
The first findings of a slug *Boettgerilla pallens* (Stylommatophora, Boettgerillidae) in Crimea

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ABSTRACT. Slug *Boettgerilla pallens* was found in 4 localities in Crimea in 1987-1988. Three of these localities are situated in the urban landscapes on the south coast of Crimea. The fourth locality is in the natural mountain forest of the Crimean Nature Reserve. Short description of the slugs is given, reproductive system illustrated. The concomitant terrestrial molluscs are specified. The borders of *B. pallens* native range are discussed.

The Crimean Mountains are a small mountain system located parallel to the Black Sea coast on the south of the Crimean Peninsula (southern Ukraine). Its extension is about 160 km and width is up to 50 km, the highest point – 1545 m (Roman-Kosh Mountain). Origin of this mountain system and its biodiversity are connected with Caucasus and northern Pontic Mountains. Terrestrial molluscs of the Crimean Mountains, as well as urban fauna of the nearby cities, were studied in detail as early as in the XIX — beginning of the XX century, when the most currently known species were recorded. 102 species of terrestrial molluscs are registered here, including 20 endemics [Balashov, Gural-Sverlova, 2012]. Only several of these were registered for the first time in Crimea during last 60 years. Nevertheless, the number of species in any region always can be increased by the invasive species. Moreover, each mountain system contains very diverse habitats, and some invertebrates populations can exist in the very restricted area and live secretively. Thus a population of *Vertigo moulinsiana* (Dupuy, 1849) was discovered in the Crimean Mountains in 2009. It inhabits very small marshland (< 0.01 km²) in the ravine. This is the only known population of this species in Ukraine [Balashov, Palatov, 2011]. New interesting finding for Crimea is the slug *Boettgerilla pallens* Simroth, 1912 collected by Dr. A.A. Baidashnikov in 4 localities in 1987-88, both in the urban and natural mountain habitats.

Material and methods

Material was collected by Dr. A.A. Baidashnikov

in 1987 and 1988. Collecting cites (Fig. 1 A): 1 – Alushta city, park near the sea coast, under stones (05.10.1987); 2 – Yalta city, stand of poplar trees along a fence, under stones (12.10.1987); 3 – Nikita settlement (Yalta municipality), neglected area near Nikita botanical garden and homesteads, under stones (13.10.1987); 4 – the Crimean Nature Reserve (Alushta municipality), near Seduna cordon and Kos'mo-Demianovsky monastery, beech forest on the rocky slope, in litter and under stones, approximate coordinates 44°40'N, 34°16'E, elevation above sea level about 650-850 m (04.10.1988).

Results

Six specimens of *B. pallens* were collected in 4 localities. All specimens have cylindrical vermiform body with very thin sole, their length is up to 30 mm (soft fixation). Reproductive system was studied in one specimen from the Crimean Nature Reserve (Fig. 1 B) and one more specimen from the Yalta city. Atrium is long, vagina of about same length as atrium, thinner than atrium. Free oviduct in 2-3 times shorter than vagina, of the same width. *Bursa copulatrix* enters vagina far from the atrium. Duct of *bursa copulatrix* is short, about same length as free oviduct. Reservoir of *bursa copulatrix* is long and massive, elongate, somewhat pointed. Penis is slightly longer and wider than vagina. Penial retractor is short, but massive. Middle part of *vas deferens* with a fusiform muscular body (*corpus fusiformis*), which is slightly larger than penis. Presence of this structure is a differential characteristic of the Boettgerillidae [Likharev, Wiktor, 1980]. By the elongate shape of *bursa copulatrix* our specimens differ from the second species of this family – *Boettgerilla compressa* Simroth, 1910 [Likharev, Wiktor, 1980].

From 4 studied localities 3 are situated in the settlements. Together with *B. pallens* in these urban landscapes were collected such species as *Oxychilus deilus* (Bourguignat, 1857), *Monacha fruticola* (Krynicky, 1833) [localities 1-3], *Tandonia retowskii* (Boettger 1882) [syn. *T. kaleniczenkoi*

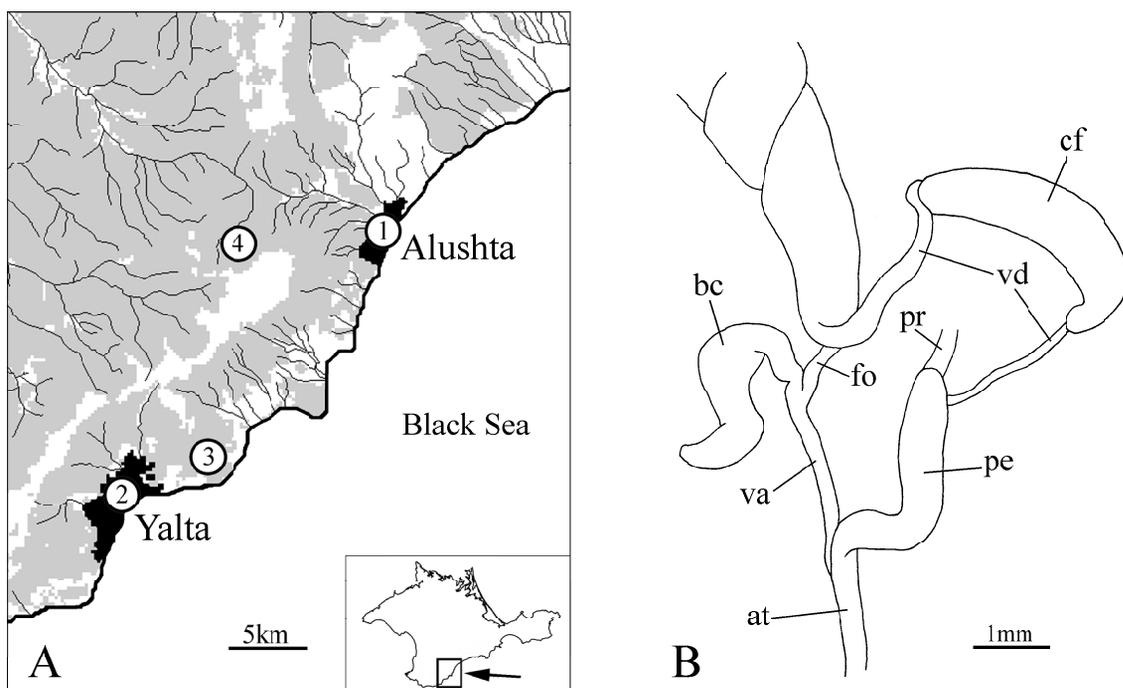


FIG. 1. A – collecting cites: 1-4 – see “Material and methods”; B – reproductive system of *Boettgerilla pallens* from the Crimean Nature Reserve (locality 4): at – atrium; va – vagina; fo – free oviduct; bc – bursa copulatrix; vd – vas deferens; cf – corpus fusiformis; pe – penis; pr – penial retractor.

РИС. 1. А – места сбора: 1-4 см. “Material and methods”; В – половая система *Boettgerilla pallens* из Крымского природного заповедника (местонахождение 4): at – атриум; va – вагина; fo – яйцевод; bc – семяприемник; vd – семяпровод; cf – веретеновидное тело; pe – пенис; pr – пениальный ретрактор

[*kalenzkoi*] (Clessin, 1883)] [localities 1, 2], *Dero-ceras reticulatum* (O.F. Müller, 1774), *Limacus maculatus* (Kaleniczenko, 1851), *Helix albescens* Rossmässler, 1839 [localities 1, 3], *Eobania vermiculata* (O.F. Müller, 1774) [locality 3] and *Lauria cylindracea* (Da Costa, 1778) [locality 1]. These species are more or less common in urban environment on the south coast of Crimea (Sverlova *et al.*, 2006; our data). *D. reticulatum* and *E. vermiculata* are probably not native in Crimea.

In natural mountain forest (locality 4) *B. pallens* was collected together with such native species as *Carychium tridentatum* (Risso, 1826), *Cochlicopa lubrica* (O.F. Müller, 1774), *Cochlicopa lubricella* (Porro, 1838), *Vertigo substriata* (Jeffreys, 1833), *Cochlodina laminata* (Montagu, 1803), *Mentissa canalifera* (Rossmässler, 1836), *Discus ruderatus* (W. Hartmann, 1821), *Punctum pygmaeum* (Draparnaud, 1801), *Euconulus fulvus* (O.F. Müller, 1774), *Vitrea contracta* (Westerlund, 1871), *Aegopinella minor* (Stabile, 1864), *Oxychilus diaphanellus* (Krynicky, 1836), *Deroceras tauricum* (Simroth, 1901) and *Krynickyillus melanocephalus* Kaleniczenko, 1851. Except *B. pallens* and *V. substriata* such species composition of molluscs is typical for

the primary natural mountain beech forests of the Crimean Mountains (our data). *V. substriata* is a rare species in Crimea, known only by few records.

Discussion

B. pallens, as well as *B. compressa*, was described from the natural mountain forest in Abkhazia. For the long time these species were known only from the Western Caucasus. But since 1950-th numerous populations of *B. pallens* were found in the urban landscapes of Central, Western, Northern and Eastern Europe [Likharev, Wiktor, 1980; Reise *et al.*, 2000]. Moreover, this species was introduced in Canada and Columbia [Reise *et al.*, 2000; Hausdorf, 2002]. In Ukraine *B. pallens* is known from the Lvov city, Ivano-Frankovsk city and Chernovka village of Chernovitsy region in the western Ukraine [Sverlova *et al.*, 2006]; from Kiev [Sverlova *et al.*, 2006], Vinnitsa city [Balashov, Baidashnikov, 2012] and Lubny town of Poltava region [Balashov, 2010] in the central Ukraine; from the natural forest habitat on the Donetsk Upland in the eastern Ukraine [Gural-Sverlova, Martynov, 2009]. Consequently, our finding of this species in Crimea

is the first record from the southern Ukraine. However, for the urban landscapes in the southern coast of Crimea the presence of this species would be expected. Much more unusual is the finding in the natural forest of the Crimean Mountains. This forest is situated in the middle of the largest Crimean reserve, at the distance more than 5 km from the nearest settlement. However, in the vicinities of this locality small residence of reserve forestry (Seduna cordon) and active monastery are present. These places, especially monastery, probably would be a source of *B. pallens* invasion. But it is also possible that this species is native in the Crimean Mountains. In the Central Europe *B. pallens* was found in the natural habitats several times [De Wilde *et al.*, 1983; Seidl, Seidl, 1997; Reise *et al.*, 2000] and some authors even suggest that this species is native here [Turner *et al.* 1998]. But for Belgium, where *B. pallens* is known since 1967, it was proven, that this species did not occur here at least before 1950 [De Wilde *et al.*, 1983; Reise *et al.*, 2000]. Currently this species is almost widespread in Belgium, sometimes occurs in the natural habitats [De Wilde *et al.*, 1983; Reise *et al.*, 2000]. A rapid range expansion of *B. pallens* was also shown in Austria in 1994-1997 [Seidl, Seidl, 1997; Reise *et al.*, 2000]. If this species would be native in Central Europe it would occupy these habitats much earlier. In the same way *B. pallens* is clearly a not native in Great Britain, but sometimes occurs in natural habitats here [Reise *et al.*, 2000]. Consequently, in the main part of Europe *B. pallens* is not a native species, which inhabits the urban landscapes and in some places it is even naturalized in the undisturbed habitats.

However, in the Crimean Mountains and Donetsk Upland situation is not so clear. Origin of biodiversity of these regions is closely associated with Caucasus. Many species with main range located in Caucasus, are present in Donetsk Upland and especially in the Crimean Mountains, including some slugs: *Limacus maculatus*, *Deroceras caucasicum* (Simroth, 1901), *Deroceras subagreste* (Simroth, 1892), *Krynickyllus melanocephalus* and others [Likharev, Wiktor, 1980; Gural-Sverlova *et al.*, 2009]. All these species for the Crimea and at least *D. caucasicum* and *D. subagreste* for the Donetsk Upland are considered as native ones (Gural-Sverlova *et al.*, 2009). In the Donetsk Upland *B. pallens* was found in the oak forest together with snail *Elia novorossica* (Retowski, 1888) (Clausiliidae), which was considered as a relic native species [Gural-Sverlova, Martynov, 2009]. Other part of its native range is located in the Northern Caucasus [Gural-Sverlova, Martynov, 2009]. In the same way in natural forest of the Crimean Mountains *B. pallens* was found together with some rare native molluscs species (see above). Slugs of Crimea till last years

were studied not so deeply, several species, including native ones, were found for the first time recently [Gural-Sverlova *et al.*, 2009; Balashov, Gural-Sverlova, 2012]. Molluscs of Donetsk Upland till last years were almost not studied at all. Therefore, *B. pallens* probably could have been missed for the long time in these territories. Moreover, *B. pallens* is mainly subterranean species [Likharev, Wiktor, 1980; Seidl, Seidl, 1997; Reise *et al.*, 2000] and in the natural mountain habitats of Crimea it probably much harder to be found. Consequently, it is possible, that *B. pallens* is a native species in the Crimean Mountains and Donetsk Upland. Further investigation is required to clarify the appearance of *B. pallens* in the Crimean Mountains and Donetsk Upland.

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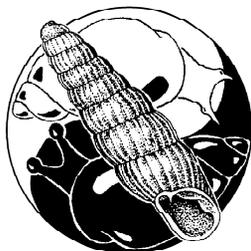
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Первые находки слизня *Boettgerilla pallens* (Stylommatophora, Boettgerillidae) в Крыму

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Слизень *Boettgerilla pallens* был найден в 4 местонахождениях в Крыму на протяжении 1987-1988. Из этих местонахождений 3 расположены в урбанистических ландшафтах южного берега Крыма. Четвертое местонахождение находится в естественном горном лесу Крымского природного заповедника. Дано краткое описание слизней, проиллюстрирована половая система. Перечислены сопутствующие виды наземных моллюсков. Обсуждаются границы природного ареала *B. pallens*.



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