

Problems of studying Ostracoda of the Caspian basin

Evgenij I. SCHORNIKOV

About 350 species of ostracods are known from the Pliocene and Post-Pliocene deposits of the Caspian basin area. However, the status of the study of a majority of these species does not permit their accurate identification. The fauna, to which species of marine origin belong, being a derivative of the fauna of the Tethys Ocean, has had – together with their Paratethys habitats – a very hectic history of desalination and salinization events, of climatic warmings and coolings, extensions, reductions and fragmentations of their distribution areas. As a result, elements of this fauna have significantly divergated and radiated from their oceanic tropical ancestors. Basically, the ostracod fauna of marine origin of these deposits is constituted by representatives of Leptocytheridae, Hemicytheridae, Loxoconchidae and Xestoleberididae, but none of them can be justifiedly assigned to original tropical genera of these families. The endemic taxa have been formed there on the level of genera. The only exception is the holeuryhaline species *Cyprideis torosa* (JONES, 1850). The species is known from Europe from the Miocene and have now settled in the Old World from the Yamal Peninsula in the north to the Seychelles Islands in the south, and from Iceland in the west to northwest China and the Krasnoyarsk region in Russia in the east. Meanwhile, the lists of Ostracoda from the Caspian region sometimes include the names of real marine species that are known from the Mediterranean Sea, for example, *Loxoconcha bairdi* MÜLLER, 1912, *Loxoconcha parallela* MÜLLER, 1894, and others. These identifications are, of course, wrong. Ostracods, as well as other representatives of the Caspian fauna, are variable. It is characteristic of Leptocytheridae to possess balanced polymorphism associated with sex. Their polymorphism is expressed in different localization and different degrees of development of tubercles, bars and ridges in the posterior part of the shell. This is especially distinctly manifested in the genus *Amnicythere*. Up to six variations are found among females: 1) without macrosculpture, with a flattened area at the posterior margin, 2) with a posteromedian tubercle, 3) with a posteroventral tubercle, 4) with a posteromedian and posteroventral tubercles, 5) with two posteroventral tubercles, 6) with a massive bar along the posterior part of the ventral and the lower part of the posterior margins of the shell. In males, the macrosculpture is stable. Different species have a posteroventral bar or a single posteroventral tubercle or are devoid of macrosculpture in the posterior part of the shell. In the taxonomy of Leptocytheridae from sediments of the Paratethyan basins, these characters are usually taken as species-spe-

cific, and the literature reports a number of species established by these features. At the same time, little attention is paid to the features by which the real species are differentiated: details of the outline of the valves and the shape of the shell convexity, the details of the structure of other types of the sculpture and the structure of the fused zone, which is extremely rarely studied. Juvenile instars of many species are very different in form and sculpture of their shells from adult specimens, and sometimes they are described as separate species. So, juvenile instars of *Amnicythere pirsagatica* (LIVENTAL in AGALAROVA et al., 1940) and *Amnicythere longa* (NEGADAEV, 1955) are represented in the literature under the name *Amnicythere bendovanica* (LIVENTAL in AGALAROVA et al., 1940), and the instar A-2 of *Euxinocythere virgata* (SCHNEIDER in MANDELSTAM et al., 1962) = *Euxinocythere lopatici* (SCHORNIKOV, 1964) is described with the name *Leptocythere plicatotuberculata* SCHNEIDER in MANDELSTAM et al., 1962. A number of Loxoconchidae have pronounced sexual dimorphism, and specimens of males and females are sometimes described as separate species. For example, in some cases, the female is identified as a Caspian brackishwater endemic, and the male of the same species is presented as a Mediterranean species that is characteristic for water with normal marine salinity. Even greater problems arise in identification of species of freshwater origin with shells devoid of sculpture. These species are understood in very much broad sense by the researchers. This is especially true for the genus *Caspiolla*, which includes evidently far more Caspian species than those described in the literature. There is a need to develop new species criteria for each group of these species. It should be borne in mind that most of the Pliocene ostracods have not survived to our time. Throughout the geologic history of the Caspian Basin, there were several critical moments, when old species partially died out and similar but new species appeared. Particularly dramatic changes in the fauna of ostracods occurred between Apsheronian and Bakunian time. However, many authors continue to identify most Holocenian and Recent species as the species that were described by LIVENTAL and others from Akchagilian and Apsheronian beds. In the USSR, descriptions of microfauna from deposits of the oil-producing regions were for a long time considered to be "closed", non-public information, so they could not be published and were available only in handwritten records. The subsequent researchers had to identify fauna basing on these records. Describing new species from their materials, they identified the species as described in the earlier reports. The subsequent researchers tried to preserve the priority of the first authors and so referred to the handwritten records (in lit.). With that, the researchers did not indicate holotypes, but reported their own "originals" (that is not the same). Sometimes these descriptions of species with identical names and references to the first authors (in lit.) were published independently by different researchers with designations of their "originals" from different localities. As a result, these species often happened to belong even to different genera. A particularly heavy blow was struck on ostracodology of the Caspian region with an independent publication of two books on ostracods Pliocene and Post-Pliocene deposits of Azerbajdzahn (AGALAROVA et al. 1961) and Turkmenistan (MANDELSTAM et al. 1962). A number of

these species appeared in these books. There is an urgent need for a radical revision of the species described in this way. The situation is even more complicated by the fact that many reports and voucher collections, on which they were composed, are presently lost or hardly accessible. According to our estimates, the Caspian Sea is now inhabited by over 70 species of autochthonous ostracods. The soft body is described in only 16 of them. Meanwhile, for the species taxonomy, the researchers of the soft parts possess a real “nature miracle”, the male copulative organ that allows us, accordingly to its form, to determine species under the maximum possible resolution, as far as one may conceive using morphological characters. The pattern of species characters in the shell structure has its peculiar traits within the genera and smaller groups of ostracods. Considering the results of investigation of ostracod penis, we can set limits in the variability of shells within individual taxa and extrapolate these data to the nearest fossil species. We have to admit in all honesty that, despite the apparent favourable state and seemingly great knowledge on ostracods of the Caspian basin, the situation is really catastrophic. Published in the recent years, the lists of fossil and Recent Ostracoda from the Caspian region represent nothing more but “information noise”, because it is not clear what each of the authors has in mind under this or some other name. What can be done to overcome the current crisis? It is necessary to intensify the research on three fronts: 1. To study the structure of the soft body of ostracods, now living in the Caspian Sea. Among other things, this will give the opportunity to develop a system of new taxonomic features in the shell structure for each systematic group. It might happen that we can be late with this. Ostracods are very sensitive to pollution and some of them may extinct in the nearest future, if has not already extinct. 2. To do a radical revision of ostracod taxa described for the Caspian basin. 3. To study the morphology of fossil ostracods in more details than is usually done, with the aim to reveal new taxonomical features comparable with those found for the recent groups of species.

References

- AGALAROVA, D.A., KADYROVA, Z.K. & KULIEVA, S.A. (1961): Ostracoda from Pliocene and Post-Pliocene deposits of Azerbaijan, Baku. – 420 p., Azerbaijan State Publisher, Baku. [in Russian].
- MANDELSTAM, M.I., MARKOVA, L., ROSYEVA, T. & STEPANAITYS, N. (1962): Ostracoda of the Pliocene and post-Pliocene deposits of Turkmenistan. – 288 p., Turkmenistan Geological Institute, Ashkhabad.

Authors address:

Evgenij I. Schornikov

A. V. Zhirmunsky Institute of Marine Biology, Far East Branch, Russian Academy of Sciences, Vladivostok, 690041, Russia; eschornikov@yandex.ru