Korean J. Malacol. 41(2): 55-59 2025
https://doi.org/10.9710/kjm.2025.41.2.55

Newly Record of *Euthymella concors* (Hinds, 1843) (Gastropoda: Caenogastropoda: Triphoridae) from Korea

Sang-Hwa Lee[1], Sung-Jin Hwang[2] and Myung-Hwa Shin[3]

[1]*Invertebrate Diversity Institute (InDI), Cheongju, 24339, Republic of Korea*
[2]*Department of Life Science, Woosuk University, Jincheon, South Korea*
[3]*National Marine Biodiversity Institute of Korea, Seocheon, 33662, Republic of Korea*

ABSTRACT

In this study, two specimens of the triphorid species *Euthymella concors* (Hinds, 1843) were collected during a SCUBA survey on Jeju Island and are newly recorded in the Korean fauna. To date, 20 species in the family Triphoridae have been reported from Korean waters. Herein, we provide additional information about *E. concors*, including its morphological description, images of the shell and mitochondrial cytochrome c oxidase subunit I (*cox1*) partial sequence.

Keywords: New species, Triphoridae, *Euthymella concors*, Korea

INTRODUCTION

The family Triphoridae is the only typically sinistral group among marine gastropods, characterized by sinistral coiling and an elongate, many-whorled shell (Laseron, 1954; Kil and Lee, 2012). These snails are found worldwide, from the intertidal zone of rocky shores and coral reefs in tropical to temperate regions to the ocean bottom at depths of up to 1,000 m, including arctic seas (Kosuge, 1966; Kil and Lee, 2012; Kil *et al*, 2013). All species of Triphoridae are known to feed on sponges, and their organ and nervous system arrangements are a reversal of those in dextral gastropods (Kosuge, 1966; Kil and Lee, 2012; Kil *et al*, 2013). Due to the characteristics of this family, species identification based solely on morphology is limited (Bouchet and Guillemot, 1978; Bouchet and Strong, 2010), necessitating the use of additional techniques such as radula morphology and genetic studies (Fernandes *et al*, 2021).

According to the MolluscaBase 2025 data, about 1,000 triphorid species have been recorded worldwide. In Korea, 20 species from 14 genera in the family Triphoridae have been recorded so far (Lee and Min, 2002; Min *et al.*, 2004; Kil and Lee, 2012; Kil *et al.*, 2013; Lee, 2016; National Institute of Biological Resources, 2024).

Herein, we report a *Euthymella concors* (Hinds, 1843) with a morphological description, shell images and a mitochondrial *cox1* partial sequence as a new record for the Korean fauna.

MATERIALS AND METHODS

In this study, two specimens were collected by SCUBA diving from depths of 23 m the subtidal zone of Jeju Island on October 7, 2022. The morphological charcteristics of this specimen was observed under a stereomicroscope (Leica MZ12.5, Germany) and identified as *E. concors* (Hinds, 1843), a new record from Korean waters. The specimens preserved in 99% ethanol solution were deposited at the National

Received: June 14, 2025; Revised: June 19, 2025; Accepted: June 29, 2025
Corresponding author: Myung-Hwa Shin
Tel: +82 (41) 950-0815, e-mail: speciosus@marbik.re.kr
1225-3480/24893

Marine Biodiversity Institute of Korea (MABIK), Seocheon, Korea (MABIK MO00187334).

Total genomic DNA was extracted from body using a E.Z.N.A Mollusc DNA Kit (Omega Co., USA) following the manufacturer's protocol. A partial sequence of mitochondrial cytochrome c oxidase subunit I (*coxI*) was amplified using the primer set LCO1490 and HCO2198 (Folmer *et al.*, 1994). Polymerase chain reaction (PCR) was performed using TOPsimple™ DryMIX-nTaq (Enzynomics, South Korea) and PCR cycling conditions were as follows: an initial denaturation at 95°C for 2 minutes; 35 cycles of denaturation at 95°C for 30 seconds, annealing at 47°C for 30 seconds, extension at 72°C for 60 seconds; followed by a final extension at 72°C for 5 minutes. The PCR product was sequenced using the ABI 3730XL DNA Analyzer (Applied Biosystems, Foster City, CA, USA).

SYSTEMATIC ACCOUNTS

Class Gastropoda Cuvier, 1795 복족강
Subclass Caenogastropoda Cox, 1960 신생복족아강
Superfamily Triphoroidea J. E. Gray, 1847 띠줄고둥상과
Family Triphoridae J. E. Gray, 1847 띠줄고둥과
Genus *Euthymella* Thiele, 1929 왼돌이띠줄고둥속 (신칭)
Euthymella concors **(Hinds, 1843) (Fig. 1)** 상아뿔왼돌이띠줄고둥 (신칭)

Triphoris concors Hinds 1843: 17, Tryon 1887: 178, pl. 37, fig. 80, Melvill 1918: 151, Viader 1937: 43.
Triphoris (Ino) *concors* Hinds 1844: 28, pl. 8, fig. 2, Albano *et al.*, 2019: 193-194, fig. 26.
Iniforis concors Habe and Kosuge 1966: 109, pl. 41, fig. 47, Kosuge 1966: 307, 309, pl. 1, Fig. 5; Text figs. 22a, b, c, 31.
Euthymella concors Okutani 2000: 313, pl. 155, fig. 67, Dumrongrojwattana *et al*, 2016: 287, Fig. 3A; Dumrongrojwattana and Tanamai 2020: 4, fig. 2F.

Type locality: Strait of Malacca, in 18 fathoms deep (33 m).
Habitat: On rocky and sandy gravel bottoms, intertidal to 50 m deep.
Distribution: Straits of Malacca, Australia, China, Japan, Philippines, Taiwan, Thailand, Indonesia, Polynesia, Hawaii, Marshall Islands, Mauritius, Micronesia, New Caledonia, Persian Gulf, Red Sea, South Africa, and South Korea (Jeju Island, this study).

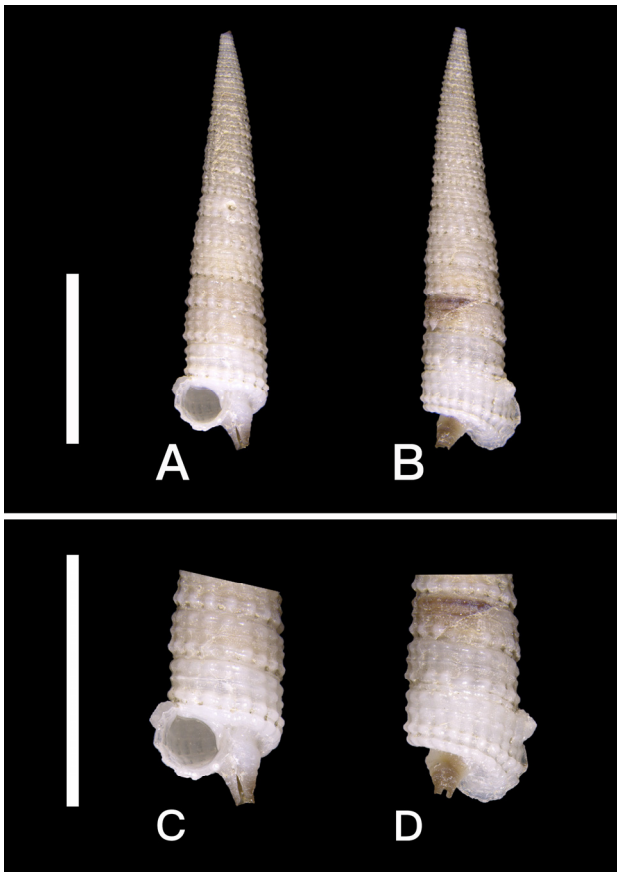

Fig. 1. *Euthymella concors*. **A, C.** ventral view; **B, D.** dorsal view, Scale bars: 10 mm.

Material examined: 1 specimen (MABIK MO00187334), depth of 23 m, Seop-Seom, Bomok-dong, Seogwipo-si, Jeju-do (33°13'44.04" N, 126°35'46.86" E), 7 October 2022, S-H. Lee.
Measurement: Shell height 24 mm; shell width 6 mm.
Description: Shell small, elongate cytoconoid shape with white or ivory in body color. Total 20-22 flat side whorls consist of three spiral cords with bearing tubercles; 3rd spiral cord strongly granulated than 1st and 2nd cords; fourth smooth suprasutural cord visible on the last whorls. Spiral cords intersected by slightly prosocline axial ribs, forming the tubercles. Numerous fine spiral striae between the main cords

on the lower whorls. Aperture round, outer lip well expanded outwardly. Posterior canal short, deep, folded and opened.

Remarks: From a taxonomic perspective, family Triphoridae is considered one of the most challenging among gastropods due to the large number of species and the limited understanding of both intra- and interspecific variation (Albano and Bakker, 2016). Although several research groups have recently undertaken genetic studies on this family, the available data remain insufficient to resolve the issue. In this study, we obtained mitochondrial *cox1* partial sequence of *E. concors* with a length of 658 bp (Appendix). However, GenBank lacks sequence data from multiple individuals of the same species or from different species within the same genus, making molecular comparisons impossible. We hope that the *E. concors* sequence obtained in this study will contribute to resolving the phylogenetic issues within the Triphoridae in the future.

ACKNOWLEDGMENTS

This work was supported by a grant from the National Marine Biodiversity Institute of Korea (MABIK, 2024M00200).

REFERENCES

Albano, P.G. and P.A.J. Bakker. (2016) Annotated catalogue of the types of Triphoridae (Mollusca, Gastropoda) in the Museum für Naturkunde, Berlin, with lectotype designations. *Zoosystematics and Evolution*, **92**(1): 33-78.

Albano, P.G., Bakker, P.A.J. and B. Sabelli. (2019) Annotated catalogue of the types of Triphoridae (Mollusca, Gastropoda) in the Natural History Museum of the United Kingdom, London. *Zoosystematics and Evolution*, **95**(1): 161-308.

Bouchet, P. and H. Guillemot. (1978) The Triphora perversa-complex in Western Europe. *Journal of Molluscan Studies*, **44**: 344-356.

Bouchet, P. and E. Strong. (2010) Historical name-bearing types in marine molluscs: an impediment to biodiversity studies? CRC Press, London. The Linnaean Ark-Systema Naturae 250, pp. 63-74.

Dumrongrojwattana, P., Tanamai, S, Wongkamhaeng, K. and J. Nabhitabhata. (2016) Triphorid snails family from Similan Islands (Gastropoda: Triphoroidea: Triphoridae), southern Thailand. The 5th Burapha University International Conference. Published by Burapha University, Thailand. p. 283?289.

Dumrongrojwattana, P. and S. Tanamai. (2020) Triphorid snails in Thai Waters (Gastropoda: Triphoroidea: Triphoridae). IOP Conference Series: Earth and Environmental Science, 420 (012010).

Fernandes, M.R., Salgueiro, F., De Paula, T.S., Lôbo-Hajdu, G. and A.D. Pimenta. (2021) Cryptic speciation in the "*Marshallora nigrocincta*" species complex (Gastropoda, Triphoridae) from the Western Atlantic. *Journal of Zoological Systematics and Evolutionary Research*, **59**: 10.1111/jzs.12461.

Folmer, O., Black, M., Hoeh, W., Lutz, R. and A.R. Vrijenhoek. (1994) DNA primers for amplification of mitochondrial cytochrome c oxidasesubunit I from diverse metazoan invertebrates. *Molecular Marine Biology and Biotechnology*, **3**: 294-299.

Habe, T. and S. Kosuge. (1966) Shells of the World in colour, 2. Hoikusha, Osaka.

Hinds, R.B. (1843) Descriptions of new shells from the collection of Captain Belcher, R.N., C.B. *Annals and Magazine of Natural History*, **11**: 16-21.

Hinds, R.B. (1844) The Zoology of the Voyage of H.M.S. Sulphur, Under the Command of Captain Sir Edward Belcher, R.N., C.B., F.R.G.S., etc. during the years 1836-42. Smith, Elder and Co., London, 72 + iv pp.

Kil, H.J. and J.S. Lee. (2012) The first record of *Bouchetriphora consfera* (Caenogastropoda, Triphoridae) from Korean Waters. *Korean Journal of Malacology*, **28**(3): 275-276.

Kil, H.J., Lee, Y.S. and J.S. Lee. (2013) Three Unrecorded Triphorid Snails (Caenogastropoda, Triphoridae) from Korea. *Korean Journal of Malacology*, **29**(3): 259-262.

Kosuge, S. (1966) The family Triphoridae and its systematic position. *Malacologia*, **4**(2): 297-324.

Laseron, C.F. (1954) Revision of the New South Wales Triphoridae. *Records of the Australian Museum*, **23**: 139-158.

Lee, J.S. (2016) List of Korean Mollusks. Malacological Society of Korea. pp. 404.

Lee, J.S. and D.K. Min, (2002) A Catalogue of Molluscan Fauna in Korea. *The Korean Journal of Malacology*, **18**(2): 93-217.

Melvill, J.C. (1918) Descriptions of thirty - four species of marine Mollusca from the Persian Gulf, Gulf of Oman, and Arabian Sea, collected by Mr. F. W. Townsend. *The Annals and Magazine of Natural History*, **9**(1): 137-158.

Min, D.K., Lee, J.S., Koh, D.B. and J.G. Je. (2004) Mollusks in Korea. Hanguel Graphics, Busan. pp. 1-566 (in Korean).

National Institute of Biological Resources. (2024) National list of species of Korea, 2024 [Internet]. National list of species, Accessed 05 Dec 2024, http://kbr.go.kr.

Okutani, T. (2000) Marine mollusks in Japan. Tokay

University Press, Tokyo. pp. 1-1173.

Tryon, G.W. (1887) Manual of Conchology; Structural and Systematics, with illustrations of the species. Vol. IX. Academy of Natural Sciences, Philadelphia, Pennsylvania, 488 pp.

Viader, R. (1937) Revised catalogue of the testaceous Mollusca of Mauritius and its dependencies. *Mauritius Institute Bulletin*, **1**(2): 1-111.

Appendix

Appendix 1. The mitochondrial cytochrome *c* oxidase subunit I (*cox1*) partial sequence of *Euthymella concors* (658bp).

> *Euthymella concors*_mtDNA_*cox1*_sequence
AACTTTATATATTTTATTTGGTATATGATCTGGGTTAGTTGGAACAGCTCTAAGTTTATTAATTCGAGCAGAATTAGGTCAACCTGGAGCTTTATTAGGTGA
TGATCAACTTTATAATGTTATTGTAACGGCTCATGCTTTTGTTATAATTTTTTTTTTAGTTATACCTATGATAATTGGAGGATTTGGAAATTGATTAGTTCCT
TTAATATTAGGAGCTCCAGATATAGCTTTTCCTCGACTAAATAATATAAGTTTTTGATTACTACCTCCTGCTTTATTATTATTATTATCATCTGCTGCAGTTGA
AAGAGGTGTAGGAACTGGATGAACTGTTTATCCTCCTTTATCAGGAAACCTAGCTCATGCTGGAGGTTCTGTAGATTTAGCTATTTTTTCTTTACACCTTG
CAGGTGTTTCTTCTATTTTAGGTGCAGTAAATTTTATTACTACTATTATTAATATACGATGACGAGGTATACAATTTGAGCGTCTTCCTTTATTTGTTTGATC
TGTAAAAATTACAGCTGTTTTATTACTTCTTTCATTACCTGTATTAGCTGGAGCTATTACAATGCTTTTAACAGATCGAAATTTTAACACGGCTTTCTTTGA
CCCGGCTGGAGGAGGTGATCCTATTTTATATCAACATCTTTTC