New records of the genus *Euthria* (Mollusca, Buccinidae) in the Miocene Paratethys

**Introduction**

Results of recent fieldwork in Middle Miocene localities of Hungary have presented a more detailed picture of the Badenian gastropod diversity in the Neogene Pannonian Basin of the Central Paratethys. In this paper a new species, *Euthria* *viciani* n. sp is designated on the basis of a recently collected early Badenian mollusc assemblage from Bánd (Bakony Mts, W Hungary), as well as new occurrences of four *Euthria* species (*E. intermedia*, *E. curvirostris*, *E. puschi*, *E. subnodosa*) are recorded from Letkés (Börzsöny Mts) and Márkháza (Cserhát Mts) (N Hungary) (Figure 1). Bánd is known for rich Badenian invertebrate assemblages; molluscs were described by KÓKAY (1966), FEHÉR & VICÍÁN (2004), and DULAI (2005). The recently excavated section — characterised by clayey sand of 2m thickness (Lower Badenian Pécsszabolcs Member of the Leitha Limestone Formation) — yielded a highly diverse gastropod material. The Badenian sites of Letkés and Márkháza were treated by VICÍÁN et al. (2017) with additional references, the Miocene marine deposits of the Pannonian Basin were examined by NAGYMAROSY & HÁMOR (2012). All specimens described herein were collected by Zoltán VICÍÁN. The holotype and the paratype 2 are deposited in the Hungarian Natural History Museum, Budapest. The taxonomy and description terminology follow ROLÁN et al. (2003), FRAUSSEN & SWINNEN (2016), and FRAUSSEN & STAHLSCHEIDT (2017). Shell lengths (SL) are given in mm.

**Systematic Palaeontology**

Superfamily Buccinoidea RAFINESQUE, 1815
Family Buccinidae RAFINESQUE, 1815
Subfamily Pisaniinae GRAY, 1857
Genus *Euthria* M. E. GRAY, 1850
Type species: *Murex corneus* LINNAEUS, 1758

*Euthria vicíáni* n. sp.
(Figures 2–9)

**Holotype**: PAL 2018.1.1. HNHM, Department of Palaeontology and Geology, SL 51 (Figures 2–3).

**Paratypes**: 1 and 3: Coll.V.2017.02–03, Collection VICÍÁN (Figs 4–7), 2: PAL 2018.2.1. HNHM (Figures 8–9).
Type strata and locality: Lower Badenian clayey sand (Pécsszabolcs Member of the Leitha Limestone Formation), Bánd, Hungary.

Derivation of name: In honour of Zoltán VíCÍAN, Hungarian fossil collector.

Material: 36 well-preserved specimens.

Diagnosis: Medium-sized Euthria species with pauci-spiral protoconch, flattened spire whorls (last whorl with weak subsutural concavity), recurved siphonal canal, smooth shell surface and reticulate colour pattern.

Description: Medium-sized, broad, ovoid-fusiform shell (max. length 52 mm), with a protoconch of 1 1/4 smooth whorls. Moderately high, slightly pointed conical shell (max. length 52 mm), with a protoconch of 1 1/4 smooth whorls. The convex part of the last whorl.

light or darker brownish rectangular blotches on the ramp and the convex part of the last whorl.

Discussion: Based on the observed morphology the new species is assigned to genus Euthria. Numerous Euthria species are known in the Middle Miocene Central Paratethys (Austria, Bulgaria, Hungary, Poland and Romania). E. viciani n. sp. is can be distinguish mainly by its broad shell, flattened spire whorls and reticulate colour pattern. Additional morphological features are also compared to the congeners below.

Comparison: The type species, E. cornea is characterised by a highly variable shell morphology, but the spire is generally higher with rounded spire whorls. In the Miocene, E. intermedia (MICHELOTTI, 1839) is the most closely allied form. It is variable with respect to shell width, but differs by having a rounded last whorl without subsutural concavity; it has a less curved siphonal canal, somewhat rounded spire whorls, a reticulate sculpture on the early spire whorls, and spiral cords on the last three whorls (Figures 10–12, 19–20).

E. subnodosica (HOERNES & AUINGER, 1890) is sculptured by weakly-developed axial ribs (Figures 13–14). E. fusco-cingulata (HORNES in HOERNES & AUINGER, 1890) and this agrees with the type of curvirostris (GRATELOUP, 1845) was recorded from the Middle Miocene NE Atlantic (France) and the Proto-Mediterranean Sea (Turkey) by LANDAU et al. (2013). The species can be documented in the Central Paratethys as well. Beside the new recording mentioned in this paper, the specimen with a recurved siphonal canal was illustrated by BALUK (1995, pl. 34, fig. 7) as E. intermedia and this agrees well with the type of curvirostris (GRATELOUP, 1845, pl. 24, fig. 3). This species differs from E. viciani n. sp. with respect to its reticulate sculpture on the early spire whorls, its slightly shouldered whorls, and longer, strongly recurved siphonal canal (Figures 15–18). Among the Miocene Euthria species described by BELLARDI (1873) from Italy, three have a similar morphology. However, E. magna and E. inflata differ by having stronger sculpture, rounded spire whorls and a less curved canal; E. patula has straight siphonal canal (BRUNETTI & DELLA BELLA 2016).
Early Badenian geographic distribution of *Euthria* in Hungary

Three widespread *Euthria* species have hitherto been known in the lower Badenian localities of Hungary (CSEPREGHY-MEZNERICS 1954, 1956, 1969, 1971–1972; KÖKAY 1966). *E. intermedia* was recorded from Szob, Borsodbóta and Bánd; *E. subnodosa* is known from Balaton and Borsodbóta; and *E. puschi* was described from Szob, Mátraverebély, Balaton and Borsodbóta. These records are completed herein with the Lower Badenian occurrences of *E. curvirostris* (new record in Hungary), *E. puschi* and *E. subnodosa* at Letkés, and *E. intermedia* at Letkés and Mátrákzsa. *E. viciani* n. sp. is known only at Bánd, it was relatively abundant in the gastropod assemblage.

Conclusion

*Euthria viciani* n. sp., and the new records of other *Euthria* species contribute to the knowledge of the Middle Miocene marine gastropod faunas of the Central Paratethys. This study indicates that the genus is characterised by higher diversity and a more extended geographic range in the Neogene Pannonian Basin than was recognised before.

Acknowledgements

I am grateful to Miklós KAZMÉR (Department of Palaeontology, Eötvös University, Hungary) for their professional help. Critical comments by Koen Fraussen (Muséum National d’Histoire Naturelle, Paris), Alfréd DULAI (HNHM, Budapest), and Helmut KROCK (Lüneburg, Germany) helped to improve the manuscript. Figure 1 was prepared by Domonkos VERESTHÓ-KOVÁCS (Budapest).

References — Irodalom

BALUK, W. 1995: Middle Miocene (Badenian) gastropods from Korytnica, Poland. Part II. — *Acta Geologica Polonica* 45/3–4, 153–255.

BELLARDI, L. 1873: I molluschi dei terreni terziarii del Piemonte e della Liguria. 1. Cephalopoda, Pteropoda, Heteropoda, Gasteropoda (Muricidae et Tritonidae). — *Memorie della Reale Accademia delle Scienze di Torino* 27, 33–294.

BRUNETTI, M. M. & DELLA BELLA, G. 2016: Revisioni di alcuni generi della famiglia Buccinidae Rafinesque, 1815 nel Plio-Pleistocene del Bacino Mediterraneo, con descrizione di tre nuove specie. — *Bollettino Malacologico* 52, 3–37.

CSEPREGHY-MEZNERICS, I. 1954: A keletcserháti helvéti és tortónai fauna. (Helvetische und Tortonische fauna aus dem Östlichen Cserhátgebirge.) — *Jahrbuch der Ungarischen Geologischen Anstalt* 41/4, 1–185.

CSEPREGHY-MEZNERICS, I. 1956: Die Molluskenfauna von Szob und Letkés. — *Jahrbuch der Ungarischen Geologischen Anstalt* 45/2, 363–477.

CSEPREGHY-MEZNERICS, I. 1969: Nouvelles Gastropodes et Lamellibranches pour la faune hongroise des gisements tortonien-inférieurs de la Montagne de Bükk. — *Annales Historico-Naturales Musei Nationalis Hungarici, Pars Mineralogica et Palaeontologica* 61, 63–127.

CSEPREGHY-MEZNERICS, I. 1971–1972: La faune Tortonienne-Inférieure des gisements tufiques de la Montagne de Bükk: Gastropodes II. — *Egri Múzeum Évkönyve*, 26–36.

DULAI, A. 2005: Badenian (Middle Miocene) Polyplacophora from the Central Paratethys (Bánd and Devecser, Bakony Mountains, Hungary). — *Fragmenta Palaeontologica Hungarica* 23, 29–49.

FEHSE, D. & VICIÁN, Z. 2004: A new Zonarina (Mollusca: Gastropoda: Cypraeidae) from the middle Miocene (Badenian) of Hungary. — *Földtani Közlöny* 115/2, 201–208.

FRAUSSEN, K. & STAHL-SCHMIDT, P. 2017: Comparing the living eastern Atlantic *Euthria* Gray, 1839 (Gastropoda: Buccinoidea), with brief remarks on the paleontological and biogeographical context. — *Gloria Maris* 55/3, 70–82.

FRAUSSEN, K. & SWINNEN, F. 2016: A review of the genus *Euthria* Gray, 1839 (Gastropoda: Buccinidae) from the Cape Verde Archipelago. — * Xenophora* *Taxonomy* 11, 9–31.

GRATELOUP, J. P. S. de 1845–1847: *Conchyliologie fossile des terains tertiaires du Bassin de l’Adour (environs de Dax)*, 1. Univalves. *Atlas.* — Lafargue, Bordeaux, pls. 1–45 (1840); i–xx, 12 p.; pls. 46–48 (1846). [All plates published 1845, except plates 2, 4, 11 (1847)].

KÖKAY, J. 1966: Geologische und paläontologische Untersuchung des Braunkohlengebietes von Herend–Márkó (Bakony-Gebirge, Ungarn). — *Geologica Hungarica, series Palaeontologica* 36, 147 pp.

LANDAU, B. M., HARZHAUSER, M., ISLAMOGLU, Y. & SILVA, C. M. 2013: Systematics and palaeobiography of the gastropods of the middle Miocene (Serravallian) Karaman Basin, Turkey. — *Cainozoic Research* 11–13, 584 p.

NAGYMAROSY, A. & HÁMOR, G. 2012: Genesis and Evolution of the Pannonian Basin. — In: HAAS, J. (ed.): *Geology of Hungary*. Springer, Berlin–Heidelberg, 149–200. https://doi.org/10.1007/978-3-642-29100-8

ROLÁN, E., MONTEIRO, A. & FRAUSSEN, K. 2003: Four new *Euthria* (Mollusca, Buccinidae) from the Cape Verde archipelago, with comments on the validity of the genus. — *Iberus* 21/1, 115–127.

VIGÁN, Z., KOCK, H. & KÖVÁCS, Z. 2017: New gastropod records from the Cenozoic of Hungary. — *Földtani Közlöny* 147/3, 265–282.

Kézirat beérkezett: 2017. 10. 15.
Figures 2–22. Different *Euthria* species from Hungarian Lower Badenian localities
Figures 2–9. *Euthria viciani* n. sp.
2–3: holotype, SL 51 (1×).
4–5: paratype 1, SL 44 (1×).
6–7: paratype 3, SL 47 (1×).
8–9: paratype 2, SL 50 (1×).
Figures 10–12. *Euthria intermedia* (Michelotti). 10: Bánd, SL 23 (1.5x). 11–12: Márkháza, SL 19 (1.5×).
Figures 13–14. *Euthria subnodosa* (Hoernes et Auinger), Letkés, SL 14 (2.5×).
Figures 15–18. *Euthria curvirostris* (Grateloup). 15–17: Letkés, SL 51 (1x). 18: Letkés, SL 38 (1×).
Figures 19–20. *Euthria intermedia* (Michelotti), Letkés, SL 28 (1.5×).
Figures 21–22. *Euthria puschi* (Andrzejowski), Letkés, SL 46 (1×).