Synanthropic rodent fauna of Eastern Transbaikalia in the early 21st century

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Abstract. The article provides information on the synanthropic rodent fauna of Eastern Transbaikalia. In 2017–2020 the city of Chita, the town of Baley and small settlements of Zabaykalsky krai were surveyed. True synanthropes: the house mouse and the brown rat are most abundant in residential landscapes. Natural populations of the house mouse are typical for coastal biotopes of the steppe zone, and the brown rat is typical for forest-steppe zone of Zabaykalsky krai. In Chita (administrative centre of Zabaykalsky krai) the share of the brown rat in rodent communities has considerably increased in recent decades. There is an extension of the brown rat's habitat in the area of Baikal-Amur Mainline. Optional synanthropes: striped field mouse, striped dwarf hamster, Maximowicz's vole, and narrow-headed vole are less important in residential landscapes of the region. In the beginning of the 21st century the field mouse is extending its habitat to the disjunct zone to the west of Transbaikalia: it is now common in the residential area of the town of Baley. Penetration of another optional synanthropic species recorded in the neighbouring Siberian regions – the East European vole – has not been detected.

1. Introduction
The mammals of human settlements in Eastern Transbaikalia were studied in the mid-20th century during specialized large-scale surveys [1–4]. The greatest attention in these studies was paid to the rodents, which are found directly in human constructions.

2. Materials and Methods
This paper is based on the small mammal trapping data in 2017–2020 in some settlements of Zabaykalsky krai: the city of Chita and the town of Baley, villages of Ononsky district (Nizhny Tsasuchey, Bolshevik), Olovyaninsky district (Yedinenie), Novaya Chara settlement (Kalarsky district), at cattle-breeding stations and cordons in Ononsky and Borzinsky districts. The data on trapping of synanthropic rodents outside residential settlements were used as well. Trappings were carried out with lines of medium-sized metal mouse snap traps with standard bread bait.

3. Results and Discussion
The house mouse (Mus musculus Linnaeus, 1758) is the most characteristic synanthropic mammal in Transbaikalia. It is found in all surveyed human settlements, and in some areas it reaches high numbers. In the northern taiga areas this species is rarely seen away from human constructions, while in the southern steppe areas the house mouse is a common species of coastal plant communities. In the
The brown rat (*Rattus norvegicus* Berkenhout, 1769) is not as common in Eastern Transbaikalia as the house mouse. The indigenous form of this species *R. n. coraco* inhabits coastal habitats in the forest-steppe zone of Transbaikalia. For example, in Chita district the species in their natural habitats is usually trapped along the banks of the Ingoda River in areas with shrubby or meadow vegetation. The species was also captured in coastal scrubs in the middle reaches of the Nikishikha River away from the nearest human settlements. In typical steppe habitats and in small human settlements the brown rat is practically not found. For example, in 2008–2020 the rat was never registered in the protected zone of the Daursky Nature Reserve at cordons and cattle-breeding stations. A single albino rat was caught on the banks of the Borzya River (tributary of the Onon River), and could be an escaped pet. Low abundance of the brown rat in the steppes during our study could be related to dry period, drying out of water bodies, and degradation of the coastal plant communities. In the north of Transbaikalia the brown rat was widespread in the second half of the 20th century in Muisko-Kuandinskaya depression, but there is no information about its immigration to the neighbouring Charskaya depression [5; survey data]. At the beginning of the 21st century, according to surveys, the rat became a common species in the settlement Novaya Chara, and was trapped by us in 2021 in single storey residential buildings.

Two species of rodents currently dominate in the city of Chita: the house mouse and the brown rat (table 1). In outdoor trapping in the city area one or the other dominates in different years. The share of the brown rat in trappings has increased considerably compared with the surveys of the second half of the 20th century. In early 1960s the share of the brown rat in trapping [3] was only 2%; in late 1970s and early 1980s it reached 16.7% [4]. However, the rats were mainly found at the outskirts of the city. Nowadays, the brown rat is common in vacant lots and near domestic waste containers all over Chita, and it often reaches high numbers. The percentage of rat trapped in mouse traps is practically equal to that of the house mouse in populated areas outside human constructions. This is most likely due to the increased volume of food waste thrown away with domestic waste outside equipped airtight containers and the abundance of stray dogs fed by the public.

### Table 1. Percentage of rodent trapping in a line of mouse snap traps in Chita.

| Year | *Rattus norvegicus* | *Mus musculus* | Trap-nights |
|------|---------------------|----------------|-------------|
| 2017 | 6.7                 | 6.7            | 45          |
| 2019 | 13.5                | 2.3            | 215         |
| 2020 | 6.7                 | 11.7           | 120         |
|      | Wasteland in the central part of the city |             |             |
| 2019 | 14.0                | 11.6           | 45          |
| 2020 | 6.7                 | 11.7           | 120         |

The field mouse (*Apodemus agrarius* Pallas, 1771) is primarily an agrophilic species, which habitat is an example of classical European-Eastern Asian disjunction. In the 20th century the field mouse was known only from the Argun River floodplain on the border with China. At the beginning of the 21st century the species dispersed westward throughout the south eastern areas of Zabaykalsky krai up to Chita district [6; 7]. In recent years the species has not been trapped within the city of Chita despite some trappings in Chita district in the past. In 2020, the species was observed on vacant lots among multi-storey buildings in the town of Baley. In the suburbs of Baley the species is common in meadow-shrub habitats.

The striped dwarf hamster (*Cricetulus barabensis* Pallas, 1773) and transbaikal hamster (*C. pseudogriseus* Orlov et Iskhakova, 1975) are allopatrically dispersed inhabitants of forest-steppe and
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steppe of Transbaikalia. In most cases they penetrate residential structures of small human settlements of steppe zone (farm camps, small villages, etc.). In Chita, the striped dwarf hamster is mostly found at the outskirts of the city, but it rarely penetrates into buildings.

Other rodents most often found in inhabited areas are the Maximowicz's vole (Alexandromys maximowiczii Schrenk, 1859) and the narrow-headed vole (Lasiopodomys gregalis Pallas, 1778). Both species do not belong to typical synanthropes, but they may find favourable conditions in slightly modified habitats or those similar to natural ones. Both species are most common at the outskirts of populated areas (e.g., Chita), in anthropogenically modified steppe (L. gregalis), or meadow habitats (A. maximowiczii). The East European vole (Microtus rossiaemeridionalis Ognev, 1924), which is being introduced in cities of Eastern Siberia, including Western Transbaikalia [8], has not yet been found in Zabaykalsky krai.

4. Conclusion
The residential landscapes in Eastern Transbaikalia are inhabited predominantly by synanthropic and semi-synanthropic species. True synanthropes among mammals in Eastern Transbaikalia are represented by the house mouse and the brown rat. Among semi-synanthropes the most common are the striped dwarf hamster, the transbaikal hamster and the field mouse.

Compared to the second half of the 20th century, the share of the brown rat in the rodent population of Chita has increased significantly. The brown rat became common in northern Transbaikalia in Chara depression (Novaya Chara settlement), in the area of Baikal-Amur Mainline, where it had not been recorded before.

The habitat of the field mouse is expanding in the south eastern part of Zabaykalsky krai. In addition to natural habit areas the species is now observed directly in populated areas (the centre of the town of Baley).

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