

Fauna And Ecology Of Shell Mites Of Cenoses Of Southern Uzbekistan

¹Majidova Dilfuza Zubaydullaevna, ²Raximov Matnazar Shomurodovich

^{1,2}National University of Uzbekistan Named After Mirzo Ulugbek, Tashkent, Uzbekistan.

E-mail: ¹majidovadz12@gmail.com

Article Info

Volume 83

Page Number: 3852 - 3856

Publication Issue:

July - August 2020

Article History

Article Received: 06 June 2020

Revised: 29 June 2020

Accepted: 14 July 2020

Publication: 30 August 2020

Abstract:

This article presents data on the species composition, seasonal distribution, on average, per 1 m² of shell-mite soils in natural ecosystems in 30 cm soil layers of cotton and wheat agroecosystems in the Sariosiyo region of Surkhandarya region. As a result of studies of cotton and wheat agroecosystems of natural ecosystems of soil layers in April-May, i.e. in the spring, an increased frequency of occurrence was detected compared with the autumn period.

The study of the species composition in the Surkhandarya region of the Sariosiyo region in agroecosystems of cotton and wheat revealed 29 species of oribatids. It has been established that 29 species of shell mites belong to 23 genera and 19 families.

Keywords: oribatids, agroecosystems, soil, seasonal dynamics.

I. INTRODUCTION

The subclass of carapace or oribatid mites (Oribatidae) is part of the order of mites (Acari) of the arthropod type (Arthropoda). All of their representatives, together with stingbacks and tardigrades, make up the soil microfauna. Oribatid mites move in soil cracks and through paths that are opened by other soil animals. They are found in soil layers to a depth of 1.5 m [1,2].

Mites are the oldest of the arthropods, which passed into the land mode of life. Their bodies are covered with a rigid chitinous cuticle. A waterproof epicuticle on the surface of the body protects the body from drying out. Due to the high endurance

to the influence of adverse conditions, these mites are widespread and have a diverse species composition. Among ticks, representatives of the family of carapace mites (Oribatidae) are found in various climatic conditions in various soils. Common in tropical conditions, the species is hardy to the forty-degree heat. They are mainly found in the soils of moist forests. The biomass of invertebrate animals in the soil litter is 10-15%. During the year, 2-3 generations of mites develop, females lay up to 400 eggs [3,4].

According to the peculiarities of distribution in soil sections, mites are divided into litter, litter-soil and soil mites.

The species living in the litter have a dark shade of the body and it is covered with a thick skin.

Mites belonging to this group consist mainly of saprophage carapace mites. Species living in the soil are very sensitive to soil moisture, because the body is whitish, and the body cover is much thinner. Species found in the litter-soil are an intermediate form between these two groups. Mites are also very demanding on the type of food. They can be divided into groups that are real herbivores, fungal hyphae, yeast, spores, pollen, lichens, algae or predators. Predatory mites feed on other microfauna of the soil - ticks, amphibians, nematodes, etc., which play an important role in controlling their numbers. But the main part of oribatid mites are saprophages.[5, 6].

The number of oribatid mites in 1 m² of the soil layer is more than 1 million. They have sizes from 0.3 mm to 1 mm, sometimes up to 3 mm. But, despite this, they very actively increase the amount of humus in the soil [7, 8]. In addition, oribatid mites, like other microorganisms, serve as an indicator of the detection of environmental disturbances in anthropogenic zones. That is why their study is one of the most important tasks.

II. MATERIALS AND RESEARCH METHODS

Experiments and observations were carried out at the "Department of Zoology" of the biological faculty of the National University of Uzbekistan named after Mirzo Ulugbek. Soil samples for the study of oribatid mites were brought from agroecosystems of cotton and wheat and soil layers of natural ecosystems of Sariosiyo district of Surkhandarya region in April, May, July and October 2019.

Soil samples were taken from soil layers 0–10 cm, 10–20 cm, 20–30 cm in an amount of 1 dm³ 5 times in each cenosis of 20 samples.

The conventional Berlese-Tulgren apparatus was used to isolate oribatid mites from soil samples.

III. RESEARCH RESULTS AND THEIR ANALYSIS

It was revealed that on 30 cm of soil layers of cotton agroecosystems of Sariosiyo district of Surkhandarya region, oribatid mites are found up to 1220 specimens in April, 5560 in May, 4100 in July and 2080 in October per 1 m² compared with the seasons; 2200 samples in wheat fields in April, 7260 in May, 5640 in July and 3800 in October; 11,000 individuals were found in the soil layers of the natural ecosystem in April, 8,900 in May, 6,580 in July and 7,420 in October (Table 1).

In the spring, i.e., in April-May, in the soil layers 10-20 cm in size there are many oribatid mites, that is, 820 samples per 1 m² in cotton fields in April and 2200 samples in May, 1200 samples in wheat fields in April and 2600 samples in May; 2400 individuals were found in the natural soil layers of the ecosystem in April, and 2900 in May. In soil layers from 0 to 10 cm, it is less common than in other layers, and in May, oribatid mites are more common than in April.

In summer, in July, at depths of 0-10 cm, 10-20 cm, 20-30 cm per 1 m², an average of 4100 individuals were observed in cotton fields, 5640 in wheat fields, and 6580 individuals in soil layers of the natural soil ecosystem oribatid ticks.

In autumn, that is, in October, in a soil layer of 0-10 cm, 600 specimens per 1 m² in cotton fields, 1000 specimens in wheat fields, 1400 specimens of oribatid mites in the natural soil layers of the soil ecosystem.

200 copies in April, 2900 in May, 400 in July, 600 in October in cotton fields on average 1 m² in layers of 0-10 cm; 400 copies in wheat fields in April, 3200 in May, 560 in July and 1000 in October; 600 specimens of oribatid mites were found in the soil layers of the natural ecosystem in April, 4200 in May, 600 in July and 1400 in October.

In layers of 10-20 cm per 1 m², the number of oribatid mites is 820 samples in April, 2200 samples in May, 1300 samples in July and 1000 samples in October; 1200 copies in wheat fields in April, 2600 in May, 1480 in July and 1400 in October; In April, 2400 specimens were found in the natural soil layers of the ecosystem, in May - 2900, in July - 1980, and in October - 3600.

In layers of 20-30 cm per 1 m² of oribatid ticks, 200 individuals in April, 460 in May, 2400 in July, 480 in October in cotton fields; 600 in April in wheat fields, 1,460 in May, 3,600 in July and 1,400 in October; In April, 8000 individuals were found in the soil layers of the natural ecosystem, in May - 1800, in July - 4000, and in October - 2420.

Table 1
Seasonal dynamics of carapace mites in cenoses

Soil layers	Cotton agrocnosis				Wheat agrocnosis				Natural ecosystem			
	IV *	V	VII	X	IV	V	VII	X	IV	V	VII	X
0-10 cm	200*	2900	400	600	400	3200	560	1000	600	4200	600	1400
10-20 cm	820	2200	1300	1000	1200	2600	1480	1400	2400	2900	1980	3600
20-30 cm	200	460	2400	480	600	1460	3600	1400	8000	1800	4000	2420
Total	1220	5560	4100	2080	2200	7260	5640	3800	11000	8900	6580	7420

*- serial number of months of the year

*- 1 m²

In Sariosiyo district of Surkhandarya region, 29 species of oribatid mites were

found in the soil layers of agrocnoses of cotton and wheat and natural ecosystems. 29 species of mites belonging to 23 orders and 19 families were identified. (table 2).

Table 2
The species composition of oribatid mites in the soil layers of cotton and wheat agrocnoses and natural ecosystems

No	Species	Coenoses								
		Cotton agrocnosis			Wheat agrocnosis			Natural ecosystem		
		0-10 cm	10-20 cm	20-30 cm	0-10 cm	10-20 cm	20-30 cm	0-10 cm	10-20 cm	20-30 cm
1	Glarovellademetrii Lang 1974	+	+							
2	SphearochthoniusplendidusBerlese 1904					+	+			
3	Cosmchthoniuslana-tusMichael 1887	+	+							
4	Cosmchthoniusplu-matusBerlese 1910							+	+	
5	Synchthoniuselegans Forsslund 1957							+	+	
6	Brachythoniusscricoi-desWillmann 1936							+	+	
7	Liochthoniuskirghi-sicusD.Kriv. 1971					+	+			

8	Micheliaparadoxa Haller 1884	+	+						
9	Lohmannidaelanceo-lataGrandjean 1950						+	+	
10	L. lanceolatatureme-nicaBul-Zachv 1960						+	+	
11	Thamnacarusdeser-ticolaGrandjean 1934						+	+	
12	Thamnacarusmoribei Aoki 1971			+	+				
13	Asiacarus elongates D.Kriv.1971	+	+						
14	CryptacaruspromecusGrandjean 1950						+	+	
15	Epilohmanneacylin-odricaBerlese 1904						+	+	
16	EulohmanniaskrjabiniBashkistrova 1958						+	+	
17	Nothrusborissicus Sellinck 1929						+	+	
18	Nothuspeltifer C.L.Koch 1839						+	+	
19	PlatynotrusgrandjeaniC.L.Koch 1839						+	+	
20	Hermanniadubini Nicolet 1855						+	+	
21	Hermanniareticylata Sitnikova 1974						+	+	
22	Prolidofarinosus C.L.Koch 1840						+	+	
23	AllodameushispanicusGrandjean 1928						+	+	
24	Gubnodameusautri-acusWillmann 1940						+	+	
25	Hupodamestenuitidialis Bul-Zachv 1962						+	+	
26	Belbameridionalis Bul-Zachv 1962						+	+	
27	Probelbaspinosa Sellinck 1929						+	+	
28	Nellacarusasiaticus D.Kriv.1975						+	+	
29	Hermannia granulate Nicolet,1855						+	+	

IV. CONCLUSIONS

Thus, it can be concluded from the data in Table 1 that the soil layers of agrocenoses and natural ecosystems have more oribatid mites in April-May, that is, in spring than in summer and autumn.

The data table 2 show that in the soil layers of cotton and wheat agrocenoses

located in Sariosiyo district of Surkhandarya region, there are 21 species of oribatid mites of natural ecosystems from 29 species of shell mites identified from soil layers of the natural ecosystem. It was found that most of the species found are found in the natural soil layers of the ecosystem 10–20 cm and 20–30 cm.

V. REFERENCES

1. Artem'yeva T. I.
Kompleksypochvennykhzhivotnykhiv
oprotyrekul'-
tivatsiitekhnogennykhterritoriy. M.:
Nauka, 1989. str. 111.
2. Gilyarov M. S.
Uchetmelkikhchlenistonogikh
(mikrofauny) inematod //
Metodypochvenno-
zoologicheskikhissledovaniy. M.:
Nauka. 1975. str. 30-43.
3. Golosova L. D., Lyashchev A. A.
PantsirnyyekleshchinadsemeystvaBel
boidea o. Sakhalin //
Problemypochvennoyzoologii.
Minsk: Naukaitekhnika. 1978. str. 59.
4. Dunger V. Uchetmikroartropod
(mikrofauna)
//Kolichestvennyyemetody v
pochvennoyzoologii. M.: Nauka,
1987. str. 26-51.
5. Zakhvatkin YU.A. Akarologiya –
Nauka o kleshchakh:
IstoriyarazvitiyaSovremennoyesostoy
aniye, Sistematika:
Uchebnoyeposobiye –M:
Knizhnyydom «LIBROKOM» 2012.
192.str.
6. Krivolutskiy D. A., Lebedeva N. V.
Pantsirnyyekleshchi (Oribatei,
Acariformes) v opereniiptits. M.:
Tsentr Media Proyektov "ABF",
2003. str. 68.
7. Pan'kov A. N.
Novyyevidypantsirnykhkleshchey
(Oribatei) s Dal'negoVostoka // Zool.
zhurn. 2002. T. 81, № 2. str242-245.
8. Shtanchayeva U. YA., Netuzhilin I.
A.
Obzormirovoyfaunyoribatidsemeystv
aScutoverticidae (Acari, Oribatidae) s
opisaniiemnovykhvidov // Zool.
zhurn. 2003. T. 82, № 7. str. 781-803