JOURNAL OF MULTIDISCIPLINARY SCIENCES AND INNOVATIONS
VOLUME 04, ISSUE 08
MOPNTHLY JOURNALS
ISSN NUMBER: 2751-4390
IMPACT FACTOR: 9,08

ENTOMOFAUNA OF TOMATO AGROCENOSIS IN THE CONDITIONS OF KHORESM REGION: SPECIES COMPOSITION AND BIOECOLOGICAL FEATURES

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Abstract: This study investigates the composition and bioecological characteristics of entomofauna in the tomato agrocenosis under the conditions of the Khorezm region. It examines harmful and beneficial insect species, their activity during vegetation, and their impact on tomato crops. The results contribute to the development of integrated pest management (IPM) systems and serve as a scientific basis for promoting ecological sustainability in tomato cultivation.
Keywords: tomato, agrocenosis, entomofauna, bioecology, Khorezm, pests, beneficial insects

Tomato cultivation is one of the most important directions in the agriculture of Uzbekistan. Especially in the Khorezm region, favorable climatic conditions, fertile soils and a developed irrigation system create wide opportunities for tomato cultivation. However, in-depth study of the diversity of entomofauna in the tomato agrocenosis and their bioecological characteristics is an important factor in increasing the efficiency of this crop. Entomofauna - that is, the set of insects living in the plant agroecosystem - changes in various ways during the growing season of tomatoes, and these changes directly affect the quality and quantity of the product. This scientific research analyzes the entomofauna of the tomato agrocenosis in the Khorezm region, that is, the types of insects, their adaptation to the environment, biological role and ecological behavior. Tomato agrocenosis is a very complex biological system in which representatives of beneficial and harmful entomofauna coexist. In particular, harmful insects attack tomato plants at various stages of their growth, damaging leaves, flowers, fruits, and roots. The most common harmful species include Liriomyza sativae (leafhopper), Tuta absoluta (tomato moth), Thrips tabaci (tobacco thrips), aphids (saplings), and Helicoverpa armigera (fruitworm). They inhibit the photosynthesis process, flowering, and fruiting stages of tomato plants, and reduce the quality and quantity of the crop. In particular, Tuta absoluta has been distinguished in recent years as one of the most dangerous harmful species of tomato agrocenosis. This insect reproduces rapidly, gives several generations, and is resistant to pesticides, and integrated methods must be used to combat it without disrupting the ecological balance. Also, as a result of observations conducted in the Khorezm region, species belonging to beneficial entomofauna are also found in the tomato agrocenosis. The most important of these are ladybirds (e.g. Coccinellidae septempunctata), Chrysopidae (golden-winged flies), Syrphidae (flower flies), and parasitic flies and mosquitoes of the family Coccinellidae. They play an important ecological role in the natural regulation of the number of harmful species in the crop agrocenosis. Representatives of the Coccinellidae feed on aphids, while the larvae of the Chrysopidae prey on thrips and other small insects. Thus, these beneficial species are of great importance in ensuring the stability of the agrocenosis and as a means of biological control.

Phenological observations, entomological networks, pitfall traps and manual collection methods were used to study the composition of the entomofauna. During the observations, the number, type, activity and dynamics of insects during the growing season were determined. In the spring season, especially in May, a sharp increase in the number of aphids feeding on leaf juice was observed. In the summer, the activity of Tuta absoluta and thrips increased. In the autumn months, a relative increase in the number of beneficial entomofauna representatives was observed, and it was determined that the natural balance began to be restored during this period. This situation indicates that factors such as climate, agrotechnical measures, the use of biological

agents and the phenological state of the plant have a strong impact on the change in the entomofauna within the agrocenosis. In addition, the bioecological characteristics of the entomofauna were studied in depth. Each species is distinguished by its ecological niche (i.e. habitat), feeding strategy, reproduction speed, movement pattern and hidden lifestyle. For example, aphids live in colonies and gather on the underside of leaves, requiring careful observation to detect them. Tuta absoluta, on the other hand, moves through secret mines on leaves, fruits and stems and is difficult to see with the naked eye. These features play a decisive role in their detection, monitoring methods and the selection of control measures.

A balanced state of the entomofauna of the tomato agrocenosis has a direct positive effect on crop productivity. This indicates the importance of the Integrated Pest Management (IPM) system. In IPM, biological and agrotechnical means take the lead, limiting chemical methods. For example, it is recommended to protect and multiply beneficial entomofauna species, rotate crops, use catch crops, use pheromone traps and use pesticides only when necessary. This has a positive effect not only on the ecosystem, but also on human health.

In conclusion, in the conditions of the Khorezm region, the entomofauna of tomato agrocenosis is a diverse and ecologically balanced system. Understanding the natural balance between harmful and beneficial insects, and in-depth study of their bioecological characteristics, it is possible to develop effective agrotechnical and biological measures. The scientific observations obtained show that by monitoring entomofauna and selecting control measures taking into account phenological stages, it is possible to increase tomato yield and ensure ecological stability. Future research in this area will provide practical recommendations that can be applied not only to tomato agrocenosis, but also to other crop species.

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