

NOTES

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**THE KUBAN RIVER BASIN,  
A NEW PAGE IN THE EXPANSION OF THE ASIAN CLAM  
*CORBICULA FLUMINEA* (O. F. MÜLLER, 1774) (BIVALVIA: CYRENIDAE)**

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The invasive bivalve *Corbicula fluminea* (O. F. Müller, 1774) was found in the Kuban River basin. Three live Asian clams were recorded in the Protoka River near the settlement of Grivenskaya (Krasnodar Krai) in the autumn of 2022. Assumably, high invasive potential of this species and its ability to withstand salinity up to 5‰ will allow the clam to inhabit not only freshwater bodies, but also estuarine zones of rivers and Azov limans. *C. fluminea* is a food item for fish, and its naturalization can increase the resource potential of water bodies in the south of Russia.

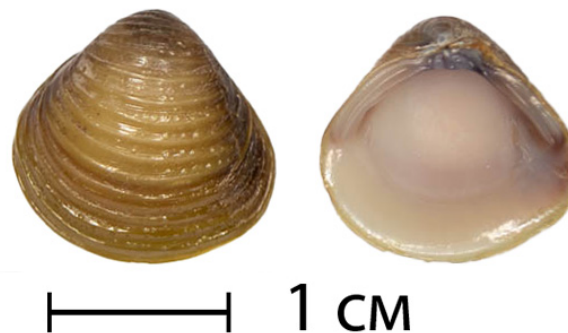
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The freshwater gold clam *Corbicula fluminea* (O. F. Müller, 1774) is a bivalve with a typical habitat in Guangzhou, China [Araujo et al., 1993]. In the early XX century, this mollusc penetrated into North and South America [Araujo et al., 1993; Counts, 1981]; since the 1980s, it has been actively settling in freshwater and estuarine water bodies of Europe [Allen, 2019]. In 2015, this bivalve was first found in European Russia – in the basin of the Northern Dvina River [Bespalaya et al., 2016] and in the Gorky Reservoir of the Volga River [Pryanichnikova et al., 2019]. In 2017, *C. fluminea* was recorded in the Don River basin [Zhivoglyadova, Revkov, 2018]. The listed findings were confined to water bodies heated by discharge warm water from the Arkhangelsk, Kostroma, and Novocherkassk power plants. Later, the Asian clam was registered in the Don basin outside the anomalous temperature zone – in the main river bed, below the Manych River mouth [Zhivoglyadova et al., 2018].

In 2013–2018, findings of a closely related species, *Corbicula fluminalis* (O. F. Müller, 1774), were reported for water bodies of the Caspian Sea coast [Khlopko et al., 2019; Nabozhenko, Nabozhenko, 2016]. In 2019 and 2021, *C. fluminea* settlements were noted in the Dagestan sector of the Caspian Sea, including those in sympatry with *C. fluminalis* [Khlopko et al., 2023].

This communication provides data on *C. fluminea* record in the basin of the Kuban River, a major waterway in the south of Russia. Three live freshwater gold clams were found during ichthyological survey in November 2022 in the Protoka River (right branch of the Kuban River) near the settlement of Griven-skaya (Kalininsky District, Krasnodar Krai). Coordinates of the spot are N45.656877°, E38.129956°. Bivalves were noted in shallows along the water edge. The substrate of the sampling area is represented by silty sand and pebbles. Shell length (maximum distance between its anterior and posterior ends) was 14.8–16.3 mm; shell height (maximum dorsoventral size measured from the top) was 14.3–15.7 mm; and shell convexity (maximum distance with closed valves) was 10.7–11.8 mm. Weight of specimens after mantle fluid was removed amounted to 1.4–2.1 g.

The species was identified based on conchological characters [Hubenov et al., 2013; Kamburska et al., 2013; Korniushev, 2007; Son, 2007; Zhadin, 1952]. Shells of all the clams are oval-triangular, with a broad top in the center (Fig. 1). Shell radial ribs are well pronounced. Each specimen has 10 ribs *per* 1 cm of its height. The inner surface of shells is light-colored, with violet darkening in the area of muscle scars.



**Fig. 1.** Shell of *Corbicula fluminea* from the Protoka River (right branch of the Kuban River)

The success of global expansion of *Corbicula* representatives is likely to be related to their effective reproductive strategy and ecological plasticity [Allen, 2019]. These clams can reproduce both sexually and by producing clones [Pigneur et al., 2011]. Also, those are known for their early maturity (starting from 3 months of age) and high fecundity (up to 570 pediveligers *per* day) [McMahon, 2000]. These bivalves can inhabit various substrates [Sousa et al., 2008], are not demanding to the type of water body, and successfully survive in different ecological environments – from drainage channels to large rivers, ponds, lakes, and estuaries [Karatayev et al., 2007; McMahon, 2000; Sousa et al., 2008]. These molluscs are relatively resistant to hypoxia: with oxygen concentration 1–3 mg·L<sup>-1</sup>, their growth slows down, but they remain viable [Karatayev et al., 2007]. Moreover, *C. fluminea* is more tolerant to salinity compared to freshwater mussels, such as unionids and *Dreissena bugensis* (Andrusov, 1897). Under natural conditions, the Asian clam tends to inhabit only upper estuarine zones with salinity up to 5‰; however, features of osmoregulation allow this species to withstand salinity up to 14–17‰ [Karatayev et al., 2007; McMahon, 2000].

The distribution of *C. fluminea* in the Kuban River is still unclear. However, given its high ecological plasticity and tolerance to salinity, it can be assumed as follows: the distribution of the freshwater gold clam and its naturalization are possible in freshwater bodies of the lower river basin, including reservoirs and irrigation canals, and in estuarine zones of water bodies in the south of Russia.

Potential recipient ecosystems include the Azov limans as well, with water salinity being up to 5‰. Since small clams (up to 5 mm in size) are a food object for benthos-feeding fish [Robinson, Wellborn, 1988], the new invasive species may become an additional food resource and increase the receiving capacity of water bodies.

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**БАССЕЙН РЕКИ КУБАНЬ —  
НОВАЯ СТРАНИЦА В ЭКСПАНСИИ АЗИАТСКОГО МОЛЛЮСКА  
*CORBICULA FLUMINEA* (O. F. MÜLLER, 1774) (BIVALVIA: CYRENIDAE)**

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В бассейне реки Кубань обнаружен двустворчатый инвазивный моллюск *Corbicula fluminea* (O. F. Müller, 1774). Три живые особи найдены в реке Протока вблизи станицы Гривенская Краснодарского края осенью 2022 г. Предполагается, что высокий инвазионный потенциал вселенца и способность осваивать среды с солёностью до 5 ‰ позволят этому виду заселить не только пресноводные водоёмы, но и эстуарные зоны рек и азовские лиманы. Моллюск является кормовым объектом рыб, его натурализация может увеличить ресурсный потенциал водных объектов юга России.

**Ключевые слова:** вселенцы, биологическая инвазия, европейская часть России, пресноводные и эстуарные экосистемы