

# PRESENT SITUATION OF THE ZOOPLANKTON OF THE AZERBAIJANI SECTOR CASPIAN SEA

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In the present work the basic attention is given to research of zooplankton which within several years (1999-2006) was under the strongest influence *Mnemiopsis leidyi*. Last from spontaneous invasion found out on Caspian Sea was *Mnemiopsis leidyi*. For two (1999 - 2000) year this kind completely "occupied" Average, Southern and a part of Northern Caspian Sea therefore has suffered zooplankton. Have sharply decreased a biodiversity of zooplankton and weight characteristics. The number of kinds of zooplankton was considerably reduced. In 2000 on the average Caspian sea it was totaled 36, in Southern-24 kinds of zooplankton, and in 2001 the qualitative structure was reduced: on the average Caspian sea up to 12, in Southern - up to 7 kinds (1). The ambassador of invasion there were the some people change in trophic to structure in pelagial and in benthos of Caspian Sea (2). During time research in coastal waters of Absheron peninsula which it was carried out within 5 years (2001-2005), the biomass of zooplankton and meroplankton was almost equal. It is necessary will note, that to the end of XX century the biomass of meroplankton has made the one third part of the general of a biomass of all of zooplankton (3).

In many publications (4, 5, 6) are analyzed a long-term course of biomass *Mnemiopsis leidyi* and examples of its doubtless influence on structures fine fodder of zooplankton are resulted, however the consecutive analysis of change of structure of meroplankton communities was not carried out. The purpose of the present research just also is the detailed analysis connected to development - invasion.

## Material and methods

In 2006 research spent in the summer during years flight SRS "Alif Gadzhiev". A material in Southern Caspian Sea it has been collected standard sections: Pirsagat, Bandovan, Northeast a part the Mouth of the Kura, Southeast a part the Mouth of the Kura, Kurkosa, Lenkoran, Astara. The material on Southern Caspian sea was collected from July, 27-th till August, 8-th total catching networks Jedy a filtering cone from a sieve №38 from a bottom up to a surface on everyone by stations. Tests selected day time and night hours and fixed 4 %-s' formalin and have packed.

The collected tests treat by the standard technique (7, 8). In laboratory all over again defined specific structure. Animals met in tests the basic determined up to a kind (*Rotatoria*, *Cladocera*, *Copepoda*), and other animals up to a sort and larger taxonomic units. Tests counted under binokulyar MBC-1 in chamber Bogorov.

## Results and discussion

According to the hydrological measurements which are carried out in flight, during researches the temperature of a superficial layer of water changed in limits 26,5° S–29,8° S. In the beginning of August there was an appreciable rise in temperature in the top layer of waters. In some sections; northeast a part the Mouth of the Kura, Lenkoran, Astara was formed termoklin.

Distribution of number and biomass of zooplankton sections is submitted in the table. The average biomass of zooplankton on Pirsagat section the end of July the beginning of August has in wet weight 18,22 mg/m<sup>3</sup>, and their number achieved up to 900 specimen/m<sup>3</sup> (without taking into account of *Mnemiopsis*). Group *Copepoda* deserve a separate mention because, their average

number approximately is three times more than biomass of all rest of mezoplankton. Our researches reveal natural distribution of zooplankton on Pirsagat section. The highest number and a biomass of zooplankton was marked on the section first to station, number and a biomass of zooplankton gradually is deeper in other stations decreased.

In Bandovan section *group Rotatoria* it is submitted by two kinds. On number *Asplanchna pridonta pridonta* on the section second to station it is marked *Keratella cochlearis*. In the first and second sections of *group Cladocera* represents kinds from sorts *Evadne* and *Podonevadne*. Role *Pleopis polyphemoides* and kinds from sort *Cercopagis* more deeply increases. In the beginning of August at 3-rd station it is marked congestions *Cercopagis anonyx* and *C. micronyx*. To the end of July in the beginning of August a plankton a huge role played larvae of *Mnemiopsis* and larvae of *Annelida* which big quantity were present on the first station. Larvae *Balanus* formed the maximal biomass on the second stations of a section. It is connected we are present here the old thrown platforms which adult cancers *Balanus improvisus* use as a substratum.

In a section Northeast a part the Mouth of the Kura will penetrate river waters of the river of the Kura. This hydrological picture typically and for the following section, Southern - east a part the Mouth of the Kura. Observed here the hydrological picture strengthens a role *group Rotatoria*. On the first station of a section has met *Keratella cochlearis*, *Trichocerca caspica caspica*, *Asplanchna pridonta pridonta*. Last from them continue to be present, and at the second and third stations of a section. The first and the second stations are marked everybathic kinds; *Polyphemus exiguus* and *Pleopis polyphemoides* and also shallow; *Evadne anonyx typica*, *Podonevadne trigona typica*. At deep-water stations a section a place with everybathic kinds continue to be present and *Ev. anonyx typica*. This the phenomenon speaks with complex hydrological structure in a section. The most indicative kind in community is *Acartia clausi*. Its prevalence in structure of all zooplankton it is typical on all section. A maximum biomass *A. clausi* was on the first and the second station of a section. In deep-water stations its quantity gradually decreased up to the smallest sizes. The maximal values number and biomass *nauplii Copepoda* are observed on the first station of a section. Thus, number and a biomass of *group Copepoda* naturally decreases, since the section first to station. From other components of mesoplankton prevails larvae of *Balanus* larvae of *Mnemiopsis*. They are present at all stations of a section. It is necessary will note that, all revealed laws in distribution of zooplankton have static character, and is shown only on the big samples.

In a section Southeast a part the Mouth of the Kura hydrological a picture are similar to a section Northeast a part the Mouth of the Kura. Therefore here the increase number and a biomass of *Rotatoria*. Them is observed dominate *Keratella cochlearis*. This kind was only the first station of a section. *Group Cladocera* formed a maximum a biomass and number on the first stations of a section.

In this shallow stations a huge role played kinds of sort *Cercopagis*. Here flash number and bioweights *Cercopagis anonyx* and *C. prolongata* was observed. They usually occupy deep-water parts of the sea. This phenomena or has taken place casually, or here really there is a certain law connected complex hydrological picture of a section. The basic part of a population of *Acartia clausi* was is concentrated the first and the second station of a section. At the fourth station its quantity goes down, and at the fifth station of honey agarics rises. Distributions of other organisms in a plankton on stations it is not constant. It directly has any character. The maximum number and a biomass of zooplankton was a shallow section first to station, the quantity of zooplankton gradually is deeper decreases, and on the fifth deep-water stations number and a biomass considerably increases. It is connected to a complex hydrological picture of a section. Average number of zooplankton on a section Southeast a part the Mouth of the Kura twice more observed in a section Northeast a part the Mouth of the Kura similar hydrological a picture.

In Kurkosa section complex face-to-face interaction of various water weights is marked. Features of circulation of waters of this area the Kura is determined by a mode of a drain. In the

The table

Distribution of zooplankton on sections of the Azerbaijan sector of Southern Caspian Sea in the summer of 2006 (specimen/m<sup>3</sup>)

mg								
The name of kinds	Pir-sagat	Ban-dovan	Northeast part of the Mouth of the Kura	Southeast part of the Mouth of the Kura	Kur-kosa	Len-koran	As-tara	Average
1	2	3	4	5	6	7	8	9
<i>Rotatoria</i>								
<i>Keratella cochlearis</i>	$\frac{38}{0,04}$	$\frac{2}{0,01}$	$\frac{20}{0,02}$	$\frac{363}{0,36}$	$\frac{80}{0,08}$	$\frac{25}{0,03}$	$\frac{16}{0,02}$	$\frac{78}{0,08}$
<i>Trichocerca caspica caspica</i>			$\frac{20}{0,02}$	$\frac{3}{0,01}$				$\frac{3}{0,01}$
<i>Asplanchna pridonta pridonta</i>		$\frac{60}{0,06}$	$\frac{72}{0,07}$	$\frac{121}{0,12}$				$\frac{36}{0,04}$
<i>Hexarthra oxyuris</i>					$\frac{2}{0,01}$			$\frac{1}{0,01}$
The general	$\frac{38}{0,04}$	$\frac{62}{0,06}$	$\frac{112}{0,11}$	$\frac{487}{0,49}$	$\frac{82}{0,08}$	$\frac{25}{0,03}$	$\frac{16}{0,02}$	$\frac{117}{0,10}$
<i>Cladocera</i>								
<i>Polyphemus exiguus</i>	$\frac{4}{0,03}$		$\frac{27}{0,19}$	$\frac{19}{0,13}$	$\frac{7}{0,05}$	$\frac{28}{0,19}$	$\frac{12}{0,09}$	$\frac{14}{0,10}$
<i>Cercopagis pengoi</i>	$\frac{3}{0,65}$							$\frac{1}{0,09}$
<i>C. prolongata</i>				$\frac{20}{5,00}$				$\frac{3}{0,71}$
<i>C. micronyx</i>		$\frac{2}{0,50}$	$\frac{1}{0,09}$					$\frac{1}{0,08}$
<i>C. anonyx</i>		$\frac{1}{0,25}$	$\frac{1}{0,21}$	$\frac{10}{2,50}$				$\frac{2}{0,42}$
<i>Apagis cylindrata</i>		$\frac{1}{0,20}$						$\frac{1}{0,03}$
<i>Pleopis polyphemoides</i>	$\frac{38}{1,14}$	$\frac{15}{0,44}$	$\frac{58}{1,73}$	$\frac{44}{1,33}$	$\frac{63}{1,90}$	$\frac{25}{0,75}$	$\frac{7}{0,19}$	$\frac{35}{1,07}$
<i>Evadne anonyx typica</i>	$\frac{14}{0,28}$	$\frac{10}{0,20}$	$\frac{26}{0,87}$	$\frac{4}{0,08}$				$\frac{7}{0,20}$
<i>Ev. anonyx prolongata</i>		$\frac{10}{0,20}$						$\frac{1}{0,03}$
<i>Ev. anonyx producta</i>	$\frac{18}{0,54}$			$\frac{4}{0,08}$				$\frac{3}{0,09}$
<i>Podonevadne trigona typica</i>	$\frac{36}{0,38}$	$\frac{4}{0,06}$	$\frac{30}{0,42}$	$\frac{4}{0,06}$				$\frac{11}{0,13}$
<i>P. trigona pusilla</i>				$\frac{10}{0,14}$		$\frac{25}{0,35}$		$\frac{5}{0,07}$
The general	$\frac{113}{3,02}$	$\frac{43}{1,85}$	$\frac{143}{3,51}$	$\frac{115}{9,32}$	$\frac{70}{1,95}$	$\frac{78}{1,29}$	$\frac{19}{0,28}$	$\frac{83}{3,03}$

1	2	3	4	5	6	7	8	9
<i>Copepoda</i> <i>Acartia clausi</i>	<u>206</u> 13,40	<u>126</u> 8,22	<u>255</u> 16,58	<u>562</u> 37,10	<u>918</u> 59,64	<u>356</u> 23,17	<u>251</u> 16,31	<u>382</u> 24,92
<i>Nauplii</i> <i>Copepoda</i>	<u>214</u> 1,50	<u>66</u> 0,13	<u>120</u> 0,84	<u>362</u> 1,81	<u>296</u> 0,59	<u>434</u> 0,87	<u>105</u> 0,21	<u>228</u> 0,85
The general	<u>420</u> 14,90	<u>192</u> 8,35	<u>375</u> 17,42	<u>924</u> 38,91	<u>1214</u> 60,24	<u>790</u> 24,04	<u>356</u> 16,52	<u>610</u> 25,77
Others								
<i>Ctenophora</i> Larvae of <i>Mnemiopsis</i>	169	43	59	77	351	168	88	136
Larvae of <i>Annelida</i>	4	84		26	30	120	22	41
<i>Cirripedia</i> Larvae of <i>Balanus</i>	<u>26</u> 0,26	<u>18</u> 0,18	<u>97</u> 0,97	<u>20</u> 0,20	<u>20</u> 0,20	<u>10</u> 0,10	<u>5</u> 0,05	<u>28</u> 0,28
<i>Ostracoda</i> <i>Cyprideis</i> <i>litoralis</i>	128	1	5	2	5	231	6	54
<i>Isopoda</i> <i>Jaera sarsi</i> <i>casgica</i>	2		3	4	1			1
Larvae of <i>Mollusca</i>				<u>13</u> 0,07	<u>7</u> 0,03		<u>2</u> 0,01	<u>3</u> 0,02
The general	<u>329</u> 0,26	<u>146</u> 0,18	<u>164</u> 0,97	<u>142</u> 0,27	<u>414</u> 0,23	<u>529</u> 0,10	<u>123</u> 0,06	<u>264</u> 0,30
In total	<u>900</u> 18,22	<u>443</u> 10,45	<u>794</u> 22,01	<u>1668</u> 48,99	<u>1780</u> 62,50	<u>1422</u> 25,46	<u>514</u> 16,88	<u>1074</u> 29,21

beginning of August, 2006 here a huge role played group *Rotatoria*. In shallow the first station flash of number *Keratella cochlearis* was observed. Group *Cladocera* it is submitted mainly *Pleopis polyphemoides* a smaller role played *Polyphemus exiguus*. On the first stations (0-10 m) a section number *Acartia clausi* the biomass of 55,25mg/m<sup>3</sup> has made 850 species/m<sup>3</sup>, and. On the second (0-25 m) number reached station up to 1100 species/ m<sup>3</sup>, and a biomass of 71,50 mg / m<sup>3</sup>. For the third stations quantity *Acartia clausi* insignificantly decreased. More deeply on the fourth (0-75) and at the fifth (0-100) stations number and biomass *Acartia clausi* unexpectedly increased. This phenomenon deserves a separate mention. Because, under influence of any factors have completely changed natural distribution of mesoplankton. Except for Kurkosa section, in other sections this law it is not broken. Probably, this phenomenon have casual character or operated any biotic and abiotic factors as a whole. From biotic factors it is possible to name influence of *Mnemiopsis leidyi*. Complex the hydrological picture of a section too has caused distribution *Acartia clausi*. As *A. clausi* is a mass organism Caspian ecosystem, infringement natural distribution of it crayfish should affect distributions of all fodder plankton.

In Lenkoran section *Keratella cochlearis*, it is marked on shallow the first station. A maximum quantity of group *Cladocera* was on a shallow zone of a section. The mass kind of it group *Acartia clausi* at shallow stations of a section formed rather high biomass, it was the first and second stations. At deep-water third and fourth stations a picture has completely changed, number and biomass *A. clausi* has decreased to the smallest sizes. Reduction of number *A. clausi* should

affect size of all fodder plankton because the basic contribution to the general biomass fodder of mesoplankton brought as rule *Acartia clausi*.

In deep-water stations of Astar section meets *Keratella cochlearis*. This is interesting to that *K.cochlearis* usually meets in shallow parts of the sea. The maximum biomass *Acartia clausi* was on shallow the second station. More deeply, in the third and fourth stations number and biomass *A.clausi* sharply decreased. In deep-water fifth station its quantity unexpectedly increased. It is necessary will pay attention to that fact that, this the phenomenon, non-uniform distribution *A.clausi* on number of Astar were observed by a section and on sections of Southeast a part the Mouth of the Kura and Kurkosa. The reason of it it is not quite clear, though can, it it has been connected by influence *Mnemiopsis leidy*.

As we have shown above, role of *Acartia clausi* in community were high. As if to all of mesoplankton, the parity of share *Copepoda* with other groups (*Rotatoria*, *Cladocera*) on depths does not vary. Thus, supervision over development of zooplankton in the beginnings of August, 2006 show the end of July, despite of fluctuations of number separate, including dominating kinds, general structure planktonic the community of the Azerbaijan sector of Southern Caspian sea remains more or less to a constant. Presence essential at the same time proves to be true; it is possible to tell - basic differences in structure of communities between northern and southern parts.

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