

Chinese Academy of Sciences
INSTITUTE OF OCEANOLOGY

Ministry of Science and Higher Education
Far Eastern Branch of the Russian Academy of Sciences
A.V. ZHIRMUNSKY NATIONAL SCIENTIFIC
CENTER OF MARINE BIOLOGY

**MARINE BIODIVERSITY AND ECOSYSTEMS
IN A CHANGING OCEAN:
TOWARD SUSTAINABLE DEVELOPMENT GOALS**

Proceedings of the China – Russia Bilateral Workshop

Edited by Sun Xiaoxia, Zhang Junlong, Zheng Shan

October 17–19, 2023, Qingdao, China

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Gastropods from the Pacific northernmost chemosynthetic ecosystems

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The study is based on materials collected during the cruises of the RV Akademik M.A. Lavrentyev in 2016 and 2018 in two types of the reducing biotopes: hydrothermal fields on the underwater Piip Volcano and the methane seeps on the Koryak slope both localities are in the Bering Sea. The Piip Volcano (~ 368 – 495 m) is the northernmost (55°22' – 55°24' N) hydrothermal region in the Pacific. Methane seep fields of the Koryak slope found between 400 and 700 m depth are the northernmost chemosynthesis-based habitats known to date in the Pacific (60°49 – 61°10).

In total, 27 species of shell-bearing gastropods were identified from both areas. Three of them (*Provanna annae* Nekhaev, 2023, *Parvaplusgtrum wareni* Chaban, Schepetov, Ekimova, Nekhaev et Chernyshev, 2022, *Astyris axicostata* Kantor, Zvonareva et Krylova, 2023) have been described as new for science, and at least three more species are presumably new to science but not described yet. Also, five species were new to the fauna of the Bering Sea and adjacent areas of the Pacific Ocean.

Nine species were encountered at the Piip Volcano, including one, *Provanna annae*, previously only found in chemosynthesis-based communities, and another, *Parvaplustrim wareni*, potentially exclusive to such environments. The methane seeps on the Koryak slope revealed nineteen species; however, none were identified as specific to chemosynthesis-based communities. Gastropod populations displayed a more dispersed structure on the Koryak slope compared to the Piip Volcano, where four times as many specimens were collected. Generally, the distribution patterns of taxonomic and functional groups in the Koryak slope methane seep area appear to resemble those in background communities, while in the hydrothermal zone of the Piip Volcano, they align with other extreme community types.

Phylogenetic analysis has revealed that at least two of the newly discovered species (e.g. *Provanna annae* and *Astyris axicostata*) share their closest relatives with hydrothermal communities off the Japanese coast. Additionally, one species was found to be common to both the Piip Volcano and the American shore.