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ECOLOGICAL CHARACTERISTICS OF TRUE WASPS (HYMENOPTERA: VESPIDAE) IN THE BIOCECENOSIS OF THE TASHKENT OASIS

Abstract: *this article presents the ecological characteristics of vespid wasps occurring in different areas of the Tashkent Oasis. The study analyzes their territorial distribution and the climatic conditions that are favorable for their life activity.*

Keywords: *Vespidae, Eumeninae, Polistes, dominant, subdominant, recedent, species, research.*

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**ЭКОЛОГИЧЕСКАЯ ХАРАКТЕРИСТИКА
НАСТОЯЩИХ ОС (HYMENOPTERA: VESPIDAE)
В БИОЦЕНОЗЕ ТАШКЕНТСКОГО ОАЗИСА**

Аннотация: в статье представлены экологические характеристики настоящих ос, встречающихся в различных районах Ташкентского оазиса. В исследовании проанализированы их территориальное распространение и климатические условия, благоприятные для их жизнедеятельности.

Ключевые слова: *Vespidae, Eumeninae, Polistes*, доминант, субдоминант, рецедент, виды, исследование.

True wasps belonging to the family Vespidae are represented in the world fauna by 7,745 species, 381 genera, and six subfamilies [2]. In Russia, 215 species belonging to 39 genera of this group have been recorded [3]. In the fauna of Uzbekistan, 122 species of true wasps belonging to 38 genera have been identified [6]. In previous classifications, they were grouped into three separate taxa: social wasps or hornets (Vespidae), pollen wasps (Masaridae), and eumenine wasps (Eumenidae). At present, all true wasps are included within the family Vespidae. This family consists of six subfamilies: Euparagiinae, Masarinae, Eumeninae, Stenogastrinae, Polistinae, and Vespinae. The representatives of the first three groups are primarily solitary wasps, whereas the remaining three groups comprise wasps characterized by a social way of life [1].

As a result of the research conducted in the Tashkent Oasis, ecosystem zones corresponding to the natural conditions of this territory were identified. Species adapted to living in these areas were studied, and a database on their ecological significance was compiled. Statistical and ecological methods were used during the research process.

During the study, the research area was divided into three types of ecosystem zones: the foothill ecosystem, the mixed ecosystem around water bodies, and the anthropogenic landscape zone. In these ecosystems, biocenosis plays an important role in the formation and stable functioning of life processes.

A biocenosis is a complex of phytocenoses, zoocenoses, and microbiocenoses that coexist within a specific habitat, namely a biotope [7]. The species comprising this community are interconnected through biotic interactions and life processes, forming the living component of the ecosystem. One of the key factors in the development of true wasp populations is the reproductive potential of the colony. This process is determined by ecological factors such as temperature regime, prey availability, food resources, and the availability of conditions for mating [4; 5].

The dynamics of species distribution across different areas were assessed based on ecological indicators such as dominant, subdominant, and recedent categories. The term dominant was applied to species that were widespread and frequently encountered in the given area. Subdominant was used to describe secondary species that occurred relatively less frequently. Recedent, in turn, was used as a term for species that were very rarely encountered in the area.

Foothills. Foothills are generally areas located at elevations ranging from 400–500 m to 1000–1500 m above sea level. They consist of low hills and ridges situated at the foot of mountains and are considered relief forms mainly characteristic of mountain ranges. The hills, ridges, and piedmont areas of the Parkent, Zarkent, and Bostanlyk districts of the Tashkent Oasis were included in the foothill ecosystem.

During the studies conducted in the foothill ecosystem, the occurrence of the following species was recorded: *Polistes wattii* (63), *Vespa orientalis* (69), *Polistes dominula* (39), *Vespula germanica* (36), *Polistes gallicus* (22), *Vespula vulgaris* (18), and *Eumenes mediterraneus* (6).

Analysis of the relative proportions of the collected specimens showed that dominant species (*Polistes wattii* and *Vespa orientalis*) accounted for 52.17%, subdominant species (*Polistes dominula*, *Polistes gallicus*, and *Vespula germanica*) for 38.34%, and recedent species (*Vespula vulgaris* and *Eumenes mediterraneus*) for 9.49% (Fig. 1).

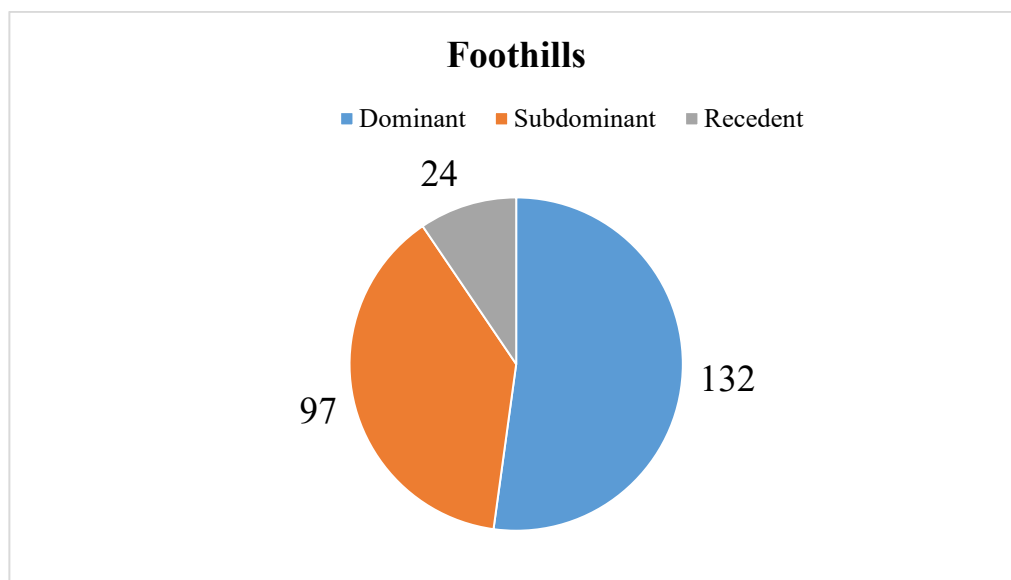


Fig. 1. Proportions of true wasps in the foothills of the Tashkent Oasis

As a result of the studies conducted in the Tashkent Oasis, *mixed ecosystems formed around water bodies* were identified. This ecosystem mainly included the areas surrounding the Tuyabuguz and Charvak reservoirs, as well as the territories around the Zahariq, Bozsuv, Qorasuv, Salar, Jonariq, Northern Tashkent, and Upper Tashkent canals, along with numerous irrigation ditches.

During the studies carried out in this ecosystem, the occurrence of the following species was recorded: *Polistes dominula* (139), *Polistes wattii* (126), *Vespula germanica* (129), *Vespa orientalis* (97), *Polistes gallicus* (63), *Vespula vulgaris* (35), *Euodynerus strigatus* (27), *Eumenes dubius* (6), *Eumenes coarctatus* (9), *Eumenes papillarius* (27), *Eumenes pomiformis* (21), *Eumenes mediterraneus* (9), *Antepipona delfenda* (4), and *Antepipona specifica* (3) (Fig. 2).

Analysis of the relative proportions of the identified species in this biocenosis showed that dominant species (*Polistes dominula*, *Polistes wattii*, *Vespula germanica*, and *Vespa orientalis*) accounted for 70.6%. Subdominant species (*Euodynerus strigatus*, *Eumenes papillarius*, *Eumenes pomiformis*, *Polistes gallicus*, and *Vespula vulgaris*) accounted for 24.9%, while recedent species (*Antepipona delfenda*, *Antepipona specifica*, *Eumenes coarctatus*, *Eumenes dubius*, and *Eumenes mediterraneus*) accounted for 4.5%.

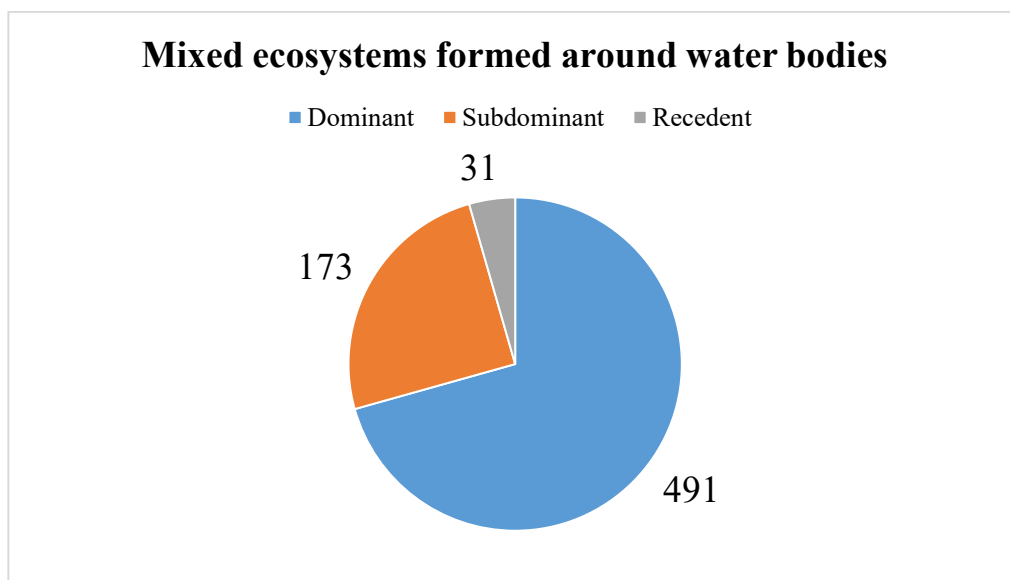


Fig. 2. Proportions of true wasps in the mixed ecosystem surrounding water bodies of the Tashkent Oasis

Agroecosystem. These areas included extensive anthropogenic-agricultural territories covering all districts, cities, settlements, and crop fields of the Tashkent Region. In these areas, various construction structures, residential buildings, as well as cultivated and wild plants occurring in field habitats are associated with wasp activity. This indicates the important role of these ecosystems in the formation of biocenotic relationships and the continuation of matter cycling.

During the studies conducted in all districts, villages, central areas of the Tashkent Oasis, as well as in anthropogenic experimental sites within urban areas, the occurrence of the following species was recorded: *Polistes dominula* (189), *Polistes wattii* (226), *Vespula germanica* (203), *Polistes gallicus* (133), *Vespa orientalis* (67), *Ancistrocerus gazella* (34), *Antepipona delfenda* (29), *Ancistrocerus nigricornis* (11), *Allodynerus delphinalis* (5), *Euodynerus dantici* (22), *Eumenes dubius* (8), *Eumenes mediterraneus* (6), *Antepipona barrei* (9), *Vespula vulgaris* (13), *Odynerus melanocephalus* (11), and *Euodynerus strigatus* (7) (Fig. 3).

Analysis of the results obtained in urbanized areas, agrocenoses, and anthropogenic conditions in general showed that dominant species (*Polistes dominula*, *Polistes gallicus*, *Polistes wattii*, and *Vespula germanica*) accounted for 77.19%. Subdominant species (*Euodynerus dantici*, *Antepipona delfenda*, *Ancistrocerus gazella*, and *Vespa*

orientalis) accounted for 15.62%, while recedent species (*Allodynerus delphinalis*, *Antepipona barrei*, *Euodynerus strigatus*, *Ancistrocerus nigricornis*, *Eumenes dubius*, *Eumenes mediterraneus*, *Odynerus melanocephalus*, and *Vespula vulgaris*) accounted for 7.19%.

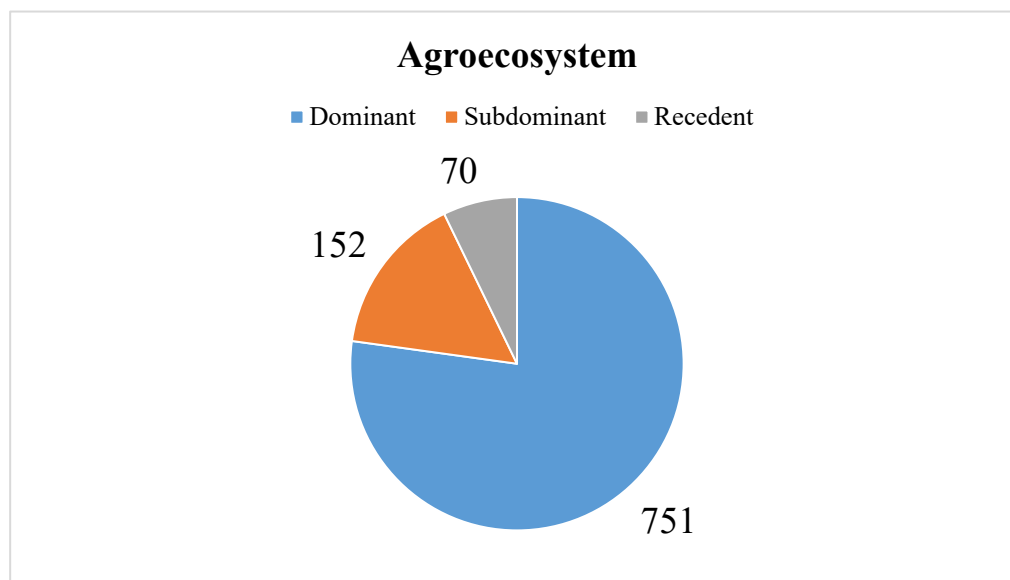


Fig. 3. Proportions of true wasps in the agrocnosis landscape of the Tashkent Oasis

The research results showed that agroecosystems are a relatively favorable habitat for true wasps. The moderate climate of agrocnoses, the availability of food resources, and the balance between abiotic and biotic factors ensure the survival and adaptation of these species, as well as their important role in the food chain of the ecosystem.

Список литературы

1. Antropov A.V. Superfamily Vespoidea / A.V. Antropov, A.V. Fateryga // Annotated catalogue of the Hymenoptera of Russia. Volume I. Symphyta and Apocrita: Aculeata. – St. Petersburg, 2017. – P. 175–193. – (Proceedings of the Zoological Institute RAS. Supplement 6).
2. Catalogue of Life Consortium. Catalogue of Life. 2026. – URL: <https://www.catalogueoflife.org/> (date of request: 25.06.2026).
3. Fateryga A.V. New records of the vespidae wasps (Hymenoptera: Vespidae) from Russia / A.V. Fateryga, D.N. Kochetkov // Journal of Insect Biodiversity and Systematics. – 2025. – Vol. 11, No. 4. – P. 895–909. – DOI: 10.48311/jibs.11.4.895.

4. Gamboa G.J. Effects of different habitats on the productivity of the native paper wasp *Polistes fuscatus* and the invasive, exotic paper wasp *P. dominulus* (Hymenoptera: Vespidae) / G.J. Gamboa, J.A. Austin, K.M. Monnet // Great Lakes Entomologist. – 2005. – Vol. 38. – P. 170–176.

5. Inagawa K. Colony productivity of the paper wasp *Polistes snelleni*: comparison between cool-temperate and warm-temperate populations / K. Inagawa, J. Kojima, K. Sayama, K. Tsuchida // Insectes Sociaux. – 2001. – Vol. 48. – P. 259–265. EDN ASXQBB

6. The fauna of Vespidae (Hymenoptera) in Uzbekistan / M. Medetov, M. Embergenov, Z. Minazhatdinova, [et al.] // Biosystems Diversity. – 2025. – Vol. 33, No. 2. – P. 252–260. – DOI: 10.15421/012526. EDN YNHFUR

7. Турсунов Ҳ.Т. Экология / Ҳ.Т. Турсунов, Т.У. Рахимова. – Тошкент : Чинор ЭНК, 2006.