ACTA PALAEONTOLOGICA POLONICA

Bathyal molluscs from Upper Pleistocene methane seeps in Krishna-Godavari Basin, offshore eastern India

Crispin T.S. Little, Rajendar Kumar, Joel E. Johnson, and Leon Hoffman
Acta Palaeontologica Polonica 70 (3), 2025: 443-477 doi:10.4202/app.01179.2024

Compared to other ocean basins there are few reported Recent methane seep communities from the Indian Ocean, with records from offshore Indonesia and Pakistan, and, more recently the east coast of India, in the Krishna-Godavari and Mannar Basins in bathyal water depths. Also from the former area, Upper Pleistocene aged fossil methane seep assemblages have been recovered from sediment cores. Here we describe systematically bivalves, gastropods and scaphopods from a methane seep assemblage penetrated by two sediment cores, drilled in 1045 m and 1050 m water depth, at horizons dated to between 40 and 52 kyrBP. The fossil molluscs comprise 29 taxa: 15 gastropods, 12 bivalves and two scaphopods. Of these, nine are new species: six gastropods (*Paralepetopsis bathyalus* Hoffman & Little sp. nov., *Mesopelex godavariensis* Hoffman & Little sp. nov., *Anatoma sahlingi* Hoffman & Little sp. nov., *Cirsonella aperta* Hoffman & Little sp. nov., *Dikoleps? magnarota* Hoffman & Little sp. nov., and *Alvania axistriata* Hoffman & Little sp. nov.) and three bivalves (*Ledella favus* Hoffman & Little sp. nov., *Yoldiella umbostriata* Hoffman & Little sp. nov., and *Vesicomya prashadi* Hoffman & Little sp. nov.). Six of the molluscan taxa likely had chemosymbionts: (*Acharax* sp., *Gigantidas* cf. *platifrons, Conchocele* sp., *Pliocardia* cf. *solidissima, Callogonia* cf. *leeana,* and *Archivesica* cf. *kawamurai*), representing 21% of the diversity in the seep assemblage. Apart from *Acharax* sp., all these putative chemosymbiotic taxa were likely obligate to seeps, as was probably the case for *Paralepetopsis bathyalus* Hoffman & Little sp. nov. and *Anatoma sahlingi* Hoffman & Little sp. nov. The other bivalve, gastropod and scaphopod species in the assemblage have living relatives common in bathyal habitats and can thus be considered as facultative or 'background' fauna. The fossil seep assemblage shares some taxa with recent seep communities in the east coast of India and elsewhere in the Indian Ocean, although additional systematic work is needed on the living taxa for a full comparison to be made.

Key words: Mollusca, Gastropoda, Bivalvia, Scaphopoda, taphonomy, hydrocabon seeps, Bay of Bengal, Indian Ocean.

Crispin T.S. Little [earctsl@leeds.ac.uk, ORCID: 0000-0002-1917-4460], School of Earth and Environment, University of Leeds, Woodhouse Lane, Leeds LS2 9JT, UK;
Life Sciences Department, Natural History Museum, London, Cromwell Road,

London SW7 5BD, UK. R. Rajendar Kumar [rrkumar@zsi.gov.in, ORCID: 0000-0003-3711-4178], Zoological Survey of India, Marine Biology Regional Centre, 130 Santhome High Road, Chennai, Tamil Nadu, 600 028, India. Joel E. Johnson [joel.johnson@unh.edu , ORCID: 0000-0002-5671-7209], Department of Earth Sciences, University of New Hampshire, Durham, NH 03824, USA. Leon Hoffman [Leon.Hoffman@senckenberg.de, ORCID: 0000-0002-0205-186X], Marine Research Department, Senckenberg am Meer, Südstrand 40, 26382 Wilhelmshaven, Germany.