THE USE OF AMPHIBIANS AS INDICATORS OF ENVIRONMENTAL HEALTH

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Amphibians are reacting sensitive to environmental perturbations because of their exposure to external factors throughout their development. On the one hand amphibians are first terrestrial vertebrates whose development proceeds in external environment and significantly depends on it. Because of that specimens with abnormalities are always present in amphibian populations. The reasons of their occurrence are variable: toxic effects [1], influence of ultra-violet radiation [2], changes in hormonal background under effect of pollution [3], inbreeding depression connected with natural habitat fragmentation and isolation [4, 5, 6], influence of parasites invasion [7] etc. Anyway, spectrum and frequency of morphological anomalies in amphibian populations are result of interaction of ontogenesis and environment [8, 9]. On the other hand - amphibian have the common anatomic features with higher vertebrates. This fact allows extrapolating negative trends that we found in amphibian populations on the human. These two circumstances and amphibian global decline in modern biosphere [10] attract attention of the researchers to that taxonomic group [11]. The main factors of amphibian disappearance: habitat destruction and chemical pollution [12, 13]. Nevertheless, it has turned out to be difficult to clearly identify the factors that are responsible for the decline of amphibians and these factors seem to differ among different regions in the world [14, 15]. Amphibians have been variously suggested as suitable indicators for environmental health and for changes of the environment [16, 17, 6]. But there is no well-developed methodology for the use of amphibians as indicators of environmental health. The reasons are adaptive changes in populations [18], geographical, geochemical and some other features. The main objective of the study is to test an indicator system for the quality of the environment in urban areas that was developed in the Ural and in Germany. We will use the results to improve existing classifications of developmental deviations and to improve methods for the use of the spectrum and frequency of anomalies as well as changes in population structure in amphibians as indicators of environmental health. The participants of the project have a long-term experience of amphibian teratogenesis study on urbanized, polluted and non-disturbed areas of Eurasia. The theoretic value of the study in understanding the relationship between functional ecology and evolution.

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