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Method For Determining the Dynamics of *Rodentia*

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Abstract: This article presents information about the experience of artificial cultivation of Artemia in the Chimbai district of our republic and about research works on artificial cultivation of Artemia using intensive methods tested by scientists of the University of Canto, Vietnam.

Keywords: Arthropoda, Crustacea, Brachiopoda, Anostrasa, Artemiidae, halophilic, predator,

Annotation.The article studied the method for determining the dynamics of the number of rodents. The state of the population is described by two groups of criteria: the relative abundance (the number of animals per 100 trap-days) and the structural index of the population (the proportion of animals caught from each group). To prove the quantitative impact of anthropogenic pollutants on the structure and dynamics of the population of the studied small mammals, mathematical models were created that calculate the coefficient of determination (R2), showing the influence of each selected factor.

Key words: population, biotope, dominant, index, endogenous factor, exogenous factor.

The island's ecological crisis demonstrates that species composition, population density, and associated serene ecosystems are powerful determinants of mammalian population management. As a result of anthropogenic impact on natural complexes, the fauna is changing, not only species composition, but also drastic changes in the population structure and number of animals are taking place. Therefore, the use of small mammals as indicators is important. When determining changes in the environment, it is important to determine their amount. Cenotypic indicators are used to describe the herd of rodents: the number of species, the degree of dominance, the participation share of each species, the sum of the quantity in 100 trap-days, as well as L.A. The index of species diversity (μ) and the proportion of rare species (h) proposed by Zhivotovskim (1980).

The selection of biotopes in the natural group is related to the main types of forest vegetation landscape. Natural habitats are sections of the forest area with different grassland levels and sections along the canals that have preserved their original natural state: streams with fresh water, slopes and bottoms of ravines, second marshy areas along the coast. At the same time, the groves and reed beds in the Amudarya river valleys were also studied. In the anthropogenic groups of biotopes, abandoned (non-cultivated) land, areas along the collector-drainage system, tree groves along the railway, and fields planted with various agricultural crops [7] were studied. The condition of the population is described by two groups of criteria: by relative number (the number of animals per 100 trap-days) and by the structural indicator of the population (the percentage of animals caught from each group). The activity of rodent populations is determined by endogenous (the number and structure of the population in the current and previous time intervals) and exogenous (average monthly air temperature, the total amount of monthly precipitation, and for the winter season - the thickness of the snow cover and the seed yield of the main tree crops) [5,398 b] .

For the analysis of the demographic structure, the average value of the population characteristics and their level of variability were calculated. Reliability of differences in mean values was checked using analysis of variance and Schaffe's multiple comparison method. The relative importance of the shares in the complex and the comparison of the shares belonging to different large complexes was carried out according to the method of sample contribution (proportion) [3].

In this research work, the concept of "associations" means any set of interrelated groups of species within a naturally limited habitat, including at the biotope level [6,7]. In the description of associations, we tried not to use the concept of "species diversity", which aims to use calculated coefficients accepted by many [1,6]. When there are a small number of species occupying different ecological niches, making up the association

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of small mammals and having different sizes (biomass), the use of such indicators can cause a large error in the analysis and interpretation of the obtained data.

In this case, we used a simple description - the number of species and the diversity of species. The concepts of "quantity" and "serobly" and "climax" (permanent) and "local" plant associations were used as synonyms [1,5]. According to their laws, they are close to the level of plant associations, but they do not correspond to each other.

In a number of cases, currently different areas are also recorded as habitats (roadside areas and sidewalks, lake shores, etc.). The reason for this is the need to obtain specific and complete characteristics of the location of the animals of the studied group and information about the changes taking place under the influence of anthropogenic transformation of the territory's landscapes. The concept of "landscape" is used on a broad scale, that is, natural-territorial complexes of various sizes, but not as a taxonomic category at a certain level of the territorial hierarchy. But here under the concept of landscape are understood natural-territorial complexes with a relatively wide territorial level (at the level of high regions or meso-relief elements). In the study of the population dynamics of small mammal model species, the main focus was on quantity, and the transient series structure of distribution types and multi-year quantity dynamics was evaluated, and statistical models were used.

It is known that classical environmentalists Ch. Elton (1933), Yu. Odum (1975), E. Pianka (1981), R. Ricklefs (1979), S.S. Schwartz (1969; 1980), N.F. Reimers and A.V. In their works, Yablokov (1982) and others divided the complex of all factors affecting the population into two groups: external (exogenous) and internal (endogenous). The separation of endo- and exogenous factors affecting the dynamics of the studied mammalian model species was carried out in accordance with the existing theoretical concepts of modern ecology [7]. We carried out an assessment of the main factors of the quantitative dynamics of the studied small mammal species in relation to two periods: the beginning and the end of the breeding season. It is known that the viability of the population is determined by the conditions of its formation in the previous period. Among the reproduction parameters, the following were selected: 1) Percentage of breeding females - pregnant and parturient females were removed from breeding females; 2) total spring and autumn quantity - as an indicator, the calculation data of hunting in April and October were used; 3) the amount of all females, regardless of the number and age of pregnant females; Fertility is the average number of embryos per female. In the analysis, the survival coefficient for the winter season was also used - the ratio of the spring amount to the autumn amount of the previous year. When using a factor analysis model, it would often be appropriate to use more of the proportion of the variance of the common factors attributable to the cumulative total and to report the contribution of each factor as a percentage.

In order to prove the quantitative impact of anthropogenic pollutants on the structure and dynamics of the population of small mammals under study, mathematical models calculating the coefficient of determination (R2) showing the influence of each selected factor were created [2,3,4].

An overview of the multiple regression equation is as follows:

$$y = b_0 + b_1x_1 + b_2x_2 + \dots b_mx_m \quad (2.2)$$

where, b_i are estimates of regression coefficients.

The index of the coefficient corresponds to the index of the variable being explained. Thus, when the x1 indicator changes relative to unity and the remaining variable indicators do not change, the average size of the variables can show the average effect of certain changes, only if the condition of its constituents is preserved at a certain level; b_0 is equalization function.

In regression analysis, the complete variance of the dependent variable (S) is divided into two organizational states: the variance added to the regression of the actual factors (S_r) and the variance caused by random errors of observation, and the residual regression (S_l), which consists of the variances of certain variables not added to the analysis.

$$S = S_r + S_l \quad (2.3)$$

$R^2 = S_r / S$ - coefficient of determination.

It performs two functions: first, it reflects the contribution of the variability resulting from the full variance regression of the dependent variable; the second is the quality criterion of regression. If R_2 is statistically significant, then the estimated regression equation reflects the real relationship between the analytical characteristic and the blinded variable.

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We used a special transformation to determine the significance of R_2. We should note another property of the multiple determination coefficient - it is equal to the sum of the products of normalized coefficients of regression (bí) and correlation coefficients (rí) [2,3,4]. The coefficients of this sum are quantitative estimates of the contribution of each factor to the formation of the dependent variable. If a covariate is larger, then the corresponding variable will contribute more to the regression and capture more of the variance in the demographic characteristic being analyzed. In pairwise linear correlation, the correlation coefficient characterizes the density of connections between variables. A suitable metric in multiple regression is the multiple correlation coefficient R, or total correlation coefficient. In this case, we calculated it as a correlation coefficient between the actual values of the factor and their estimates. The square of multiple correlation is called coefficient of multiple determination [2,3,4].

Quantitative estimates obtained by means of multifactorial analysis characterizing the power of constellation factors affecting the quantity dynamics of the rodent population allow to determine their quantity with great accuracy.

The coefficient of multiple determination consists of several variables, and each of them contributes. According to the coefficient of multiple determination, it is possible to determine which part of the factor variance consists of variables, and which part remains abstract. Usually the coefficient of determination is expressed as a percentage. When estimating a factor without introducing a large error, it is possible to exclude variables that make a small contribution to its variance [5, 398 b; 7,736 b; 10,352b]. The coefficient of determination performs two functions: the first one - the first one - reflects the contribution of variability arising from the regression of the dependent variable in full variance; the second is the quality criterion of regression. if the coefficient of determination is statistically significant, then the calculated regression equation reflects the real relationship between the analytical characteristic and most understandable variables, and at the same time it is the sum of the products of normalized regression coefficients (bí) and correlation coefficients (rí) is equal to [5, 398 b; 7,736 b; 10, 352 b].

It should be concluded that in order to verify the obtained results and increase their reliability, two fundamentally different methods were used in parallel: a multi-criteria method of assessing the influence of factors, the main factors of population dynamics, and multiple regression, which occurs by dividing the total variance of the variable indicator into parts proportional to the actual factors. Based on the modified method of the analysis, it allows to use the analysis of the screen to evaluate their contribution to the population processes.

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