

## EUTROPHICATION OF THE DEAD THEISS INDICATED BY OLIGOCHAETE

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(Received September 08, 1988)

### Abstract

The study of oligochaete communities in the dead Theiss in the period 1983—1987 shows a very rapid process of eutrophication in this stagnant tributary. On the base of average percentage presence of oligochaete, it is clearly visible that dominant are eutrophic species, such as: *Limnodrilus* sp., *L. hoffmeisteri*, *L. claparedeanus*, *L. udekemianus* and *Potamothrix hammoniensis* characterizing their environment as eutrophic. At the same time the number of individuals and their bio-mass have the tendency of expressive increase, which is the characteristic of eutrophic waters.

### Introduction

By analysing the presence of oligochaeta communities, a very good estimate of the eutrophication degree can be made for stagnant waters. How current and important this problem is, shows in the work of research teams throughout the world, and their numerous reports about the process of eutrophication in shallow stagnant waters as well as in large, deep mountain lakes of Switzerland, Sweden and other countries: LANG and LANG—DOBLER 1980, LANG and HUTTER 1981, LANG 1984 and MILBRINK 1980. Recently, studies of the eutrophication process were made also in Vojvodina, DJUKIĆ 1984. So in this work, the trophic status of a stagnant water river lake of the dead Theiss is presented, according to the presence of oligochaeta species.

### Materials and Methods

The bottom fauna samples from the dead Theiss were collected seasonally in the period 1983—1987. The silt (mud) was taken by a dredge, type "Ekman-Birge". The collected material was prepared in the laboratory by standard treatment methods. Determination was made on live oligochaete individuals. The number of individuals is represented as a total number of individuals per m<sup>2</sup> of observed surface, while the bio-mass of oligochaete, as freshly weighed individuals in g/m<sup>2</sup>.

### Results and Discussion

Within the frame of complex hydrobiologic research of the dead Theiss, the structure and dynamics of oligochaete fauna in the period 1983—1987, was followed. So on the base of obtained data, it was possible to determine also the trophic status of this stagnant tributary.

On Fig. 1. it can be clearly seen, according to relative abundance of the oligochaete species, that dominant were — *Limnodrilus* sp. (juvenile), *Limnodrilus hoffmeisteri* *L. claparedeanus*, *L. udekemianus*, *Potamothrix hammoniensis* and *Psamoryctides barbatus*, so that the majority of oligochaete communities are eutrophic species. Over 70% of the species are eutrophic, enduring eutrophic environment, determined according to the classification of LANG 1984, who had determined the trophic status of lakes in Switzerland according to the presence of oligochaete, pooling the species into oligotrophic, mesotrophic and eutrophic.

The studied river lake is situated in the region of arable land with an intensive agriculture, which, due to inflow of nutritive elements has a great influence on the increase of primary and secondary production. For this reason, the quantitative analyse of oligochaete in the investigated period, shows a tendency of expressed increase of individual's number (even up to 5 300 ind./m<sup>2</sup>) as well as the bio-mass up to 17 g/m<sup>2</sup> yearly, which is characteristic for eutrophic waters. So this locality can be considered, according to quantitative analysis, as eutrophic.

Further research of this eco-system in the future from the aspect of eutrophication, will probably give solutions for the slowing of this process.

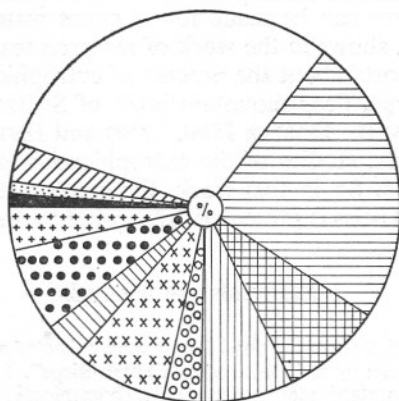
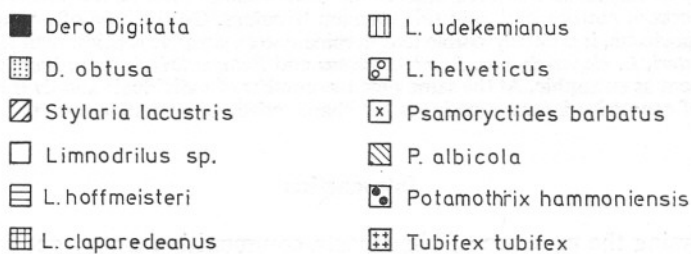


Fig. 1. Average percentual presence values of particular oligochaete species in the dead Theiss (1983—1987)

### Conclusion

The studies of the structure and dynamics of oligochaete in the dead Theiss in the period 1983—1987 have shown that this stagnant tributary (former riverbed of Theiss) has a very rapid process of eutrophication.

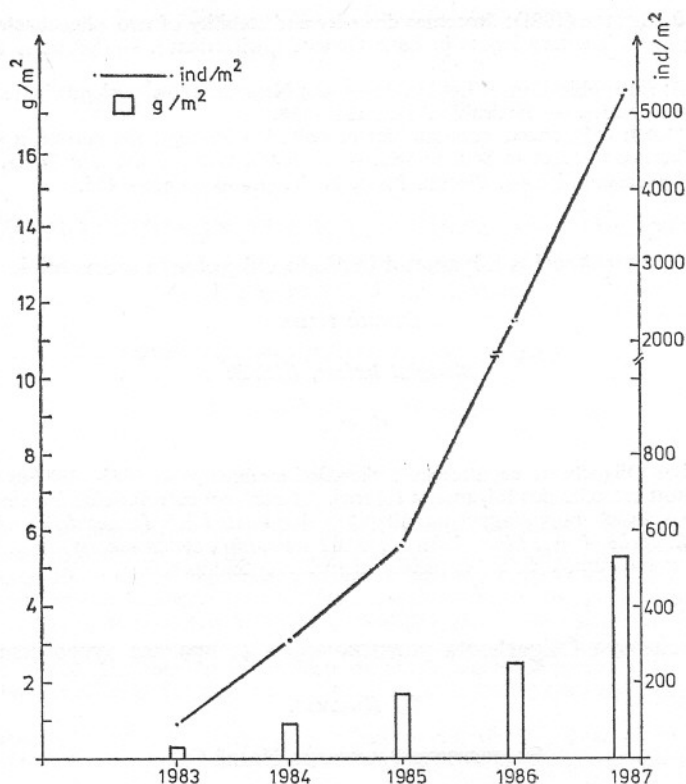


Fig. 2. Mean yearly values of the number of oligochaete (ind · m<sup>-2</sup>) and the bio-mass (g · m<sup>-2</sup>) in the dead Theiss (1983—1987)

The relative abundancy of oligochaete species has shown that dominating were eutrophic species — *Limnodrilus* sp. (juvenile forms), *L. hoffmeisteri*, *L. claparedeanus*, *L. udekemianus* and *Potamothrix hammoniensis*, which by their large number define the environment in which they live.

The quantitative analysis of oligochaete ascertained an expressed increase of the number of individuals and their bio-mass, which is characteristic of eutrophic waters. For these reasons, the dead Theiss, in the classification of water currents through oligochaete as indicators of eutrophication, can be classified as an eutrophic water.

### References

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## Az autrofizációs folyamatot indikáló Oligochaeta szervezetek

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### Kivonat

A Holt-Tisza Oligochaeta együtteseinek vizsgálati eredménye az 1983—1987-es időszakban a holtág felgyorsított eutróficációs folyamatát tükrözi. Az ezirányú eutróficációs folyamatra utal egyrészt az átlagos százalékarány alapján megállapított domináns fajok (*Limnodrilus hoffmeisteri*, *L. claparedeanus*, *L. udekemianus*, *Limnodrilus* sp. és a *Potamothrix hammoniensis*) jelenléte, másrészt megnövekedett egyedszámuk és a biomasza kiemelkedő feldúsulása.

## Организмы Oligochaeta указывающие на процесс эвтрофикации

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### Резюме

Изучение популяции Oligochaeta в Мертвой Тисе в период 1983—1987 гг. указывает на ускоренный процесс эвтрофикации. На процесс эвтрофикации указывает с одной стороны присутствие следующих доминантных видов *Limnodrilus hoffmeisteri*, *L. claparedeanus*, *L. udekemianus*, *Limnodrilus* sp. и *Potamothrix hammoniensis*, а с другой — увеличение числа особей, а также значительное нарастание биомассы.

## Oligochaeta kao indikatori eutrofizacije u mrtvoj Tisi

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### Izvod

Proučavanje oligohetnih zajednica Mrtve Tise u periodu od 1983—1987. godine pokazuju da ova mrtvaja ima veoma ubrzan process eutrofizacije. Na osnovu prosečne procentualne zastupljenosti oligoheta se jasno vidi da su dominirale eutrofne vrste *L. hoffmeisteri*, *L. claparedeanus*, *L. udekemianus*, *Limnodrilus* sp. i *Potamothrix hammoniensis* i one zapravo karakterišu sredinu u kojoj žive, kao eutrofnu. Istovremeno su broj individua i njihova biomasa imali tendenciju izrazitog povećanja, a to je osobina eutrofnih voda.