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Уміщено роботи дослідників, які працюють над вивченням екологічного стану довкілля та розв'язанням проблем збереження біорізноманіття й оптимального використання територій природно-заповідного фонду України, зменшенням негативних антропогенних впливів і рекреаційного навантаження на природні екосистеми, формуванням національної екомережі. Також сюди увійшли результати наукових досліджень у сфері екології, гідрохімії, гідробіології, токсикології, біологічного різноманіття, охорони і раціонального використання природних ресурсів.

Для екологів, біологів, геологів, географів, працівників лісового господарства, заповідників, національних парків та інших природоохоронних установ.

За достовірність викладених наукових фактів відповідальність несуть автори.

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freshwater fishes undergo numerous morphological and physiological changes during the metamorphosis of the larvae.

Freshwater fishes tend to have less distinct periods of larval metamorphosis than marine or diadromous species, but this postembryonic process still unequivocally occurs, transforming the larval organism into a morphologically distinct juvenile form.

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VARIABILITY OF THE MITOCHONDRIAL DNA CONTROL REGION IN THE GREATER MOLE RAT (*SPALAX MICROPHTHALMUS*)

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The study of the intraspecific molecular genetic variability of the greater mole rat was conducted for the first time. We investigated the control region of mtDNA from the central and eastern parts of its range. Our results indicate a low level of variability of this marker and the absence of genetic differentiation in S. microphthalmus in most of its area.

Keywords: greater mole rat, molecular genetic variability, control region of mtDNA

The greater mole rat (*Spalax microphthalmus*) is a monotypical species of the subfamily of blind mole rats (Spalacinae) of the family Spalacidae. It is widespread in the steppe and forest-steppe zone between the Dnipro and the Volga (Ognev, 1947). The greater mole rat is an obligate fossorial subterranean and truly blind rodent. High migration activity carried out by the surface is observed during the time of resettlement of young and adult individuals in the post-reproductive period (Korobchenko, 2012).

To date, the intraspecific variability of *S. microphthalmus* is generally poorly understood. According to morphological features, this species does not show intraspecific geographic variability (Ognev, 1947). At the same time, intrapopulation craniometric variability of the mole rat was observed in the ratio of proportions and skull size and is associated with sex and age (Puzachenko, 2001). In addition to craniological parameters, sexual dimorphism in *S. microphthalmus* is found in the size of the body, the length of the hind foot, and body weight.

The genetic variability in this species was found in the form of translocation karyotypic variability (Puzachenko, Baklushinskaya, 1997). The greater mole rat has the reduced number of chromosomes (2n = 60), unlike other members of the genus (2n = 62).

Now, the results of molecular genetic analysis are widely used in modern studies of species structure. However, data on molecular genetic variability of the greater mole rat are still not available.

We investigated the variability of the control region (CR) of *S. microphthalmus* mtDNA from the central and eastern parts of its range for the first. The material for genetic analysis is 22 sequences of CR (1012-1013 bp) from individuals from 3 localities: 1) the vicinity of Regional Landscape Park Veliko-Burlutskaya Steppe (Nesterovka village – 7 specimens and Srednii Burluk village – 3) in Kharkiv region of Ukraine; 2) the vicinity of Central Black Earth Nature Reserve (Streletskaya Steppe – 8 and Kozatskaya Steppe – 2) in Kursk region; 3) the vicinity of Zhiguli Nature Reserve (village Yagodnaya Polyana – 1) in Samara region of Russia., 11 haplotypes with 17 variable sites were found in the sample. The total haplotype diversity in the total sample is 0.879, the nucleotide diversity is 0.0043, the average pairwise difference between haplotypes is 4.325. The average genetic distance is $d_p = 0.004$ in total sample ($d_p = 0.002$ in the sample from Kharkiv region, and $d_p = 0.003$ from Kursk region). Differences between samples vary from 0.005 to 0.007. ML and Bayesian cladograms with Mount Carmel blind mole rat *S. carmeli* (northern Israel) as outgroup do not significantly differ in their topology. Branching on the cladograms has very low statistical support as a whole except for two clusters. Samples from Kharkiv region, including from both Sredny Burluk and Nesterovka, except for 2 samples from the last, form one cluster with high support. The second cluster includes two specimens from Kozatskaya Steppe.

The mtDNA control region is widely used as a marker of intraspecific variability due to its higher polymorphism compared to protein coding genome sites. The CR variability shows the phylogeographic differentiation in many species. Our results indicate a low level of variability of this marker and the absence of genetic differentiation in *S. microphthalmus* in most of its area of about 1000 km from West to East.

The low level of genetic variability in *S. microphthalmus* is consistent with the low level of intraspecific interpopulation morphological polymorphism. At the same time, the detected high karyotype variability indicates the instability of the nuclear genome of this species at the chromosome level (Puzachenko, Baklushinskaya, 1997).

For sedentary burrowing steppe animals like *S. microphthalmus* large rivers may be physic-geographical barriers fragmenting their ranges (Vorontsov et al., 1980). The differentiation of mole rats inhabiting the territory from the Volga to the Dnipro is similar to the speckled ground squirrel ones (Brandler et al., 2015). However, unlike the ground squirrels, the Don is not a barrier for mole rats apparently.

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MORPHOLOGICAL DIFFERENTIATION OF *CORBICULA* CLAMS (MOLLUSCA: BIVALVIA) FROM THE LOWER DANUBE

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The morphological variance of *Corbicula* sp. in the Lower part of the Danube river was examined. The method of a geometric morphometric analysis helped to distinguish two different morphotypes: round form and saddle-like.

Keywords: mollusks, geometric morphometric analysis, morphotype, Danube river

The invasion of *Corbicula* sp. can cause a certain impact on ecology and economic of the country due to changes in food webs, bioaccumulation of environmental contaminants, competition with native bivalves and serious biofouling problems (Phelps, 1994; Darrigran, 2002). Its taxonomical, biological and ecotoxicological studies are fundamental and can help to develop specific management steps to prevent problems resulting from their invasion and habitat colonization.

For a morphometric analysis we used two *Corbicula* sp. populations from the main Danube channel (Izmail City surroundings) and Ochakove Branch of the Danube Delta. Two linear distances in left shells per a site were measured with a digital caliper: a shell length and width. Additionally, a geometric morphological analysis based on landmarks was performed. Shape variance and difference was analyzed through the Principal Component Analysis and Discriminant Function Analysis. Significant shell shape differences between sites were tested with ANOVA (Sousa et al., 2007).

Shape analysis revealed the evident of shell differences between the two populations (ANOVA: F – 219,04, $P < 0.001$). The morphometric measures showed clearly that «Izmail» individuals have more roundness shells (ratio length/width – 0,97), whereas «Ochakiv» individuals have more oval and elongated shells (ratio length/width – 0,91). In relation to the geometric morphometric analysis used we verified that the first principal component (PC1) explained 54.51%, the second (PC2) 20% and the third (RW3) 7,36%, summing 81,86 % of variance explained. ANOVA results also confirmed a highly significant difference between individuals shell shape across locations (F – 39,88, $P < 0.001$).

Two morphotypes of *Corbicula* sp. in the Danube are distinguished by the following features: a position of the umbo, proportions of valves, a degree of asymmetry of valve's curve. The first, known as a "round shape", has an asymmetrical valve, a weakly protruding umbo which shifted to the middle of a shell, the width of a shell is bigger than length. In contrast, the morphotype so-called "Saddle-like" shape has a strongly projecting umbo, the width of a shell is less/equal to its length.