NOTES ON TURKISH MENTISSOIDEINAE WITH DESCRIPTION OF THREE NEW TAXA (GASTROPODA: PULMONATA: CLAUSILIIDAE)

BARNA PÁLL-GERGELY

Department of General and Applied Ecology, University of Pécs, Ifjúság útja 6., H-7624 Pécs, Hungary

Abstract *Recently collected material provided new information on the anatomy and taxonomy of Turkish clausiliids.* Euxinastra (Odonteuxina) harchbelica *sp. nov.,* Armenica (Armenica) laevicollis nemethi *subsp. nov. and* Strumosa strumosa erasmusi *subsp. nov. are described here from Prov. Ordu, Erzurum-Erzincan and Bursa, respectively.* Sumelia latecostata *Nordsieck 1994 is separated from* Sumelia boniferae *(Neubert 1993) as an independent species using anatomical data.*

Key words *Clausiliidae, Mentissoideinae, taxonomy,* Armenica, Euxinastra, Strumosa

INTRODUCTION

In the past couple of years our knowledge about the malacofauna of Turkey has increased significantly. A huge number of taxa were described in the last decades. There are about 170 forms of clausiliids in Turkey, more than 80% of these are endemic. The new species and two new subspecies described here, as well as the other forms mentioned in this article were collected during field trips in Turkey by László Németh and myself.

MATERIALS AND METHODS

The material used in this paper is deposited in the following public collections: Hungarian Natural History Museum, Budapest (HNHM), Mátra Múzeum, Gyöngyös (MMGY), Senckenberg Naturmuseum und Forschunginstitut, Frankfurt am Main (SMF). Further material can be found in the private collections of L. Németh, Budapest, B. Páll-Gergely, Mosonmagyaróvár.

SYSTEMATICS

Family CLAUSILIIDAE
Subfamily MENTISSOIDEINAE

Genus *Euxinastra* O. Boettger 1888
Subgenus *Odonteuxina* Nordsieck 1975
Type species: *Clausilia iberica* Roth 1850

Euxinastra (*Odonteuxina*) *iberica* (Roth 1950)

Contact author : pallgergely2@gmail.com

Turkey, Ünye Kalesi (castle), 8 km from Ünye, 160 m a.s.l., 19 May 2006, L. Németh & B. Páll-Gergely coll. (dissected)

Euxinastra (*Odonteuxina*) *harchbelica* sp. nov.
(Figs 1–8, 23)

Holotype 1 shell, Turkey, Prov. Ordu, Harçbeli geçidi (pass), 1410 m a.s.l. (leg.: B. Páll-Gergely & L. Németh 20 May 2006), HNHM 96920.

Paratypes 284 shells, Turkey, Prov. Ordu, Harçbeli geçidi (pass), 1410 m a.s.l. (leg.: B. Páll-Gergely & L. Németh, between 1999 and 2007, HNHM 96921, MMGY 60345, SMF 332860, the collection of L. Németh and the author. All of the paratypes are collected in the type locality.

Type locality Turkey, Prov. Ordu, Harçbeli geçidi (pass), 1410 m a.s.l.

Measurements Shell height 15.7–18.4 mm (mean 16.9, n=14), shell width 4.4–4.8 mm (mean 4.62, n=14). Aperture height 3.8–4.3 mm (mean 4 mm, n=14), aperture width 2.8–3.2 mm (mean 3 mm, n=14).

Diagnosis *Euxinastra* (*Odonteuxina*) *harchbelica* sp. nov. differs from *E.* (*O.*) *iberica* by its smaller, usually lighter shell, less denticulate aperture, and less cylindrical apex. The penis of the new species is much longer, and the inner wall of the penis is smoother.

Description of the shell (Figs 1–4) Shell fusiform, rather thin, translucent, of 11–12.5 whorls. Colour variable, brown, yellowish or corneous. Last

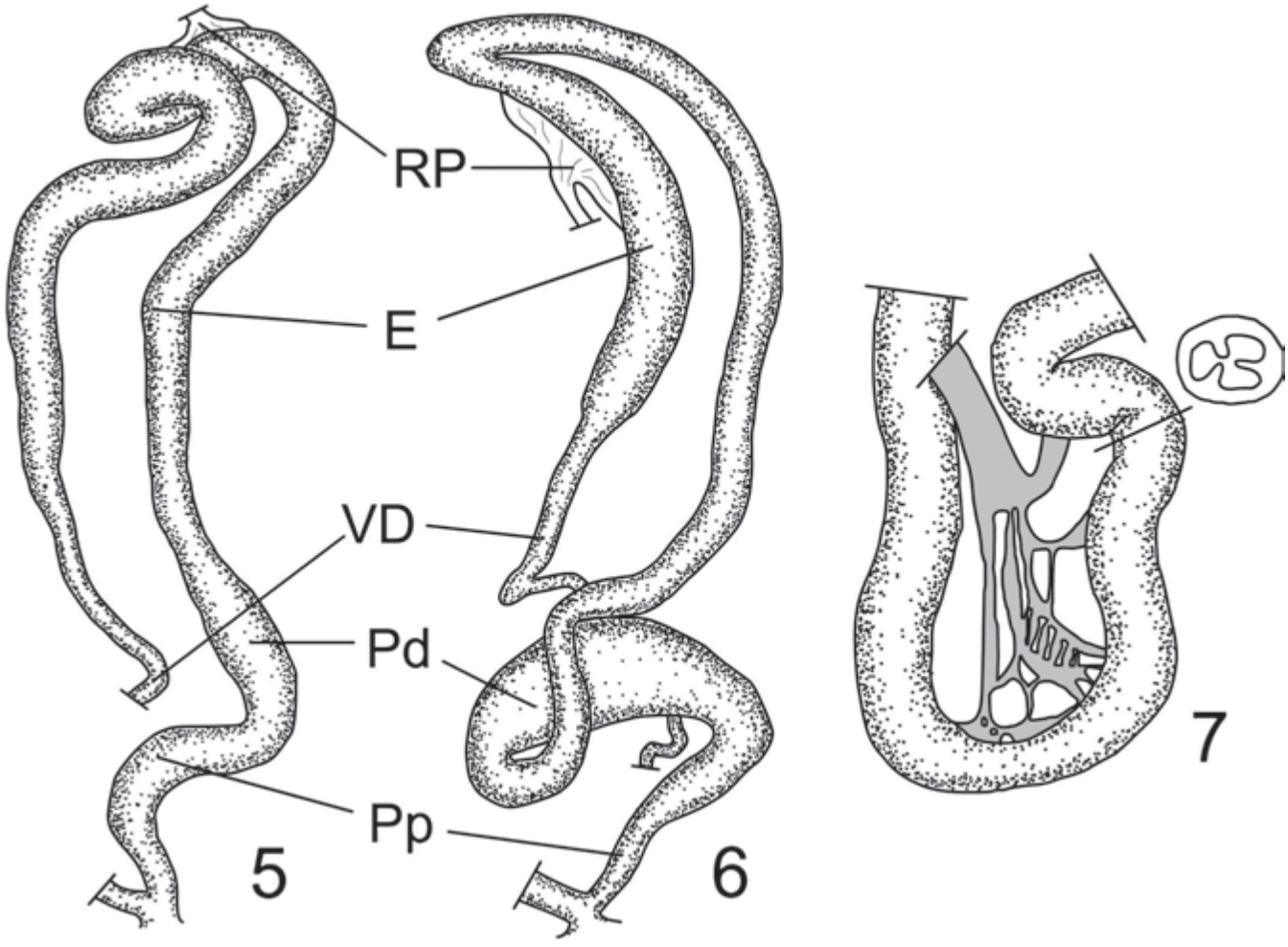
Figures 1–4 *Euxinastra* (*Odonteuxina*) *harchbelica* sp. nov. holotype.

whorl with basal and dorsal keel. Protoconch comprises 3 regularly, very finely ribbed whorls. Teleoconch regularly ribbed. Near the suture, between the ribs very fine transverse sculpture visible between ribs where these approach sutures. Ribs fewer on basal crest. Aperture oval, with white peristome not attached and recurved. Sinulus wide. Teeth present only on columellar and palatal parts of peristome, not on basal part, as sometimes seen in *O. iberica*. Inner end of relatively long lamella superior lies deeper than external end of relatively weaker lamella spiralis. Lamella inferior curves upward to end on dorsal side of shell. Upper end of spiral lamella situated also on the dorsal side, but ends deeper than the inferior lamella. Lunella absent. Principal plica lies above the short palatal plica and is twice as long. Both plicae more or less parallel. Shallow incision visible on lower end of the blunt clausilium (Fig. 23).

Genital structure (Figs 5–8) Penis long and comprising two sections. Proximal and distal parts have almost smooth, fine, granular internal surface. Proximal part less wide than distal part, but diameter generally variable. Epiphallus extremely long, cylindrical. Internal sculpture comprises three long, parallel folds (Fig. 7). Retractor muscle attaches to epiphallus by several arms (Fig. 7).

Derivation of name The name of the new species refers to the pass (Harçbeli pass) where the species was collected.

Habitat This species was collected in moist beech forest with *Rhododendron* undergrowth, under decaying tree stumps and leaf litter around the trunks of big beech trees (*Fagus*), together with *Serrulina serrulata* (L. Pfeiffer 1847), *Strigileuxina discedens* (Retowski 1889), *Strigileuxina illustris* Neubert 1993, *Pravispira subserrulata* Németh &



Figures 5–7 Male part of the genital structure of *Euxinastra* (*Odonteuxina*) *harchbelica* sp. nov. (Figs 5, 6) and fine structure of the musculus retractor penis (Fig. 7). Abbreviations (also used in Figs 8–9, 21–22): A, atrium; B, bursa of the bursa copulatrix; D, diverticulum of the bursa copulatrix; E, epiphallus; Ed, distal part of the epiphallus; Ep, proximal part of the epiphallus; Pd, distal part of the penis; Pp, proximal part of the penis; RP, retractor muscle of the penis; SO, spermoviductus; U, pedunculus; VD, vas deferens.

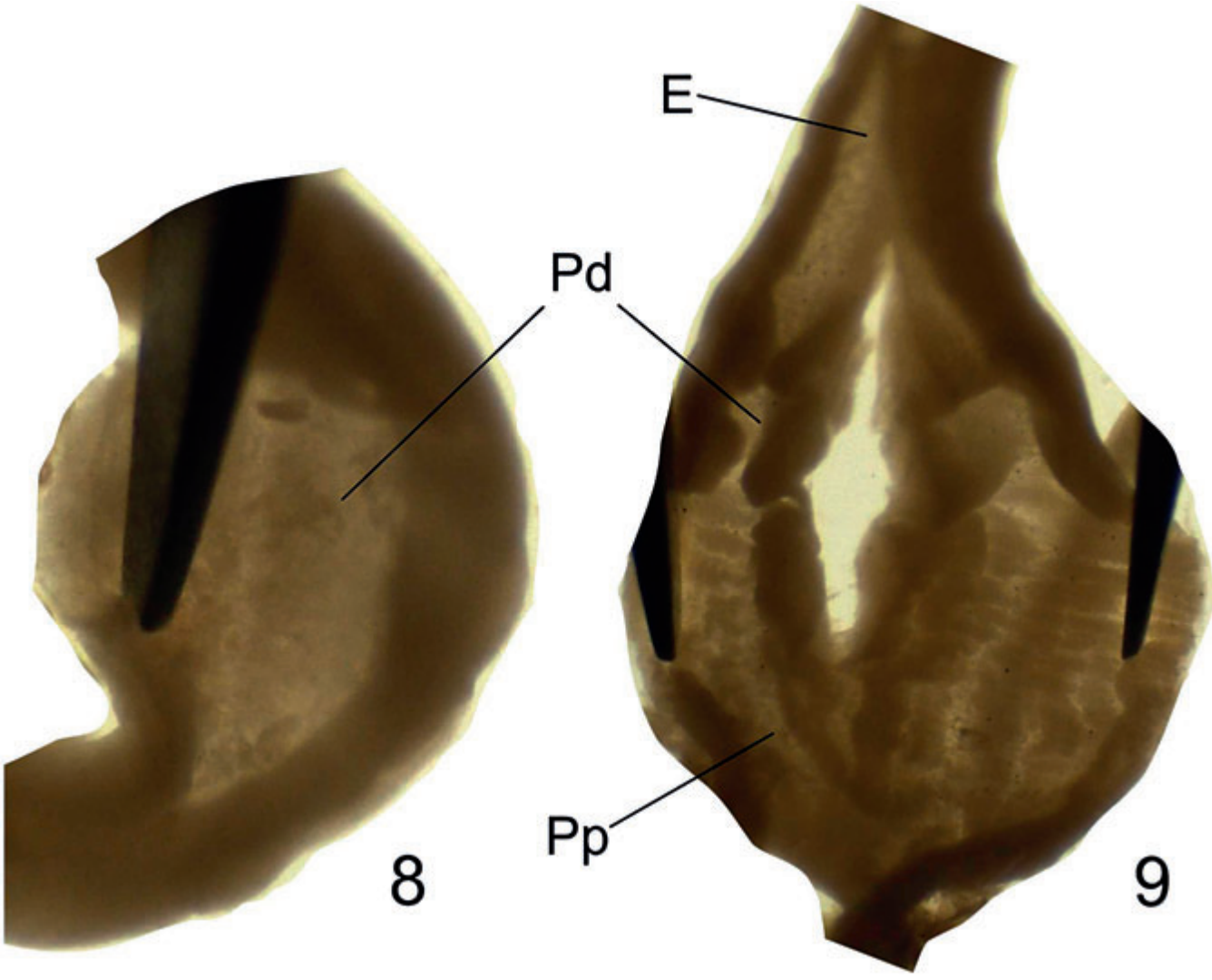
Szekeres 2004, *Euxinolauria pontica* (Retowski 1889), and *Ena menkhorsti* Hausdorf & Bank 2001.

Geographic range The new species is known only from the type locality.

Generic status *Odonteuxina* was described by Nordsieck (1975) as an independent monotypic genus. Later on, Bank & Menkhorst (1994), Neubert (1993) and Nordsieck (2001, 2005) used *Odonteuxina* as the subgenus of *Euxinastra* O. Boettger 1888, and Schileyko (2000) elevated it to generic status (without arguments).

The longer epiphallus, the retractor muscle having several arms attached to the epiphallus and the denticulate aperture, in my opinion, seem enough to classify *Odonteuxina* as an independent genus. The decision of whether *Odonteuxina* is a genus or subgenus is arbitrary and I rather use the subgenus level, which is followed by Bank & Menkhorst (1994), Neubert (1993) and Nordsieck (2001, 2005).

Internal structures within the penis of *Euxinastra* (*Odonteuxina*) species reported here (Figs 8–9) is not, however, useful for diagnosis at generic level, since it is differs significantly in the two species *E.* (*O.*) *iberica* and *E.* (*O.*) *harchbelica* sp. nov. The inner wall of the penis of *Euxinastra hamata* (O. Boettger 1888) (type species of *Euxinastra* O. Boettger 1888) contains "large tubercules arranged in circular



Figures 8–9 Inner structure of the penis of *Euxinastra* (*Odonteuxina*) species. *Euxinastra* **(***Odonteuxina***)** *harchbelica* sp. nov. (Fig. 8), *Euxinastra* **(***Odonteuxina***)** *iberica* (Roth 1850) (Fig. 9)

ridges'' (Schileyko, 2001), giving a much rougher surface.

Remarks The type locality lies about 45 km from the Black Sea, *E.* (*O.*) *iberica* inhabits the Black Sea coast (Bank & Menkhorst, 1994).

The species is ovoviviparous, as seven embryos were found (whorls up to 4) in the ovaries of the two dissected specimens.

Genus *Strumosa* O. Boettger 1877

Strumosa strumosa erasmusi subsp. nov.
(Figs 10–13, 24)

Holotype 1 shell, Turkey, Prov. Bursa, between İnegöl and Bursa, ca. 18 km from Bursa, along the road, near a farm, 580 m a.s.l., 40º14'33.2'' N, 29º15'46.6'' E (leg.: B. Páll-Gergely, 30 September 2007), HNHM 96917.

Paratypes 5 shells, same locality as the holotype, SMF 332861, and in the collection of the author.

Type locality Turkey, Prov. Bursa, between İnegöl and Bursa, ca. 18 km from Bursa, along the road, near a farm, 580 m a.s.l., 40º14'33.2'' N, 29º15'46.6'' E

Measurements Shell height 12.58–14.45 mm (mean 14 mm, n = 5), shell width 2.86–3.6 mm (mean 3.2 mm, n = 5). Aperture height 2.86–3.6 mm (mean 3.24 mm, n = 5), aperture width 2–2.3 mm (mean 2.22 mm, n = 4).

Figures 10–13 *Strumosa strumosa erasmusi* subsp. nov. holotype.

Diagnosis *Strumosa strumosa erasmusi* subsp. nov. is a small, corneous *Strumosa* which differs from all other subspecies in its long plicae. The first plica is the longest, which runs parallel with the plica principalis, and sometimes forms a swelling near a prominent thickening behind the aperture.

Description Shell sinistral, fusiform, thin, translucent, yellowish-corneous, comprising 11¾–13 whorls. Shell surface except apex covered with low, more or less equal ribs. Ribs reduce in number and height towards last whorl. Last whorl with strong, sharp basal keel and very prominent, lighter, circular thickening behind aperture. Aperture corneous, adnate, triangular in shape with narrow, reflexed rim. Sinulus normal. Inner end of strong lamella superior lies deeper than external end of weaker lamella spiralis. Lamella inferior and lamella subcolumellaris both low, lamella inferior less visible through aperture. Lunella absent and narrow plica principalis starts on dorsolateral side. Palatal plicae four and dorsally situated. First palatal plica stronger than plica principalis, and runs together with it, forming a triangular fusion with thickening behind the aperture. Second palatal plica is short and thick. Second and fourth plicae not visible through aperture. Clausilium small, narrow and sharp (Fig. 24).

Derivation of name The new subspecies was collected during my Erasmus scholarship in Dumlupınar University, Turkey.

Habitat *Strumosa strumosa erasmusi* subsp. nov. have been found under a small *Quercus* bush in a calcareous hillside covered with macchia bushes together with the clausiliid *Euxina circumdata* (L. Pfeiffer 1848), and many xerophilous species (*Chondrus zebrula* (Fèrussac 1821), *Zebrina eburnea* (L. Pfeiffer 1842), *Zebrina detrita* (O. F. Müller 1774), *Chondrus tournefortianus* (A. Fèrussac 1821),

Figures 14–17 *Armenica* (*Armenica*) *laevicollis nemethi* subsp. nov. holotype.

Multidentula ovularis (Olivier 1801), *Helicopsis subcalcarata* (G. Nägele 1903), *Helix lucorum* Linnaeus 1758, *Multidentula microdon* (Schütt 1995) and *Rupestrella philippii* (Cantraine 1840)).

Geographic range The new species is known only from the type locality.

Remarks Some subfossil shells and fragments of the new subspecies have been found in the clayey wall of the basin of an arid stream. These fragments are not paratypes.

Genus *Armenica* O. Boettger 1877

Armenica (*Armenica*) *laevicollis nemethi* subsp. nov. (Figs 14–17, 25)

Holotype 1 shell, Turkey, Tercan Tüneli (tunnel); on the boarders of the provinces Erzurum and Erzincan, 1810 m a.s.l., 39°49′55.06″N 40°33′25.69″E (leg.: B. Páll-Gergely & L. Németh 29 May 2006) HNHM 96918.

Paratypes 356 shells, collected between in 2005 and in 2006 by L. Németh and B. Páll-Gergely in the type locality, HNHM 96919, MMGY 60345, SMF 332862 in the collection of the author and L. Németh.

Type locality Turkey, Tercan Tüneli (tunnel); on the boarders of the provinces Erzurum and Erzincan, 1810 m a.s.l., 39°49′55.06″N 40°33′25.69″E.

Measurements Shell height 13.35–15.05 mm (mean 14, n=10), shell width 3.3–3.95 mm (mean 3.52 mm, n=10). Aperture height 3.12–3.4 mm (mean 3.3 mm, n=10), aperture width 2.3–2.65 mm (mean 2.45 mm, n=10).

Diagnosis There are four subspecies of *Armenica* (*Armenica*) *laevicollis* (Charpentier 1852) living in

Figures 18–20 *Sumelia* species from Vil. Trabzon, Turkey. 18. *S. latecostata* (Nordsieck 1994) Turkey, Prov. Trabzon, Çatak, 2. Köprüsü, 390 m alt. GPS-coordinates: 40° 48′ 02, 4″N 39° 35′ 05, 6″E; limestone cliffs along the road (leg. L. Németh & B. Páll-Gergely, 22/05/2006); 19. *S. latecostata*: Turkey, Prov. Trabzon, 2 km NE Maçka, on the street Maçka- Trabzon, basalt cliffs, 350 m alt. (loc. typ., Leg. L. Németh & B. Páll-Gergely, 21/05/2006); 20. *Sumelia boniferae* (Neubert 1993): Turkey, Prov. Trabzon, Hamsıköy S 3, 5 km; 1350 m alt. GPS-coordinates: 40° 41′ 45, 5″N 39° 28′ 14, 5″E; cliffs in a beach forest (leg. L. Németh & B. Páll-Gergely, 22/05/2006).

NW-Anatolia: *A.* (*A.*) *laevicollis banki* Neubert & Menkhorst 1994, *A.* (*A.*) *laevicollis flava* Neubert & Menkhorst 1994, *A.* (*A.*) *laevicollis laevicollis* and *A.* (*A.*) *laevicollis rotundata* Neubert & Menkhorst 1994. *A.* (*A.*) *laevicollis nemethi* subsp. nov. differs from *A.* (*A.*) *laevicollis rotundata* by its denser, lower riblets, and higher and sharper dorsal crest. The teleoconch of *A.* (*A.*) *laevicollis banki* is smooth, and its lunella is more curved. It has more prominent crests than the new subspecies. *A.* (*A.*) *laevicollis flava* is bigger and smoother than the new form. *A.* (*A.*) *laevicollis laevicollis* has a brown shell with a white sutural band, which is less visible in *A.* (*A.*) *laevicollis nemethi*. The peristome of the new subspecies is not so well-developed, and not recurved as in the nominate subspecies.

Description The horny yellowish shell is narrowly fusiform, consists of 10.5–11.5 whorls. The protoconch consists of 3 whorls is smooth, somewhat thickened. Teleoconch is finely, regularly ribbed. The ribs became denser towards the last whorl. The ribs are the rarest behind the rim of the peristome. The sharpest ribs can be found on the dorsal crest. Cervix with two strong crests. Aperture is pear-shaped or oval, it is slightly shifted to the left side of the shell. Sinulus is normal, not so wide. The lip of the peristome is cream-coloured, does not bent outwards. The basal channel opens on the peristome. The lunella lies dorsally with three plicae of the same size. The lowest plica in most cases does not connect with the lunella. The lunella is slightly curved and strong, somewhat apically thickened. There is no basalis. The superior lamella is very short, low and straight. Inferior lamella is situated deep in the peristome, very narrow. A vestigial parallel lamella (parallelis) is visible on the dorsal side of the shell. Subcolumellaris is curved and short. The clausilium is trapezoid and blunt (Fig. 25). It is partly visible from the aperture.

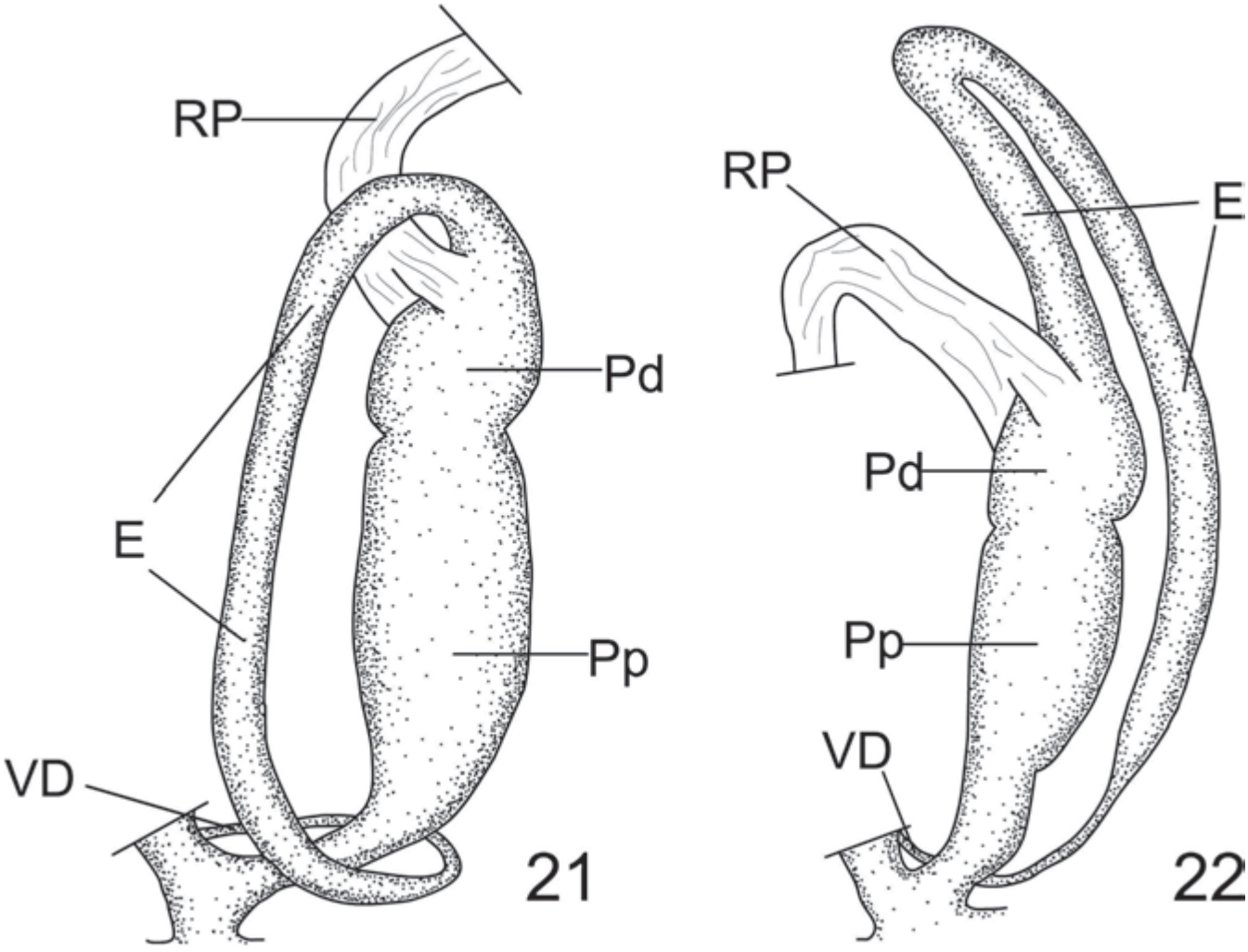
Derivation of name The new subspecies is dedicated to and named after Mr. László Németh (Budapest, Hungary).

Habitat *Armenica* (*Armenica*) *laevicollis nemethi* subsp. nov. have been found on a calcareous hillside next to the Tercan tunnel, together with *Orculella* (?) cf. *sigma* Hausdorf 1996.

Geographic range The new species is known only from the type locality.

Genus *Sumelia* Nordsieck 1994

Sumelia has been described by Neubert (1993), in his dissertation, but not published. The name was used first by Nordsieck (1994) without description, on the mistaken supposition that the description of Neubert (1995) was already published in 1994 (Nordsieck, 2005).



Figures 21–22 Male part of the genital structure of *Sumelia* species. 21. *Sumelia latecostata* (Nordsieck 1994) Turkey, Prov. Trabzon, Çatak, 2. Köprüsü, 390 m alt. GPS-coordinates: 40° 48′ 02, 4″N 39° 35′ 05, 6″E; limestone cliffs along the road (leg. L. Németh & B. Páll-Gergely, May 22, 2006); 22. *Sumelia boniferae* (Neubert 1993) Turkey, Prov. Trabzon, Hamsıköy S 3, 5 km; 1350 m alt. GPS-coordinates: 40° 41′ 45, 5″N 39° 28′ 14, 5″E; cliffs in a beach forest (leg. L. Németh & B. Páll-Gergely, May 22, 2006).

Sumelia latecostata Nordsieck 1994

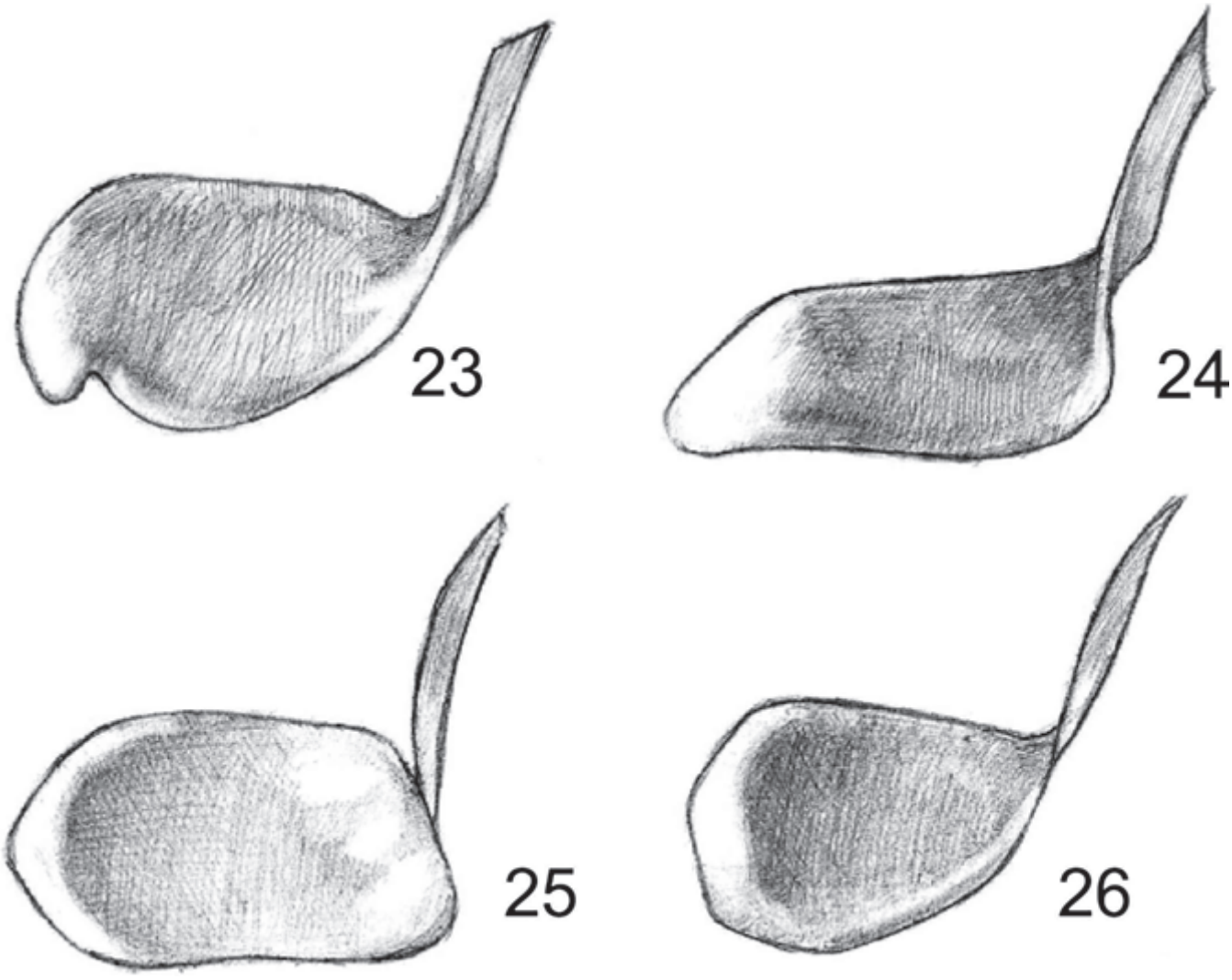
Sumelia boniferae latecostata Nordsieck 1994: 513: 36 S., 6 Taf., Nordsieck, H. 1994 Türkische Clausiliidae, II: Neue Taxa der Unterfamilien Serrulininae und Mentissoideinae in Anatolien (Gastropoda: Stylommatophora) *Stuttgarter Beiträge zur Naturkunde* 513: 1–36.

Material examined Sumelia boniferae (Neubert 1993): Turkey, Prov. Trabzon, Hamsıköy S 3, 5 km, cliffs in a beach forest, 1350 m alt., 40° 41′ 45, 5″N 39° 28′ 14, 5″E; 22 May 2006, L. Németh & B. Páll-Gergely coll. (Fig. 20)

Sumelia latecostata (Nordsieck 1994): Loc. typ.: Turkey, Prov. Trabzon, 2 km NE Maçka, on the street Maçka- Trabzon, basalt cliffs, 350 m a.s.l. 21 May 2006, L. Németh & B. Páll-Gergely coll. (Fig. 19)

Sumelia latecostata (Nordsieck 1994): Turkey, Prov. Trabzon, Çatak, 2. Köprüsü, 390 m alt. GPS-coordinates: 40° 48′ 02, 4″N 39° 35′ 05, 6″E; Limestone cliffs along the road 22 May 2006, L. Németh & B. Páll-Gergely coll. (Figs 18, 26)

Sumelia latecostata (Nordsieck 1994) was described as a subspecies of *Sumelia boniferae*



Figures 23–26 Clausiliums of Turkish clausiliids. 23. *Euxinastra* **(***Odonteuxina***)** *harchbelica* sp. nov., 24. *Strumosa strumosa erasmusi* subsp. nov., 25. *Armenica laevicollis nemethi* subsp. nov., 26. *Sumelia latecostata* Nordsieck 1994 (original drawings by Csaba Horváth).

(Neubert 1993) on the basis of conchological data only. Live specimens we collected have helped us clarify the taxonomic status of *S. latecostata*. Two specimens each of the above mentioned *Sumelia* species have been dissected. The epiphallus of *S. latecostata* is much shorter than that of *Sumelia boniferae* (Figs 21–22). According to this, the elevation of *S. boniferae latecostata* to species level is suggested.

Remarks There are two different ecological variations of *S. latecostata*. The smaller, thinner form living in the locus typicus (Turkey, Vil. Trabzon, 2 km NE Maçka, at the street Maçka-Trabzon) on basalt cliffs, have lighter shells, probably determined by the lime-deficient biotope. Shell height 13.8–15.4 mm (mean 14.6 mm, n=4), shell width 2.6–2.75 mm (mean 2.7 mm, n=4). The other form lives on limestone cliffs by Çatak (see material). Shell height 17.1–19 mm (mean 17.7, n=20), shell width 3–3.5 (mean 3.2, n=20). Other than the dimensions and the colour of the shells, there are no conchological differences between the two populations.

Sumelia boniferae is oviparous, not ovoviviparous like most other members of the subfamily Mentissoideinae (Likharev, 1962).

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