

## SUMMARY

The studies directed at researching the condition of biodiversity in various agrocenoses with different management methods have a comparatively long history. The scientists for such type of studies select various groups of organisms able to point at the condition of biodiversity. Various groups of invertebrates are most frequently selected for evaluation of biodiversity. The most popular groups in such studies are beetles (ground beetles, rove beetles), butterflies and bumble bees. Due to an increasing necessity to conduct similar studies in the agrocenoses on the territory of Latvia, a possibility of application of such research approaches and methods in the conditions of Latvia were analysed and evaluated. Upon evaluation of the data available in the literature on the qualitative and quantitative composition of organisms used in the similar studies, the conclusions were drawn that a comparatively large amount of information is available on the ground beetles. The ground beetles as the research group is used extensively, comparing biodiversity in the fields managed by applying different methods; similar studies were conducted also in Lithuania, where the fauna of the ground beetles is similar to the fauna of Latvia.

The ground beetles is a broad group of entomophagous insects. The beetles of this family belong to various ecological groups and they have different requirements in respect of the environmental factors, pollution, amount of food, quality of soil, type of vegetation and use of various chemicals. The ground beetles play a significant role in agrocenoses in limitation of the number of organisms harmful to agriculture. The ground beetles for these reasons have been selected for conducting of the respective study. A methodology for monitoring of topsoil fauna was selected for the conducting of this study. This methodology is planned for a long-term research of the ground beetle fauna and provides for a placement of soil traps during the period of maximum activity of the ground beetles. The time for placement of traps pursuant to the methodology is divided in two parts for the total duration of four weeks. The methodology for the collection of coleopterological material is slightly modified pursuant to specifics of the study. Changes to methodology are related to the placement of traps in the research plot. The traps were placed on the side of the plot and in its centre with a purpose to establish any changes to composition of species in the direction from the side of the field toward the centre, thereby evaluating the impact of the habitats near agrocenosis on the researched plots. Significant attention was paid to selection criteria of the agricultural holdings, which allowed selecting similar fields to extent possible, where the most important changes to a population of ground beetles are related to the type of management.

6967 specimens of the ground beetles were collected during the study, wherefrom 4036 specimens were from conventional agricultural holdings and 2931 – from organic agricultural holdings. The total number of collected species was 47, constituting 14% of the ground beetle fauna in Latvia. Regardless of comparatively large number of species, a number of species in some research plots was small, and the largest number of species established in the research plot was 24. Analysis of the

results obtained in this year did not show significant dependency of the composition of species on the management type of the field.

The results obtained in the studies in 2014 are not unequivocal, since the qualitative indicators of the ground beetles in two research plots with conventional management were higher than the respective indicators in the organic agricultural holdings, while the populations of ground beetles in other research plots were characteristic for the management type of the field.

The information concerning methodology of the study and analysis of the findings was obtained during the study. Taking into account various circumstances affecting the fauna of the ground beetles, including meteorological conditions, management activities of the field, agricultural crops and the length of respective use of the land plot, the studies with a purpose to compare the impact of the management types on biodiversity must take place for the duration of several seasons, which would allow to obtain reliable results and use various mathematical methods in the data analysis. Changes in the research methodology need to be made during the planning of potential subsequent studies, since a small number of collected species is related to short period of placement of the traps, which needs to be extended to 60 days during the activity season of the ground beetles, thereby increasing the reliability of the obtained data. A control group of traps for a better evaluation of biodiversity should be placed in the habitat located next to agrocenosis.

The study was conducted by the Daugavpils University, Institute of Systematic Biology, Coleopterological Research Centre. Dr. biol. Maksims Balalaikins, Dr. biol. Aleksandrs Aniščenko and Msc. biol. Kristīna Aksjuta participated in conducting of the study.