

Malacocoenoses of backwaters of the Upper Tisza
with various vegetations

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Abstract

The author has carried out malacocoenological investigations in four various plant associations belonging to the association series *Hydrocharietalia* R ü b e l 1933 and *Potametalia* K l i k a 1944. The populations of Mollusks of the various reed-grass associations cannot be identified with mathematical methods, although more species are common in the single populations. The *synusia* found in the reed-grass associations are characterized by two-two species of obvious characteristics. In the *synusia*, the ratio of the juvenile specimens is high, the species number and the total number of specimens is comparatively low.

Introduction

The malacocoenological conditions of the backwaters along the Tisza are so far unknown. About their snail fauna there are sporadic data to be found in the works of C z ö g l e r /1935/, H o r v á t h /1957, 1958, 1962, 1964/. B á b a /1967/. Coenological investigations were carried out so far by the author /1967/ in one of the backwaters of the middle reaches of the Tisza.

The backwaters along the Upper Tisza are less disturbed than those in other reaches of the Tisza. The purpose of my investigations was to establish the elementary population types as they developed in the various reed-grass vegetations.

Time, site, and method of the collection

My coenological collections originate from three backwaters in the area of the community Kisar /June 22-27 1967/ and from a backwater beside the community Tizsakerecseny /August 24-26 1968/. In the environs of the community Kisar I collected from two backwaters in the inundation area at the right side of the Tisza, and from one backwater in the inundation area at the left side, in the height of 723, 725, 728 rkm. /In Table 1, I have performed the determination of the position by the help of rkm-s/.

I have collected from the 5-25 cm deep riparian waterstrides of the backwaters. My methods agree with those described in my investigations of the backwaters at Szikra: B á b a /1967/. The comparison of *synusia* was carried out with the help of R a m s a y 's formula controlled by P ó c s /1966/, on the basis of the identity of species and constancy. The coenological characteristics are contained in Table 1. The Table contains, apart from the list of species, also the total specimen number of species /sum/, the percentage of juvenile specimens as compared with the total number of specimens /juv. n.c./, the dominance percentage /D n.c./, and the constancy percentage /C n.c./.

I have compared my results with those observed in a backwater at an earlier investigation: B á b a /1967/.

My plant coenological data have been supervised by jun. univ. lecturer Dr. Gy. B o d r o g k ő z y

Vegetation of the backwaters

The four backwaters investigated are members of association series having different vegetations: S o ő /1964/.

The Tisza of "Mrs. J. K i s s " lying in the height of 723 rkm at Kistar belongs to the *Hydrochari-Stratiotetum* /Langendonck 1935/ association of the association series *Hydrocharietalia* R ú b e l 1933. The backwaters found in the height of 725 rkm in the inundation area on the right side, at Kistar, as well as in the height of 728 rkm in the same inundation area, and at Tiszakerecseny, are members of the *Potametalia* K l i k a 1944 association series. The vegetation of the backwater lying in the height of 725 rkm is formed by the *Trapa natans* facies of *Nymphoidetum peltatae* /A l l o r g e 1922/. The vegetation of the backwater being in the height of 728 rkm is the *Nymphaeetum albo-luteae* Nowinski 1928. *nymphaeetosum* K á r n á t i V. 1963. facies. The vegetation of the backwater at Tiszakerecseny is: *Trapaetum natantis* Müller-Görs 1960.

Species discovered, oecological observations

In the four backwaters I have discovered 14 species and the varieties of two species /cf. the list of species in Table 1/. The species found are generally distributed in the home and Central-European waters of different types. The fauna of the backwaters are separated from those in other types by differences concerning the composition and number of species. The composition and amount of species changes even according to the state of water and vegetation of the single backwaters. The snail species were found on various plants and plant fragments. Only *Viviparus fasciatus* O. F. M ú l l. and *Gyraulus crista* var. *nautilus* L., as well as two shell species were found on the soil. /At the same time, *Gyraulus crista*, L. stayed on the leaf of *Potamogeton crispus* L., close to the water surface. /Also three young specimens of *Sphaerium corneum* L. were found among the roots of the floating *Stratiotes aloides* L. The fewest snail species were found on the plant

Trapa natans L. I could collect from that plant only a few *Lymnaea auricularia* L. specimens and some *Acroloxus lacustris* L. specimens.

The Mollusks discovered were in various states of development. In all the four backwaters I have found some ovumbunches of *Lymnaea ovata* Drap., resp. of *L. ovata* var. *ampla* Hartm. /In Tiszakerecseny, e.g. 9 ovule-bunches were found/. I have found in one specimen of *Viviparus fasciatus* O.F. Mull. 33 embryos of 2 to 2.1 mm. The number of ova in the ovum-bunches corresponds to the data published by Frömmering /1956/. The size of the *Lymnaea ovata* var. *ampla* Hartm. that crept out of the smallest yolk bag was 0,90: 0,55 mm. We have got more embryonal specimens of the species *Hippeutis complanatus* Drap., as well. And I collected a great lot of embryonal specimens of the species *Sphaerium corneum* L., too. Their size was: 0,16-0,20: 0,20-0,22: 0,05-0,10 mm.

The specimens of various size and the ovum-bunches found prove the continuous multiplication of the water Mollusks in the summer season.

Coenological analysis

The single *synusia* differ from each other according to their vegetations.

To the plant association *Hydrochari-Stratiotetum* Langenk 1935 corresponds a Mollusk *synusium* of the type *Gyraulus albus-Planorbarius corneus*, containing 9 species. In the *Nymphoidetum peltatae* Allorge 1922 association a *synusium* of *Viviparus fasciatus-Planorbarius corneus* type came about. In the *Nymphaeetum albo-luteae* Nowinski 1928 association a *synusium* of the type *Sphaerium corneum-Viviparus fasciatus* can be found, with the subconstant component *Planorbarius corneus* L. The *Trapaetum natantis* Müller-Görs 1960 association may be characterized with the *synusium* type *Hippeutis complanatus-Acroloxus lacustris*, and the dominant species *Lymnaea ovata* Drap.

The number of species in the single *synusia* moves between 6-9. The highest total number of specimens, 167, was found in the *Sphaerium corneum-Viviparus fasciatus synusium*. Here was the *Sphaerium corneum* L. alone represented with 136 specimens. In the other *synusia*, the total individual number was, in the order of their description, 64, 71 and 112. Only in the *Viviparus fasciatus-Planorbarius corneus synusium* does not reach the ratio of juvenile specimens compared to the full-grown ones the 50 per cent /it is 46 n.c./. In the other *synusia* it moves between 69-84 p.c.

It is characteristic of the water *synusia* described that, apart from the eponymous two constant-dominant species, there occurs at most one subconstant or dominant species. The other species of *synusia* have but low characteristics /Table 1/.

Although in all the reed-grass associations described there occurs the *Planorbarius corneus* L., resp. in the most of them also the *Viviparus fasciatus* O.F. M ü l l. and *Acroloxus lacustris* L., and in addition, in the single associations, also other common species are to be found, nevertheless, we cannot speak about a species identity because its calculated values are moving only between 14-40 p.c. The same is characteristic of the constant-identities, too /16-40 p.c./. We find only between the *Gyraulus albus*-*Planorbarius corneus* and *Viviparus fasciatus*-*Planorbarius corneus* *synusia* a species identity of 60 p.c. The constancy-identity is, however, only 42 p.c., their immediate identification is, therefore, not possible.

Summary

It appears from the described data that: 1. The water mollusk populations differ from each other concerning the quality and quantity of species corresponding to the single plant associations. This conclusion is confirmed by my investigation carried out in the backwaters at Szikra is the Central Tisza /Bába 1967/. In the reed-grass associations investigated the species number is low /6-9/.

The total number of individual specimens is not high, generally the characteristics of the two species are striking. At the other species they are very low. 3. In the various reed-grass associations various plants take part, and corresponding to the vegetation also the detritus-formation is different. It is easy to understand that the here and there common *Gasteropoda*, too, that participate in the populations, are represented with different distribution and mass relations. 4. In harmony with my earlier investigations /Bába 1967/, it is supported by the size conditions of the snails in the four backwaters investigated that both the land and the water snail species can multiply during the whole year.

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List of species and the corresponding
coenological characteristics.

Table I.

No.	A r t	723 river km				725 river km				728 river km				Tiszakereseny			
		at Kisar				at Kisar				at Kisar							
		Summa	D %	C %	Summa	Summa	D %	C %	Summa	Summa	D %	C %	Summa	Summa	Juv. %	D %	C %
1.	<i>Viviparus fasciatus</i> O.F. Mull.	4	50	6,25	40	41	87	57,74	70	9	66	4,91	80	-	-	-	-
2.	<i>Lymnaea truncatula</i> O.F. Mull.	-	-	-	-	-	-	-	-	5	80	2,75	20	3	33	2,67	30
3.	<i>Lymnaea stagnalis</i> L.	8	-	12,50	60	3	-	4,22	30	4	-	2,15	30	3	-	2,67	30
4.	<i>Lymnaea auricularia</i> L.	-	-	-	-	7	28	9,85	40	-	-	-	-	-	-	-	-
5.	<i>Lymnaea ovata</i> var. <i>amplex</i> Hartm.	6	83	9,37	40	2	100	2,81	20	5	60	2,75	30	-	-	-	-
6.	<i>Lymnaea ovata</i> Drap.	-	-	-	-	-	-	-	-	-	-	-	-	61	96	54,46	20
7.	<i>Lymnaea peregra</i> O.F. Mull.	1	100	1,56	10	1	100	1,40	10	-	-	-	-	-	-	-	-
8.	<i>Physa fontinalis</i> L.	-	-	-	-	-	-	-	-	-	-	-	-	2	100	1,78	10
9.	<i>Planorbis cornutus</i> L.	7	28	10,93	70	8	50	11,26	70	8	25	4,31	60	10	80	8,92	50
10.	<i>Gyraulus crista</i> var. <i>naucleus</i> L.	17	76	26,56	40	-	-	-	-	-	-	-	-	-	-	-	-
11.	<i>Gyraulus crista</i> L.	1	100	1,56	10	-	-	-	-	-	-	-	-	-	-	-	-
12.	<i>Gyraulus albus</i> L.	14	28	21,87	70	-	-	-	-	-	-	-	-	4	75	3,57	10
13.	<i>Hippelutis complanatus</i> Drap.	-	-	-	-	-	-	-	-	-	-	-	-	18	100	16,16	70
14.	<i>Acrostox lacustris</i> L.	6	33	9,37	40	3	-	4,22	30	-	-	-	-	11	38	9,82	60
15.	<i>Anodonta cygnaea</i> f. <i>zeffensis</i> Cmelin.	-	-	-	-	6	83	8,45	30	-	-	-	-	-	-	-	-
16.	<i>Spaerium cornueum</i> L.	-	-	-	-	-	-	-	-	136	73	81,43	100	-	-	-	-
Zusammen:		64	46	100	-	71	70	100	-	167	69	100	-	112	84	100	-