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PRELIMINARY RESEARCHES REGARDING THE EPIGEAL FAUNA IN THE GUȘTERIȚA ECOLOGICAL GARDEN (SIBIU COUNTY)

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Abstract

The researches in the agroecosystem Guștericța started in 2014 with the identification of the fauna on the vegetal substratum, by the method of observation. In the year 2015, the purpose of our researches was to collect and to identify the epigeal fauna of the same agroecosystem. By using the "Barber traps" method, in the period between 04.05.2015 -22.05.2015 the were collected 1,877samples of invertebrates. In the laboratory were identified 12 taxonomical groups; among them, the insects have the biggest number.The research will continue with the identification of invertebrate hill the species level. It will be established the report between the useful and pest fauna in the studied agroecosystem.

Key words**:** *the epigeal fauna, Guștericța (Sibiu county)*

INTRODUCTION

The simple plants exercised from the beginning, a strong fascination on the man, because they assured his sustenance, having in the same time a great degree of magic.
Homer was interested in the herbs used by Circe in the metamorphosis of Ulysses' comrades. Pythagoras claimed the existence of the soul in all the plants and respected them as a result of the theory of metempsychosis. The immortal soul in his wanderings in order to obtain his salvation, embodied himself in men, animals or plants.
His excessive piety got him lost; by his run from enemies he stopped at the edge of bean field where he was found and assassinated. In the Hellenistic kingdom of Pergam, the king Attalos the III, tilled plants in his royal garden, mostly medicinal herbs for the famous doctor and physician Galenus in order to be used in the Asclepion medical establishment.
Pliny the Elder praised the vegetables gardens in Rome and underlined the emulation between the patricians in obtaining the best vegetables. He told us how much Cato appreciated the cabbage from his own garden. Pliny the Elder was delighted by the Romans gardens that he sustained that their admiration was as high as for the Hesperidins Gardens. The noble Valeria family was given the cognomen of Lactucini (garden lettuce). Pliny the Elder asserted in the 9th book of Naturalis Historia that: "I presented the system of constellations and of the seasons in a simple shape and above all doubts even for those lacking experience in the field; for those who truly understand, the fields don't contribute less to the observation of the sky than the astronomic science to the cultivation of the soil". [14]
In the last years, the researches of the agricultural [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 17, 21], forest [16, 18, 19, 20, 22] and a meadows [11, 13, 15] ecosystems in the Sibiu county, demonstrated the important role of faunadiversity in soil and on the soil of the studied areals.
Biodiversity is a large term that comprises all the component parts of the biological diversity to emphasize for food and agriculture and all the components of the biological diversity that constitutes the agricole and forest ecosystems: animal variety and variability, the plants and microorganisms, at the genetic, specieis and ecosystematical level that is necessary for the maintaining of the key function of the agro-forest system and of his

internal processes [23]
Although it can not be established a direct value of biodiversity, the economic value of the goods and servicies offered by ecosystem were estimated between 16-54 trillions USD/yearly [12]. The values were calculeted taking into consideration the services offerend by ecosystems: food production, raw materials, the climate, and the atmospherical gases control, the circuit of the nutrients, of the water, the control of erosion, building of the soil and also we can add the educational aspect.
The basic idea of the experiment in the *Gușterița ecological garden*, knowu under the name: the ”Priestess's garden”, is the educational one. In the present it is about a return in the past regarding the agriculturel practice and it can be added new notions like biodiversity, the use of the natural factors and the removing all the allogen elements in practice, sustainability, durability and the education of population in order to understand and to practice the ecological agriculture. [1]
The purpose of our researches is to collectand to identify the epigeal fauna in the agrosystem Gușterița, Sibiu County. These data will be corroborated with the data obtained by direct observation method, in agroecosystem. [1]
Our study refers to two major objectives: the synthesis of the tehnological measures applied in the Gușterița garden, and the collecting and identification of the biodiversity of the epigeal fauna present in the studied agroecosystem.

MATERIALS AND METHODS

The period of investigation was between 04.05.2015-22.05.2015.
Locality of investigations: Gușterița (Sibiu county).
The samples were collected by ”Barber traps” method.
These were installed at the soil level, using alcohol as attractant and conservant, too.
The collecting time for such a trap was 48 hours from its installing.
The first traps were installed in 04.05.2015, with the first collecting on 06.05.2015, the last one was 22.05.2015.They used a number of ten traps: three in solarium (BT8, BT9, BT 10) and seven in the garden (BT1, BT2, BT3, BT4, BT5, BT6, BT7) (Fig.1).
The traps were placed in the different culture, crops, at 10 m distance between them (Table 1).
The biologicol material was collected in the plastic container, in 70% alcohol, one for every traps (sample) and them it was studied in laboratory.

Fig. 1. The setting of the ”Barber traps” in the studient agroecosystem
Source: Google Earth – adapted

Table 1. The setting of the ”Barber traps” in the culture of the ecological garden Gușterița

The settings of the traps	Barber traps Number	The culture where the traps was installed
garten	BT1	Parsley, rucola
	BT2	Salad (lettuce), cabbage
	BT3	Salad, field spinach
	BT4	Grund with weeds
	BT5	Pea, onion, garlic
	BT6	Cucumber, lean
	BT7	Celery, cabbage, red beet
solarium	BT8	Carrots, peppers
	BT9	Tomatoes, hot peppers
	BT10	Oats, turnips, salad

In laboratory on develop the standard proceeding: to unpack, the samples, to label, to number and to identify the collected material.
They were analyzed a total 80 samples.

RESULTS AND DISCUSSIONS

The Gușterița was included in the Sibiu city as early as 1950. Here, the Lutheran-Evangelist Parish from Sibiu, certified in the community system EMAS (Environmental Management Systems), foundet in its

precincts of the fortified ckeerch and educational youthful and medium centre.
In this centre, the pupils, the students and the citipens of Sibiu learn to respect the environing medium.
In this context was refounded the ”Priestess's garden” [1] a garden with vegetables (Fig. 2), as the first informal, educational school in our county Sibiu. Here is applied technology of culture that respect the methodology of the traditionel and ecological works accepted by ecological agriculture (Table 2).

Fig. 2. The ecological garden Gușterița (original photo)

Table 2. The technological measures used in the ecological garden Gușterița

The technological measure	Observation
Using of adequate tools to protect the soils and the organismus in soil	On use only hoe, weed hook and grubbing hoe. In this way on avoid the return of the soil layers with soil structure protection, mostly its microorganismus.
Using”the green fertilifer”	An ecological fertiliger is a mixture of *Sinapis alba*, *Brassica rapa* and *Avena sativa*. This encourage the activity of the faune in soil.
Using “ointment of the soil” (”mulch”)	Protective work, on use a mixture of horse manure with sawdust.
Compost	Compost is natural fertiliger extremely valuable for soil and for plants, too. It proceed from personal, own sources: sawdust, grass from haymaking, leafs from orchard, stalks, corn cobs, beau-creeping stabes and ou adds animal manure (horse and cow).
Wattering the soil with natural, bioactive preparates.	The preparates are ecological and have the role to recover the health of the soil.
Using seeds not treated, traditional, multiyearly.	They are not used hybrids and treated transplants.
The culture rotation.	Crops rotation is in the incipient phase.
Alelopatie	The plants are associated after needs and their specific feature (Table 1).
Applying the culture in bands.	It is preventive or reduce the pest attack, encourage the biological activity of soil, reduce the weeds.
Encuraging the useful weeds and eliminating the dangerous ones.	The useful wceds are not eliminated, but only when they disturb the cultivated plants.
Rational wattering	Using the rain water (Fig.3)
Hygiene of the culture	Breaking up the vegetal material.

Fig. 3. The colleting rain water in Gușterița (original photo)

Another objective of our researches was the identification of the epigealfauna in the studied agroecosystem till the order level. The knowledge of the faunistical components and the interrelationship between different structural parts of the agro-biocenosis Gușterița has a special importance for the establishment of the most effective phytosanitary measures and in the same time the total removing of the chemical materials used for the eliminating the animal and vegetal pest.
In the table 3 are presented both, the taxonomic and quantitative structure of the fauna collected by ”Barber traps” method in the agroecosystem Gușterița during the May month, 2015.
In the period between 06.05.2015-22.05.2015 they were collected 1,877 specimens of invertebrata.
In the 80 analized samples were found 12 taxonomic groups of invertebrata: Gasteropoda, Aranea, Acarina (Acari), Julida, Polydesmida, Isopoda, Collembola, Orthoptera, Homoptera, Coleoptera, Diptera, Hymenoptera (Table 3).

Table 3. Taxonomic and quantitative structure of the fauna collected by ”Barber traps” method in the agroecosystem Gușterița in May monts, 2015

Class/Order	Numerical Abundance	Relative Abundance
Gasteropoda	7	0.38
Aranea	142	7.57
Acarina (Acari)	66	3.52
Julida	111	5.92
Polydesmida	10	0.54
Isopoda	256	13.64
Collembola	90	4.79
Orthoptera	4	0.22
Homoptera	3	0.16
Coleoptera	353	18.80
Diptera	66	3.51
Hymenoptera	769	40.95
Total	**1,877**	**100%**

Source: Own calculation.

The most abundant groups are Hymenoptera with 769 specimens (40.95%), Coleoptera with 354 specimens (18.80%), Isopoda with 256 specimens (13.64%), Aranea with 142 specimens (7.57), Julida with 111 specimens (5.92%).

The groups with Numerical Abundance reduced are Polydesmida with 10 specimens (0.54%), Gasteropoda with 7 specimens (0.38%), Orthoptera with 4 specimens (0.22%). The most numerical group is Homoptera with 3 specimens (0.16%) (Fig. 4). In the same Table 3 on can observe the dominant group of Insecta class (Collembola, Orthoptera, Homoptera, Coleoptera, Diptera, Hymenoptera) with 1,285 specimens (68.46%) comparative with other invertebrata group (Gasteropoda, Aranea, Acari, Julida, Polydesmida, Isopoda) with only 592 specimens (31.54%).

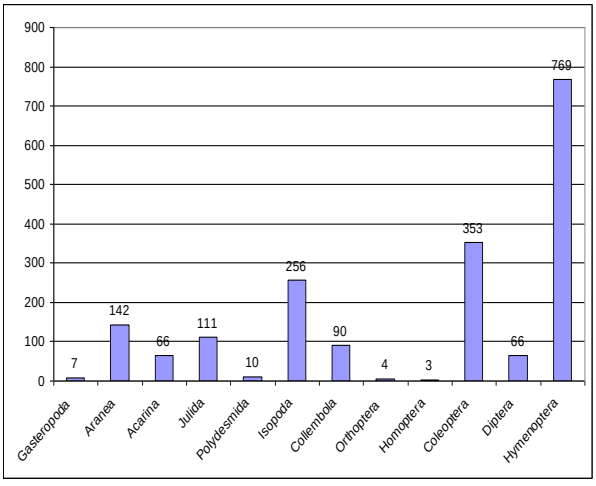

Fig. 4. The structure of the invertebrata faune in the ecological garden Gușterița (by Barber method).
Source: Own calculation.

CONCLUSIONS

The survey of the technological measures applied in Gușterița garden certified that the technology og culture is an ecological one.

Using the ”Barber traps” method were collected 80 samples with 1,887 specimens.

The collected fauna belongs to 12 taxonomical groups: Gasteropoda, Aranea, Acarina (Acari), Julida, Polydesmida, Isopoda, Collembola, Orthoptera, Homoptera, Coleoptera, Diptera, Hymenoptera.

Among the Invertebrata the most numerous are Insecta wits 1.285 specimens, comparative with the other Invertebrata groups with only 592 specimens.

They are a reduced number of researches in the corenty Sibiu rgarding the faunistical components structure in a cultivated agroecosystem in ecological conditions.

Our researches will continue with identification of the Invertebrata fauna till species level and also with survery about the report between useful and pest fauna in the studied agroecosystem.

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