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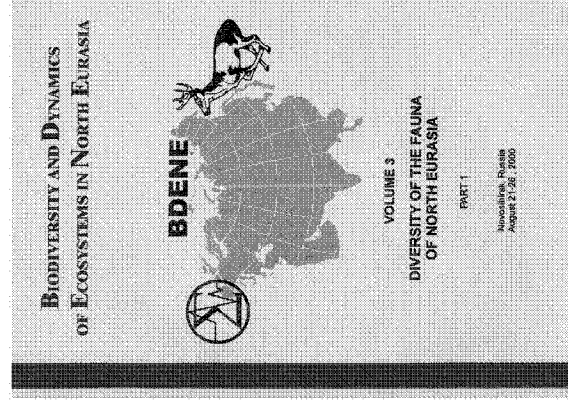
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BIODIVERSITY OF LAND SNAILS IN ZOOGEOGRAPHICAL PROVINCES OF THE URALS (BASED ON MALACOLOGICAL COLLECTIONS FROM THE INSTITUTE OF PLANT & ANIMAL ECOLOGY)

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Abstract

The authors tried to estimate and study the biodiversity of land snails in zoogeographical provinces of the Urals based on collection materials. The data analyzed show that the collection includes at least 70% of the species ever described in literature for the region. Recently a series of the species rare and previously unknown for the Urals fauna were added to the museum fund. The Urals territory makes a part of European-Siberian sub-region of the Palaearctic Region which is indicated by predominance of the widespread species in all the provinces. Beside those, 21 relatively specific species are numbered in the boreal zone, 11 – in the forest zone, and 16 species – in the forest-steppe zone. In general, land snails of the Urals are represented by the palaeartic species. Further development of the computer database, addition of new literature materials and registration of significant biogeocoenoses' characteristics would provide the detailed description of species biodiversity in land snails in concern to zoogeographical aspect.

Introduction

Study of land snails in the Urals started at the end of the XIX-th – beginning of the XX-th centuries. However, early works contained but fragmentary information about random collected specimens and only few species. Purposeful and detailed investigations for malacofauna in the Urals region were begun in 1960-ies; they dealt mainly with distribution patterns in land snails (Khohutkin, 1961, 1968, etc.; Krestyaninov, 1973; Boev, 1984). Special attention was paid to study ecology and genetics in populations (Khohutkin, 1997). Thus, significant collections of snails were gathered but not published. Now the authors have created malacological section within zoological museum of the Institute of Plant & Animal Ecology (Russian Academy of Sciences). This collection includes mainly series of land snails from the vast territory of the former SU; it numbers 3382 samples with 64240 specimens in total (180 species). The bulk of the collection comes from the Urals region (3234 samples, 52376 items; 109 species in total, 42 species – of land snails).

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Materials and Methods

A computer database has been developed (PARADOX) including all the collection materials. This made it possible to analyze in detail the distribution patterns for the land snails of the Urals, according to zoogeographical provinces, and to compare these data to the previous similar information (Likharev, Rammelmeyer, 1952).

Results

The territory at study is situated in European-Siberian sub-region of the Palaearctic zoogeographical region. Within the sub-region, a series of provinces (zones) are distinguished. In the Urals, there are provinces of tundra, taiga, european mixed and broad-leaved forests, steppes. 22 species are widespread in the Palaearctic, they are registered practically in all provinces.

In regard to the land snails, *tundra* represents a northern derivative of *the taiga zone*, and thus both these provinces are examined together as one boreal unit. Materials of the collection allow to mark several specific groups of the species. One species was registered only in this province. Four species are usually related to the

province of mixed and broad-leaved forests and previously were not registered in the boreal zone. One of them, *Ena montana*, was found beyond the formerly known eastern line of its European area (territory of the Middle Urals). Among the species initially characteristic of the province of mixed and broad-leaved forests, by the present time three species have expanded as far as the tundra zone, 4 species invaded taiga regions, 2 species are now registered in both taiga and steppe habitats, and one more species – in the steppes. One of the two circumboreal-and-alpine species and one of the steppe species were never marked here before. Besides those, 21 widespread species are represented. Three more species were not described in literature in regard to their zonal preferences. One of them, East Siberian snail *Bradybaena transbaicalia*, needs additional proof in order to confirm its presence in the Middle Urals. In total, 42 species are represented for this province in the museum funds; 11 of 15 species marked in literature are specific of the province (73,3%).

From the province of mixed and broad-leaved forests in the Urals, the museum funds include the following groups of species. 7 species are peculiar of this province only, one of which is *Gastrocopta theeli*, a tertiary relict. 4 species initially inhabiting this province now have expanded to the taiga zone, two more – to the tundra; and another pair of species invaded even to the steppe province (one of the latter besides came to live in taiga, too). One circumboreal-and-alpine and one steppe species were not formerly registered in this zone. Lastly, there are 19 widespread species. Two species are not described in literature with regard to their zonal preferences (*Br. transbaicalia* was mentioned earlier). The total of 37 species from this province are represented in the museum funds; 18 species are specific of the province, 13 of them were marked in literature (72,2%).

If the whole territory at study is fractionated to lesser units, the picture looks as follows: 3 species are marked in tundra, 11 in the forest-tundra; 18 – in the middle and 39 – in south taiga; 24 species come from the mixed and 9 – from the broad-leaved forests; 35 species inhabit forest-steppe zone.

Thus, the major part of the territory within the Urals is situated in the boreal zone, though nature conditions differ significantly. The number of land snail species met in the boreal province is practically equal to that in the foliate forests (21 and 18 correspondingly, exclusive of the widespread taxa). This makes malacocoenoses in the Urals look uniform enough.

We should mark especially that steppe forms (*Truncatellina cylindrica*, *Pupilla bigranata*, *Chondrula tridens*) were found on western and eastern slope of the Urals, at the boundary separating the taiga and steppe zones. These species expand to the taiga zone through the open woodlands and steppified plots of craggy slopes in river plains. Information of the malacofauna of the insular Kungursko-Krasnoufimsky-Mesyagutovsky forest-steppe remains insufficient and needs further studies.

Thus, terrestrial malacofauna of the Urals (46 species) shows the prevailing widespread species (22 species in different provinces); there are 10 boreal species, 8 species of land snails inhabit the mixed and broad-leaved forests; 3 species refer to circumboreal-alpine forms, and 4 species are specific of steppes. Some species are marked in different zones; due to the features of their origin and distribution they may be characteristic of either zone. Several species were registered for the first time in the Urals: *Vertigo pusilla*, *Pupilla sterri*, *Zoogenetes harpa*, *Ena montana*, *Br.transbaicalia*(?); and in the Middle Urals: *G. theeli*, *Acanthinula aculeata*, *Ch. tridens*, *Cochlodina laminata*.

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