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SHORT COMMUNICATIONS

Statistical Analysis of Progressive Succession in the Vegetation of Abandoned Villages in the Mountain Forest Zone of Bashkortostan

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Between 1918 and 1988, many villages in the mountain forest zone of Bashkortostan were abandoned for various reasons, including famine, postwar devastation, and the campaign to "liquidate unpromising villages," which had the most severe consequences: the number of populated localities decreased by 43% (Asfandiyarov, 1990; Yagudi, 2000). The sites of these villages were then either used for livestock grazing and hay harvesting or abandoned completely. These small areas (0.04–2 km^2) were chosen as the object of this study.

Although the history of research on the flora and vegetation of populated localities is more than 400 years old (Gorchakovskii, 1973), we are unaware of publications dealing with successions in the vegetation of abandoned villages. The purpose of this study was to analyze specific features of vegetation restoration processes in the abandoned village sites. According to Mirkin and Naumova (1998), such processes are classified as autogenic progressive successions.

Studies were performed in the broadleaf forest zone on the western macroslope of the Southern Urals (Burzyanskii, Ishimbaiskii, Zilairskii, Kugarchinskii, and Meleuzovskii districts of Bashkortostan). The study region has a moderately cold climate: the sum of active temperatures over the growing season (106–110 days) ranges from 1500 to 1800°C, the average annual temperature is 1.2°C, and the maximum and minimum annual temperatures are 31°C and –41.5°C, respectively (*Bashkortostan*…, 1996). Annual average precipitation reaches 600–650 mm. The period with a steady snow cover is 160–170 days. The region has rolling, ridge topography and a well-developed hydrographic network. The soil cover has a patchy pattern with prevalence of mountain-forest gray soils. (Martynenko et al., 2005).

From 2000 to 2002, the sites of 33 abandoned villages were surveyed to make 584 geobotanical releves according to the Braun-Blanquet approach (1964). Communities occupying small areas were described within their natural boundaries. When their areas were sufficiently large, 100-m^2 test plots were established.

The material was processed by the following methods:

(1) Two-factor ANOVA (Plokhinskii, 1970) with respect to qualitative characters (species presence/absence) for the main cenosis-forming species occurring in the sample more than 30 times. A total of 100 species were analyzed. The first factor was land-use type, which had three gradations: hayfield, pasture, and wasteland. The second factor was the succession stage, with three gradations corresponding to plant communities aged less than 30 years, 30–45 years, and more than 45 years.

(2) Two-factor ANOVA for quantitative parameters characterizing species richness of plant communities (with the same factors and gradations as above).

(3) An analysis of the phytosociological spectrum of main cenosis-forming species, including the proportion of species belonging to the better represented vegetation classes of the Braun-Blanquet system (Yamalov et al., 2005): Molinio-Arrhenatheretea, Festuco-Brometea, Trifolio-Geranietea sanguinei, Querco-Fagetea, Galio-Urticetea, Artemisietea vulgaris, Chenopodietea, Plantaginetea zatin, and Agropyretea repentis.