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THE MIGRANT MOLLUSC (DREISSENA POLYMORPHA PALL.) AS THE ALIMENT OF NATATORIAL BIRDS AT THE TISZA-VALLEY

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Abstract

A report is given on the studies regarding the occurrence of the Dreissena polymorpha on the basis of 386 stomach contents of 27 natatorial-merganser and diver bird species at the Tisza-valley. Table 1. comprises the results from which it could be determined that the *Dreissena* has dominant role in the alimentation of the species belonging to the *Gavia, Aythya, Bucephala* and *Mergus* genera wintering at the Tisza river. The fluctuation of occurrence and quantity relations of mollusca is also reflected from the Winter dynamism of the aquatic birds feeding from it. The evaluation of this process could be utilized in practice as an environment-protection indicator.

Introduction

The praeglacial spreading of the Dreissena polymyorpha endemically populated enormous areas from the Azov-sea to western Europe, but the later glacial periods eliminated the European stock. Nevertheless, starting from the XVIII. century, partly through natural expansion, and partly through importation, it vigorously began to spread towards the West and during the course of 160 years, its fossil spreading was reconstructed here in about 35% (THIENEMANN 1950, STANCZYKOWSKA 1963, ZIELCH —JACCKEL 1965, NOWAK 1977).

Its dynamic expansion also displayed effect on the areal changes of some aquatic birds. Firstly the Northern natatorial birds, also wintering in Central Europe, took advantage of this characteristic aliment-prosperity (OLNEY 1963, GÉRUDET 1968, LEUZINGER 1969).

According to authors knowledge no evaluation has been achieved as yet regarding the dynamism at the Tisza-valley of the migrant mollusc. Author has been carrying out ornithoecological studies continuously since 1947 at this area, during the course of which the striking progression of the Dreissena was experienced after 1951, which phenomenon gradually diminished after 1970. Up to now it is unclear whether this could be explained by natural or anthropogenic effects. In greater quantities the migrant mollusc occurs in insular zones at the live and dead channels of the Tisza river. In the Winter periods these centres particularly attract the Northern aquatic birds assembling at this area. It seemed likely that the abundance in nutriment from migrant mollusca gave rise to this bird concentration. The study demonstrated in this paper was carried out to clarify this.

Materials and Methods

The following material was at disposal from the collection of the stomach contents from the Institute of Ornithology and the authors own collection from the period between 1947—1983:

Live and dead channel from the river section at Algyő — Csongrád:
Gavia arctica 2, *Podiceps ruficollis* 5, *Podiceps nigricollis* 4, *Podiceps cristatus* 23, *Podiceps griseigena* 1, *Anser albifrons* 6, *Anser fabalis* 4, *Anas platyrhynchos* 219, *Anas querquedula* 15, *Anas crecca* 23, *Anas acuta* 5, *Anas strepera* 4, *Anas clypeata* 2, *Aythya ferina* 6, *Aythya fuligula* 11, *Aythya nyroca* 31, *Aythya marila* 1, *Bucephala clangula* 6, *Mergus albellus* 3, *Mergus merganser* 1, *Mergus serrator* 1.

Backwater at Szolnok: *Anser fabalis* 2.

Area of the live and dead Tisza at Tiszasüly: *Gavia stellata* 1, *Gavia arctica* 1, *Tadorna tadorna* 1, *Aythya ferina* 1, *Clangula hyemalis* 1, *Melanitta fusca* 1.

Live Tisza and water storage tank at Tiszafüred: *Gavia stellata* 1, *Bucephala clangula* 2, *Melanitta nigra* 1.

The stomach content analysis regarding the significant proportion of the listed material has been discussed in detail in the publications cited (STERBETZ 1967, 1969, 1969a, 1973, KISS—STERBETZ 1973, STERBETZ 1975, 1983). Therefore, Table 1 only demonstrates the analysis of occurrence and amount of the *Dreissena* from the period of the whole year. Migrant mollusca only exclusively occurred between the period of October — February in the bird stomach contents from the area of the Tisza river.

Results

It was evident from the analysis of the 386 stomach contents of the 27 natatorial bird species collected from the Algyő-Tiszafüred section of the Tisza river that from the species in question, 14 consumed migrant mollusca. From these, in the case of 11 species, this type of nutriment occurred with a frequency of 90—100%!

Dreissena was not present in the case of the *Podiceps, Anser, Branta, Tadorna* genera. From the *Anas* genus only the *A. platyrhynchos* consumed a non-significant amount of migrant mollusc. The *Aythya ferina, Aythya fuligula* and *Bucephala clangula* regularly wintered at the place where the migrant mollusc was present in concentrated form. The *Gavia, Aythya, Clangula, Melanitta* and *Mergus* species characteristic of the marine or oligotrophic deep waters are relatively rare in Eastern Hungary. Their regular occurrence demonstrated at the Tisza river is also explained by the *Dreissena* found from their studied stomach contents. Their average quantity relations from the period between 1947—1982 is demonstrated on Table 2, from the Algyő—Csongrád section.

Conclusions

The spreading and mass ratio of the migrant mollusc showed sensitive fluctuation during the course of the recent years as the consequence of increasing water contamination. This fluctuation also exerts considerable influence on the Winter occurrence at the Tisza river and the period of duration of the Northern natatorial birds feeding from them and being characteristic of the marine or oligotrophic deep waters, therefore, continuous studies on their dynamisms may also be utilized as an environment-protection indicator.

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Table 1. *The occurrence of Dreissena polymorpha in the stomach contents of aquatic birds studied at the area of the Hungarian Tisza-valley*

Studied bird species	Ind. No.	No. of cases in wich *Dreissena* occurred	Amount of Dreissena (pieces)
Gavia stellata	2	2	2
Gavia arctica	3	3	19
Podiceps ruficollis	5	—	—
Podiceps nigricollis	4	—	—
Podiceps cristatus	23	—	—
Podiceps griseigena	1	—	—
Anser albifrons	6	—	—
Anser fabalis	6	—	—
Branta leucopsis	1	—	—
Tadorna tadorna	1	—	—
Anas platyrhynchos	219	4	12
Anas querquedula	15	—	—
Anas crecca	23	—	—
Anas acuta	5	—	—
Anas strepera	4	—	—
Anas clypeata	2	—	—
Aythya ferina	7	4	57
Aythya fuligula	11	10	140
Aythya nyroca	31	3	3
Aythya marila	1	1	39
Bucephala clangula	8	7	37
Clangula hyemalis	1	1	2
Melanitta nigra	1	1	22
Melanitta fusca	1	1	12
Mergus albellus	3	3	12
Mergus merganser	1	1	1
Mergus serrator	1	1	2

Table 2. *Average individual number of Winter aquatic birds regularly consuming Dreissena polymorpha from the Algyő—Csongrád section of the Tisza river between the period 1947—1982 (+ = marine, or oligotrophic deep water species)*

Bird species	X.	XI.	XII.	I.	II.
+ *Gavia stellata*	6	5	2	1	2
+ *Gavia arctica*	10	8	6	2	4
Aythya ferina	450	120	10	8	300
+ *Aythya fuligula*	220	280	300	200	400
Aythya nyroca	60	—	—	—	10
+ *Aythya marila*	4	2	1	—	—
+ *Bucephala clangula*	80	250	500	400	450
+ *Clangula hyemalis*	1	—	1	—	—
+ *Melanitta nigra*	—	2	—	1	—
+ *Melanitta fusca*	—	3	2	—	—
+ *Mergus albellus*	10	40	150	90	20
+ *Mergus merganser*	2	6	22	30	20
+ *Mergus serrator*	1	2	1	2	1

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A vándorkagyló (Dreissena polymorpha Pall.) mint a Tisza-völgy úszó madarainak tápláléka

STERBETZ I.

Kivonat

A dolgozat a Tisza völgyéből 27 úszó-bukó és búvár madárfaj 386 gyomortartalmából vizsgálja a *Dreissena polymorpha* előfordulásokat. Az 1. táblázatban ismerteti annak eredményeit. Megállapítja, hogy a Tiszán telelő *Gavia, Aythya, Bucephala, Clangula* és *Mergus* genusokba tartozó fajok táplálkozásában a *Dreissenának* kiemelt szerepe van.

A *Dreissena* elterjedési és tömegviszonyai a fokozódó vízszennyeződés következtében az utóbbi években érzékenyen fluktuálnak. Ez az ingadozás a belőlük táplálkozó marin és oligotróf mélyvizekre jellemző északi vízimadarak tiszai, téli előfordulását és itt tartózkodásuknak időtartamát is befolyásolja. Ennek az értékelése a gyakorlatban környezetvédelmi indikátorként hasznosítható.

Моллюск-путешественник (Dreissena polymorpha Pall.) как пища для плавающих птиц долины Тисы

И. Штербец

Резюме

Работа исследует места появления *Dreissena polymorpha* на основе анализа содержания 386 желудков плавающе-ныряющих и ныряющих птиц (27 видов). Таблица 1 приводит результаты исследований. Автор установил, что в питании видов, относящихся к зимующим на Тисе *Gavia, Aythya, Bucephala, Clangula* и *Mergus*, особое значение имеет *Dreissena.*

Распространение и массовое появление *Dreissena* в силу усиливающегося загрязнения воды в последние годы чувствительно флуктирует. Эти колебания оказывают влияние на частоту появления на Тисе зимой и на длительность нахождения здесь северных водных птиц, характерных для мариновых и олиготрофных глубоких вод. Выяснение этого может служить на практике индикатором степени загрязнённости воды.

Dreissena polymorpha Pall. u ishrani ptica plovuša reke Tise

STERBETZ I.

Istraživačka grupa reke Tise, Szeged

Abstrakt

U radu su prikazani rezultati analize 386 želudaca ptica plovuša i gnjuraca, pripadnika 27 vrsta, iz doline reke Tise, na prisustvo *Dreissena polymorpha* (Tab. 1.). Utvrdjeno je da Dreissena polymorpha ima značajnu ulogu u ishrani rodova *Cavia, Aythya, Bucephala, Clangula* i *Mergus,* koji zimuju duž reke Tise.

Rasprostranjenje i koncentracija Dreissena zadnjih godina pokazuje osetne fluktuacije usled zagadjivanja vode. Ova kolebanja utiču na pojavu i dužinu zadržavanja ptica severnih krajevasa marinskih i oligotrofnih dubinskih voda, na reci Tisi. Rezultati ove analize u praksi mogu poslužiti kao indikator u zaštiti životne sredine.