

NEW DATA CONCERNING DIATOM COMMUNITIES AND WATER QUALITY OF THE SOMEȘUL MIC RIVER BETWEEN FLOREȘTI AND APAHIDA (CLUJ COUNTY, ROMANIA)

Lidia SZIGYÁRTÓ¹, Leontin Ștefan PÉTERFI²

¹ Sapientia - Hungarian University of Transylvania, Department of Environmental Sciences,
str. Deva, nr. 19, **RO-400375, Cluj-Napoca, România**

² Universitatea “Babeș-Bolyai”, Facultatea de Biologie și Geologie, Catedra de Taxonomie și Ecologie,
str. Republicii, nr. 42, **RO-400015, Cluj-Napoca, România**

e-mail: lidia_szigyarto@yahoo.com

peterfileontin@yahoo.co.uk

Abstract: This paper presents new comparative data concerning the diatom communities inhabiting the Florești–Apahida section of the Someșul Mic River, based on benthic samples collected in April and July 2007 from four different sampling sites along this section of the river. General water quality has also been estimated, both by physicochemical measurements and values of the Biological Diatom Index (BDI) calculated based on species composition, relative abundance and indicator value of the diatom species. Preliminary data, regarding similar evaluations, were published in 2008 [10]. Both chemical composition and obvious changes in the composition and structure of diatom assemblages confirm that the waters of the Someșul Mic River contain low to medium amounts of dissolved inorganic substances, being oligohalobous and oligotrophic upstream from Cluj-Napoca, but are subject to qualitative transition to the class of highly mineralized waters, containing especially larger quantities of NaCl and presenting signs of organic pollution toward and downstream of Apahida. Diatoms dominant at all four sampling sites were cosmopolitan, largely tolerant species, but we have also identified xeno- to oligosaprobic indicators upstream from Cluj-Napoca, respectively α -meso- to polisaprobic and mesohalobous/halophilic species near Apahida. Based on the values of BDI, the general water quality was considered excellent upstream from Cluj-Napoca, good immediately downstream from Cluj-Napoca at Someșeni, and acceptable at Apahida, for both sampling seasons. The results indicating generally good environmental conditions in 2007, the relatively high diversity indices of the diatom communities, and the presence of species recorded most probably for the first time or very rarely from Romanian waters, should justify increased effort to maintain the basin of the Someșul Mic River in quality condition that is as good as possible.

Keywords: Biological Diatom Index, Cluj-Napoca, halophilic diatoms, oligohalobous diatoms, organic pollution, Someșul Mic, water quality

Introduction

It is generally accepted that diatoms (Bacillariophyceae) are good indicators for the quality of aquatic ecosystems, primarily because many species have specific environmental requirements, but also because they are distributed in almost all aquatic habitats, allowing scientists to compare quality evaluation results. Due to their good indicator qualities, diatoms are also included in the methodology of the EU Water Framework Directive 2000/60/EC. General and specific water quality estimations are usually based on the study of the species composition of the communities (qualitative data) and the relative abundance of each species (quantitative data). These characteristics of the communities significantly correlate with the physical, chemical and biological parameters of the water, changing according to the reaction of the different species to complex modifications of their environment.

The results summarized in the present paper are based on this principle. The aims of the investigations were thus to study the qualitative and quantitative structure of benthic diatom communities inhabiting the Floreşti–Apahida section of the Someşul Mic River (Cluj County, Romania), not only to indicate the presence of newly or rarely recorded species from this area, but also to continue evaluation of the water quality of the river [6] and monitor significant changes over time. Preliminary data, regarding evaluations in 2006, were published in 2008 [10].

Materials and Methods

The investigations were performed based on samples collected in April and July 2007 from four stations located on the Someşul Mic River between Floreşti and Apahida, as follows: near Floreşti (SM F), downstream from Cluj-Napoca near the Grigorescu district (SM CG), at Someşeni downstream from Cluj-Napoca (SM S) and downstream from Apahida (SM A).

In order to survey some physical and chemical parameters of the water, measurements were conducted in the field using a pH/Cond 340i WTW conductometer. Benthic diatom samples were also collected in the littoral zone of the river from all available substrates, mostly from the surface of underwater stones, plants or sediments [3]. After preserving these samples in 96% ethanol, cleaning with HCL and H₂O₂ [2] and mounting the frustules in colophony, the diatom samples were examined in the laboratory. The identification of diatom taxa and the counting of frustules (for relative abundance) were performed using a Krüss MBL2100 light microscope with oil immersion lens, based on the standard literature [5]. The complexity and richness of the diatom communities were estimated based on the Shannon-Wiener Diversity Index, while the ecological state of the river (quality of the water) was evaluated by calculating the Biological Diatom Index (BDI) [1], according to which rivers and streams belong to one of five different quality classes (Table 1), a classification frequently used especially in European countries.

Table 1: Water quality classes established based on the Biological Diatom Index (BDI)

BDI	Quality classes
BDI < 5	inferior
5 ≥ IBD < 9	mediocre
9 ≥ IBD < 13	acceptable
13 ≥ IBD < 17	good
IBD ≥ 17	excellent

Results and Discussion

Values of the main physical and chemical parameters of the water are shown in Table 2. The temperature varies between normal values characteristic of spring and summer. The pH and the quantity of dissolved oxygen also vary between normal values all along the length of the river section, in both seasons. With regard to the specific electric conductance, which correlates with the salinity of the water, it should be noticed that the values are always a little higher in spring than in summer, probably due to the larger amount of dissolved inorganic substances washed into the river during snow melt and spring rain, without exceeding, however, a medium value, in concordance with data from the literature [12], indicating oligo/mesohalobic and oligo/mesotrophic conditions on this river section.

We have identified 203 diatom taxa in the collected samples, representing 35 genera (Table 3).

30.	<i>C. meneghiniana</i> Kützing		+	+	+		+	+	+
31.	* <i>C. pseudostelligera</i> Hustedt				+				
32.	<i>Cymatopleura solea</i> var. <i>apiculata</i> (W. Smith) Ralfs			+			+		+
33.	<i>C. solea</i> (Brébisson) W. Smith var. <i>solea</i>	+			+				+
34.	<i>Cymbella amphicephala</i> Naegeli	+			+				
35.	** <i>C. compacta</i> Østrup	+		2.33	+	2.15	+	+	+
36.	** <i>C. excisa</i> Kützing	+	+	+	1.77	+	1.02	+	+
37.	<i>C. laevis</i> Naegeli	+	+	+	+	+	+	+	+
38.	<i>C. microcephala</i> Grunow			+	+				
39.	<i>C. minuta</i> Hilse	18.74	3.54	27.13	7.28	22.8	8.32	12.10	1.76
40.	<i>C. naviculiformis</i> (Auerswald) Cleve			+	+	+	+	+	+
41.	<i>C. prostrata</i> (Berkeley) Cleve	+		+		+	+	+	+
42.	<i>C. silesiaca</i> Bleisch	1.01	+	+	+	1.39	+	+	+
43.	<i>C. sinuata</i> Gregory	+	1.36	+	+	1.52	4.24	+	+
44.	<i>C. subcistula</i> Krammer	+			+	+		+	+
45.	<i>C. tumida</i> (Brébisson) Van Heurck				+		+		+
46.	** <i>Cymbopleura anglica</i> Lagerstedt	+							
47.	<i>Denticula elegans</i> Kützing								+
48.	<i>D. tenuis</i> Kützing	+	2.41	+	+	+	+	+	+
49.	<i>Diatoma ehrenbergii</i> Kützing	+	+	+	+	+	+	+	
50.	<i>D. mesodon</i> (Ehrenberg) Kützing	+		+		+			
51.	<i>D. moniliformis</i> Kützing	+	+	+		+		+	+
52.	<i>D. tenuis</i> Agardh	+			1.25				
53.	* <i>D. vulgaris</i> var. <i>distorta</i> Grunow		+	+	+	+	+	+	+
54.	<i>D. vulgaris</i> var. <i>linearis</i> Grunow	+		+	+		+		
55.	<i>D. vulgaris</i> var. <i>linearis</i> Grunow ("mit kopfförmigen enden")	+	+	+	2.29	+	+	+	+
56.	** <i>D. vulgaris</i> var. <i>ovalis</i> (Fricke) Hustedt			+		+		+	
57.	<i>D. vulgaris</i> var. <i>producta</i> Grunow	2.23	+	1.72	2.50	2.78	2.04	1.36	+
58.	<i>D. vulgaris</i> Bory var. <i>vulgaris</i>	+		+	+	+	+	+	+
59.	<i>Didymosphaenia geminata</i> (Lyngbye) M. Schmidt	+	+	+	+	+	+	+	+
60.	<i>Diploneis elliptica</i> (Kützing) Cleve	+	+	+	+				
61.	** <i>D. parma</i> Cleve			+					+
62.	<i>D. puella</i> (Schumann) Cleve			+	+	+	+	+	+
63.	*** <i>Eunotia muscicola</i> var. <i>tridentula</i> Nörpel & Lange-Bertalot	+							
64.	<i>E. paludosa</i> Grunow	+							
65.	<i>Fragilaria arcus</i> (Ehrenberg) Cleve var. <i>arcus</i>	+		+	+	5.69	+	+	+
66.	<i>F. bicapitata</i> Mayer				+				
67.	<i>F. brevistriata</i> Grunow			+					
68.	*** <i>F. capucina</i> var. <i>capitellata</i> (Grunow) Lange-Bertalot	+		+	+	+		+	+
69.	<i>F. capucina</i> Desmazières var. <i>capucina</i>	1.42	+	+		+	+	+	+
70.	<i>F. capucina</i> var. <i>gracilis</i> (Oestrup) Hustedt	1.01	+	+	+	+	+	+	+
71.	<i>F. capucina</i> var. <i>mesolepta</i> (Rabenhorst) Rabenhorst						+		
72.	** <i>F. capucina</i> var. <i>perminuta</i> (Grunow) Lange-Bertalot	+	+						
73.	<i>F. capucina</i> var. <i>vauchaeriae</i> (Kützing) Lange-Bertalot	9.93	+	4.35	+	+	1.53	1.36	+
74.	<i>F. crotonensis</i> Kitton		+	+	+		+	+	+
75.	<i>F. delicatissima</i> (W. Smith) Lange-Bertalot	+		+	+	+	+		
76.	<i>F. leptostauron</i> (Ehrenberg) Hustedt var. <i>leptostauron</i>			+		+		+	
77.	<i>F. parasitica</i> (W. Smith) Grunow var. <i>parasitica</i>			+		+			
78.	<i>F. parasitica</i> var. <i>subconstricta</i> Mayer	+				+		+	

79.	<i>F. pinnata</i> Ehrenberg var. <i>pinnata</i>	+	+	+		+			+
80.	<i>F. pulchella</i> (Ralfs) Lange-Bertalot								+
81.	<i>F. ulna</i> var. <i>acus</i> (Kützing) Lange-Bertalot	1.01	+	+	+		+	+	+
82.	<i>F. ulna</i> (Nitzsch) Lange-Bertalot var. <i>ulna</i>	+	+	+	1.46	+	+	+	+
83.	<i>Frustulia vulgaris</i> (Thwaites) De Toni	+			+	+	+	+	+
84.	<i>Gomphonema acuminatum</i> Ehrenberg		+	+	+				
85.	<i>G. angustatum</i> (Kützing) Rabenhorst	+	+	+	+	+	+	+	
86.	<i>G. angustum</i> Agardh		+					+	+
87.	<i>G. clavatum</i> Ehrenberg			+					
88.	<i>G. gracile</i> Ehrenberg			+					
89.	<i>G. minutum</i> (C. Agardh) C. Agardh	+	+	+		+	2.55	+	3.65
90.	<i>G. olivaceum</i> (Hornemann) Brébisson	1.72	+	2.02	+	+	10.36	10.89	1.26
91.	<i>G. parvulum</i> var. <i>exilissimum</i> Grunow		+	+	+				+
92.	** <i>G. parvulum</i> var. <i>parvulus</i> Lange-Bertalot & Reichardt			+	+				+
93.	<i>G. parvulum</i> Kützing var. <i>parvulum</i> f. <i>parvulum</i>	+	+	+	+	+	+	+	+
94.	<i>G. parvulum</i> var. <i>parvulum</i> f. <i>saprophilum</i> Lange-Bertalot & Reichardt				+	+	+	+	2.27
95.	<i>G. tergestinum</i> Fricke	+	+	+		+	+	+	+
96.	<i>G. truncatum</i> Ehrenberg	+	+	+	+	+	+	+	
97.	<i>Gyrosigma acuminatum</i> (Kützing) Rabenhorst					+	+	+	+
98.	<i>G. nodiferum</i> (Grunow) Reimer	+			+	+	+	+	+
99.	<i>G. scalproides</i> (Rabenhorst) Cleve					+	+		+
100.	<i>Hantzschia amphioxys</i> (Ehrenberg) W. Smith			+	+	+	+	+	
101.	<i>Hippodonta capitata</i> (Ehrenberg) Lange-Bertalot, Metzeltin & Witkowski	+	+	+	+	+	+	+	+
102.	*** <i>Melosira nummuloides</i> (Dillwyn) Agardh			+	+	+	+	+	+
103.	<i>M. varians</i> Agardh	+	+	+	+	+	+	+	+
104.	<i>Meridion circulare</i> (Greville) Agardh	+				+			
105.	* <i>Navicula amphiceropsis</i> Lange-Bertalot & Rumrich				+				+
106.	<i>N. antonii</i> Lange-Bertalot	+	+	+	+	+	+	+	
107.	*** <i>N. atomus</i> (Kützing) Grunow	+				+	3.90	1.51	24.31
108.	<i>N. capitatoradiata</i> Germain	+	+	+	+	+	4.24	+	+
109.	<i>N. cari</i> Ehrenberg	+							
110.	<i>N. cincta</i> (Ehrenberg) Ralfs					+	+		
111.	<i>N. cryptocephala</i> Kützing	+	+	+	+	+	+		+
112.	<i>N. cryptotenella</i> Lange-Bertalot	+	+	+	+	+	1.02	+	+
113.	<i>N. decussis</i> Østrup	+	+	+	+	+	+	+	+
114.	<i>N. densilineolata</i> (Lange-Bertalot) Lange-Bertalot	+							
115.	** <i>N. diluviana</i> Krasske					+			
116.	<i>N. elginensis</i> (Gregory) Ralfs var. <i>elginensis</i>			+	+	+	+		
117.	<i>N. erifuga</i> Lange-Bertalot						+		+
118.	* <i>N. germainii</i> Wallace						+		
119.	<i>N. goeppertiana</i> (Bleisch) H. L. Smith var. <i>goeppertiana</i>			+				+	+
120.	<i>N. gregaria</i> Donkin	+	+	1.72	+	4.55	+	28.14	1.76
121.	* <i>N. ignota</i> var. <i>acceptata</i> (Hustedt) Lange-Bertalot	+							
122.	* <i>N. ignota</i> Krasske var. <i>ignota</i>				+	+			
123.	<i>N. lanceolata</i> (Agardh) Ehrenberg	36.27	+	7.89	+	14.66	+	15.43	+
124.	<i>N. lundii</i> Reichardt			+	+	+			
125.	<i>N. menisculus</i> Schumann var. <i>menisculus</i>				+		+		+
126.	<i>N. minima</i> Grunow	+	+	+	+	+	2.89	+	+
127.	<i>N. minuscula</i> Grunow var. <i>minuscula</i>	+	+	+				+	

128.	* <i>N. monoculata</i> Hustedt var. <i>monoculata</i>	+	+	+		+		
129.	<i>N. mutica</i> var. <i>mutica</i> Kützing	+		+	+	+	+	+
130.	<i>N. nivalis</i> Ehrenberg	+						
131.	*** <i>N. placenta</i> Ehrenberg	+						
123.	<i>N. pupula</i> Kützing var. <i>pupula</i>	+		+	+	+	+	+
133.	<i>N. pygmaea</i> Kützing			+	+		+	
134.	<i>N. radiosa</i> Kützing	+	+	+	+	+		+
135.	** <i>N. reichardtiana</i> Lange-Bertalot	+	+	+	+	+	+	
136.	<i>N. rostellata</i> Kützing	+	+		+	+	1.70	+
137.	<i>N. salinarum</i> Grunow						+	
138.	** <i>N. saprophila</i> Lange-Bertalot					+	3.74	1.51
139.	* <i>N. schmassmannii</i> Hustedt	+		+				42.19
140.	<i>N. seminulum</i> Grunow				+			
141.	<i>N. subhamulata</i> Grunow	+					+	
142.	<i>N. subminuscula</i> Manguin	+				+		+
143.	<i>N. slesvicensis</i> Grunow					+		+
144.	<i>N. tenelloides</i> Hustedt							+
145.	<i>N. tripunctata</i> (O. F. Müller) Bory	+	+	+	+	+	+	+
146.	<i>N. trivialis</i> Lange-Bertalot	+	+	+	+	+	+	+
147.	<i>N. upsaliensis</i> (Grunow) Peragallo			+	+	+		
148.	<i>N. veneta</i> Kützing	+				+	+	+
149.	<i>N. viridula</i> (Kützing) Ehrenberg var. <i>viridula</i>			+	+		+	
150.	* <i>N. weisneri</i> Lange-Bertalot			+				
151.	* <i>N. wildii</i> Lange-Bertalot		+		+		+	
152.	* <i>Neidium bisulcatum</i> var. <i>subampliatum</i> Krammer			+				
153.	<i>Nitzschia amphibia</i> (Kützing) W. Smith	+	+				+	+
154.	<i>N. angustata</i> Grunow	+	+	+	+	+	+	+
155.	** <i>N. angustatula</i> Lange-Bertalot	+						
156.	* <i>N. bacillum</i> Hustedt	+	+		+	+	+	+
157.	<i>N. brevissima</i> Grunow				+			+
158.	<i>N. calida</i> Grunow					+	+	+
159.	<i>N. capitellata</i> Hustedt	+	+	+	+	+	+	2.02
160.	<i>N. clausii</i> Hantzsch				+		+	+
161.	<i>N. constricta</i> (Kützing) Ralfs					+	+	
162.	<i>N. debilis</i> Arnott	+						
163.	<i>N. dissipata</i> (Kützing) Grunow var. <i>dissipata</i>	1.62	+	2.73	+	+	+	+
164.	** <i>N. dissipata</i> var. <i>media</i> (Hantzsch) Grunow	+		+	+	+	+	+
165.	<i>N. fonticola</i> Grunow	+	+	+	+	+	+	+
166.	<i>N. frustulum</i> (Kützing) Grunow		+	+	+	+	+	+
167.	<i>N. gracilis</i> Hantzsch	+						
168.	<i>N. hungarica</i> Grunow					+	+	+
169.	<i>N. incognita</i> Krasske				+			
170.	<i>N. inconspicua</i> Grunow	+	+	+	+	+	1.87	1.97
171.	<i>N. intermedia</i> Hantzsch	+			+			
172.	<i>N. levidensis</i> (W. Smith) Grunow							+
173.	<i>N. linearis</i> (Agardh) W. Smith var. <i>linearis</i>	+	+	3.74	+	1.26	+	+
174.	<i>N. linearis</i> var. <i>subtilis</i> (Grunow) Hustedt			+		+		+
175.	<i>N. linearis</i> var. <i>tenuis</i> (W. Smith) Grunow	+		+		+	+	
176.	<i>N. palea</i> (Kützing) W. Smith		+	+		+	+	+
177.	<i>N. paleacea</i> Grunow					+	+	3.78
178.	<i>N. perminuta</i> (Grunow) M. Peragallo	+	+	+	+	+	+	+
179.	<i>N. pura</i> Hustedt	+		+		+	+	
180.	<i>N. pusilla</i> Grunow					+		+
181.	<i>N. recta</i> Hantzsch	+	+	+	+	+	+	+
182.	<i>N. sigmoidea</i> (Nitzsch) W. Smith		+	+		+	+	+

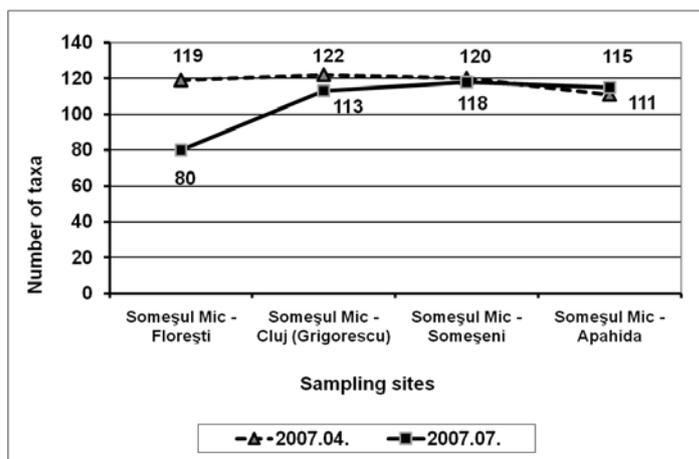


Fig. 1: Number of identified diatom taxa in samples collected from the Floreşti-Apahida section of the Someşul Mic River, April and July 2007

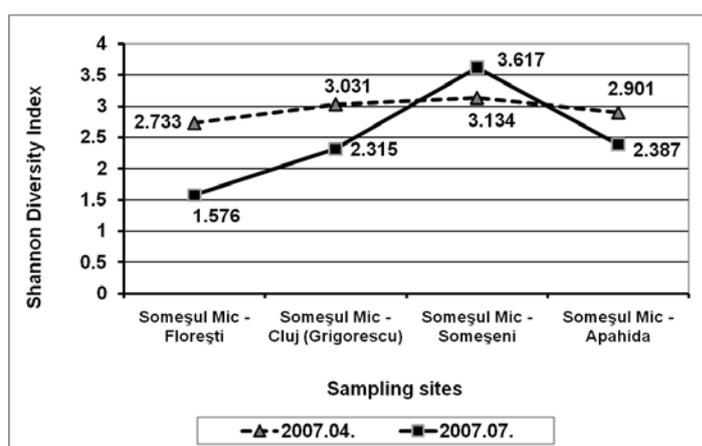


Fig. 2: Shannon Diversity Index values computed for the diatom samples collected from the Floreşti-Apahida section of the Someşul Mic River, April and July 2007

The indicator quality of diatom communities inhabiting the different sampling sites along the river is defined also by the presence of less abundant species. We identified xeno-/oligosaprobic indicator species (*Achnanthes laterostrata*, *Eunotia muscicola* var. *tridentula*, *Gomphonema gracile*, *Neidium bisulcatum* var. *subampliatum*, and *Surirella linearis*) and oligo-/oligo- β -mesosaprobic indicators (*Diatoma mesodon*, *Gomphonema acuminatum*, and *Surirella linearis* var. *helvetica*) upstream from Cluj-Napoca, showing that water quality here is generally good or even excellent. As mentioned above, there seems to be an evident, though not drastic, change toward the medium (and even high – downstream from the studied section of the river) in the degree of mineral nutrient loading in the water, and toward the acceptable downstream of Cluj-Napoca, at Someşeni and Apahida sampling sites in the general quality of the water, demonstrated by the appearance, on one hand, of mesohalobic and halophilic elements such as *Actinocyclus normanii*, *Amphora veneta*, *Fragilaria pulchella*, *Navicula erifuga*, *Navicula salinarum*, *Navicula slesvicensis*, *Surirella ovalis*, *Thalassiosira weissflogii*, etc., and on the other hand of α -mesosaprobic/polisaprobic indicator species such as *Craticula accomoda*, *Gomphonema parvulum* var. *parvulum* f. *saprophilum*, *Navicula saprophila*, *Nitzschia calida*, *Nitzschia hungarica* and *Nitzschia umbonata*.

It is known that water quality evaluations are carried out in order to monitor and maintain, if possible, good environmental conditions in aquatic habitats. Due to the presence of species

that are rare, very rare or most probably recorded for the first time (Table 2) from Romanian waters [4, 7, 8, 9], we consider that in particular the river section upstream from Cluj-Napoca should deserve more attention to be preserved in a good quality state. One should mention the species which most probably have not yet been recorded in Romania, such as *Cyclotella pseudostelligera*, *Diatoma vulgare* var. *distorta*, *Navicula amphiceropsis*, *N. germainii*, *N. monoculata*, *N. schmassmannii*, *N. wiesneri*, *Neidium bisulcatum* var. *subampliatum* and *Nitzschia sinuata* var. *delognei*. Among others, very rarely or rarely recorded species, are some (e.g. *Cymbella compacta*, *Stephanodiscus niagarae*, *Achnanthes laevis*, *Cyclotella bodanica*) that, to our knowledge, have not yet been mentioned by previous authors studying the diatoms of the Someșul Mic River [7, 8, 9].

According to the Biological Diatom Index (BDI) (Table 1.) calculated on the basis of species composition and relative abundances, we estimated that the water quality was generally excellent at Florești and Cluj (Grigorescu) in both seasons, shifting into good quality downstream of Cluj-Napoca at Someșeni, and became only acceptable at Apahida (Fig. 3), probably due to the inflow of pollutants of anthropogenic origin.

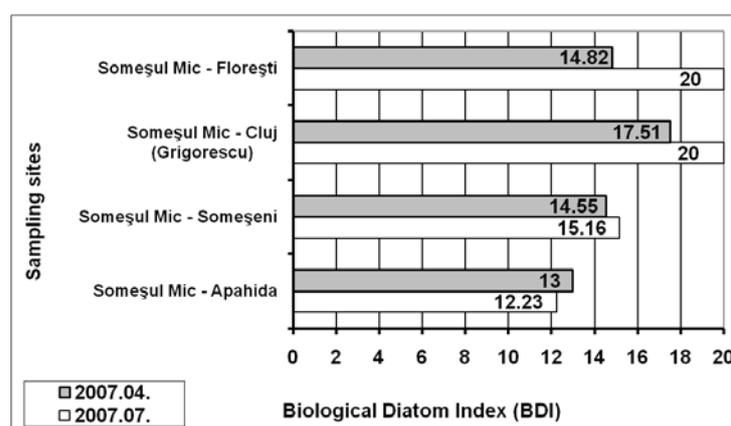


Fig. 3: Biological Diatom Index values in the four sampling sites on the Florești–Apahida section of the Someșul Mic River, April and July 2007

Conclusions

Based on the main physical and chemical parameters, the Florești–Apahida section of the Someșul Mic River is characterized by oligohalobic and oligotrophic conditions, especially upstream from Cluj-Napoca, with low to medium content of dissolved inorganic substances, but with parameters – both chemical and biological – exhibiting qualitative transition to the class of highly mineralized waters, containing larger quantities of NaCl and presenting signs of organic pollution upstream and downstream of Apahida.

The number of species and the diversity of the diatom communities are relatively high, but there is an obvious change in community composition as well, upstream and downstream of Cluj-Napoca and Someșeni: besides cosmopolitan, largely tolerant species as dominant elements, xeno- to oligosaprobic indicators have been identified upstream from Cluj-Napoca, while α -meso- to polisaprobic, respectively mesohalobic and halophilic species occur near Apahida. The Biological Diatom Index indicates excellent water quality upstream from Cluj-Napoca, good quality next downstream from Cluj-Napoca at Someșeni and acceptable water quality at Apahida, both in April and July 2007.

The presence of species recorded for the first time, or those very rarely recorded in Romania, most of which are characteristic of unpolluted or special aquatic habitats, should justify increased attention and effort to maintain the ecological state of the Someșul Mic River in quality condition that is as good as possible.

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DATE NOI PRIVIND COMUNITĂȚILE DE DIATOMEE ȘI CALITATEA APEI DIN SOMEȘUL MIC ÎNTRE FLOREȘTI ȘI APAHIDA (JUD. CLUJ, ROMÂNIA)

(Rezumat)

Lucrarea de față cuprinde rezultate noi privind studiul comparativ al comunităților de diatomee din Someșul Mic pe secțiunea dintre Florești și Apahida, și se bazează pe analiza probelor bentonice prelevate în aprilie și iulie 2007, din patru puncte diferite situate de-a lungul secțiunii menționate. S-a urmărit, de asemenea, aprecierea calității apei râului, atât din punct de vedere chimic cât și algologic. Date preliminare, referitoare la anul 2006, au fost publicate în 2008. În cursul realizării studiului, s-au măsurat valorile principalilor parametri fizico-chimici ai apei, și s-au determinat, paralel, compoziția specifică a probelor de diatomee și abundența relativă a fiecărei specii. Pe baza abundenței relative procentuale și a prezenței speciilor indicatoare s-a atribuit fiecărei probe o valoare a Indicelui Biologic de Diatomee (IBD), careia îi corespunde o anumită clasă de calitate a apei. Atât rezultatele fizico-chimice, cât și diferențele structurale dintre probele de diatomee, confirmă plasarea Someșului Mic în clasa apelor cu grad de mineralizare redus până la mijlociu, pe secțiunea de dinaintea municipiului Cluj-Napoca. În același timp însă, s-a evidențiat, în apropierea localității Apahida, schimbarea calității apei înspre grad de mineralizare înalt, în primul rând datorită concentrațiilor semnificative de NaCl originare din diapirele din zonă, precum și înspre o poluare organică mai accentuată, semnalată prin apariția speciilor indicatoare polisaprobe. Speciile dominante au avut caracter cosmopolit, cu spectru larg de toleranță pe tot cursul cercetat al râului, dar s-au identificat și specii xeno- și oligosaprobe în amonte de Cluj-Napoca, respectiv specii indicatoare α -mezo- și polisaprobe și mezohalobe/halofile în aval de Someșeni. Pe baza valorilor IBD, s-a constatat că în perioada de prelevări apa Someșului Mic a fost, în general, de calitate excelentă în amonte de Cluj-Napoca, bună la Someșeni, și acceptabilă în aval de Apahida. Valorile satisfăcătoare ale calității apei în 2007, bogăția și diversitatea specifică relativ mare a comunităților de diatomee, precum și prezența mai multor specii semnalate (probabil) pentru prima oară sau foarte rar din apele României, ar trebui să conducă la eforturi mai însemnate în încercarea de a menține Someșul Mic în stare calitativă cât mai bună.