Leukocyte blood composition of *Naturix natrix* (Serpentes: Colubridae) in the Mordovian State Nature Reserve (Russia)

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Abstract. The state of the grass snake (*Natrix natrix*) population in the Mordovian State Nature Reserve was assessed using the hematological approach. The leukocyte blood count was estimated together with calculation of the associated leukocyte indices (neutrophil:lymphocyte (N:L), eosinophil:lymphocyte (E:L), heterophil:eosinophil (H/E) and heterophil:lymphocyte (H:L) ratios). The surface area of leukocytes (heterophils, basophils, eosinophils, azurophils, monocytes, and lymphocytes) was measured. The leukocyte blood composition of *Natrix natrix* was characterized by the predominance of agranulocytes, and the granulocyte fraction was 31–37% ($u = 1.99$, $p = 0.04$). The population pattern of the leukocyte blood composition of *Natrix natrix* was as follows: heterophils – 8.07±0.6%, basophils – 12.33±0.95%, eosinophils – 8.33±0.65%, azurophils – 5.25±0.53%, monocytes – 9.77±0.42%, and lymphocytes – 56.22±1.7%. According to the averaged area, the leukocytes were arranged in the following order: eosinophils – monocytes – azurophils, basophils – heterophils – lymphocytes. The diameter of the largest cells (eosinophils) was (17.5±2.42) μm. The smallest lymphocytes had diameters within (7.22±1.21) μm. The absence of any differences in the quantitative content of all types of granulocytes and agranulocytes in the blood of the grass snake from different parts of the reserve indicated a comparable level of impact and the identity of the physiological mechanisms of adaptation that occur in the body of animals in protected habitat conditions. Most of the leukocyte integral indices revealed the same type of variability in the parameters of the white blood cell system of the *Natrix natrix* in three areas of the reserve, with the exception of an increased value of the heterophiles/lymphocytes ratio in the sample from the village Pushta. The increase in this indicator made it possible to draw a conclusion about the stress effect on the individuals of this sample. The principal component method was used to differentiate the samples of the grass snake with a more complete quantitative description of the leukocyte composition of the objects of study; the results obtained are presented in a visual, integrated and generalized form. The use of the principal component method made it possible to combine samples of *Natrix natrix* with similar indicators of leukocyte composition, as well as to identify a population of *Natrix natrix* that differs in its indicators in the urbanized territory of the Samara region. The blood pattern and the dynamics of blood leukocyte indices reflected the active response of the *Natrix natrix* body to the complex of environmental factors of the habitat on the territory of the Mordovian State Nature Reserve.

Keywords: *Natrix natrix*, WBC (white blood cells), leukocytal index, peripheral blood

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