

OBSERVATIONS ON THE ENTOMOFAUNA EXISTING IN THE CULTURE OF GOJI (*LYCIUM BARBARUM*)

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Abstract

The observations were made in 2022 on a goji plantation within the Vinifruct Society, located in Raducaneni, Iasi. To capture the entomofauna, we used Bio-Plantella yellow sticky traps. These were installed in the goji culture in 2022, starting from May until August. The reading of the catches was done periodically, with the naked eye or with the help of a binocular magnifier. The traps were changed every four weeks. Two traps were used at a distance of 10–12 m between them. The determination of the captured material was done with the help of the Raitter and Panin determiners. From the analysis of the material collected at the 2 traps during the observations, the following groups of insects were found in the culture: wasps, cicadas, aphids, coleoptera, ants, etc.

Key words: goji, insects, traps, entomofauna, yellow

INTRODUCTION

The plant is cultivated in many regions of the world, as well as in Romania, in Codlea, Brașov, where goji is grown in an ecological system on an area of 3.5 hectares and where there is also a nursery of Romanian goji varieties. Traditional Chinese medicine has used the fruit for over 2000 years. (Endes et al.) Since the beginning of the 21st century, it has appeared under the trade name of goji, and it has seen a growing appreciation and demand both in the U.S. and in many other developed countries. Goji fruits have antioxidant, cardioprotective, anti-obesity, anti-cancer, anti-inflammatory, stimulating, anti-diabetic, anxiolytic, and immunostimulating properties. All this is due to the fact that these fruits are rich in vitamin C, selenium, polyphenols, and fibers, among others. When administered to patients undergoing chemotherapy, berries provide significant protection to the liver, so goji berries can also have a beneficial effect on this organ. In oriental

medicine, it is said that goji fruits correct energy deficits, insomnia, palpitations, and even anxiety (Gao et al.). Goji berries are particularly susceptible to pests and diseases because of their high sugar content, especially to aphids and mites. Statistics show that each year, aphid damage reduces Goji berry production by 1/4 and significantly lowers quality (Islam et al., 2017; Huang et al., 2021).

MATERIALS AND METHODS

The traps were read in 2022, from May to August, with the readings being done periodically and their analysis being done with the naked eye or with a binocular magnifier. To maintain the effectiveness of capturing insects, the traps were changed every 4 weeks. Reading dates: 25.05; 02.06; 07.06; 15.06; 27.06; 09.07; 18.07; 25.07; 02.08; 19.08. Adhesive traps are specially designed to attract insects in order to monitor and combat them biologically. It also contributes to the reduction of insect populations. The

adhesive trap comes in the form of a yellow plastic plate covered with glue to monitor insects. They are specially designed to attract small insects. Adhesive tiles can be hung above the crop surface, parallel to the crop rows, or in the center of the infected area. They are resistant to high temperatures and are not affected by sprinkler systems. They are 15 cm wide and 100 meters long and have the following advantages: They reduce the number of insecticide treatments; residues are 0 on fruit; their use leaves no residue or glue; they have UV resistance; the number of insects can be easily found by means of the lines; they are extremely attractive to harmful insects; they are easy to mount and handle; and they are ecological.

RESULTS AND DISCUSSIONS

On **May 25, 2022**, at **trap no. 1**, 108 samples of insects were collected belonging to the following groups (tab. 1): cicadas, 60 samples; aphids, 30 samples; wasps, 11 samples; ants, 3 samples; coleoptera, 3 samples; and mercoptera, 1 copy.

At **trap no. 2**, a number of 80 samples of insects belonging to the following groups were collected: coleoptera 20, wasps 3, diptera 20, aphids 20, hymenoptera 3, cycads 15, mercoptera 1, and chrysopids 1.

Table 1. The situation regarding the catches from 25.05.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 1	Wasps	11
	Ants	3
	Coccinella 10 punctata	1
	Mordella aculeata	1
	Anthaxia nitidula	1
	Panorpa communis	1
	Aphids	30
	Cycads	60
Total	108	
Trap no. 2	Philanthus triangulum	18
	Wasps	3
	Panorpa communis	1
	Diptera	20
	Micraspis sedecimpunctata	1
	Phyllotreta atra	1
	Chrysopa perla	1
	Aphids	20
Cycads	15	
Total	80	

On **June 2, 2022**, 116 samples of insects were collected at **trap no. 1**. By species category, the situation is as follows (tab. 2):

cicadas 52, aphids 24, diptera 7, parasitic wasps 5, ants 3, coleoptera, and one copy. At **trap no. 2**, 86 samples belonging to the following groups were collected: ants 30, cycads 40, aphids 25, wasps 6, coleoptera 8, diptera 1, and mercoptera 6.

Table 2. The situation regarding the catches from 02.06.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 1	Diptera	7
	Aphids	24
	Cycads	52
	Ants	3
	Parasitic wasps	5
	Philanthus triangulum	1
Total	90	
Trap no. 2	Ants	30
	Wasps	6
	Ragoletis cerasi	1
	Philanthus triangulum	8
	Panorpa communis	6
	cycads	40
	Aphids	25
	Total	116

On **June 7, 2022**, a total of 109 samples belonging to the following groups were collected at **trap no. 1** (tab. 3): aphids 45, wasps 8, cycads 30, diptera 25, coleoptera 1 specimen.

At **trap no. 2**, 114 samples belonging to several groups of insects were collected, as follows: 88 cicadas, 13 wasps, 9 diptera, 2 coleoptera, and 2 mercoptera.

Table 3. The situation regarding the catches from 07.06.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 1	Ragoletis cerasi	2
	Diptera	23
	Cycads	30
	Aphids	45
	Mordella aculeata	1
	Wasps	3
	Parasitic wasps	5
Total	109	
Trap no. 2	Parasitic wasps	13
	Diptera	9
	Philanthus triangulum	2
	Cycads	88
Total	114	

On **June 15, 2022**, at **trap no. 1**, 89 samples of insects belonging to several groups were captured, as follows (tab. 4): aphids 46, ants 22, diptera 11, coleoptera 6, and wasps 4.

Table 4. The situation regarding the catches from 15.06.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 1	Wasps	2
	Ichneumonide	2
	Diptera	11
	Ants	22
	Anthaxia nitidula	3
	Philanthus triangulum	3
	Aphids	46
Total		89

On **June 27, 2022**, 106 samples of insects belonging to several groups were collected at **trap no. 1**, as follows (tab. 5): aphids 32, diptera 30, cycads 25, wasps 7, ants 6, beetles 4, and hemipteran 2 samples. At **trap no. 2**, 165 samples belonging to the following species groups were collected: aphids 45, diptera 43, ants 28, wasps 15, coleoptera 2, and mercoptera 1.

Table 5. The situation regarding the catches from 27.06.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 1	Diptera	30
	Mordella aculeata	4
	Ichneumonide	7
	Cycads	25
	Aphids	32
	Hemiptera	2
	Ants	6
Total		106
Trap no. 2	Ants	28
	Diptera	43
	Ichneumonide	15
	Philanthus triangulum	1
	Panorpa communis	1
	Cycads	31
	Aphids	45
	Mordella aculeata	1
Total		165

On **September 7, 2022**, 128 insect samples belonging to the following groups were captured at **trap no. 2** (tab. 6): cycads 21, diptera 59, aphids 19, wasps 15, and coleoptera 14.

Table 6. The situation regarding the catches from 09.07.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 2	Cycads	21
	Aphids	19
	Coccinella 7 punctata	1
	Anthaxia nitidula	1
	Diptera	59
	Ichneumonide	15
	Philanthus triangulum	1
	Phyllotreta atra	10
	Lixus cardui	1
Total		128

On **July 18, 2022**, 138 samples of insects belonging to the following groups were collected at **trap no. 1**, as follows: aphids 45, diptera 40, ants 25, wasps 11, and coleoptera 17.

At **trap no. 2**, 84 samples of insects belonging to the following groups of species were collected: aphids 30, diptera 20, coleoptera 19, wasps, and 15 samples (tab. 7).

Table 7. The situation regarding the catches from 18.07.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 1	Mordella aculeata	4
	Agriotes sp.	3
	Phyllotreta atra	3
	Aphids	45
	Ants	25
	Diptera	40
	Ichneumonide	11
	Philanthus triangulum	3
	Halyomorpha halys	4
Total		138
Trap no. 2	Mordella aculeata	4
	Halyomorpha halys	6
	Diptera	20
	Ichneumonide	15
	Philanthus triangulum	9
	Aphids	30
Total		84

On **25.07.2022**, a number of 41 insects belonging to the following groups were collected at **trap no. 1** (tab. 8): diptera 20, wasps 9, coleoptera 8, bees 2 and ants 2.

At **trap no. 2**, 103 samples of insects belonging to the following groups were collected: aphids 40, coleoptera 20, wasps 10, diptera 11, hemiptera 9.

Table 8. The situation regarding the catches from 25.07.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 1	Diptera	20
	Mordella aculeata	3
	Bees	2
	Ichneumonide	9
	Philanthus triangulum	2
	Anthaxia nitidula	3
	Ants	2
Total		41
Trap no. 2	Mordella aculeata	3
	Agriotes sp.	3
	Diptera	11
	Ichneumonide	20
	Philanthus triangulum	9
	Anthaxia nitidula	8
	Hemiptera	9
	Aphids	40
Total		103

On **August 2, 2022**, 129 insects belonging to the following groups were collected at **trap no.**

1: 92 diptera, 25 cicadas, 9 wasps, 2 beetles, and 1 bee.

At **trap no. 2**, 184 samples of insects belonging to several groups were collected, as follows (tab. 9): diptera 156, cycads 20, coleoptera 7, bees 1 specimen.

Table 9. The situation regarding the catches from 02.08.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 1	Diptera	92
	Ichneumonide	9
	Bees	1
	Anthaxia nitidula	2
	Cycads	25
Total	129	
Trap no. 2	Bees	1
	Mordella aculeata	2
	Diptera	156
	Anthaxia nitidula	2
	Phyllotreta atra	3
Total	184	

On **10.08.2022**, 41 insects belonging to the following groups were collected at **trap no. 1** (tab. 10): 19 cycads, 9 wasps, 6 bees, and 7 beetles.

Table 10. The situation regarding the catches from 10.08.2022

The yellow sticky trap		
Goji	Species	No. of copies
Trap no. 1	Phyllotreta atra	4
	Bees	6
	Ichneumonide	9
	Agriotes sp.	3
	Cycads	19
Total	41	

In the goji culture, in 2022, a number of 1682 insects were collected with the help of Bio Plantella sticky yellow traps; 851 were collected at trap no. 1 and 831 at trap no. 2. (fig. 1).

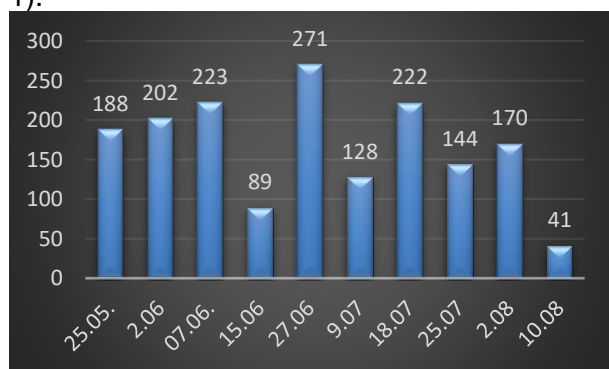


Fig. 1 - the graphic representation of the entomofauna collected in the goji plantation in 2022

CONCLUSIONS

Bio-Plantella yellow sticky traps were used to capture insects and were installed in the goji plantation from May to August.

The insects collected in 2022 totaled a 1682 samples; 851 individuals were collected at trap no. 1 and, respectively, 831 individuals at trap no. 2.

The collected species belong to the following groups of taxa: wasps, diptera, homoptera (cycads and aphids), coleoptera, lepidoptera, and heteroptera.

Of the total insects collected, 401 samples were aphids, or 24%. Goji berries are sensitive to pests and diseases due to their high sugar content, with statistics showing that every year, damage due to aphids reduces the production of Goji berries by 1/4.

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