SUMMARY

In the period 2022 - 2023, following the observations made, some more important aspects were clarified, including the pests that affect the lavender and goji crops in the Eastern part of Moldova.

The purpose of the research that was carried out was to determine with as much precision as possible the pests that affect or can affect these crops in Iași county, the prevention and control measures, as well as the knowledge of the useful and harmful fauna as well as the possibilities of protecting it.

Also, a new concept appeared, namely integrated combat, which can be defined as a form of applied ecology, dividing pest populations, on the one hand, and predator and parasite populations, on the other, within agrobiocenoses.

The doctoral thesis "**Research on the distribution, structure, abundance and dynamics of invertebrate species found in medicinal plant cultures**" deals with the study of entomofauna from lavender and goji crops according to the climatic conditions in Iași County; knowledge of the current state of research on useful fauna; identification of beneficial fauna from lavender and goji crops; the feeding mode of the useful fauna from these two crops, as well as the calculation of ecological biodiversity indices.

The work extends over 157 pages and conforms to the regulations in force and consists of two parts, namely: the first part entitled "The current state of knowledge at the national and international which includes 44 pages and the second part entitled "Own Research" , which includes 113 pages, 44 tables and 22 figures.

"The current state of knowledge" includes two chapters in which the information from the specialized literature is briefly presented with reference to the invertebrate species found in lavender and goji culture, the subject of the doctoral thesis and were later used for the interpretation and comparison of the obtained data in the part of "Own research" as well as the description of the natural framework of Iași county, in this chapter information is presented regarding the geographical location, pedoclimatic conditions and meteorology.

Part II, "Own Research", consists of 2 chapters:

Chapter III presents the purpose and objectives of the research, the research materials and methods used. The proposed objectives were:

1. Knowing the current state of research regarding the useful fauna from lavender and goji crops in Iași County.

For this they will study:

- specialized scientific works and other materials (books, monographs, etc.) that refer to the invertebrate fauna of lavender crops, the importance of the culture, culture technology, etc., worldwide and in our country;
- specialized scientific works and other materials (books, monographs, etc.) that refer to the invertebrate fauna of goji cultures, the importance of culture, culture technology, etc., worldwide and in our country.

2. Establishing the structure, dynamics and abundance of invertebrate species existing in lavender and goji crops.

For this, the following steps will be taken:

- ✓ Identifying and establishing the work method;
- ✓ Organization of field experiences;
- ✓ Direct observations in the field
- ✓ Collection of invertebrate fauna using different methods (Barber soil traps and yellow traps)
- ✓ Identification of the collected invertebrate species.
- ✓ Systematic classification of collected invertebrates
- ✓ Establishing the dynamics and abundance of invertebrate species

3. Establishing the biodiversity of invertebrates from lavender and goji crops.

For this, the following alpha diversity indices will be calculated:

-Shannon index, or Shannon-Weaver index

-Simpson diversity index

- Dominance index.
- Menhinick index.
- Buzas and Gibson index.

Chapter IV "Results and Discussions" presents the data obtained that will lead to the knowledge of the main components of the agrobiocenosis in the studied area, knowing that human intervention as a constructive factor results in continuous transformations, which makes organisms dependent on the biocenosis not be components constants of the agroecosystem.

As part of the research carried out in the period 2022-2023, two research methods were used - the yellow sticky trap method and the Barber soil trap method.

Samples were collected periodically according to the applied research method, during the vegetation period, during the 2 years that the research was carried out, and the collected material was labeled, then brought to the laboratory, where it was preserved and determined by species groups: diptera, hymenoptera, hemiptera, ants, parasitic wasps, myriapods, arachnids, etc. All coleopterans were identified to species level.

In the year 2022, 6 collections of invertebrate species were carried out in the lavender culture from the Barber-type soil traps, and the results are presented as

follows: at the first collection carried out on 25.05. 220 specimens of invertebrates were collected; at the 2nd harvest carried out on 06.06. 427 specimens of invertebrates were collected; at the 3rd harvest carried out on 27.06. 305 specimens of invertebrates were collected; at the 4th harvest carried out on 06.07. 516 specimens of invertebrates were collected; at the 5th harvest carried out on 18.07. 150 specimens of invertebrates were collected; at the 6th harvest carried out on 23.08. 153 specimens of invertebrates were collected, all from the Order Arthropoda.

In the year 2023, 6 collections of invertebrate species were carried out in the lavender culture from the Barber-type soil traps, and the results are presented as follows: at the first collection carried out on 30.05. 341 specimens of invertebrates were collected; at the 2nd harvest carried out on 10.06. 306 specimens of invertebrates were collected; at the 3rd harvest carried out on 24.06. 224 specimens of invertebrates were collected; at the 4th harvest carried out on 02.07. 328 specimens of invertebrates were collected; at the 5th harvest carried out on 26.06. 550 specimens of invertebrates were collected; at the 6th harvest carried out on 07.08. 257 specimens of invertebrates were collected, all from the Order Arthropoda.

In 2022, 1768 invertebrates were collected from the lavender crop, all belonging to the order Arthropoda and the following classes: Hexapoda (the most numerous), Arachnida and Miriapoda.

Among the Hexapoda, the most numerous were the Coleoptera species with 804 specimens belonging to a number of 53 species.

In 2023, 2006 invertebrates were collected from the lavender crop, all belonging to the Order Arthropoda and the following classes: Hexapoda (the most numerous), Arachnida and Miriapoda.

Among the Hexapoda, the most numerous were the Coleoptera species with 1148 specimens belonging to a number of 52 species.

In the yellow traps, from the lavender culture, in 2022, 1058 specimens were collected, all belonging to the Insecta class. The most specimens (229 specimens) were collected on 06.06., followed by the collection on 06.27. (187 copies).

Among the hexapods collected, cicadas, ants, dipterans and parasitic wasps had the highest number.

At the yellow traps, from the lavender culture, in 2023, 855 specimens were collected, all belonging to the Insecta class. The most specimens (217 specimens) were collected on 07.08., followed by the collection on 24.06. (181 copies).

Among the hexapods collected, cicadas, ants, dipterans and parasitic wasps had the highest number.

In the year 2022, 6 harvests of invertebrate species were carried out in the goji culture from the Barber-type soil traps, and the results are presented as follows: at the first harvest carried out on 25.05. 523 specimens of invertebrates were collected; at the 2nd harvest carried out on 06.06. 658 specimens of invertebrates were collected; at the 3rd harvest carried out on 27.06. 632 specimens of invertebrates were collected; at the 4th harvest carried out on 06.07. 420 specimens of invertebrates were collected; at the 5th harvest carried out on 18.07. 532 specimens of invertebrates were collected; at the 6th harvest carried out on 23.08. 513 specimens of invertebrates were collected, all from the Order Arthropoda.

In the year 2023, 6 harvests of invertebrate species were carried out in the goji culture from the Barber-type soil traps, and the results are presented as follows: at the first harvest carried out on 30.05. 626 specimens of invertebrates were collected; at the 2nd harvest carried out on 10.06. 748 specimens of invertebrates were collected; at the 3rd harvest carried out on 24.06. 611 specimens of invertebrates were collected; at the 4th harvest carried out on 02.07. 526 specimens of invertebrates were collected; at the 5th harvest carried out on 26.06. 543 specimens of invertebrates were collected; at the 6th harvest carried out on 07.08. 349 specimens of invertebrates were collected, all from the Order Arthropoda.

In 2022, 3278 invertebrates were collected from the goji culture, all belonging to the order Arthropoda and to the following classes: Hexapoda (the most numerous), Arachnida and Miriapoda.

Among the Hexapoda, the most numerous were the Coleoptera species with 1693 specimens belonging to a number of 59 species.

In 2023, 3403 invertebrates were collected from the goji culture, all belonging to the order Arthropoda and the following classes: Hexapoda (the most numerous), Arachnida and Miriapoda.

Among the Hexapoda, the most numerous were the Coleoptera species with 1722 specimens belonging to a number of 63 species.

At the yellow traps, from the goji culture, in 2022, 3388 specimens were collected, all belonging to the Insecta class. The most specimens (1187 specimens) were collected on 27.06., followed by the collection on 25.05. (825 copies).

Among the hexapods collected, cicadas (*Metcalpha pruinosa*), dipterans, and ants had the largest number.

In the yellow traps, from the goji culture, in 2023, 1447 specimens were collected, all belonging to the Insecta class. The most specimens (356 specimens) were collected on 30.05., followed by the collection on 10.06. (1336 copies).

Among the hexapods collected, cicadas, ants and diptera had the highest number.

Biodiversity indices capture certain aspects of ecosystems but are insensitive to many others. The interpretation of these biodiversity indices is as a characteristic of ecosystems, therefore an unequivocal relationship with environmental conditions is often lacking. The interpretation of the results can be profoundly altered depending on the choice of the biodiversity index. Biodiversity indices depend on how they are determined. Since the statistical distribution of the samples is generally not known, it is difficult to estimate the accuracy of a given index value. As discussed earlier, sample size and thoroughness of sampling play an important role. Sampling species with an irregular distribution pattern easily leads to faulty numbers (underestimated or overestimated).

Tiny species and rare species with an important role in the ecosystem are often not fully included or even missed entirely. The premise that all species are equal is questionable. For example, rare species can form a reservoir of functional and genetic diversity, contributing to ecosystem stability and resilience. However, the identity of species and their role in the community is lost in biodiversity indices. Another problem is related to the definition of the spatial boundaries of an ecosystem. It can be argued that a natural community is an open system with nothing approaching a fixed number of species.

However, biodiversity indices, and in particular the analysis of species abundance distributions, have proven useful in practice to act as an early warning tool for the effects of disturbances on ecological communities and to provide a means of measuring the implementation of management regulations ecological.

The alpha diversity index values of the arthropods collected from the lavender crop during the research period were as follows:

• The Simpson index had the value of 0.1268 in 2022 and 0.1687 in 2023

• The dominance index (D) had the value of 0.8732 in 2022 and 0.8313 in 2023

• The Shannon index (H') had the value of 3.888 in 2022 and 3.797 in 2023

• The Shannon index (H) had the value of 2.695 in 2022 and 2.632 in 2023

• The Shannon index had the value of -1.17 in 2022 and -1.143 in 2023

• The Menhinick index had the value of 1.736 in 2022 and 1.585 in 2023

• The Buzas and Gibbson index had the value of 0.2028 in 2022 and 0.1957 in 2023

• The equity index had the value of 0.6281 in 2022 and 0.6174 in 2023

• The Berger-Parker dominance index had the value of 0.2828 in 2022 and 0.3749 in 2023

• The Margalef index had the value of 9.629 in 2022 and 9.206 in 2023

Analyzing the Preston diagram of the lavender crop, in the year 2022, it turns out that there are 23 species with abundance 1; 13 species with abundance 2; 10 species with abundance 2-4; 5 species with abundance 4-8, 5 species with abundance 8-16, 3 species with abundance 16-32, 2 species with abundance 32-64,

4 species with abundance 64-128, 1 species with abundance 128-256 and 2 species with abundance 256-512.

The Preston diagram of the lavender crop, in the year 2023, shows that there are 10 taxa with abundance 1; 14 species with abundance 2; 14 species with abundance 2-4; 12 species with abundance 4-8, 9 species with abundance 8-16, 4 species with abundance 16-32, 5 species with abundance 32-64, 3 species with abundance 64-128 and 3 species with abundance 256-512.

The Lorerenz curve measures inequality within a population. The closer the curve is to the diagonal line, the closer we are to perfect equality in the distribution of entomofauna.

Analyzing the Lorenz curve for the lavender crop in 2022 and 2023, we find that it deviates significantly from the diagonal line, which indicates higher levels of inequality.

- ✓ The alpha diversity index values of the arthropods collected from the goji crop during the research period were as follows:
- ✓ The Simpson index had the value of 0.1586 in 2022 and 0.1719 in 2023
- ✓ The dominance index (D) had the value of 0.8414 in 2022 and 0.8281 in 2023
- ✓ The Shannon index (H') had a value of 3.64 in 2022 and 3.461 in 2023
- ✓ The Shannon Index (H) had the value of 2.523 in 2022 and 2.399 in 2023
- ✓ The Shannon index had the value of -1.096 in 2022 and -1.042 in 2023
- ✓ The Menhinick index had the value of 1.602 in 2022 and 1.389 in 2023
- ✓ The Buzas and Gibbson index had the value of 0.1598 in 2022 and 0.136 in 2023
- ✓ The equity index had the value of 0.5791 in 2022 and 0.5459 in 2023
- ✓ Berger-Parker dominance index had the value of 0.337 in 2022 and 0.3206 in 2023
- ✓ The Margalef index had the value of 9.909 in 2022 and 9.837 in 2023

Analyzing the Preston diagram of the goji crop in the year 2022, it turns out that there are 31 taxa with abundance 1; 9 taxa with abundance 2; 6 taxa with abundance 2-4; 11 taxa with abundance 4-8, 7 taxa with abundance 8-16, 2 taxa with abundance 16-32, 3 taxa with abundance 32-64, 6 taxa with abundance 64-128, 3 taxa with abundance 128-256, 2 taxa with abundance 256-512 and 2 taxa with abundance 512-1024.

Preston's diagram of goji culture in the year 2023 demonstrates that there are 22 taxa with abundance 1; 13 taxa with abundance 2; 17 taxa with abundance 2-4; 5 taxa with abundance 4-8, 9 taxa with abundance 8-16, 3 taxa with abundance 16-32, 2 taxa with abundance 32-64, 4 taxa with abundance 64-128, 3 taxa with abundance 128-256, 1 taxon with abundance 256-512, 1 taxon with abundance 512-1024 and 1 taxon with abundance 1024-2048.

The Lorerenz curve measures inequality within a population. The closer the curve is to the diagonal line, the closer we are to perfect equality in the distribution of entomofauna.

Analyzing the Lorenz curve for the goji crop in 2022 and 2023, we find that it deviates significantly from the diagonal line, indicating higher levels of inequality.