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Organisms That Affect the Life of Termites of the Genus Anacanthotermes and Living in Their Nest

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Abstract This article shows the species composition of organisms and insects living in the nests of Anacanthotermes termites and their role in the life of termites and their number control. The importance of some vertebrates has been shown. Studies on the interaction and behavior of classes in termite nests belonging to the genus Anacanthotermes were carried out in termite nests in natural and laboratory conditions based on Korb's methods. In our conducted studies, 30 species of invertebrate arthropods belonging to 5 families and 16 genera were recorded living in termite nests as parasites, predators or disease spreaders.

Keywords Termite, Ant, Invertebrate, Mites, Fungi, Soil, Termite nest, Food

1. Introduction

Studies conducted by scientists to identify the natural habitats of termites [1] show that there are more than 70 species of them. Carnivorous ants belonging to the genera Camponotus and Cataglyphis of the Formicidae family play an important role in reducing the number of termites. In Turkmenistan, 124 species of crustaceans (Crustacea), arachnida (Arachnida), myriapoda (Myriapoda), insects (Insecta) belonging to 45 families and 124 species belonging to 69 genera were found in Turkmenistan. 58 species of vertebrates feeding on termites have been identified [3,4,5]. Also, 28 types of birds, 26 types of reptiles, and 5 types of mammals that feed on termites were identified in the research carried out in the territory of Uzbekistan. Biotic relationships of Anacanthotermes termites with other species of animal populations is an important factor in the study of insect life and management of termite populations. Some groups of biota components are symbionts and commensals, while others are parasites and predators [6,7,8,9].

The use of microbiological agents in the fight against termites has also been established [10,11,12]. Unfortunately, there are very few studies on the delivery of disease-causing pathogenic microorganisms to termite colonies. It was observed that termites began to weaken and die when food based on Cloeophulium trabeum, Phanerochaeta chrysosporium, Marasmiellus troyamus fungi was used against Coptotermes formosanus, Reticulitermes flavipes. When dead termites were collected and planted in an agar nutrient medium, spores of the tested fungi were found in this medium [6,9,13].

More than 3,000 species of 9 families of termites have been identified in the world, two of which have completely disappeared. There are 7 species belonging to 4 families (Kalotennitidae, Hodotennitidae, Rliinotemiitidae, Tennitidae) in the territory of the CIS [5,8,12]. Termites are small insects, and they are popularly called "white ant" because they resemble the way of life of ants, "white ant" because they live in the mountains, "grave worm" and "lahad worm" because they live in cemeteries. Although all this information refers to termites, the name termite was not used in the old literature [1]. The word "termes" was first used by K. Linnaeus in his work "Systema naturae" to give the name "Termes fatale" to worker termites. From this, the terrible name "terma-tamom" and "fatum-taqdir" appeared. The term "Termitinae" was first used by Latreille. Later, J.H. Comstock distinguished the Isoptera family separately, independently. The first scientific information about termites appeared 220 years ago [6,8,13].

2. Methods of Conducting Experiments

Studies on the interaction and behavior of classes in termite nests belonging to the genus Anacanthotermes were carried out in termite nests in natural and laboratory conditions based on Korb's methods. During 2019-2020 (spring, summer, autumn and winter), studies related to the study of termite nests Beruniy ("Ozod" farmer) farm), Khiva (Khiva farm), Shavot (Arab neighborhood) districts, three in

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total 12 nests were selected in each season. Based on the methods of Pasteels (1971), Y. Roisin (2000), C. Everaerts and M. Leponce. They were collected from their open chambers in their nests or by shaking termite feed logs. Samples were collected separately with tweezers and stored in 80% alcohol, Buena's solution or formalin-alcohol-acetic acid (20: 75: 5). [10,12,13].

In order to study the morphology and physiological processes of termite mycobiota and distinguish them from each other, the following food environments were used.

Wort-agar nutrient medium. The unhopped wort was diluted to 6-80 according to Baling. In this, 400-500 ml of wort was poured into 1 liter of water and 2% agar-agar was added. The nutrient medium was heated in a steam bath to ensure even distribution of agar-agar in the nutrient medium. Then the two layers were filtered with gauze and poured into test tubes. Citric or lactic acids were used to make Rn 4.5-5.0. The nutrient medium was sterilized in an autoclave at a pressure of 0.7 atm for 15 minutes. The prepared nutrient medium was stored in a refrigerator.

3. Research Results

In our conducted studies, 30 species of invertebrate arthropods belonging to 5 families and 16 genera were recorded living in termite nests as parasites, predators or disease spreaders.

RHABDITIDA (RHABDITIDS) category
Panagrolaimidae family
Panagrolaimus
SCOLOPENDROMORPHA
(SCOLOPENDRCIMONES) category
Scolopendridae оиласи

Scolopendra Linnaeus, 1758 generation
1. Scolopendra aralocaspia (Kessler, 1876)
2. Scolopendra cingulate (Latreille, 1829)

SCORPIONES (Scorpions) category
Buthidae family
Mesobuthus generation

3. Mesobuthus caucasicus (Nordmann, 1840)
4. Mesobuthus eupeus (Koch, 1839)

Liobuthus Birula, 1898 generation

5. Liobuthus kessleri (Birula, 1898)

SOLIFUGAE (FALANGAS) category
Rhagodidae Pocock, 1897 family
Rhagoduja Roewer, 1933 авл generation оди

6. Rhagoduja finnegani (Roewer, 1933)

Galeodidae Sundevall, 1833 category
Galeodes Olivier, 1971 generation

7. Galeodes fumigatus (Walter, 1889)
8. Galeodes turcmenicus **(**Birula, 1937)

SARCOPTIFORMES (TICKS) category
Acaridae Latreille, 1802 **family**

Acarus generation

9. Acarus siro (Linnaeus, 1758)

Acotyledon generation

10. Acotyledon obsoloni Sams.
11. Acotyledon oudemansi (Henan, 1993)
12. Hypoaspis miles

HYMENOPTERA (THE WINGED ONES) category
Formicidae (Ants) family
Camponotus Mayr, 1861 generation

13. Camponotus xerxes (Forel, 1904).
14. Camponotus fedtschenkoi (Mayr, 1877)
15. Camponotus buddhae (Forel, 1892)
16. Camponotus lameerie (Emery, 1898)
17. Camponotus turkestanicus (Emery, 1887)

Cataglyphis Forester, 1850 generation

18. Cataglyphis setipes (Forel, 1894)
19. Cataglyphis cinnamomea (Karavaiev, 1910)
20. Cataglyphis emeryi (Karavaiev, 1911)
21. Cataglyphis pallida (Mayr, 1877)
22. Cataglyphis oxiana (Arnoldi, 1964)

Tapinoma Forster, 1850 generation

23. Tapinoma erraticum (Latreille, 1798)
24. Tapinoma karavaievi (Emery, 1925)

Formica Linnaeus, 1758 generation

25. Formica clara (Forel, 1886)
26. Formica subpilosa (Ruzsky, 1902)

Lepisiota Santschi, 1926 generation

27. Lepisiota semenovi (Ruzsky, 1905)

Plagiolepis Mayr, 1861 generation

28. Plagiolepis pallescens (Forel, 1888)

Cardiocondyla Emery, 1869 generation

29. Cardiocondila uljanini (Emery, 1889)

Crematogaster Lund, 1831 generation

30. Crematogaster subdentata (Mayr, 1877)

Pheidole Westwood,1839 generation

31. Pheidole pallidula (Nylander, 1849)

In our research, we tried to determine the importance of the above-mentioned species in termite life and its natural biocontrol.

It was found that species belonging to the genus Scolopendra, Mesobuthus, Liobuthus, Galeodes, Rhagoduja feed on termites in natural conditions and play a role in reducing their number. According to our observations, there are many Camponotus xerxes Forel, 1903, Cataglyphis aenescens Nylander, 1849 ants belonging to the Formicidae family in termite nests in sandy and rocky areas (Tuproqkala, Boday grove, Beruniy) and they cause damage to them. The presence of these ants around the nest, drastically reducing the number of termites, and the loss of organic connection between the termite colonies caused a decrease in the immune system in the family. When 100 termite colonies (1500 workers and larvae) from each termite nest (15 nests)

were brought to the laboratory and examined, it was noted that they were infected with various diseases (fungal, bacterial, nematode and mites) as a result of their weakness and decreased immune system.

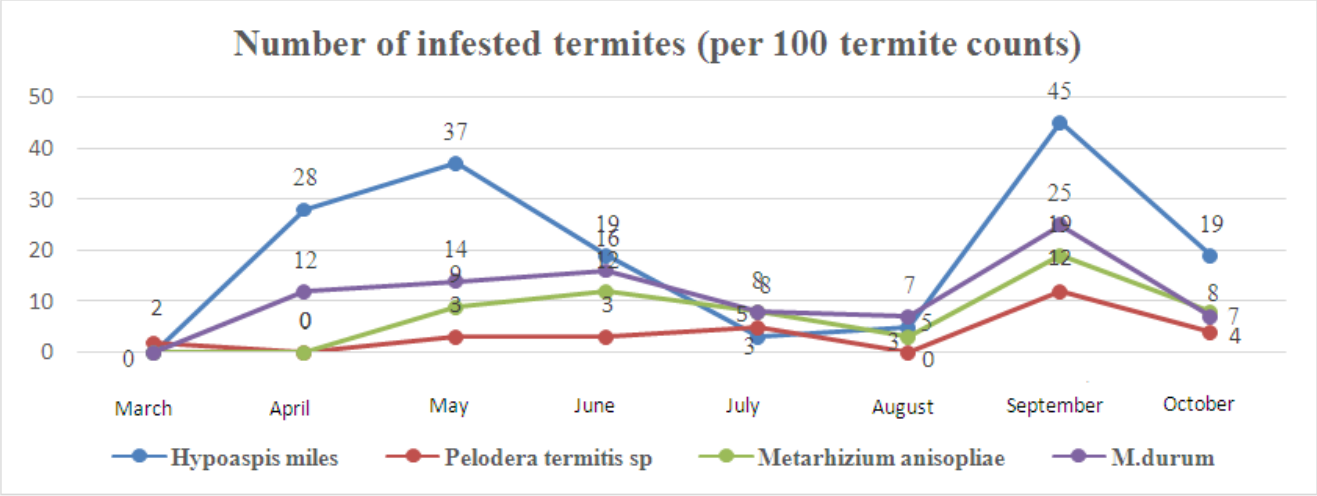

Figure 1. Levels of damage by termites (in different districts, 2019)

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