

Land snail fauna of the Humosu Secular Forest (Suceava County, Romania); a new locality of *Serrulina serrulata* (L. Pfeiffer, 1847) (Gastropoda: Pulmonata: Clausiliidae)

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The paper reports faunistic data on the land snail fauna of the protected beech forest reserve of Fagetul Secular Humosu (Suceava County, Romania). We found several species with Carpathian distribution, and the study area is probably the easternmost locality of these species. The Humosu Forest Reserve is the fourth locality of *Serrulina serrulata* (L. Pfeiffer, 1847) in Romania. The species survival requires occurrence of preserved old-growth forests with decaying tree trunks and logs.

Key words: Gastropoda, Pulmonata, *Serrulina serrulata*, Carpathian elements, beech forest.

Introduction

The Humosu Old Growth Beech Forest is located on the Suceava Plateau, near the eastern limit of beech (*Fagus sylvatica*) distribution in Europe (ROIBU 2010). This reserve was established in 1970 and has a 70 ha total area. The Humosu Reserve is located in the Hârlău Forest District, Production Unit III Humosu, parcel 62 and 64, at an altitude of around 455 m, with the coordinates 47°30'02" North, and 26°43'27" East (see Fig. 1, indicated with a square). Geomorphologically speaking, the sample plot is located on a wavy slope with a 12 degrees declination. The main type of soil is luvisol, and the specific flora is formed by species of the genus *Asperula*. From structural and specific phytocoenosis analyses, according to adopted typology, we can see that the flora corresponds to the *Geranio robertianae-Fagetum* association.

Until now most of the research conducted in this reserve has been focused on the structural dynamics of natural ecosystems (ROIBU & POPA 2007, ROIBU et al. 2008, ROIBU 2010; BARBIR et al. 2010) and the dendroclimatological responses of beech at its eastern limit of European distribution (ROIBU 2010).

Material and methods

Land snails were collected by hand sampling on 9 Aug 2006 and 9 Aug 2007 (B. Páll-Gergely) and by hand picking and collecting soil material on 20 Aug 2008 (B. Páll-Gergely & C. Roibu). The soil material, the living individuals and some empty shells were collected mainly under decaying logs and around living tree trunks. Some logs were opened in order to find living snails between wood fibers.

The nomenclature of taxa belonging to the family Clausi-

liidae follows NORDSIECK (2007), whereas those of other species are according to www.faunaeur.org. The systematic arrangement is according to the alphabetical order of the families. In most cases we cited the zoogeographical distribution type of land snail species according to KERNEY et al. (1983). *Serrulina serrulata* (L. Pfeiffer, 1847) is classified as Pontic species here. Most of the species were identified using conchological features (based on the comparative collection of the first author), but the exact identification of *Aegopinella epipedostoma* (Fagot, 1879) was based on anatomical examinations as well (we followed KERNEY et al. 1983).

The collected material was deposited in the collection of the first author (Mosonmagyaróvár, Hungary).

Results

List of species found in the forest is presented here.

Argnidae:

Argna bielzi (Rossmässler, 1859)

Clausiliidae:

Bulgarica (Strigilecula) cana (Held, 1836), *Cochlodina laminata* (Montagu, 1803), *Cochlodina (Paracochlodina) orthostoma* (Menke, 1828), *Laciniaria plicata* (Draparnaud, 1801), *Macrogastra borealis bielzi* Nordsieck, 1993, *Alinda (Pseudalinda) stabilis* (L. Pfeiffer, 1847), *Ruthenica filigrana* (Rossmässler, 1836), *Serrulina serrulata* (L. Pfeiffer, 1847) (shell height: 12.6–13.4 mm), *Vestia elata* (Rossmässler, 1836)

Euconulidae:

Euconulus fulvus (O. F. Müller, 1774)

Helicidae:

Isognomostoma isognomostomos (Schröter, 1784)

Oxychilidae:

Aegopinella epipedostoma (Fagot, 1879), *Morlina glabra striaria* (Westerlund, 1881), *Cellariopsis deubeli* (A.J. Wagner, 1914) (= *Oxychilus orientalis* (Clessin, 1887))

Patulidae:

Discus ruderatus (W. Hartmann, 1821)

Pristilomatidae:

Vitrea crystallina (O.F. Müller, 1774), *Vitrea diaphana* (S. Studer, 1820), *Vitrea transsylvanica* (Clessin, 1877)

Valloniidae:

Acanthinula aculeata (O. F. Müller, 1774)

The living snails and empty shells were collected mainly under decaying logs, under the removable bark and around living tree trunks. The main habitat of *Argna bielzi* and *Serrulina serrulata* was inside decaying, wet logs and trunks, between wood fibres.

In the flotsam of a small stream about 1 km from the center of the protected forest, the following additional species were found: *Merdigera obscura* (O. F. Müller, 1774), *Carychium tridentatum* (Risso, 1826), *Monachoides vicinus*

(Rossmässler, 1842) and *Vestia turgida* (Rossmässler, 1836). These species might live in the old forest as well, but their presence is not yet confirmed.

Discussion

Twenty species were collected in the Humosu Reserve and four additional species were found in the flood debris of a small stream nearby. Ten of the 24 taxa have Carpathian distribution (see Table 1) and probably the Humosu Reserve and its environment represents the easternmost occurrence of some of these species. Some other species with wider area type (e.g. European) are also common and very characteristic of Carpathian forests: *Isognomostoma isognomostomos*, *Aegopinella epipedostoma* and *Cochlodina orthostoma*.

A peculiar member of the land snail community is *Serrulina serrulata* which has a vast area throughout Eastern Bulgaria and Northern Turkey to the Central Caucasus (SCHÜTT 2001). The species is known from four localities in Romania, but the collection data of LICHERDOPOL (1903) in the county of Ilfov could not be verified by GROSSU (1981), therefore this location was not indicated in the map of HUNYADI & SZEKERES (2009). Accordingly, this more than a hundred years old doubtful record is not shown on our map either (see Fig. 1). In the forest near Bârnova (Bîrnova) Village (Iași County), which is the ne-

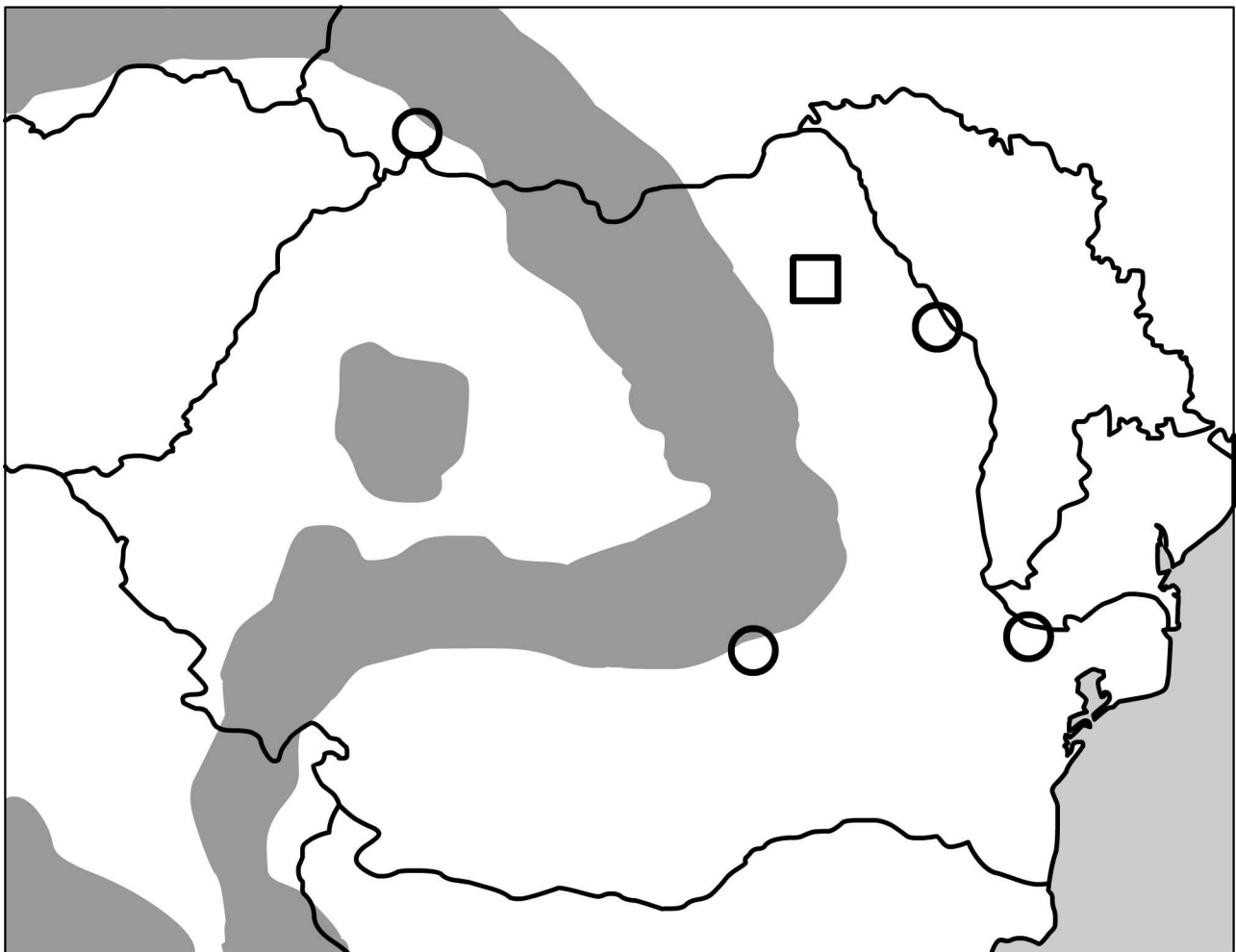


Fig 1. Distribution of *Serrulina serrulata* (L. Pfeiffer, 1847) in Romania and in Ukraine. Circles indicate the known localities from the literature and the square shows the new locality at Humosu Secular Forest.

Table 1. Biogeographical distribution type of collected species.

Species name	Distribution type
<i>Argna bielzi</i>	Carpathian
<i>Bulgarica (S.) cana</i>	Central and East European
<i>Cochlodina laminata</i>	European
<i>C. (P.) orthostoma</i>	Central and East European
<i>Laciniaria plicata</i>	Central and East European
<i>M. borealis bielzi</i>	Carpathian
<i>Alinda (P.) stabilis</i>	Carpathian
<i>Ruthenica filograna</i>	East European
<i>Serrulina serrulata</i>	Pontic
<i>Vestia elata</i>	Carpathian
<i>Discus ruderatus</i>	Palaeartic
<i>Euconulus fulvus</i>	Holarctic
<i>I. isognomostomos</i>	Alpine and Carpathian
<i>A. epipedostoma</i>	Pyrenean and European
<i>M. glabra striaria</i>	South and Middle European, Pontic
<i>Cellariopsis deubeli</i>	Carpathian
<i>Vitrea crystallina</i>	Alpine, South European
<i>Vitrea diaphana</i>	Carpathian, Alpine, North Balcanic
<i>Vitrea transsylvanica</i>	Carpathian
<i>Acanthinula aculeata</i>	West Palaeartic
<i>Merdigera obscura</i>	European
<i>C. tridentatum</i>	European
<i>Monachoides vicinus</i>	Carpathian
<i>Vestia turgida</i>	Carpathian

arest known locality to the new population, we have not found the species. *S. serrulata* also lives in Ukraine (LIKHAREV 1962, MAJOROS & NÉMETH 1997). This is the only location where the species crosses the chain of the Carpathian Mountains. The low number of known localities in Romania can be explained by the marginal position of these locations in the distribution of the species.

S. serrulata has very narrow ecological tolerance, since it needs undisturbed beech forests with large decaying tree logs. The other clausiliids found in the forest are typical corticolous species, whereas *S. serrulata* lives inside the fibres of humid trunks. This biotope type is common within the whole *Serrulina* group (Clausiliidae, subfamily Phaedusinae) and the rare *Soosia diodonta* (Férussac, 1821) (Helicodontidae), which also has very similar ecological preferences.

Old, natural and undisturbed forests in Eastern Romania can support rich snail communities (SÓLYMOS & PÁLL-GERGELY 2006), as well as rare species, endemic and relic species (GEACU & DUMITRAȘCU 2009). Therefore, the protection of the Humosu Reserve is essential for maintaining the natural biodiversity of this zoogeographically unique region.

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