



Article

# Species Composition of Willow Tree Pests in Our Country

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**Abstract:** Based on field observations and collected materials, a total of 29 major pest species belonging to 2 classes, 5 orders, and 13 families were identified in the willow groves of the Tashkent region of Uzbekistan. The occurrence frequency of each species and the extent of damage inflicted on trees were assessed, providing important data for the monitoring and management of forest pests.

**Keywords:** Willow groves; Forest pests; Pest diversity; Species occurrence; Damage assessment; Tashkent region; Uzbekistan; Pest monitoring; Forest protection; Entomofauna.

## Introduction

Willow trees (*Populus* spp.) are of significant economic and ecological importance in Uzbekistan. Effective protection against their pests plays a crucial role in maintaining forest health and productivity. This study is aimed at identifying the species composition of pests in willow stands, as well as assessing their occurrence and the degree of damage they inflict.[1][2][3]

## Materials and Methods

Entomological observations were conducted in 2022–2024 in the Burchmulla forestry of the Ugom–Chotqol State National Nature Park, located in the Bo'stonliq district of the Tashkent region. Samples were collected from tree trunks, branches, and leaves, and were identified using anatomical characteristics and standard taxonomic keys.[4][5][6]

## Results

Based on observations and collected materials, a total of 29 major pest species belonging to 2 classes, 5 orders, and 13 families were identified in willow stands of the Tashkent region of Uzbekistan. Entomological studies were conducted in the Burchmulla forestry of the Ugom–Chotqol State National Nature Park, located in the Bo'stonliq district. The findings revealed 9 species from 5 families (Cossidae, Erebidae, Tortricidae, Plutellidae, and Aegeriidae/Sesiidae) of the order Lepidoptera; 9 species from 3 families (Cerambycidae, Scarabaeidae, and Chrysomelidae) of the order Coleoptera; 7 species from 2 families (Diaspididae and Aphididae) of the order Homoptera; 1 species from the family Tingidae of the order Hemiptera; and 3 species from 2 families (Tetranychidae and Eriophyidae) of the order Acariformes. [7][8][9]

All collected pest specimens were considered as 100%, and the relative abundance of each species was determined based on their occurrence and the degree of damage inflicted on willow trees. Accordingly, four dominant species of Lepidoptera (*Lymantria dispar* L., *Semasia minutana* Hb., *Coccus coccus* L., and *Recurvaria nanella* Schiff.) accounted for 39% of the total damage in the willow biocenosis.[10] Three principal species of Coleoptera (*Plagioderma versicolora*, *Aeolesthes sarta* Solsky, and *Adelastica alni orientalis* Baly) contributed 23% of the damage. Two species of Homoptera (*Diaspidiotus salicis* and *Quadraspidotus slavonicus* G.) accounted for 15%, while one species of Hemiptera

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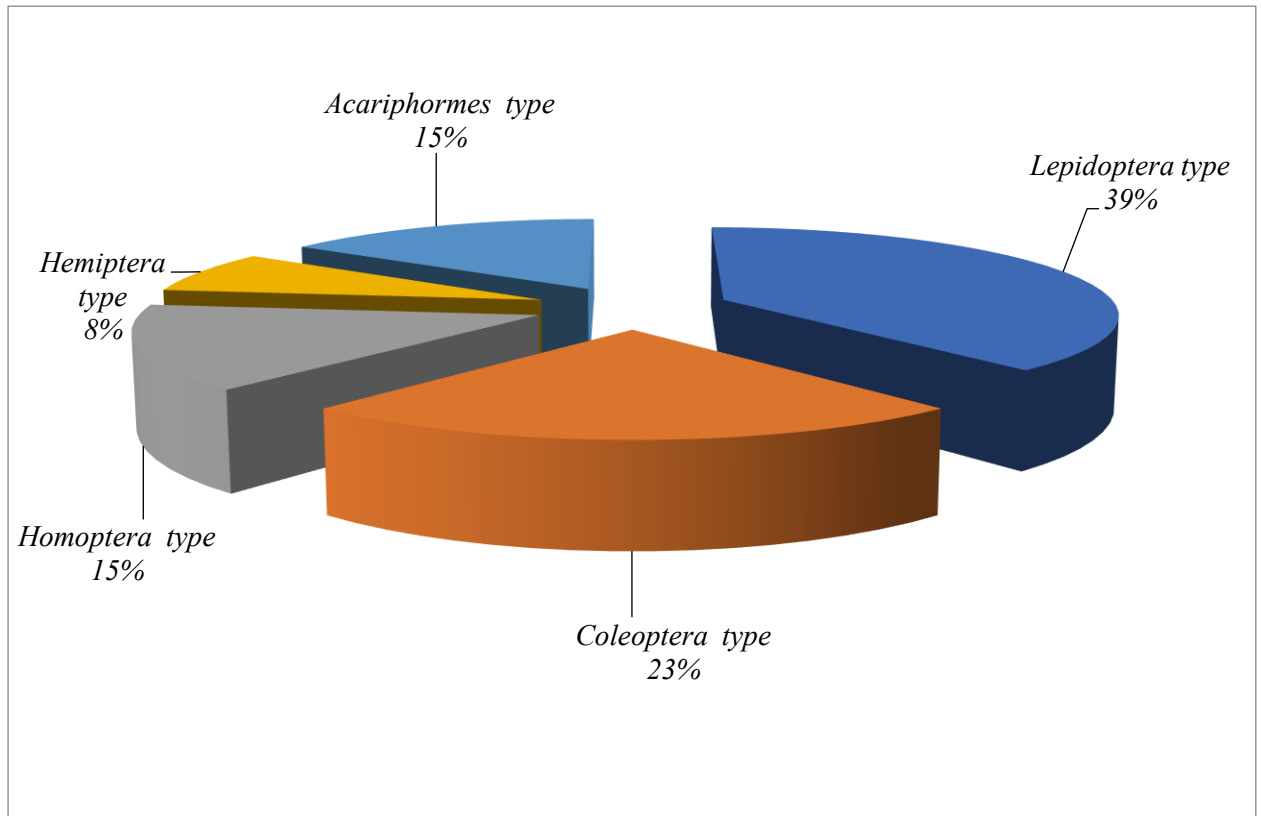
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(*Monosteira discoidalis* Jakovlev) caused 8% of the damage. Additionally, three species of Acariformes (*Tetranychus urticae* Koch, *Eriophyes tetanothrix* Nalepa, and *Eriophyes rudis* Nalepa) were responsible for 15% of the total damage. Damage symptoms on branches, trunks, and leaves of affected trees were observed and subjected to phytoexpert examination (see figure 1).[11]



**Figure 1.** Occurrence frequency of the main insect orders in the willow biocenosis (Burchmulla forestry, Tashkent region, 2022–2024).

**Results (continued):** Of the recorded species, seven belong to the class Insecta: *Lymantria dispar* L., *Recurvaria nanella* Schiff., *Coccus coccus* L., *Aeolesthes sarta* Solsky, *Plagioderia versicolora* Laich., *Adelastica alni orientalis* Baly, and *Diaspidiotus turanicus*. The remaining species belong to the class Arachnida (Acarina), including *Eriophyes tetanothrix* Nalepa.[12]

Under the conditions of the Tashkent region, observations in willow stands of forest хозяйства revealed that among 19 pest species, 1 species of mites and 7 species of insects were identified as dominant. In total, 8 of the identified pest species were classified as dominant and were found to cause significant economic damage (see Table 1).

**Table 1.** Occurrence frequency of the principal representatives of insect orders in the willow biocenosis (*Burchmulla forestry, Tashkent region, 2023–2025*).

№	Names of pests	Toshkent
order	Family	
<b>I. Kapalaklar–<i>Leridoptera</i> turkumi</b>		
<b>Oynachilar–<i>Aegeriidae</i> yoki <i>Sessiidae</i> oilasi</b>		
1.	1. Terak katta oynachisi ( <i>Aegeria apiformis</i> ).	++
2.	Terak kichik oynachisi–( <i>Paranthrene tabanifonnis</i> ).	+
<b>Tasmalilar–<i>Erebidae</i> oilasi</b>		

№		Names of pests	Toshkent
order	Family		
3.	2.	Tengsiz ipakchi ( <i>Lymantria dispar</i> L.). <b>Yog'och o'ymakorilar–Cossidae oilasi</b>	+++
8.	5.	Badbo'y yog'ochxo'r ( <i>Coccus coccus</i> L.). <b>II. Qo'ng'izlar–Coleoptera turkumi</b> <b>Mo'ylovdorlar–Cerambycidae oilasi</b>	++
9.	6.	Shahar mo'ylovdori ( <i>Aeolesthes sarta</i> Solsk.).	+++
10.		Namangan mo'ylovdori <i>Xylotrechus namanganensis</i> Heyd.	+++
		<b>Buzoqboshilar–Scarabagidae oilasi</b>	
11		Mart buzoq boshisi ( <i>Melolontha aticta</i> Ball.).	+
12	7.	May sharq buzoqboshisi ( <i>Melolontha hippocastani</i> F.).	++
13		Zararli buzoq boshi ( <i>Polyphilla adspersa</i> M.).	++
14		Iyun buzoqboshisi ( <i>Amphimallon solstitialis</i> ).	+
		<b>Bargxo'rlar–Chrysomelidae oilasi</b>	
15		Tol bargxo'ri ( <i>Plagioderma versicolor</i> Laich.).	+++
16	8.	Qayrag'och bargxo'ri ( <i>Galerucella Luteola</i> Muell.).	+
17		Sharq bargxo'ri ( <i>Adelastica alni orientalis</i> Baly.).	++
		<b>III. Teng qanotlilar–Homoptera turkumi</b> <b>V. Kanalar–Acariphormes turkumi</b> <b>4 juft oyoqlilar–Tetranychidae oilasi</b>	
18	9.	Oddiy o'rgimchakkana ( <i>Tetranychus urticae</i> Koch.).	++
		<b>2 juft oyoqlilar–Eriophyidae oilasi</b>	
19	10.	Tol gall kanasi ( <i>Eriophyes tetanothrix</i> N.).	+++

**Note:** Degree of infestation: (+++) high, (++) moderate, (+) low.

### Discussion

Favorable conditions for the survival and development of pests are associated with dry weather. Under such conditions, their larvae become highly voracious and actively migrate from one tree to another within forest stands. As a result, some of the affected trees may die. During periods of mass proliferation of a particular pest species, the presence of other pest species on the same trees is observed only rarely. In the course of feeding, larvae often bind branches together with silk-like webs they produce.[13][14]

The study revealed that hot and dry climatic conditions are especially conducive to the mass development of pests. Under these circumstances, rapid growth of caterpillars and larvae is observed, enabling them to spread quickly from one tree to another and cause damage over extensive areas.

At peak population levels, the occurrence of secondary pests on infested trees decreases, while overall phytosanitary pressure increases, leading to the weakening or even death of some trees. In particular, caterpillars of species such as *Lymantria dispar* form large colonies by enveloping branches with silk threads produced during feeding.[15]

### Conclusion

As a result of the conducted research, it was established that willow stands in the Tashkent region of Uzbekistan are inhabited by a total of 29 major pest species belonging to 2 classes, 5 orders, and 13 families. Among them, representatives of the orders Lepidoptera and Coleoptera constitute the largest proportion and are identified as the primary groups causing significant damage to willow trees. In terms of infestation level, Lepidoptera ranked first with 39%, followed by Coleoptera (23%), Homoptera and Acariformes (15% each), and Hemiptera (8%).

During the study, 8 pest species were identified as dominant and were found to cause considerable economic damage to willow stands. In particular, species such as *Lymantria dispar*, *Aeolesthes sarta*, and *Plagiodera versicolora* were assessed as the most destructive pests.

It was also observed that hot and dry climatic conditions significantly contribute to the mass development of pest populations. Under such conditions, rapid development and dispersal of larvae and caterpillars across large areas were recorded, leading to the weakening and, in some cases, the death of trees.

Overall, the obtained results provide a comprehensive assessment of the species composition, distribution, and damage level of pests in willow ecosystems. These findings serve as a scientific basis for future monitoring and the development of integrated pest management strategies.

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