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Short Communication

# Two *Potamogeton* species (Potamogetonaceae) new to the Caucasus

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**Abstract** – This study presents the first records of *Potamogeton compressus* L. and *P. friesii* Rupr. in the Caucasus, where both are confined to Lake Tabatskuri, Georgia. *Potamogeton compressus* was identified from 1965 herbarium specimens found in TGM, while *P. friesii* was documented in 2023. These findings extend their known southern ranges, highlighting the importance of high-altitude lakes in preserving boreal aquatic flora in the South Caucasus.

**Keywords**: aquatic plants, boreal species, high-altitude lakes, Lake Tabatskuri, Samtskhe-Javakheti region

## Introduction

The genus *Potamogeton* L. *s.s.* (Potamogetonaceae) is represented in the Caucasus by 13 species and two hybrids: *P. acutifolius* Link, *P. alpinus* Balb., *P. berchtoldii* Fieber, *P. coloratus* Hornem., *P. crispus* L., *P. gramineus* L., *P. lucens* L., *P. natans* L., *P.* × *nitens* Weber, *P. nododus* Poir., *P. perfoliatus* L., *P. praelongus* Wulf., *P. pusillus* L., *P.* × *salicifolius* Wolfg., and *P. trichoides* Cham. & Schltdl. (Grossheim 1939, Tzvelev 2006, Tikhomirov et al. 2024). However, the individual regions of the Caucasus remain unevenly studied regarding the diversity and distribution of pondweeds, with only a few recent records.

In this report, two pondweeds, *P. compressus* L. and *P. friesii* Rupr., are first recorded for the Caucasus. Both species are common in northern temperate regions, but in the Caucasus, they are known only from single localities restricted to the Georgian part of the Lesser Caucasus, north of the Armenian Highlands (Fig. 1A).

## Material and methods

Material of *P. compressus* was found during herbarium studies at TGM (herbarium acronyms follow Thiers 2025) and originates from the Samtskhe–Javakheti region. It was collected in the vicinity of Lake Tabatskuri in 1965 and initially identified as *P. gramineus*, one of the commonest pondweeds in the region. A few leaves were isolated for detailed microscopic studies. *Potamogeton friesii* was observed by the author during field studies in 2023 in the same area. A few plants of *P. friesii* were found only once, in a small shallow bay in the western part of the lake dominated by communities of *P. gramineus*, *P. crispus*, and *Ceratophyllum demersum* L. Specimens were collected by hand, pressed for herbarium storage and deposited at IBIW. Collection of TBI was also checked for possible specimens. The specimens were studied under an NSZ818 Nexcope stereomicroscope (Ningbo Yongxin Optics Co., Ltd., China).

## Results and discussion

*Potamogeton compressus* L. 1753, Sp. Pl.: 127 (Fig. 1B, C). – [Georgia, Samtskhe–Javakheti region, Borjomi municipality] Djavachethi. Ad ripam lac. Tabatzkuri [41.65° N, 43.63° E]. 2000 m.s.m., coll.: K. Kimeridze, Aug 24, 1965, TGM 24145!, TGM 67357! The studied specimens are characterized by strongly flattened stems, approximately 2–4 mm wide, and long (up to 200 mm), linear leaves that are 5-veined and 2.5–4.5 mm wide, with numerous sclerenchymatous strands. These specimens lack fruits, with apical and axillary turions present.

*Potamogeton friesii* Rupr. 1845, Beitr. Pflanzenk. Russ. Reiches 4: 43. (Fig. 1D, E) – Samtskhe–Javakheti, Borjomi municipality, Lake Tabatskuri, 1991 m a.s.l., Moliti, 41.63875° N, 43.58911° E, water depth 1 m, water conductivity 130 μS $cm^{-1}$, coll., det.: V.S. Vishnyakov, Aug 17, 2023, IBIW. The specimens are characterized by compressed stems and linear leaves 45–55 × 1.5–2.5 mm, which are 3- or 5-veined. Nodal glands are well developed. These specimens are sterile and fragile, with apical turions.

Both *P. compressus* and *P. friesii* are widely distributed in boreal and temperate zones but become rare in southern

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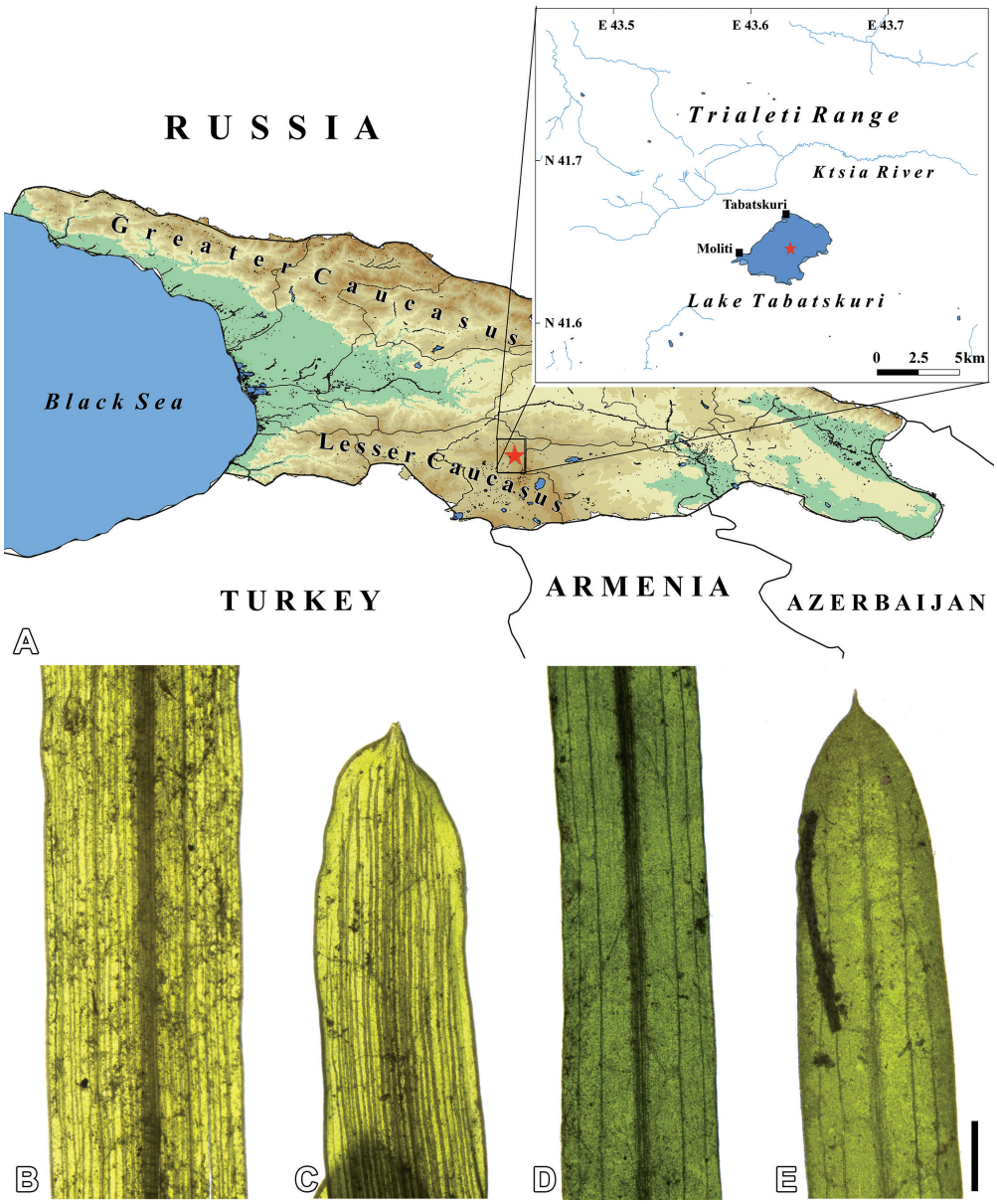



**Fig. 1.** *Potamogeton* species from Georgia new to the Caucasus: A – map of the Lake Tabatskuri area; B, C – *P. compressus*, 5-veined leaves with numerous sclerenchymatous strands, TGM 67357; D, E – *P. friesii*, 5-veined leaves without sclerenchymatous strands, IBIW. Scale bar = 1 mm (photo: Vasily S. Vishnyakov).

regions (Casper and Krausch 1980, Wiegleb and Kaplan 1998, GBIF 2025, POWO 2025). The nearest known *P. compressus* records are approximately 900 km to the north (e.g., Seregin and Stepanova 2025a). The only similar species in the region, *P. acutifolius*, differs in having narrower, 3-veined leaves. In Europe, both species exhibit broad areas of overlap (Kaplan and Marhold 2012); however, their distributions within the Caucasus are distinct: *P. acutifolius* is confined to steppe plains near the Black and Azov seas, barely entering western Ciscaucasia, whereas *P. compressus* appears to be restricted to the mountainous region of south-western Transcaucasia. The nearest *P. friesii* records are ca. 820 km to the north (Seregin and Stepanova 2025b) and 590 km to the southeast (Abbasi et al. 2015). This species can be distinguished from the similar *P. pusillus* and *P. berchtoldii*, previously recorded throughout the Caucasus, by its broader leaves with rounded to apiculate tips, more numerous veins (not always 3-veined), and white stipules connate at the base with coarse veins.

The new records extend the southern range of these two pondweed species, filling a large gap in their distribution within the Caucasus. A review of herbarium specimens, combined with field surveys, confirms that both species are rare in this region, being restricted to a single locality – Lake Tabatskuri, one of the largest of Georgia's lakes. Situated on the volcanic Javakheti Plateau at 1991 m a.s.l., Lake Tabatskuri (83.1 km$^2$) has a maximum depth of 40 m. Its hydrographic network is poorly developed, lacking permanent tributaries, with an outlet draining underground into the Ktsia River (Caspian basin). The lake is primarily fed by low-mineral groundwater, supplemented by minimal precipitation and temporary streams. This groundwater

influx helps maintain cool summer temperatures, with an August maximum of 15 °C. Severe climatic conditions lead to complete ice cover from late December for about three months (Apkhazava 1975). Previously classified as oligotrophic, the lake has recently shown signs of macrophyte overgrowth, as reported by local residents in 2023. Despite these changes, its environmental conditions remain similar to those of remote northern regions, characterized by cool temperatures, prolonged ice cover, and low ion content.

It is likely that the high-altitude positioning of waterbodies in the Armenian Highlands and adjacent regions provides favorable conditions for pondweed species typically found in more northern latitudes, such as *P. alpinus* and *P. praelongus* (İkinci and Bayındır 2021). The Javakheti region, in particular, has long been recognized as a refuge for remnants of boreal aquatic flora that have persisted since cooler and wetter climatic periods, such as the Last Glacial Maximum, and which now occur only rarely and in low abundances (Zedelmeyer 1933). The occurrence of *P. compressus* and *P. friesii* in this area may similarly reflect the long-term survival of relict populations in isolated habitats. However, their presence could also be the result of recent introductions linked to human activity, as Lake Tabatskuri was stocked with whitefish originating from Lake Ladoga in northern European Russia during the 1930s (Kuljanishvili et al. 2021).

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