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Occurrence and habitat differences of the freshwater limpet *Ancylus fluviatilis* O.F. Müller, 1774 (Mollusca Planorbidae) in two rivers of South Epirus (Greece)

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ABSTRACT This paper reports the occurrence of the freshwater limpet *Ancylus fluviatilis* O.F. Müller, 1774 (Mollusca Planorbidae) in two rivers of South Epirus, Greece: the Acheloos River and the Rema Marks River. The two rivers differ significantly in their geological composition and hydrological features. As known in the bibliography, the presence of *A. fluviatilis* in a given aquatic biotope is influenced above all by the quality of the water, which must be clean and well oxygenated but also by the nature of the substrate, with limestone-based systems (Rema Marks River) supporting larger populations than those dominated by flysch (Acheloos River), as also confirmed in this work. The presence of *A. fluviatilis*, found in the Acheloos River and the Rema Marks River during this study, represents new records for these environments.

KEY WORDS Freshwater limpet; Geology; Flysch; Limestone; Greece.

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INTRODUCTION

The freshwater mollusk fauna of Aetolia–Acarnania is generally considered well studied, particularly in lacustrine habitats (Koussouris & Pugh-Thomas, 1982; Petridis, 1993; Reischütz & Reischütz, 2002; Schütt, 1962). However, information concerning riverine systems remains scarce. As in lakes, rivers are threatened by hydroelectric power stations, excessive water abstraction, and eutrophication (Reischütz & Reischütz, 2002). Additional anthropogenic pressures, such as riverbed excavation, bank concreting, and the destruction of riparian vegetation, further degrade their ecological condition (Manganelli et al., 2000).

This study provides new records of *A. fluviatilis* from two rivers in South Epirus and discusses the possible influence of geological substrate on its distribution.

MATERIAL AND METHODS

Study area

The investigated area extended in Greece from Theodoriana and Neraida in the North, to Vourgareli and Athamanio in the South, bounded by the Acheloos River to the East and Katarraktis to the West.

The Acheloos River, also known as Achelous, is one of the longest rivers in Greece. It rises at about 2,000 m on the eastern slope of Mount Lakmos in the Pindus range, near Anthousa village, in the westernmost part of the Trikala Regional Unit. The river flows southwards, forming boundaries between several regional units and ultimately reaching the Ionian Sea after approximately 220 km. The Acheloos delta is recognized as a wetland of international importance, protected under the Ramsar

Convention and Natura 2000 (Psilovikos & Papathanasiou, 2023).

The Rema Marks River is a small tributary near Theodoriana; its upper course is known as the Nerata River. This river is known for its waterfalls that form natural pools, a popular tourist destination in the summer. The Rema Marks flows into the Gkoura River, which in turn joins the Achelous River.

Material

Fieldwork was conducted from 9 to 26 August 2025 in the Tzoumerka region of South Epirus, Greece, under permits issued by the Greek Ministry of Environment and Energy (ΑΔΑ: ΨΨΤ74653Π8-4Ψ0). Sampling focused on freshwater mollusks inhabiting riverine habitats. Freshwater mollusk were collected manually from stones and aquatic vegetation, photographed in situ, and subsequently identified based on shell morphology and published diagnostic features.

DISCUSSION

Previous research on the Acheloos River documented 13 species of freshwater mollusks (Reischütz et al., 2008):

Theodoxus varius callosus (Deshayes, 1832),
Pseudobithynia falniowskii Glöer et Pesic, 2006,
Dianella schlickumi Schütt, 1962,
Valvata macrostoma Mörch, 1864,
Valvata piscinalis (O.F. Müller, 1774),
Physella acuta (Draparnaud, 1805),
Radix auricularia (Linnaeus, 1758),
Planorbis planorbis (Linnaeus, 1758),
Planorbis corneus (Linnaeus, 1758),
Potomida acarnica (Kobelt, 1879),
Unio crassus ionicus Drouet, 1879,
Pisidium amnicum (O.F. Müller, 1774),
Dreissena blanci Westerlund, 1890.

Figure 1. *Ancylus fluviatilis* (Acheloos River, Epirus, Greece).

The presence of *Ancylus fluviatilis*, found in this river during this study, represents a new record.

In the Acheloos River, *A. fluviatilis* was found in a single locality near Skarpari, where the current was moderate and the substrate contained calcareous components. Some specimens were observed on the upper surfaces of submerged stones. No other specimens were detected in faster sections of the river. In contrast, the Rema Marks River hosted abundant populations of *A. fluviatilis* in the numerous pools along its course. This presence is little known and each stone and even submerged leaves were inhabited by this small mollusk, indicating optimal habitat conditions. *Ancylus fluviatilis* is a freshwater gastropod widely distributed across North Africa, most of Europe, and southwestern Asia (Glöer, 2019). It inhabits clear, oxygen-rich, fast-flowing waters and is sensitive to organic pollution and substrate instability (Welter-Schultes, 2012). The Acheloos and Rema Marks rivers represent two contrasting environments. The Acheloos flows through formations dominated by flysch, while the Rema Marks runs through limestone terrain.

For terrestrial mollusks, calcareous substrates are known to provide highly favorable habitats (Manganelli et al., 2000), and this pattern appears to extend to freshwater taxa as well. The observed differences in population density may be explained by the contrasting geochemistry of the two river systems. Waters flowing over limestone typically have alkaline pH values (7.5–8.5) due to the dissolution of carbonates and their buffering capacity. In contrast, flysch — composed mainly of clay, sandstone, and marl — lacks this buffering effect, resulting in neutral to slightly acidic waters (pH 6.5–7.5). Such chemical differences likely influence the occurrence and abundance of *A. fluviatilis*.

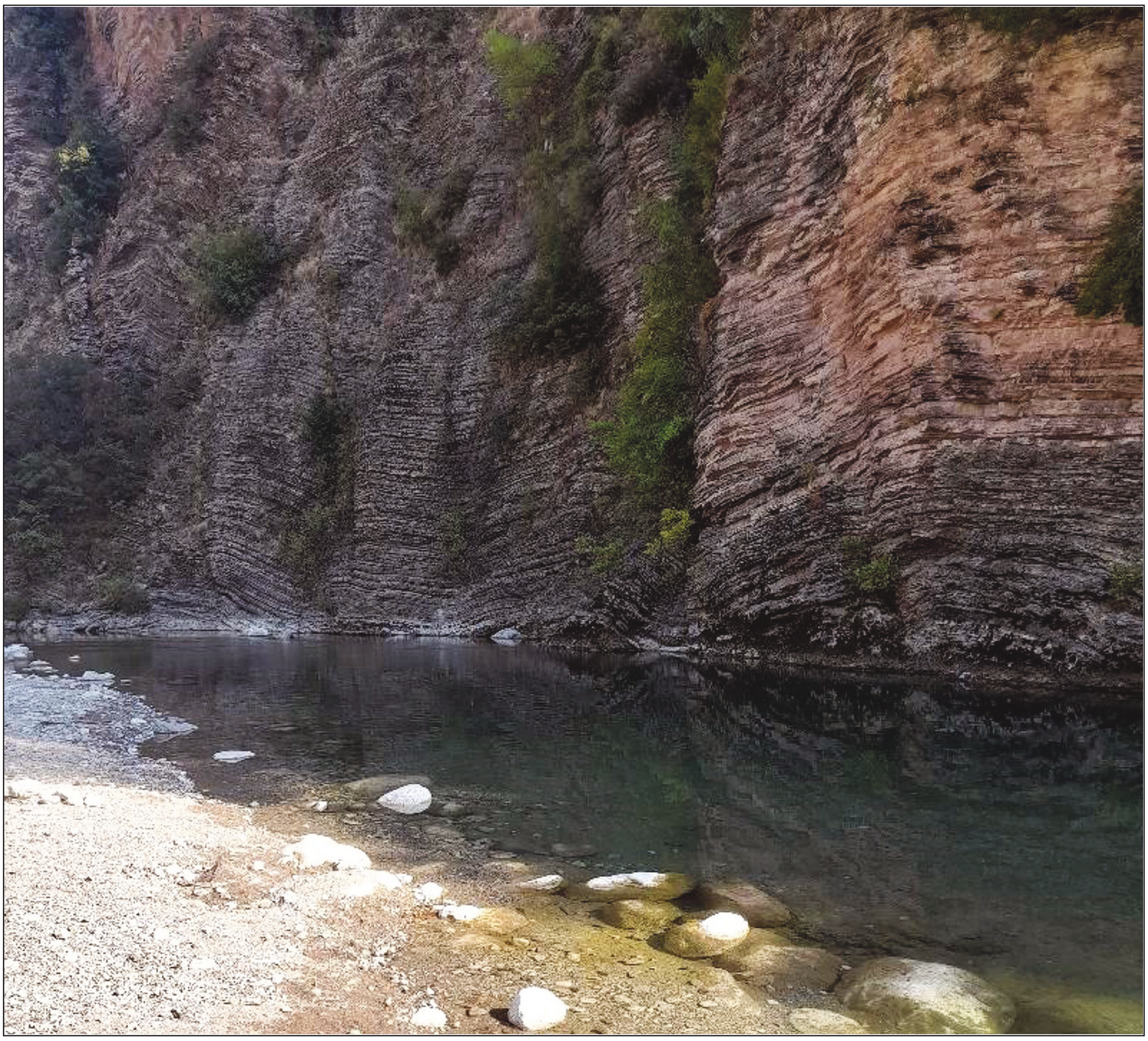

Figure 2. Acheloos River near Skarpari (Epirus, Greece).

CONCLUSIONS

This study reports for the first time the presence of *Ancylus fluviatilis* in the Acheloos and Rema Marks rivers of South Epirus. The findings suggest that, beyond water quality, the geological composition of the riverbed plays a crucial role in determining the distribution of this species. Limestone substrates appear to provide optimal conditions for its development, while flysch-based environments support only sparse populations. A qualitative and quantitative study to further explore these ecological aspects of *Ancylus fluviatilis* populations in these localities is planned.

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