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ON THE CRIMEAN ENDEMIC TERRESTRIAL MOLLUSCS IN THE IUCN RED LIST

By Igor Balashov

The Crimea is a large peninsula (27,000 km²) in southern Ukraine, it is surrounded by the Black and Azov seas, connected with mainland Ukraine by a narrow neck of land. The northern, larger part of the peninsula is a dry plain (altitude up to 189 m) that was covered primarily by steppe (dry grassland), currently almost completely replaced by agricultural landscapes and settlements; its biodiversity is very low. The Crimean Mountains are in the southern, smaller part of the peninsula (about a quarter of its area), with their highest elevation being 1,545 m. This is an “island” of high biodiversity, consisting of numerous invertebrate and plant endemics, and Mediterranean species and habitats, including various mountain forests. Being legally a part of Ukraine the Crimea was occupied by the Russian Federation in 2014 and currently is under de facto control by its government.

Among the terrestrial molluscs of the Crimea, 17-21 species are considered endemic or almost endemic (i.e. with a few scattered naturally occurring populations just to the north of the Crimea), with the species status of four of them not generally accepted (Balashov & Gural-Sverlova, 2012; Balashov, 2014, 2016a, b). Of these 21 species, 12 are listed in the [IUCN Red List](#) and correspondingly in the European

IUCN Red List of non-marine molluscs of Europe (Cuttelod *et al.*, 2011), eight as Least Concern (LC), two as Not Threatened (NT), one as Data Deficient (DD) and one as Extinct (EX). However, this does not conform to current knowledge of the terrestrial molluscs of the Crimea (Balashov, 2016a, b) and requires reconsidering.

According to my estimate, using the IUCN criteria (IUCN, 2012), of the 21 endemic species, 13 are LC, one is NT, three are Endangered (EN), two are almost certainly intraspecific forms of the LC species and two more are of unclear systematic status and should be referred to as DD (Balashov, 2016a, b).

The 13 LC Crimean endemic and almost endemic molluscs are: *Brephulopsis cylindrica* (Menke, 1828), *Brephulopsis bidens* (Krynicky, 1833), *Peristoma rupestre* (Krynicky, 1833), *Peristoma ferrarii* (Hausdorf, 1994) (traditionally placed in *Thoanteus*, but it is most certainly a species of *Peristoma* (Balashov, 2016b)), *Thoanteus gibber* (Krynicky, 1833) (Enidae), *Mentissa canalifera* (Rossmässler, 1836), *Mentissa gracilicosta* (Rossmässler, 1836), *Mentissa velutina* Baidashnikov, 1990 (Clausiliidae), *Oxychilus diaphanellus* (Krynicky, 1836) (Oxychilidae), *Bilania boettgeri* (Clessin, 1883) (Daudebardiidae), *Deroceras tauricum* (Simroth, 1901) (Agriolimacidae), *Helicopsis retowskii* (Clessin, 1883) (Geomitridae) and *Monacha fruticola* (Krynicky, 1833) (Hygromiidae) (Balashov, 2016a). All except *Brephulopsis cylindrica* and *Monacha fruticola* are endemic to the Crimea, with these two species also occurring naturally in a few adjacent areas to the north. Six of these 13 species are correctly listed as LC in the IUCN Red List and six more are not listed. One species, *P. rupestre*, is listed as NT in the IUCN Red List. This species lives in the Crimean Mountains only, but is widely distributed across the entire mountain system. It lives most commonly in beech and oak forests, but often also in any other types of forests and in high montane open habitats, with a few records in urban environments on the southern coast (Balashov, 2016a, b). Therefore there is no reason to expect significant decline of this species in the foreseeable future and it should be considered LC.

The recently described *Brephulopsis konovalovae* Gural-Sverlova & Gural, 2010 is probably an intraspecific form of *B. bidens* that sometimes occurs in populations of the latter species in the central and eastern Crimean Mountains (Balashov, 2016b), and therefore there is no reason to assess its conservation status.

However, the taxonomy of the Crimean *Helicopsis* species is in flux. Four species are reported from the Crimea in the recent literature: *H. retowskii*, *H. filimargo* (Krynicky, 1833), *H. arenosa* (Krynicky, 1836) and *H. paulhessei* (Lindholm, 1936). The first two of these species are listed as LC in the IUCN Red List, the third as DD and the last as extinct. However, these species are extremely variable geographically, there are no distinct boundaries between their morphological variability and there are no localities where any two of these species are sympatric. It is possible that all these forms represent just one complex and variable species (Balashov, 2016b) (Fig. 1). It is especially unlikely that *H. paulhessei* is a



Fig. 1. *Helicopsis* cf. *retowskii* on the rock near the Great Canyon of Crimea. Photo: I. Balashov



Fig. 2. *Taurinellushka babugana* (from Balashov, 2014).

separate species, as most specialists consider it to be an intraspecific form of the common *H. retowskii* (Gural-Sverlova, 2012; Balashov, 2016b). Moreover, it is not obvious that this form is extinct in its type locality. During an expedition in May 2015 I found a *Helicopsis* population near the type locality of *H. paulhessei* in the town of Gaspra. These snails do not correspond perfectly to the original description of *H. paulhessei*, but are quite close to it (Fig. 1).

For another *Helicopsis* species the situation is more difficult. At least one species is common and widespread in the Crimea (and even spreads into some other regions north of the Black Sea); it is traditionally referred to as *H. retowskii*. Another two forms, *H. filimargo* and *H. arenosa*, have much more limited distributions, mainly inhabiting natural grasslands. They may be threatened or near threatened, especially *H. arenosa*. Therefore, these species should be evaluated as DD prior to revision using molecular genetic methods.

The recently described *Taurinellushka babugana* Balashov, 2014 (Prisilomatidae) (Fig. 2) lives in undisturbed habitats at altitudes above 1,000 m in the central Crimean Mountains; it is considered to be NT (Balashov, 2014, 2016a). This is the only known species of the genus with its closest relatives in the Balkans (Balashov, 2014), which may suggest additional conservation importance.

The rare *Peristoma merduenianum* Krynicki, 1833 (Fig. 3) is listed as NT in the IUCN Red List. There are only around nine known extant populations of this species, almost all of which

are exclusively associated with sparse forests of Greek juniper (*Juniperus excelsa*). This habitat is a relic and most threatened in the Crimea not only because of its destruction and transformation (which often takes place), but also because of genetic degradation of the Crimean populations of this tree. The Greek juniper is listed in the Red Book of Ukraine as “vulnerable” and sparse forests of it are listed in the Green Book of Ukraine (list of protected habitats) in the highest most threatened first category (MENR, 2009; Balashov & Baidashnikov, 2013). These habitats occur mainly in the southern foothills of the Crimean Mountains along the southern coast, with their overall area of occupancy here being about 40 km². *Peristoma merduenianum* was found in six of nine plots with sparse forests of Greek juniper (Balashov & Baidashnikov, 2013), so its area of occupancy must be less than 40 km². The overall extent of its occurrence is about 2,000 km² but it is very much fragmented. Therefore this species should be considered EN B1ab(iii)+2ab(iii).

Another rare endemic species is *Ramusculus subulatus* (Rossmässler, 1837) (Enidae) (Fig. 4). This species is listed as LC in the IUCN Red List, but in fact it is one of the most threatened molluscs in the Crimea (Balashov & Baidashnikov, 2013; Balashov, 2016a). This species is known only from seven recent locations, six being montane steppe and one sparse Greek juniper forest. A single fossil record of this species is from the early Holocene of the Kerch Peninsula (eastern Crimea). This fossil finding is on the Crimean plain quite far from the current range of *R. subulatus*, which suggests that the species was much more widely distributed in prehistoric times and has declined because of destruction of the natural steppe habitat. Most of these seven populations are not protected or are insufficiently protected. The largest and most numerous population of this species, on the northern slope of Chatyr-Dag Plateau (Fig. 4) is near but outside the boundary of the Crimean Nature Reserve. The steppes are threatened habitats in the Crimea, facing afforestation (which is especially concerning for mountain populations of *R. subulatus*), excessive grazing and mowing, premeditated fires, off-road driving, etc. (Parnikoza & Vasiliuk, 2011; Balashov, 2016a). The area of *R. subulatus* occupancy is about 20 km² and its extent of occurrence is about 2,000 km². Therefore, as for the previous species, it should be considered EN B1ab(iii)+2ab(iii). It also should be stated that *R. subulatus* is sometimes placed in the other endemic Crimean genus, *Brephulopsis*, without explanation (Gümüş & Neubert, 2012; Welter-Schultes, 2012). However, this is clearly incorrect, as these snails are very different from *Brephulopsis* both in shell structure and in significant anatomical characters (Balashov, 2016b). It is most likely that *Brephulopsis* is not the closest relative of *Ramusculus*. Perhaps a reason of this placement is



Fig. 3. *Peristoma merduenianum*. Photo: A. Baidashnikov



Fig. 4. *Ramusculus subulatus* on the northern slope of the Chatyr-Dag plateau. Photo: I. Balashov

confusion of *R. subulatus* and *B. bidens*, which are of similar size and shape (Fig. 5), the photo of the latter species labelled as *B. subulatus* by Welter-Schultes (2012). Thus *R. subulatus* is the only species of this endemic Crimean genus.

Another concern regarding conservation of *P. merduenianum* and *R. subulatus* is that both these species were excluded from



Fig. 5. *Brephulopsis bidens* (left) and *Ramusculus subulatus*. Photo: I. Balashov

the Red Book of the Crimea in 2015, despite the first species being listed in the Red Book of Ukraine since 1994 and the decision to include *R. subulatus* in the next edition having been accepted in 2014 by the Commission on the Red Book of Ukraine (Balashov, 2016a).

One more species among the most threatened in the Crimea is *Vitrea nadejdae* Lindholm, 1926 (Pristilomatidae), which is not covered by the IUCN Red List. This species occurs exclusively in a few forested massifs on the subtropical coast near Yalta, specifically inhabiting forests of oriental hornbeam and Greek juniper on the mountain foothills. All known records are within the southern part of the Yalta Forest-Mountain Nature Reserve or its former lands. This is one of the most troublesome protected areas in the Crimea. It is located in the most attractive resort area where often semi-legal building of personal residences and other infrastructure takes place (both before and after 2014), exactly where *V. nadejdae* occurs. In 2012, part of the protected lands on the southern coast were excluded from the reserve and instead some much less valuable forests in the other part of the mountains were added to it. Currently, the boundaries of the reserve are not officially designated. Therefore, it cannot be said that this species is protected and it is threatened by habitat destruction and transformation. The extent of *V. nadejdae* occurrence is no more than 100 km² and its area of occupancy is less than 30 km². Therefore according to the IUCN criteria it should be evaluated as EN B1ab(iii)+2ab(iii) or perhaps even CR B1ab(iii) (Balashov, 2016a). Most recently, I found this rare species in May 2015 near the town of Gaspra in sparse Greek juniper forest (just a few fresh empty shells).

Consequently, I suggest making the following changes in the IUCN Red List: 1) exclude *Helicopsis paulhessei* or at least switch its status to DD; 2) change the status of *Peristoma rupestre* from NT to LC; 3) change the status of *Peristoma merduenianum* and *Ramusculus subulatus* to EN; 4) include *Vitrea nadejdae* and *Taurinellushka babugana* in the IUCN Red List as EN and NT, respectively.

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