



Map showing locations of Eurasian seas and their borders, as referenced in this volume.

In recognition of the interest of our international colleagues in these keys, we are publishing the keys in two editions—a Russian edition and an English edition.

The keys include accurate and inclusive species lists, which may differ from those published in 2001.

Each key names zoogeographical groupings where the species are found, referring to a section in the book with maps showing distribution in the world's oceans.

Volume I includes a small group of crustaceans, the rotifers and sea spiders. The following individuals took part in the preparation of this publication: L.A. Kutikova, Zoological Institute RAS, St. Petersburg (Rotifera); E.P. Turpaeva, P.P. Shirshov Institute of Oceanology RAS, Moscow (Pycnogonida); V.V. Petryashov, Zoological Institute RAS, St. Petersburg (Leptostraca, Euphausiacea, Anomura, Mysidacea); V.I. Sokolov, Russian Federal Research Institute of Fisheries and Oceanography, Moscow (Dendrobranchiata and Pleocyemata); S.V. Vassilenko, Zoological Institute RAS, St. Petersburg (Caprellidea); G.A. Kolbasov, Moscow State University, Moscow (Cirripedia); and M.E. Vinogradov and T.N. Semenova, P.P. Shirshov Institute of Oceanology RAS, Moscow (Hyperiidia).

PHYLUM ROTIFERA

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Rotifers are predominantly freshwater or brackish, and rarely marine. They are found in aquatic habitats, in plankton, littoral, and interstitial, and also terrestrial habitats including soil. About 2000 species are known from aquatic habitats of polar, temperate, and tropical latitudes. They feed on bacteria, detritus, small algae, and small invertebrates. A few species are parasitic.

Rotifers are bilaterally symmetrical, microscopic pseudocoelomates. Some are several tens of microns to hundreds of microns in size, rarely 2-3 mm. They live singly or in colonies, but are as a rule free moving. Sexual dimorphism is strongly expressed in most species. Males are dwarfed, very reduced, rarely seen, and not known in all species. Descriptions, taxonomy, and classification of rotifers are based on females.

Rotifers are surprisingly variable morphologically. In most species, the body is divided into a head (more rarely there is a neck), a body, and foot section. The foot is often absent in planktonic forms (Pl. I).

Two specific organs characterize the rotifers: the corona on the head and the mastax in the pharynx. Classification of the group is based on these key characters. Rotifers move using the more or less developed corona, and they grind their food in coordination with the corona and jaws. Depending on habit, the corona has several structures and is located terminally on the head in swimming and sedentary species and ventrally in species that crawl. In swimming rotifers the corona is composed of two concentric ciliated bands called the trochus and the cingulum. The head of several species of rotifers (*Synchaeta*) has lateral earlike ciliated appendages, called auricles. The cilia of the corona can be reduced in parasitic forms. Seven structural types are recognized in the organization of the mastax, which consists of a muscular sac and a series of hard jaw parts comprising the trophi. Trophi include the lamellate pair of rami fused by distal ends in the fulcrum. A pair of plates called the unci are supported proximally by the upper ends of the rami and connected distally to the club-shaped manubria. All parts of the trophi are attached by ligaments.

The body, divided by a fold or neck, is covered by a more or less developed lorica in many species; the lorica sometimes has sculpturing in the form of facets, ribs, spines, or dots. Most of the organs are located in the body cavity, including the digestive system (the mouth, mastax, esophagus, stomach, digestive gland, intestine, cloaca, and anus); the excretory system (terminal cells of the protonephridium, a pair of protonephridial canals emptying into a urinary bladder); and the reproductive system (in females the ovaries, yolk gland, oviduct, and cloaca). The muscle and nervous systems are well differentiated. The presence of eyespots and dorsal and lateral organs (cirri) often serve for vision and species determination. The foot, if present, has a pedal gland and often ends in one or two toes.

Rotifers have a very fast reproductive rate and can generate dense populations, sometimes even changing the color of seawater. Heterogenesis is often characteristic of rotifers, alternating sexual and parthenogenetic reproduction which can produce males and mictic females. Only one order, the fairly large Bdelloida, is obligate parthenogenetic. In sexual reproduction, the females produce mictic eggs, which can produce mictic males and females. After fertilization, resting eggs develop into mictic females, and after a resting period they give rise to amictic females. These females reproduce parthenogenetically, quickly increasing the population.

Rotifers are a component of the zooplankton in all possible aquatic habitats and play an important role in the food chain. Many species of rotifers are the indicators of specific environments. Marine rotifers predominantly inhabit coastal waters of the world's oceans. They are also found on drift ice in polar regions. The system of pores and canals, especially on the bottom of the ice, is rich in algae and bacteria, which serve as the food for rotifers (Friedrich and De Smet 2000).