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# ZOOPLANKTON PRODUCTIVITY IN THE COASTAL AREA OF THE SOUTHERN BARENTS SEA IN SPRING

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The results of the analysis of zooplankton assemblage state of the southern Barents Sea are presented. Zooplankton samples were collected during the cruise of the RV “Dalnie Zelentsy” in May 2016. Hydrological conditions were typical for Murmansk coastal water this season. A total of 47 zooplankton taxa were identified. Taxa number varied between stations, ranging 18–29, with copepods being a dominant group in zooplankton. The most frequent ones were *Calanus finmarchicus*, *Metridia longa*, *Metridia lucens*, *Microcalanus* spp., *Oithona atlantica*, *Oithona similis*, *Pseudocalanus* spp., copepod nauplii and ova, as well as cladoceran *Evadne nordmanni*, larvae of Echinodermata and Polychaeta, chaetognath *Parasagitta elegans*, and early stages of the euphausiids of the genus *Thysanoessa*. In populations of common copepod species *Pseudocalanus* spp. and *Oithona similis*, early age stages dominated, which indicated their continued reproduction. Total zooplankton abundance ranged from 748 to 6576 ind.·m$^{-3}$, averaging 3012. Total zooplankton biomass varied from 17 to 157 mg of dry mass per m$^3$, with a mean value of 83. The data obtained were comparable to those registered in Murmansk coastal water in July 2008 and were higher than those in August 2007. The authors suggest that it might be related to the differences in sampling seasons and hydrological conditions. Daily zooplankton production was estimated to be 0.49–4.04 mg of dry mass per m$^3$, averaging (2.17 ± 0.17). These estimates were about twice as high as mean values, registered in Murmansk coastal water during summer period. This seems to be due to higher phytoplankton concentrations in spring. Total zooplankton stock for water area studied (25.8 thousand km$^2$) was estimated to be 425,000 thousand tons of dry mass. Cluster analysis revealed four groups of stations that differ in relative abundance of *Calanus finmarchicus*, Copepoda nauplii, *Oithona similis*, larvae of Echinodermata, and appendicularian *Fritillaria borealis*. Spatial variation of zooplankton abundance was closely related to station location (latitude, longitude, and sampling depth), as well as bottom layer temperature and mean salinity at the station.

**Keywords:** zooplankton assemblage, copepods, pelagic ecosystem

Zooplankton is a key component of pelagic ecosystems, providing energy transfer from primary producers to higher trophic levels (Kiselev, 1980). It is an important part of commercial fish diet in the northern seas. The southern Barents Sea is characterized by high biological productivity (Zelikman & Kamshilov, 1960 ; Zenkevich, 1963). In its coastal zone, spawning and feeding areas of many fish species are located (Dalpadado & Mowbray, 2013 ; Orlova et al., 2011). Data on zooplankton composition and quantitative characteristics make it possible to assess the availability of food resources for commercial hydrobionts (Dvoretsky & Dvoretsky, 2015 ; Orlova et al., 2004 ; Raymont, 1983).

The most important phase of plankton succession cycle in the Arctic seas is spring (Timofeev, 2000 ; Orlova et al., 2011): in this period, primary production reaches its maximum values. Its significant part is utilized by zooplankton and subsequently used on its growth and development (Orlova et al., 2004 ; Plankton morei…, 1997). Phytoplankton abundance in spring largely determines zooplankton stock and its production and, ultimately, total amount of food available for fish (Kiselev, 1980 ; Orlova et al., 2004 ; Raymont, 1983).

The aim of this work is to study zooplankton assemblage structure, abundance, biomass, and production characteristics in the coastal area of the southern Barents Sea in spring.

## MATERIAL AND METHODS

The study was carried out in May 2016 during a cruise of the RV "Dalnie Zelentsy" (Fig. 1, Table 1). Murmansk coastal water area was considered a coastal zone. Data on temperature and salinity were obtained using a SBE 19plus V2 SeaCAT profiler. Information on chlorophyll *a* concentration was taken from (Chislenko, 1968).

During the study period, a total of 25 zooplankton samples were collected with a Juday net (mouth diameter of 37 cm; mesh size of 180 µm). The samples were fixed with 4 % formalin. The scheme of sampling stations is shown in Fig. 1. Material processing was carried out in a coastal laboratory by standard methods (Instruktsiya po sboru…, 1971 ; ICES Zooplankton…, 2000). Zooplankton representatives were identified up to species level, if possible. From each sample, three subsamples with a volume of 5–10 mL were taken; the results of their quantitative analysis were averaged and calculated in ind.$\cdot$m$^{-3}$ and ind.$\cdot$m$^{-2}$. Zooplankton biomass was calculated using nomograms, tables of individual standard weight of marine hydrobionts, and length-weight equations (Chislenko, 1968 ; Richter, 1994). All values were converted to dry mass in accordance with transition coefficients for main systematic groups (Dvoretsky & Dvoretsky, 2015 ; ICES Zooplankton…, 2000). Daily zooplankton production was calculated by the method (Dvoretsky, 2012 ; Dvoretsky & Dvoretsky, 2015, 2018), based on mean water temperature, biomass, and potential growth rate of hydrobionts. For hydrobionts, individual dry/carbon mass was calculated, as well as egg production rate / growth rate. Their values were taken from sources published [complete list is given in (Dvoretsky, 2012 ; Dvoretsky & Dvoretsky, 2015, 2018)].

The data obtained were processed by the methods of variation statistics, with mean values and standard errors being determined. The analysis of zooplankton assemblage structure was based on the calculation of Bray – Curtis indices. To establish the relationship between zooplankton abundance and environmental factors, BIO-ENV routine of Primer 5.0 software package was used. Calculations of zooplankton stock and integrated daily production for water area studied were performed using a GIS CardMaster (VNIRO, Moscow) (Bizikov et al., 2007).

## RESULTS AND DISCUSSION

Mean water temperature in the sampling layer ranged from +4.1 to +5.4 °C, and salinity – from 34.15 to 34.66 ‰. The estimates obtained were typical for Murmansk coastal water (Ozhigin & Ivshin, 1999). According to (Vodopyanova et al., 2017), chlorophyll *a* concentration varied in a photic layer from 0.11 to 0.91 mg$\cdot$m$^{-3}$; at a depth of 75 m (station 4), a local maximum (1.26 mg$\cdot$m$^{-3}$) was recorded; in bottom layers, pigment content was 0.15–0.30 mg$\cdot$m$^{-3}$ (Vodopyanova et al., 2017). Similar mosaic distribution of phytopigments was observed in previous years (Plankton morei…, 1997), being typical for Kola Peninsula coastal water (Plankton morei…, 1997).

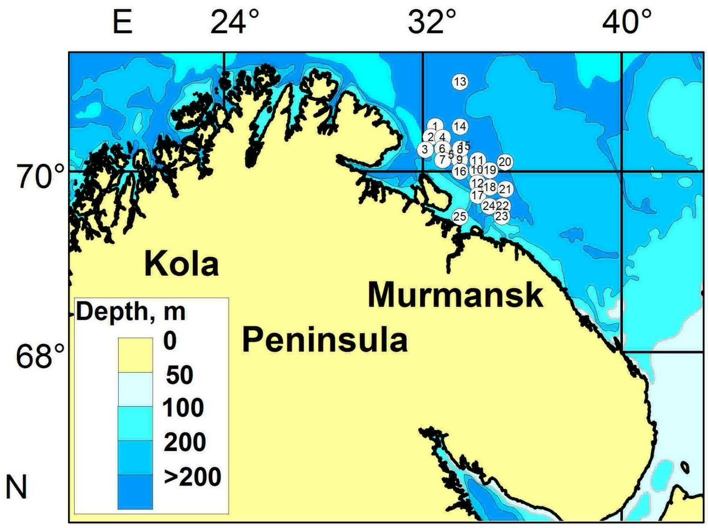


**Fig. 1.** Scheme of zooplankton sampling stations in the southern Barents Sea in May 2016

**Table 1.** Characteristics of zooplankton sampling stations in the southern Barents Sea

| Station | Date | Sampling time (UTC+3:00) | Depth, m | Sampling layer, m | Coordinates | |
|---|---|---|---|---|---|---|
| | | | | | N | E |
| 1 | 22.05.2016 | 23:58 | 284 | 270–0 | 70°30′ | 32°31′ |
| 2 | 23.05.2016 | 20:35 | 181 | 170–0 | 70°23′ | 32°20′ |
| 3 | 24.05.2016 | 12:37 | 300 | 280–0 | 70°15′ | 32°06′ |
| 4 | 24.05.2016 | 17:30 | 261 | 250–0 | 70°23′ | 32°49′ |
| 5 | 24.05.2016 | 23:43 | 192 | 180–0 | 70°11′ | 33°09′ |
| 6 | 25.05.2016 | 03:52 | 169 | 160–0 | 70°15′ | 32°48′ |
| 7 | 25.05.2016 | 10:05 | 137 | 130–0 | 70°08′ | 32°48′ |
| 8 | 25.05.2016 | 19:00 | 247 | 240–0 | 70°15′ | 33°30′ |
| 9 | 26.05.2016 | 01:07 | 238 | 230–0 | 70°08′ | 33°30′ |
| 10 | 26.05.2016 | 04:52 | 214 | 210–0 | 70°01′ | 34°11′ |
| 11 | 26.05.2016 | 09:25 | 249 | 240–0 | 70°07′ | 34°13′ |
| 12 | 27.05.2016 | 00:10 | 208 | 200–0 | 69°52′ | 34°12′ |
| 13 | 27.05.2016 | 12:16 | 219 | 210–0 | 70°60′ | 33°31′ |
| 14 | 27.05.2016 | 16:35 | 247 | 240–0 | 70°30′ | 33°30′ |
| 15 | 27.05.2016 | 19:25 | 246 | 240–0 | 70°15′ | 33°31′ |
| 16 | 27.05.2016 | 21:54 | 147 | 140–0 | 70°00′ | 33°31′ |
| 17 | 28.05.2016 | 00:51 | 180 | 170–0 | 69°44′ | 34°13′ |
| 18 | 28.05.2016 | 04:04 | 213 | 200–0 | 69°50′ | 34°42′ |
| 19 | 28.05.2016 | 06:45 | 244 | 240–0 | 70°01′ | 34°42′ |
| 20 | 28.05.2016 | 09:37 | 215 | 200–0 | 70°06′ | 35°19′ |
| 21 | 28.05.2016 | 20:05 | 233 | 220–0 | 69°48′ | 35°20′ |
| 22 | 28.05.2016 | 23:00 | 187 | 180–0 | 69°37′ | 35°13′ |
| 23 | 29.05.2016 | 01:43 | 176 | 160–0 | 69°30′ | 35°11′ |
| 24 | 29.05.2016 | 05:35 | 167 | 160–0 | 69°37′ | 34°41′ |
| 25 | 29.05.2016 | 14:35 | 263 | 250–0 | 69°30′ | 33°30′ |

A total of 47 zooplankton taxa were found in samples (Table 2). The most common (> 80 % of the samples studied) were *Calanus finmarchicus*, copepod nauplii and ova, *Metridia longa*, *Metridia lucens*, *Microcalanus* spp., *Oithona atlantica*, *Oithona similis*, *Pseudocalanus* spp., *Evadne nordmanni*, larvae of Echinodermata and Polychaeta, *Parasagitta elegans*, and early stages of *Thysanoessa* spp. Taxa number at the stations varied from 18 to 29. The maximum was recorded at st. 13, and the minimum – at st. 20. The southern Barents Sea is the richest area in plankton species composition: more than 280 animal taxa have been found here (Dvoretsky & Dvoretsky, 2015, 2010). In spring, species number increases due to emerge of meroplankton, which consists mainly of larvae of benthic invertebrates (Plankton morei…, 1997 ; Timofeev, 2000 ; Orlova et al., 2011); that was confirmed by our study.

**Table 2.** List of zooplankton taxa, their frequency in samples, and mean abundance in the southern Barents Sea in May 2016

| Taxon | Frequency in samples, % | Mean abundance, ind.·m$^{-3}$ |
|---|---|---|
| *Acartia longiremis* | 64 | 1 |
| *Anomalocera patersoni* | 4 | < 1 |
| *Calanus finmarchicus* | 100 | 1743 |
| *Calanus hyperboreus* | 36 | < 1 |
| *Centropages hamatus* | 32 | < 1 |
| Copepoda ova | 100 | 12 |
| Copepoda nauplii | 100 | 400 |
| *Metridia longa* | 96 | 36 |
| *Metridia lucens* | 100 | 16 |
| *Microcalanus pusillus* | 100 | 8 |
| *Microcalanus pygmaeus* | 100 | 98 |
| *Oithona atlantica* | 100 | 10 |
| *Oithona similis* | 100 | 308 |
| *Triconia borealis* | 16 | < 1 |
| *Paraeuchaeta* spp. I–IV | 20 | < 1 |
| *Paraeuhaeta norvegica* V–VI | 12 | < 1 |
| *Pseudocalanus* spp. I–IV | 100 | 26 |
| *Pseudocalanus minutus* V–VI | 100 | 10 |
| *Pseudocalanus acuspes* V–VI | 96 | < 1 |
| *Temora longicornis* | 40 | < 1 |
| *Evadne nordmanni* | 100 | 6 |
| *Podon leuckartii* | 32 | < 1 |
| *Aglantha digitale* | 48 | < 1 |
| *Rathkea octopunctata* | 8 | < 1 |
| Bivalvia juv. | 56 | 7 |

Continue on the next page…

| Taxon | Frequency in samples, % | Mean abundance, ind.·m$^{-3}$ |
|---|---|---|
| Cirripedia nauplii | 8 | < 1 |
| Echinoidea (echinopluteus larvae) | 100 | 126 |
| Gastropoda larvae | 72 | 3 |
| Ophiuroidea (ophiopluteus larvae) | 100 | 36 |
| Polychaeta larvae | 88 | 11 |
| *Chionoecetes opilio* zoea + megalopa | 12 | < 1 |
| *Hyas* spp. zoea | 4 | < 1 |
| *Paralithodes camtschaticus* zoea | 4 | < 1 |
| *Pandalus borealis* larvae | 8 | < 1 |
| *Boroecia borealis* | 68 | < 1 |
| Pisces larvae | 64 | < 1 |
| *Limacina helicina* larvae | 4 | < 1 |
| *Parasagitta elegans* | 88 | < 1 |
| *Meganyctyphanes norvegica* | 8 | < 1 |
| *Thysanoessa inermis* | 4 | < 1 |
| *Thysanoessa raschii* | 4 | < 1 |
| *Thysanoessa* spp. calyptopis | 100 | 49 |
| *Thysanoessa* spp. nauplii | 96 | 23 |
| *Thysanoessa* spp. furcilii | 100 | 24 |
| *Fritillaria borealis* | 52 | 43 |
| *Oikopleura labradoriensis* | 40 | 13 |
| Nemertini pilidium larvae | 4 | < 1 |

Total zooplankton abundance varied over a wide range 748–6576 ind.·m$^{-3}$, averaging (3012 ± 255). Zooplankton abundance in coastal water depends largely on external factors: circulation system, presence of frontal zones, and freshwater runoff (Dvoretsky & Dvoretsky, 2015 ; Timofeev, 2000). The highest variability in zooplankton abundance is characteristic of the southeastern area of the sea and some bays (Zelikman, 1977 ; Zenkevich, 1963 ; Plankton morei…, 1997), having favorable conditions for forming plankton aggregations.

Total zooplankton biomass varied from 17 to 157 mg of dry mass per m$^3$; mean value was (83 ± 7). The data were comparable to those, obtained in the southern Barents Sea in July 2008 (Dvoretsky & Dvoretsky, 2015), and exceeded estimates, recorded in Kola Bay area in August 2007 (Dvoretsky & Dvoretsky, 2012), which, in turn, determine the phase of seasonal development of zooplankton assemblage (Zelikman, 1977 ; Orlova et al., 2011 ; Raymont, 1983).

Zooplankton production varied from 0.49 to 4.04 mg of dry mass per m$^3$ per day, with a mean value of (2.17 ± 0.17). The values obtained were approximately twice as high as those recorded for Murmansk coastal water (2008–2013) during summer period: 0.64–1.25 mg of dry mass per m$^3$ per day (Dvoretsky & Dvoretsky, 2015, 2016, 2018). This is probably due to food abundance for zooplankton in May. It is known that an increase in phytoplankton abundance is observed in spring and usually followed by a peak in zooplankton biomass (Zenkevich, 1963 ; Kiselev, 1980 ; Timofeev, 2000). In summer, microalgae concentration is significantly lower; so, the level of zooplankton production decreases (Plankton morei…, 1997). The waters at the junction of frontal zones are considered to be the most productive ones. In August 2010, zooplankton production within the frontal zones in the central Barents Sea was 0.18–4.02 mg of dry mass per $m^3$ per day (Dvoretsky & Dvoretsky, 2017). In May 2016, the estimates were quite similar, confirming high zooplankton productivity in the coastal area. In other seasons, daily zooplankton production can be much higher than in spring. In the Pechora Sea in June 2001, maximum copepod production reached 14.6 mg of dry mass per $m^3$ per day; in Dvorovaya Bay in July 2008, maximum zooplankton production exceeded 28.3 mg of dry mass per $m^3$ per day (Dvoretsky & Dvoretsky, 2015). As a rule, zones of increased productivity are registered in bays with waters, enriched with nutrients and suspended matter (Dvoretsky & Dvoretsky, 2015, 2016 ; Timofeev, 2000). Daily P/B ratio (production/biomass ratio) of zooplankton was 0.02–0.03, which is comparable to the estimates, obtained previously in Barents Sea coastal water (Dvoretsky & Dvoretsky, 2015, 2016, 2012).

Copepods were a dominant zooplankton group during the period of our study: on average, they accounted for 90 % of zooplankton abundance, 96 % of biomass, and 94 % of total production. This result is quite expected, since copepods are the major constituent of zooplankton in the Arctic seas throughout the year (Vodopyanova et al., 2017 ; Orlova et al., 2004, 2011). Table 3 shows zooplankton quantitative estimates in the study period.

**Table 3.** Total zooplankton and copepod abundance, biomass, and daily production in the southern Barents Sea in May 2016

| Parameter | $\overline{X}$ | SE | Min | Max |
|---|---|---|---|---|
| Zooplankton/copepod abundance, thousands of ind. per $m^2$ | 584 / 521 | 36 / 29 | 202 / 178 | 889 / 802 |
| Zooplankton/copepod biomass, g of dry mass per $m^2$ | 16.3 / 15.8 | 1.1 / 1.1 | 4.2 / 4.0 | 25.8 / 25.6 |
| Zooplankton/copepod production, mg of dry mass per $m^2$ | 426 / 403 | 27 / 26 | 121 / 113 | 648 / 636 |

**Note:** $\overline{X}$ is mean; SE is standard error; min is minimum; max is maximum.

Distribution of total zooplankton biomass and daily production is shown in Fig. 2. For the water area studied (25.8 thousand $km^2$), total value of zooplankton stock is estimated to be 425 thousand tons of dry mass. In this water area, according to the data calculated, daily zooplankton production was about 10 thousand tons of dry mass.

Cluster analysis revealed presence of four groups of stations (Fig. 3), being quite similar in zooplankton abundance and composition. Minimum similarity between clusters according to Bray – Curtis index was 65 %. The main contribution to the difference between groups of stations was made by *Calanus finmarchicus* (2–8 %), *Oithona similis* (1–4 %), copepod nauplii (2–4 %), Echinodermata larvae (1–5 %), and appendicularian *Fritillaria borealis* (1–3 %). Four clusters significantly differed in structure of zooplankton assemblages, *i. e.* in the ratio of common species (ANOSIM Test, global $R = 0.779$, $p < 0.001$).

The highest zooplankton abundance and biomass were registered at stations of cluster 3, the lowest – at stations of cluster 4. *Calanus finmarchicus*, as well as copepod nauplii, dominated in abundance (on average, 58–63 and 12–18 %, respectively) at stations of clusters 1–3. A peculiar characteristic of cluster 4 was high *Oithona similis* ratio in total zooplankton abundance. In terms of biomass, *Calanus finmarchicus* dominated within all groups of stations, but at stations of cluster 4 its contribution was minimal (< 88 %).

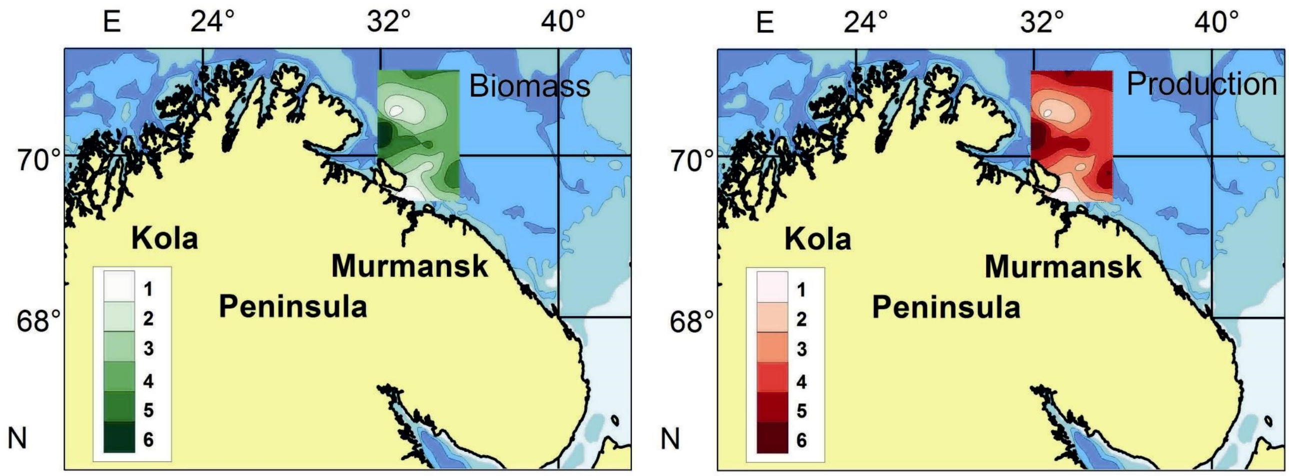


**Fig. 2.** Distribution of total zooplankton biomass and daily production in the southern Barents Sea in May 2016. Biomass (g of dry mass per m$^2$): 1 – < 5; 2 – 5–10; 3 – 10–15; 4 – 15–20; 5 – 20–25; 6 – > 25. Daily production (mg of dry mass per m$^2$ per day): 1 – < 100; 2 – 100–200; 3 – 200–300; 4 – 300–400; 5 – 400–500; 6 – > 500

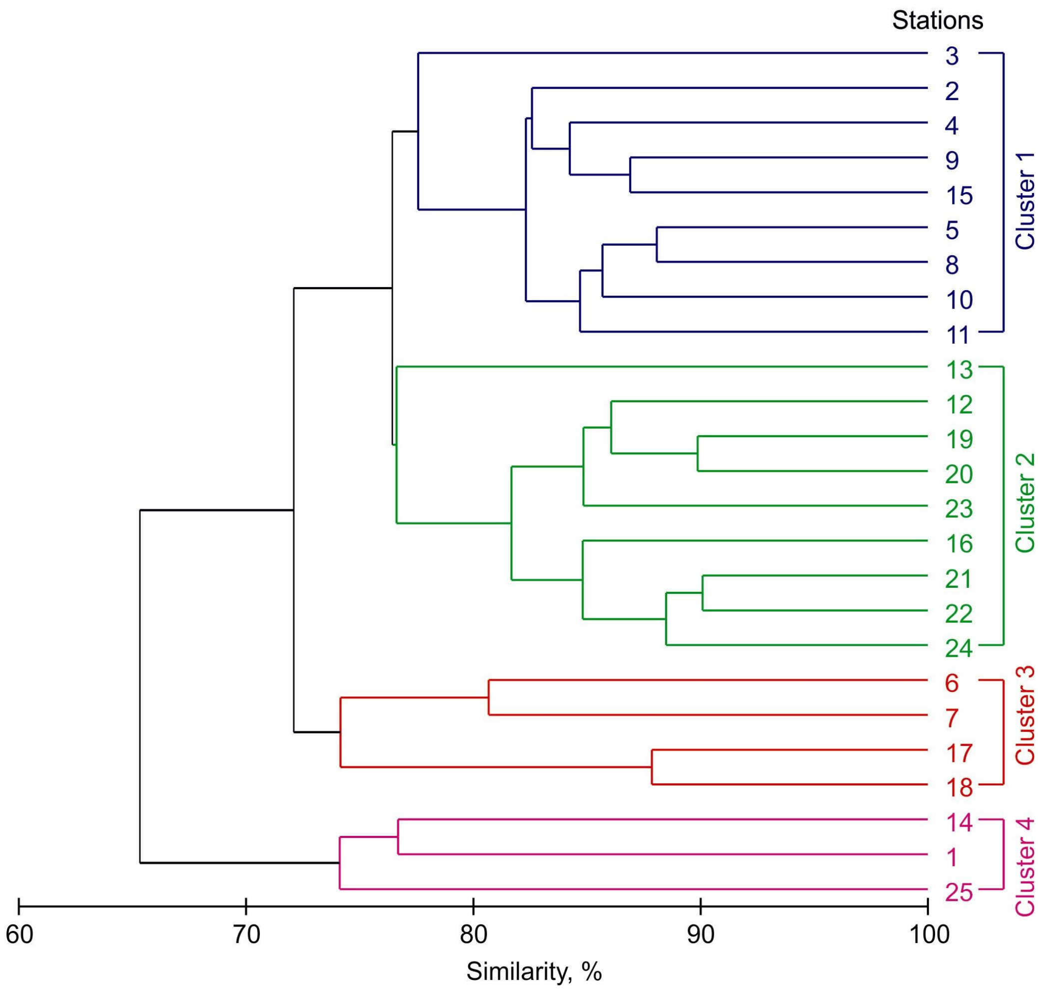


**Fig. 3.** Dendrogram of stations similarity in terms of zooplankton abundance (Bray – Curtis index, %) in the southern Barents Sea in May 2016

BIO-ENV routine showed as follows: spatial variations in zooplankton abundance were determined by a combination of five factors, being latitude, longitude, station depth (location), bottom temperature, and mean salinity ($r$ = 0.541). A similar value of the correlation coefficient ($r$ = 0.540) was obtained for a combination of three factors, being latitude, bottom temperature, and mean salinity. For other combinations of factors, values of the correlation coefficients were lower. Hydrological conditions and geographic location are known to effect zooplankton assemblages. These factors are significant in the distribution of planktonic organisms in the Arctic seas (Degtereva, 1973 ; Timofeev, 2000). In our case, zooplankton variations were most likely associated with hydrological factors (temperature and salinity), while latitude indirectly reflected the spatial changes of these two factors. As moving northward, temperature decreased, and salinity increased; these affected the ratio of common species, as well as zooplankton abundance.

We revealed a weak correlation between zooplankton abundance and chlorophyll *a* concentration, the value of which indirectly reflects the state of phytoplankton, being the main zooplankton food resource. It seems to be associated with different periods of phyto- and zooplankton abundance. A peak of phytoplankton bloom in the southern area of the sea is observed in April, but zooplankton was sampled in May, when phytoplankton concentration decreased (Plankton morei…, 1997). Therefore, no direct relationship between phyto- and zooplankton abundance was established (Dvoretsky & Dvoretsky, 2015 ; Timofeev, 2000).

*Calanus finmarchicus* age structure was characterized by the dominance of early copepodites, which, on average, accounted for more than 60 % of total population abundance. The ratio of adults was lower than 1 % (Fig. 4).

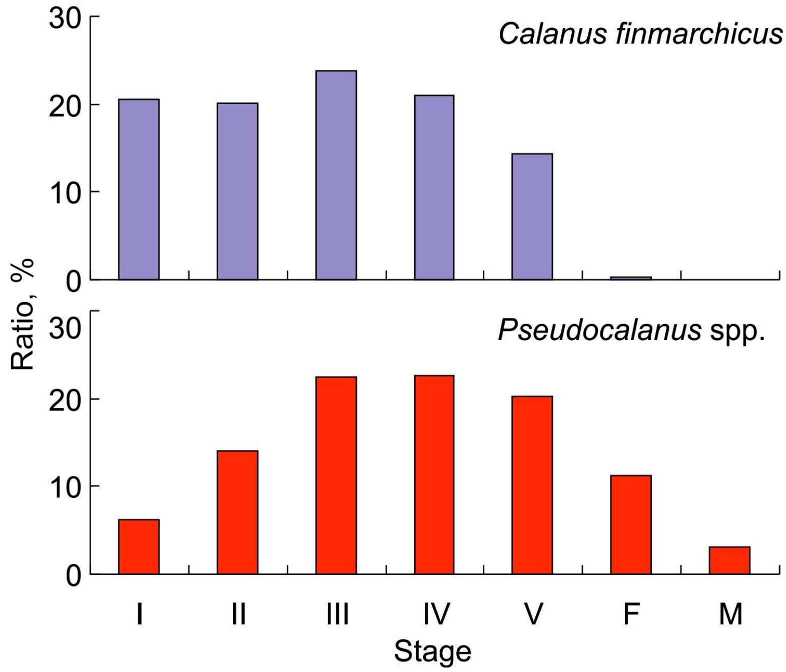


**Fig. 4.** Age structure of common copepod species (mean ratio in population at all stations) in the southern Barents Sea in May 2016

Such distribution of different age stages indicated recently completed species spawning within the water area studied, which is in good agreement with the general pattern of *Calanus finmarchicus* development in the Barents Sea (Dvoretsky & Dvoretsky, 2015 ; Kamshylov, 1952 ; Plankton morei…, 1997 ; Timofeev, 2000). In *Pseudocalanus* spp. populations, mainly copepodites of stages II–IV were recorded (Fig. 4), with the ratio of adults averaging 10 %, which undoubtedly indicated *Pseudocalanus* spp. continued reproduction (Dvoretsky & Dvoretsky, 2015). In *Oithona similis* population, all developmental stages were found, with the ratio of early ones being low, which is associated with low catchability of the net, used for these age groups. As a rule, in the Barents Sea, small opportunistic species reproduce throughout the year, forming 1–2 generations (Dvoretsky & Dvoretsky, 2011 ; Raymont, 1983).

High values of copepod abundance, biomass, and production created favorable feeding conditions for larvae and early age stages of pelagic fish, as well as for larvae of benthic fish. In general, the analysis carried out indicates a high production potential of zooplankton in the southern Barents Sea in spring.

**Conclusions:**

1. In the southern Barents Sea, 47 taxa were identified in zooplankton samples. The most common ones were copepods *Calanus finmarchicus*, *Metridia longa*, *M. lucens*, *Microcalanus* spp., *Oithona atlantica*, *O. similis*, *Pseudocalanus* spp., as well as copepod nauplii and ova, cladoceran *Evadne nordmanni*, larvae of Echinodermata and Polychaeta, chaetognath *Parasagitta elegans*, and early stages of euphausiids of the genus *Thysanoessa*. On average, copepods accounted for 90 % of zooplankton abundance, 96 % of biomass, and 94 % of total production.
2. Total zooplankton abundance varied within a wide range, averaging (3012 ± 255) ind.·$m^{-3}$. Mean values of zooplankton dry mass and daily production were (83 ± 7) and (2.17 ± 0.17) mg of dry mass per $m^3$, respectively. According to our calculations, daily zooplankton production in this water area was about 10 thousand tons of dry mass.
3. Based on zooplankton abundance and composition, cluster analysis revealed four groups of stations. The main contribution to the difference between these groups was made by *Calanus finmarchicus*, Copepoda nauplii, larvae of Echinodermata, *O. similis*, and *Fritillaria borealis*. Spatial variations in zooplankton abundance were determined by a combination of five factors, being latitude, longitude, station depth, bottom temperature, and mean salinity. Of these, the most important ones were temperature, salinity, and latitude.
4. Age structure of common copepod species *Pseudocalanus* spp. and *Calanus finmarchicus* was characterized by predominance of early stages, which indicated *Pseudocalanus* spp. continued reproduction, as well as recently completed *C. finmarchicus* spawning.

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## ПРОДУКТИВНОСТЬ ЗООПЛАНКТОНА В ПРИБРЕЖНОЙ ЗОНЕ ЮЖНОЙ ЧАСТИ БАРЕНЦЕВА МОРЯ В ВЕСЕННИЙ ПЕРИОД

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Представлены результаты анализа состояния зоопланктонного сообщества в южной части Баренцева моря. Пробы отобраны в ходе экспедиции НИС «Дальние Зеленцы» в мае 2016 г. Гидрологические условия были типичными для мурманской прибрежной водной массы в этот сезон. Всего обнаружено 47 таксонов зоопланктона. Их количество колебалась по станциям от 18 до 29. Копеподы были доминирующей группой в зоопланктоне. Наиболее часто встречались *Calanus finmarchicus*, *Metridia longa*, *Metridia lucens*, *Microcalanus* spp., *Oithona atlantica*, *Oithona similis*, *Pseudocalanus* spp., науплии и яйца копепод, а также кладоцеры *Evadne nordmanni*, личинки иглокожих, полихет, щетинкочелюстные *Parasagitta elegans*, ювенильные стадии эвфаузиид рода *Thysanoessa*. В составе популяций массовых видов копепод *Pseudocalanus* spp. и *Oithona similis* преобладали младшие возрастные группы, что свидетельствовало о продолжающемся их размножении. Суммарная численность зоопланктона варьировала от 748 до 6576 экз.·м$^{-3}$, составляя в среднем 3012. Общая биомасса колебалась от 17 до 157 мг сухой массы·м$^{-3}$, средняя величина равнялась 83. Полученные величи́ны сопоставимы с данными июля 2008 г. и превышают показатели августа 2007 г., что авторы связали с разными сезонами отбора проб и с различающимися гидрологическими условиями. Суточная продукция зоопланктона колебалась в диапазоне 0,49–4,04 мг сухой массы·м$^{-3}$ при средней величине (2,17 ± 0,17), что примерно в 2 раза выше, чем средние показатели для мурманских прибрежных вод в летний период. Вероятно, эти различия связаны с более высокой концентрацией фитопланктона в весеннее время. Суммарная величина запаса зоопланктона в исследуемой акватории (25,8 тыс. км$^2$) оценена в 425 тыс. т сухой массы. Кластерный анализ выявил наличие четырёх групп станций, которые различались соотношением *Calanus finmarchicus*, Copepoda nauplii, *Oithona similis*, личинок иглокожих и аппендикулярий *Fritillaria borealis*. Пространственную изменчивость численности зоопланктона определяли местоположение станций (широта, долгота, глубина), а также температура придонного слоя и средняя солёность вод на станции.

**Ключевые слова:** зоопланктонное сообщество, копеподы, пелагическая экосистема