



## A Georgian and an Iranian new species of *Renea* G. Nevill, 1880 enormously extend the genus's distribution (Gastropoda: Caenogastropoda: Aciculidae)

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### Abstract

*Renea caucasica* n. sp. and *R. nemethi* n. sp. are described from Georgia and northern Iran, respectively. Since the genus *Renea* has been reported from an area between south-eastern France and southern Albania, these two species extend the distribution of *Renea* eastwards enormously.

**Key words:** biogeography, Caucasus, Caspian Sea, taxonomy, systematics

### Introduction

The Aciculidae is a family of terrestrial operculate snails with western Palaearctic distribution (Boeters *et al.* 1989), and includes four genera as follows: *Acicula* W. Hartmann, 1821, *Menkia* Boeters, E. Gittenberger & Subai, 1985, *Platyla* Moquin-Tandon, 1856 and *Renea* G. Nevill, 1880. *Acicula* has the widest distribution among them, from North Africa to northern Iran; *Platyla* is known from the Iberian Peninsula to western part of Turkey, and *Menkia* is a narrow range endemic known from northern Spain and southern France (Boeters *et al.* 1989). The ten extant species of *Renea* are known so far from south-eastern France through northern Italy, southern Switzerland and Austria and the Adriatic coast to southern Albania (Boeters *et al.* 1989; Niero *et al.* 2012; Lika *et al.* 2021). Fossil records are known from as north as central Germany and southwestern Poland (Fig. 1).

So far, only the genus *Acicula* have been reported from the Caucasus region and northern Iran (Subai 1981; Boeters *et al.* 1989; Sysoev & Schileyko 2009). Here we describe a new *Renea* species from Georgia and another one from northern Iran, which extends the distribution of the genus *Renea* eastwards enormously.

### Materials and methods

Shells were imaged and measured using a Nikon SMZ25 digital microscope with Nikon Nis-Elements software. The map (Fig 1.) was made using Google Earth.

### Abbreviations

HNHM:	Hungarian Natural History Museum, Budapest, Hungary
ISU:	Institute of Zoology, Ilia State University, Tbilisi, Georgia
JG:	Collection of Jozef Grego, Banská Bystrica, Slovakia
SH:	shell height
SW:	shell width (diameter)



**FIGURE 1.** Extant (darker grey) and fossil (lighter grey) distribution of the genus *Renea* G. Nevill, 1880 (after Boeters *et al.* 1989 and Lika *et al.* 2021), and type localities of the new species. Triangle: *Renea caucasica* n. sp., circle: *Renea nemethi* n. sp.

## Taxonomy and Systematics

### Family Aciculidae Gray, 1850

#### Genus *Renea* G. Nevill, 1880

**Type species.** *Renea bourguignatiana* G. Nevill, 1880, by original designation

#### *Renea caucasica* n. sp.

(Fig. 2)

**Type material. Holotype:** (dry shell, SH: 3.7 mm, SW: 1.45 mm), GEORGIA: Samegreglo Reg.: Mukhuri vicinity, road to Lugella, small karst spring well just at left side of road from Mukhuri to Lugella, behind Shurubumu springs, 42°38.985'N 42°12.300'E (locality code: 28x), leg. J. Grego & M. Szekeres, 17 September 2021 (ISU TM-T002-H). **Paratypes:** same data as for holotype, 2 adult specimens in ethanol (coll. JG).

**Additional material.** 1 juvenile specimen in ethanol, same data as for holotype, coll. JG.

**Diagnosis.** A spindle-shaped *Renea* species with relatively widely-spaced, strong ribs (ca. 18 above aperture) without spiral striation, a deep suture, and a strong angularis that runs on ca. half parietal callus.

**Description.** Shell spindle-shaped with blunt apex, light reddish brown, with ca. 5.5 convex whorls separated by deep suture. Protoconch smooth, glossy, protoconch-teleoconch boundary not clearly discernible, ribbing starts after ca. 0.75 whorls. Teleoconch strongly ribbed, ribs equidistant, widely-spaced compared to most congeners, with ca. 18 ribs above aperture in apertural view. Spiral striation absent. Apertural rim asymmetrically arched in lateral view: its upper part leans slightly deeper backwards than lower part. A sinulus not clearly marked, parieto-palatal junction pointed. Palatal wall normally curved. Neck bulge missing. Peristome purple, not expanded on palatal part, but slightly expanded on basal and columellar area, where it covers umbilicus. Parietal callus visible, it is the direct continuation of columellar peristome without any interruption. Angularis whitish, strong, pointed, elongated triangular, situated on the anterior edge of parietal callus, starts ca. at middle of parietal callus and gradually increases

towards parieto-palatal junction until it reaches its maximal height. Between highest point of angularis and palatal wall there is a narrow channel with much weaker parietal callus (even ribs of body whorls visible). Umbilicus is covered by reflected peristome.

**Measurements** (in mm). SH = 3.7–3.8, SW = 1.45–1.5 (n = 3).

**Differential diagnosis.** This new species differs from all other *Renea* species by the spindle-shaped (not conical or cylindrical) shell shape, and the angularis, that runs along the parietal callus instead of being oriented into the aperture as in Southern European *Renea* species (*Renea berica* Niero, Nardi & Braccia, 2012, *Renea kobelti* (A. J. Wagner, 1910), *Renea spectabilis* (Rossmässler, 1839) (*Renea veneta* (Pirone, 1865))). Moreover, the rib density is lower than in the majority of *Renea* species, and most species has dense spiral striation between the ribs (Boeters *et al.* 1989, Niero *et al.* 2012, Lika *et al.* 2021). See also under *Renea nemethi* n. sp.

**Etymology.** Named after the Caucasus Mountains where it was found.

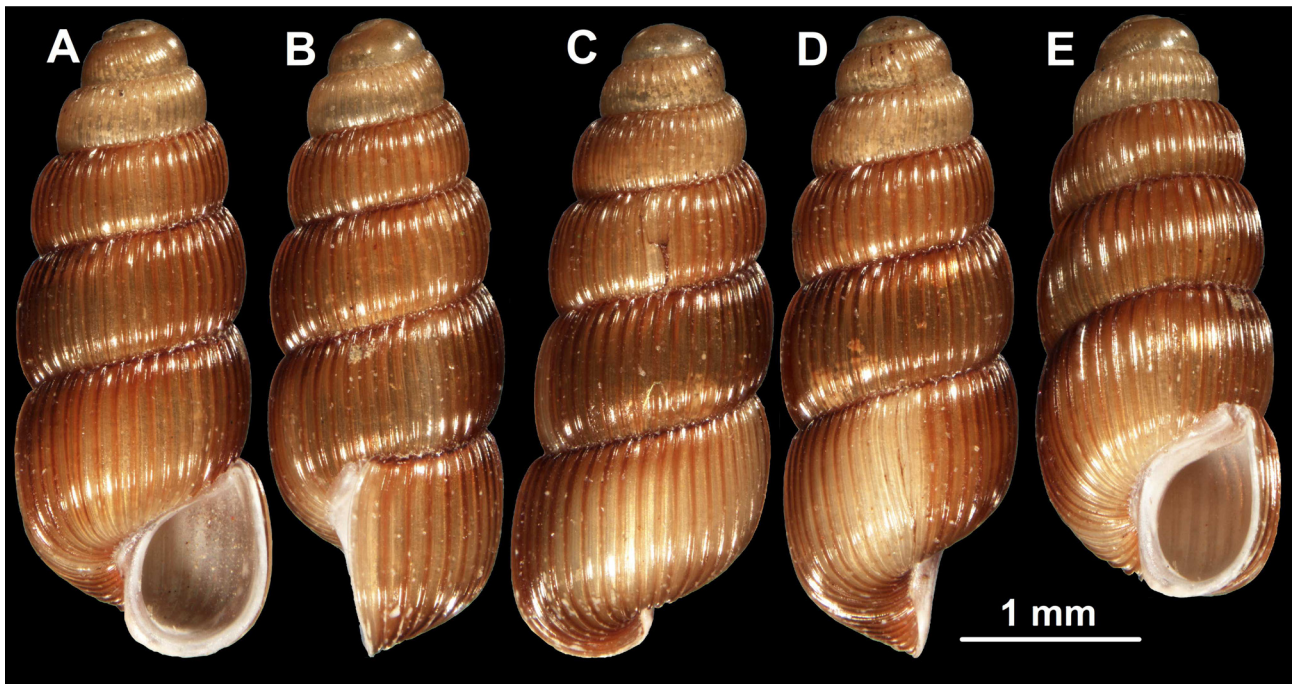


FIGURE 2. *Renea caucasica* n. sp., holotype. Photos: B. Páll-Gergely.

### *Renea nemethi* n. sp.

(Fig. 3)

**Type material. Holotype:** 1 dry shell, IRAN: Gilan Province: Mt. Talesh, side Valley 24 km from Asalam toward Khalkhal, 1300 m a.s.l., 37°39.583'N, 48°39.733'E, leg. L. Németh, 10–11 June 1999 (HNHM 105328). **Paratype:** 1 shell, same data as for holotype (coll. JG).

**Diagnosis.** A slender conical *Renea* species with relatively ca. 20–22, low ribs above aperture, a shallow suture, distinct spiral striation, and a strong angularis that runs on ca. half parietal callus.

**Description.** Shell slender conical with moderately pointed apex, light brownish, with ca. 5.5 convex whorls separated by shallow suture. Protoconch smooth, glossy, protoconch-teleoconch boundary not clearly discernible, ribbing and spiral striation starts after ca. 1–1.25 whorls. Teleoconch ribbed, ribs low, equidistant (although higher and more widely-spaced on last ca. quarter whorl), with ca. 20–22 ribs above aperture in apertural view. Fine spiral striation present on entire teleoconch. Apertural rim asymmetrically arched in lateral view: its upper part leans slightly deeper backwards than lower part. A sinulus not clearly marked, parieto-palatal junction pointed. Upper part of palatal region nearly straight or even concave resulting in an almost quadrangular aperture shape. Neck bulge missing. Peristome and angularis light brown, do not differ from other parts of teleoconch in colour, overall thin, not expanded on palatal part, but slightly expanded on basal and columellar area, where it covers umbilicus. Parietal callus visible, it is the direct continuation of columellar peristome without any interruption. Angularis strong,

pointed, elongated triangular, situated on the anterior edge of parietal callus, starts ca. at middle of parietal callus and gradually increases towards parieto-palatal junction until it reaches its maximal height. Between highest point of angularis and palatal wall there is a narrow channel with much weaker parietal callus (even ribs of body whorls visible). Angularis continues inside aperture as a slight, gradually weakening angular lamella. Umbilicus is covered by reflected peristome.

**Measurements** (in mm). SH = 3.1–3.2, SW = 1.3 (n = 2).

**Differential diagnosis.** The shell is slender conical as most other *Renea* species, but the shell width/shell height is higher than that of other Southern European *Renea*, which are more elongate, conical or cylindrical. Moreover, the strong angularis that runs along the parietal callus is only present in *R. caucasica* n. sp. *Renea caucasica* n. sp. is larger, have stronger (more elevated), and more widely-spaced ribs, lack the spiral striation between ribs, has a deeper suture, and the palatal part of the aperture is more rounded, whereas it is straight or slightly concave in *R. nemethi* n. sp.

**Etymology.** This species is dedicated to and named after our friend, László Németh (Budapest), who collected this new species.

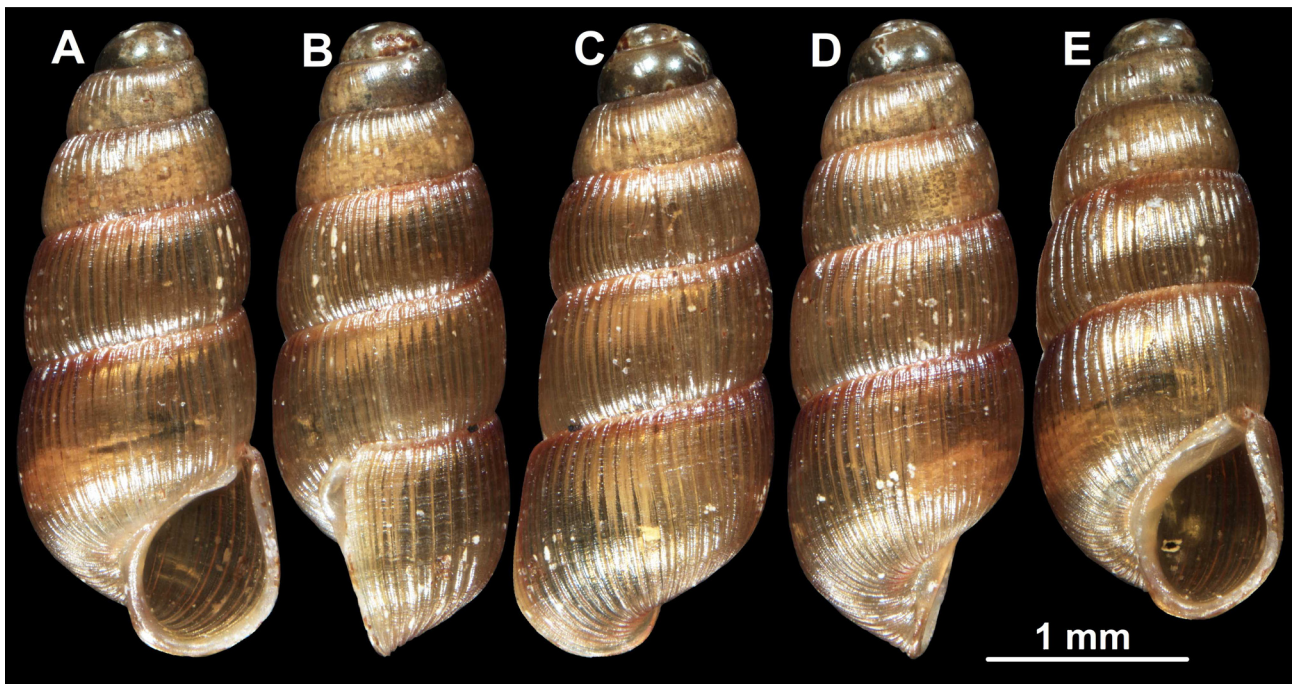


FIGURE 3. *Renea nemethi* n. sp., holotype. Photos: B. Páll-Gergely.

## Discussion

The two new species described herein share conchological traits that are different from those of the Southern European *Renea* species. Namely, their shells are relatively wide compared to their height (maybe only the Miocene fossil *Renea pretiosa* (Andreae, 1904) is similar), and the angularis runs along the parietal callus being highest near the parieto-palatal junction, whereas some Southern European species have a short angularis that 'runs' into the aperture. Consequently, it is possible that *R. caucasica* n. sp. and *R. nemethi* n. sp. are closer relatives of each other and form a monophyletic unit different from Southern European *Renea* species. Still, these conchological characters seem insufficient to erect a new genus for the Georgian and Iranian *Renea* species.

The two new species show that *Renea* is not a Mediterranean endemic, but has a peculiar disjunct distribution type. Among land snails, it is difficult to find anything similar. *Poiretia* P. Fischer, 1883 is probably the most similar in terms of distribution. It is known from an area ranging from Sicily to northeastern Italy and northern Croatia until western Crete (with an additional species known from Algeria), whereas a single species is known from Georgia (Subai 1980). Furthermore, the family Cochlostomatidae Kobelt, 1902 is distributed in the entire Mediterranean region from Morocco and the Iberian Peninsula until southern Turkey (Kekov Ada) (Schütt 1978; Zallot *et al.* 2015),

and there is a single monotypic genus (*Rara* A. J. Wagner, 1897) in the Caucasus. In some earthworm species the distribution type that includes eastern Black Sea coast and Eastern Europe (with Carpathian Basin as a centre) is termed Trans-Aegean, and can be similar to the case of *Renea* (Csuzdi *et al.* 2011). It is highly unlikely that the disjunct distribution of *Renea* is caused by the lack of taxonomic research in the middle area where no *Renea* is known, because Greece and Turkey are relatively well-known in terms of land snails.

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