

лированных друг от друга. Очевидно, это находит отражение в полиморфизме популяций их специфичных паразитов – моногеней рода *Ligophorus*. Выявлены некоторые различия в морфометрии прикрепительных структур особей одних и тех же видов, локализующихся на разных жаберных дугах. Однако общей закономерности в характере их изменчивости установить не удалось.

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INTRASPECIFIC VARIABILITY OF REPRESENTATIVES OF *LIGOPHORUS* EUZET ET SURIANO, 1977 (MONOGENEA: PLATHELMINTHES) IN THE BLACK SEA

Geographic, host and topical variability of 34 characters of haptor, male copulatory organ and vagina structures of 8 *Ligophorus* spp. from the Black Sea is analysed. Pearson coefficient of variation for the most measurements was below 10 %. Dependence of sizes of monogenean haptor structures on fish size and numbers of *Ligophorus* spp. wasn't found.

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ПАРАЗИТЫ САЙКИ *BOREOGADUS SAIDA* (LEPECHIN, 1774) ИЗ РАЙОНА БИЛЛЕФИОРД (ШПИЦБЕРГЕН)

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PARASITES OF POLAR COD *BOREOGADUS SAIDA* (LEPECHIN, 1774) FROM THE BILLEFJORDEN REGION (SPITSBERGEN)

Spitsbergen is the largest island of the Svalbard archipelago in the Arctic Ocean, covering 39.000 km². The western and northern shores of the island feature a number of strongly branched fjords which incise deep into the land.

The polar cod *Boreogadus saida* (Lepechin, 1774) is a member of the Gadidae family. *B. saida* inhabits waters of Arctis and sub-Arctis basins, i.e. North Atlantic (White Sea, Iceland, and southern Greenland into the Miramichi River, New Brunswick in Canada), and North Pacific (Bering Sea to Cape Olyutorski, the Pribilof Islands, and Bristol Bay (Froese and Pauly 2011). In Arctic many parasites are integral components of the ecosystems. The polar cod in various seas were found to be infected by parasites which represented the Myxozoa, Monogenea, Digenea, Cestoda, Nematoda, Acanthocephala, and Copepoda. The parasitic fauna of the polar cod has been subject of several ecological and parasitological examination from the Russian Arctic, Greenland, eastern Canada, Alaska and off Spitsbergen (e.g. Shul'man, Shul'man-Al'bova 1953, Bradstreet et al. 1986, Karasev 1988, Karasev, Mitenev 1993, Moles 2007, K ie 2009). Due to *B. saida* is common occurrence and huge abundance, its the main nutrient of predator fish (e.g. cods), marine mammals (seals, toothed whales) and marine birds, and by that it could be an important vector of many parasites.

The present paper provides new data on parasites in *B. saida* from the region of Spitsbergen.

The fish (n=20 spec., 9.6-22.2 cm of length) were caught in August, 2008 in the Billefjorden area (Central Spitsbergen). The catch was done by pelagic trawling by towing in water at 50 meters deep. Standard parasitological methods were applied in the studies.

The overall prevalence (with all parasites species) was 100%, the mean intensity and intensity range amounting to 5.1 and 1-6 spec., respectively. The fish were found to support the digeneans *Brachyphallus crenatus*, *Derogenes varicus*, *Hemiurus levinseni*, *Lecithaster gibbosus*, the cestode *Diphyllobothrium* sp., the nematodes *Anisakis simplex* L3, *Contracaecum* sp. L3, *Hysterothylacium aduncum* L3, and the copepod *Clavella adunca* (Tabl.).

The dominant taxa were the digeneans, both qualitatively and quantitatively (Fig.). The most commonly found parasites were *H. levinseni* and *D. varicus* (95.0%, 3.1, 1-6 and 75.0%, 2.0, 1-4, respectively) (Tabl.). The digenean *B. crenatus* and nematode *Contracaecum* L3 were recorded for the first time on the polar cod from Spitsbergen. Digeneans *D. varicus*, *H. levinseni*, and *L. gibbosus* are also often found in *B. saida* from different water basins (K ie 2009).

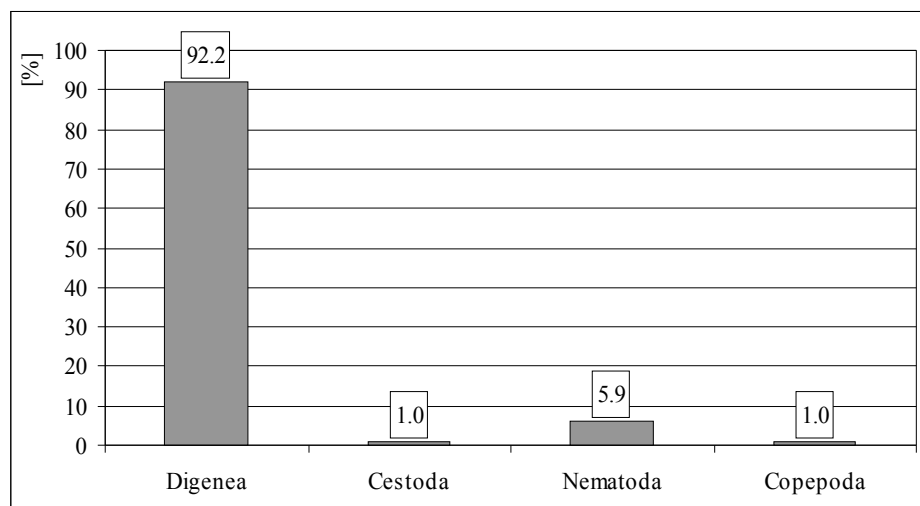


Figure. Quantitative contributions of higher parasitic taxa in *Boreogadus saida* from Spitsbergen

Polar cod becomes infected with all found digeneans and nematodes by ingesting crustaceans, mainly planktonic copepods, which are their first intermediate host. Based on data from the literature *B. saida* feeds mainly on crustacean, including mysids, amphipods and copepods (Cohen et al. 1990). As reported by K ie (2009), *B. saida* acquires digeneans *B. crenatus*, *D. varicus*, *H. levinseni*, *L. gibbosus* by eating copepods. Also mainly planktonic copepods, are the first intermediate host of cestode *Diphyllobothrium* sp. and nematode *Contracaecum* sp. *H. aduncum* also used various crustaceans (mainly copepods) as the intermediate hosts, and other invertebrates and fish as transport hosts. Low level of prevalence and intensity of *A. simplex* (only one specimens was found), might have resulted that euphasiaceans (crustacean host) are not among preferred food of *B.*

saida. It has to be emphasised that the polar cod as a host for various parasites plays an important role in the arctic ecosystem and may be a significant vector to infect predator fish, sea birds and mammals.

Parasites of the *Boreogadus saida* from Spitsbergen

Parasite	Prevalence [%]	Mean intensity	Range of intensity
DIGENEA			
<i>Brachyphallus crenatus</i> (Rudolphi, 1802)	10.0	1.0	1
<i>Derogenes varicus</i> (Müller, 1784)	75.0	2.0	1-4
<i>Hemiurus levinseni</i> Odhner, 1905	95.0	3.1	1-6
<i>Lecithaster gibbosus</i> (Rudolphi, 1802)	15.0	1.0	1
CESTODA			
<i>Diphyllobothrium</i> sp.	5.0	1.0	1.0
NEMATODA			
<i>Anisakis simplex</i> , L3 (Rudolphi, 1809)	5.0	1.0	1
<i>Contracaecum</i> sp., L3	10.0	1.0	1
<i>Hysterothylacium aduncum</i> , L3 (Rudolphi, 1802)	15.0	1.5	1-2
COPEPODA			
<i>Clavella adunca</i> (Ström, 1762)	5.0	1.0	1
Total	100	5.1	1-6

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МОЛЕКУЛЯРНЫЕ АСПЕКТЫ ВЗАИМОДЕЙСТВИЯ ПАРАЗИТ-ХОЗЯИН

Взаимные адаптации паразитов и их хозяев происходят на всех уровнях их биологической организации – от молекулярного до популяционного. Помимо этого, биотические, абиотические и антропогенные факторы окружающей среды могут существенным образом модифицировать эти взаимоотношения и приводить к драматическим последствиям, как для самих организмов, так и для среды их обитания. В связи с изменением климата распространение па-



The Russian Parasitological Society, Russian Academy of Sciences



Zoological Institute, Russian Academy of Sciences



FEDERAL AGENCY FOR FISHERIES

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«ATLANTIC RESEARCH INSTITUTE OF MARINE
FISHERIES & OCEANOGRAPHY» (FSUI «AtlantNIRO»)

PROCEEDINGS
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In this volume has been presented the papers on actual questions of theoretical, evolutionary, ecological, marine and sanitary parasitology. Its authors are parasitologists from Azerbaijan, Belorussia, Canada, Finland, Germany, Makedhonia, Poland, Russia and Ukraine. There are described the modern problems of formation of the theoretical and evolutionary parasitology, the special and general questions of functional morphology, systematics, genetics and phylogeography of parasitic organisms, parasite life cycles/life histories theory and composition of marine, freshwater and terrestrial animals parasite fauna. In some papers are described the important from practical and theoretical point of view aspects of parasite population biology and using of parasites as biological tags in the ecological investigations of different aspects of host ecology, and also on possibilities of adaptation the modern genetic and mathematic methods for optimization of parasitological investigations.

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