CHANGES IN BIODIVERSITY OF DECAPODS (DECAPODA, CRUSTACEA) FROM ROMANIAN BLACK SEA COAST

BY

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In our study we make an analysis about the present composition of the decapods fauna from the Romanian littoral. We established that there is a tendency of recovering in decapods effectives, due to the neozoa influx of brachyuran species from Mediterranean waters The disappeareance of perennial macrophyte, which constituted favourite biotop for many decapods from the stony infralittoral caused the disappeareance of invertebrates species.

We also discussed about the main factors, which lead to disappeareance of species and the main cause is degradation of favourite biotopes.

Bental studies about ecological changes of species have described the communities and associations of living forms, which lived on the hard or soft substratum (Bacescu, Gomoiu).

The antropic influence concentrated in hydrotechnical constructions (the Danube-Black Sea canal) the development of maritime navigation, including the building of new harbours, the local discharge of sewage and industrial waste are the activities which have had the greatest impact on biodiversity of species from Black Sea.

The biggest and the most vagile species changed their biotopes, adapting to live on a new substratum. The smaller sized species, which weren't so mobile and were sheltering in the anfractuosities in the stones, had disappeared, covered by sand or mud or decreased their number of populations.

The main cause was the degradation of their favourite biotopes, as a result of terrigeneous pollution or winter hard frost.

Increasing eutrophication produced a quantitative and qualitative decline in the macrophytobentos. Fishing with the bottom trawl was another fact that destroyed the perennial macrophyte (*Cystoseira barbata* covered the bottom substratum, with 20-25 years before), which were the favourite biotop for many bottom species.

The favourite biotop of decapods is the hard substratum covered by algae and because of that, their populations decreased also, after 1980, but recently, it can hardly observe a tendency of recovering in biodiversity.

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Our study is based on bibliography, studies about decapods from Romanian Black Sea coast, and on personal observations. Samples were collected by free diving, using a hand net, at 2-3m depth, in Agigea-Eforie Sud and Vama Veche, and by trawling at north of Constanța. The average of depth, for colleting decapods by trawling was 10-12m.

The small sized species of Suborder Natantia are the most affected by these changes in their biotopes.

In 1980 there were 11 species of decapods living on a hard substratum, *Pachygrapsus marmoratus, Pilumnus hirtellus, Xantho poressa* and *Rhitropanopeus harrisi* were the most frequent among them. The big sized species: *Crangon crangon, Palaemon adspersus, Palaemon elegans*, which were very abundant in the past (1960-1970), were in the most critical situation. *Palaemon adspersus*, the most appetizing shrimp of the Romanian decapods was considered almost disappeared.

In 2002-2003 we found frequently *Palaemon adspersus*, more abundant than before at least from Agigea to Eforie Sud.

Athanas nitescens lives in anfractuosities in the stones and became very rare in 1980. We found frequently and even at variable depths between 0.5-12m.

Hippolyte inermis, Lysmata seticaudata, Philocheras fasciatus, Philocheras trispinosus are considered as disappeared from 1980 (Gutu). In 2002 we found a specimen of *Philocheras fasciatus* at 2-3m depth, near Agigea dam.

From anomurans, *Diogenes pugilator* is constantly found in our samples and lately it is frequent. We mention the presence of *Diogenes pugilator* in juveniles shells of *Viviparus acerosus* and *Rapana venosa*, about 3cm in length.

It seems that there is a tendency of restablishing of a new equilibrum for populations of *Clibanarius erythropus*. We mention for the first time the presence of *Clibanarius erythropus* in the juveniles shells of *Rapana venosa*, about 3cm, at 5m depth, near Agigea dam.

Callianassa pontica and *Callianassa truncata*, mentioned only on the basis of the larvae found on the Romanian coast are considered as disappeared. They were absent in our samples.

Pisidia longicornis is frequently again for our littoral. In 2002-2003 we found it in our samples, in the stony superior infralittoral from Agigea-Eforie Nord, among mussels.

A better situation is recorded for Brachyura with which out of 10 species known in the past in the fauna of the Romanian littoral, 9 are still present today. If we mention that *Macropodia czerniawskii* was also rare in the past, practically all the species and subspecies survived.

The presence of exotic species *Callinectes sapidus* and *Eriocheir sinensis*, originating from Mediterranean waters is a new factor of increasing in biodiversity. They are big sized predators. Adults feed on mollusks, dead and alive fish, shrimps, benthic macroinvertebrates, mollusks spat. Juveniles feed mostly on benthic

Changes in biodiversity of decapods (Decapoda, Crustacea) (...)

macroinvertebrates, small fish, dead organisms and this is a reason for being worried about the effects they can produce on autochtonous fauna of invertebrates.

Among the species of crabs, which became very rare for our waters, we mention: *Liocarcinus arcuatus, Carcinus aestuarii, Eriphia verrucosa*.

We have to remark that excepting collectings from 1980, 1993-1994 and 2002-2003, the others were not made especially for decapods: systematical collectings made from a large number of stations were made only in the 60-70's by Băcescu and collaborators. Agigea was the most studied locality along the years, here being a station of marine researching.

Name of species	Situation of species			
-	1930-1970	1980	2002-2003	
Hippolyte varians	frequent	very rare	very rare	
Hippolyte inermis	very rare	disappeared	-	
Lysmata seticaudata	very rare	disappeared	-	
Athanas nitescens	frequent	rare	frequent	
Processa pontica	rare	disappeared	-	
Palaemon adspersus	abundant	rare	frequent	
Palaemon elegans	abundant	frequent	frequent	
Crangon crangon	abundant	abundant	frequent	
Philocheras fasciatus	rare	disappeared	very rare	
Philocheras trispinosus	frequent	disappeared	-	
Callianassa pontica	rare	disappeared	-	
Callianassa truncata	very rare	disappeared	-	
Upogebia pusilla	abundant	frequent	frequent	
Clibanarius erythropus	rare	very rare	rare	
Diogenes pugilator	abundant	frequent	frequent	
Pisidia longicornis	frequent	rare	frequent	
Macropodia czerniawskii	very rare	disappeared	-	
Callinectes sapidus	-	-	rare	
Carcinus aestuarii	frequent	frequent	rare	
Liocarcinus arcuatus	frequent	frequent	rare	
Liocarcinus vernalis	abundant	frequent	frequent	
Rhitropanopeus harrisi	abundant	rare	frequent	
Xantho poressa	abundant	frequent	frequent	
Eriphia verrucosa	frequent	rare	rare	
Pilumnus hirtellus	abundant	frequent	frequent	
Brachynotus sexdentatus	abundant	frequent	frequent	
Eriocheir sinensis	-	-	rare	
Pachygrapsus marmoratus	abundant	rare	frequent	

Tab. 1. Decapods found in 2002-2003 on Romanian littoral

Between 1930-1970 there is a constant presence of decapods in our waters, but it can hardly observe a decreasing of number of populations.

Between 1970-1980 it is observed a decreasing of number of species, because of the eutrophication influence.

From 1980 to 1990 the number of decapods species is drastically reduced. Only 30% from decapods species survived. Stony, fitophyl, thermophyl and halophyl species were considered as disappeared.

After 1990, the intensity of eutrophication and pollution of marine waters has been decreasing, not because of the non-polluting measures, but the economical collapse, after 1989, in the Black Sea river countries.

There is a tendency of increasing in biodiversity thanks to maintaining the long term marine pollution at a low level. 2003 year was the first year without a mass algal blooming. Decreasing from 2001 is not a real one, it is because of the lack of researches. In the end of our study we can say that:

- an increasing in biodiversity is possible through recovering autochtonous populations or extension of populations of species from Bulgarian or Ucrainean waters,

- neozoa influx is another possibility of increasing in biodiversity. In the latel 8 years there are mentioned 2 species of brachyuran decapods: *Callinectes sapidus* and *Eriocheir sinensis*. Unfortunately, we assum that they will have a negative impact on ecosystems, if they establish real populations,

-there are still missing the fitophyl shrimps because of disappearing of perennial macrophyte,

-we mention for the first time the presence of pagurans *Diogenes pugilator* in juveniles shells of *Viviparus acerosus* and *Clibanarius erythropus* in juveniles shells of *Rapana venosa*.

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Changes in biodiversity of decapods (Decapoda, Crustacea) (...)

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Species	1930-1970	1971-1980	1981-1990	1991-1995	1996-2000	2001	2002-2003
<i>Hippolyte varians</i> Leach, 1814	+ Bacescu	+ Gutu, Tiganus	-	-	-	-	-
Hippolyte inermis Leach 1815	+ Bacescu	+ Bacescu	-	-	-	-	-
Lysmata seticaudata Risso 1816	+ Bacescu	+ Bacescu	-	-	-	-	-
Athanas nitescens Leach 1813	+ Bacescu, Tiganus	+ Gutu, Bacescu	-	-	+ Micu	+ Micu	+ Micu, Abaza
Processa pontica Sowinsky 1882	+ Bacescu	+ Bacescu	-	-	-	-	-
<i>Palaemon adspersus</i> Rathke 1837	+ Bacescu	+ Bacescu, Gutu	-	+ Petrescu	+ Micu, Abaza	+ Micu	+ Micu
<i>Palaemon elegans</i> Rathke 1837	+ Bacescu	+ Bacescu, Gutu, Tiganus	+ Petrescu	+ Petrescu, Micu	+ Micu, Abaza	+ Micu	+ Micu
Crangon crangon Linnaeus 1758	+ Bacescu	+ Bacescu, Gutu	-	+ Micu	+ Micu, Abaza	+ Micu, Abaza	+ Micu, Abaza

Tab.2. Name of the authors who made researches about decapods from Romanian Black Sea coast

Species	1930-1970	1971-1980	1981-1990	1991-1995	1996-2000	2001	2002-2003
Philocheras fasciatus Risso 1816	+ Bacescu	+ Bacescu	-	-	-	-	+ Micu
Philocheras trispinosus Hailstone 1835	+ Bacescu	+ Bacescu	-	-	-	-	-
Callianassa truncata Giard et Bonnier 1890	+ Bacescu	+ Bacescu	-	-	-	-	-
Callianassa pontica Czerniavsky 1884	+ Bacescu	+ Bacescu	-	-	-	-	-
<i>Upogebia pusilla</i> Petagna 1792	+ Bacescu	+ Bacescu, Gutu	-	-	+ Micu	+ Micu, Abaza	+ Micu
<i>Clibanarius erythropus</i> Latreille 1818	+ Bacescu	+ Bacescu, Gutu	-	-	+ Micu	+ Micu	+ Micu
Diogenes pugilator Roux 1828	+ Bacescu	+ Bacescu, Gutu	+ Petrescu	+ Petrescu, Micu	+ Micu	+ Micu	+ Micu, Abaza
<i>Pisidia longicornis</i> Linnaeus 1767	+ Bacescu, Tiganus	+ Bacescu, Gutu	-	-	-	-	+ Micu
<i>Macropodia</i> <i>cyerniawskii</i> Brandt, 1890	+ Bacescu	-	-	-	-	-	-

Species	1930-1970	1971-1980	1981-1990	1991-1995	1996-2000	2001	2002-2003
Callinectes sapidus Rathbun 1896	-	-	-	-	+ Gomoiu, Skolka, Petrescu, Nicolaev	+ Gomoiu, Skolka	+ Gomoiu, Skolka, Papadopol
<i>Carcinus aestuarii</i> Nardo 1847	+ Bacescu, Andriescu	+ Bacescu, Gutu	+ Petrescu	+ Petrescu	+ Micu, Abaza	+ Abaza	+ Abaza
<i>Liocarcinus arcuatus</i> Leach 1815	+ Bacescu	+ Bacescu, Gutu	-	-	-	-	-
<i>Liocarcinus vernalis</i> Risso 1818	+ Bacescu	+ Bacescu, Gutu	+ Petrescu	+ Petrescu	+ Micu	-	-
Rhithropanopaeus harrisi Maitland 1874	+ Bacescu	+ Bacescu, Gutu	+ Petrescu	+ Petrescu	+ Micu	+ Micu, Abaza	+ Micu, Abaza
Xantho poressa Olivi 1792	+ Bacescu	+ Bacescu, Gutu	+ Petrescu	+ Petrescu, Micu	+ Micu, Abaza	+ Micu	+ Micu

Sînziana Micu and Valeria Abaza

Species	1930-1970	1971-1980	1981-1990	1991-1995	1996-2000	2001	2002-2003
<i>Eriphia verrucosa</i> Forskal 1775	+ Bacescu, Andriescu	+ Bacescu, Gutu	-	-	+ Micu	+ Micu, Abaza	+ Micu, Abaza
<i>Pilumnus hirtellus</i> Linnaeus 1766	+ Bacescu, Andriescu	+ Bacescu, Gutu	+ Petrescu	+ Petrescu	+ Micu	+ Micu, Abaza	+ Micu, Abaza
Brachynotus sexdentatus Risso 1827	+ Bacescu	+ Bacescu, Gutu	+ Petrescu	-	+ Micu	-	+ Micu
<i>Eriocheir sinensis</i> H.Milne-Edwards 1853	Vasiliu	-	-	-	+ Gomoiu, Skolka	-	-
<i>Pachygrapsus marmoratus</i> Fabricius 1787	+ Bacescu, Andriescu	+ Bacescu, Gutu	+ Petrescu	+ Petrescu, Micu	+ Micu, Abaza	+ Micu	+ Micu, Abaza



Fig. 1.Decapoda diversity trend