RESEARCH ON THE FAUNA OF OLIGOCHAETA - LUMBRICIDAE FROM GREENHOUSES

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Conventional agriculture has negative effects on one or several natural resources. The main degraded resource is the soil which suffers the most quick and intense changes. At the same time with the physical, chemical or biological degradation, the useful fauna from the soil is also affected, fauna represented by coprophagous or necrophagous insects, but especially by earthworms (Oligochaeta - Lumbricidae) which have a role in the soil aeration and formation of humus.

Our research aims to accurately describe the Lumbricidae fauna in the soil of several greenhouses, with different tillage or exploitation degrees and the relationship between their presence or absence with the land usage. For the ***comparison****, there have been used the available resources on the Lumbricidae fauna in the area.*

Key words*: earth worms, soil, biodiversity, biological degradation*

MATERIAL AND METHOD

The biological material has been removed from the greenhouses soil, at the same time with the establishment of the soil profile. The earthworms have been detected and collected from the soil layer from 1 - 40 cm depth. In the deeper layers, there were discovered drifts, but there were not discovered the Lumbricidae specimens.

The earthworms were not eradicated immediately. They were collected in boxes with moist soil and transported to the laboratory, where they were later washed and destroyed by having been kept in ethyl alcohol 20% for 30 minutes. After this operation, they were examinated on the binocular magnifying glass.

In order to determine the species, there have been studied the following morphological characteristics:

- the presence or absence of the hypodermic pigment and its nature;
- the setae disposal;
- the position of the segmented parts and the position of body;
- body dimensions and number of segments;
- the shape of the head;
- the position of the first posterior porus;
- the presence or absence of the glandular areas around the male pori;
- the number of seminal vesicles and of the seminal receptacles.

We have also made a comparison between these characteristics from specimens of the same species, in order to highlight the variations met in the species and to interpret them according to the degradation degree of the soil they were extracted from.

The biological material has been extracted from three places in the county of Neamţ: Vînători, Sihăstria Monastery and Sihla Monastery.

RESULTS AND DISCUSSIONS

The first collection of material was done in a private greenhouse from Vînători village – county of Neamţ, a greenhouse which has been used for 5 years and it is exclusively destined to flower beds.

The collection was done on April, 30th 2009, but even though we found numerous galleries towards the surface and deeper in the soil, we have only gathered three specimens, belonging to one species: *Dendrobaena octaedra* Say var.*typica.*

The morphological characteristics and its variations are as follows:

Shape of the head: 1-pro-epilobic, 2 and 3 epilobic.

Clitelum: circular.

Colour: reddish-brown, violaceus.

Length variations- between 30-50 mm-3 specimens (1oo). Average length: 32,5 mm.

Diameter - 2 mm, (100%).

Clitelum position: on segment 29-33 – 2 specimens (66,6%), on segment 28-33-1 specimen (33,3%)

Total number of body segments: minimum-30, maximum -35.

In comparison to the other descriptive materials, the collected specimens are under the normal variation limits, the only element which is specified and confirmed by the pedological observations is that the soil they were taken from had sometimes been flooded by the local river, a fact which indicates the preference of the species for humidity in excess.

The small number of specimens, but a single species indicates a deprivation of the soil due to the unilateral exploitation.

For the second location, the collection of material took place in the greenhouse from Sihastria / Neamt Monastery. The greenhouse is not thoroughly exploited, it is only used during the cold seasons of the year to keep the flowers from the pots. The soil is pressed and excessively moist, as the greenhouse is placed in a swampy area.

The biological material was also collected from the soil layer of 1 to 40 cm deep, but there were found galleries at even bigger depth. There were collected 9 specimens belonging to one species: *Octolasium lissaense* Mich.

The morphological characteristics and their variations are as follows:

Shape of the head: epilobic.

Clitelum: saddle.

Colour: grey.

Length variations - between 80-100 mm-6 specimens (1oo), between 101- 150 mm- 3 specimens. Average length: 91,5 mm.

Diameter – minimum -4mm (1 specimen -11,1%), maximum – 6 mm (6 specimens - 66,6%) average - 5,5%.

Clitelum position: on segments 29-36– 7 specimens (77,7%), on segments 28-36- 3 specimens (22,2%).

Total number of body segments: minimum-118, maximum-150, average -134.

The third location for the collection of biological samples was Sihla – Neamt Monastery. The collection was made on May, 20th 2009. The greenhouse from this monastery is very old, at present being partially uncovered and used to cultivate greens and vegetables. The soil from this location proved to be much richer, due to its position near the woods, so that there were collected 39 specimens from 6 species. Their morphological characteristics and variations are presented in *table 3-8.*

The collected species were the following: *Eisenia submontana* Vejd.-11 specimens; *Lumbricus rubellus* Hoff. - 4 specimens; *Eiseniella tetraedra typica* Sav.- 11 specimens; *Lumbricus terestris* L.- 2 specimens. *Eisenia foetida* Sav.- 4 specimens, *Octolasium lissaense* Mich.-7 specimens.

Morpological characteristics of the species *Eisenia submontana* Vejd.

Shape of the head: epilobic.

Clitelum: saddle.

Colour: bright red.

Length variations - 130-149- 5 specimens (45,45%) 150-180 – specimens (55,55%). Average length: 160

Diameter – minimum-5mm (1 specimen-33,3 %), maximum- 6 mm (2 specimens-66,6 %) average - 5,25 mm.

Clitelum position: on segments 24-32– 9 specimens (81,81%). 24-31 (1 specimen-9,09 %), 27-33 (1 specimen- 9,09%)

Total number of body segments: minimum-115, maximum-130. Average number: 126,6.

Morpological characteristics of the species *Lumbricus rubellus* Hoff.

Shape of the head: tanilobic.

Clitelum: saddle.

Culoarea: purple red.

Length variations - 130-150 -4 specimens(100%). Average length: 141,2.

Diameter – minimum-5mm (2 specimens-50 %), maximum- 6 mm (2 specimens-50 %) average - 5, 5 mm.

Clitelum position: on segments 26-32– 1 specimen (25%), 26-33 (2 specimens-50 %), 27-33 (1 specimen- 25%).

Total number of body segments: minimum-134, maximum-145. Average number: 1142,2.

Morpological characteristics of the species *Eiseniella tetraedra typica* Sav.

Shape of the head: epilobic.

Clitelum: saddle.

Colour: brown-red.

Length variations - 50-80 - 6 specimens(54,54%), 80- 100 mm-5 (45,45%). Average length: 72,7.

Diameter – minimum-2mm (7 specimens-63,6 %), maximum- 4 mm (2 specimens-18,18 %) average- 2,5 mm.

Clitelum position: on segments 23-27– 9 specimens (81,81%).24-37 (1 specimen-9,09 %), 23-36 (1 specimen- 9,09%).

Total number of body segments: minimum-70, maximum-90. Average number: 76,8

Morpological characteristics of the species *Octolasium lissaense* Mich.

Shape of the head: epilobic.

Clitelum: saddle.

Colour: bright, violet-red.

Length variations - 50-99 mm: 3 specimens (42,8%), 100-170: 4 specimens (7,2%), average length: 106,4.

Diameter – Minimum: 3 mm, maximum: 7 mm, average : 5,3 mm.

Clitelum position: 30-35- 3 specimens (42,8%), 31-36: 4 specimens (57,2%)

Total number of body segments: minimum: 97, maximum: 170, average:139,28.

Morpological characteristics of the species *Eisenia foetida*

Shape of the head: epilobic.

Clitelum: circular.

Culour: violet-red on the back.

Length variations - 40-90 mm: 1 specimen (25%); 100-130mm: 4 specimens (75%). Average: 107,5 mm.

Diameter –minimum: 3 mm, maximum: 4mm, average: 3,75 mm.

Clitelum position: 24-31: 1 specimen (25%); 25-31: (25%); 26-33:2 specimens (50%).

Total number of body segments: minimum: 87, maximum 120, average: 101,75.

CONCLUSIONS

The physical and chemical deterioration of the soil entail a degradation of the life style of the inhabitants from the soil, mainly of the insects and earthworms. This phenomenon consists in the reduction of the numerical density, of the specific density, changes in the quantity and quality of the ecological parametres, a decrease in the specific variations.

Oligochaeta-Lumbricidae which are active in soil determine positive changes in the soil morphology, by the creation of galleries and large pores which allow and favour the air and water circulation. By their feeding activity, the vegetable remains are decomposed and transformed into soil matters, which

increase the soil fertility and recirculate the material from different layers in the soil.

The negative impact of the unilateral exploitation of the soil can be noticed in the case of the greenhouse from Vânători- Neamţ, as well as in the case of the greenhouse from Sihăstria- Neamţ Monastery.

In the soil from the greenhouse at Vânători- Neamţ there was found the presence of a single species of lumbricidae - *Dendrobaena octaedra* Say var.*typica.* (*Oligochaeta- Lumbricidae*) with a reduced number of specimens. (3). Moreover, the collected specimens are situated in the inferior half, even though they fit to the parametres of the species.

In the soil from the greenhouse at Sihăstria- Neamţ Monastey, there was found only one species, as well - *Octolasium lissaense* Mich., with a reduced number of specimens.

In comparison, in the soil from Sihla - Neamţ Monastery, there were collected 6 species, with a variation rate which is quite high, a fact which is due to the cultivation system, a traditional system which allows the gathering of fodder at the surface of the soil, thus determining the formation of a favourable habitat for the organisms in the soil, especially for the earthworms.

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