

# On some interesting species of Mollusca Gastropoda in the Pliocene of Romagna (Italy) with description of *Skenea enricoi* n. sp.

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## ABSTRACT

In the present paper, the discovery of further specimens of *Trochaclis isabellae* Tabanelli, Bongiardino et Scarponi, 2017 (Gastropoda Trochaclididae) in the Zanclean of Monte Castellaccio (Ravenna, Brisighella, Pietramora, Italy) is reported. The discovery in Pliocene outcrops of some specimens determined as *Acrochalix* cf. *callosa* Bouchet et Warén, 1986 (Gastropoda Eulimidae), a deep-sea Atlantic species, is also reported. Furthermore, *Skenea enricoi* n. sp. (Gastropoda Skeneidae) is described from the Zanclean of Monte Cerreto (Forlì-Cesena, Castrocaro Terme, Italy). This new species is doubtfully placed in the genus *Skenea* J. Fleming, 1825 because it is morphologically atypic due to the globular outline and squared opening of the shell. *Skenea enricoi* n. sp. also differs from congeneric species for the globular outline and sunken suture.

## KEY WORDS

Mollusca; *Trochaclis*; *Acrochalix*; *Skenea*; new species; Pliocene; Romagna; Italy.

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## INTRODUCTION

The bathyal fauna of fossil molluscs from Romagna (Italy) was widely studied by Ruggieri (1962) and, later, by Tabanelli (1991; 1993; 2008).

In this area are present Blue Clays (in Italian language: “Argille Azzurre”) of Pliocenic age, containing a deep-sea fauna (Tabanelli, 2008) showing a close relation with present day deep-sea Atlantic mollusca fauna. In addition, in some localities are present blocks of the sedimentary complex known as “spungone” (Tabanelli, 2008), made up of a coarse mixture of marine organism remains, held together by a calcareous cement.

## MATERIAL AND METHODS

The fossil material was collected in various localities of the Romagna (north-east Italy) and other Italian localities containing thanatocoenoses referred to Pliocene (Table 1). The micro-molluscs were obtained by sorting out the shell grit directly grabbed from the outcrop.

ABBREVIATIONS AND ACRONYMS. Museo Civico di Scienze Naturali di Faenza, Italy (CMF); Museo di Zoologia, Università di Bologna, Italy (MZUB); Claudio Bongiardino collection, Ravenna, Italy (CBR); Cesare Tabanelli collection, Cotignola, Italy (CTC); Paolo Petracci collection, Cesena, Italy (PPC). H = shell height; sh/shs = shell/shells.

Locality code	Locality	Coordinates	Age
001AL	RIO ALBONELLO (Ravenna, Brisighella): right bank of the Rio Albonello river. Interval L2 in Tabanelli & Segurini (1995). Slightly cemented yellow sands, spungone.	44°12'03.74" N, 11°50'57.11" E	Piacenzian
017CA	CASTELLACCIO (Ravenna, Brisighella, Pietramora): Monte Castellaccio, sandy clays, spungone.	44°10'41.14" N, 11°52'18.30" E	Zanclean
026MC	MONTE CERRETO (Forlì-Cesena, Castrocaro Terme): cliffs of Monte Cerreto, right bank of Torrente Samoggia, below Casa Monte Valbelle. Locality A4 in Ruggieri (1962). Slightly cemented sands, spungone.	44°10'07.30" N, 11°53'56.79" E	Zanclean
028CE	CEPARANO (Ravenna, Brisighella): field adjacent to the road that leads to the Ceparano Tower, organogenic yellowish sands intercalated between clays in contact with the upper part of the spungone.	44°12'0.97" N, 11°50'8.52" E	Piacenzian
036ME	RIO MERLI (Ravenna, Brisighella): along Bicocca road, intercalations of yellowish sands of the spungone in the grey-blue clays.	44°12'39.46" N, 11°48'45.56" E	Piacenzian
038FI	FIUMANA (Forlì-Cesena, Predappio): blue-grey clays containing deep-sea fauna also coming from spungone; small cliff adjacent to via Lucchina.	44°8'11.64" N, 11°59'15.00" E	Piacenzian

Table 1. List of locations in Romagna (north-east Italy) where the studied specimens of this note were found.

## RESULTS

### Systematics

Ordo SEGUENZIIDA Haszprunar, 1986  
 Superfamilia SEGUENZIOIDEA A.E. Verrill, 1884  
 Familia TROCHACLIDIDAE Thiele, 1928  
 Genus *Trochaclis* Thiele, 1912

*Trochaclis isabellae* Tabanelli, Bongiardino et Scarponi, 2017 (Figs. 1–3)

MATERIAL EXAMINED. ITALY • 2 shs; Ravenna, Brisighella, Pietramora, Monte Castellaccio (017CA); 44°10'41.14" N, 11°52'18.30" E; Zanclean, Sandy clays, "spungone", C. Bongiardino legit, H= 2.5 mm and 1.8 mm; CBR collection.

DESCRIPTION. Original description (Tabanelli et al., 2017): "*Conchiglia turboniforme, molto piccola (h. max. ~ 1,6 mm), globosa, ombelicata,*

*con la base molto larga per cui il rapporto larghezza/altezza oscilla fra valori appena inferiori o uguali a uno. Protoconca di circa un giro con un diametro di poco inferiore ai 200µm la cui superficie non presenta cenni di scultura, ma ciò potrebbe essere dovuto al suo cattivo stato di conservazione. Il passaggio protoconca-teleoconca è segnato da un rialzo, purtroppo anche questo non visibile nelle fotografie della tavola. La teleoconca è composta da circa tre giri lisci con il primo che generalmente appare percorso, poco sopra la metà, da un piccolo cingolo disposto come una minuscola carena. I giri successivi seguono un profilo convesso, mentre l'ultimo, molto largo, all'altezza dell'intaccatura del labbro continua con una decisa angolazione dando luogo alla base della conchiglia. Linee di crescita sono visibili soprattutto sull'ultimo giro. La base presenta un ombelico stretto da cui fuoriesce una minuscola piega o funicolo che si raccorda con il margine*

anteriore del labbro, ma in alcuni esemplari adulti questa sembra essere occlusa dal margine del peristoma (vedi fig. 2a). Apertura circolare, ampia, con peristoma intero [Shell turbiniform, very small (max. height ~ 1.6 mm), globose, umbilicated, with a very wide base so the width/height ratio ranges between values just lower than or equal to one. Protoconch of approximately one whorl, with a diameter of just under 200µm, whose surface does not show signs of sculpture, but this could be due to its poor state of conservation. The protoconch-teleoconch boundary is marked by a rise, unfortunately this too is not visible in the photographs of the table. The teleoconch is composed of approximately three smooth whorls with the first generally appearing to be crossed, just above the middle, by a small spiral cord, similar to a tiny hull. The following whorls have a convex profile, while the last, very wide, at the height of the notch of the lip, continues at a sharp angle delimiting the base of the shell. The growth lines are more visible on last whorl. The base has a narrow umbilicus from which emerges a tiny fold or funiculus, which connects with the anterior margin of the lip, but in some adult specimens this seems to be occluded by the margin of the peristome (see fig. 2a). Aperture circular, wide, peristome continuous]”.

REMARKS. The description of *Trochaclis isabellae* was based on material from Torre di Ceparano (Brisighella, Ravenna, Italy), but was also reported from Monte Castellaccio in sandy-silt outcrop dated as Zanclean. The original description indicated three teleoconch whorls, and for what concerns the umbilicus it was stated that the base has a narrow umbilicus from which emerges a tiny fold or funiculus, which connects with the anterior margin of the lip, but in some adult specimens this seems to be occluded by the margin of the peristome (see original description, reported above). The shells scope of this note show the umbilicus covered by the columellar lip, and correspond with the paratype of *T. isabellae* (Figs. 4–6).

The most similar species is *Trochaclis fortis* Hoffman, Gofas et Freiwald, 2020 from the depths of NE Atlantic, which differs for the more globose whorls with deeper suture, more depressed outline, periphery slightly angulate instead of regularly curved and larger protoconch (diameter about 250 µm, against about 180 µm).

#### Ordo TROCHIDA

Superfamilia TROCHOIDEA Rafinesque, 1815

Familia SKENEIDAE W. Clark, 1851

Genus *Skenea* J. Fleming, 1825

*Skenea enricoi* n. sp. (Figs. 4–7; 8, 9)

<https://www.zoobank.org/D95BD7D1-4F57-42B3-9BCB-BFB0B9297780>

TYPE LOCALITY. Monte Cerreto (Forlì-Cesena, Castrocaro Terme, Italy), locality identified as 026MC(S8) and referred to Zanclean by Tabanelli et al. (2023); layer of slightly cemented sands, coordinates: 44°10'07.30" N, 11°53'56.79" E.

TYPE MATERIAL. Holotype: ITALY • 1 sh; Forlì-Cesena, Castrocaro Terme, Monte Cerreto (026MC); 44°10'07.30" N, 11°53'56.79" E; Zanclean, slightly cemented sands, “spungone”, C. Bongiardino legit, H = 1.0 mm; holotype CMF235.

Paratypes: ITALY • 1 sh; same data as the holotype, H = 0.98 mm; paratype 1 MZUB60365 • 1 sh; same data as the holotype; paratype 2 CBR collection • 1 sh; same data as the holotype; paratype 3 PPC collection.

DESCRIPTION. Shell globose, very small, a little wider than high, moderately solid. Protoconch paucispiral, consisting of about 0.43 smooth whorls, protruding over the first teleoconch whorl. Protoconch-teleoconch border marked by a weak varix. Nucleus diameter about 100 µm, protoconch diameter 200 µm. Protoconch of the holotype was damaged/repared during the growth, so description and dimensions have been taken from paratypes. Teleoconch consisting of about two whorls, rapidly increasing (last whorl occupies about 95% of total height), slightly convex, gradate, separate by a very deep, sunken suture. The whorls are adapically weakly angled, forming a narrow, almost horizontal ramp, then turn abapically, so that suture is sunken. Sculpture consisting of regular, orthocline, lamellose axial ribs, on the initial ½ whorl are very crowded, on the following whorls are large as the interspaces on initial whorls, tending to become large about half of the interspaces near the aperture. The ribs became a little prosocline near the aperture (angle about 15°). In the holotype the ribs are in number of about 40 on last whorl, plus 5–6 weaker before the aperture. Number is slightly variable, up to 44. The ribs extend over the base, entering the

umbilicus. Spiral sculpture absent. Periphery regularly convex, base covered by the axial ribs. Umbilicus well developed. Aperture squarish, slightly prosocline (about 15°), columella vertical, columellar callus thickened. Dimensions: height 1.0 mm.

ETYMOLOGY. Named after Enrico Dall'Alba, father-in-law of the second author.

REMARKS. The new species is very characteristic, mainly for the outline. The placement in genus *Skenea* J. Fleming, 1825 is doubtful. Genus *Moelleria* Jeffreys, 1865 was described by Jeffreys (1865: 291) to allocate *Margarita costulata* Møller, 1842, an arctic species living at low depth (Warén, 1992: 184).

*Moelleria costulata* differs for the more depressed outline, the stronger ribs separate by narrower interspaces, the presence of three periumbilical spirals and a almost circular aperture (photo in Warén, 1992, fig. 39 E, F; Romani et al., 2016).

*Moelleria jansseni* Hoeksema, Rijken et Simons, 2020 from the Manche (NE Atlantic) of possible Pleistocene age clearly differs for the much more depressed outline, larger umbilicus bordered by sharp peri-umbilical edge, the axial ribs flexuous and partly dichotomous, separate by narrow interspaces.

*Skenea ponsonbyi* (Dautzenberg et Fischer, 1897) from the depths of NE Atlantic shows a taller outline. The species was figured by Gofas et al. (2021: 48, fig. 15 E-F) and Hoffman et al. (2020: 72, fig. 61). It clearly differs for the much more swollen whorls, the not gradate outline, lack of sutural ramp, prosocline ribs and well rounded aperture.

The presence of axial ribs is common to some recent Mediterranean species, as *Dasykenaea suavis* Fasulo et Cretella, 2002, *Dasykenaea digeronimoi* (La Perna, 1998), *Skenea costulata* Sbrana & Siragusa, 2018 and *Dasykenaea dibellai* Nofroni, Renda, Agamennone et Giacobbe, 2022, plus the Atlantic species *Dasykenaea nilarum* (Engl, 1996) and *Dasykenaea victori* Segers, Swinnen et de Prins, 2009. All of them are more depressed and no one has a squarish aperture.

*Skenea divae* Carozza et van Aartsen, 2001 has a more elevate spire compared to cogeners, but differs from the new species for having a more globose outline, regularly convex whorls and a taller profile. In addition it shows very weak spiral grooves, miss-

ing in the new species and a rounded aperture instead of squarish.

Ordo LITTORINIMORPHA A.N. Golikov et Starobogatov, 1975

Superfamilia VANIKOROIDEA Gray, 1840

Familia EULIMIDAE R.A. Philippi, 1853

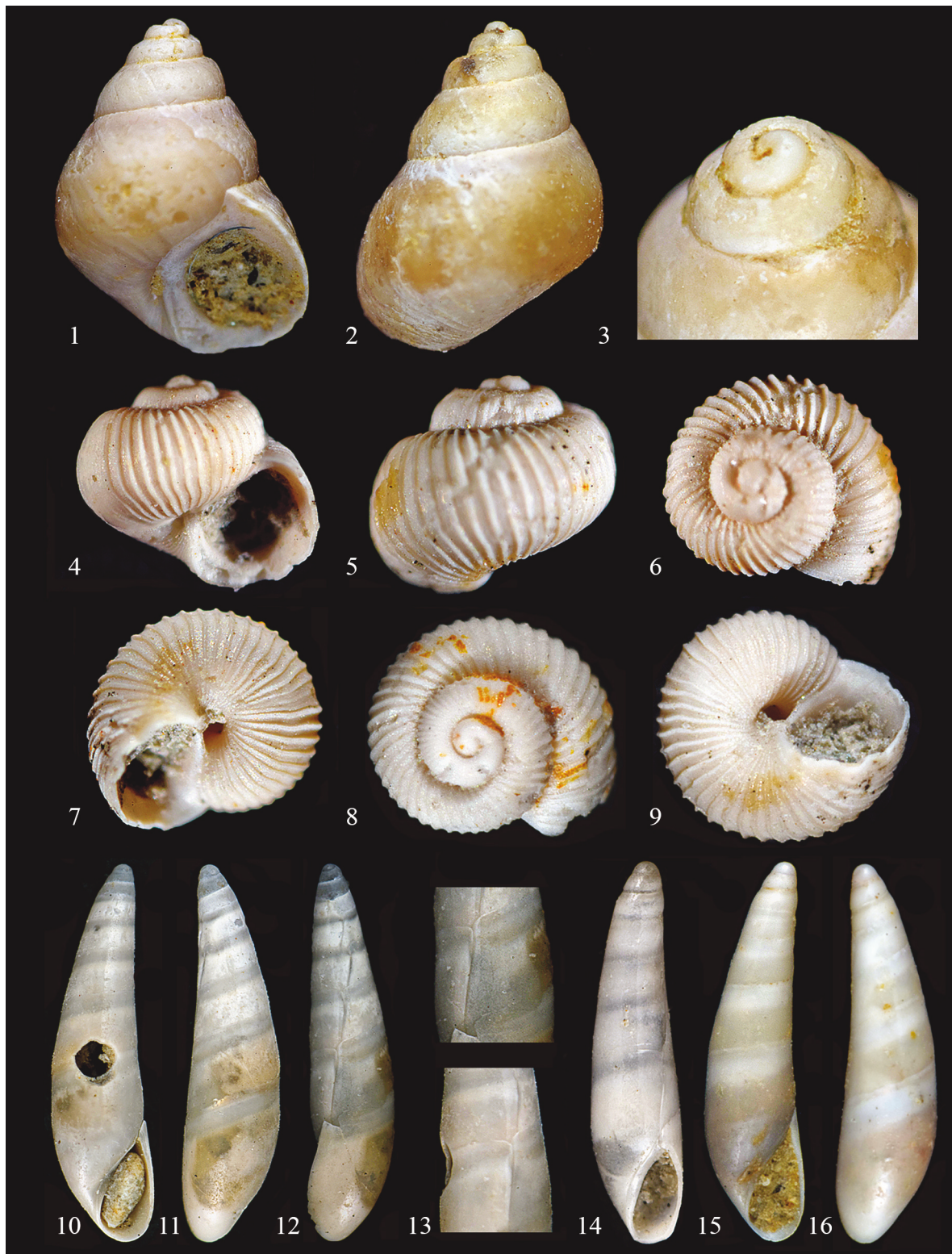
Genus *Acrochalix* Bouchet et Warén, 1986

*Acrochalix* cf. *callosa* Bouchet et Warén, 1986 (Fig. 10–13; 14; 15, 16)

TYPE LOCALITY. This species is only known for the holotype found from off Canarias at 670 m depth.

MATERIAL EXAMINED. ITALY • 8 shs; Ravenna, Brisighella, Ceparano (028CE); 44°12'0.97" N, 11°50'8.52" E; Piacenzian; organogenic yellowish sands intercalated between clays in contact with the upper part of the "spungone", C. Bongiardino legit; CBR collection • 1 sh; Ravenna, Brisighella, Rio Albonello (001AL); 44°12'03.74" N, 11°50'57.11" E; Piacenzian, slightly cemented yellow sands, "spungone", C. Bongiardino legit; CBR collection • 2 shs; Ravenna, Brisighella, Rio Merli (036ME); 44°12'39.46" N, 11°48'45.56" E; Piacenzian, intercalations of yellowish sands of the "spungone" in the grey-blue clays, C. Bongiardino legit; CBR collection • 1 sh; Forlì-Cesena, Fiumana (038FI); 44°8'11.64" N, 11°59'15.00" E; Piacenzian; blue-grey clays containing deep-sea fauna also coming from "spungone", C. Bongiardino legit; CBR collection • 4 shs; Forlì-Cesena, Castrocaro Terme, near the church of Converselle; 44°11'32.20" N, 11°54'19.38" E; lower Pleistocene possibly Gelasian, C. Tabanelli legit; CTC collection • 1 sh; Ravenna, Brisighella, near the church of San Giorgio di Ceparano; 44°12'42.76" N, 11°50'38.66" E; lower Pleistocene possibly Gelasian, C. Tabanelli legit; CTC collection • 5 shs; Ravenna, Brisighella, Monte Lodolone; 44°11'37.80" N, 11°52'28.95" E; lower Pleistocene possibly Gelasian, grey-blue clays, C. Tabanelli legit; CTC collection.

DESCRIPTION. Original description (Bouchet & Warén, 1986): "*Shell small, rather solid, colourless, transparent, pointed, distinctly curved. The larval shell consists of 2.5 whorls and is 380 µm high. Its whorls are evenly convex, colourless and the initial whorl is bluntly rounded. The holotype has 6 post-larval whorls, perfectly smooth and flat. Suture very*



Figures 1–3. *Trochaclis isabellae*, Monte Castellaccio, Zanclean, H: 2.5 mm, front, back and apical views (CBR). Figures 4–9. *Skenea enricoi* n. sp. Figs. 4–7: holotype, Monte Cerreto, Zanclean, H: 0.99 mm (CMF235). Figs. 8, 9: paratype 1, Monte Cerreto, Zanclean, H: 0.98 mm (MZUB60365). Figures 10–16 *Acrochalix cf. callosa*. Figs. 10–13: Rio Albonello, Piacenzian, H: 3.0 mm (CBR). Fig. 14: Fiumana, Piacenzian, H: 2.1 mm (CBR). Figs. 15, 16: Ceparano, Piacenzian, H: 2.3 mm (CBR).

indistinct. The incremental scars form an almost perfect series, with the second scar on the apex situated less than 0.1 whorl behind (see along the spire) the outer lip. The distance between the larval and 2<sup>nd</sup> scar is 0.9 whorls. The right side of the shell is almost perfectly straight, the left side forms an even curve. The shell is distinctly flattened, i.e. the diameter measured from outer lip to opposite side of the shell is larger than the diameter measured at a right angle to this. The relation is 0.84. Aperture high and pear-shaped. Outer lip orthocone, joining the suture at a right angle, slightly projecting in his lower part, most so at 2/5 of its height. Inner lip reflected over the columella and parietal wall, as a solid callus. Columella straight in its upper part, curved below, continuous with the parietal wall. Dimensions: Height of the shell 3.34 mm, diameter 0.88 mm, height of the aperture 1.00 mm, breadth 0.40 mm”.

REMARKS. Genus *Acrochalix* Bouchet et Warén, 1986 (type species *A. callosa* Bouchet et Warén, 1986 from deep waters off Canarias) at present (WoRMS, 2024) includes only the type species. Cavallo & Repetto (1992: 82, fig. 174) figured a specimen from Lugagnano clays (Piemonte, Roero, Zanclean age) as *Acrochalix* sp., fully corresponding with specimens found in Romagna. With respect to the holotype (Bouchet & Warén, 1986: 436, figs. 1034–1035), the specimen from Roero, as well as the specimens from Romagna, show a more slender outline and narrower aperture, for this reason we left it in open nomenclature.

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