Terrestrial gastropods (Mollusca, Gastropoda) of Strandzha Mountain and the Black Sea coast (Bulgaria and Turkey)

Atanas Irikov, Ivelin Mollov

Abstract: The current synopsis presents an overview of the terrestrial malacofauna of Strandzha Mountain in Bulgaria and Turkey, based on previously published and new data. As a result of the research we recorded 101 species and subspecies of terrestrial molluscs belonging to 27 families. The data on the terrestrial malacofauna from the Turkish part of Strandzha is entirely new and presented here for the first time. The synopsis includes a list of synonymous species and subspecies concerning the area of research, all known localities, new localities reported for 50 taxa, systematic and environmental data. For the first time a zoogeographical and conservation analysis of the terrestrial snails is made.

Key words: terrestrial gastropods, snails, slugs, Strandzha Mountain, Bulgaria, Turkey.

Introduction

50 publications contain data on the terrestrial malacofauna of Strandzha Mountain in Bulgaria. For Strandzha Mnt. in Turkey there are limited data only on the presence of a few species of the genus Monacha (Hausdorf, 2000). Most publications report species composition and localities or describe new taxa. Information on the malacofauna is fragmentary and mostly referring to the Bulgarian part of Strandzha. With almost no data on the Turkish part of Strandzha, this is the first major study of Turkish region.

In contrast, the first reports of molluscs in Strandzha in Bulgaria were published more than 80 years ago (Wagner, 1927). Most data refer to terrestrial species, but there are some data on aquatic species of molluscs.

Notwithstanding the accumulated information (mainly for the coastal part of the mountain), there is no summarizing study about the contemporary state of malacofauna of Strandzha Mnt.

The purpose of this paper is to present a review of the malacofauna from Strandzha (Bulgaria and Turkey) based on all published data so far, and also on new data from modern research.

In the present work, malacofaunistic data from 50 publications and new data of the authors are summarized.

Original data on species distribution, as well as taxonomic, systematic, zoogeographical and ecological data resulting from studies in the years 2002-2010 are included.

Material and methods

Names of species and subspecies, with a few exceptions, follow Irikov & Mollov (2006). The list of synonyms applies only to Strandzha Mnt. New data resulting from research in the period 2002-2010 are presented. Comments, taxonomic data, ecological data, and zoogeographic classification are given below each taxon.

Figure 1 presents a map of the studied region with its physical-geographical boundaries in a UTM grid (10x10 km), according to the Global Positioning System. Every quadrant has its UTM code.

Tables 1 and 2 present all localities of terrestrial snails in the Strandzha (Bulgaria and Turkey) from literature sources or new records with a UTM code. Serial number of each locality within the UTM quadrant is provided.

Symbols used:

● Species or subspecies identified as new to the
fauna of Strandzha or Southern Black Sea coast in Bulgaria;
- ●Species or subspecies identified as new to the fauna of Strandzha or Southern Black Sea coast in Turkey;
- ●●Species or subspecies identified as new to the fauna of Strandzha (Bulgaria and Turkey);
- ■Species and subspecies identified as new to the fauna of Turkey;
- SSpecies (or subspecies) synonymized;
- ▲Species or subspecies with revised nomenclature: taxa transferred to other genera or a change of species / sub-species status;
- #Species (or subspecies) not found in Strandzha and southwestern Black Sea Coast (Bulgaria and Turkey);
- ?Species (or subspecies) questionable for the researched areas;
- ≈Species registered under Black Sea coast, but not part of the malacofauna in the researched area (Bulgaria and Turkey). All found shells are carried by sea currents from other close or distant regions, and deposited by waves on the Bulgarian and Turkish coast.
- ISpecies or subspecies introduced in Bulgaria or Turkey;
- BGEspecies endemic to Bulgaria;
- BLEspecies endemic to the Balkan Peninsula;

For the species' ecological characteristics their ecological preferences (mainly concerning humidity and temperature) are registered, as well as their ecological valency and adaptive behavior against the environmental factors, the habitat and vertical distribution and the contemporary range of the taxa as a reflection of its ecological requirements.

For the zoogeographical characteristics of the species the contemporary range of each species is noted and also its ecological requirements and adaptations as a reflection of its historical development, geological history of the land, as well as some published paleontological data.

For the zoogeographic characteristics mainly the works of the following authors were used: Gruev (1995, 2000a, 2002a, 2002b), GRUEV (In: Gruev & Kuzmanov, 1999), GRUEV & BECHEV (2000), Damjanov & Likharev (1975), as well as the zoogeographic characteristics made for terrestrial snails from the Dobrostan Ridge in the Western Rhodopes by IRIKOV (2002) and IRIKOV & MOLLOV (2006) for terrestrial snails from the Western Rhodopes.

The names of the zoogeographic categories (complexes, elements, subelements) follow GRUEV & BECHEV (2000).

The snails were identified in laboratory conditions by their conchiological indices and anatomical

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Fig. 1. Map of the studied region
Table 1. Codes of the localities of the terrestrial gastropods in Strandzha Mountain

<table>
<thead>
<tr>
<th>UTM code</th>
<th>Locality</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NG17</td>
<td>Varovnik Village</td>
<td>River Fakiyska 7 km west of the village</td>
</tr>
<tr>
<td>NG18</td>
<td>Sredetz Town</td>
<td></td>
</tr>
<tr>
<td>NG26</td>
<td>Mladezhko</td>
<td>about 40 km north-west of Malko Tarnovo</td>
</tr>
<tr>
<td>NG24</td>
<td>Derekov Village</td>
<td></td>
</tr>
<tr>
<td>NG35</td>
<td>Cave Hambarcheto</td>
<td>Brashljan Village district</td>
</tr>
<tr>
<td>NG36</td>
<td>Zvezdezit Village</td>
<td></td>
</tr>
<tr>
<td>NG44</td>
<td>Malko Tarnovo Town</td>
<td></td>
</tr>
<tr>
<td>NG45-1</td>
<td>Cave Bazat</td>
<td>Stoilovo Village district</td>
</tr>
<tr>
<td>NG45-2</td>
<td>Cave Malkata vapa</td>
<td>Stoilovo Village district</td>
</tr>
<tr>
<td>NG45-3</td>
<td>Cave Peshterata s dvata vhoda</td>
<td>Stoilovo Village district</td>
</tr>
<tr>
<td>NG48-58</td>
<td>Yasna Poy ana Village</td>
<td></td>
</tr>
<tr>
<td>NG49-59</td>
<td>Bakarlaka Hills</td>
<td>Between villages Rosen and Ravadinovo, in &quot;Medni Rid&quot; Hill</td>
</tr>
<tr>
<td>NG51</td>
<td>3 km north-east of Yenice</td>
<td></td>
</tr>
<tr>
<td>NG55-1</td>
<td>Gramatikovo Village</td>
<td></td>
</tr>
<tr>
<td>NG55-2</td>
<td>Place Kachul</td>
<td>About 20 km northeast of Malko Tarnovo Town</td>
</tr>
<tr>
<td>NG56-1</td>
<td>Kondolovo Village</td>
<td>On 3 km west of the village</td>
</tr>
<tr>
<td>NG56-2</td>
<td>Coomb Trionski dol</td>
<td>Upstream Trionska River, at 5-7 km north of the village Balgari</td>
</tr>
<tr>
<td>NG56-3</td>
<td>Balgari Village</td>
<td></td>
</tr>
<tr>
<td>NG58-1</td>
<td>Riverside on Ropotamo River</td>
<td>200 meters east of the bridge on the road Sozopol - Primorsko</td>
</tr>
<tr>
<td>NG58-2</td>
<td>Veselie Village</td>
<td></td>
</tr>
<tr>
<td>NG58-3</td>
<td>Arkutino</td>
<td>Camping and marsh</td>
</tr>
<tr>
<td>NG58-4</td>
<td>Between villages Veselie and Yasna Polyana</td>
<td></td>
</tr>
<tr>
<td>NG58-5</td>
<td>Riverside on Ropotamo River</td>
<td>3, 5 km upstream from the mouth of the river</td>
</tr>
<tr>
<td>NG58-6</td>
<td>Mouth of Ropotamo River</td>
<td>1-5 km from the river outfall</td>
</tr>
<tr>
<td>NG58-7</td>
<td>Mouth of Ropotamo River</td>
<td>3 km upstream from the outfall</td>
</tr>
<tr>
<td>NG58-68</td>
<td>Mouth of Ropotamo River</td>
<td></td>
</tr>
<tr>
<td>NG59-1</td>
<td>Cape Sveti Agalina</td>
<td>Between Sozopol and &quot;Diuni&quot; Resort</td>
</tr>
<tr>
<td>NG59-2</td>
<td>Sozopol</td>
<td></td>
</tr>
<tr>
<td>NG59-3</td>
<td>Camping site “Zlatna Ribka”</td>
<td>About 5 km south of Chernomoret</td>
</tr>
<tr>
<td>NG59-4</td>
<td>Camping site “Kavatsite”</td>
<td>Camping site “Kavatsite”</td>
</tr>
<tr>
<td>NG62</td>
<td>Demirkoy</td>
<td>About 5 km southwest of the town</td>
</tr>
<tr>
<td>NG65-1</td>
<td>Cave Kerechiya</td>
<td>Kosti Village district</td>
</tr>
<tr>
<td>NG65-2</td>
<td>Reserve Silkosia</td>
<td>Kosti Village district</td>
</tr>
<tr>
<td>NG66-1</td>
<td>Tsarevo Town</td>
<td></td>
</tr>
<tr>
<td>NG66-2</td>
<td>Izgrev Village</td>
<td>Place Glarus Bair</td>
</tr>
<tr>
<td>NG66-3</td>
<td>Protected area “Marina reka”</td>
<td>Between villages Izgrev and Balgari</td>
</tr>
<tr>
<td>NG67-1</td>
<td>Kitin Village</td>
<td></td>
</tr>
<tr>
<td>NG67-2</td>
<td>Lozenets</td>
<td></td>
</tr>
<tr>
<td>NG67-3</td>
<td>North of Tsarevo Town</td>
<td>Few kilometers</td>
</tr>
<tr>
<td>NG67-4</td>
<td>Camping site “Arapya”</td>
<td>2 km north of Tsarevo</td>
</tr>
<tr>
<td>NG67-5</td>
<td>Beach “Popski plaz”</td>
<td>In the northern part of Tsarevo</td>
</tr>
<tr>
<td>NG67-6</td>
<td>Camping site “Oazis”</td>
<td>South of Lozenets</td>
</tr>
<tr>
<td>NG67-68</td>
<td>Primorsko Town</td>
<td></td>
</tr>
<tr>
<td>NG68-1</td>
<td>Cape Maslen nos</td>
<td></td>
</tr>
<tr>
<td>NG68-2</td>
<td>Cape Kondrus nos</td>
<td></td>
</tr>
<tr>
<td>NG73(1)</td>
<td>5 km west of Iğneada Town</td>
<td></td>
</tr>
<tr>
<td>NG73(2)</td>
<td>Half-way between Demirköy Town and Iğneada Town</td>
<td>Between Ahtopol Town and Sinemorets Village</td>
</tr>
<tr>
<td>NG-75</td>
<td>Lower reaches and mouth of Veleka River</td>
<td>Between Ahtopol Town and Sinemorets Village</td>
</tr>
<tr>
<td>NG76-1</td>
<td>Varvara Village; Ahtopol Town</td>
<td></td>
</tr>
<tr>
<td>NG76-2</td>
<td>Between Varvara Village and Tsarevo Town</td>
<td></td>
</tr>
<tr>
<td>NG76-3</td>
<td>1 km west of Iğneada</td>
<td></td>
</tr>
<tr>
<td>NG83(1)</td>
<td>beach to Iğneada Village</td>
<td></td>
</tr>
<tr>
<td>NG84</td>
<td>Rezovo Village</td>
<td>Firth of the river mouth</td>
</tr>
<tr>
<td>NG85-1</td>
<td>Silistar River</td>
<td></td>
</tr>
<tr>
<td>NG85-2</td>
<td>Sinemorets Village</td>
<td></td>
</tr>
</tbody>
</table>
and morphological peculiarities of the genital system. For identifying the taxa, we used mainly the works of Damjanov & Likharev (1975), Nordsieck (1973, 1974), Urbański (1960b,c, 1964, 1969), Riedel (1963-2000), Wiktor (1983) and others.

Results

As a result of the research conducted in Strandzha (Bulgaria and Turkey) we found 101 species and subspecies terrestrial mollusks belonging to 27 families. One taxon new for Strandzha Mountain and the Black Sea coast in Bulgaria was found, 16 taxa are new for Strandzha Mountain and the Black Sea coast in Turkey, two taxa are new for Strandzha in Bulgaria and Turkey, one taxon is new to the fauna of Turkey, 16 taxa with a revised nomenclature are reported; we believe that 13 taxa cannot be found in the study area and 7 taxa remain under question, 1 species is thought to have been introduced in Bulgaria, 4 taxa were brought to the Bulgarian coast from other regions through sea currents, 3 taxa are Bulgarian and 9 Balkan endemites. New localities are reported for 50 taxa.

The nature of this article, with its summary of all previously available and newly included data makes it useful as a basis for future research, as well as for new data finding.

List of the taxa of terrestrial snails, inhabiting the Strandzha Mountain and the Black Sea Coast (Bulgaria and Turkey):

Terrestrial snail
Family Pomatiasidae
1. Pomatias elegans (Müller, 1774)


   Published for the studied area (Table 1; Fig. 1): Urbanski (1960b) NG66(1); Urbanski (1960c) NG58(3), NG58-68, NG67-68 (south-east coast of Dyavolsko Marsh); Urbański & Wiktor (1968) NG58(3,7), NG58-68; Pintér & Pintér (1970) (“right bank of the Ropotamo River”), NG66(1); Damjanov & Likharev (1975) (“the entire Black Sea coast”); Körnig (1983) NG58(3), NG59(2), NG66(1).

   New localities (Table 1; Fig. 1):
   - Malko Tarnovo town (Bulgaria), NG44, 3.03.2003, leg. S. Uzunov.
   - Mladezhko village, NG26 (Bulgaria), 9.05.2005, leg., A. Irikov.

   Ecological data: In the Black Sea coast it occurs in leaf surface of deciduous forests, and also among coastal bushes and grass vegetation.


   # Pomatias rivulare (Eichwald, 1829)


   Notes: The species is wrongly reported by Pintér & Pintér (1970) for the region of Tsarevo together with Pomatias elegans (Mül.). Our studies showed that P. rivulare does not occur in Strandzha or anywhere in the Black Sea coast in the studied area.

   Family Aciculidae
2. Platyla polita (Hartmann, 1840)


   Acicula (Platyla) polita: Damjanov & Likharev, 1975: 89.

   Acicula polita: Hubenov (In: Delchev et al., 1993): 188.

   Published for the studied area (Table 1; Fig. 1): Damjanov (1971) NG85(1); Damjanov & Likharev (1975) NG67(1), NG67(1), NG85(1); Hubenov (In: Delchev et al., 1993) (“Silistar River”), NG67(1), NG67(1); Hubenov (2005) (“Strandzha”);

   New localities (Table 1; Fig. 1):
   - Silkosiya Reserve, near Kosti village (Bulgaria), NG65(2), 23.06.2001, leg., A. Irikov.

   Ecological data: Lives among leaf litter and in rotten wood residues mixed with soil at high humid-
ity (Damjanov & Likharev, 1975) and in the crevices of rocks (Falkner et al., 2013). Mesohygrophilic (Hubenov, 2005).

Zoogeography: Mid European element, European faunistic complex.

Conservation status: Listed as “Least Concern” (LC) under IUCN criteria (Falkner et al., 2013).

3. ▲ Platyla similis (Reinchardt, 1880)
   Published for the studied area (Table 1; Fig. 1): Körnig (1983) (“Bosna ridge”);
   Ecological data: Inhabits limestones within the leaf cover of deciduous forests with high humidity and moderate or low temperature, usually found under stones or at the base of rocks. However this is not an obligate rock-dwelling species (Páll-Gergely, 2013a). Mesohygrophilic, cool-loving species (Irikov, 2002).
   Zoogeography: East-Submediterranean subelement, Submediterranean element, European faunistc complex (Irikov & Mollov, 2006).
   Conservation status: Listed as “Least Concern” (LC) under IUCN criteria. Local subpopulations might be threatened by destruction of the vegetation (Páll-Gergely, 2013a).

4. Platyla orthostoma (Jackiewicz, 1979) BGE
   Acicula (Platyla) orthostoma: Jackiewicz, 1979: 137.
   Published for the studied area (Table 1; Fig. 1): Jackiewicz (1979) NG55(1); Hubenov (2005) (“South Black Sea coast”);
   Ecological data: Occurs in subterranean part of rocky (mostly limestone) habitats or under decaying leaf litter (Páll-Gergely, 2013b). Mesohygrophilic (Hubenov, 2005).
   Zoogeography: Bulgarian endemic.
   Conservation status: Listed as “Near Threatened” (NT) under IUCN criteria. A potential threat to the species is destruction of the rocks it inhabits by quarrying, road construction or other. However the total destruction of the whole habitat is not very likely, therefore this threat is mostly hypothetical. Deforestation of its habitat can be a threat to this species, however this is not an ongoing threat. The species is not protected at national level in Bulgaria. The geographic range and the existing sub-populations of this species are not exactly known, therefore research activities should focus on these two areas (Páll-Gergely, 2013b).

Family Ellobiidae

5. Carychium minimum Müller, 1774
   Carychium minimum: Körnig, 1983: 32.
   Published for the studied area (Table 1; Fig. 1): Körnig (1983) (“Bosna ridge”);
   Ecological data: Lives in places with high humidity, in dense deciduous forests and meadows, under leaf litter, among decaying plant debris, moss-grown stumps, especially in marshy places up to 1000 m altitude (Damjanov & Likharev, 1975).
   Zoogeography: Holarctic element, Siberian faunistic complex.

Family Piramidulidae

# Pyramidula rupestris (Draparnaud, 1801)
   Published for the studied area (Table 1; Fig. 1): Damjanov (1971) NG75, NG85(1);
   Notes: We reckon that the presence of this species in the studied regions is questionable. There is no other data about it, except those of Damjanov (1971). The material from Strandzha reported by Damjanov (1971) is most probably related to P. cephalonica (Westerlund, 1898) or less probably to P. pusilla (Vallot, 1801) (see Dedov & Subai, 2012).

6. Pyramidula cephalonica (Westerlund, 1898)
   Published for the studied area (Table 1; Fig. 1): Dedov & Subai (2012) NG44.
   Zoogeography: South European mountainous subelement, European mountainous element, European faunistic complex.

Family Vertiginidae
   Subfamily Vertigininae

7. Vertigo (Vertigo) pygmaea (Draparnaud, 1801)
   Published for the studied area (Table 1; Fig. 1): Körnig (1983) (“Ropotamo River”);
   Ecological data: Usually lives under the leaf cover in grass and moss, with high humidity, in mixed and deciduous forests (Damjanov & Likharev, 1975).
   Zoogeography: Holarctic element, Siberian faunistic complex.

8. ● Vertigo (Vertilla) angustior (Jeffreys, 1830)
   Published for the studied area in the present study.
   Localities (Table 1; Fig. 1):
   - Kiten resort (Bulgaria), NG67(1), leg. D. Georgiev.
   Ecological data: Lives in very moist woodlands
among grass and moss, under stones and in leaf litter (Damjanov & Likharev, 1975).

Zoogeography: Eurosiberian subelement, Euroasiatic Paleartctic element, Siberian faunistic complex.


Subfamily Truncatellininae
9. Truncatellina claustralis (Gredler, 1856)

Published for the studied area (Table 1; Fig. 1):
- Damjanov (1971) NG75, NG85(1); Damjanov & Likharev (1975) (“the entire Black Sea coast”).

Ecological data: Inhabits limestones (calcerous) in the mountains with medium and low humidity (xeromesophile), thermophile, in dry periods considerably drought-resistant (Irikov & Mollov, 2006).

Zoogeography: Mid European mountainous subelement, European mountainous element, European faunistic complex (Irikov & Mollov, 2006).

10. Truncatellina cylindrica (Ferussac, 1807)

Published for the studied area (Table 1; Fig. 1):

Ecological data: It inhabits limestones at medium and low humidity. Xerophilic, thermophile, drought-resistant, found mostly in heterozonal rocky sites (Irikov, 2002).

New localities (Table 1; Fig. 1):
- Tsarevo town (Bulgaria), NG66(1), leg. D. Georgiev.

Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

11. Truncatellina costulata (Nilsson, 1822)


Zoogeography: Mid European element, European faunistic complex.

Family Lauridae
12. Lauria cylindracea (Da Costa, 1778)
Lauria (Lauria) cylindracea cylindracea: Urbański, 1960b: 89.
Lauria (Lauria) cylindracea: Pintér, 1968: 211.

Published for the studied area (Table 1; Fig. 1):

New localities (Table 1; Fig. 1):
- Tsarevo town (Bulgaria), NG66(1), leg. D. Georgiev.

Ecological data: The species is found on sunny slopes, under andesite stones and among dry grass vegetation. Lives in average wet and dry places under grasses, crop residues and leaves in low mixed forests and shrubs (Damjanov & Pintér, 1969; Damjanov, 1971; Damjanov & Likharev, 1975).

Mesophilic (Hubenov, 2005).


13. Euxinolauria schweigeri (Götting, 1963)
Lauria (Leitostyla) anglica: Damjanov, 1971:
**Lauria (Leiostyla) anglica**: Damjanov & Likharev, 1975: 104.

**Lauria anglica**: Körnig, 1983: 32.

**Lauria anglica**: Hubenov (In: Delchev et al., 1993): 185, 191.

**Lauria anglica**: Dedov, 1998: 748.

**Leiostyla anglica**: Hubenov, 2005: 236.

**Euxinolauria schweigeri**: Irikov & Erőss, 2008: 200.

Published for the studied area (Table 1; Fig. 1):
- Damjanov (1971) NG75, NG85(1);
- Damjanov & Likharev (1975) NG75, NG85(1);
- Körnig (1983) (“Bosna ridge”);
- Hubenov (In: Delchev et al., 1993) (“Veleka River and Silistar River”);
- Hubenov (2005) (“South Black Sea coast”);
- New localities (Table 1; Fig. 1):
  - Silkosiya Reserve, near Kosti village (Bulgaria), NG65(2), 23.06.2001, leg., A. Irikov.
  - Maslen Nos Cape (Bulgaria), NG68(1), 4.06.2005, leg. A. Irikov.

Taxonomical data: The species *Lauria (Leiostyla) anglica* has not previously been distinguished from *Euxinolauria schweigeri* and therefore was erroneously reported in Bulgaria (Irikov & Erőss, 2008).

Ecological data: The species occurs in mixed forests at the base of cliffs in shady and humid places under decayed leaves mixed with soil (Damjanov, 1971; Damjanov & Likharev, 1975).

Zoogeography: euxinian subelement, Submediterranean element, european faunistic complex.

**Family Argnidae**

14. *Agardhiella parreyssii* (Pfeiffer, 1848) BLE


Published for the studied area (Table 1; Fig. 1):

Notes: This species was reported as *A. rumelica* (Hesse, 1916) by Hubenov (1993) with no specific deposit in Strandzha Mountain. We consider that the existence of this species in the studied regions is questionable. Strandzha does not meet the ecological requirements of the species – it lacks the typical medium-and high karst habitats.

Taxonomical data: According to Subai (2011), *A. rumelica* is a synonym of *A. parreyssii*.

Zoogeography: Endemic for the Balkan Peninsula (Irikov, 2008).

**Family Orculidae**

15. *Orcula (Hausdorfia) zilchi* Urbanski, 1960


*Orcula (Orcula) zilchi*: Urbanski, 1960c: 139.

*Orcula (zilchi)*: Damjanov & Likharev, 1975: 115.


*Orcula zilchi*: Hubenov, 2005: 236.

*Orcula (Hausdorfia) zilchi* Páll-Gergely et al., 2013: 37, 38.

Published for the studied area (Table 1; Fig. 1):
- Urbanski (1960a) NG58-68 (right bank of the river, 3 km from the mouth);
- Urbanski (1960c) NG58-68;
- Damjanov & Likharev (1975) NG58-NG68-NG67-NG66-NG76-NG75-NG85-NG84;
- Körnig (1983) (“Ropotamo River and Bosna ridge”);
- Hubenov (In: Delchev et al., 1993) (“South Black Sea coast and Strandzha Mountain”);
- Hubenov (2005) (“South Black Sea coast and Strandzha Mountain”);
- Páll-Gergely et al. 2013 NG56(1), NG65(2).

Notes: A. Irikov (in: Páll-Gergely et al., 2013) could not find this species in the type locality. It is reasonable to suppose that Urbanski’s population was “washed down” from some location in the Strandzha Mountain and settled a temporary subpopulation in the Ropotamo floodplain (Páll-Gergely et al., 2013).

Ecological data: The species lives in shady and damp places under leaf waste mixed with soil, under rotten boles at the base of syenite rocks, in mixed forests and shrubs near the swamps of the Black Sea coast (Urbanski, 1960a; Damjanov & Likharev, 1975). In Strandzha Mountain (near Kondolovo village), living specimens were collected in an oriental beech (*Fagus orientalis*) forest in shady and moist microhabitats between the leaf litter and soil (Páll-Gergely et al., 2013).

Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

Conservation status: Listed as vulnerable (V) under IUCN criteria (Páll-Gergely, 2011). Deforestation and disturbance of the forests are the main threat to this species (Páll-Gergely et al., 2013).


Published for the studied area (Table 1; Fig. 1):

Notes: So far, there has been no evidence for the existence of this species in Strandzha.
Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

17. ▲ Sphyradium doliolum (Bruguiere, 1792)
Orcula (Sphyradium) doliolum: Urbański, 1960a: 59.
Orcula (Sphyradium) doliolum: Urbański, 1960c: 139.
Orcula (Sphyradium) doliolum: Urbański & Wiktor, 1968: 60.

Published for the studied area (Table 1; Fig. 1): Urbański (1960a) NG58(7); Urbański (1960c) NG58-68; Urbański & Wiktor (1968) NG58(3,7); Pintér & Pintér (1970) (“right bank of the Ropotamo River”); Körnig (1983) (“Ropotamo”).

New localities (Table 1; Fig. 1):
- Maslen Nos cape (Bulgaria), NG68(1), 4.06.2005, leg. A. Irikov.
- Near the mouth of Veleka River (Bulgaria), NG75, 28.06.2004, leg. A. Irikov.
- Near the mouth of Rezovska River (Bulgaria), NG84, 27.08.2004, leg. T. Irikova & A. Irikov.

Ecological data: Inhabits limestones at moderate humidity, in the leaf cover of deciduous and rarely pine forests. Because of the thermophilic preferences this species is considerable drought-resistant and can be found in xerothermic sites. Mesophilic, thermophilic species with relatively high drought-resistance. Euryhygro- and eurythermibiontic (Irikov, 2002; Irikov & Mollov, 2006).

Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

18. Vallonia pulchella (Müller, 1774)

Published for the studied area (Table 1; Fig. 1): Körnig, 1983: 32.

Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) (“right bank of the Ropotamo River”); Körnig (1983) (“Ropotamo”);

New localities (Table 1; Fig. 1):
- Near the mouth of Rezovska River (Bulgaria), NG84, 27.08.2004, leg. T. Irikova & A. Irikov.

Ecological data: Mesohygrophilic, cool-loving and cold-resistant species (Irikov, 2002).

Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

19. Acanthinula aculeata (Müller, 1774)


Published for the studied area (Table 1; Fig. 1): Damjanov (1971) NG75, NG85(1); Körnig (1983) (“Ropotamo River”);

Ecological data: Mesophilic, cool-loving and relatively cold-resistant (Irikov, 2002).

Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

Superfamily Cochlicopoidea
Family Cochlicopidae
20. Cochlicopa lubrica (Müller, 1774)

Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) (“right bank of the Ropotamo River”); Körnig (1983) (“Ropotamo River”);

Ecological data: It inhabits wooded areas under the leaf cover, under moss and grass, at high moisture (Damjanov & Likharev, 1975).


21. Cochlicopa lubricella (Porto, 1838)


Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) (“right bank of the Ropotamo River”); Körnig (1983) (“Bosna ridge”);

Ecological data: Mesohygrophilic, cool-loving and cold-resistant species (Irikov, 2002).

Zoogeography: Irikov & Mollov (2006) assigned the species to the Siberian faunistic complex, but erroneously as a Holarctic element. The species actually belongs to the Siberian faunistic complex, but just to be classified as Euroasiatic Palaearctic element and just like Euro-south-Siberian (sub-Siberian) subelement of this faunistic complex.

Family Enidae
Subfamily Eninae
22. ▲ Merdigeria obscura (Müller, 1774)

Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) (“right coast of the Ropotamo River”) NG58(2); Körnig (1983) (“Ropotamo and Bosna ridge”);

New localities (Table 1; Fig. 1):
Terrestrial gastropods (Mollusca, Gastropoda) of Strandzha Mountain and the Black Sea coast (Bulgaria and Turkey)

- Near the mouth of Veleka River (Bulgaria), NG75, 28.06.2004, leg. A. Irikov.

Ecological data: Mostly forest species – inhabits diverse microsites in deciduous and mixed forests and bushy habitats. Drought-resistant, capable of standing tough conditions and continuous dry periods. Mesophilic, thermophilic, drought-resistant, eurythermic and euryhygrophilic species (Irikov, 2002; Irikov & Mollov, 2006).

Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

# Ena montana (Draparnaud, 1801)


Published for the studied area (Table 1; Fig. 1): Damjanov (1971) NG75, NG85(1).

Notes: In our study this species was not found in the lower reaches of rivers Veleka and Silistar or elsewhere in the studied area, where it was reported previously. We consider that Ena montana does not occur in Strandzha (Bulgaria) due to the lack of suitable habitats. Most likely the determination by Damjanov (1971) is a mistake – probably confused with a shell of Mastus rossmaessleri (Pfeiffer, 1846) with no or underdeveloped angularis.

# ≈ Ena nogeli (Roth, 1850)


Notes: Hudec & Vašátko (1971) reported this species as Chondrula (Mastus) ponticus (Retowski, 1887) from the Ropotamo River mouth. According to Irikov & Mollov (2014), the shell found belongs to Ena nogeli, which cannot be found in Bulgaria. According to these authors, sea currents brought the shell from northwestern Turkey to the Bulgarian coast.

23. Zebrina kindermanni (Pfeiffer, 1853)


Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“South Black Sea coast”); Hubenov (2005) (“South Black Sea coast”);

Ecological data: Lives in very dry places, overgrown with low shrubs and herbaceous plants under leaf cover and soil (Damjanov & Likharev, 1975).

Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex.

≈ Zebrina varnensis (Pfeiffer, 1847)


Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) NG66(1); Damjanov & Likharev (1975) NG76-2; Hubenov (In: Delchev et al., 1993) NG76(2);

Notes: Our studies showed that this species does not live in the southern Black Sea coast of Bulgaria and all reports are based on found empty shells, brought by sea currents from more northern regions. We consider this Balkan endemic species occurs only on the northern Bulgarian Black Sea coast and southern Romanian coast.

In our research we found in tidewrack on the coast of Arkutino Beach NG58(3), empty shells, brought by sea currents, 12.09.2005, leg. A. Irikov.

24. ? ▲ Multidentula ovularis (Olivier, 1801)


Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“the entire Black Sea coast”);

Notes: In our study this species was not found anywhere on the Black Sea coast or in Strandzha. We consider that this species does not live in the researched area and if it is registered, it will probably be shells brought by sea currents from other regions.

Ecological data: In Bulgaria lives in damp places, in soil mixed with plant debris and under the grass (Damjanov & Likharev, 1975).

Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex.

25. ▲ Pseudochondrula seductilis (Rossmaßler, 1846)


Imparietula seductilis seductilis: Damjanov & Likharev, 1975: 150.

Published for the studied area (Table 1; Fig. 1): Damjanov (1971) NG75, NG85(1);

Notes: The morphology of the shell shows considerable variability in different populations. There are large variations in terms of size of shell and the degree of development of folds in the mouth.

Ecological data: In Strandzha (Bulgaria) species found in mixed forests at the base of rocks in shady and humid places under decayed leaves mixed with soil. (Damjanov, 1971). Lives in soil among grass
and bushes vegetation at low humidity (Damjanov & Likharev, 1971).

Xerophilic, termophilic, drought-resistant.
Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex.

Subfamily Chondrulinae
26. Chondrula (Chondrula) tridens (Müller, 1774)

Chondrula (Chondrula) tridens: Pintér & Pintér, 1970: 89.
Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) NG66 (1).
Notes: In our study this species was not found anywhere in the town of Tsarevo and elsewhere in Strandzha (Bulgaria).
The shell of this species is characterized by strong variability in terms of size, shape and degree of development of folds in the mouth.
Ecological data: Lives in the soil, in dry places covered with grass, low shrubs and low-growing rare mixed forests (Damjanov & Likharev, 1975).
Xerophilic, termophilic, drought-resistant.
Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

27. Chondrula (Chondrula) microtraga (Rossmannässler, 1839)

Chondrula (Chondrula) microtraga: Hudec & Vašátko, 1971: 5.
Published for the studied area (Table 1; Fig. 1): Urbański (1960b) NG66(1), NG67(1), NG67-68; Damjanov & L. Pintér (1969) NG58 (1); Pintér & Pintér (1970) (“right bank of the Ropotamo River”) NG58(3); Hudec & Vašátko (1971) NG58(3), NG59(2); Körnig (1983) NG58(3), NG59(2);
New localities (Table 1; Fig. 1): - Sandy beach north of the estuary Ropotamo River (Bulgaria), NG58-68, 26.06.2004, leg. A. Irikov.
Taxonomical and ecological data: (see previous species).
Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex.

28. Chondrula (Chondrula) tricuspidata (Küster, 1841)

Published for the studied area (Table 1; Fig. 1): Urbański (1960b) NG67(2).
New localities (Table 1; Fig. 1):
- Sandy beach north of the estuary Ropotamo River (Bulgaria), NG58-68, 26.06.2004, leg. A. Irikov.
- Camping „Oazis”, south of Lozenets resort (Bulgaria), NG67(6), 25,27.08.2007, A. Irikov.
Taxonomical and ecological data: (see previous species).
Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex.
Terrestrial gastropods (Mollusca, Gastropoda) of Strandzha Mountain and the Black Sea coast (Bulgaria and Turkey)

New localities (Table 1; Fig. 1):
- Malko Tarnovo town (Bulgaria), NG44, 3.03.2003, leg. S. Uzunov.
- Near the mouth of the Rezovska River (Bulgaria), NG84, 27.08.2004, leg. T. Irikov & A. Irikov.
- Firth of estuary of Silistar River (Bulgaria), NG85(1), 25.08.2006, A. Irikov.
- Fakiyska River, 7 km west of the Varovnik village (Bulgaria), NG17, 8.05.2006, A. Irikov.

Ecological data: Damjanov & Pintér (1969) found this species on sunny hillside under the andesite stones and among the dry grass vegetation. Lives on sunny hillside under the andesite stones and among the dry grass vegetation. Lives in soil and under stones to a depth of 10-15 cm, most often in oak forests, at an average humidity (Damjanov & Likharev, 1975).

Xerophilic, termophilic, drought-resistant (Irikov, 1999; Irikov, 2002; Irikov & Mollov, 2006).


30. **Mastus rossmaessleri** (Pfeiffer, 1846)

**Chondrula rossmaessleri**: Damjanov & Pintér, 1969: 39.

**Chondrula (Mastus) rossmaessleri**: Pintér & Pintér, 1970: 88, 89.

**Chondrula (Mastus) rossmaessleri gocevi**: Hudec & Vašátko, 1971: 5.


**Mastus rossmaessleri**: Körnig, 1983: 33.

Published for the studied area (Table 1; Fig. 1):

New localities (Table 1; Fig. 1):
- Fakiyska River, 7 km west of the Varovnik village (Bulgaria), NG17, 8.05.2006, A. Irikov.

Ecological data: Mesophilic and calciphilos (Hubenov, 2005).

Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex.

31. **Mastus carneolus** (Mousson, 1863)

**Mastus carneolus**: Wagner, 1927: 313.

**Chondrula (Mastus) carneola**: Urbański, 1983: 33.

**Chondrula (Mastus) carneolas**: Urbański, 1960c: 139.

**Mastus carneola carneola**: Damjanov & Likharev, 1975: 158.

**Mastus carneolus**: Körnig, 1983: 33.

**Mastus carneolus**: Hubenov, 2005: 237.

Published for the studied area (Table 1; Fig. 1):
- Wagner (1927) NG44; Urbański (1960b) NG66(1), NG67(2); Urbański (1960c) NG58-68; Körnig (1983) (“Ropotamo River”), NG66(1), NG67(2); Hubenov (2005) (“South Black Sea coast”);

New localities (Table 1; Fig. 1):
- Fakiyska River, 7 km west of the Varovnik village (Bulgaria), NG17, 8.05.2006, A. Irikov.

Ecological data: Mesophilic and calciphilos (Hubenov, 2005).

Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex.

# **Mastus etuberculatus** (Frauenfeld, 1867)

**Mastus pupa**: Damjanov & Likharev, 1975: 158.

Published for the studied area (Table 1; Fig. 1):
- Damjanov & Likharev (1975) (“rare the entire Black Sea coast”).

Notes: This species has been erroneously reported as **Mastus pupa**, which does not occur in Bulgaria.

# ≈ **Mastus pontica** (Retowski, 1887)

**Chondrula (Mastus) pontica**: Hudec & Vašátko, 1971: 6.

Notes: See comments for **Ena nogeli**.

## Family Clausiliidae

**Subfamily Serrulininae**

**Tribe Serrulinini**

32. •• **Serrulina (Serrulina) serrulata** (Pfeiffer, 1847)

**Serrulina (Serrulina) serrulata**: Urbański, 1960c: 114, 143.

**Serrulina (Serrulina) serralata**: Urbański & Wiktor, 1968: 95, 96.

**Serrulina serralata**: Körnig, 1983: 33.

**Serrulina serralata**: Hubenov (In: Delchev et al., 1993): 186.

Published for the studied area (Table 1; Fig. 1):
Urbański (1960c) NG58(3), NG58(7), (“protected natural area Ropotamo”), NG59(1); Urbański & Wiktor (1968) NG58(3,7); Damjanov (1971) NG75, NG85(1); Damjanov & Likharev (1975) NG58-NG68-NG67-NG66-NG85-NG84; Körnig (1983) (“Bosna ridge”); Hubenov (In: Delchev et al., 1993) (“Rezovska River – Kamchiya River”).

New localities (Table 1; Fig. 1):
- Silkosiya Reserve, near Kosti village (Bulgaria), NG65(2), 23.06.2001, 2.06.2005, leg., A. Irikov.
- Within 3 km east of the Malko Tarnovo town (Bulgaria), NG44, 4.06.2004, leg., A. Irikov.
- Veleka River the Gramatikovo village (Bulgaria), NG55(1), 2.06.2005, leg. A. Irikov.
- About 6 km southwest of Demirköy town (Turkey), in the valley of the creek with vegetation of alder (Alnus glutinosa) and undergrowth of pontic rhododendron (Rhododendron ponticum), NG62, 10.05.2006, leg. A. Irikov.

Ecological data: The species lives in humid forests, under putrescent bark, in damp and rotten holes in the trees and stumps (Damjanov & Likharev, 1975).

Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

33. Dobatia goettingi (Brandt, 1961)
Dobatia goettingi: Nordzieck, 1973: 82.

Published for the studied area (Table 1; Fig. 1):

New localities (Table 1; Fig. 1):

Ecological data: Mesophilic (Hubenov, 2005).

Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

Subfamily Alopiinae
Tribe Cochlodinini

# Cochlodina laminata (Montagu, 1803)

Published for the studied area (Table 1; Fig. 1):
Urbański (1960a) NG58(7);

Notes: In our study this species was not found in the lower reaches of the Ropotamo or elsewhere in the researched area. Our opinion is that this species does not occur in Strandzha Mountain and along the Black sea coast.

Subfamily Mentissioideinae
Tribe Acrotomini
Scrobifera taurica (Pfeiffer, 1848)
one shell was found in tidewrack of camping “Arapy”, 2 km north of Tsarevo, NG67(4), 26.08.2004, leg. A. Irikov.

Notes: According to Irikov & Mollov (2014), this species does not belong to the Bulgarian fauna. According to these authors, sea currents brought the shell to the Bulgarian coast from the Caucasus region or from northeastern Turkey.

Tribe Mentissioideini
34. ●● Euxina (Euxina) circumdata (Pfeiffer, 1848)
Euxina (Euxina) circumdata: Urbański, 1960a: 116, 140, 143, 144.
Euxina (Euxina) circumdata: Urbański, 1960c: 93.

Euxina (Euxina) circumdata: Urbański, 1960c: 116, 140, 143, 144.
Euxina (Euxina) circumdata: Urbański & Wiktor, 1968: 56, 60.

Published for the studied area (Table 1, 2; Fig. 1):
Urbański (1960a) NG58(7); Urbański (1960b) NG66(1); Urbański (1960c) NG58(3,5,6), NG59(1,2), NG58-68, “protected natural area Ropotamo”, NG66(1), NG67(1,2), NG67-68 (south-eastern coast of Dyavolsko Marsh), NG68(1,2); Urbański & Wiktor (1968) NG58(3,7); Damjanov (1971) NG75, NG85(1); Hudec & Vašátko (1973) NG58(3), NG67(1), NG67-68; Damjanov & Likharev (1975) NG59-NG68-NG67-NG66-NG76-
NG75-NG85-NG84, (place “Padaloto”), NG44, NG55(1); KÖRNIG (1983) (“Ropotamo River and Bosna ridge”), NG58(3), NG67(1); HUBENOV (In: DELCHEV et al., 1993) NG59-NG68-NG67-NG66-NG76-NG75-NG85-NG84, (place “Padaloto”’), NG44, NG55(1); HUBENOV (2005) (“South Black Sea coast and Strandzha Mountains”);

New localities (Table 1; Fig. 1):
- Silkosiya Reserve, near Kosti village (Bulgaria), NG65(2), 1.06.2001, 2.06.2005, leg., А. Irikov.
- “Glarus Bair” near Izgrev village (Bulgaria), NG66(2), 24.06.2004, leg., А. Irikov.
- 5 km west of İğneada town (Turkey), in leaf litter of the oak forest to the road to Demirköy, NG73(1), 10.05. 2006, leg. А. Irikov.

Ecological data: The species is found in mixed forests at the base of rocks in shady and humid places under decayed leaves mixed with soil (DAMJANOV, 1971).

Mesophilic (HUBENOV, 2005).

Zoogeography: euxinian subelement, Submediterranean element, European faunistic complex.

35. ●● Euxina (Euxina) persica (Boettger, 1879)
Euxina (Thraciella) paulhessei: URBAŃSKI & WIKTOR, 1968: 56, 60.
Euxina persica paulhessei: DEDOV, 1998: 752
Published for the studied area (Table 1; Fig. 1): URBAŃSKI (1960a) NG58(7); URBAŃSKI (1960c) NG44, NG58(3,7), “protected natural area Ropotamo”, NG59(1), NG67-68 (south-eastern coast of Dyavolsko Marsh), NG68(2); URBAŃSKI & WIKTOR (1968) NG58(3), NG58-68; DAMJANOV (1971) NG75, NG85(1); HUDEC & VAŠÁTKO (1973) NG67(1), NG67-68; DAMJANOV & LIKHAREV (1975) (“River basins Ropotamo, Veleka and Rezovska”), NG59(1), NG58(3), NG67(1), NG67-68, (“place “Padaloto”), NG44; KÖRNIG (1983) (“Ropotamo River and Bosna ridge”); HUBENOV (In: DELCHEV et al., 1993) (“River basins Ropotamo, Veleka and Rezovska”), NG58(3), NG59(1), NG67(1), NG67-68, NG44, (“place “Padaloto”’); HUBENOV (2005) (“South Black Sea coast and Strandzha Mountains”);

New localities (Table 1; Fig. 1):
- Silkosiya reserve, near Kosti village (Bulgaria), NG65(2), 1.06.2001, 2.06.2005, leg., А. Irikov.
- Mladezhko village (Bulgaria), NG26, 3.V.2005, leg., А. Irikov.
- “Glarus Bair” near Izgrev village (Bulgaria), NG66(2), 24.06.2004, leg., А. Irikov.
- Popski Beach, Tsarevo (Bulgaria), NG66(1), 6.06.2004, leg. A. Irikov.
- Half-way between Demirköy and İğneada (Turkey), in leaf litter in the oak forest, NG73(2), 10.05. 2006., leg. А. Irikov.
- About 5 km southwest of Demirköy (Turkey), in the valley of the river with riverbank vegetation of alder (Alnus glutinosa) and undergrowth of pontic rhododendron (Rhododendron ponticum), NG62, 10.05. 2006, leg. А. Irikov.

Ecological data: The species is found in mixed forests at the base of rocks in shady and humid places under decayed leaves mixed with soil (DAMJANOV & LIKHAREV, 1975).

Mesohygrophilic (HUBENOV, 2005).

Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

36. ▲ Euxina (Euxina) pontica (Retowski, 1887)
Published for the studied area (Table 1; Fig. 1): URBAŃSKI (1960c) NG58-68, NG58(5); URBAŃSKI & WIKTOR (1968) NG58(7); DAMJANOV (1971) NG75, NG85(1); DAMJANOV & LIKHAREV (1975) (“River basins of Ropotamo and Rezovska”); HUBENOV
Atanas Irikov, Ivelin Mollov

(In: Delchev et al., 1993) (“Ropotamo River and Rezovska River”);

Ecological data: The species is found in mixed forests at the base of rocks in shady and humid places under decayed leaves mixed with soil (Damjanov, 1971). Lives in humid subtropical forests on trunks of decaying trees (Damjanov & Likharev, 1975).

Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

37. ●● Elia (Elia) corpulenta (Pfeiffer, 1847)
Published for the studied area in the present study.

Localities (Table 1; Fig. 1):
- 5 km south-west of Demirköy (Turkey), river (Asker Deresi) with a bridge near the main road, NG62, 10.05. 2006, leg. A. Irikov.
- 5 km west of Iğneada (Turkey), in leaf litter of the oak forest to the road to Demirköy, NG73(1), 10.05. 2006, leg. A. Irikov.
- 1 km west of Iğneada (Turkey), on rocks on the riverside of a small creek in oak forest, NG83, 10.05. 2006, leg. A. Irikov.

Ecological data: In oak woods, near small rivers, on the rocks and among leaf litter.

Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

≈ Elia (Acroeuxina) huebneri (Pfeiffer, 1848)
One shell was found in tidewrack of camping “Arapya”, 2 km north of Tsarevo, NG67(4), 26.08.2004, leg. A. Irikov.

Notes: According to Irikov & Mollov (2014), this species does not belong to the Bulgarian fauna. According to these authors, sea currents brought the shell to the Bulgarian coast from the Caucasus region or from northeastern Turkey.

38. Galeata schwerzenbachi (Pfeiffer 1848)
Galeata galeata schwerzenbachi: Damjanov & Likharev, 1975: 188.


Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“Veleka River and Silistar River”), (“Strandzha Mountain – between Zvezdets and Malko Tarnovo”); Hubenov (In: Delchev et al., 1993) (“Veleka River and Silistar River”), NG44, NG18; Hubenov (2005) (“South Black Sea coast and Strandzha Mountain”);

New localities (Table 1; Fig. 1):
- Mladezhko Village (Bulgaria), NG26, 3.05.2005, leg., A. Irikov.

Ecological data: Inhabit dry slopes overgrown with bushes, under stones, among plant debris and rocks, especially limestone rocks (Damjanov & Likharev, 1975).

Zoogeography: Bulgarian endemic.

40. ●● Laciniaria plicata plicata (Draparnaud, 1801)


Published for the studied area (Table 1; Fig. 1): Urbański (1960a) NG58(1), “protected natural area Ropotamo”; Urbański (1960c) NG58-68, NG67-68 (south-eastern coast of Dyavolsko Marsh); Urbański & Wiktor (1968) NG58(7); Damjanov (1971) NG75, NG85(1); Körnig (1983) (“Ropotamo River and Bosna ridge”)
New localities (Table 1; Fig. 1):
- Kiten resort (Bulgaria), NG67(1), 7.06.2002, leg. A. Irikov.
- Banks of the river flowing into the sea by camping “Arapya”, under fallen and decaying trees, NG67(4), 29.08.2004, leg. A. Irikov.
- Near the mouth of the Rezovska River (Bulgaria), NG84, 27.08.2004, leg. T. Irikova & A. Irikov.
- Dense forest to the mouth of the Silistar River (Bulgaria), NG85(1), 27.08.2004, leg. T. Irikova & A. Irikov.
- Izgrev (Bulgaria), NG66(2), 24.06.2004, leg. A. Irikov.
- Silkosiya reserve (Bulgaria), near Kosti, NG65(2), 23.06.2001, leg., A. Irikov.
- About 5 km southwest of Demirköy (Turkey), in the valley of the river with riverbank vegetation of alder (Alnus glutinosa) and undergrowth of pontic rhododendron (Rhododendron ponticum), NG62, 10.05.2006, leg. A. Irikov.

Ecological data: Due to its polyvalence this is one of the widest spread species of the Clausiliidae family. It can be found within rocks as well as in the leaf cover of forest habitats. Mesophilic, meso-thermic, eurythermic and euryhygrobiotic species (Irikov & Mollov, 2006).

Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

41. ▲ ●●● Alinda (Alinda) biplicata orientalis
Nordsieck, 2008 BLe

Published for the studied area (Table 1; Fig. 1):
Körnig (1983) (“Ropotamo River”)
- Mouth of Veleka (Bulgaria), NG75, 28.06.2004, leg. A. Irikov.
- Dense forest to the mouth of Silistar (Bulgaria), NG85(1), 27.08.2004, leg. T. Irikova & A. Irikov.
- Silkosiya reserve, near Kosti (Bulgaria), NG65(2), 23.06.2001, leg., A. Irikov.
- 1 km west of İğneada (Turkey), on rocks on the shore of a small creek in oak forest, NG83, 10.05.2006, leg. A. Irikov.

Ecological data: Mesophilic and mesothermic species.
Zoogeography: Endemic for the Balkan Peninsula.

Bulgarica (Bulgarica) thessalonica thessalonica (Olivier, 1801) BLe

Laciniaria (Denticularia) denticulata thessalonica (Olivier, 1801) BLe

Laciniaria (Denticularia) thessalonica: Urbański, 1960b: 93.
Laciniaria (Denticularia) thessalonica: Urbański, 1960c: 140.
Laciniaria (Bulgarica) thessalonica: Urbański & Wiktor, 1968: 60.


Bulgarica (Bulgarica) thassalonica: Damjanov & Likharev, 1975: 212.

Bulgarica thassalonica: Hubenov (In: Delchev et al., 1993) 182.

Published for the studied area (Table 1; Fig. 1):
Urbański (1960a) NG58(7); Urbański (1960b) NG66(1); Urbański (1960c) NG58-68; Sajó (1968) (“mouth of Ropotamo River”); Urbański & Wiktor (1968) NG58(7); Damjanov (1971) NG75, NG85(1); Hudec & Vašátko (1973) NG67(1), NG67-68; Damjanov & Likharev (1975) (“Rezovska River to Shabla Lake”); Körnig (1983) (“Ropotamo River”), NG58(3), NG59(2), NG66(1), NG67(1,2); Hubenov (In: Delchev et al., 1993) (“Strandzha Mountain”);
New localities (Table 1; Fig. 1):
Maslen Nos cape (Bulgaria), NG68(1), 4.06.2005, leg. A. Irikov.
Near the mouth of Rezovska (Bulgaria), NG84, 27.08.2004, leg. T. Irikova & A. Irikov.
Dense forest to the mouth of Silistar (Bulgaria), NG85(1), 25,27.08.2004, leg. T. Irikova & A. Irikov.
Popski Beach, Tsarevo (Bulgaria), NG67(5), 06.2002, А. Irikov & K. Kirov.
1 km west of Iğneada (Turkey), on rocks on the shore of a small creek in oak forest, NG83, 10.05.2006, leg. A. Irikov.

Ecological data: This is one of the polyvalent species from the Clausiliidae family, which inhabits very diverse types of habitats. Polysubstrate, eurybiontic species. (Irikov & Mollov, 2006).

Zoogeography: Endemic for the Balkan Peninsula (Irikov & Mollov, 2006).

Superfamily Succineioidea
Family Succineidae
44. Succinea oblonga Draparnaud, 1801

Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) (“right bank of the Ropotamo River”); Körnig (1983) (“Ropotamo River”); Georgiev & Stoycheva (2013) (“the mouth of Veleka River”).

Ecological data: He lives in the root system of grass plants, mainly in calcareous soils to a depth of 50 cm and more (Damjanov & Likharev, 1975).

Zoogeography: Transpalearctic subelement, Euroasiatic Palearctic element, Siberian faunistic complex.

45. Oxyloma elegans (Risso, 1826)


Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) NG58(2); Damjanov & Likharev (1975) (“basin Ropotamo River”); Hubenov (In: Delchev et al., 1993) (“Ropotamo River”).

New localities (Table 1; Fig. 1):
- Popski Beach, Tsarevo (Bulgaria), NG67(5), 2.VI.2005, leg. I. Mollov.

Ecological data: Inhabits wet habitats near freshwater reservoirs (rivers, streams, floods, swamps, etc.).

Zoogeography: Transpalearctic subelement, Euroasiatic Palearctic element, Siberian faunistic complex.

Superfamily Achatinoidea
Family Ferussaciidae
46. Cecilioides janii (De Betta & Martinati, 1855)
Cecilioides (Cecilioides) aciculoides: Damjanov & Likharev, 1975: 229.


Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“the mouth of Veleka River to Dobrudja plane”); Hubenov (In: Delchev et al., 1993) (“Veleka River”); Georgiev & Stoycheva (2013) (“the mouth of Veleka River”).

Ecological data: Mesohygrophilic, cool-loving, cold-resistant (Irikov & Mollov, 2006).

Zoogeography: Endemic for the Balkan Peninsula.

Superfamily Punctacea
Family Punctidae
Subfamily Punctinae
47. Punctum pygmaeum (Draparnaud, 1801)
Punctum pygmaeum: Körnig, 1983: 35.

Published for the studied area (Table 1; Fig. 1): Damjanov (1971) NG75, NG85(1); Körnig (1983) (“Ropotamo River”).

Ecological data: Mesohygrophilic, cool-loving, cold-resistant (Irikov & Mollov, 2006).

Zoogeography: Eurosiberian subelement, Euroasian Palearctic element, Siberian faunistic complex.

Family Gastrodontidae
48. Zonitoides nitidus (Müller, 1774)
Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“the entire Black Sea coast”);

New localities (Table 1; Fig. 1):
- Protected area “Marina Reka”, between villages Izgrev and Balgari (Bulgaria), NG66(3), 24.06.2004, leg. A. Irikov.

Ecological data: Hygrophilic, cool-loving, cold-resistant species (Irikov & Mollov, 2006).

Family Euconulidae
49. Euconulus fulvus (Müller, 1774)
Euconulus fulvus: Körnig, 1983: 35.

Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) (“right bank of the Ropotamo River”), NG58(2); Damjanov (1971) NG75, NG85(1); Körnig (1983) (“Ropotamo River”);

Ecological data: According to Irikov (2002) this species is mesohygrophilic and cool-loving.

Superfamily Vitrinoidea
Family Vitrinidae
50. Gallandia annularis (Studer, 1820)
Phenacolimax(Gallandia) annularis: Damjanov & Likharev, 1975: 299.

Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) NG67-68.

Ecological data: Xeromesophilic and thermophilic species (Irikov, 2002).
Zoogeography: South European mountainous subelement, European mountainous element, European faunistic complex (Irikov & Mollov, 2006).

Family Zonitidae
Subfamily Vitreininae
51. Vitrea diaphana diaphana (Studer, 1829)

Vitrea diaphana diaphana: Riedel, 2000: 44.

Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“Strandzha Mountain”); Riedel (2000) (“South-east Bulgaria”);

Ecological data: Inhabits mountain forests in leaf litter and under the stones (Damjanov & Likharev, 1975).
Zoogeography: South European mountainous subelement, European mountainous element, European faunistic complex.

52. Vitrea contracta (Westerlund, 1871)
Vitrea contracta: Damjanov & Likharev, 1975: 263.


Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) (“right bank of the Ropotamo River”), Pintér (1972) (“Ropotamo River”); Damjanov & Likharev (1975) (“the entire Black Sea coast”); Körnig (1983) (“Ropotamo River”);

Ecological data: Polyvalent species in terms of temperature and humidity, which is mesohygrophilic, mesothermic and considerably cool-loving (Irikov, 2002).
Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

53. Vitrea riedeli Damjanov & L. Pintér, 1969

Ecological data: In the type locality this species is found on sunny slopes, under andesite rocks and also among dry grass vegetation. It occurs also in mixed forests at the base of cliffs in shady and humid places under decayed leaves mixed with soil (Damjanov, 1971).
Mesophilic (Hubenov, 2005).
In our opinion the species is mesophilic, drought-resistant.

Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

54. Vitrea pygmaea (Boettger, 1880)

Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“Strandzha Mountain”); Hubenov (In: Delchev et al., 1993) (“Strandzha Mountain”).
Ecological data: Xeromesophilic and thermophilic species Irikov (2002).


Subfamily Zonitinae

55. Aegopinella minor (Stabile, 1864)
Published for the studied area (Table 1; Fig. 1): Pintér & Pintér (1970) NG58(2); Damjanov & Likharev (1975) (“the entire Black Sea coast”); New localities (Table 1; Fig. 1):
- Fakiyska River, 7 km west of the Varovnik Village (Bulgaria), NG17, 8.05.2006, A. Irikov.
Ecological data: According to Irikov & Mollov (2002) the species is mesophilic and mesothermic, relatively eurythermic and euryhygrobiontic.
Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

56. ▲ Oxychilus (Mediterranea) hydatinus (Rossmässler, 1838)
Oxychilus (Oxychilus) hydatinus: Damjanov & Likharev, 1975: 281.
Oxychilus (Oxychilus) hydatinus: Riedel, 1975: 162.
Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“South Black Sea coast”); Riedel (1975) (Strandzha Mountain);
Ecological data: Lives in the top layer of soil and in caves (Damjanov & Likharev, 1975)
Zoogeography: Holosubmediterranean subelement, Submediterranean element, European faunistic complex.

57. ●● Oxychilus (Longiphallus) deilus rumelicus (Hesse, 1913)
Oxychilus (Longiphallus) deilus rumelicus: Urbański, 1960b: 93.
Oxychilus (Longiphallus) deilus rumelicus: Riedel, 1963: 483, 484.
Oxychilus (Longiphallus) deilus rumelicus: Urbański & Wiktor, 1968: 56, 60.
Oxychilus (Longiphallus) deilus rumelicus: Damjanov & Likharev, 1975: 280.
Oxychilus (Longiphallus) deilus rumelicus: Riedel, 1975: 162.
Oxychilus deilus rumelicus: Körnig, 1983: 35.
Oxychilus deilus malinowskii: Hubenov (In: Delchev et al., 1993), 184.
Published for the studied area (Table 1; Fig. 1): Urbański (1960a) NG58(7); Urbański (1960b) NG66(1); Urbański (1960c) NG58(3), NG58-68, “Protected natural area Ropotamo”, NG67-68 (south-eastern coast of Dyavolsko marsh); Riedel (1963) NG58-68, NG55(1); Urbański & Wiktor (1968) NG58(3,7); Pintér & Pintér (1970) (“right bank of the Ropotamo River”), NG58(2,3), NG67-68, Damjanov (1971) NG75, NG85(1); Damjanov & Likharev (1975) (“Strandzha Mountain and coastal areas of the Black sea”); Riedel (1975) (Strandzha Mountain); Körnig (1983) (“Ropotamo River”), NG59(2), NG66(1); Hubenov (In: Delchev et al., 1993) (“Strandzha Mountain”); 1971).
New localities (Table 1; Fig. 1):
Malko Tarnovo (Bulgaria), NG44, 3.03.2003, leg. S. Uzunov.
Veleva River by Gramatikovo (Bulgaria), NG55(1), 2.06.2005, leg. A. Irikov.
Mladzho (Bulgaria), NG26, 9.05.2005, leg., A. Irikov.
“Arapia” camping, 2 km north of Tsarevo (in tidewrack on the coast) (Bulgaria), NG67(4),
Kiten resort (Bulgaria), NG67(1), 7.06.2002, leg. A. Irikov.
Fakiyska River (Bulgaria), 7 km west of Varovnik, NG17, 8.05.2006, A. Irikov.
Half-way between Demirköy and Iğneada (Turkey), in leaf litter of the oak forest, NG17,
10.05.2006, leg. A. Irikov.
5 km west of Iğneada (Turkey), in leaf litter of the oak forest to the road to Demirköy, NG73(1),
10.05.2006, leg. A. Irikov.
About 5 km southwest of Demirköy (Turkey), in the valley of the river with riverbank vegetation of alder (Alnus glutinosa) and undergrowth of pontic rhododendron (Rhododendron ponticum), NG62,
10.05.2006, leg. A. Irikov.
Ecological data: The species is found in mixed forests at the base of rocks in shady and humid places under decayed leaves mixed with soil (Damjanov & Likharev (1975).
Zoogeography: euxinian subelement, Submediterranean element, european faunistic complex.

58. ▲ Oxychilus (Spinophallus) investigatus: Riedel, 1993
Oxychilus (Schistophallus) oscari: Riedel, 1961: 134, 137.
Oxychilus (Schistophallus) oscari: Riedel, 1963: 483.
Oxychilus (Schistophallus) oscari: Riedel, 1969a: 39.
Oxychilus (Schistophallus) moussoni: Riedel, 1969c: 191.
Oxychilus (Schistophallus) moussoni: Damjanov & Likharev, 1975: 284.
Oxychilus (Schistophallus) moussoni: Riedel, 1975: 163.
Oxychilus (Schistophallus) investigatus: Riedel, 1998: 49.

Oxychilus (Schistophallus) investigatus: Riedel, 2000: 66.
Oxychilus investigatus: Hubenov, 2005: 239.
Published for the studied area (Table 1; Fig. 1):
New localities (Table 1; Fig. 1):
Protected area “Marina Reka”, between Izgrev and Balgari (Bulgaria), NG66(3), 24.06.2004, leg. A. Irikov.
Camping Arapia, 2 km north of Tsarevo (in tidewrack on the coast) (Bulgaria), NG67(4),
Ecological data: Mesophilic, trogloxenic (Hubenov 2005).
Usually inhabits the leaf litter of forests at middle and high humidity. Mesohygrophilic.
Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

# Oxychilus (Schistophallus) moussoni (Kobelt, 1878)
This species has been erroneously reported from Bulgaria (see Riedel, 1993).

59. ●● Oxychilus (Morlina) glaber striarius (Westerlund, 1881)
Oxychilus (Morlina) glaber striarius: Riedel, 1975: 163.
Published for the studied area (Table 1; Fig. 1):
New localities (Table 1; Fig. 1):
Protected area “Marina Reka”, between Izgrev and Balgari (Bulgaria), NG66(3), 24.06.2004, leg. A. Irikov.
Dense forest near the mouth of Silistar River (Bulgaria), NG85(1), 27.08.2004, leg. T. Irikova & A. Irikov.
Fakiyska River, 7 km west of Varovnik, NG17, 8.05.2006, A. Irikov.
Atanas Irikov, Ivelin Mollov

- About 5 km southwest of Demirköy (Turkey), in the valley of the river with riverbank vegetation of alder (*Alnus glutinosa*) and undergrowth of pontic rhododendron (*Rhododendron ponticum*), NG62, 10.05.2006, leg. A. Irikov.

Ecological data: Mesohygrophilic, mesothermic and cool-loving (IRIKOV & MOLLOV, 2002).

Zoogeography: Eastsubmediterranean subelement, Submediterranean element, European faunistic complex (IRIKOV & MOLLOV, 2006).

60. *Oxychilus (Morlina) urbanskii* Riedel, 1963

*Oxychilus (Morlina) urbanskii*: Riedel, 1963: 473-477, 483, 484.


*Oxychilus (Morlina) urbanskii*: Riedel, 1975: 163.

*Oxychilus urbanskii*: KÖRNING, 1983: 35.


*Oxychilus (Morlina) urbanskii*: Riedel, 1997: 382.


*Oxychilus urbanskii*: HUBENOV, 2005: 239.

Published for the studied area (Table 1; Fig. 1): Riedel (1963) NG58-68, NG55(1); Riedel (1969b) NG55(1); PINTÉR & PINTÉR (1970) (“right bank of the Ropotamo River”); NG84; DAMJANOV & LIKHAREV (1975) (“Strandzha Mountain and South Black Sea coast”); Riedel (1975) NG59-NG58-NG68-NG57-NG67-NG66-NG76, NG44, NG55(1); KÖRNING (1983) (“Ropotamo River and Bosna ridge”); HUBENOV (In: DELCHEV et al., 1993) (“South Black Sea coast”); BERON (1994) NG35, NG45(1,2,3); Riedel (1997) (“South-east Bulgaria”); Riedel (2000) (“South-east Bulgaria”); HUBENOV (2005) (“South Black Sea coast”).

New localities (Table 1; Fig. 1):

- Fakiyska River, 7 km west of Varovnik (Bulgaria), NG17, 8.05.2010, leg. A. Irikov.

Ecological data: BERON (1972) found this species in three caves in the area of Stoiilovo and classified it as troglophilous. According to DAMJANOV & LIKHAREV (1975), this species inhabits moist subtropical forest in holes in fallen trees and under stones. Mesophilic, troglophilous (HUBENOV, 2005).

- Usually inhabits the leaf litter of forests at middle and high humidity. Troglophilous ? (RIEDEL, 1997).

We classify this species as mesohygrophilic.

Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

61. *Oxychilus (Riedelius) inopinatus* (Ulicny, 1887)

*Vitreia (Mediterranea) inopinata*: URBAŃSKI, 1960b: 89.


*Oxychilus inopinatus*: KÖRNING, 1983: 35.

Published for the studied area (Table 1; Fig. 1): URBAŃSKI (1960b) NG58(3), NG58-68; DAMJANOV & LIKHAREV (1975) (“Strandzha Mountain”); KÖRNING (1983) (“Ropotamo River”), NG66(1); ecological data: According to IRIKO (2002) it is a xeromesophilic, thermophilic, drought-resistant species capable of surviving considerable temperature fluctuations.

Zoogeography: Eastsubmediterranean subelement, Submediterranean element, European faunistic complex (IRIKOV & MOLLOV, 2006).

62. ***Oxychilus (Riedelius) depressus*** (Sterki, 1880)

Published for the studied area in the present study.

Localities (Table 1; Fig. 1):

- 5 km south of Panchevo (Bulgaria), NG17, 8.05.2010, leg. A. Irikov.

- Fakiyska River, 5 km west of Varovnik (Bulgaria), NG83, 9.05.2010, leg. A. Irikov.

- Half-way between Demirköy and İğneada (Turkey), in leaf litter of the oak forest, NG73(2), 9.05.2006, leg. A. Irikov.

- About 5 km southwest of Demirköy (Turkey), in the valley of the river with riverbank vegetation of alder (*Alnus glutinosa*) and undergrowth of pontic rhododendron (*Rhododendron ponticum*), NG62, 10.05.2006, leg. A. Irikov.

Ecological data: According to IRIKO (2002) it is a mesopholic, cool-loving and cold-resistant species.

Zoogeography: Mid Europe Mountain subelement, European Mountain element, European faunistic complex (IRIKOV & MOLLOV, 2006).

Subfamily Daudebardiinae

63. *Daudebardia (Daudebardia) brevipes* (Draparnaud, 1805)
Daudebardia brevipes: Hubenov, 2005: 239.

Published for the studied area (Table 1; Fig. 1): Riedel (1967) (“Bosna ridge in Strandzha”, “Ropotamo reserve near Arkutino”) Damjanov & Likharev (1975) (“Southern Black Sea coast”); Körnig (1983) (“Ropotamo and Bosna ridge”); Hubenov (2005) (“Southern Black Sea coast”).


Zoogeography: Mid European Mountain subelement, European Mountain element, European faunistic complex.

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Daudebardia (Daudebardia) rufa cycladum Martens, 1889
Daudebardia rufa: Riedel, 1967: 466, 469.
Daudebardia rufa cycladum: Riedel, 1978: 149.

Published for the studied area (Table 1; Fig. 1): Riedel (1967) (“Bosna ridge in Strandzha Mountain”, “three deposits in reserve Ropotamo”) NG44; NG59(4); Pintér & Pintér (1970) (“right bank of the Ropotamo River”); Riedel (1978) (“Balkan Peninsula”); Körnig (1983) (“Ropotamo River and Bosna ridge”);

New localities (Table 1; Fig. 1):
- 5 km south-west of Demirköy (Turkey), river (Asker Deresi) with bridge to main road, NG62, 10.05. 2006, leg. A. Irikov.

Ecological data: Mesohygrophilic, cool-loving, cold-resistant (Irikov & Mollov, 2006).

Zoogeography: East-Submediterranean subelement, Submediterranean element, European faunistic complex (Irikov & Mollov, 2006).

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Daudebardia (Libania) wiktori Riedel, 1967


Published for the studied area (Table 1; Fig. 1): Körnig (1983) (“Ropotamo River”);

Notes: This species is found only in the Western Rhodope Mountains and its announcement for Strandzha and the Black Sea coast is untrustworthy.

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Carpatica (Illyrica) stussineri: Hubenov, 2005: 239.
Published for the studied area (Table 1; Fig. 1): Hubenov (2005) (“Strandzha Mountain”);

Ecological data: Mesohygrophilic (Hubenov, 2005).

Zoogeography: Mid European Mountain subelement, European Mountain element, European faunistic complex.

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66. Carpathica (Illyrica) bielawskii Riedel, 1963

Carpathica bielawskii: Riedel, 1963: 477-482, 484.

Carpathica bielawskii: Riedel, 1975: 165.

Carpathica bielawskii: Hubenov, 2005: 239
Published for the studied area (Table 1; Fig. 1): Riedel (1963) NG55(1); Riedel (1967) (“reserve Ropotamo”) NG48-58, NG55(1,2), NG58(2), NG58-68, NG56(2), NG58(2), NG59(4), NG85(2); Pintér (1968) NG67(1), NG67-68; Riedel (1969a) (“Strandzha Mountain”); Hudec & Vašátko (1973) NG67(1), NG67-68; Damjanov & Likharev (1975) (“Rezovska River”), NG59(2), NG44, NG55(1); Riedel (1975) “Strandzha Mountain”; Riedel (1978) (“Strandzha Mountain”); Hubenov (In: Delchev et al., 1993) NG59-NG68-NG67-NG66-NG76-NG85-NG84, NG44, NG55(1); Riedel (2000) (“South-east Bulgaria”); Hubenov (2005) (“South Black Sea coast and Strandzha Mountain”);

New localities (Table 1; Fig. 1):
- Silkosiya reserve, near Kosti (Bulgaria), NG65(2), 2.06.2005, leg. A. Irikov.
- Protected area “Marina Reka”, between Izgrev and Balgari (Bulgaria), NG66(3), 24.06.2004, leg. A. Irikov.

Ecological data: Mesophilic (Hubenov, 2005).

Zoogeography: Endemic for the Balkan Peninsula.
Superfamily Arionidae
Family Arionidae
67. *Arion subfuscus* (Draparnaud, 1805)


Published for the studied area (Table 1; Fig. 1):

Ecological data: Lives under rotting tree trunks, in trunks and under leaf litter of deciduous and coniferous forests (Damjanov & Likharev, 1975).

Zoogeography: Eurosiberian subelement, Euroasian Palearctic element, Siberian faunistic complex.

Family Milacidae
68. *Milax parvulus* Wiktor, 1968 BGe


Published for the studied area (Table 1; Fig. 1):

Ecological data: Mesohygrophilic, calciphilos (Hubenov, 2005).

Zoogeography: Bulgarian endemic.

*Milax sp.*

*Milax sp.: Urbański, 1960c: 140.

Published for the studied area (Table 1; Fig. 1):
Urbański (1960c) NG58-68.

69. *Tandonia kusceri* (Wagner H., 1931)

*Milax kusceri*: Urbański & Wiktor, 1968: 56, 60, 86.


Published for the studied area (Table 1; Fig. 1):

Localities (Table 1; Fig. 1):
Tsarevo (Bulgaria), NG66-1, leg. 23.06.2004, I. Mollov.

Ecological data: In old beech woods, under bark of fallen, decaying trees (Urbański & Wiktor, 1968). Largely tolerant to most ecological factors. Found in biotopes of various humidity (including xerothermic ones) – forests, bushes and rock rubble with sparse vegetation (Wiktor, 1983).

Eurythermic, euryhygrobiotic, considerably drought-resistant species (Irikov & Mollov, 2006).

Zoogeography: East-Submediterranean subelement, Submediterranean element, European faunistc complex (Irikov & Mollov, 2006).

70. *Tandonia cristata* (Kaleniczenko, 1851)


Published for the studied area (Table 1; Fig. 1):

New localities (Table 1; Fig. 1):

Ecological data: Hiding under large stones deep in the soil. Found mostly in mixed and deciduous forests, also among shrubs. Found most frequently in loamy soils, lower parts of valleys and their bottoms (Wiktor, 1983).

Mesothermic, mesophilic (Irikov & Mollov, 2006).

Zoogeography: Euxinian subelement, Submediterranean element, European faunistc complex (Irikov & Mollov, 2006).

Superfamily Limacoidea
Family Limacidae
71. *Limax (Limax) maximus* Linnaeus, 1758

*Limax (Limax) maximus*: Urbański & Wiktor, 1968: 56, 60.


Published for the studied area (Table 1; Fig. 1):

Ecological data: Found in both natural and anthropogenic habitats. Most frequent in mixed and deciduous forests, especially of damp hornbeam-oak and beech type. Usually hiding under logs, stones, in stumps, less frequently under bark (Wiktor, 1983).

Eurythermic, euryhygrobiotic, cool-loving (Irikov & Mollov, 2006).

Zoogeography: MidEuropean element, European faunistic complex (Irikov & Mollov, 2006).
72. *Limax (Limax) cinereoniger* Wolf, 1803
   *Limax (Limax) cinereoniger*: Urbański & Wiktor, 1968: 56, 60.
   Published for the studied area (Table 1; Fig. 1): Urbański & Wiktor (1968) NG58(3), NG58(7); Damjanov & Likharev (1975) (“Strandzha Mountain”); Wiktor (1983) NG55(1,2), place Aydere River near Malko Tarnovo.

Ecological data: Inhabits mostly mixed and deciduous forests of all types, crawling on the ground and in the trees. Hiding in stumps, decaying tree trunks and under bark (Wiktor, 1983).

Eurythermic, euryhygrobiontic species (Irikov & Mollov, 2006).

Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

73. *Limax (Limax) macedonicus* Hesse, 1928 BLE
   *Limax (Limax) macedonicus*: Wiktor, 1983: 139.
   Published for the studied area (Table 1; Fig. 1): Urbański & Wiktor (1968) NG58(7); Hudec & Vašátko (1973) NG58(3); Damjanov & Likharev (1975) (“to Ropotamo River”); Wiktor (1983) NG55(1), NG58(3); Hubenov (In: Delchev et al., 1993) (“Ropotamo River”);
   New localities (Table 1; Fig. 1):
   Ecological data: Living in deciduous forests of all types and in shrubs. Hiding under stones and bark of trees (Wiktor, 1983).
   Mesophilic, mesothermic species (Irikov & Mollov, 2006).
   Zoogeography: Endemic for the Balkan Peninsula (Irikov & Mollov, 2006).

74. *Limax (Limacus) flavus* Linnaeus, 1758
   *Limax (Limacus) flavus*: Urbański & Wiktor, 1968: 56, 60.
   Published for the studied area (Table 1; Fig. 1): Urbański & Wiktor (1968) NG55(1) place “Hasekiyata”, NG58(3,7), NG68(1); Damjanov & Likharev (1975) (“the entire Black Sea coast”).

Ecological data: In natural conditions inhabits deciduous forests, most often under rotten logs, felled trees, under stones and hollows (Damjanov & Likharev, 1975). Sinantropic widespread species introduced into many countries and continents (North and Central Europe, Chile and South Africa), where found among the vegetable gardens, places with concentrated compost, wells, gardens, farmyards, entrance halls of the caves, basements of abandoned old buildings and ruderal habitats with high humidity and concentration of organics.

Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

75. *Limax (Limacus) maculatus* (Kaleniczenko, 1851)
   *Limax maculatus*: Hubenov, 2005: 239.
   Published for the studied area (Table 1; Fig. 1): Wiktor (1983) NG44, NG55(1), NG49-59, place Aydere River near Malko Tarnovo, NG68(1); Hubenov (2005) (“Strandzha Mountain”);
   New localities (Table 1; Fig. 1):
   Notes: Taxonomic status of this species is unclear (variable) (Wiktor, 2001).
   Ecological data: Mesophilic (Hubenov, 2005).
   Zoogeography: Euxinian subelement, Submediterranean element, European faunistic complex.

76. *Lehmania nyctelia* Bourguignat, 1861
   Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“Strandzha Mountain”); Körnig (1983) (“Bosna ridge”); Wiktor (1983) NG44, NG55(1).
Ecological data: A forest species occurring mainly in deciduous forests, especially beech woods. Frequent in mountains, also above upper timberline. Creeping on trees and hiding under bark, hollows in tree stumps, on rocks or rock rubble. After rain slugs creep out in great numbers, especially high in the mountains (Wiktor, 1983).

Mesohygrophilic, cool-loving, cold-resistant species (Irikov & Mollov, 2006).

Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

# Lehmania marginata (Müller, 1774)

This species is reported by Damjanov & Likharev (1975) an area in Strandzha Mountain, between Malko Tarnovo and Gramatikovo, and by Körnig (1983) in Bosna ridge. According to Wiktor (1983), however, the species does not occur in Bulgaria. Our opinion is that it is not part of the fauna of Strandzha and probably has been confused with the very similar Lehmania nyctelia.

Family Agriolimacidae

77. Deroceras (Deroceras) sturanyi (Simroth, 1894)


Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) NG84; Hubenov (In: Delchev et al., 1993) NG84; Wiktor (1983) NG58-68.

New localities (Table 1; Fig. 1):

Ecological data: Mesophilic species, found however in wet biotopes. Always in open biotopes or only shaded by brushes or under single trees. Very frequent in ruderal biotopes. Found in meadows, at roadsides, in parks and gardens (Wiktor, 1983).

Mesophilic, mesothermic species.

Zoogeography: Mid European element, European faunistic complex (Irikov & Mollov, 2006).

78. Deroceras (Agriolimax) turcicum (Simroth, 1894)


Published for the studied area (Table 1; Fig. 1): Wiktor (1983) NG58-68.

Taxonomical data: This species has been mixed for a long time with the morphologically very close Deroceras reticulatum (Müller, 1774). The latter turns out to be much less spread in Bulgaria than Deroceras turcicum (see the species below – taxonomical data).

Ecological data: A forest species living in deciduous, mixed and coniferous woods, rarely in meadows. In beech and hornbeam woods, sometimes in great numbers (Wiktor 1983).

Mesothermic, meshygrophilic species (Irikov & Mollov, 2006).

Zoogeography: Eastsubmediterranean subelement, Submediterranean element, European faunistic complex (Irikov & Mollov, 2006).

# Deroceras (Agriolimax) reticulatum (Müller, 1774)


Published for the studied area (Table 1; Fig. 1): Wiktor (1983) “reserve Ropotamo”; Hubenov (2005) (“South Black Sea coast”);

Taxonomical data: Although Deroceras reticulatum was reported by Wiktor (1983) and Hubenov (2005) we consider that it does not occur in the studied area and the reports are based on the very close species Deroceras turcicum.

79. Deroceras (Agriolimax) thersites (Simroth, 1886) BLE

Agriolimax (Agriolimax) thersites: Wagner, 1934. 54.


Published for the studied area (Table 1; Fig. 1): Wagner (1934) NG44, NG56(3); Urbański & Wiktor (1968) NG55(1) place “Hasekiyata”; Damjanov & Likharev (1975) (“Strandzha Mountain – between Malko Tarnovo and Tsarevo”); Wiktor (1983) NG44, NG84, Hubenov (In: Delchev et al., 1993) NG84;

New localities (Table 1; Fig. 1):
Silkosiya reserve, near Kosti (Bulgaria), NG65(2), 2.06.2005, А. Irikov.

Ecological data: insufficient data.

Zoogeography: Balkan endemic.
80. ▲ **Deroceras (Agriolimax) agreste** (Linnaeus, 1758)

**Deroceras (Deroceras) agreste**: DAMJANOV & LIKHAREV, 1975: 320.

**Deroceras (Deroceras) agreste**: WIKTOR, 1983: 180.

Published for the studied area (Table 1; Fig. 1): DAMJANOV & LIKHAREV (1975) ("Strandzha Mountain – place Padaloto"); WIKTOR 1983 ("Strandzha Mountain – place Padaloto").

Ecological data: Lives in humid forests, scrubs and meadows, as well as in swamps. In arid areas lives very close to water tanks. More often found in natural than cultivated biotopes (DAMJANOV & LIKHAREV, 1975).

Zoogeography: Mid European element, European faunistic complex (IRIKOV & MOLLOV, 2006).

81. ●● **Krynickillus urbanskii** (WIKTOR, 1971)

**Deroceras melanocephalus**: URBAŃSKI & WIKTOR, 1968: 60, 72.

**Deroceras (Krynickillus) urbanskii**: URBAŃSKI, 1960b. 93.

**Deroceras (Krynickillus) urbanskii**: URBAŃSKI, 1960c. 140.

**Lindholmiola corcyrensis**: URBAŃSKI & WIKTOR, 1968: 60.

**Lindholmiola corcyrensis**: KÖRNIG, 1983. 35.

**Krynickillus urbanskii**: WAGNER, 1927: 364.

**Lindholmiola contorta girva**: WAGNER, 1927: 364.

**Lindholmiola contorta girva**: KÖRNIG, 1983. 35.

**Krynickillus urbanskii**: WAGNER (1927) NG44; URBAŃSKI (1960b) NG66(1); URBAŃSKI (1960c) NG58(7), NG67-68 (on the southeastern coast of the Dyavolsko marsh); URBAŃSKI & WIKTOR (1968) NG58-68; KÖRNIG (1983) ("Ropotamo and Bosna ridge"); HUBENO (NG58(3), NG59(2));

New localities (Table 1; Fig. 1):
- Popski Beach, Tsarevo (Bulgaria), NG67(5), 1.06.2004, leg. A. Irikov.
- Near the mouth of Veleka River (Bulgaria), NG75, 28.06.2004, leg. A. Irikov.
- Mladenov village (Bulgaria), NG66, 3.05.2005, leg. A. Irikov.

Ecological data: Xeromesophilic, thermophilic, drought-resistant, capable of surviving considerable temperature fluctuations (IRIKOV, 2002). Usually found in open habitat within forest and shrublands (TRIANTIS, 2013a).

Zoogeography: East-Submediterranean subelement, Submediterranean element, European faunistic complex (IRIKOV & MOLLOV, 2006).
Atanas Irikov, Ivelin Mollov

Conservation status: Indexed as “Least Concern” (LC) under IUCN criteria (TRIANTIS, 2013a).

Superfamily-group of the Helicoidea
Superfamily Hygromioidea
Family Hygromiidae
Subfamily Trichiinae
Tribe Trichiini

83. **Trichia erjaveci** (Brusina, 1870) BLe

**Trichia erjaveci**: Hubenov (In: Delchev et al., 1993): 183.

Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“south-eastern coast of Dyavolsko marsh”); Hubenov (In: Delchev et al., 1993) (“Ropotamo River”); Ecological data: In wooded areas around swamps and rivers, under the leaf litter and under the stones, with high humidity (Damjanov & Likharev, 1975).

Zoogeography: Endemic for the Balkan Peninsula.

84. ▲ **Xerolenta obvia obvia** (Menke, 1828)

**Helicella (Helicella) obvia**: Urbanški, 1960b: 93.
**Helicella (H.) obvia dobrudschae**: Hudec & Vašátko, 1971: 5.

Published for the studied area (Table 1; Fig. 1): Urbanški (1960b) NG66(1); Hudec & Vašátko (1971) NG58(3), NG59(2);

Ecological data: Xerophilic, thermophilic, drought-resistant (Irikov & Mollov, 2006).

Zoogeography: Eastsubmediterranean subelement, Submediterranean element, European faunistic complex (Irikov & Mollov, 2006).

85. ? **Xerolenta obvia pappi** (Schüt, 1962)

**Xerolenta obvia pappi**: Dedov & Subai, 2012: 105.

Published for the studied area (Table 1; Fig. 1): Dedov & Subai (2012) NG44.

Notes: We believe that there are no reliable data on the presence of this species in Bulgaria.

Zoogeography: East-Submediterranean subelement, Submediterranean element, European faunistic complex.

86. ▲ **Xerolenta spiruloides** (Wagner A., 1916) BLe

**Helicella (Helicella) spiruloides**: Urbanški, 1964: 33.
**Helicella (H.) spiruloides**: Hudec & Vašátko, 1971: 5.

**Helicella (Helicella) spiruloides**: Damjanov & Likharev, 1975: 349.
**Helicella spiruloides**: Körnig, 1983: 36.
**Helicella spiruloides**: Hubenov (In: Delchev et al., 1993): 181.

Published for the studied area (Table 1; Fig. 1): Urbanški (1964) NG66(1); Hudec & Vašátko (1971) NG58(3), NG59(2); Damjanov & Likharev (1975) NG66(1); Körnig (1983) NG58(3); Hubenov (In: Delchev et al., 1993) NG58(3), NG66(1);

New localities (Table 1; Fig. 1):
- Sandy beach north of the estuary of Ropotamo River (Bulgaria), NG58-68, 26.06.2004, leg. A. Irikov.

Ecological data: Most often lives in stems and leaves of various herbaceous plants, but sometimes also occurs under stones in sandy soils and sands, near the sea. Survives long drought by hiding in the roots of grass plants (Damjanov & Likharev, 1975).

Zoogeography: Endemic for the Balkan Peninsula.

Conservation status: Indexed as “Least Concern” (LC) under IUCN criteria. Local sub-populations might be threatened by the complete or severe destruction of the vegetation (Páll-Gergely, 2013c).

87. ▲ **Helicopsis striata** (Müller, 1774)

**Helicella (Helicopsis) striata**: Damjanov & Likharev, 1975: 351.

Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) (“by Rezovo to Varna”);

New localities (Table 1; Fig. 1):

Ecological data: Lives mostly on leaves and stems of herbaceous plants in dry meadows and shrubs along roads adjacent to waterways and the sea in sandy soils. Survives drought by hiding in plant roots (Damjanov & Likharev, 1975).

Zoogeography: Holo-Submediterranean subelement, Submediterranean element, European faunistic complex.

Conservation status: Listed as “Least Concern” (LC) under IUCN criteria. Abandonment of grazing and the subsequent encroachment of bushy vegetation is the main threat to the species. Urbanisation
also has some impact on some populations (VON PROSCHWITZ & NEUBERT, 2013).

# Helicopsis (Xeropicta) vestalis (Pfeiffer, 1841)


Published for the studied area (Table 1; Fig. 1):
HUDEC & VAŠÁTKO NG67(1), NG67-68, NG59(2);
Taxonomical data: According to SCHÜTT (2001) and HAUSDORF (2008) this species is synonymous with Xeropicta krynickii (Krynicki, 1833).

Helicopsis (Helicopsis) sp.

PINTÉR & PINTÉR (1970) reported this undetermined species for an area of Arkutino Coast.

88. ●● Xeropicta krynickii (Krynickii, 1833)


Helicella (Xeropicta) krynickii: HUDEC & VAŠÁTKO, 1971: 5.

Helicella (Xeropicta) krynickii: DAMJANOV & LIKHAREV, 1975: 356.


Published for the studied area (Table 1; Fig. 1):
HESSE (1934) (“from Burgas to Ahtopol”); URBAŃSKI (1960b) NG59(2,4), NG76(2); PINTÉR & PINTÉR (1970) (“right bank of the Ropotamo River”), NG66(1); HUDEC & VAŠÁTKO (1971) NG58(3), NG59(2); DAMJANOV & LIKHAREV (1975) (“the entire Black Sea coast – mouth of the Rezovska River to the Durankulak Village”); KÖRNING (1983) NG66(1), NG67(1);

New localities (Table 1; Fig. 1):
- Ecological data: Lives on stems of phanerogamic plants and close to the root system in steppe areas adjacent to waterways or around the beach (DAMJANOV & LIKHAREV, 1975).

Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex.

Subfamily Hygromiinae

90. Cernuella virgata (Da Costa, 1778)

Cernuella (Cernuella) virgata variabilis: PETROBOK, 1941, after URBAŃSKI, 1960b: 98.

Cernuella (Cernuella) virgata: PETROBOK & PINTÉR, 1970: 88, 93.


Published for the studied area (Table 1; Fig. 1):
PETROBOK (1941) NG59(2), NG66(1); PINTÉR & PINTÉR (1970) (“right bank of the Ropotamo River”);
HUDEC & VAŠÁTKO (1971) NG58(3), NG59(2);
HUDEC & VAŠÁTKO (1973) (“Ropotamo River”);
DAMJANOV & LIKHAREV (1975) (“the entire Black Sea coast”); KÖRNING (1983) (“Ropotamo River”), NG58(3), NG67(1,2);

New localities (Table 1; Fig. 1):
- Camping “Oaziș”, south of Lozenets resort (Bulgaria), NG67(6), 25, 27.08.2007 A. Irikov.
- Ecological data: Lives on the stems of phanerogamic vegetation in the coastal area.

Zoogeography: Atlantic element, European faunistic complex.

91. ▲ ●● Cernuella cisalpina (Rossmässler, 1837)

Published for the studied area (Table 1; Fig. 1): Damjanov & Likharev (1975) ("the entire Black Sea coast – estuary from Rezovska River to Kamchija River");

New localities (Table 1; Fig. 1):
- Firth of Rezovska River (Bulgaria), NG84, 5.06.2005, leg. A. Irikov.
- Firth of Silistar River (Bulgaria), NG85(1), 7.06.2005, leg. A. Irikov.
- Beach near Iğneada (Turkey), NG83(2), 10.05.2006, A. Irikov.

Ecological data: Lives on vegetation near the Black Sea coast. Can withstand a long drought.

Zoogeography: Atlantic element, European faunistic complex.

Conservation status: Indexed as “Least Concern” (LC) under IUCN criteria. This species is not very sensitive to ecosystem modification and local events would affect only local populations to some extent (Páll-Gergely, 2013d).

Subfamily Euomphaliini

A thorough revision of the genus Monacha Fitzinger, 1833 in Bulgaria was made by Irikov (2008).

# Monacha (Monacha) cartusiana (Müller, 1774)

M. cartusiana has been reported by many authors for Strandzha and the southern Black Sea coast, but according to Irikov (2008) material from this region belongs to Monacha claustralis (Menke, 1828) (see the species below).

92. Monacha (Monacha) claustralis (Menke, 1828)

Monacha (Monacha) carthusiana: Urbánski, 1960b: 92, 93.

Monacha (Monacha) carthusiana: Urbánski, 1960c: 140.


Published for the studied area (Table 1; Fig. 1): Urbánski (1960b) NG66(1), NG67(2); Urbánski (1960c) NG58-68; Urbánski & Wiktor (1968) NG58(7); Pintér & Pintér (1970) NG66(1), NG58(3); Damjanov (1971) NG75, NG85(1); Hudec & Vašátko (1971) NG58(3), NG59(2); Körnig (1983) NG66(1), NG67(2); Irikov (2008) NG67(1,3), NG58(3), NG58-68, NG65(2), NG76(1), NG84, NG85(1),

New localities (Table 1; Fig. 1):
- Camping “Oazis”, south of Lozenets resort (Bulgaria), NG67(6), 25,27.08.2007, A. Irikov.

Taxonomical data: This species has longly been confused with the closely related M. carthusiana and therefore the distribution of both species in Bulgaria is still not well understood.

Ecological data: According to Irikov (2008), this species prefers open grass areas with high grass, but often occurs as a sinanthrope species among farmed lands, hay meadows and in gardens and yards in urban areas. In the towns it inhabits open spaces with high grass, in largest quantities of perennial plants near paths.

In the firth of river Silistar it is distributed among psammophyte vegetation, especially Sylene euxina Rupr., Eringium maritimum L., etc.

Mesohygrophilic, mesothermophilic, drought-resistant species (Irikov, 2008).

Zoogeography: East-Submediterranean subelement, Submediterranean element, European faunistic complex (Irikov, 2008).

Conservation status: Indexed as “Least Concern” (LC) under IUCN criteria. Local subpopulations might be threatened by the complete or severe destruction of the vegetation (Páll-Gergely, 2013e).

# Monacha (Monacha) carascaloides (Bourguignat, 1855)

This species is reported by many authors for Strandzha and the southern Black Sea coast, but according to Irikov (2008), all material from this re-
gion belongs to *Monacha solidior* (Mousson, 1873) (see the species below).

93. ●● *Monacha* (*Monacha*) *solidior* (Mousson, 1873)


Published for the studied area (Table 1; Fig. 1): Urbański (1960b) NG66(1); Urbański (1960c) NG58-68; Urbański & Wiktor (1968) NG58-68; Damjanov & Pintér (1969) NG58(1); Pintér & Pintér (1970) (“right bank of the Ropotamo River”), NG58(3), NG66(1); Hudec & Vašátko (1971) NG58(3), NG59(2); Hudec & Vašátko (1973) (“Ropotamo River”), NG59(2), NG58(3), NG66(1), NG67(1), NG67-68; Damjanov & Likharev (1975) (“Black Sea coast”); Körnig (1983) (“Ropotamo River and Bosna ridge”), NG58(3), NG59(2), NG67(1); Irikov (2008) NG58(3), NG58-68, NG67(3).

New localities (Table 1; Fig. 1):  
- Firth of estuary Silistar River (Bulgaria), NG85(1), 25.08.2006, A. Irikov.  
- About 5 km southwest of Demirköy (Turkey), in the valley of the river with riverbank vegetation of alder (*Alnus glutinosa*) and undergrowth of pontic rhododendron (*Rhododendron ponticum*), NG62, 10.05.2006, leg. A. Irikov.

Taxonomical data: This species has longly been confused with the closely related *M. carascaloides* and therefore the distribution of both species in Bulgaria is still not well understood.

Ecological data: According to Irikov (2008) the species occurs on the Black Sea Coast among sand dunes. The ecological conditions during the summer season are extreme, with strongly expressed xerothermics around the sand surface, but sometimes there is a high aerial humidity over the dunes due to the proximity of the sea. The animals are found mostly among microhabitats of psamophytic and halophilyc grassy vegetation.

Xerophilic, thermophilic, drought-resistant species (Irikov, 2008).

Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex (Irikov, 2008).

Conservation status: Indexed as “Least Concern” (LC) under IUCN criteria. Local subpopulations might be threatened by the complete or severe destruction of the vegetation (Páll-Gergely, 2013f).

94. *Monacha* (*Monacha*) *ovularis* (Bourguignat, 1855)


Published for the studied area (Table 1; Fig. 1): Pintér (1969) (“left bank of the Ropotamo River”), NG58(2,4); Pintér & Pintér (1970) (“right bank of the Ropotamo River”), NG58(2); Hudec & Vašátko (1973) (“Ropotamo River”); Körnig (1983) NG66(1), NG67(2); Hubenov (In: Delchev et al., 1993) (“Ropotamo River”), NG66(1), NG67(2); Dedov (1998) (“Ropotamo River”), NG67(1,2); Hausdorf (2000) (“border of Bulgaria with Turkey”); Hubenov (2005) (“South Black Sea coast and Strandzha Mountain”); Irikov (2008) (“left bank of the Ropotamo River”), NG26, NG58(2,4), NG59(3), NG85(1).

New localities (Table 1; Fig. 1):  
- Camping “Oaziš”, south of Lozenets resort (Bulgaria), NG67(6), 25,27.08.2007, leg. A. Irikov.  
- Firth of Silistar River (Bulgaria), NG85(1), 27.08.2004, leg. A. Irikov.
Taxonomical data: According to DAMJANOVIĆ \& LIKHAREV (1975) this species is only a population form of *M. cartusiana*. KÖRNIĞ (1983) and IRIKOV (2008) support the independent status of this species.

Ecological data: Xerophilic (HUBENOV, 2005).

According to IRIKOV (2008), the species occurs in xerothermal habitats in Strandzha and the southern Black Sea Coast. It prefers open habitats with grasses and bushes, but also in sands on the seacoast too, among psamophytic and halophytic vegetation. During the summer period, due to the prolonged droughts and high temperatures in this habitat, *M. ovularis* is inactive, and is buried deep in the wet sand around the roots of plants.

Xerophilic, thermophilic, drought-resistant species (IRIKOV, 2008).


Conservation status: Indexed as “Near Threatened” (NT) under IUCN criteria. Local subpopulations might be threatened by the complete or severe destruction of the vegetation (PÁLL-GÉRGEY, 2013h).

95. *Monacha (Monacha) venusta* Pintér L., 1968


*Monacha (Monacha) venusta*: IRIKOV, 2008: 796.

Published for the studied area (Table 1; Fig. 1): Pintér (1969) NG58-68; Pintér \& Pintér (1970) (“right bank of the Ropotamo River”), NG67-68; HuDEC \& VaŠÁTKO (1973) (“Ropotamo River”); Hausdorf (2000) (“area Ropotamo River”); Irikov (2008) NG58-68, NG85(1).

Taxonomical data: According to DAMJANOVIĆ \& LIKHAREV (1975) this species is only a population form of *M. cartusiana*. IRIKOV (2008) confirms the independent status of this species.

Ecological data: According to IRIKOV (2008) inhabits open grass spaces in xerothermal biotopes near the beach. In the summer the animals are hiding under rocks and are active only after rain or at night.

Xerophilic, thermophilic, drought-resistant species (IRIKOV, 2008).

96. *Monacha (Monacha) ocellata* (Roth, 1839)

*Monacha (Monacha) ocellata*: IRIKOV, 2008: 792.

Published for the studied area (Table 1; Fig. 1): IRIKOV (2008) NG58(3).

New localities (Table 1; Fig. 1):

Camping “Oazis” (Bulgaria), south of Lozenets resort, NG67(6), 25-27.08.2007, A. Irikov.

Ecological data: According to IRIKOV (2008) this species lives on the beach farther from the sand dunes where there is abundant psamophyte vegetation.

Xerophilic, thermophilic, drought-resistant species (IRIKOV, 2008).


Conservation status: Indexed as “Least Concern” (LC) under IUCN criteria (TRIANTIS, 2013b).

Family Cochlicellidae

97. *Cochlicella acuta* (Müller, 1774)


Published for the studied area (Table 1; Fig. 1): HuDEC \& VaŠÁTKO (1973) NG58(3); DAMJANOVIĆ \& LIKHAREV (1975), Dedov (1998), NG58(3); Hubenov (2005) (“South Black Sea coast”);

Notes: HuDEC \& VaŠÁTKO (1973) first reported this Atlanto-Mediterranean species for Bulgaria. According to DAMJANOVIĆ \& LIKHAREV (1975) the species was introduced in Bulgaria.

Ecological data: Mesophilic (HUBENOV, 2005).

Zoogeography: Atlantic element, European faunistic complex.

Superfamily Helicoidea

Family Helicidae

Subfamily Helicinae

98. *Helix* (*Helix*) *lucorum* Linnaeus, 1758

*Helix (Helix) lucorum*: UrBaňSki, 1960b: 92, 93, 105.

Helix (Helix) lucorum onixiomicra: Damjanov & Likharev, 1975: 400.


Published for the studied area (Table 1; Fig. 1):
Urbański (1960b) NG58(3), NG66(1), NG67(2);
Pintér & Pintér (1970) (“right bank of the Ropotamo River”), NG66(1);
Damjanov & Likharev (1975) (“Ropotamo River”), NG59(2), NG66(1), NG76(2);
Körnig (1983) (“Bosna ridge”), NG66(1);
Hubenov (In: Delchev et al., 1993) (“Ropotamo River”),
NG59(2), NG66(1), NG76(2);

New localities (Table 1; Fig. 1):
- 3 km north-east of Yenice (Turkey), NG51, 10.05.2006, leg. A. Irikov.

Taxonomical data: A study of specimens from Strandzha and the southern Black Sea coast showed that H. l. onixiomicra is only an ecological form.

Ecological data: Xeromesophilic, thermophilic, drought-resistant, capable of surviving temperature fluctuations (Irikov & Mollov, 2006).


Conservation status: Included in Annex IV of the Bulgarian Biodiversity Act (State Gazette, 2002).

99. ♂ Helix (Pelasga) pomacella Mousson, 1854

Published for the studied area (Table 1; Fig. 1):
Urbański (1960b) (Kristo Cape), NG58(3), NG59(1),
NG76(2);
Damjanov & Pintér (1969) NG58 (1);
Pintér & Pintér (1970) (“right bank of the Ropotamo River”), NG58(2,3);
Hudec & Vašátko (1971) NG58(3), NG59(2);
Hudec & Vašátko (1973) NG67(1), NG67-68;
Damjanov & Likharev (1975) (“Ropotamo River”),
NG44, NG58(3), NG59(1,2), NG66(1);
Körnig (1983) (“Ropotamo River”) NG67(1);
Hubenov (In: Delchev et al., 1993) (“Ropotamo River”),
NG44, NG58(3), NG59(1,2), NG66(1);
Hubenov (2005) (“South Black Sea coast and Strandzha Mountain”);
Zaprijanov (1996-1997) NG59(2);

Ecological data: Lives in sunny southern slopes, in places overgrown with rare mixed forests and bushes, under leaf litter, with an average humidity (Damjanov & Likharev, 1975).

Mesophilic (Hubenov, 2005).

Zoogeography: Asia Minor subelement, Subiranian element, Southwestern Asiatic complex.

Conservation status: Indexed as “Least Concern” (LC) under IUCN criteria. Local sub-populations might be threatened by the complete or severe destruction of the rocky habitat – quarrying, earthquakes, mining, etc. (Páll-Gergely, 2013i).

100. Eobania vermiculata (Müller, 1774)

Published for the studied area (Table 1; Fig. 1):
Urbański (1960b) NG58(3), NG59(1),
NG76(2);
Damjanov & Pintér (1969) NG58 (1);
Pintér & Pintér (1970) (“right bank of the Ropotamo River”),
NG58(2,3);
Hudec & Vašátko (1971) NG58(3),
NG59(2);
Hudec & Vašátko (1973) NG67(1), NG67-68;
Damjanov & Likharev (1975) (“Ropotamo River”),
NG44, NG58(3), NG59(1,2), NG66(1);
Körnig (1983) (“Ropotamo River”) NG67(1);
Hubenov (In: Delchev et al., 1993) (“Ropotamo River”),
NG44, NG58(3), NG59(1,2), NG66(1);
Hubenov (2005) (“South Black Sea coast and Strandzha Mountain”);
Zaprijanov (1996-1997) NG59(2);

Ecological data: Lives on herbaceous plants in places, strongly lit by the sun, in conditions of low humidity (Damjanov & Likharev, 1975).

Zoogeography: Holomediterranean element, Mediterranean faunistic complex.

101. Cepaea vindobonensis (Ferussac, 1821)

Published for the studied area (Table 1; Fig. 1):
Urbański (1960b) NG58(3), NG59(1),
NG76(2);
Damjanov & Pintér (1969) NG58 (1);
Pintér & Pintér (1970) (“right bank of the Ropotamo River”),
NG58(2,3);
Hudec & Vašátko (1971) NG58(3),
NG59(2);
Hudec & Vašátko (1973) NG67(1), NG67-68;
Damjanov & Likharev (1975) (“Ropotamo River”),
NG44, NG58(3), NG59(1,2), NG66(1);
Körnig (1983) (“Ropotamo River”) NG67(1);
Hubenov (In: Delchev et al., 1993) (“Ropotamo River”),
NG44, NG58(3), NG59(1,2), NG66(1);
Hubenov (2005) (“South Black Sea coast and Strandzha Mountain”);
Zaprijanov (1996-1997) NG59(2);

Ecological data: Lives on herbaceous plants in places, strongly lit by the sun, in conditions of low humidity (Damjanov & Likharev, 1975).

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Urbański (1960b) NG58(3), NG66(1), NG67(2);
Damjanov & Pintér (1969) NG58 (1); Pintér & Pintér (1970) (“right bank of the Ropotamo River),
NG58(3); Körnig (1983) (“Bosna ridge”), NG58(3);
Zaprjanov (1991) NG67-68;
New localities (Table 1; Fig. 1):
Kiten resort (Bulgaria), NG67(1), 7.06.2002, leg. A. Irikov.
Malko Tarnovo (Bulgaria), NG44, 3.03.2003, leg. S. Uzunov.

Ecological data: Xeromesophilic, thermophilic, drought-resistant (Irikov, 2002). This species usually inhabits open warm shrub vegetation, preferably on sheltered southwards exposed slopes and valleys (Neubert, 2013).


Conservation status: Indexed as “Least Concern” (LC) under IUCN criteria (Neubert, 2013).

Discussion

Strandzha Mountain is located in the most southeastern part of the European continent and a very typical feature of the mountain is the great diversity of terrestrial molluscs. This is mainly due to its geographical location and specific climatic conditions, as well as the diverse landscapes, habitats and communities. The malacofauna of this physiogeographic region has been relatively well studied in Bulgaria and poorly explored in Turkey. Most of the data from Bulgaria refers to the coastal part of the mountain; however, the interior has been poorly explored.

Currently in Strandzha there are 101 species of terrestrial mollusks known, ranking the mountain second in Bulgaria in terms of diversity of terrestrial snails after the Western Rhodopes Mountains, where there are 111 species (see Irikov & Mollov, 2006). The species belong to the families Zoninitidae (16 taxa), Hygromiidae (14 taxa), Clausiliidae (12 taxa) and others. The lack of limestone has limited the presence of calcicolous species at the expense of forest mollusc species adapted to higher temperatures and humidity and the prevalence of mesohygrophilic and mezotherm species.

From zoogeographic point of view the malacofauna of Strandzha is very diverse, including various faunistic complexes and endemics: European (58 taxa), South-western Asian (17 taxa), Siberian (11 taxa), Mediterranean (1 taxon), Steppe Euro-Asian (1 taxon) faunistic complexes, Bulgarian endemics (3 taxa) and Balkan endemics (10 taxa). The predominating presence of the European faunistic complex is due to the high number of sub-Mediterranean species (15 taxa). This is due to the soft transitional Mediterranean climate in Strandzha as a result of its geographical location and the influence of the Black Sea. In addition to the specific humid and warm climate prevailing low altitude and the strong character of the wooded mountains are a prerequisite for the presence of a relatively large number of species separated as specific eastern-sub-Mediterranean subelement (11 taxa). The presence of only two taxa belonging to the holo-sub-Mediterranean element supports the notion that Strandzha is a separate eastern zone with specific characteristics within the sub-Mediterranean area. In support of this statement there is also the presence of a small number of Atlantic elements (5 taxa), as well as European element and only one taxon belonging to the Mediterranean element. On the other hand, the dominance of species of the Euxinian subelement (17 taxa), as a remnant of the rich fauna of the Pliocene forests of the Black Sea, has a unique character in Europe and underlines the link of the malacofauna of Strandzha with the Pontic part of Asia Minor and the Caucasus. In the south-Pontic region of Caucasus and from the northern part of coastal Asia Minor to Strandzha, in Europe there is a relatively mild and humid climate, which contributed to the preservation of the Pliocene relict flora and fauna that distinguish this area with a specific identity. The presence of a small number of European mountain species (9 taxa – 4 Middle European and 3 Southern European) is also a result from the specific climate and homogeneous appearance of wooded mountains, and also the absence of habitats from the vertical zones and characteristic for the European mountains. Unlike typical mountain species, the mountain is rich in mezophilic and thermophilic, European species (16 taxa), common in mixed and deciduous forests of Europe. This is the second largest group, which is widespread in the vast wooded areas of the mountain. The overwhelming presence of species from the European fauna

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determines the appurtenance of the malacofauna of Strandzha to the sub-Mediterranean zoogeographic province in Bulgaria and highlights two trends in its formation. On one hand, the mountain is an island refuge in the European continent, with preserved stenobiontic relict fauna favouring mild and humid climate and on the other hand – for euribiontic species. In the fauna of Strandzha there are many species belonging to the South-western Asian complex and particularly to the Sub-Iranian element (17 taxa). Among them the species from the Asia Minor subelement dominate (15 taxa) and only two belong to the Irano-Turanian subelement. This is the basis of the mixed European-Asian character of the malacofauna of Strandzha, which due to its geographical position unites the Asia Minor and the European fauna. The other faunistic complexes are with negligible presence, the number of species from the Siberian complex (11 taxa) is relatively large, as it includes the European-Asian (3 taxa), Transpalearctic (2 taxa) and Holarctic (5 taxa) elements, which are generally widespread in temperate latitudes, and Mediterranean and Eurasian steppe fauna complexes are represented with only one taxon. Endemism in Strandzha Mountain has stressed east Balkan character mostly due to the specific location of the mountain. The lack of regional endemic species and the small number of Bulgarian (3 taxa) and more Balkan endemics (10 taxa), compared to other mountain areas in Bulgaria, for example Western Rhodopes (see IRIKOV & MOLLOV, 2006) is the result of the generic nature of the conditions and habitats. So in terms of endemism, Strandzha cannot be considered a speciation region, but rather a storage area for East Balkan endemic fauna.

Conservation status and contemporary threats for the malacofauna of Strandzha.

According to the Bulgarian nature conservation legislation, the European conventions and directives and the IUCN criteria, 17 species of the recorded terrestrial snails have a conservation status. Eleven are classified as “least concern”, three as “near threatened” and one is “vulnerable”, according to the IUSN criteria. One species is included in Annex II of the Bulgarian Biodiversity Act and Annex II of Directive 92/43 and another one is included in Annex IV of the Bulgarian Biodiversity Act. Currently, in our opinion there are no major threats to the terrestrial malacofauna of Strandzha. The deforestation and habitat destructions are two potential threats for the populations of terrestrial snails. A positive effect on the conservation of the terrestrial malacofauna of the mountain have the many protected territories (almost all of the territory of the mountain in the Bulgarian part is included in Nature Park “Strandzha”, 5 reserves and several protected areas), as well as the border area between Turkey and Bulgaria, where human activities are greatly restricted.

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Bibliography

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Сухоземните охлюви (Mollusca, Gastropoda) на Странджа планина и черноморското крайбрежие (България и Турция)

Атанас Ириков, Ивелин Мolloв

(Резюме)

За първи път в настоящата статия се представя пълен преглед на сухоземната малакофауна на Странджа планина (в България и Турция), на базата на всички досега публикувани данни и нови изследвания. В резултат на изследването са установени 101 вида и подвида сухоземни мекотели, които принадлежат на 27 семейства. Данните за малакофауната на Странджа планина в Турция са нови и се представят за първи път в тази статия. В статията са включени синонимите на видовете и подвидовете, които са използвани за сухоземните охлюви на изследвания район, всички известни находища, нови находища за 50 таксона, систематични и екологични данни. За първи път е направен зоогеографски анализ и е представен консервационния статут на видовете. Статията е с обзорен характер и заедно с новите данни представлява добра основа, върху която да бъдат надграждани резултатитите от бъдещи изследвания.