

**THE DYNAMICS OF THE ICHTHYOFAUNA'S  
ECOLOGICAL GROUPS OF THE DANUBE (IN THE BRAILA  
ZONE) IN DIFFERENT PERIODS**

**DINAMICA GRUPELOR ECOLOGICE ALE IHTIOFAUNEI  
DIN DUNĂRE (ZONA BRĂILA), ÎN DIFERITE PERIOADE**

GHEORGHE DANIELA-CRISTINA, FLOREA LUIZA

*Faculty of Food Science and Engineering, Department of Aquaculture and Environment,  
"Dunărea de Jos" University of Galați  
Str. Domneasca nr.47, 800008 – Galați, Romania*

*From the statistic dates was analyzed the dynamic of the different species of fish and the ecological groups which are taking part, on the Danube, in the Braila zone, realized in different periods.*

**Key words:** the Danube, captures, ichthyofauna, limnique species, rheophile species, semi migratory, catadromous migratory species.

**Introduction**

Of the Romania's natural richness, the fishing and the fish occupied and still occupy an importance place between the domains of national importance. The Danube hydrographical basin included the richest ichthyofauna from all the European rivers. This biodiversity of the piscicultural communities is conditioned by the big capacity of the river and by the variation of the ecological conditions.

Along the time the ichthyofauna undergoes the importance modification (the change quantitative and qualitative), either because of natural conditions from river, but especially the human intervention: the damming (over 85% from Danube floodplain surface was dammed-up, the barrages making, the navigation intensification, the pollution, the poaching, etc).

In the past, the Lakes of Braila, had a total length of approximate 60 km and a width of 23 km in the maximum point, totalizing a surface of 96 000 ha. If at this surface it adds and external floodplain, then the complete surface it's raising to over 153 000 ha.

As a result of the hydrotechnical arrangements from 1964-1970 which were effectuated on the Braila's Lake through draining, the damming and the directing soil to use in agriculture (the Big Island of Braila), from what was one of the most vast zone the floodplain, today just a rest. So, at 1990 end, from the total surface of

the Braila's Lake complex was found in natural and semi natural conditions of 30 300 ha

The fish from Danube and from the due afferent floodplain present different strategies of reproduction and it seems that the specialization for a certain mode of reproduction it's much more varieties confrated by the feeding strategy. Many ichthyologists tried the fish classification, in different communities to reflect a certain mode or a certain strategy to realize the principal's physiological processes. So, the ichthyofauna was divided in reproductive trophyc and migration groups. By after the migration criterion for reproduction, the ichthyofauna with economical importance from Danube it's divided in four big ecological groups:

➤ **The catadromous species** (*the beluga sturgeon, the starry sturgeon, the Russian sturgeon, the Pontic shad, the Caspian shad*) – these are the species which migrate for reproduction from Black Sea in Danube River, after that they turn in the sea.

➤ **The semimigratory fish** (*the common carp, the wels catfish, the pikeperch, the common bream, the white bream, the ziege, the ide, the bleak*) - these are the species witch are lives in the river and witch in the spring penetrate the lakes for to reproduce and the summer or autumn they return in the Danube river.

➤ **The rheophill fish** (*the sterlet, the vimba, the asp, the barbel, the silver carp, the grass carp, the bighead carp, the sneep, the white-eye bream, the burbot, the zingel, the Danube streber*) – this species lives permanently in the run water , they feed and reproduce here. In lakes they penetrate incidental the: the zingel, the asp, the asiatic ciprinide.

➤ **The limnique species** (*the pumpkinseed, the crucian carp, the goldfish, the european perch, the roach, the northern pike, the rudd, the ruffe, the tench*) – are the species which live and reproduce permanently in the lakes or in the river's slow parts.

## Materials and Methods

To prove the changes which intervned in the river's ichthyofauna structure, we used information's about industrial captures took over from different sources, for analyzed periods like this:

- For 1952-1962 "The Rumanian Limnology sector Danube River" (The Monographic Study) – cap. The fish quantity fished in Rumanian's sector of the Danube river in 1952-1962%", from where I worked information in Braila – Calarasi sector (Th.Busnita).

- For 1972-1986 period – PhD these, Florea Luiza.

- For 2006-2007 periods - information took over from ANPA.(National Agency of Aquaculture and Fishing)

This information were processed statistically and analyzed.

## Results and Discussions

As a result of this worked information for Braila's area, I established the following structure of the ichthyofauna components and relative abundance of each species in the analyzed periods.

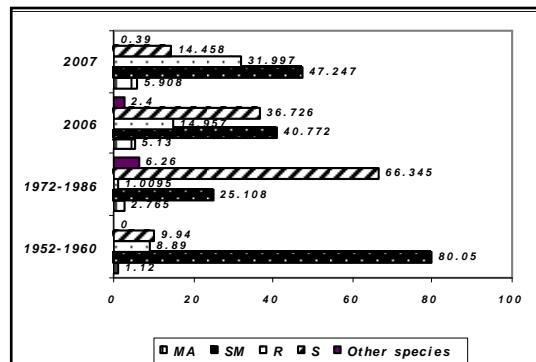


Fig.1 The evolution's captures, on ecological groups, in the analyzed period

It's being observed that in the period:

- In **1952-1962** period, before the damming, the structure of the industrial capture was:
  - 80.05% semimigratory species
  - 9.94% limnique species
  - 8.89% rheophilic species
  - 1.12% migratory marine species (catadromous)

In this period the domination in captures it's being held by the semimigratory species.

- In **1972-1986**. the period immediately after damming the structure of industrial capture was:
  - 66.34% limnique species
  - 25.10% semimigratory species
  - 2.76% migratory marine species (catadromous)
  - 1.01% migratory marine species

The domination in captures dues to the limnique species. with the percentage 66.64%, owed the new life conditions created in ecosystem's after damming.

➤ In **2006-2007** periods, between ecological groups it's being observed equilibrium. In this period, for every Danube sector established a certain capture (TAC=Total Admissible Capture). The information are taken over from ANPA and centralized on Braila region, where the fishermen associations are developing the activity. The information's credibility reported from the fisherman associations is approximately 70%.

- In **2006** year the structure of ecological groups it's being presented was:
  - 40.77% semimigratory species
  - 36.76% limnique species

- 14.95% rheophil species
- 5.13% migratory marine species (catadromous)
- In 2007 year, the structure of ecological groups it's being presented was:
  - 47.24% semimigratory species
  - 31.99% rheophil species
  - 14.45% limnique species
  - 5.91% migratory marine species (catadromous)

The richness in species is an indicator of ecosystem conditions and its presents in next figure.

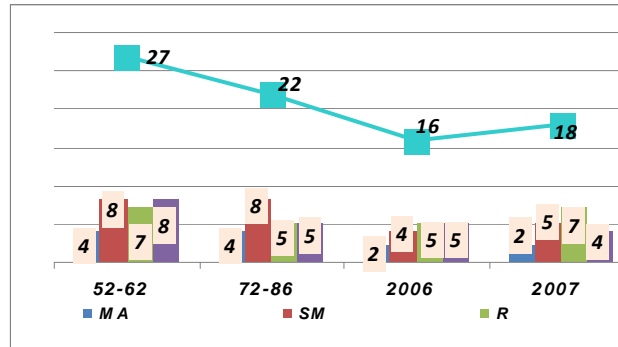


Fig. 2 The dynamic of richness in species (in analyzed period)

We consider the 1952-1965 period, as “reference period” when the intervened modifications over different cenossies and implicit ichthyofauna were due in big part the natural evolution and less the antropic intervention. Following the number of the captured species in the analyzed periods, it's being observed a continuous decrease comparative with the reference period. So, from 27 species captured in this period, the number of economical species with importance, the industrial captures decrease at 16 (in 1970-1986 period), with a jump in 2007 at 18 species. This situation isn't due that these species disappeared but some species are in regress, and the dominance in captures is very small.

The dominant species evolution in these four ecological groups is the next:

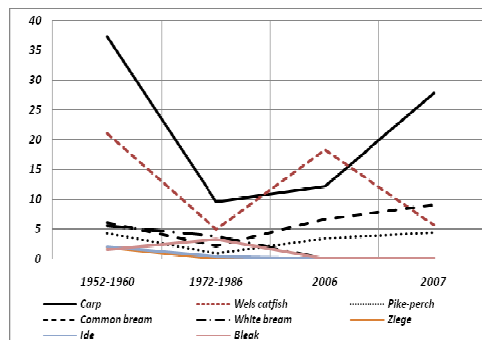


Fig. 3 The dynamic of the semimigratory species

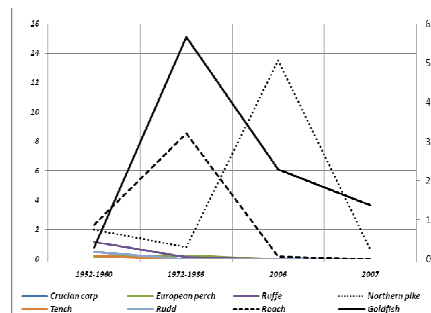


Fig. 4 The dynamic of the limnique species

1. The semimigratory species group is dominated of the carp presence in percentage between 40% and 10% by the total capture.

2. The limnique species group – the dominant species is the goldfish in the captures after 1970, followed by the roach. In the 1970-1986 periods, the goldfish owned 55, 57%. In 2006 year, the northern pike had a big increase – 13, 57%.

3.

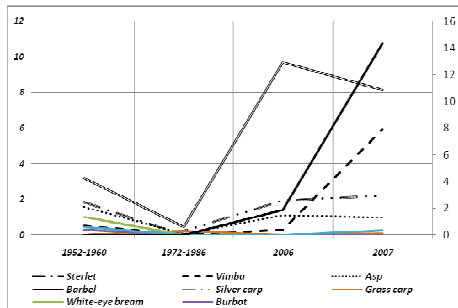


Fig. 5 The dynamic of the rheophil species

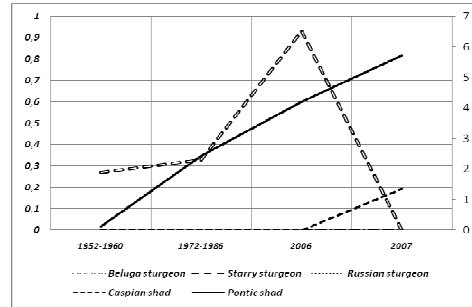


Fig. 6 The dynamic of the marine species

The rheophil species group: the barbell maintains her dominance in the rheophil industrial captures. The asiatic cyprinid, introduced in Romania after 1970, begin after 1986 to have importance percentage in captures, the prove being their reproduction in Danube.

3. The marine migratory species group (catadromous): the sturgeons had always small percentages in the industrial captures. After damming their decline was owned the habitats loss and the environment conditions change.

## Conclusions

➤ The Danube's ichthyofauna's structure depends of many factors, as: the hydrological regime, the reproduction conditions (the temperature of water, during the inundation period, the trophic base quantitative, the water quality, etc). The damming of Danube's floodplain constituted the principal factor of order which had as result the loss of specific habitats for reproduction and feeding, especially for semimigratory and limnique groups of fish. The demand from the 612 ha of floodplain on 1 km of the Danube's length to 118 ha of floodplain on 1 km of the Danube's length, represents a diminution with 80% of the traditional habitats for reproduction and feeding.

➤ After damming, the semimigratory species were the most affected due to the lost and the degradation of the habitats. The carp, which in the past, before the damming was (together the Wels catfish) the biggest percentage in captures (37, 39% and 21, 12%) after damming period, decreased at 9, 57% and respective 4, 94%. In the last analyzed period it's being observed a tendency of straightening a

percentage of carp in the captures. The only semimigratory species which shows an evident increase of capture after reference period is the bream.

➤ The limnetic species show an increase of approximately 7% or in the captures owing to the increase of the goldfish, which reaches at much more than half from the industrial capture, approximately 55%. In exchange, the crucian carp, the northern pike, the tench, are in decline.

➤ Concerning the rheophilic structure species, in the Braila zone, this species had a smaller percentage, but in equilibrium. After damming, the percentage of this ecological group decreased very much in the industrial capture; disappear from the captures species as: the burbot, the Danube sturgeon, the starlet. This species hasn't disappeared but this percentage was very insignificant and introduced as "other species". In last analyzed period it's being observed a return of rheophilic species. These increases especially the asiatic cyprinids, which has a percentage as far as 10%.

➤ The marine migratory group shows a regress after damming. As structure, from the literature information, the beluga sturgeon and the russian sturgeon, are the most affected species of sturgeons in this period, owing to the interruption of migration towards the upper sector of Danube, where were favorable places for reproduction; as well the sturgeons decline being owed for environment change conditions but not on the last place the supraexploitation, the sturgeons being the fish with a big economical importance. The only species, which has a positive evolution in this group, is the pontic shad. In the last analyzed period, in the captures, we find only the pontic shad and the caspian shad. The sturgeon fishing was forbidden for a 10 years, as a conserving measure of sturgeon species, which population was drastically reduced.

➤ For a clear image of the ichthyofauna structure from the Danube, it's necessary ANPA statistics registering continuity and the development of a scientific monitoring of the Danube's ichthyofauna's situation.

## Bibliography

1. **A., Vădineanu,** (2004) – *"The development management – An ecosystemic landing"* – (chapter.3.3 *"Lower Danube wetlands system"*)
2. **ANPA, Galați** – *The statistics of industrial capture, Braila areas, in the 2006, 2007 periods.*
3. **D., Davidescu,** (2002) – *The conservation of biodiversity of the vegetable's and animal's species", chapter III, „The piscicultural fauna”, Nicolae Bacalbasa-Dobrovici*
4. **L., Florea,** (1998) - *PhD these*
5. **L., Florea, D., Gheorghe,** *„The analysis of the semimigratory and the limnetic ichthyofauna in the Danube's sector without floodplain comparative with the sectors with floodplain”; The National Conference of Ecology with the topic: “The protection and restoration of bio and the eco-diversity's. The fundamental*

*measures for the adaptation at the climate's changes and the ecological sustainability's assurance of the*

6. *Romania's development, Mamaia 11-14 October 2007, ``The National Conference's Volume of ecology, ISBN: 978-973-558-315-6.*

7. **Th., Bușniță** (1967) – *“The Rumanian Limnology sector Danube River” (The Monographic Study) – cap. “The fish quantity fished in Rumanian's sector of the Danube River in 1952-1962%”.*

8. **P., Bănăreșcu** (1964) – *„The fauna of the Socialist Republic Romania, The ganoids and the osseous fish”, tome XIII*