Anomalies of Gonads in *Bufo viridis* from Uzbekistan

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Abstract.- Collected material of *Bufo viridis* inhabiting the Ferghana Valley, the city of Tashkent, Tashkent and Dzhizak regions of Uzbekistan in 1971, 1972, and 1992-1993 has revealed cases of hermaphroditism (0.8%) and anomalies (7.4%) in the gonads of male toads from areas with different levels of urbanization.

Key words: Amphibia, Anura, Bufonidae, Ranidae, *Bufo viridis*, *Rana ridibunda*, Uzbekistan, gonads, hermaphroditism.

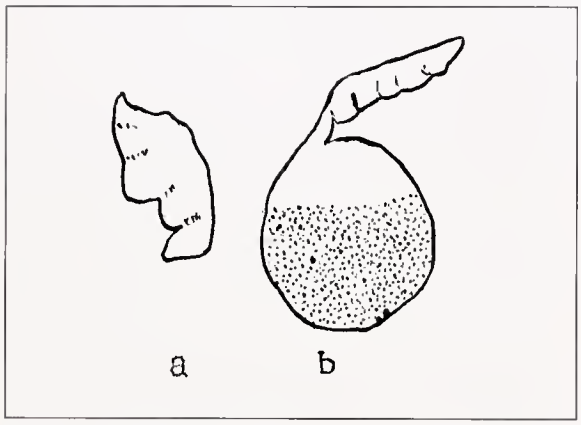

Figure 1. Underdeveloped ovary (a) and testis (b) in a hermaphrodite *Bufo viridis*.

Introduction

There is not much evidence in the literature, at least in the former USSR, of cases of hermaphroditism and anomalies in the inner organs of reptiles and amphibians. Terentyev (1950) reported the anomalies of the gonads in various frog species, which were recorded by other researchers. Yakovleva (1964) observed a combination of male and female sexual organs in *Vipera ursini* from the vicinity of the city of Frunze (currently Bishkek), Kyrgyzstan. Brushko (1968) and Radzhabov (1975(described cases of hermaphroditism in *Elaphe dione* and anomalies of the gonads in *Coluber ravergieri* and *Elaphe Dione*.

During the whole period of collection of the material on the ecology of tailless amphibians in Uzbekistan (1971-1995), the authors recorded the individuals of *Bufo viridis* showing anomalies in their gonads.

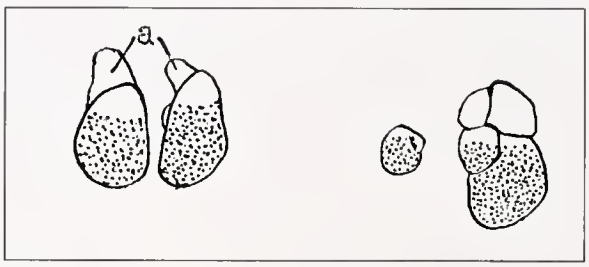

Figure 2. Normal testes (left) and lobular testes (right) of the male *Bufo viridis* (a- appendage).

Materials and Methods

The material was collected in the Ferghana Valley (vicinity of the village Yangikishlak, the foot of Mount Karatash, Lake Aidarkul), Tashkent region (stow Aksakata, the villages Urta-aul and Yangi-Bazar) and in the city of Tashkent, in the span from 1992-1995. The gonads (241 males) were measured (length x width, mm) and weighed (mg). The index of gonads was then calculated as a ratio of the gonad weight to body weight. If some anomalies were observed, the testes were drawn or photographed.

Results and Discussion

While collecting the material, we encountered two individuals of *Bufo viridis* that had testes at one side and underdeveloped ovaries and oviduct at the other (Fig. 1). The testes were well developed, with a high relative index (4.7 and 3.6%).

The testes of the toads are normally oval or spheric, slightly compressed in the direction "back-abdomen" (Fig. 2). Their lower part is often pigmented. There is a small appendix in the upper part.

The anomalies in the testes constituted 7.4% and concerned mainly those in the integrity of the latter

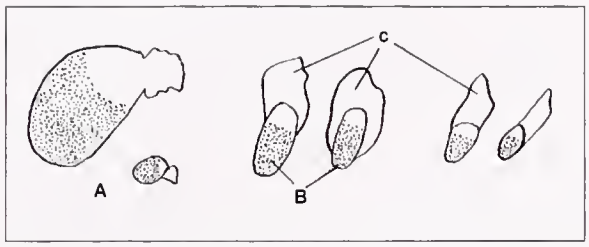

Figure 3. The ratio of the testes (a), testes (b), and appendages (c).

(Fig. 2), when one or both testes consisted of 2-4 in the lobes. In the collection of 1971, there was and individual whose both testes consisted of the lobes: the right lobe measuring 3x2.5; 3x2; 3.5x2.5 mm and the left one 3x2.5; 5x3 mm. The individuals that constituted 4.5% showed gonads significantly different in size (Fig. 3), one testis being bigger than the other (10x5.1 and 4.5x3; 12.5x3 and 7x3.5mm, etc.). In 0.8% of the cases the individuals had only one testis, relatively well developed (9x7 mm and 9x6 mm), and which well corresponded in weight and indices to the testes of the animals with the same sizes. So, two testes of a male, whose body length reached 68.5 mm, weighed 134 mg, and a single testis of a male measuring 67 mm was 176 mg. Besides, there were individuals whose gonad appendices were equal to or bigger than the gonad itself (Fig. 3). So, the length of the right testis was 8 mm and its appendix 7 mm. The length of the left testis was 6.5 mm and its appendix 6 mm.

Noteworthy, similar anomalies of the gonads have been recorded for *Rana ridibunda* from the Ferghana Valley as one testis of an individual was bigger than the other (8.5x4.5 mm and 4.5x2.5 mm); another individual's left testis consisted of three lobes (3x2; 2x1.5; 2x1 mm) and the right one measured 7x4 mm. Besides, the testes of another individual were unusually knobby and consisted of 5-8 lobes.

While analyzing the material collected from different areas, our attention was drawn to the fact that anomalous changes in the male gonads were characteristic of those individuals inhabiting areas with different levels of urbanization of their habitats.

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