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THE BANK VOLE AND SPECIES DIVERSITY OF GROUND VEGETATION IN BROAD-LEAVED FORESTS

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Abstract. The role of the European bank vole (*Myodes glareolus*) in maintaining the species diversity of the ground vegetation in broad-leaved forests was analysed. The study was carried out in Nerusso-Desna Woodland in the southeast of the Bryansk region (Russia). Geobotanical research methods were used. The vole's burrowing and foraging activities create ecotopic heterogeneity and a mosaic of ground vegetation, which increases habitat capacity. As a result, the species density and species richness of communities increase. The mosaic created by the animals is represented by three variants of plant microcommunities: 1) with a predominance of vegetatively immobile annual and biennial plants of the ruderal group (*Alliaria petiolata*, *Cardamine impatiens, Geranium robertianum, Lapsana communis, Moehringia trinervia, Polygonum convolvulus, Torilis japonica*) in places with severe soil disturbance; 2) with a predominance of vegetatively mobile perennials of the ruderal group (*Elymus caninus*, *Glechoma hederacea*, *Lamium maculatum, Stachys sylvatica*, *Stellaria holostea*, *Urtica dioica, etc.*), and with the significant participation of phytocenotically tolerant plants (*Asarum europaeum, Brachypodium sylvaticum, Geum urbanum, Poa nemoralis, Polygonatum multiflorum, Pulmonaria obscura, Viola mirabilis, etc.*) in the foraging area represented by "pastures"; 3) with a predominance of vegetatively mobile perennials of the competitive group (*Aegopodium podagraria*, *Mercurialis perennis*) on the peripheral part of the "pastures". This sequence of microcommunities, which can replace each other in time, is a microsuccession. Microsuccession begins when there is a sharp decline in the number of animals. Competitive herb species are the driving force behind the development of microcommunities. They gradually replace ruderal and tolerant plants and can become dominant in the ground vegetation for long periods. However, regular increases in vole abundance periodically interrupt these unidirectional microsuccessions. In this case, both elongated and shortened developmental cycles of microcommunities can be formed. Elongated cycles develop if voles eat competitive plants over a large area and reduce the density of the ground vegetation cover to a minimum. Shortened cycles develop if animals, in their search for food, return to their former foraging territory after 2 or 3 years, when vegetatively mobile perennials of the ruderal group dominate. In this case, the stage dominated by competitive plants does not occur. Thus, the constant burrowing and trophic activity of bank voles transforms the unidirectional development of ground vegetation microcommunities into cycles. Thanks to cyclic microsuccessions, a multi-species and polydominant composition is maintained in the ground vegetation. The mechanism for maintaining this diversity involves the spatial redistribution of vegetation patches with the dominance of plant species with different types of strategy – ruderal, tolerant and competitive.

Keywords: The European bank vole, *Myodes glareolus*, species diversity of communities, environmental transformation, mosaic of ground vegetation cover, microcommunities, microsuccession, broad-leaved forest.

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