Biology of the stone cockscomb from the littoral near Nikolskaya hill in 2019

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Abstract. The article discusses the size and weight indicators of stone cockscomb *Alectrias alectrolophus*, as well as its feed composition. The study area is Avachinskaya Bay. It was found that males with a length of 91.1 mm, weighing 4.2 and females with a length of 79.2 mm, weighing 2.8 predominated. Amphipods predominated among food items.

Keywords: stone cockscomb, littoral, Avacha Bay, size composition, weight composition, nutrition

Cockscombs *Alectrias alectrolophus* is a small group of coastal fish found only in the waters of the North Pacific Ocean. All cockscombs are characterized by an elongated, laterally compressed body and the absence of pelvic fins. They have on their heads a long, tall, skin-like comb, from which their name comes from (fig. 1). *A. alectrolophus* is a typical littoral species that constantly lives during the open water period in the tidal zone, remaining here in shelters under rocks and in puddles at low tide. In the pebble-boulder biotopes of Avacha Bay, stone cockscomb is considered a common species [2, 6, 7]. Since the late 1980s, due to the more than 2-fold reduction in the species composition of the ichthyofauna of the tidal zone of Avacha Bay as a result of anthropogenic impact, *A. alectrolophus* has been the basis of its littoral ichthiocene [3]. However, despite its wide range and easy accessibility for collection, the biology of stone cockscomb is poorly understood. In addition, the habitat in the intertidal zone and the massiveness of stone cockscomb make it possible to consider it as a possible biological indicator of the ecological state of the Avachinskaya littoral zone. Our data allow us to get an idea of the dynamics of the dimensional structure and composition of stone cockscomb food in this reservoir in 2019.

Fig. 1. Stone cockscomb *Alectrias alectrolophus*

The material was collected in June - July 2019 at the littoral near Nikolskaya hill. This area, subject to significant anthropogenic impact, is located in the very center of Petropavlovsk-Kamchatsky (fig. 2). *A. alectrolophus* was caught by hand under stones in tidal puddles during maximum low tide. The caught fish were fixed in 6% formalin, then measured under laboratory conditions with an accuracy of 1 mm and weighed with an accuracy of 0.1 g. Analysis of the contents of stomachs was carried out in laboratory conditions according to the general method [4].

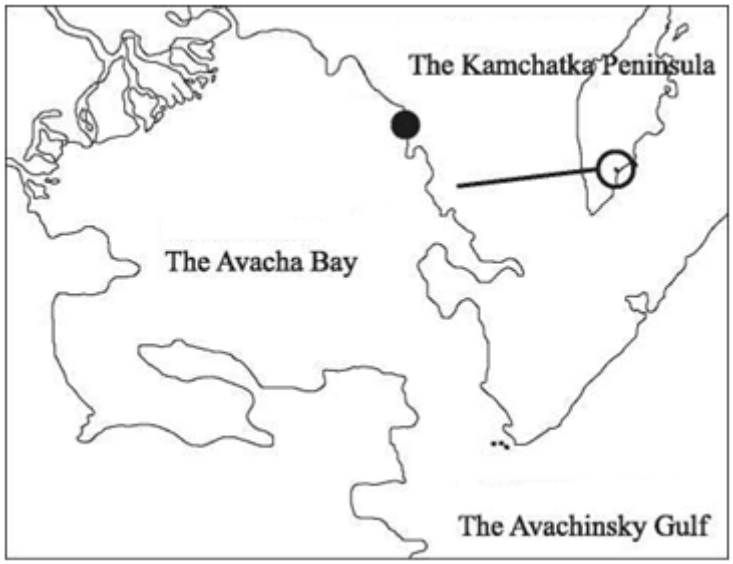

Fig.2 Study area

Stone cockscomb is a small, short-cycle species of this family. Stichaeidae. The maximum length of fish, according to the information available in the literature, does not exceed 150 mm [2], and the maximum age is 7 years [5]. In 2019, stone cockscomb was represented by individuals ranging in size from 62 to 122 mm and weighing from 1.1 to 10.3 g. The length of *A. alectrolophus* in males was 67-122 mm (average 91.1), and in females 62-108 mm (average 79.2), the body weight of males varied 1.3-10.3 g, and females - 1, 1-6.6 g, on average 4.2 g and 2.8 g, respectively (fig. 3, 4). In contrast to the previous years of the study [5], in 2019, individuals with a length of 90-100 mm prevailed among males, and 100-110 mm in females. Weight also shifted to lower rates in both females (23%) and males (28%), individuals weighing up to 2 g dominated.

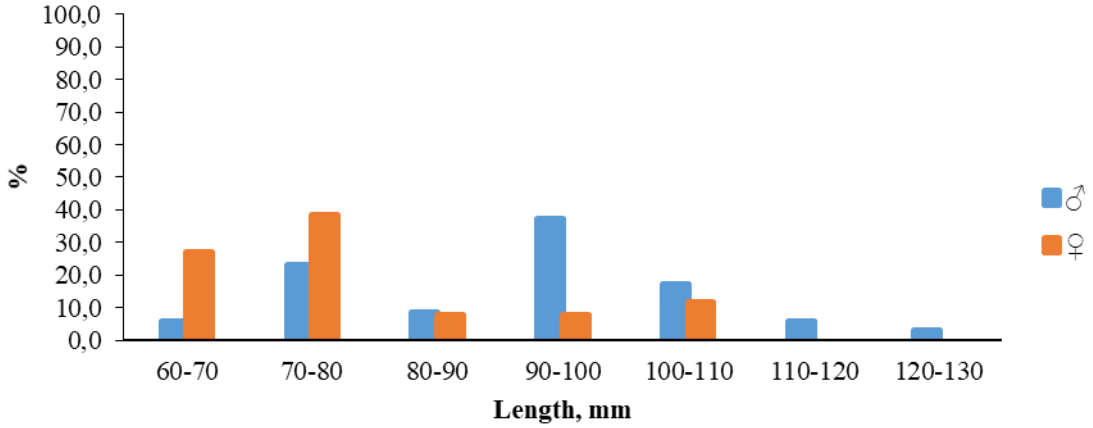

Fig 3. Dimensional composition of stone cockscomb

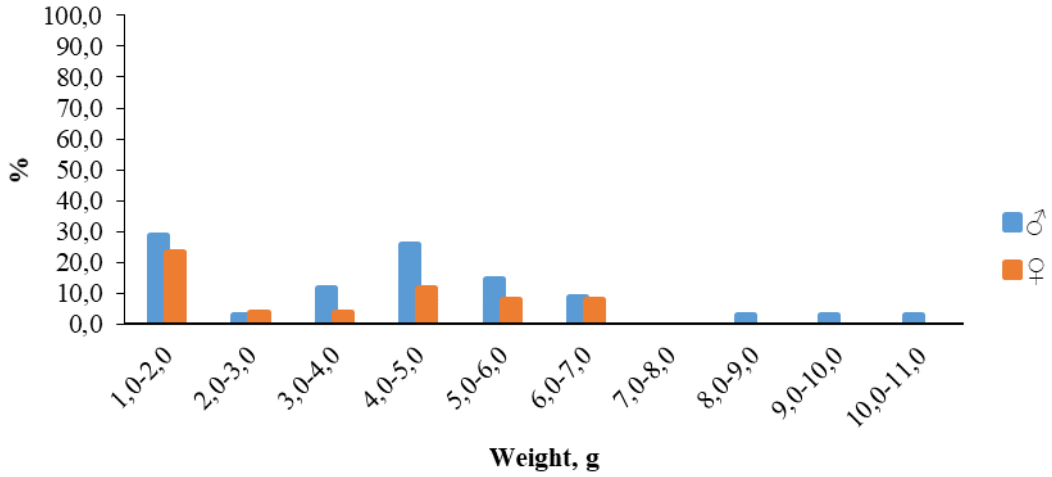

Fig 4. Weight composition of stone cockscomb

According to the data available in the literature, stone cockscomb is a benthophage that consumes various small benthic invertebrates, primarily crustaceans, molluscs, and worms [1, 6].

The results of our research indicate that in the summer months the main food of *A. alectrolophus* in the tidal zone of Avacha Bay is amphipoda (60.9% by weight). The larvae of bell mosquitoes (Chironomidae) play a significant role in the study area - 24.1%. The importance of representatives of all other groups of invertebrates is relatively small: mussels (Mytilus) - 7.6%, also gastropods of the genus *Littorina* - 7.4% (fig. 5).

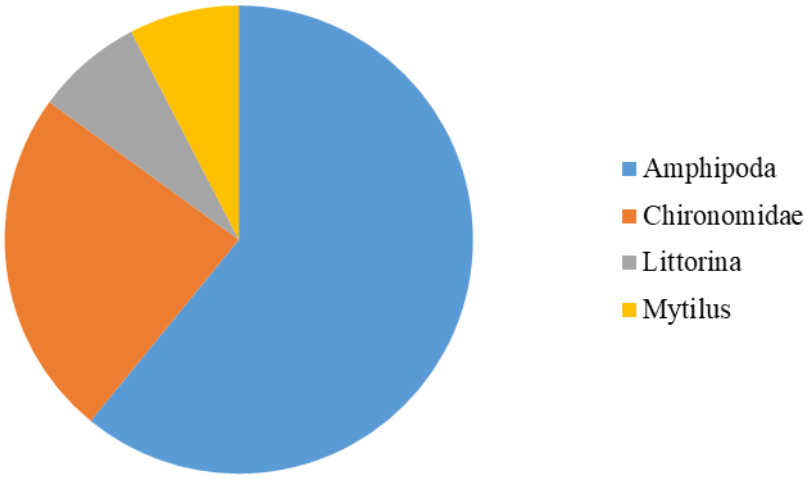

Fig. 5. Feed composition of stone cockscomb

The data available today make it possible to compare the composition of the dominant food organisms of *A. alectrolophus* in Avacha Bay in the first half of the XX century and at the beginning of the XXI century. In the 1930s [2] the main food items of this species here were polychaete worms (mainly Eleone longa) and gastropods (Gastropoda), but at present, the main food items of this species in the surveyed areas of the littoral are side-floats. Polychaeta worms (Polychaeta) were not found in stomachs at all. In our opinion, one of the possible reasons for the change in the dominant food item for the stone cockscomb in Avacha hy6e may be a significant increase in the second half of the XX century in anthropogenic pollution of the coastal zone of this reservoir with organic waste and the resulting increase in the number of amphipods in the coastal waters.

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