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*Short research contribution*

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# ECTOPARASITES OF THE EDIBLE DORMOUSE *GLIS GLIS* L. OF SAMARSKAYA LUKA PENINSULA (RUSSIA)

ABSTRACT: The parasitic fauna of the edible dormouse was studied in 2004. Nine species of ectoparasites were registered: fleas (Siphonaptera) – 7, gamasid mites (Gamasoidea) – 1, harvest mites (Trombidiidae) – 1. Two ectoparasite species predominated: a flea *Nosopsyllus sciurorum* and a harvest mite *Trombicula zachvatkini*. We revealed differences in the infection rates of dormice of different age and sex. Adult individuals were more infected than juveniles in terms of the index of abundance. Infection among males was higher than in females in terms of index of occurrence.

KEY WORDS: ectoparasites, *Nosopsyllus sciurorum*, *Trombicula zachvatkini*, *Glis glis*, Samarskaya Luka

Two species of the family Gliridae (Mammalia: Rodentia) inhabit the Samarskaya Luka Penninsula: the edible dormouse (*Glis glis* L.) and the forest dormouse (*Dryomys nitedula* Pall.). The edible dormouse is more numerous. There have been few studies of this rodent's parasites in the former USSR (Sosnina 1949, Arsamasov 1963, Vysozhkaya 1964, Andreiko 1965) and none have been carried out on the Samarskaya Luka.

The research was carried out from May to September 2004 in the Mordovo flood-lands (53°10'N, 49°30'E), in the territory of Samarskaya Luka National Park. Samarskaya Luka lies in the southern part of the forest-steppe zone of the Russian Plain. Woodland occupies 51% of the area (Roshchevsky 1992). Samarskaya Luka is surrounded by the bend of the river Volga at North, East and South. The dormice were caught in inundated oak woods – the main landscape component of the Mordovo flood plain.

The research on the parasites of the edible dormouse was carried out in parallel with a study of this mammal's biology and ecology.

While catching the animals the standard traps for mouse-like rodents were used. Traps were hanged on trees in a line at 1.5 m height with 10 m distance between them. Line consisted of 20 traps and functioned during 5 full days. The period of dormouse parasite research included 500 trap-days in total.

Thirty eight individuals of both sexes were examined in total (18 males and 20 females). The collection of parasites was carried out by standard methods. They were collected into tubes with 70% ethyl alcohol. After fixation mites were rinsed in lactic acid

and placed into glycerin-gelatinous mixture. Fleas were placed in water for 12 hours and after that in 8–10% solution of caustic alkali (KOH or NaOH) for the same period. Then they were cleansed in water and placed in alcohol of different concentration (50%, 70%, 96%) and in absolute alcohol (with dehydrated $CuS0_4$). After that fleas were carried into xylene then into clove oil and were placed in Canada balsam. The standard parasitological index of occurrence (E = % of infected animals) and the index of abundance (A = average number of parasites on one dormouse) were calculated. The t Student test was used to compare an infection (E and A) of males and females and animals of different age.

The age of the dormice was determined relying on difference of length and weight of their body and also the development of thymus and genitals (Bashenina 1977, 1981). The rodents were divided into two groups: sexually mature (adults – 18) and not sexually mature (juveniles – 20). Nine ectoparasites species of two systematic groups were found: fleas (Siphonaptera) – 7 species, gamasid mites (Gamasoidea) – 1 species, harvest mites (Trombidiidae) – 1 species (Table 1). Six of them are «aliens», not peculiar to the dormouse, getting to it occasionally from other animals living in the same biotopes. Fleas from insectivorous mammals, including *Palaeopsylla soricis* Dale, 1878 and *Hystrichopsylla talpae* Curtis, 1826 were found on them as well as the murid rodent fleas *Megabothris turbidus* Roths, 1909, *Meghabothris walkeri* Roths, 1902, *Nosopsyllus consimilis* Wagn., 1898 and *Ctenophthalmus wagneri* Tiflov, 1927. The exchange of ectoparasites between different groups of mammals probably took place.

Overall, 79% of dormice carried ectoparasites, only 8 individuals were found parasite-free. A total of 180 individual parasites were taken off the rodents; only 2 of them were mites and the rest were fleas.

Two parasite species predominated: one species of Siphonaptera, specific for squirrels and dormice (Nazarova 1981), *Nosopsyllus sciurorum* Schrank, 1803 (71% of all parasites) and the larvae of the harvest mite *Trombicula zachvatkini* Schluger, 1948 (31% of all parasites). *N. sciurorum* is seldom found on mice and voles, but often attacks humans (Nazarova 1981). The edible dormouse, along with the squirrel, is the host of this flea species (Nazarova 1981) and also of the mite *Hirstionyssus sciurinus* Hirst, 1921, although the latter was met only twice in our material. *T. zachvatkini* is a common parasite of forest mammals (rodents and insectivores) (Vysozhkaya 1959).

Table 1. Ectoparasites of the edible dormouse *Glis glis* from Samarskaya Luka (E = % of infected animals, A = average number of parasites per individual).

| Parasites | Number of parasites | E occurrence (± standard error) | A abundance (± standard error) |
|---|---|---|---|
| Siphonaptera: | | | |
| *Nosopsyllus sciurorum* | 88 | 68±7.5 | 2.3±0.4 |
| *Nosopsyllus consimilis* | 6 | 5±3.6 | 0.2±0.1 |
| *Megabothris turbidus* | 4 | 10±5.0 | 0.1±0.05 |
| *Megabothris walkeri* | 4 | 5±3.6 | 0.1±0.07 |
| *Ctenophthalmus wagneri* | 12 | 15±5.9 | 0.3±0.2 |
| *Hystrichopsylla talpae* | 6 | 5±3.6 | 0.2±0.1 |
| *Palaeopsylla soricis* | 2 | 5±3.6 | 0.05±0.04 |
| Trombidiidae: | | | |
| *Trombicula zachvatkini* | 56 | 10±5.0 | 1.5±0.3 |
| Gamasoidea: | | | |
| *Hirstionyssus sciurinus* | 2 | 5±3.6 | 0.05±0.04 |

Other species of parasites were found on the edible dormouse as single specimens (Table 1). Fleas of insectivores (*H. talpae, P. soricis*) amounted to 5%, while 14% of the ectoparasites collected normally infect mice and voles (*M. turbidus, M. walkeri, N. consimilis, C. wagneri*).

Our data showed that infection by parasites in the edible dormouse was linked to sex of the rodent. Total infection of males (E = 100%) was higher than infection of females (E = 60%) Fisher exact test: $fi^2 = 0.24$, df = 3, $P < 0.04$. This is probably caused by their higher spatial activity increasing the probability of infection by parasites in comparison with females (Morris and Hoodless 1992). Nevertheless index of abundance was not significantly different between males (A = 5.2) and females (A = 4.3) – Student's t-test: t = 0.61, df = 28, $P > 0.05$.

The differences in the indexes of infection of edible dormouse males and females for single parasite species are not statistically significant in most cases due to small sample size. Significant differences in infection of edible dormouse males and females are revealed for one species only – *Nosopsyllus sciurorum.* Occurrence of infection of males (E = 89%) differs significantly from females (E = 50%) – test chi$^2$: $\chi^2 = 9.58$, df=3, $P < 0.023$. Significant differences were also revealed for index of abundance of males (A = 3.3) and females (A = 1.4) – Student's t-test: t = 2.6, df = 36, $P < 0.05$.

Total ectoparasitic infection of adult edible dormice (E = 89%) was relatively higher than infection of juveniles (E = 70%), but this difference is not statistically significant – Fisher exact test: $fi^2 = 0.054$, df = 3, $P > 0.238$. Significant differences were registered for the index of abundance of ectoparasites. Adult edible dormice (A = 6.7) were infected more than juveniles (A = 2.1) – Student's t-test: t = 2.80, df = 36, $P < 0.01$. Furthermore only 2 ectoparasite species (specific for squirrels and dormice: *N. sciurorum* and *H. sciurinus*) were recorded on juveniles in contrast to 7 species found on the adults.

Adult dormice were exposed for longer time to ectoparasites than juveniles. They probably also used more nests and contacted more conspecifics (sources of ectoparasites infections) than juveniles in their lifetime. Besides in contrast to juveniles, which did not hibernate the adults had more opportunities to catch ectoparasites specific for ground-dwelling mammals as dormice hibernate under ground.

The differences in the indexes of infection of young and adult edible dormice for single parasite species are not statistically significant.

The edible dormouse plays an epidemiological role, being the host of ectoparasites that are carriers of dangerous diseases of man and animals. Six of 7 flea species, recorded from the Samarskaya Luka, have epidemiological importance. *N. consimilis, M.turbidus, M. walkeri, C. wagneri*, *P. soricis* and *H. talpae* are the host and carrier of plague, rabbit-fever, hemorrhagic fever and tick-borne encephalitis. However, none of the diseases mentioned above occur in the studied area.

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