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Notes on the hatching phases and the size of the juveniles in the Snake-eyed skink *Ablepharus kitaibelii* (Bibron & Bory de Saint-Vincent, 1833)

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Abstract: *The studies dealing with the Snake-eyed skink (Ablepharus kitaibelii (Bibron & Bory de Saint-Vincent, 1833)) treat predominantly aspects of the distribution and taxonomy of the species. In the present study we provide information concerning the mechanism of hatching in the Snake-eyed skink and the dimensions of hatched specimens. We collected data from wild animals, as well as from indoor incubated juveniles. The present study provides first data on the weight of newly hatched juveniles of the species and discuss on potential misleading data concerning the size of the juveniles in A. kitaibelii.*

Keywords: *egg shell rupture, lizard, morphometrics*

Introduction

Most of the studies on the Snake-eyed lizard (*Ablepharus kitaibelii* (Bibron & Bory de Saint-Vincent, 1833)) are focused on the distribution and the taxonomy of the species. Data concerning the biology and ecology of the species are rather scarce [see 1]. According to [2], the lizards mate in April and May and deposit their eggs in loose soils in the period from the start of July to the end of August. The Snake-eyed skinks reach sexual maturity in the beginning of the third year [2] and there is no external sex dimorphism in coloration [1]. In his work [2], the author provided data concerning the size of the eggs in *A. kitaibelii*, as well as the size and the development of the embryos and the hatched

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specimens. The same study described the mating mechanism in captured specimens. According to [2], the duration of the copulation was between 30 and 60 seconds. Fragmented data concerning the reproduction of the Snake-eyed skink and the size and number of the eggs is provided by [3], [4], [5], [6], [7]. To date there is no information concerning the hatching process and the weight of the hatched individuals.

Material and Methods

We captured young specimens during the summer months in a period of four year (2010–2013). After photo documentation and recording of the size and the weight, the animals were released at the site of capture. For indoor incubation, we collected the eggs (n = 32) laid by female lizards living in captivity (Figure 1a) and the incubation itself occurred at room temperature (between 23 and 26° C). The floor of the containers (with volume of 150 ml) used for egg incubation was covered with a layer of loose soil. The eggs were buried in the upper layer of the soil (Figure 1b). The upper layer was kept constantly moist. The indoor incubation was very successful and most of the collected eggs developed to hatching of young animals. Every juvenile was measured and weighted within the first 48 hours after hatchling.

The weight of the juveniles was measured by using an electronic weighting scale MXX-123 (Denver Instrument, NY, USA) with accuracy of 0,001 g. The total number of weighted juveniles was 32 and they were offspring of lizards from eight localities in Bulgaria (see Table 1). The UTM grid squares 10×10 km of the localities are given in brackets. The hatched specimens (n = 20) were from Belovets village (MJ45), Pchelin village (MH84), and the tourist road Brodilovo-Ahtopol (NG75). Wild captured juveniles (n = 12) were from Sredna Gora Mountains, NW of Poibrene village (GN41), Osogovo Mountains, near Pelatikovo village (FM47), near Fakia village (NG07), Zemen town (FN40), and above Pancharevo, Sofia (FN91).

The total number of measured juveniles was 28 from seven Bulgarian localities (see Table 1). The snouth-vent length (Lcor) was measured with a plastic ruler from the tip of the rostrum to the posterior end of the cloacal scales. Some of the specimens (those from Pchelin) were measured with an electronic caliper for greater accuracy. Statistical procedures were performed with STATISTICA 10 [8].

Results and Discussion

Table 1. Descriptive statistics of the weights and body lengths (Lcor) of captured young lizards (wild) and newly hatched specimens with their localities. The asterisks (*) indicate the newly hatched lizards in captivity. n – number of individuals; Mean ± Std. Dev. (Min. - Max.).

Locality	Weight (g)	Lcor (mm)
Belovets*	n = 6; 0,12 ± 0,01 (0,10 - 0,14)	n = 3; 19,43 ± 0,51 (19,00 - 20,00)
Pchelin*	n = 6; 0,14 ± 0,02 (0,11 - 0,16)	n = 6; 20,13 ± 0,74 (18,74 - 20,73)
Pancharevo	n = 2; 0,19 ± 0,04 (0,16 - 0,22)	n = 2; (22,00 - 24,00)
Zemen	n = 7; 0,17 ± 0,03 (0,13 - 0,23)	n = 7; 23,36 ± 1,33 (22,00 - 25,30)
Fakia	n = 1; 0,19	n = 1; 24,00
Osogovo	n = 1; 0,16	–
Sredna Gora	n = 1; 0,20	n = 1; 24,00
Brodilovo-Ahtopol*	n = 8; 0,12 ± 0,02 (0,09 - 0,14)	n = 8; 20,19 ± 0,79 (19,50 - 22,00)

Table 2. Descriptive statistics of the weights and body lengths (Lcor) in captured juveniles (wild) and newly hatched specimens. n - number of individuals; Mean ± Std. Dev. (Min. - Max.).

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Juveniles	Weight (g)	Lcor (mm)
newly hatched	*n* = 20; 0,13 ± 0,02 (0,09 - 0,16)	*n* = 17; 20,03 ± 0,75 (18,74 - 22,00)
Wild	*n* = 12; 0,18 ± 0,03 (0,13 - 0,23)	*n* = 11; 23,41 ± 1,17 (22,00 - 25,30)
Total	*n* = 32; 0,15 ± 0,03 (0,09 - 0,23)	*n* = 28; 21,36 ± 1,91 (18,74 - 25,30)

The hatching of the juveniles occurred rather fast and can be generally divided in three phases. Initially, the young animal ruptured the egg shell with the rostrum of the snout and the head was protracted immediately outside the margins of the egg. In the following phase, the juvenile inspected the environment (Figure 1c). We observed that in case of potential danger, the juvenile could retract its head back in the shell. The duration of that "orientation" phase was between 0,5–2 min. In the next phase the juvenile lizard left the shell and attempted to find a hiding place.

The lightest newly hatched specimen was with a weight of 0,09 g and the heaviest was 0,16 g. Among the wild catches, the lightest specimen was 0,13 g and the heaviest was 0,23 g (Table 2). Investigation of the weights of the adult Snake-eyed skinks revealed that the mean weight of the adult females was about 1 g (Vergilov V, unpubl. data). Having in mind the fact that the females in *A. kitaibelii* produce between 2 and 5 eggs [3], [5], [6], [7], this should result in gain of body weight in females before egg deposition.

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Figure 1. a – egg deposition from a female *A. kitaibelii*; b – indoor egg incubation in plastic containers; c – hatching of a juvenile *A. kitaibelii* (after the phase of egg-shell rupture, the animal protruded the head outside the egg shell, but was still within the egg).

The smallest hatched specimen in our study was with measures of Lcor = 18,74 mm, and the longest was with Lcor = 22,00 mm. The smallest wild captured juvenile was measured Lcor = 22,00 mm and the longest was with Lcor = 25,30 mm. Actually, the lightest specimen was with a weight of 0,09 g, but with length Lcor = 20 mm, whereas the smallest specimen (Lcor = 18,74) was heavier (0,11 g). The statistically significant correlation of the weight and the body length of the juveniles is presented on Fig. 2, where $p < 0{,}001$ and $r = 0{,}69$.

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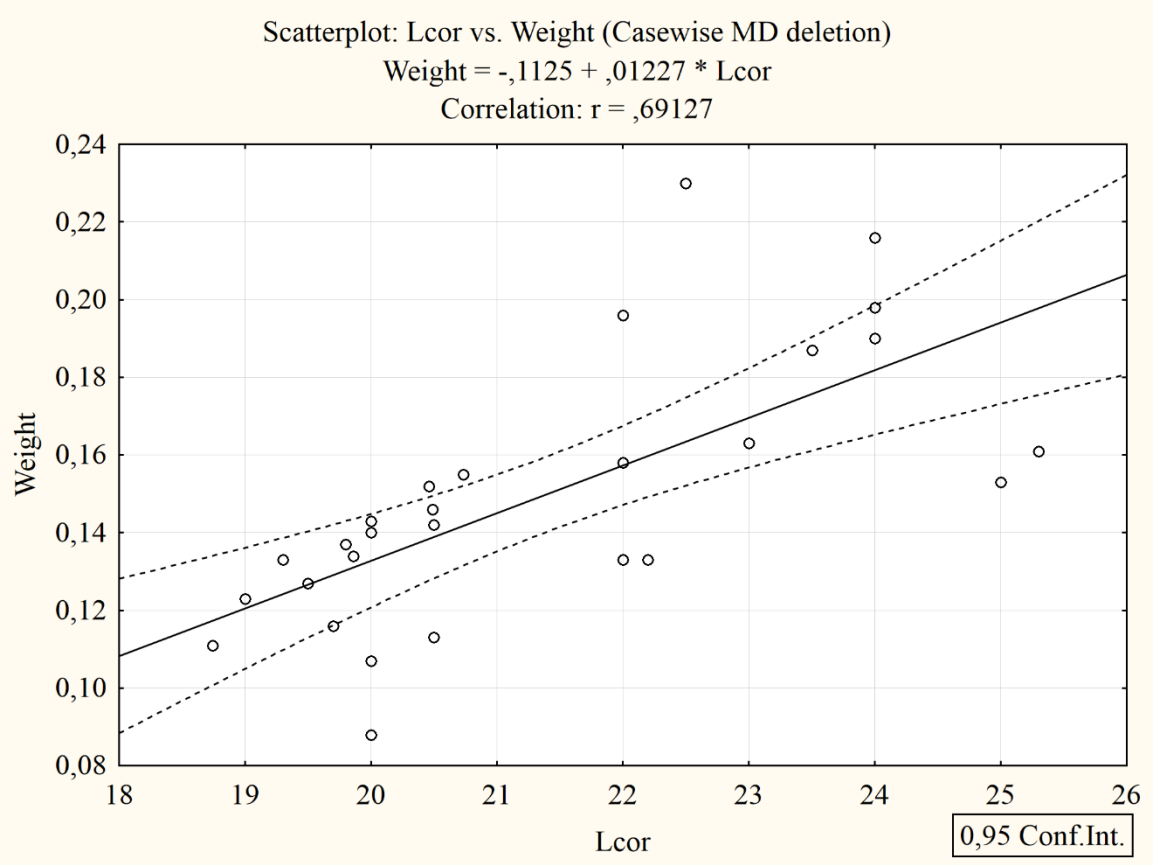

Figure 2. Correlation of the weight and the body length (Lcor) in all juvenile specimens.

In their work [9] reported that the smallest mature female specimen had a body length of Lcor = 32,10 mm. The data are confusing, because [2] reported that the juveniles in *A. kitaibelii* hatch with a length of about 33 mm. Our data are also inconsistent to those presented by [2]. We propose that the data in [2] are most probably a result of an error.

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