SUMMARY

The aim of research, conducted in the city of Rzeszów (22^{o}01’E, 52^{o}03’N), was to gain knowledge about rodent communities inhabiting sites differing in degree of isolation and urbanization pressure. The hypotheses tested regarded variation of those communities and population dynamics and other aspects of ecology of rodent populations creating them.

The research was conducted in the years 2010-2012, on two study sites with similar surface area (0,54ha and 0,6ha). The urbanization pressure was estimated based on selected measures (percent area of developed surface surrounding study sites, noise levels and night illumination). The first study site, situated in outskirts of the city (SAD), was subjected to weak anthropogenic pressure and was constructed on wastelands that had formed on abandoned gardens and cultivated fields. It was not isolated from similar types of environment by any migration barrier. The second study site (TOR) was situated in the outer zone of city center, in heavily developed area, on isolated patch of vegetation growing on degraded land between two wide strips of railway tracks. On both study sites, a grid of 10m x 10m squares was constructed and the traps were placed in the middle of each square. Animals were captured from March until December, in the middle of each month, three nights in a row with the use of CMR technique (*catch – mark – recapture*). In each session the animals were sexed and weighed, their reproductive state was determined and the place of capture was noted. On the SAD study site, 1817 captures of 8 species from 3 orders were recorded: rodents Rodentia (4 species), shrews Soricomorpha (3 species) and carnivores Carnivora (1 species). On the SAD study site, 1249 captures of two orders were recorded: rodents (5 species) and shrews (1 species).

The rodent communities differed qualitatively between two study sites. During research, on SAD study site (peripheral, with low urbanization pressure) individuals of 4 species were captured: *Apodemus agrarius* (275 individuals, 920 captures), *A. flavicollis* (142 individuals, 488 captures), *Microtus arvalis* (104 individuals, 232 captures), *Micromys minutus* (17 individuals, 20 captures). On TOR study site (outer zone of the city center, high urbanization pressure), in the same time 5 species were noted: *A. agrarius* (215 individuals, 934 captures), *A. sylvaticus* (19 individuals, 61 captures), *M. arvalis* (58 individuals, 239 captures), *M. minutus* (single capture), *Mus musculus* (2 individuals, 2 captures).

The rodent species composition on SAD study site was constant during three successive seasons. Comparison of average values of Shannon – Wiener index *H'* and average population size of rodent community in different seasons with Kruskal–Wallis test did not reveal significant differences ($p>0,05$ and $p=0,57$). On the other hand, on TOR study site, the rodent community composition was variable. The average values of *H'* index for each season and average population sizes of rodent community differed significantly between studied seasons (Kruskal- Wallis test, $p<0,001$ and $p<0,05$).

The average rodent population density was significantly higher on SAD study site in 2010 (U Mann – Whitney test, $p = 0,042$), but not in other years of study. Maximum population density of the rodent community was noted on SAD study site (144 individuals/ha).

On both of the study sites, *Apodemus agrarius* was the most abundant species. The population density changes of this species were similar on two compared study sites in 2010 ($r_s = 0,88$, $p < 0,01$), but in 2012 they were marginal ($r_s = 0,63$; $p = 0,051$). The average population densities in each year did not differ between populations (U Mann – Whitney test; $p > 0,05$). Population density peak on the peripheral study site occurred later in the year (1 or 2 months later) than on study site located in the city center. The highest population density of *A. agrarius* was noted on SAD study site (94 individuals/ha). Maximum population density on the other study site reached 82 individuals/ha.

The population sex structure of *A. agrarius* was similar in consecutive seasons on the peripheral study site, but differed significantly on TOR study site. Changes of the population sex index noted on both study sites were correlated only in 2010 ($r_s = 0,73$; $p = 0,03$).

The average body mass, calculated for cumulated number of *A. agrarius* individuals, was higher for animals on TOR study site. The average body mass of males captured on TOR study site was significantly higher than on SAD in June ($p=0,03$), however females were heavier on TOR in September ($p=0,04$) and December ($p=0,009$). The average body mass of adult males during the whole study period was significantly higher on TOR than SAD as well (U Mann – Whitney test, $p < 0,05$).

The average time that animals spent on each study site did not differ between sites, although the age structure of non-resident animals was significantly different (χ^2, $p=0,02$). There were no differences found in intensity of individual turnover, measured by *turnover index*.

The average population size of *Microtus arvalis* on SAD study site did not differ between seasons, however the difference was noted on TOR (Kruskal–Wallis test, $p < 0,001$). The average vole population densities in 2010 and 2011 were significantly higher on SAD (U Mann – Whitney test: $p_{2010} < 0,001$; $p_{2011} < 0,05$), but not in 2012 ($p > 0,05$).

Apodemus flavicollis individuals were noted only on SAD study site. The average population sizes of this species were similar between seasons (Kruskal–Wallis test, $p = 0,78$). In contrast, *Apodemus sylvaticus* individuals were noted in 2011 and 2012 only on SAD study site. Few individuals of *Micromys minutus* were captured each year during spring and autumn on SAD, but only one individual was captured on TOR. Additionally, *Mus musculus* individuals were occasionally captured only on TOR.