

ECOLOGICAL ASPECTS ON LIZARD POPULATIONS FROM OBCINELE BUCOVINEI (SUCEAVA)

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Abstract. This paper aims to present several observations upon Ocinele Bucovinei's reptile populations as a part of the biodiversity of this region. We captured, marked during 2004 (June, August, September) 5-6 viviparous lizards (*Zootoca vivipara*), 4-5 sand-lizards (*Lacerta agilis*) and 6 slow worms (*Anguis fragilis*) which we subsequently freed. The specimen belonged to two biotopes, the first one measuring 3-4 ha and the second one of 2,7 ha.

The reptiles were found in the mountain pastures and meadows and at the edge of the forests.

We have identified their gender and we have measured morphometric characters (parameters and color pattern), weight, their body temperature and the habitat temperature.

Key words: lizard, morphometry, biological aspects; Mountain area- Obcinele Bucovinei.

INTRODUCTION

Herpetological studies applied in Obcinele Bucovinei are very important because there is poor research of herpeto-fauna and biodiversity and conservation, which can be used in monitoring programmes of reptiles and their habitats. The study of the ecological aspects is absolutely necessary for understanding ecology species. Previous studies on this subject neglected the region of Obcinele Bucovinei. In this study, we intend to analyze the lizard's morphometry from Obcinele Bucovinei: weight variation, body variation, temperature and the habitats during the summer time for two lizards populations (the Sand-lizard and Viviparous lizard).

MATERIALS AND METHODS

Materials for this study consist of 107 lizards, belonging to three species: 56 *Zootoca vivipara* (Viviparous lizard)- 19 females and 36 males; 45 *Lacerta agilis*- Sandlizard- 25 females and 19 males; 6 *Anguis fragilis*- Slow Worm.

For the first two species (*Zootoca vivipara* and *Lacerta agilis*), we have analyzed the variation of morphological variables: total body length; body length; tail length; pileus length; pileus breadth, head height, posterior foot length; anal plate length; anal plate breadth.

Statistical parameters have been measured for these biometrical variables (Varvara et al., 2001): mean, standard error, middle, mod, standard deviation, variance, amplitude, minimal; values, maximal values, the confidence interval 95 %.

We have captured lizards by hand and by using a special stick- *juvat* (Ion I., 1996). We have measured every lizard (Valenciuc & Ion, 1981), by making marks, recording the body and the habitat temperature of the body.

The study area is located on the Moldovita Valley (Barbu & Ionesi, 1987) at 6 km distance North from Moldovita River in a large geographical site called Obcinele Bucovinei. Moldovita River flows into Moldova River.

The lizards have been captured in June, August and September 2004 in two biotopes. 1. Biotope (Habitat) A situated at 800 m altitude, on the right side of the Putna-Sacries Stream. The surface of the biotope is about 3,4 ha and it consists of a spruce meadow at the edge of the forest. In this area there are a small wooden building and a little marsh. 2. Biotope (Habitat) B is situated at 1 km distance from the habitat A; it has a surface of 2,7 ha, with meadow, a few ant hills and a stony ground.

Herpetofauna from Obcinele Bucovinei comprises the following species: amphibians: *Triturus alpestris* (Alpine Newt), *Triturus montandoni* (Montandon's Newt); *Triturus cristatus* (Crested Newt), *Triturus vulgaris* (Smooth Newt); *Salamandra salamandra* (Fire Salamander); *Bombina variegata* (Yellow bellied Toad); *Bufo bufo* (Common Toad); *Rana temporaria* (Grass Frog); *Hyla arborea* (Free Frog); reptiles: *Lacerta agilis* (Sand Lizard); *Zootoca vivipara* (Viviparous lizard); *Anguis fragilis* (Slow Worm); *Vipera berus* (Adder); *Natrix natrix* (Grass Snake) and *Coronella austriaca* (Smooth Snake) (Ion I, 1996).

RESULTS AND DISCUSSIONS

We have evaluated the relative frequent presence of all captured lizards (107), that belong to three species and we have found the following values: *Lacerta agilis* 42%; *Zootoca vivipara*, 53%; *Anguis fragilis* 5 %.

Estimating their occurrence we have found that *Lacerta agilis* and *Zootoca vivipara* are eu-dominants and *Anguis fragilis* is dominant.

Analyzing the body length and the body weight, both females and males at *Lacerta agilis* and *Zootoca vivipara* (Figure 1-4) we could observe that the total body length of *Lacerta agilis* (Table 1) is greater than the males' and most individuals measure 15-20 cm. For the same species, both males and female individuals measure weight, 10-15 gr. The male's weight is generally greater than of females. In June we have captured some pregnant females with a greater body-mass than of the male individuals.

At the *Zootoca vivipara*, most male individuals measure between 12 and 15 cm, and the length of the females vary highly.

For these species the limits of the length variation are not much different between females and males (Table 2).

The females' weight is 3-4.5 g, and for the 60% of males is 4.5-5 g weight. A few exemplars have 5.0-7.0 gr.

Table 1. The statistical parameters values for biometrical variables of the *Lacerta agilis*

	Tot.	L.	Cd.	L.p.	Lt.p.	l.c.	P.a.	P.p.	L.p.a.	Lt.p.a.
Mean	17.68	7.42	10.2	1.44	0.8	0.65	2.27	3.23	0.62	0.32
Standard Error	0.52	0.25	0.42	0.04	0.03	0.04	0.05	0.07	0.03	0.01
Median	18	7.3	10.2	1.5	0.8	0.6	2.4	3.2	0.6	0.3
Mod	18	7	13	1.5	0.7	0.5	2.5	3.2	0.5	0.3
Standard Deviation	3.5	1.7	2.85	0.31	0.2	0.27	0.37	0.5	0.2	0.1
Variance	12.28	2.9	8.16	0.1	0.04	0.07	0.14	0.2	0.04	0.01
Amplitude	13	11.4	12.8	1.5	1.4	1.6	1.9	2.4	0.9	0.38
Minim	8	2.8	3.2	0.5	0.4	0.2	1	1.6	0.2	0.12
Maxim	24	14.2	16	2	1.8	1.8	2.9	4	1.1	0.5
Confidence Interval (95%)	1.05	0.51	0.85	0.09	0.06	0.08	0.11	0.15	0.06	0.03

Legend: Tot- total body length; L.- body length; C.d.- tail length; L.p.- pileus length; Lt. p.- piles breath; l.c.- head high; P.a.- the anterior foot length; P.p.- the posterior length foot; L.p.a.- anal plate lenbth; Lt.p.a.- anal plate breath.

Table 2. The statistical parameters values for biometrical variables of the *Zootoca vivipara*

	Tot.	L.	Cd.	L.p.	Lt.p.	l.c.	P.a.	P.p.	L.p.a.	Lt.p.a.
Mean	12.52	5.01	7.5	1.02	0.59	0.46	1.59	2.19	0.46	0.29
Standard Error	0.21	0.07	0.2	0.01	0.01	0.01	0.02	0.02	0.01	0.01
Median	12.6	5	7.65	1	0.6	0.5	1.6	2.2	0.5	0.3
Mod	11.5	5	7	1	0.6	0.5	1.6	2.3	0.5	0.3
Standard Deviation	1.57	0.56	1.5	0.09	0.09	0.11	0.15	0.2	0.11	0.08
Variance	2.47	0.31	2.2	0.008	0.009	0.01	0.02	0.04	0.01	0.007
Amplitude	7.2	2.4	8.2	0.5	0.5	0.42	0.9	1.1	0.4	0.28
Minim	8	3.9	2	0.7	0.4	0.28	1.2	1.5	0.2	0.12
Maxim	15.2	6.3	10.2	1.2	0.9	0.7	2.1	2.6	0.6	0.4
Confidence Interval (95%)	0.42	0.15	0.4	0.02	0.02	0.03	0.04	0.05	0.03	0.02

Legend: Tot- total body length; L.- body length; C.d.- tail length; L.p.- pileus length; Lt. p.- piles breath; l.c.- head high; P.a.- the anterior foot length; P.p.- the posterior length foot; L.p.a.- anal plate lenbth; Lt.p.a.- anal plate breath.

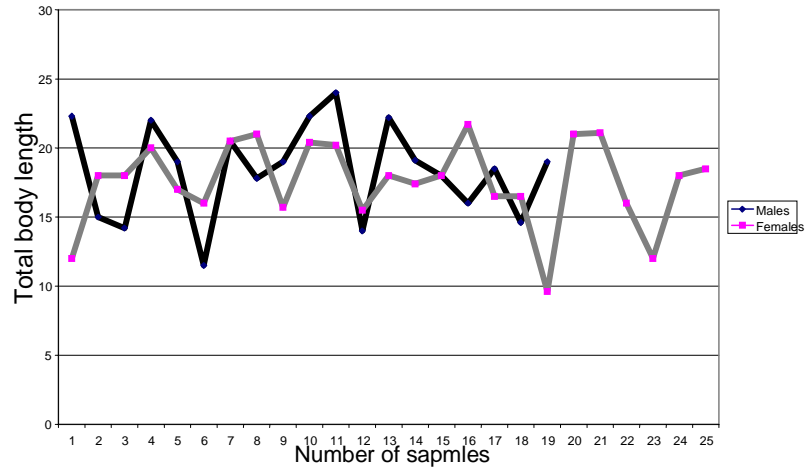


Figure 1. Body length variation at the female and male *Lacerta agilis*

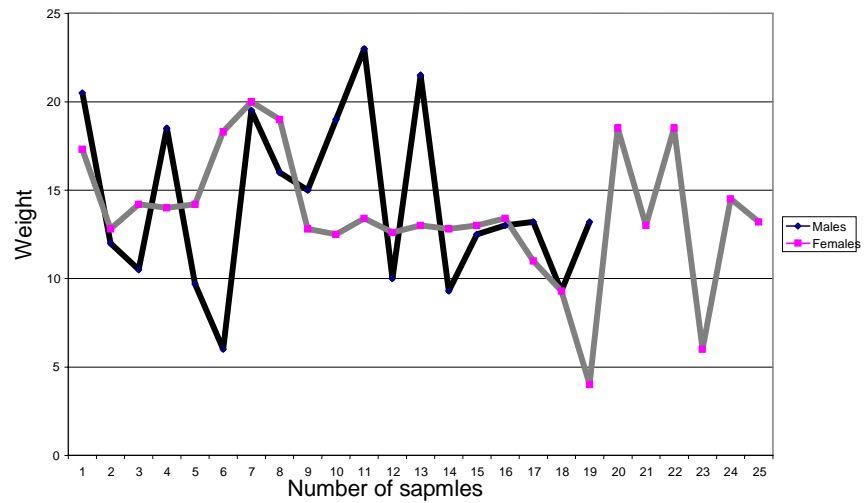


Figure 2. Weight variation at the male and female *Lacerta agilis*

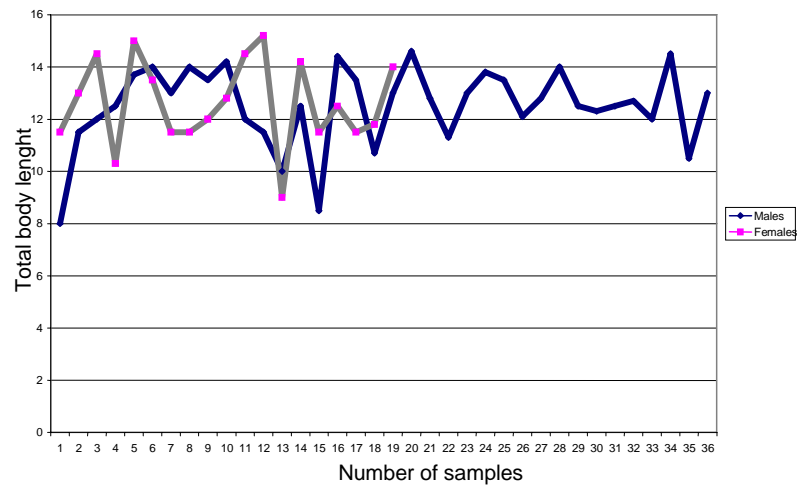


Figure 3. Body length variation of the *Zootoca vivipara*

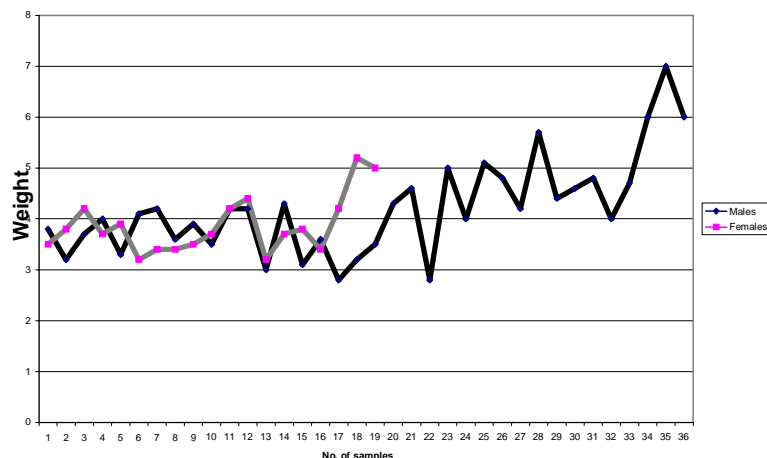


Figure 4. Weight variation of male and female *Zootoca vivipara*

Our results are very similar to the biometrical dates obtained by Fuhn and Vancea, 1961 (Table 3).

Table 3. Comparison between personal results and those found in the scientific literature concerning metric characteristics

Mean		<i>Lacerta agilis</i>				<i>Zootoca vivipara</i>			
		Males		Females		Males		Females	
		P	R	P	R	P	R	P	R
BIOMETRY	L.	7.56	7.17	7.43	7.75	5.01	4.75	5.07	5.3
	Cd.	10.63	11.9	10.12	11.54	7.49	7.5	7.54	6.45
	L.p.	1.52	1.85	1.4	1.65	1.02	1.05	1.01	1.09
	Lt. p.	0.82	1.38	0.79	1.2	0.4	0.75	0.6	0.76
	I.c.	0.67	1.28	0.64	1.13	0.46	0.95	0.46	0.62
	P.a.	2.37	1.95	2.24	2.87	1.6	1.4	1.6	1.34
	P.p.	3.42	2.88	3.14	2.87	2.2	2.01	2.21	1.9

Legend: P- Personal results, R- Results from literature

The temperature conditions during the summer 2004 were variable and we could register the minimum and maximum temperature values in June, August, September (Table 4).

Table 4. The temperature values during the three month period of observation (2004)

Maxim temperature		Minim Temperature	
July	26.6 °C	July °C	19,7 °C
August	25 °C	August °C	17,5 °C
September	24.2 °C	September °C	16 °C

In correlation to the habitat temperature we have also recorded the body temperatures of every captured lizard (Figure 5 and Figure 6).

There were high thermal fluctuations and precipitations during our observation period.

The body temperature at both studied species was greater than their habitat temperature.

The lizard's thermoregulation depends on the environmental conditions (Herczy et al., 2004) but as general rule is greater than the outside temperature with a few degrees due to the internal metabolism. Our observations on these lizards' behavior showed that many individuals of Sand Lizards were captured near the small wooden building, on the wooden ground, in the sunlit slopes, the body color matching that of

the habitat (Olsson M., 1994). Viviparous Lizards prefers damp and warm habitats, meadows, shady places near heavy rocks.

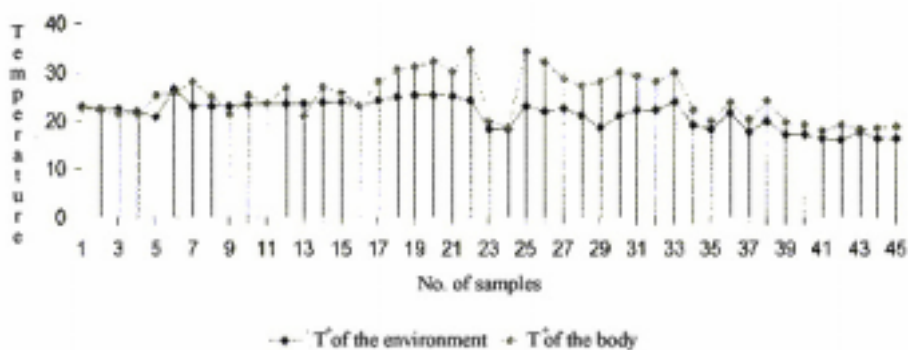


Figure 6. Body and habitat temperature variations at the *Lacerta agilis* species

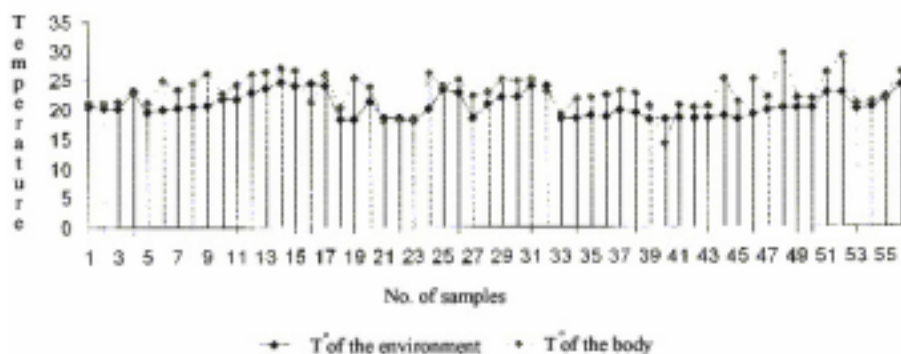


Figure 7. Body and habitat temperature variations at the *Zootoca vivipara* species

CONCLUSIONS

These observations are preliminary and the future studies have the legacy to discover more information on the life of the herpeto-fauna.

We consider that the individual marking method is efficient in order to estimate the living conditions and the behavior of the species.

Correlation showed there are many similarities between our results and other findings of research undertaken in this field

The individuals belonging to the two lizard specimen (*Lacerta agilis* and *Zootoca vivipara*) are highly significant since their anthropic influence is reduced.

The body temperature is very similar to the habitat temperature and the lizard's behavior of searching food depends on the environment conditions.

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