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GA4: Prut River investigation

D1. Site hydrobiological study (including fish sampling) performed across and alongside Prut River from the entry into the Romanian territory to the confluence with Danube river

Investigations were carried out in the Institute of Zoology of the Academy of Sciences of Moldova.Water samples and biological samples were collected in June and August 2012 in Costesti-Stinca accumulation lake directly from the lower Prut (Braniste, Sculeni Leuseni Leova Cahul , Cislita-Prut,Giurgiulesti). Investigations are focused on the assessment of diversity, quantitative structure, peculiarities production of bacteriological-, phyto-, zooplankton, zoobenthos, ichthyofauna as well as determining trophic status and water quality of the river Prut.

D1.1 The monitoring of the structural and functional characteristics of the main aquatic organisms communities inhabiting the River Prut

Bacterioplankton. Obtained results show that functional biodiversity of bacterioplankton in Costesti-Stinca Lake and in r.Prut is abundant. Were certified following groups of bacteria: nitrogen-fixing (aerobic, anaerobic), ammonification, nitrification, denitrification phosphatminirealizing, amylolytic, cellulolytic, and petrolium oxidant phenolytic. Water purification potential in r.Prut is high, which demonstrates increased numbers of microorganisms ammonifying number to 10.0 thousand at / mL in st. Leuseni, the amylolytic up to 4.0 thousand / ml and denitrification until 1500 that / ml at Caslita-Prut (Table 1). In August numerical number of physiological groups of microorganisms in Prut River was about two times higher as in June, and 7 times higher at Lake Costesti - Stinca. Bacterioplankton increasing in August is probably due to climate changes that have occurred in recent months.

Tabel 1

Quantitative indices of main physiologic groups of microorganisms from Prut river and Costesti-Stinca lake (thousand cell/ml), 2012.

Station	Ammonificators	Denitrificatiors	Phosphamineralizators	Amylolytic	Phenolitici	Petroleum-oxidants	Heterotrophics
Iunie 2012							
Costeşti-Stânca	0,20	0,050	0,250	0,150	0,59	0,60	0,255
Branişte	0,64	0,080	0,350	1,600	1,00	1,50	0,705
Leova	0,390	0,070	0,200	0,600	0,700	1,800	0,370
Cahul	0,40	0,100	0,110	0,550	0,610	1,500	0,180
Câşliţa-Prut	1,10	1,50	0,40	4,0	1,20	2,0	2,22
August 2012							
Costeşti-Stânca	3,20	0,50	0,070	0,980	0,600	1,90	6,880
Branişte	3,00	0,30	0,020	0,900	1,000	1,30	6,080
Sculeni	0,20	1,00	0,090	0,600	0,808	1,000	0,510
Leuşeni	2,160	0,300	0,080	0,360	0,700	0,960	1,420
Leova	2,200	0,400	0,300	1,000	0,500	1,100	3,000
Cahul	1,800	0,450	0,200	2,480	1,000	2,500	3,600
Câşliţa-Prut	1,200	0,380	0,095	0,900	0,900	2,00	1,420
Giurgiuleşti	1,00	0,390	0,097	0,950	0,800	1,800	1,460

Investigation of microorganisms involved in decomposition of toxic substance (phenol) and poorly degradable (oil) we found that these groups of bacteria are well represented numerically. Numerical density of phenolytics varies from 0,1 thounds cells/ ml to 1,2 thounds cells / ml, number of petroleum oxidative bacteria from 0,4 thounds cells/ml to 2,5 thounds cells/

ml (Table 1). This indirectly indicates that studied aquatic ecosystems are polluted with phenols and in particular with oil substances.

The results of total bacterioplankton numerical density, bacterial production and destruction found that the lowest total bacterioplankton number density was recorded at station Câşliţa - Prut - 0.7 mln. cells / ml. We have to mention the most microbiologically loaded sector was Leuseni (2.4 to 17.5 mln.cells / ml). Bacterial production varies very much from 0.01 cal / l * 24h. (St.Leuşeni) to 10.1 cal / l * 24h (St. Leova). Destructions bacterial indices ranging from 0.0 cal / l * 24h to 32.33 cal / l * 24h. (Table 2).

Tabel. 2

Quantitave indices of bacterioplankton in lake Costeşti – Stânca and Prut river. 2012

Station	P(cal/lx24h)	P(cal/lx24h)	N total (mln.cells/ml)
June 2012			
Costeşti - Stânca	3,22	16,93	1,1
Branişte	5,39	28,36	0,9
Leova	4,75	25	0,6
Cahul	4,65	24,46	7,5
Câşliţa – Prut	4,52	23,81	0,7
August 2012			
Costeşti - Stânca	0,232	1,22	4,3
Branişte	8,91	1,69	4,1
Sculeni	0,58	0,11	3,1
Leuşeni	0,01	0	17,5
Leova	10,1	1,92	2,4
Cahul	0,01	0	5,4
Câşliţa – Prut	2,65	0,5	2,1
Giurgiuleşti	0,01	0	1,4

Phytoplankton. In the phytoplankton composition were identified 56 species and intraspecific taxa of planktonic algae which refers to 6 phylums : Cyanophyta - 6, Chrysophyta -1, Dinophyta - 1, Bacillariophyta - 24, Euglenophyta - 4, Chlorophyta - 20. Most common were Merismopedia tenuissima species, Monoraphidium contortum, Monoraphidium komarkovae, Scenedesmus quadricauda, Trachelomonas hispida, Chlamydomonas globosa, Navicula cryptocephala, Cocconeis placentula, Nitzsche acicularis, Cyclotella kuetzingiana. Phytoplankton number ranged within 6.13 to 28.12 mln.cells / l, with biomass from 2.46 to 9.70 g/m3 (Figure 1). The principal number in phytoplankton number belong to cyanophyte algae and the biomass formation to chlorophyte and bacilariophyte algae. Dynophyte algae are represented mainly by Ceratium hirundinella species were found only in the inferior sector of Costesti-Stinca accumulation lake, with biomass 4.37 g/m3.

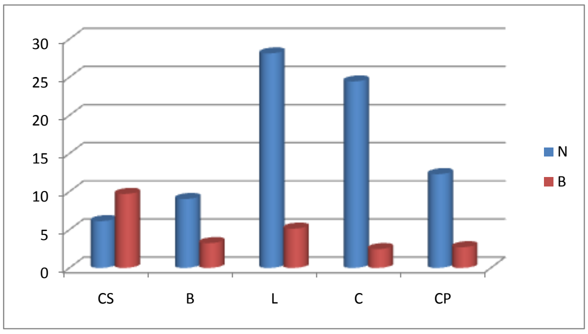

Fig.1. Effective (N-mln cells/l.)and biomass (B-g/m^3) of phytoplankton in inferior sector of lake Costeşti-Stânca (CS) and river Prut (B-Branişte, L-Leuşeni, C-Cahul, CP-Câşliţa-Prut) in summer 2012.

High values of flock phytoplankton in the river inferior sector are due to intense development of cyanophyte algae at Leova (22.4 mln cells/l) and Cahul (21,6 mln cells/l) stations

From 56 identified species of phytoplankton 34 are indicatives of water saprobity. Of which 62% are β-mezosaprobic species, 12% are α-mezosaprobic species and 9% are β-o and o–β saprobic species(Figure. 2)

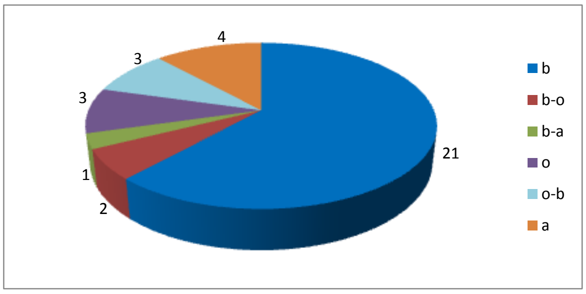

Fig. 2. Distribution of indicative species from the composition of phytoplankton in the summer time of Prut river in saprobity areas

Saprobic index values according the indicative species in composition of phytoplankton had ranged from 1.69 to 2.26 and were within the β-mezosaprobic area, water quality being good in the medial river sector and most polluted in the inferior sector.

Were established valuable differences between the values of primary production of phytoplankton and organic substances destructions in various sectors of Prut river. Maximum intensity of production processes in June was recorded in the inferior sector of the reservoir Costesti-Stinca (5,51 gO_2/m^{-2} 24h) and the medial sector of river at stations Braniste, Leuseni, and primary production values had been within 2,25-4,28 gO_2/m^{-2} 24h (Figure 3.).

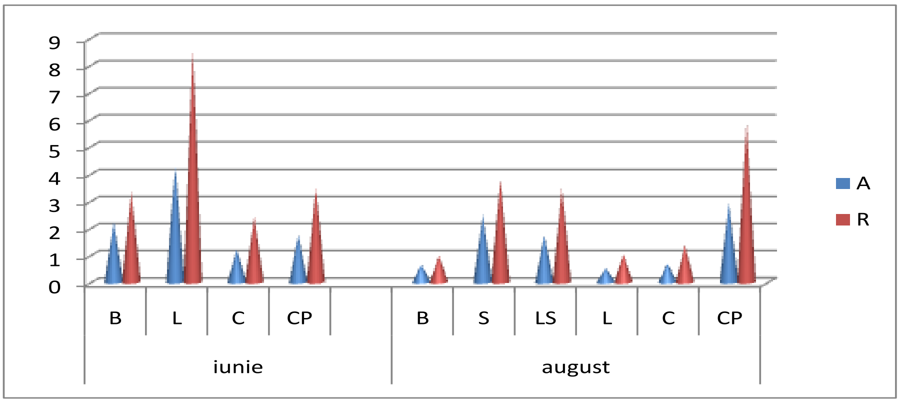

Fig. 3. Dynamics of phytoplankton primary production (A- gO_2/m^{-2} 24h) and destruction of organic substances at Prut river (B-Braniste, S-Sculeni, LS-Leuseni, L-Leova, C-Cahul, CP-Caslita-Prut) in the summer of 2012.

In August the highest primary production values were recorded in the inferior sector of the lake Costesti-Stinca (1,88 gO_2/m^{-2} 24h) and at the stations Sculeni(2,53 gO_2/m^{-2} 24h), Leuseni(1,73 gO_2/m^{-2} 24h) from the medial sector, and at Caslita-Prut(2,93 gO_2/m^{-2} 24h) of the inferior sector of Prut river. Spatial fluctuations in primary production values in river are accompanied by fluctuations of phytoplankton biomass, succession structure of planktonic algae community, nutrient elements concentrations and the values of water transparency oscillations changes, conditioned of substances subject matter.

Destructions values of organic substances exceeded the values of primary production of phytoplankton as in the inferior sector of the reservoir Costesti-Stinca, as in all river sectors. Such destructions values of organic substances in Prut river in June were ranged within the 2.46 to 8.56 gO_2/m^{-2} 24h, the maximum was recorded at station Leuseni (Figure 3.). In August values of organic matters destruction ranged from 0.97 to 5.86 gO_2/m^{-2} 24h, the maximum was recorded at station Caslita-Prut. Much higher values were the destructions values in inferior sector of Lake Costesti-Stinca in June (13,73 gO_2/m^{-2} 24h) and in August(41,18 gO_2/m^{-2} 24h), being correlated direct with primary production and biomass values of phytoplankton.

Ratio A/R lower then 1 reflect the negative balance of formation of organic matters in the river, and denotes the high content of allochthonous substances.

Zooplankton. Were identified 74 species and varieties of 3 taxonomic groups (Rotatoria, Copepoda, Cladocera), of which most (67% of total zooplankton) are *Rotatoria* species. From Copepoda are 13 species and varieties, which is 18% and the Cladocera - 11 species or 15% of the species and varieties recorded. Despite the taxonomic dominance of Rotatoria, just two species (Keratella quadrata, Brachionus angularis) were recorded in all investigated samples. The richest in terms of taxonomic diversity are stations Breniste and Caslita-Prut.

Investigations showed that the indicative species represent 80% of the total number of species. More precisely, prevails indicator species of beta-mezosaprobity (34% of the total) and oligo-beta-mezosaprobity (22%). Oligosaprobe indicative species constitue 14%. In case of indicative species of a higher level pollution (alpha-and beta-alpha-mezosaprobic) was found that their number was small and did not exceed 8% overall. There has been only one indicative alpha-mezosaprobic-polisaprobe specia terms and only one of xeno-oligosaprobe conditions indicator.

Some of the samples are still in the analysis.

Benthic macroinvertebrates. Monitoring of freshwater ecosystems necessarily includes macrozoobentonice animals as a subject, this group of animals submitted to meet several requirements as indicator organisms: the large spread, enough high number effective, relatively large size of the body, the combination of populating certain biotopes and a certain degree of mobility. Benthic invertebrates were sampled using standardized methods with the Petersen grab, area of capture - 250 cm^2 or 1/40 m^2. For qualitative samples it has been used a Dredge for different substrates including macrophytes. For the preservation of the samples it has been used formaldehyde 4% and alcohol 70 %.

The large Bivalvia molluscs were identified in the field, weighted and left in the found ecosystem according to the recommendations of the AQEM. All the other organisms were sorted as much as possible by groups or species afterwards in the laboratory and identified with using identification keys. (Jadin,1952; Kutikova L.A. Starobogatov E.I. (eds), 1977; Tsalolikin (ed.) 1994, 1995, 1997, 2004)

Afterwards, in the laboratory the samples were washed, the organisms were sorted, identified, counted and weighted. The biomass of benthic organisms was determined via their weighting being previously dried up on a filter paper in the disappearance of wet spots.

Diversity, abundance. During the summer 2012, were identified 54 invertebrate taxa that were collected using different sampling methods: Dredge and Petersen grab. ***Nematoda; Oligochaeta:*** *Lumbriculidae Gen sp, Limnodrilus hoffmeisteri, Nais spec. none, Stylaria lacustris, Tubifex sp.div, Tubifex tubifex;* ***Gastropoda;*** *Lymnaea ovata, Physa acuta, Planorbis sp. Juv, Theodoxus fluviatilis, T. danubialis, Valvata piscinalis, Bithynia tentaculata, Lithoglyphus naticoides, Fagotia esperi, F. acicularis;* ***Bivalvia:*** *Anodonta cygnea, Anodonta piscinalis, Anodonta zellensis, Sinanodonta woodiana, Unio pictorum, Unio tumidus, Pisidium amnicum, P. casertanum, Dreissena polymorpha, Dreissena bugensis, Corbicula fluminea;* ***Crustacea****: Limnomysis benedeni, Paramysis lacustris, Dikerogammarus villosus, D. haemobaphes, Corophium nobile, C. curvispinum, Iphigenela andrussowi;* ***Ephemeroptera:*** *Potamanthus luteus, Caenis sp., Baetis sp., Palingenia longicauda;* ***Trichoptera:*** *Hydropsyche ornatula, Traenodes bicolor**,** Limnephelidae, Hidroptila tineoides, Hidroptila sp., Leptoceridae;* ***Odonata:*** *Coenagrion sp., Agrion splendes, Erythromma najas**;*** ***Heteroptera:*** *Nepa cineria;* ***Diptera:*** *Chironomus plumosus, Chironomini Gen. sp, Orthocladius sp.,* ***Tabanidae,*** *Megaloptera (Sialidae).*

The number of species in each sampling site was significantly different. The greatest diversity was observed in Braniste. This difference may occur because of various ecological conditions: hydromorphological, hydrochemical, substrates, and the level of anthropogenic load.

The Neozoa species: *Sinanodonta woodiana, Dreissena bugensis, Corbicula fluminea.*

The total biomass varied from 0,2627 g/m^2 (Cahul) to 44,846 g/m^2 (Braniste) for samples were collected with the Petersen grab. The biomass without mollusks from 0,216 g/m2 (Leova) to 19,406 g/m^2 (Braniste). Density varied from 346 ind/m^2 (Cahul) to 16567 ind/m^2 (Braniste).

Total taxa, Iune, 2012

	Zoobenthos without mollusk		Total zoobenthos	
	ex/m^2	g/m^2	ex/m^2	g/m^2
Braniste	15927	19,406	16567	44,846
Leova	884	0,216	1364	1,056
Cahul	346	0,2637	346	0,2627
Cislita				

D.1.2 Qualitative and quantitative characterization of fish populations, aiming at preserving their biodiversity.

The ihtiologic material was collected in summer 2012 in Prut river and in lake Costeşti-Stânca using the stationary mesh (dimentions of 15 mm × 15 mm - 80 mm × 80 mm) and mesh for spown (l = 6 m and dimentions of 5 mm) (Fig. 3).

The most captured individuals were returned alive to the water. For laboratory study small quantity was fixed in 4% formalin solution. Ichthyologic material analysis was performed by using classical ecological and ichthyologic methods [1, 2, 3].

As a result of ichthyologic investigations, in the Prut river ecosystem, was established the ichthyologic composition of 39 species of fish assigned to 9 families and 6 orders: Order *Clupeiformes*, fam. *Clupeidae* (1 species), *Order Esociformes*, fam. *Esocidae* (1 species), Order *Cypriniformes*, fam. *Cyprinidae* (22 species), fam. *Cobitidae* (2 species), Order *Siluriformes*, fam. *Siluridae* (1 species), Order *Gasterosteiformes*, fam. *Gasterosteidae* (2 species) Order *Perciformes*, fam. *Percidae* (4 species), fam. *Gobiidae* (4 species), fam. *Centrarchidae* (1 species).

To highlight the comparative appearance of ichthyofauna in Prut ricver and ihtiofaunic succession in last decades was used analyze of the existing literature in the field, starting with scientists data: Popa L. [5, 6, 7] V. Grimaliskii [8], Dolghii V. [9] M. Usatîi [10] G. Davideanu [11] and to date (Table 1).

Tabel 1. Ichtyofaun diversity in river Prut in 2012 and its quantitative indices.

Nr. d.o	**Fish species**	r.Prut 2012		Lake Costești-Stânca 2012		Lakes Beleu and Manta 2012		r.Prut basine Popa L.*	r.Prut basine Usatîi M.**	r. Prut Davideanu ș..a.***
		Numeric abundance	Relative abundance %	Numeric abundance	Relative abundance %	Numeric abundance	Relative abundance %	Species diversity 1960-1963 1968-1974	Species diversity 1996-1997	Species diversity 2008

Ord. Petromizontiformes Fam. Petromyzontidae										
1	***Eudontomyzon mariae*** (Berg, 1931) **Chişcar de râu**	-	-	-	-	-	-	+	-	-
Ord. Acipenseriformes Fam. Acipenseridae										
2	***Acipenser ruthenus*** Linnaeus,1758, **Cegă**	-	-	-	-	-	-	+	-	-
3	***Acipenser nudiventris*** Lovetsky, 1828 **Viză**	-	-	-	-	-	-	+	-	-
Ord. Clupeiformes Fam. Clupeidae										
4	***Alosa tanaica*** (Grimm,1901) **Rizeafcă**	14	3,44	-	-	45	10,92	-	+	-
Ord. Salmoniformes Fam. Salmonidae										
5	***Hucho hucho*** (Linnaeus,1758) **Lostriță**	-	-	-	-	-	-	+	-	-
6	***Salmo trutta fario*** Linnaeus, 1758 **Păstrăv indigen**	-	-	-	-	-	-	+	-	-
7	***Oncorhynchus mykiss*** (Walbaum,1792) **Păstrăv curcubeu**	-	-	-	-	-	-	+	-	-
Ord. Esociformes Fam. Esocidae										
8	***Esox lucius*** Linnaeus,1758 **Știucă**	-	-	-	-	1	0,24	+	+	+
Fam. Umbridae										
9	***Umbra krameri*** Walbaum,1792 **Țigănuş**	-	-	-	-	-	-	+	-	-
Ord. Cypriniformes Fam. Cyprinidae										
10	***Cyprinus carpio carpio*** Linnaeus, 1758 **Crap**	7	1,72	3	1,41	13	3,16	+	+	+
11	***Carassius carassius*** (Linnaeus, 1758) **Caracudă**	-	-	-	-	-	-	+	-	-
12	***Carassius gibelio*** (Bloch, 1782) **Caras argintiu**	24	5,9	5	2,35	57	13,83	+	+	+
13	***Barbus barbus*** (Linnaeus,1758) **Mreană**	1	0,25	-	-	-	-	+	-	+
14	***Barbus borysthenicus*** Dybowski, 1862 **Mreană de Nipru**	-	-	-	-	-	-	+	-	-
15	***Barbus petenyi*** Heckel, 1852 **Mreană vânătă**	-	-	-	-	-	-	+	-	-
16	***Tinca tinca*** (Linnaeus, 1758) **Lin**	-	-	-	-	-	-	+	-	-
17	***Chondrostoma nasus*** (Linnaeus, 1758) **Scobar**	2	0,49	-	-	-	-	+	-	+
18	***Gobio gobio*** (Linnaeus, 1758) **Porcuşor comun**	-	-	-	-	-	-	+	-	+
19	***Romanogobio vladykovi*** (Fang, 1943) **Porcuşor de şes**	3	0,74	-	-	2	0,49	+	-	+
20	***Romanogobio kesslerii*** (Dybowski, 1862) **Porcuşor de nisip**	-	-	-	-	5	1,21	+	-	+
21	***Pseudorasbora parva*** (Temminck & Schlegel, 1846) **Murgoi bălțat**	4	0,98	2	0,94	12	2,91	-	+	+
22	***Abramis brama*** (Linnaeus, 1758) **Plătică**	12	2,95	19	8,92	6	1,46	+	+	+
23	***Ballerus sapa*** (Pallas, 1814) **Cosac cu bot turtit (ocheană)**	15	3,69	7	3,29	4	0,97	+	+	+
24	***Blicca bjoerkna*** (Linnaeus, 1758) **Batcă**	26	6,38	4	1,88	15	3,64	+	+	+
25	***Vimba vimba*** (Linnaeus, 1758) **Morunaş**	2	0,49	9	4,23	1	0,24	+	-	+
26	***Rutilus rutilus*** (Linnaeus, 1758) **Babuşcă**	7	1,72	15	7,04	19	4,61	+	+	+
27	***Rhodeus amarus*** (Bloch, 1782) **Boarță**	21	5,16	3	1,41	14	3,4	+	+	+
28	***Aspius aspius*** (Linnaeus, 1758) **Avat**	25	6,14	6	2,82	8	1,94	+	+	+
29	***Pelecus cultratus*** (Linnaeus, 1758) **Sabiță**	9	2,21	-	-	4	0,97	+	-	+
30	***Squalius cephalus*** (Linnaeus, 1758) **Clean**	2	0,49	-	-	1	0,24	+	+	+
31	***Leuciscus idus*** (Linnaeus, 1758) **Văduviță**	9	2,21	-	-	3	0,73	+	+	+
32	***Phoxinus phoxinus*** (Linnaeus, 1758) **Boiştean**	-	-	-	-	-	-	+	-	-
33	***Leuciscus leuciscus*** (Linnaeus, 1758) **Clean mic**	-	-	-	-	-	-	-	-	-
34	***Scardinius erythrophthalmus*** (Linnaeus, 1758) **Roşioară**	4	0,98	2	0,94	5	1,21	+	+	+
35	***Hypophthalmichthys molitrix*** (Valenciennes, 1844) **Sânger**	19	4,67	11	5,16	16	3,88	+	+	-
36	***Hypophthalmichthys nobilis*** (Richardson, 1845) **Novac**	2	0,49	8	3,76	2	0,49	-	-	-
37	***Ctenopharyngodon idella*** (Valenciennes, 1844) **Cosaş**	4	0,98	9	4,23	3	0,73	-	-	-
38	***Leucaspius delineatus*** (Heckel,1843) **Fufă**	7	1,72	-		12	2,91	+	+	+
39	***Alburnus alburnus*** (Linnaeus, 1758) **Obleț**	59	14,5	42	19,72	37	8,98	+	+	+
40	***Alburnoides bipunctatus*** (Bloch, 1782) **Beldiță**	-	-	-	-	-	-	+	-	+
Fam. Balitoridae										
41	***Barbatula barbatula***(Linnaeus, 1758) **Grindel**	-	-	-	-	-	-	+	-	-
Fam. Cobitidae										
42	***Cobitis taenia*** Linnaeus,1758 **Zvârluga**	2	0,49	9	4,23	5	1,21	+	-	+
43	***Cobitis elongatoides*** Bacescu et Maier, 1969 **Zvârluga de Dunăre**	7	1,72	-	-	1	0,24	-	-	+
44	***Sabanejewia aurata aurata*** (De Filippi, 1863) **Câră**	-	-	-	-	-	-	+	-	+
45	***Misgurnus fossilis*** (Linnaeus,1758) **Țipar**	-	-	-	-	-	-	+	-	+
Ord. Siluriformes Fam. Siluridae										
46	***Silurus glanis*** Linnaeus,1758 **Somn**	18	4,42	2	0,94	17	4,13	+	+	+

Ord. Gadiformes Fam. Lotidae										
47	***Lota lota*** (Linnaeus,1758) **Mihalț**	-	-	-	-	-	-	+	-	+
Ord. Gasterosteiformes Fam. Gasterosteidae										
48	***Pungitius platygaster*** (Kessler,1859) **Osar**	-	-	3	1,41	-	-	+	-	-
49	***Gasterosteus aculeatus aculeatus*** Linnaeus,1758 **Ghidrin**	-	-	-	-	3	0,73	-	-	-
Ord. Sygnathiformes Fam. Sygnathidae										
50	***Syngnathus abaster*** Risso, 1827 **Undrea**	-	-	-	-	-	-	+	-	-
Ord. Perciformes Fam. Percidae										
51	***Perca fluviatilis*** Linnaeus,1758 **Biban**	2	0,49	16	7,51	4	0,97	+	+	+
52	***Sander lucioperca*** (Linnaeus, 1758) **Şalău**	15	3,69	12	5,63	9	2,18	+	+	+
53	***Gymnocephalus cernuus*** (Linnaeus, 1758) **Ghiborț**	21	5,16	5	2,35	21	5,1	+	+	+
54	***Gymnocephalus schraetser*** (Linnaeus, 1758) **Răspăr**	-	-	-	-	-	-	+	-	+
55	***Gymnocephalus baloni*** Holcík & Hensel, 1974 **Ghiborț de Dunăre**	15	3,69	-	-	48	11,65	-	-	-
56	***Zingel streber*** (Siebold, 1863)**Fusar**	-	-	-	-	-	-	+	-	+
57	***Zingel zingel*** (Linnaeus, 1766) **Pietrar**	-	-	-	-	-	-	+	-	-
Fam. Gobiidae										
58	***Neogobius kessleri*** (Guenther, 1861) **Guvid de baltă**	5	1,23	-	-	4	0,97	-	-	+
59	***Neogobius gymnotrachelus*** (Kessler, 1857) **Mocănaş**	6	1,47	-	-	2	0,49	-	-	+
60	***Neogobius melanostomus*** (Pallas, 1814) **Stronghil**	-	-	-	-	-	-	-	-	+
61	***Proterorhinus semilunaris*** (Heckel, 1837) **Moacă de brădiş**	8	1,97	-	-	-	-	+	+	+
62	***Neogobius fluviatilis*** (Pallas, 1814) **Ciobănaş**	28	6,88	21	-	9	2,18	+	-	+
Fam. Centrarchidae										
63	***Lepomis gibbosus*** (Linnaeus, 1758) **Biban-soare**	2	0,49	-	-	4	0,97	+	+	+
Fam. Odontobutidae										
64	***Perccottus glenii*** Dybowski, 1877 **Guvidul de Amur**	-	-	-	-	-	-	-	-	+
Ord. Scorpaeniformes Fam. Cottidae										
65	***Cottus gobio*** Linnaeus, 1758 **Zglăvoacă**	-	-	-	-	-	-	+	-	-
66	***Cottus poecilopus*** Heckel, 1837 **Zglăvoacă pestriță**	-	-	-	-	-	-	+	-	-
	Total (specii)	**35**		**22**		**35**		**54**	**23**	**41**

* Some described species names in 1974 have been perfomed according the new nomenclature.

In Prut riverbed are determined the following species with the highest values of relative abundense: *Alburnus alburnus l(14,5%), Blicca bjoerkna (6,38%), Silurus glanis (4,42%), Aspius aspius (6,14%), Hypophthalmichthys molitrix (4,67%), Neogobius fluviatilis (6,88%), Rhodeus amarus (5,16%), Gymnocephalus cernuus (5,16%) ş.a*. Is raported the semnificative abundence of *Alosa tanaica (3,44%), Leuciscus idus (2,21%) and Pelecus cultratus (2,21%)*, which are enough rare in other natural water ecosystems in Moldova territory.

Population levels statute of some ichthyofag fish species in Prut as: ***Aspius aspius***, ***Silurus glanis*** *şi* ***Sander lucioperca*** reaches satisfactory level (in response to prey abundance response - especially fish with short life cycle), but in age structure dominate young groups, which shows a significant illegal fishing pressing.

The specific structure of ihtiocenozelor in Lake Beleu and Lake Manta largely depends on the hydrological regime of thermal gradients, gas and may change significantly during the year. In 2012, due to prolonged drought, the ihtiocenoses structure the multidominate species became ***Carassius gibelio*** (13.83%), ***Alburnus alburnus***(8.98%) and ***Gymnocephalus baloni*** (11.65%). In the spring of 2012 there were significant reproductive migrations of rizeavca of Danube, which reflects the relative abundance values ***Alosa tanaica*** (10.92%).

There has also been a significant increase in the share of economically valuable native species (***Hypophthalmichthys molitrix***, ***Hypophthalmichthys nobilis***, ***Ctenopharyngodon idella*** of Prut river ecosystem as a result of major natural disasters in the summer of 2010.

Despite anthropogenic pressing on fisheries resources of the inferior sector of the Prut river, their quantitative values are maintained due to active migration from spring of Danube and accidental or intentional penetration of culture species.

D.1.3 River Prut hydrochemical characteristics investigation

Chemical composition. Investigations have shown that in summer 2012 dissolved oxygen content was relatively satisfactory for hydrobionts development being within 7.86 and 8.86 mg / l, or 90.4 to 101% saturation (Table 1), at water temperature from 21.2 to 25.8 ° C

Table 1.

Dinamics of dissolved oxigen, mg/l and % of saturation in Prut river and lake Costesti-Stănca dam, summer 2012.

			O_2	O_2
		t,C	mg/l	% saturation
Costesti-Stînca lake, the	27.06.2012	23,5	8,82	100,3
Braneste	27.06.2012	24	8,86	101,1
Sculeni	27.06.2012	21,5	8,95	97,9
Leovo	29.06.2012	25	8,38	97,2
Cahul	29.06.2012	25,8	7,93	93,2
Căslita	29.06.2012	25,6	7,86	92,0
Giurgiulesti	29.06.2012	25,6	7,85	91,8
Costesti-Stînca	29.08.2012	22,3	8,57	95,5
Braneș te	29.08.2012	22,6	8,31	93,1
Sculeni	29.08.2012	22,6	8,07	90,4
Leuseni	30.08.2012	21,2	8,66	94,7
Leovo	30.08.2012	22,4	8,47	94,6
Cahul	30.08.2012	23,4	8,19	93,0
Căslita	30.08.2012	23,0	8,26	93,2
Giurgiulesti	30.08.2012	23,2	8,00	90,5

In the monitoring period was observed the right tributary(Jijia river) evidential influence, the suspencies content in the Prut river was ten times increased. (Fig.1).

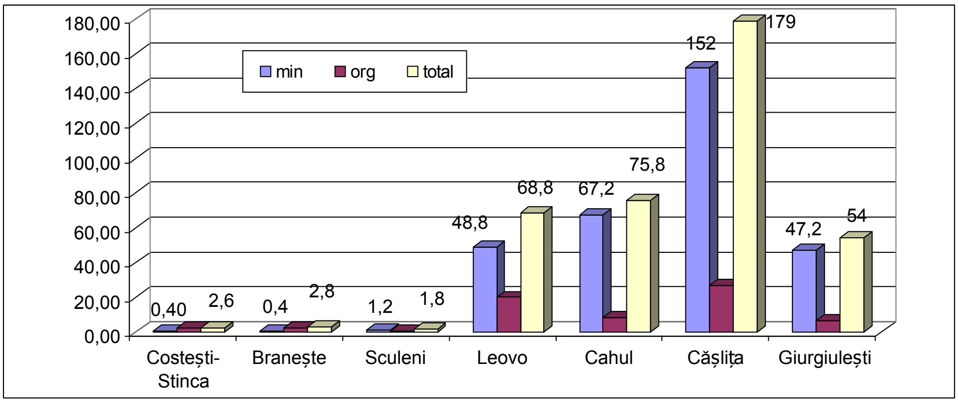

Figure 1. Dinamics of mineral suspensions (min), organic (org) and total (total) suspentions on the dam of Costesti-Stînca Lake and in the Prut river (Braniște, Sculeni, Leova, Cahul, Cîşlița-Prut,Giurgiuleș ti), June 2012, mg/l.

Increasing of suspencies content in Prut waters has negative reflection on planktonic organisms and processes of production and destruction [Zubcov E. et all, 2009; Zubcov E., Ungureanu L., Munjiu O. 2005].

Mineralization, as well as major ion content, are some conservative indices and depend mostly by natural factors. It is known that during flood water mineralization decreases and during low-water line it is higher. Is a small increase in mineralization and major ions content but not as pronounced (Table 2) and these values are within those multianuals.

Table 2.

Dinamics of hydrogenocarbonic ions, sulphatic , cloric ions , calcium, magnesium, sodium, potasium and mineralisation of waters of river Prut and Lake Costesti-Stănca dam, summer 2012, mg/l

mg/l	SO_4^{--}	HCO_3^-	Cl^-	Ca^{++}	Mg^{++}	Na^++K^+	Mineralisation
June 2012							
Braneste	55,1	158,7	21,7	52,1	10,3	22,8	320,7
Sculeni	63,4	164,8	21,3	54,1	10,3	26,8	340,7
Leovo	64,2	180,0	24,5	57,1	12,1	28,5	366,4
Cahul	66,7	180,0	24,5	56,1	13,4	28,3	369,0
Căslita	71,2	180,0	26,6	55,1	13,9	10,8	357,6
Giurgiulesti	72,4	181,5	26,6	53,1	15,8	32,3	381,7
August 2012							
Costesti-Stînca	44,4	143,4	26,2	46,1	10,9	20,3	291,3
Braneste	55,9	143,4	24,6	50,1	10,3	21,3	305,6
Sculeni	49,4	152,6	26,2	57,1	9,1	16,8	311,2
Leuseni	45,3	164,8	26,6	59,1	10,3	14,8	320,9
Leovo	71,6	161,7	26,6	50,1	14,6	29,8	354,4
Cahul	69,9	161,7	26,6	56,1	10,3	32,8	357,4
Căslita	72,4	164,8	26,6	55,1	10,3	34	363,2
Giurgiulesti	60,1	170,9	26,9	51,5	19,5	16,5	345,4

The content of nutrients is one of the most important indicators of water quality, which determines both the development of several aquatic organisms, as well as trophic level, intensity of production-destruction processes of aquatic ecosystems. Nitrate nitrogen it is often more than 90% of the mineral forms of nitrogen, and this year we see a clear increase in ammonia nitrogen (Tab.3).

Table 3.

Dinamics of concentration of mineral ammonia nitrogen ($N\text{-}NH_4$), nitrit nitrogen ($N\text{-}NO_2$) and nitrat nitrogen ($N\text{-}NO_3$) , mineral nitrogen (Nmin), organic nitrogen (Norg) and total nitrogen (Ntot) in waters of Prut river and lake Costesti-Stînca, summer 2012, mg/l

	$N\text{-}NH_4$	$N\text{-}NO_2$	$N\text{-}NO_3$	Nmin	Norg	Ntot
June 2012						
Braneste	0,224	0,055	0,784	1,063	1,5	2,563
Sculeni	0,228	0,039	0,741	1,008	0,324	1,332
Leovo	0,198	0,034	1,004	1,236	0,284	1,52
Cahul	0,331	0,032	0,73	1,093	0,151	1,244
Căslita	0,242	0,03	0,639	0,911	0,295	1,206
Giurgiulesti	0,402	0,03	0,676	1,108	0,425	1,533
August 2012						
Costesti-Stînca	0,176	0,032	0,327	0,535		
Braneste	0,146	0,029	0,338	0,513		
Sculeni	0,116	0,023	0,338	0,477		
Leuseni	0,317	0,017	0,596	0,93		

Leovo	0,346	0,023	0,601	0,97		
Cahul	0,246	0,037	0,736	1,019		
Căslita	0,25	0,031	0,725	1,006		
Giurgiulesti	0,205	0,032	0,719	0,956		

Ratio of mineral and organic nitrogen is an integrated index that reflects not only nitrogen flow processes, but also the intensity of purification processes, secondary pollution and trophic levels of aquatic ecosystems. Some of the material is in the analysis. Dynamics of mineral, organic and total phosphorus is shown in Figure 2, we have to mention that this year the concentration of mineral phosphorus has exceeded the organic one, and the recent years seen strong pollution with organic substances.

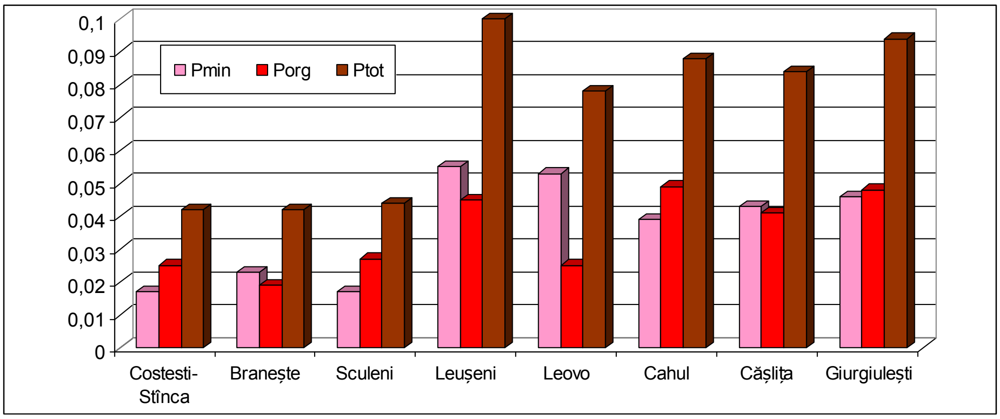

Figure 2. Dinamics of mineral phosphorus(Pmin), organic (Porg), and total (Ptotal) in r. Prut and lake Costesti-Stînca, August 2012, mg/l

On the basis of determining the chemical consume (CCO_{Cr}) and the biochemic one (CBO_5) of oxiden in August 2012 was calculated the capacity of autopurification in the Prut river, which is higher at Branesti and the lowest at Leuseni-Cahul (Fig.3)

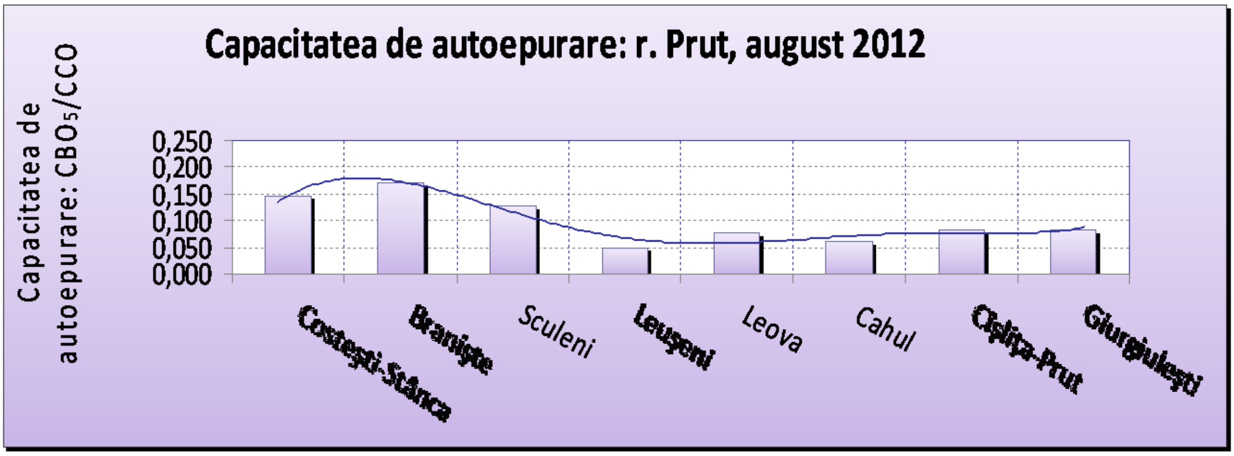

Figure 2. Aoutopurification capacity of the Prut river and lake Costesti Stinca, August 2012.

A part of materials are in processing and will be presented in Report 2.

D.1.4 Abiotic factors' influence upon aquatic organisms communities. Evaluation of the natural and anthropogenic threats upon the fish reproduction capability.

Nutrients, particularly nitrogen and phosphorus compounds, play the main role in the development of bacterioplankton and phytoplankton, zooplankton. Dynamics and the relationship between ammonifying bacteria, nitrifying, denitrifying is in direct dependence on the content of ammonium ions, nitrate and nitrite in water ecosystems. The role of phosphorus in planktonic bacteria and algae is his participation in the processes of accumulation and transformation of energy in cells. Quantitative assessment of the intensity in bacterioplanktonic and phytoplankton reaction to changes in phosphorus concentration in water is one way of developing relevant aquatic ecosystem trophic prognosis.

Dynamics of dissolved organic substances in water Prut is a picture of destruction processes, as organic substances are basic nutritional source for many groups of bacteria, especially, the amylolytic and cellulolytic. It turned out that when Prut water temperature is satisfactory for these groups of microorganisms, the dependence of the concentration of organic substances in water and numeric effective of these bacteria is almost linear. On the other hand, is clearly a negative correlation between the concentration of organic matter and organic matter values destruction. These investigations are for the following months project activity. An index of environmental factors influence on aquatic organisms is the accumulation of metals in aquatic organisms. Was collected more material that is processing, but some preliminary results such as metals level in fish is presented in Table 2

Table 2

Concentration of metals in the muscles of the fish body from Prut Rivers, mg/kg wet weight

Species	Zn	Cu	Pb	Ni	Mo	V	Cd	wet weight of fish, gramm
Sander lucioperca	35,6	5,2	3,3	6,9	1,9	2,6	0,44	970
Sander lucioperca	42,2	4,7	2,8	4,6	2,0	1,8	0,23	465
Aspius aspius	48,2	6,9	4,2	7,8	2,6	2,8	0,72	1160
Pelecus cultratus	64,4	11,2	4,8	10,2	2,8	2,6	1,25	660
Abramis brama	53,2	8,1	2,8	9,1	2,0	1,8	0,53	960
Abramis brama	46,6	5,6	2,5	6,7	1,6	2,0	0,41	460
Barbus barbus	26,8	4,5	2,6	5,2	1,3	1,2	0,50	410
Carassius auratus gibelio	25,6	5,2	2,2	8,0	2,1	2,5	0,54	280
Carassius auratus gibelio	20,8	3,5	1,8	7,6	1,8	2,1	0,47	160

These investigations are important not only for deciphering the migration processes and chemical accumulation in aquatic ecosystems, but for assessing the quality of final fishery produc to human health.

In most cases, water quality was satisfactory for the growth of bacteria, phytoplankton, zooplankton and benthic invertebrates, including fish. Hydrobionts diversity, in most cases corresponds α-, β-mezosaprobic ecosystems with water quality from moderately polluted up to polluted.