

LIMNODRILUS HOFFMEISTERI CLAPAREDE, 1862 AS A DOMINANT SPECIES IN THE TISA DEAD-ARM (ČURUG—BISERNO OSTRVO) OLIGOCHAETA COMMUNITY

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Abstract

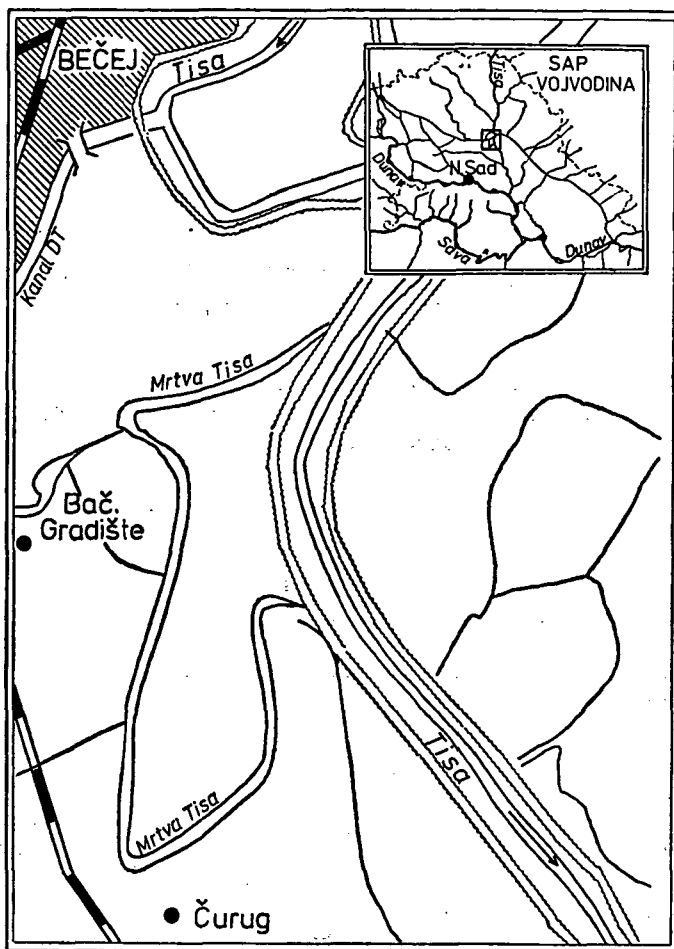
In the 1983—1988 period 11 oligochaeta have been found in the Mrtva Tisa Oligochaeta community from Naididae and Tubificidae family. *Limnodrilus hoffmeisteri* has been a dominant species in all the samples. The relative abundance, expressed as the percentage of this species has shown an increasing tendency up to 67%. The increase in the percentage of this species is closely related to the increase in the Oligochaeta dynamics of abundance. This in turn, leads to changes in the Oligochaeta community structure.

Introduction

The fauna studies of the Mrtva Tisa bottom are of recent date (initiated in 1983). Oligochaeta community as an eutrophication indicator in the Mrtva Tisa has been studied by DJUKIĆ 1987 in the period from 1983 to 1987. Within this short period, it has been found that *L. hoffmeisteri* species relative abundance is constantly reflected by the increasing tendency. Many research workers have been involved in the studies of *L. hoffmeisteri* species.

According to BRINKHURST 1969, this species is present in fresh waters of variable quality and its progressive domination in the benthic community is closely related to the organic pollution level. PODUBNAJA (1972), however, in her research work has demonstrated that this species is widely spread, inhabiting waters polluted with different types of pollutants. *L. hoffmeisteri* and *L. udekemianus* species development cycle and production in the organic matter reach mud has been studied by LAZIM and LEARNER 1986.

These authors have come to a conclusion that *L. hoffmeisteri* had the highest relative abundance within the total *Tubificidae* production. For these reasons we have decided to conduct a more detailed study of this species, which dominates in the Mrtva Tisa.



Materials and Methods

The fauna samples of the Mrtva Tisa bottom have been collected according to seasons, in the 1983—1988 period. The mud has been collected by "Ekman Birge" type dredging machine. The collected material has been prepared in the laboratory by standard method. Determination has been carried out on live Oligochaeta specimen. The number of individuals is presented as a total number of individuals per m² of the surveyed area.

The correlation is calculated on the basis of the total number of Oligochaeta individuals and those of *L. hoffmeisteri* species.

Results and Discussion

In the qualitative studies of the Oligochaeta community of the Mrtva Tisa bottom fauna, 11 Oligochaeta species of six genera and two families, Naididae and Tubificidae have been found, as follows: *Dero digitata*, *D. obtusa*, *Stylaria lacustris*, *Limnodrilus*, sp. *L. hoffmeisteri*, *L. claparedeanus*, *L. udekemianus*, *L. helveticus*,

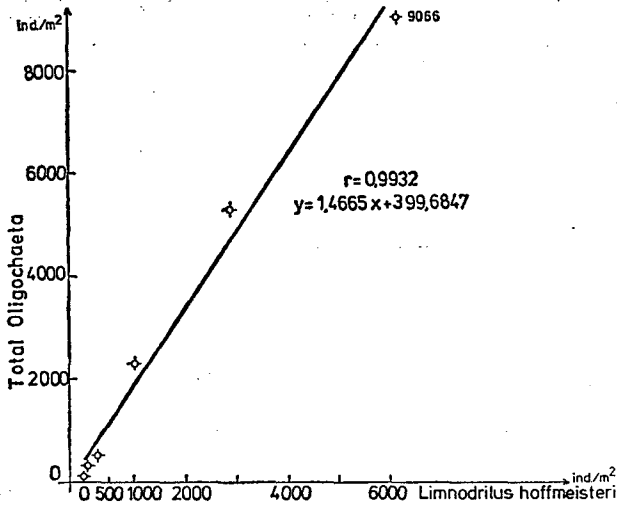


Fig. 1. Correlation of Oligochaeta total number and number of *Limnodrilus hoffmeisteri*

Psamoryctides barbatus, *P. albicola*, *Potamothrix hammoniensis* and *Tubifex tubifex*. *L. hoffmeisteri* has been a dominant species in all the samples in the 1983—1988 period.

This is confirmed by the relative abundance, as shown in Fig. 1. The mean percentage of this species has been increased from 22% in 1983, to 67% in 1988. The Mrtva Tisa mudd is of a soft, consistent state, black color, with ample detritus of the plant and animal origin, rich in organic matter, and highly suitable for the observed species development.

Similar results have been obtained by LAZIM and LEARNER, 1986. In the organic enriched fine sediment, *L. hoffmeisteri* species had the largest percentage in the total Tubificidae production. Research work carried out by BRINKHURST 1969, LANG 1984, MILBRINK 1980., and others state a large number of this species in the organic matter rich mudd. Because of that, LANG 1984 has classified them as eutrophic species.

Therefore, this species in the community with Tubificidae defines the Mrtva Tisa environment as eutrophic. The quantitative analysis contributes to this fact,

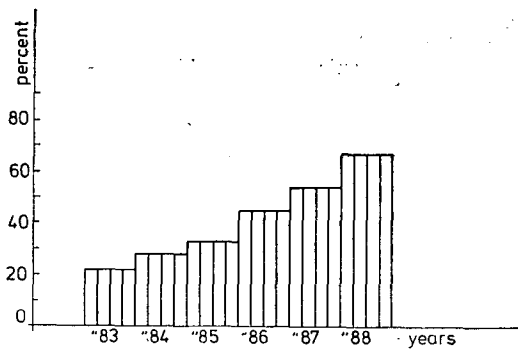


Fig. 2. Participatin percent of *Limnodrilus hoffmeisteri* individual in Oligochaeta total number

showing a striking increase in the number of Oligochaeta individuals, up to 9066 ind/m² in 1988. This is also characteristic of eutrophic waters.

The calculated relation between the total number of Oligochaeta individuals and those of *L. hoffmeisteri* reveals a close correlation between these two parameters.

This is also supported by the correlation coefficient significance (Fig. 2), thus *L. hoffmeisteri* species contributes the most to an increase in the Mrtva Tisa abundance dynamics. It has succeeded in adjusting to the conditions of the organic matter rich sediment, multiplying plentifully and thus disturbing the Oligochaeta community structure ratio in this stagnant tributary.

Conclusion

In the 1983—1988 period 11 Oligochaeta species have been defined in the Mrtva Tisa Oligochaeta community, from six genera and two families: Naididae and Tubificidae. *Limnodrilus hoffmeisteri* has been a dominant species in all the samples.

The relative abundance expressed as the percentage of species has shown an increasing tendency, even up to 67%. The correlation between the total number of Oligochaeta individuals and those of *L. hoffmeisteri* species has been very narrow (the correlation coefficient $r=0,9932$), meaning that *L. hoffmeisteri* is a major cause for an increase in the abundance dynamics of Oligochaeta in the Mrtva Tisa. It has been well adjusted to the conditions of an organic matter rich sediment, it has also multiplied abundantly, disturbing the Oligochaeta community structure in this stagnant tributary.

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A Holt-Tisza (Čurug—Biserno Ostrvo) Oligochaeta közösségének dinamikája

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Kivonat

A Holt-Tisza komplex hidrobiológiai kutatásainak szerves tartozéka az Oligochaeták vizsgálata is. Megállapítást nyert hogy az 1983—1985-ös időszakban strukturális változás állt be az Oligochaeta közösség összetételében. Mennyiségi analízis tekintetében a domináns *Limnodrilus hoffmeisteri* relatív abundanciája évről évre növekedett. Az oligochaeták mennyiségi gyarapodásán belül a *L. hoffmeisteri* feldúsult részesedése szoros korrelatív kapcsolatban áll, a szerves megterhelés következtében, a holtágra jellemző felgyorsított eutrofizációs folyamattal.

Динамика сообщества Oligochaeta в Мертвой Тисе (Чуруг — Бисерно Острво)

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Резюме

Изучение *Oligochaeta* является органической частью комплексного гидробиологического исследования Мертвой Тисы. Было установлено, что в период 1983—85 гг. в составе сообщества *Oligochaeta* произошли структурные изменения. В результате количественного анализа обнаружено увеличение из года в год относительного избытка доминантного вида *Limnodrilus hoffmeisteri*. В рамках количественного увеличения *Oligochaeta*, относительное преобладание *L. hoffmeisteri* находится в тесной корреляции с характерным для мертвого русла ускоренным процессом эутрофизации вследствие его органической нагрузки.

Limnodrilus hoffmeisteri clarede, 1862 kao dominantna vrsta u zajednici Oligochaeta u mrtvoj Tisi (Čurug—Biserno Ostrvo)

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Abstrakt

U periodu od 1983—1988 godine u oligohetnoj zajednici Mrtva Tisa je konstatovano 11 vrsta oligoheta iz familije Naididae i Tubificidae. U svim uzorcima je dominirala vrsta *Limnodrilus hoffmeisteri*. Relativna abundantnost, prikazana preko procentualne zastupljenosti ove vrste pokazuje tendenciju njenog porasta i do 67%.

Procentualno povećanje zastupljenosti ove vrste je u uskoj korelaciji sa povećanjem dinamike brojnosti oligoheta, a to dovodi do promena u strukturi oligohetne zajednice.