ASPECTS REGARDING THE LUMBICIDAE FAUNA FROM THE PROTECTED AREAS, UNDER THE CONDITIONS OF THE COUNTY OF NEAMT

ASPECTE PRIVIND FAUNA DE LUMBRICIDE (OLIGOCHAETA- LUMBRICIDAE) DIN SPAŢIILE PROTEJATE, ÎN CONDIŢIILE DIN JUDEŢUL NEAMŢ

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Abstract. *The Lumbricidae fauna represents a component of paramount importance for each type of soil. The presence of Lumbricidae, the number of species, the number of specimens, the biological, physiological and ecological characteristics of each species, represent important clues regarding the characteristics of the soils they were sampled from, details on structure, texture, fertility, humidity or exposal to floods, as well as the degree of pollution with chemical substances, especially pesticides. All these clues are evident from the changes in morphological parameters in the specimens, in comparison to the characteristics of each species. This paper concentrates on the diversity of the Lumbricidae species from four enclosed spaces (greenhouses) in the county of Neamt, as well as on the morphological characteristics of the specimens of each species.*

Key words: environment, fauna, lumbricidae, pollution, greenhouses.

Rezumat .*Fauna de lumbricide reprezintă o componentă deosebit de importantă a oricarui tip de sol. Prezenţa lumbricidelor , numărul de specii, numărul de indivizi, particularităţile biologice, fiziologice şi ecologice ale fiecărei specii în parte, reprezintă indicii preţioase cu privire la particularităţile solurilor din care au fost prelevate, atât în ce priveşte structura, textura, fertilitatea, gradul de umiditate, sau expunerea la inundaţii cât şi în ce priveşte gradul de poluare cu substanţe chimice, mai ales cu pesticide, indicii date de modificarea parametrilor morfologici ai indivizilor , faţă de parametrii caracteristici ai fiecărei specii în parte. Lucrarea de faţă abordează diversitatea speciilor de lumbricide din 3 locaţii acoperite (sere) din judeţul Neamţ, precum şi particularităţile morfologice ale indivizilor din fiecare specie.*

Cuvinte cheie: mediu, faună, lumbricide, poluare, sere.

MATERIAL AND METHOD

The observations and soil samples were during a period of two months, in 3 parts of the county of Neamt, under greenhouse conditions.

The three locations were: Vânători- Neamt (flower greenhouse), Sihăstria Monastery–Neamţ (flower greenhouse) and Sihla Monastery-Neamt (open greenhouse, soil cultivated with vegetables) .

There were collected samples of Lumbricidae from the three locations which were then transported to Iasi in 10% ethylic alcohol. In the laboratory, the material was analyzed and determined, then the data was registered and interpreted, the obtained

results were compared to the data related to the characteristics of the soils from that locations and to the data related to the agro-technical techniques employed, as well as the exploitation methods applied on those lands. The determinations and the measurements of the biological material were undertaken using binocular magnifying glasses.

RESULTS AND DISCUSSIONS

The first location to make observations and take biological samples was the greenhouse from Vânători Neamt. It is a private property used to produce flower seeds and pot flowers. The samples were taken from the soil layer of 1-40cm. Even though there were undertaken several soil samples, there were collected only three specimens.

At the moment of the sampling, the greenhouse soil was not cultivated and relatively tamped. Although we could collect only a reduced number of specimens, we noticed the presence of numerous Lumbricidae galleries. The specimens collected from that soil are part of *Dendrobaena octaedra typica* species.

After the analysis of the obtained parametres we could notice the following:

- the length of the body varies between 30-50 mm, in an average of 32,5 mm;
- the diametre is 2 mm, (100%);
- the clitellum is positioned on segments 29-33 in 2 specimens (66,6%), on segments 28-33 in 1 specimen (33,3%)
- the minimum number of body segments is 30 and the maximum is 35.

The obtained data rank the collected specimens in the normal limits of the species. Also, the presence of *Dendrobaena octaedra typica* species in that soil proves the exposal of the land to repeated floods, a fact confirmed by the owner.

The second location to take biological samples was the flower greenhouse from Sihăstria Monastery-Neamţ, an unexploited greenhouse, used only to keep the pot flowers for the winter period. The sampling was done also from the soil layer between 1-40 cm depth. There were collected 9 specimens from *Octolasium lissaense* species.

After the analysis of the morphological characteristics we could notice the following:

- the length of the body varies between 80-100 mm in 6 specimens, between 101- 150 mm in 3 specimens, with an average of 91,5 mm.;
- the minimum diametre is 4 mm, (1 specimen - 11,1%), the maximum of 6 mm (6 specimens - 66,6%) and the average is 5,5 %.
- the clitellum is positioned on segments 29-37 in 7 specimens (77,7%), on segments 28-36 in 3 specimens (22,2%)
- the minimum number of body segments is 118, the maximum number is 150.

The obtained data rank the collected specimens in the normal limits of the species.

The third location dedicated to research was the greenhouse opened at Sihla Monastery-Neamţ. The samples were taken from a depth of 1-50cm. There was noticed the presence of 6 species, as there was collected a number of 39 specimens. The species sampled from this location are the following: *Eisenia submontana*-11 specimens; *Lumbricus rubellus*- 4 specimens; *Eiseniella tetraedra typica*- 11 specimens; *Lumbricus terestris*- 2 specimens; *Eisenia foetida*- 4 specimens; *Octolasium lissaense*-7specimens.

For *Eisenia submontana* species there were found 11 specimens and their morphological characteristics proved the following traits:

- the length of the body varied between 130-149 mm in 5 specimens (45,45%), between 150-180mm in 6 specimens (55,55%), the average length being 160mm;

- the minimum diametre was 5mm in 1 specimen (33,3 %), maximum of 6 mm in 2 specimens (66,6 %); average of 5,25 mm.

- the clitellum was positioned on segments 24-32 in 9 specimens (81,81%), on segments 24-31in 1 specimen (9,09 %), on segments 27-33 in 1 specimen (9,09%)

- the minimum number of body segments was 115, the maximum number 130.

For *Lumbricus rubellus* species there were collected 4 specimens. In all, the length varied between 130-150 mm. The minimum measured diametre was 5mm, in 2 specimens, respectively 50% of them, and the maximum diametre was 6 mm, recorded for the other 2 specimens. The clitellum was positioned on segments 26-32 in 25% of the specimens (1 specimen), on segments 26-33 in 50% of them and on segments 27-33 in 25%. The minimum number of body segments was 134 and the maximum was 145.

Eiseniella tetraedra typica species was represented by 11 specimens. The length of the body varied, thus in 54,54% of the specimens (6) it varied from 50 to 80 mm, in 45,45% (5) it varied between 80-100 mm. The diametre ranged as well between 2 mm (63,6%) and 4 mm (18,18%). The clitellum was found on segments 23-27 in 81,81% of the specimens, and on segments 23-36 in 9,09%. The number of body segments varied from a minimum of 70 to a maximum of 90.

Out of *Octolasium lissaense* species there were collected 7 specimens. The recorded variations in length was from 50-99 mm - 42,8% of the specimens to 100-170-57,2% of them. The minimum diametre was 3 mm and the maximum one was 7 mm. The position of the clitellum was noticed on segments 30-35 in 3 specimens (42,8%), on segments 31-36 in 4 specimens (57,2%). The total number of body segments was a minimum of 97 and a maximum of 170.

There were collected 4 specimens from *Eisenia foetida* species. The variations in length were recorded from 40-90 mm- 25 % of the specimens to 100-130mm- 75% of them. The minimum diametre was 3 mm and the maximum one was 4 mm. The position of the clitellum was noticed on segments 24-31 in 25 %, on segments 25-31 in 50% and on segments 26-33 in 25% of the specimens. The total number of body segments was at least 87 and maximum 120.

Out of *Lumbricus terestris* species there were collected 2 specimens. The recorded variations in length were 90-300 mm.

The recorded diametre was 10 mm. The position of the clitellum was noticed on segments 32-37. The total number of body segments was 180.

CONCLUSIONS

1. Although placed at relatively small distances from one another, the locations proved to host different species of Lumbricidae, the number of collected specimens being also variable from one location to the other;

2. The greatest variety of species but also the greatest number of specimens was found in the greenhouse belonging to Sihla Monastery, where the forest soil and high degree of humidity favors the development of Lumbricidae.

3. In the non-cultivated greenhouses from Vânători Neamţ and Sihăstria Monastery, the number of collected specimens was very small, due to the tamped soil, as well as the relatively low fertility index;

4. The structure of the Lumbricidae species, as well as the abundance of the specimens highly influenced by the degree of humidity, the soil fertility but also the macro and micro-flora present on those soils;

5. Lumbricidae species are good indicators for the fertility degree, but also the pollution with pesticides, even more, the species of soil worms which populate the soils have a special impact in the agricultural eco-systems and a positive role in the improvement of the quality of the degraded soils.

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