

Foreword

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This issue of the Paleontological Journal presents the proceedings of the 10th European Conference on Echinoderms, which took place in Moscow at the A.A. Borissiak Paleontological Institute of the Russian Academy of Sciences on September 16–19, 2019. The reports made at the conference reflected a wide range of problems of morphology, taxonomy, ecology, biochemistry and physiology of modern and fossil echinoderms. The paleontological aspect was especially widely represented not only because the conference was held at the Paleontological Institute, but also because of the preparation of a new edition of the echinoderm volumes of the *Treatise on Invertebrate Paleontology*. Therefore, most of the papers submitted for publication were related to fossil echinoderms. Articles on modern echinoderms, primarily using biochemical and molecular approaches, were submitted to the *Biology Bulletin*. Unfortunately, their total number and size was insufficient for their joint publication in a separate issue of the Paleontological Journal.

The Proceedings include 11 papers, which are arranged according to the groups studied and the problems considered. They begin with a long article by B. Lefebvre and V. Ausich with a reassessment of skeletal homology in mitrates (one of the groups of Paleozoic echinoderms without five-rayed symmetry) and a description of new Silurian–Devonian representatives from Bolivia. The results of this study will help to stabilize the terminology of the mitrate skeleton and better substantiate their morphological evolution. R. Parsley's paper is on eocrinoids. Based on morphology and ontogeny of the skeleton development in the Cambrian Gogiida and predominantly Ordovician Ascocystitida, he combined these two groups, at the rank of suborders, into a new subclass in the class of eocrinoids. V. Kushlina and S. Rozhnov, using new finds, clarified and additionally substantiated their earlier reconstruction of the enigmatic taxon *Bolboporites* as a representative of eocrinoids with elements of the stem and theca merged into a single monolithic skeleton, to which a single brachiole was attached.

These papers are followed by a block of four papers on crinoids. The block opens with a detailed review by T. Ginsburg et al. of the latest data on the morphology and distribution of the earliest early Ordovician representatives of this class, the number of taxa of which has increased fivefold since 2000. These data will facilitate the understanding of the origin of crinoids. In the article by S. Rozhnov, Myelodactylidae, a small family of disparid crinoids with an unusual stem morphology, is

considered, the mesostele of which is coiled in one direction, while the proxistele with a crown is coiled in the opposite direction. These coils result from two different morphogenetic processes of body plan development associated with the succession of events when an ancestral echinoderm settled to the bottom and attached to the substrate. G. Mirantsev in his article described a new genus of cladid crinoids with an unusual morphology from the Carboniferous of the Volga region, and substantiated its separation into a new family. The article by A. Mironov with two co-authors describes crinoids of two modern species of the genus *Bathycrinus*, found in the deep-water trenches of Yap and Palau. A detailed description of these species, based on the study of the fine structures and characters of the skeleton, suggests that the species diversity of the fossil material may be much higher, since many of the fine features of the skeleton are often not preserved or taken into account.

An important comparative anatomical and physiological problem, the existence of the kidney in echinoderms, is considered in the paper by O. Ezhova and V. Malakhov. They showed that their specialized excretory organ, that is, their kidney, is the axial complex of organs, which, in their opinion, is homologous to the renopericardium of hemichordates. This is an important piece of evidence for substantiating the unity of the Ambulacraria clade.

The last three papers deal with ecological characteristics of fossil and modern echinoderms. The paper by E. Kalyakin describes traces of lifetime injuries on the shells of echinoids from the Upper Cretaceous of the Lower Volga region. An extensive review of the ecological features of the distribution of echinoderms in the Lower and Middle Ordovician of the Leningrad Region by G. Anekeeva, describes the occurrences of this animal phylum at the beginning of the Great Ordovician evolutionary radiation on the Baltica Palecontinent. The collection ends with an interesting review by S. Wu et al. on the life of the smallest sea cucumbers in the amazing interstitial ecosystem of the sandy seabed, the inhabitants of which are seldom found in the fossil record.

We expect that, with their wide scope and diverse content, these Proceedings of the 10th European Conference on Echinoderms will be of great interest and importance to the global paleontological and biological community.

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