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New data on the gonodust structure in *Hamingia arctica* (Annelida: Bonellinae)

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Echiura is a group of non-segmented marine worms. Echiurids are found in all oceans and are especially numerous at great depths. The vast majority of echiurid species live in their own burrows and expose only the proboscis on the surface of the substrate. Because of such a hidden lifestyle, whole echiurids rarely fall into the hands of scientists and data on their anatomy and biology are scant. One of the most specific features of bonellid echiurids is the organization of gonoduct, which has special compartment — the androecium, where the dwarf males live. A detailed study of the echiurid gonoduct using the latest methods will shed light on the features of the reproductive biology of these hidden animals. The material for this work was a female of *Hamingia arctica* collected in the Kara Sea during the 58th expedition of "Academician Ioffe". The gonoducts was studied using mCT, transmission electron microscopy (TEM), and light microscopy.

A pair of small gonoducts is located on the ventral side of the anterior part of the body. The gonoduct consists of two chambers: a storage chamber, which is filled with yolk-rich eggs, and the androecium. At the border between androecium and the storage chamber, the ciliary funnel, catching eggs from the coelom, is located. According to TEM data, the wall of storage chamber consists of secretory cells, which cytoplasm contains many canals of rough endoplasmic reticulum. Probably, these cells produce nutrients, which are consumed by oocytes that are kept in the storage chamber. The androecium has thick walls, which contain numerous large glands, and convoluted lumen. Each androecium opens into the environment with a separated gonopore. The gonopore is formed by strongly secretive epithelium, which differs from the epithelium of the androecium lumen and the epidermis of the trunk. In the connective tissue of the gonopore papilla, there are annular muscles and retractor muscles pass through. Numerous large glands probably take part in the formation of dense egg envelope and attach embryos to each other. Thus, the content of the gland cells can increase the chances of survival for a few offspring. The revealed features of the organization of the *H. arctica* gonoduct may reflect the special reproductive adaptations for living in specific arctic conditions. We are very grateful to Dmitry Korost for help with mCT.

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