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The *Valvata* Species of Turkey with a Description of *Valvata kebacii* n. sp. (Mollusca: Valvatidae)

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Abstract

The family Valvatidae Gray 1840 has a widespread distribution in the Holarctic. To date, four species of the genus *Valvata* have been reported from Turkey: *V. cristata* O.F. Müller 1774, *V. piscinalis* (O.F. Müller 1774), *V. saulcyi* Bourguignat 1853 and *V. macrostoma* Mörch 1864. This study is based on recently collected materials from the comprehensive field survey at Biga Peninsula streams, northwestern Anatolia, between 2009 and 2011. Additional materials were also examined from Cire Brook, Isparta, southwestern Anatolia, Turkey. *Valvata kebacii* sp. n. is described here as new for science. Further research is required in order to reveal exact ranges of dispersal of the new *Valvata* species in Turkey.

Key words: Freshwater snail, Taxonomy, Ectobranchia, Northwestern Anatolia.

Introduction

Turkey is of a zoogeographically unique position in the western Palearctic region, since located between Asia and Europe, therefore, it has a relative high biological diversity both floristic and faunistic (Demirsoy 1999). Considering the most recent studies dealing with freshwater molluscs, a high level of biological diversity can be recognized in Turkey (e.g. Glöer & Georgiev 2012; Kebapçı *et al.* 2012; Koşal-Şahin *et al.* 2012; Odabaşı *et al.* 2013). Despite the increase of research particularly focused on freshwater gastropods in recent years, there is still limited knowledge about taxonomy, diversity and distributions of Turkish freshwater gastropods (Yıldırım *et al.* 2006).

The family Valvatidae Gray, 1840 has many extant and recent taxa widespread in the Holarctic region have been reported (Strong *et al.* 2008; Haszprunar, 2014). However, only the following *Valvata* spp. have been reported from Turkey: *V. cristata* O.F. Müller 1774, *V. piscinalis* (O.F. Müller 1774), *V. saulcyi* Bourguignat 1853 and *V. macrostoma* Mörch 1864 (Yıldırım 1999; Yıldırım *et al.* 2006), the latter species mentioned in the literature as *V. pulchella* Studer 1820. Considering Boeters & Falkner (1998) the right name of this species is *V. macrostoma*. Additionally, a Pleistocene species, *V. beysehirensis* Glöer & Girod 2013, was recently reported.

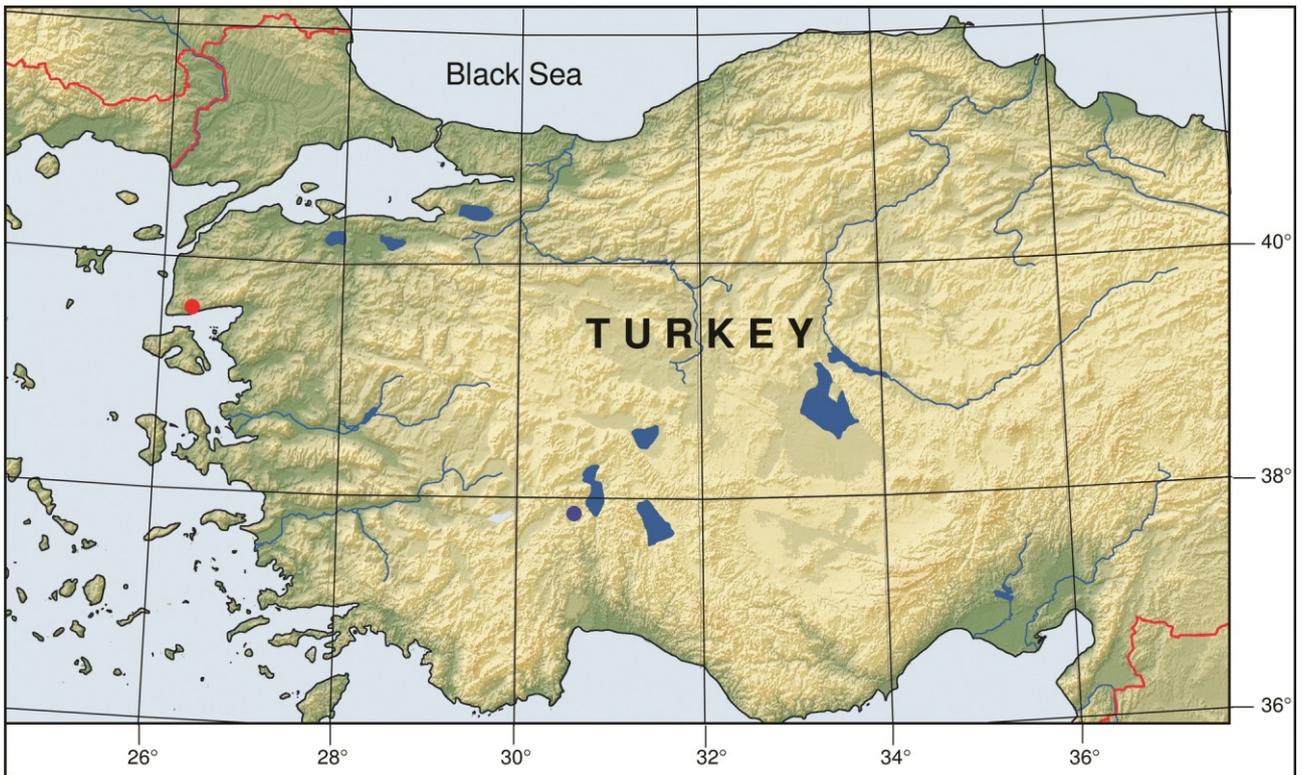


Figure 1. The map of the sampling stations. ● represents the station on the Tuzla Stream- Çanakkale, Turkey; ● represents the station on the Cire Brook, Isparta Turkey.

This study is intended to describe a new *Valvata* species inhabiting Tuzla Stream, Biga Peninsula, northwest Turkey, and Cire Brook in Lakes Region, southwest Turkey, and to increase the knowledge about the freshwater molluscs, especially the *Valvata* spp., of Turkey.

Material and Methods

The snails were collected with a sieve (mesh size: 256 µm) from the banks of the stream and the samples were put into 75% lab-grade ethanol. Shell and soft body parts were measured based on Glöer (2002) and Glöer & Meier-Brook (2003), by using stereo microscope (Olympus SZX7). Measurements were taken from digital images by QCapture Pro 7 software.

The main materials in order to make an identification in this study was obtained from the Tuzla Stream which was the samples of a comprehensive field survey conducted on Biga Peninsula streams, northwest Turkey (Anatolian part), between 2009 and 2011. Additional materials from Cire Brook, Isparta (southwest- Turkey) were also examined. The type materials are deposited at the Limnology Museum of Çanakkale Onsekiz Mart University (COMULM).

Systematics

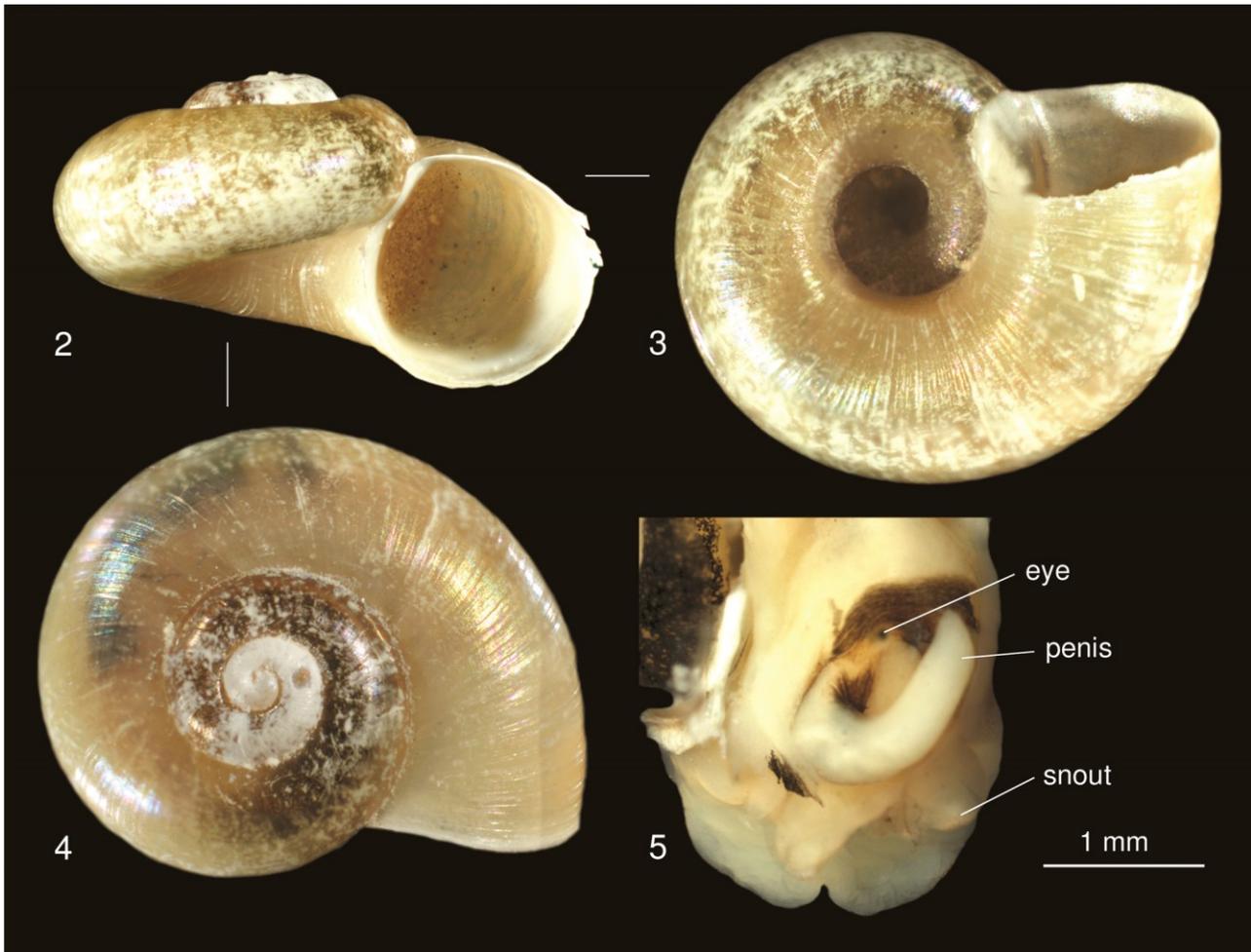
Family Valvatidae J.E. Gray, 1840

Genus *Valvata* O.F. Müller, 1773

Type species by designation *Valvata cristata* O.F. Müller, 1774

Subgenus *Tropidina* H. & A. Adams, 1854

Diagnosis. Shell with a short spire and wide umbilicus.



Figures 2-5. *Valvata kebapcii* n. sp. 2-4: shell (Holotype), 5: head (Paratype).

***Valvata kebapcii* sp. n.**

(Figs 2-5)

Material examined. 65 ex. from Tuzla Stream nearby Korubaşı and Tuzla villages; 39°31'30.8264" N 26°17'9.57" E, 81 m alt. and 39°33'29.3714" N, 26°17'9.57" E, 17 m alt. respectively, 20.03.2011, Deniz Anıl Odabaşı & Serpil Odabaşı leg.

Additional material examined. 5 ex. from Cire Brook; 37°47'26.31" N, 30°52'21.78" E, 06.05.1997, M. Z. Yıldırım leg.

Holotype. Shell height 2.47 mm, width 3.86 mm, COMULM–G 0050.

Paratypes. 5 ex. COMULM–G 0051, remainder in coll. D. A. Odabaşı.

Locus typicus. Turkey, northwestern Anatolia, Ayvacık town, Tuzla Stream, 39°31'30.8264" N, 26°17'9.57" E, 81 m alt.

Etymology. The new species is named after Dr. Ümit Kebapçı (MAEÜ, Burdur), outstanding expert on continental molluscs of Turkey.

Description

The horn-colored shell has 3½ circular whorls with a low spire and a blunt apex. The surface is densely covered by regular-silky ribs. Shell height up to 2.6 mm, diameter 3.5 - 4.0 mm. The umbilicus is wide, shell

diameter to diameter of umbilicus about 0.25. The aperture is circular and slightly angulated at the top. The concave operculum, identical with that of *V. piscinalis*, is thin, nearly circular and has dextral whorls with dense silky spiral striae. The last whorl of the operculum is apparently wider than the penultimate and has oblique growth lines near the end together with the striae.

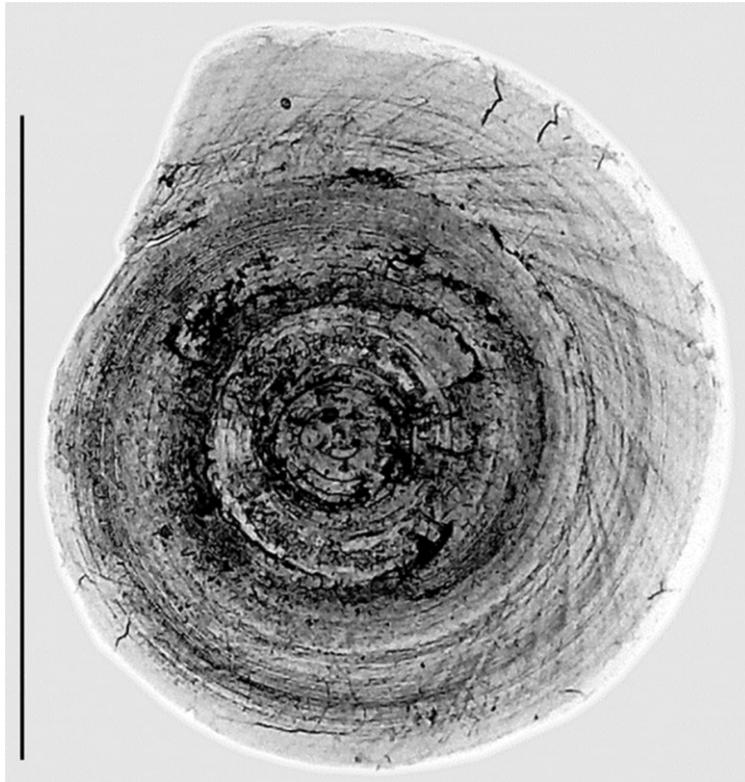


Figure 6. Operculum of *Valvata kebabcii* n. sp. Scale bar = 1 mm.

Anatomy. Head is light brown pigmented that confined to the basis of penis and snout. The pigmentation could be extended up to the half of snout in some individuals. The tentacles are white.

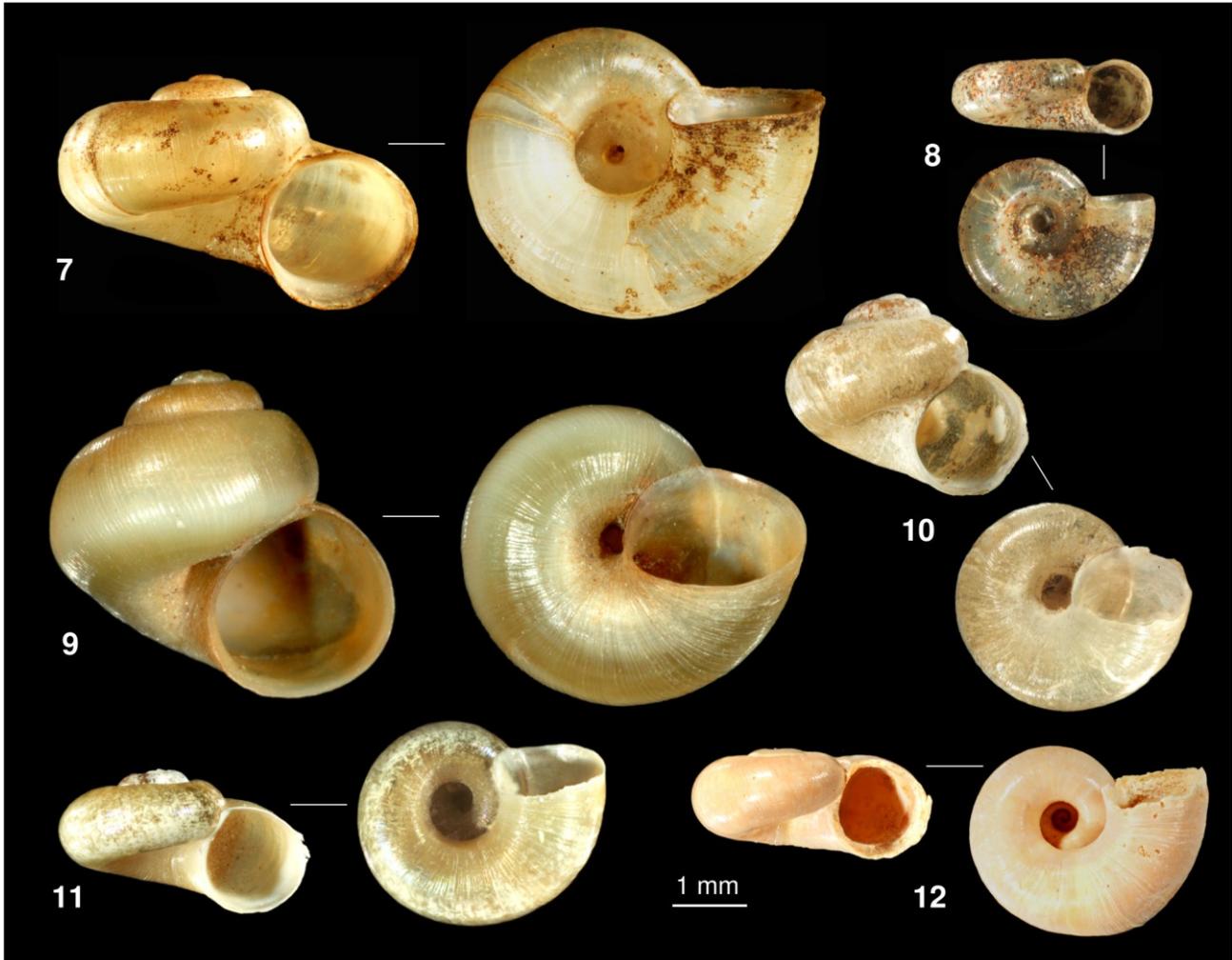
Differential diagnosis. The aperture of the new species is slightly angulated at the top unlike *V. cristata* and *Valvata macrostoma*, the aperture of which is circular without any angle. *Valvata kebabcii* sp. n. could be separated from *Valvata piscinalis* and *V. saulcyi* by its larger umbilicus and from *V. cristata* by its higher spire. In *V. kebabcii* sp. n. the spire is higher and the umbilicus is wider than in the Pleistocene *V. beysehircensis*.

Distribution. Tuzla Stream, Dümrek Brook and Karamenderes Stream (Ayvacık and Ezine towns) of Çanakkale Province, Turkey. Cire Brook, South of Lake Eğirdir, Isparta.

Ecology. The Tuzla Stream rises from the southern slopes of Kaz Dağı (National Park established in 1993) on the Biga Peninsula, northwestern Turkey (Demirsoy *et al.* 2005) (Fig. 1). The stream is rather shallow but flows year-round with lush vegetation on a coarse-sand substrate (Fig. 13). Seasonal waste discharges have been observed near the sampling station in the olive harvest season. The accompanying freshwater snails were *Pseudobithynia yildirimi* Odabaşı, Kebabçı & Akbulut, 2013, *Melanopsis buccinoidea* (Oliver 1801), *Physa acuta* (Draparnaud 1805), *Gyraulus piscinarum* (Bourguignat 1852), and *Planorbis intermixtus* Mousson 1874. According to our data, *Valvata kebabcii* n. sp. inhabits a restricted location in the Tuzla Stream and some other localities in the Biga Peninsula i.e. lowland points on Dümrek Brook and Karamenderes stream. According to the field observations and considering the paper of Odabaşı *et al.* (2013) in the type locality, wastes of an olive oil mill set up nearby the stream has been threatening the aquatic life especially prosobranch gastropods in some seasons.

Discussion

The family Valvatidae Gray 1840 is among the Heterobranchia, including two European genera *Valvata* and *Borysthenia*, of which the native range lies from Europe to western Siberia and central Asia and Far East eastward to Japan, Kurile Islands (Kantor *et al.* 2011) as well as N America (Burch & Tottenham 1980, Clarke 1981). There are about 70 valid species in six genera mentioned in the literature of this family in the northern hemisphere so far (Strong *et al.* 2008, Hawe *et al.* 2013, Burch & Tottenham 1980, Clarke 1981). In Turkey, Schütt (1965) mentioned that *Borysthenia naticina* was the firstly reported species within Valvatidae (in H. Wagner's coll.), which has a native distribution in Pontic and Balkan regions. Considering the paper of Bilgin (1980), covering some freshwater resources at the western Anatolia, *Valvata piscinalis* and *B. naticina* occurred in some small streams surrounding İzmir province, Aliğa and Selçuk towns close to the seaside. Furthermore, Yıldırım *et al.* (2006) have been recorded the occurrence of *V. macrostoma* in Turkey.



Figures 7-12. The *Valvata* spp. recorded in Turkey. **7:** *V. macrostoma*, **8:** *V. cristata*, **9:** *V. piscinalis*, **10:** *V. sauleyi*, **11:** *V. kebacii* n. sp. **12:** *V. beysehirensis*.

Çabuk *et al.* (2004) also list *V. pulchella* from Akin Stream and Bardakçı stream (both tributaries of Sakarya River). Bilgin (1967: 15, 1980: 39) gives a drawing of a wide umbilicated *Valvata* under the name *V. piscinalis*. The localities are from İzmir Province (Aliğa, Çoraklar vil. Kuzgun Stream; Selçuk, Efes Stream; Bornova, Narlıkuyu; Bornova, Mandaçayı; Bornova, Kocasu. According to the drawing the surface is smooth, ostensibly with widely spaced thin ribs below and up, ca. 3 ½ whorls, aperture close to *V. kebacii* n. sp. definition (circular and touched to penultimate whorl). The key given by Bilgin (1980: 30) surprisingly gives *V. kebacii* n. sp. like details: “width slightly higher than height, like a *Planorbis* at a first glance, 3-4 convex whorls, aperture circular, umbilicus deep”. Özbek *et al.* (2001: 151), mentioned *V. pulchella*, from

Turkey but the authors depicted a small shell with 3.5 whorls and about 2 mm in height. However, considering the size, this species could be an *Islamia*, but not *Valvata pulchella*. Öktener (2004: 23) mentioned from freshwaters of Sinop and Bafra *Valvata pulchella* but unfortunately the author did not provide a picture. The occurrence of *Valvata macrostoma* (formerly: *V. pulchella*) in Turkey is doubtful. The southern border of the distribution of *V. macrostoma* seems to be N Bulgaria (Georgiev & Hubenov 2013).



Figure 13. A view from type locality, Tuzla Stream nearby Kulfal Village, a pristine location away from settlements.

Only the shells of *V. piscinalis* are variable but not in the width of the umbilicus only in the height of the spire! Aberrant shells in *V. cristata*, with a descendent aperture can be the result of parasites (Meier-Brook pers. comm., unpublished).

Due to the variability of the shell height of *Valvata piscinalis*, taxonomic identifications based on conchological data in this family would be likely resulted in misidentifications. Consequently, literature information on the taxonomy, distribution and population ecology of Valvatidae in Turkey is very scanty. Therefore, more comprehensive investigations focusing on the Valvatidae is needed.

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