bonn; 22 (1): 29-46.

SCHMIDTLER, J. F. (1986b): Orientalische Smaragdeidechsen: 2. Über Systematik und Synökologie von *L. trilineata, L. media* und *L. pamphylica* (Sauria, Lacertidae).- Salamandra, Bonn; 22 (2/3): 126-146.

SCHMIDTLER, J. F. (1986c): Orientalische Smaragdeidechsen: 3. Klimaparallele Pholidosevariation.- Salamandra, Bonn; 22 (4): 242-258.

SNEATH, P. H. & SOKAL, R. R. (1973): Numerical Taxonomy; San Francisco (Freeman and company), 573 pp.

DATE OF SUBMISSION: December 9th, 1993

AUTHOR: Dr. Oscar J. ARRIBAS, Ntra. Sra. de Calatañazor 17 B. E-42004 Soria, Spain.