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The fauna of Vespidae (Hymenoptera) in Uzbekistan

M. Medetov*, M. Embergenov**, Z. Minazhatdinova***, Q. Saparov*****, M. Zhumanov***, M. Rakhimov******, M. Begzhanov***, Z. Sabirova*****, D. Abdullajanova******, Z. Aytmuratova***, A. Sultansuynov***

** Institute of Zoology, Academy of Sciences of Uzbekistan, Tashkent, Republic of Uzbekistan*
*** Republican Scientific and Production Center for Termite Control at the Academy of Sciences of Uzbekistan, Tashkent, Republic of Uzbekistan*
**** Karakalpak State University, Nukus, Uzbekistan*
***** National University of Uzbekistan, Tashkent, Uzbekistan*
****** Nukus State Pedagogical Institute, Nukus, Uzbekistan*
******* University of Public Security of the Republic of Uzbekistan*

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Institute of Zoology, Bogishamol st., 232b, Tashkent, 100053, Republic of Uzbekistan. Tel.: +99-894-625-08-10.

Republican Scientific and Production Center for Termite Control at the Institute of Zoology, Bogishamol st., 232b, Tashkent, 100053, Republic of Uzbekistan. Tel.: +99-894-625-08-10.

Karakalpak State University, Abdirov st., 1, Nukus, 742012, Uzbekistan. Tel.: +99-894-625-08-10. E-mail: ushakarbaev@gmail.com

National University of Uzbekistan, University st., 4, Tashkent, 100174, Uzbekistan. Tel.: +99-894-625-08-10.

Karakalpak State Pedagogical Institute, P. Seitov st., 25, Nukus, 500487, Republic of Uzbekistan. E-mail: ushakarbaev@gmail.com

Universitet of Public Safety of the Republic of Uzbekistan, Chorsu Fortress, Zangiota District, Tashkent Region, 100109, Republic of Uzbekistan. Tel.: +99-897-404-80-32.

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This article presents the results of scientific research conducted in 2020–2024 on the Vespidae family in various biotopes of all natural and anthropogenic territories of the Republic of Uzbekistan, as well as the results of a study of existing scientific literature sources. Based on the analysis of the almost 150-year history of research on the Vespidae family in Uzbekistan, we found about 40 literature data by 22 researchers. It was mentioned in the literature that the Vespidae family recorded in Uzbekistan consisted of 6 subfamilies, 38 genera and 121 species.In the research conducted from 2020 to 2024 in natural and anthropogenic parts of Uzbekstan more than 2,130 samples were collected. During the observations we found 3 subfamilies, 20 genera, 35 species and subspecies which belong to the Vespidae famly. If we investigate the subfamilies of the Vespidae family, the largest subfamily in Uzbekistan is Eumeninae containing 106 species (86.88%). The Masarinae subfamily contains 7 species (5.74%). Vespinae contains 5 species and Palistinae contains 3 species (2.45%). During the research, the species *Jucancistrocerus atrofasciatus* (Moravitz, 1885) was recorded for the first time in the fauna of Uzbekistan, bringing the species total to 122. Of the total 122 identified species, 37 species were recorded by only one author. The remaining 85 species were cited in the works of two or more authors.

Keywords: *Antepipona*; *Eumenes*; *Katamenes*; *Odynerus*; *Paravespa*; *Polistes*; *Vespa*; *Dolichovespula*; *Vespula*.

Introduction

Vespidae, belonging to the Hymenoptera order, is one of the largest families in this order in terms of their number. The family is divided into several subfamilies, ranging from solitary to gregarious (Prezoto, 2007). They belong to the family of true wasps (Vespidae), with 5,274 species in 256 genera and 6 subfamilies (Kurzenko, 2012, Antropov et al., 2017). Previously, they were grouped into three subfamilies: Vespidae, Masaridae, and Eumenidae. Today, all true wasps are grouped into the subfamilies Euparagiinae, Masarinae, Eumeninae, Stenogastrinae, Vespinae and Polistinae belonging to the Vespidae family (Carpenter, 1981; Kurzenko, 2012). The first three subfamilies are exclusively solitary insects, while the last three are gregarious wasps. In Russia, the subfamilies Eumeninae, Masarinae, Polistinae, and Vespinae make up the fauna of this family.

Faunistic analysis of Vespidae wasps – the Vespidae family in the regions of our Republic were analyzed in the works of André (1886), results of analysis of collection of wasps for the Caspian region (Radoszkowski, 1886), Morawitz (1895), Białynicki-Birula (1926), Blüthgen (1939, 1955), Kostylev (1927, 1929, 1935, 1940), Giordani Soika (1970), Van Der Vecht & Fischer (1972), in the South-West Kyzylkum Region of Uzbekistan Davletshina et al. (1979), Cumming (1989) in the Southern Aral Sea region (Kulumbetova, 1999), in the analysis of Vespidae subfamly around the world which includes some species that are found in Uzbekstan (Carpenter, 1997, 2001), Kurzenko (1977a, 1977b, 1978, 1982, 1984, 2004), Prezoto et al. (2007), Castro & Dvořák (2009, 2010), in the analysis of Vespidae subfamily around the world including some species found in Uzbekistan (Gusenleitner, 1972, 1981, 1986, 1998, 2012), Oehlke (2012), in the directory of curtain-winged wasps in Russia which includes evidence of species also found in Uzbekstan (Antropov & Fateryga, 2017), species that were found in spring in Surkhandarya region of Kashkadarya (Mokrousov et al., 2015), Girish Kumar (2019), Li et al. (2022), Fateryga (2022a), collected sample results in Surkhandarya, Kashkadrya, Fargana valley also including species that are found in different regions of Uzbekistan (Fateryga et al., 2018, 2021, 2022, 2023, 2024). The fauna of true wasps in Uzbekistan is rich and diverse. The number of true wasps in our republic, based on all literature data, is 123 species and subspecies (Fateryga et al., 2018, 2021, 2022, 2023, 2024). In recent years, a number of research studies have been conducted in Uzbekistan on the biological diversity of insects, focusing on various taxa. These include studies on the Orthoptera order by Nurjanov et al. (2023), Nurjanov et al. (2024); on the Heteroptera suborder by Musayev et al. (2023a) and Musayev et al. (2023b); on the families Sphecidae and Crabronidae by Medetov et al. (2024); and on the positive impact on entomofauna of green cover restoration in the dried-up Aral Sea bottom by Seyilkhanova et al. (2024). However, these cited literatures cannot fully reveal the fauna of true wasps. The distribution and ecology of their species in the territories of the Republic of Uzbekistan, in particular, the Ustyurt Plain, the Kyzylkum and Aralkum deserts, the Tien Shan, Hissar, Pamir mountain ranges, and the foothills of our region, have not been fully studied. The aim of this article is to conduct a detailed study of the fauna of the Vespidae family in the territories of Uzbekistan.

Materials and methods

During our research in 2020–2024, more than 2,130 samples were collected from various biotopes in different districts of the Republic of Uzbekistan. To determine the coordinates of the samples, they were recorded in the Maps.me application and a map was created using the ArGIs Pro program.

The materials were collected using the methods of Golub (2012), Moericke (1951) and the traditional method: entomological trap, Merrick plastic containers, searching bushes, tree branches, residential and farm buildings, using tweezers, camera, etc. To identify the species composition of Vespidae wasps, a comparison, catalog and identification keys from the fund collections stored at the Institute of Zoology of the Academy of Sciences of Uzbekistan were used. The morphological characteristics of the species were determined using a SMZ-161-TL microscope. In order to soften the insect's body and prepare it for the collection, cotton wool soaked in 70% ethyl alcohol was pressed onto the insect's body, then the softened wasp was straightened and transferred to foam plastic through entomological needles. Soft tweezers, thin steel wires, and various tweezers with bent and unbent ends were also used to collect the insects.

Results

Studies of the fauna of the family of Vespidae wasps were carried out in various biotopes of all natural and anthropogenic territories of the Republic of Uzbekistan in 2020–2024. As a result of the analysis of the results of the conducted research, 35 species and subspecies belonging to 20 genera and 3 subfamilies of the Vespidae family were identified (Table 1). The systematic status and faunal data of the identified species are presented below.

Eumeninae

1. *Ancistrocerus parietum* (Linnaeus, 1758)

Location and time of detection: Tashkent Regional Botanical Garden (41°20′39.64″ N 69°18′39.14″ E), 25.09.2024.

Distribution: Europe, North Africa, Russia, Armenia, Azerbaijan, Turkey, Iran, Uzbekistan, Kazakhstan, Mongolia, China (North, North-East), Korean Peninsula, North America.

2. *Antepipona barrei* (Radoszkowski, 1893)

Location and time of detection: 1♂. Tuzkon lake surroundings, Jizzakh region (40°33′35.57″ N 67°21′54.33″ E), 06.07.2021.

Distribution: Armenia, Iran, Afghanistan, Tajikistan, Kazakhstan, Uzbekistan.

3. *Antepipona deflenda* Sauders, 1853

Location and time of detection: 1♂, Yangi-Yol district, Tashkent region (41°07'15.0" N 69°06'56.7" E), 28.08.2021.

Distribution: Europe, Russia, North Africa, Caucasus, Turkey, Cyprus, Jordan, Lebanon, Israel, Iraq, Iran, Turkmenistan, Tajikistan, Uzbekistan, Kazakhstan, China.

4. *Antepipona specifica* (Morawitz 1895)

Location and time of detection: 2♀, 1♂. Yangi-Yol district, Tashkent region (41°07'19.0"N 69°07'07.5"E), 28.08.2021.

Distribution: Iraq, Iran, Turkmenistan, Kyrgyzstan, Uzbekistan.

5. *Chlorodynerus arenicola* (Kostylev, 1935)

Location and time of detection: Kyzylkum Desert, Karaozek District, Republic of Karakalpakstan (42°44′47.76″ N 60°00′03.56″ E), 19.05.2023.

Distribution: China, Turkmenistan, Kazakhstan, Uzbekistan.

6. *Chlorodynerus incisipes* (Kostylev, 1935)

Location and time of detection: Ashshikul, Nukus city, Republic of Karakalpakstan (42°30′33.54″ N 59°38′31.52″ E), 05.05.2022. Kyzylkum Desert, Navoi Region (41°40′36″ N 64°19′31.73″ E), 24.06.2023.

Distribution: Iran, Turkmenistan, Uzbekistan.

7. *Eumenes mediterraneus* Kriechbauber, 1879

Location and time of detection: Parkent district, Tashkent region (41°18'33.36" N 69°47'48.63" E) 17.06.2023.

Distribution: N. Africa, C. and S. Europe, S.-W. Asia, Iran, Central Asia, China.

8. *Eumenes sareptanus* André, 1884

Location and time of detection: Botanical Garden of Nukus, Republic of Karakalpakstan (42°25′43.14″ N 59°34′51.21″ E), 05.05.2022. Zamin National Nature Park, Jizzakh region (39°35′38.51″ N, 68°19′03.39″ E),

Distribution: Western, Southern, and Eastern Europe, Russia (European Part, Urals, Western Siberia), Turkey, Turkmenistan, Uzbekistan, Kazakhstan.

9. *Eumenes separatus* Gusenleitner, 1972

Location and time of detection: Surkhan State Reserve, Sherabad District, Surkhandarya Region (37°49′29.86″ N 66°39′43.66″ E), 13.09.2024.

Distribution: Tajikistan, Kazakhstan, Uzbekistan.

10. *Eumenes coarctatus lunulatus* Fabricius, 1804

Location and time of detection: Sangzor village, Sh. Rashidov district, Jizzakh region (40°4'28.04" N 67°41'54.34" E) 29.04.2024.

Distribution: Europe, Russia, N. Africa, Caucasus, Turkey, Cyprus, Syria, Jordan, Israel, Iran, Central Asia, Kazakhstan, Uzbekistan, Mongolia, China, Japan.

11. *Euodynerus strigatus* Radoszkowski, 1893

Location and time of detection: 2♀, 1♂. Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′33.54″ N 59°38′31.52″ E), 05.05.2022.

Distribution: China, Central Asia, Tajikistan, Kazakhstan, Uzbekistan.

12. *Euodynerus rufinus* Blüthgen, 1942

Location and time of detection: 2♀, 1♂. Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′33.54″ N 59°38′31.52″ E), 05.05.2022.

Distribution: Armenia, Israel, Egypt, Arabia, Iran, Turkmenistan, Mongolia, China, Kazakhstan, Uzbekistan.

13. *Eustenancistrocerus askhabadensis* (Radoszkowski, 1886)

Location and time of detection: Lower Amudarya State Biosphere Reserve, Republic of Karakalpakstan (41°58′40.45″ N 60°21′39.96″ E) 02.07.2022.

Distribution: Russia, Azerbaijan, Turkey, Syria, Jordan, Israel, Iran, Pakistan, Turkmenistan, Uzbekistan, Kazakhstan, Mongolia, China (North-West).

14. *Eustenancistrocerus amadanensis* (de Saussure, 1856)

Location and time of detection: 1♀. Yangi-Yul district, Tashkent region (41°07'24.8" N 69°05'43.1" E), 03.08.1951.

Distribution: Europe, Russia, North Africa, Caucasus, Turkey, Cyprus, Syria, Israel, Saudi Arabia, Iraq, Iran, Pakistan, Kazakhstan, Uzbekistan.

15. *Jucancistrocerus consimilis* (Morawitz, 1895)

Location and time of detection: Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′28.89″ N 59°38′27.09″ E), 13.05.2024.

Distribution: Iran, Turkmenistan, Tajikistan, Uzbekistan, Kazakhstan.

16. *Jucancistrocerus tachkendensis* (Dalla Torre, 1889)

Location and time of detection: Yangiarik district, Khorezm region (41°19′00.56″ N 60°27′02.01″ E), 29.05.2023. Surkhandarya region, Boysun district (37.912744° N 67.020435° E), 09.04.2024. Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′28.89″ N 59°38′27.09″ E), 13.05.2024.

Distribution: China, Afghanistan, Pakistan, Turkmenistan, Kazakhstan, Uzbekistan.

17. *Jucancistrocerus atrofasciatus* (Moravitz, 1885)

Location and time of detection: Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′28.89″ N 59°38′27.09″ E), 13.05.2024.

Distribution: China, Iran, Mongolia, Kazakhstan; Kyrgyzstan, *Uzbekistan.

18. *Katamenses dimidiatus* Brulle, 1832

Location and time of detection: 1♀, Jizzakh region, Aydarkul area (41°00′00.96″ N 65°56′18.06″ E), 16.07.2022. 3♀, Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′28.39″ N 59°38′27.06″ E), 15.05.2024. (42°30′29.38″ N 59°38′27.52″ E), 27.05.2024.

Distribution: Europe, Russia, Caucasus, Turkey, Cyprus, Syria, Israel, Iran, Mongolia, China, Afghanistan, Pakistan, Central Asia, Kazakhstan.

19. *Knemodynerus excellens* (Pérez, 1907)

Location and time of detection: Beshariq district, Fergana region (40°26′55.93″ N 70°21′39.63″ E), 22.05.2023.

Distribution: Iran, SW-Asia, Qatar, Pakistan, India, Oman, Saudi Arabia, Arabian Peninsula, Turkmenistan, Uzbekistan.

20. *Odynerus melanocephalus* (Gmelin, 1790)

Location and time of detection: 7♀, 4♂. Sangzor village, Sh. Rashidov district, Jizzakh region (40°4'28.04" N 67°41'54.34" E) 28.04.2024.

Distribution: N. Africa, almost all of Europe, the Caucasus, Kazakhstan, Central Asia, South Siberia, Iran, Palestine.

21. *Onychopterocheilus fausti* (Moravitz, 1873)

Location and time of detection: Ustyurt plain, Republic of Karakalpakstan (44°04′12.74″ N 57°46′59.44″ E), 12.07.2023.

Distribution: Central Asia.

22. *Paravespa quadricolor* (Moravitz, 1885)

Location and time of detection: Ustyurt plain, Republic of Karakalpakstan (44°04′12.74″ N 57°46′59.44″ E), 12.07.2023.

Distribution: Central Asia, Kazakhstan.

23. *Pseudepipona herzi* (Morawitz, 1895)

Location and time of detection: Ashshikul, Nukus city, Republic of Karakalpakstan (42°30′28.89″ N 59°38′27.09″ E), 12.05.2024.

Distribution: Israel, Mongolia, China, Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan.

24. *Pseudepipona herrichii* de Saussure, 1856

Location and time of detection: Lower Amudarya State Biosphere Reserve of the Republic of Karakalpakstan (42°16′37.39″ N 60°02′21.92″ E) 02.07.2022.

Distribution: Europe (WE, SE, EE), Russia, North Africa, Caucasus, Turkey, Syria, Mongolia, China, North America, Central Asia, Kazakhstan.

25. *Pseudepipona kostylevi* Fateryga, 2022

Location and time of detection: Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′27.15″ N 59°38′25.97″ E), 05.05.2024.

Distribution: Turkmenistan, Kazakhstan, Uzbekistan.

26. *Symmorphus murraris* (Linnaius, 1758)

Location and time of detection: 3♀, 1♂. Botanical Garden of Tashkent City (41°20′39.53″ N 69°18′38.13″ E), 22.05.2024.

Distribution: Europe, Russia, North Africa, Caucasus, Turkey, Iran, Korean, Central Asia, Kazakhstan.

27. *Tachyancistrocerus schmidti* (Kokujev, 1913)

Location and time of detection: Boka district, Tashkent region (40°47'21.43" N 69°14'10.13" E), 23.08.2023.

Distribution: China, Armenia, Azerbaijan, Turkey, Russia, Iran, Afghanistan, Kyrgyzstan, Turkmenistan, Uzbekistan.

28. *Xanthodynerus dentipes* (Kostylev, 1940)

Location and time of detection: The desert zone of the city of Nukus, Republic of Karakalpakstan (42°29′51.42″ N 59°48′57.19″ E), 29.05.2024.

Distribution: Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan.

Polistinae

29. *Polistes dominula* Christ, 1791

Location and time of detection: Yozyovon deserts, Fergana region (40°38'36.4"N 71°31'2.3"E), 26.07.2021. Shavat district, Khorezm region (41°39'34.8" N 60°09'38.7" E), 13.04.2022. Urgench district, Khorezm region (41°38'26.5" N 60°40'20.1" E), 24.04.2022. Urgench city, Khorezm region (41°38'51.2" N 60°40'32.5" E) 30.04.2022. Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′27.15″ N 59°38′25.97″ E), 05.05.2024. Botanical Garden of Tashkent City (41°20′39.53″ N 69°18′38.13″ E), 22.05.2024.

Distribution: Russia, Europe, North Africa, Georgia, Jordan, Israel, Iran, Afghanistan, Pakistan, Mongolia, New Zealand, China, India, Syria, Turkey, Canary Islands, Australia, North and South America, Central Asia, Kazakhstan, Turkmenistan, Uzbekistan.

30. *Polistes watti* Cameron 1900

Location and time of detection: Shavat district, Khorezm region (41°39'34.8" N 60°09'38.7" E), 13.04.2022. Urgench district, Khorezm region (41°38'26.5" N 60°40'20.1" E), 24.04.2022. Urgench city, Khorezm region (41°38'51.2" N 60°40'32.5" E) 30.04.2022. Ashshikul, Nukus city, Republic of Karakalpakstan (42°30′27.15″ N 59°38′25.97″ E), 05.05.2024. Botanical Garden of Tashkent City (41°20′39.53″ N 69°18′38.13″ E), 22.05.2024.

Distribution: Arabian Peninsula, Mauritius, Iraq, Iran, Afghanistan, Pakistan, China, India, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan.

Vespinae

31. *Vespa orientalis* Linnaeus, 1771

Location and time of detection: Shavat district, Khorezm region (41°39'34.8" N 60°09'38.7" E), 13.04.2022. Urgench district, Khorezm region (41°38'26.5" N 60°40'20.1" E), 24.04.2022. Urgench city, Khorezm region (41°38'51.2" N 60°40'32.5" E) 30.04.2022. Pop district, Namangan region (41°8'11.93" N 70°22'45.67" E) 07.08.2022. Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′27.15″ N 59°38′25.97″ E), 05.05.2024. Botanical Garden of Tashkent City (41°20′39.53″ N 69°18′38.13″ E), 22.05.2024.

Distribution: Europe, North Africa, Arabian Peninsula, Crete and Cyprus, Asia Minor, Middle East, Caucasus, Transcaucasia, Russia, China, Iran, Iraq, Afghanistan, Pakistan, India, Nepal, Ethiopia, USA, Mexico, several European countries, Southeast Asia, Lebanon, Syria, Jordan, Israel, Saudi Arabia, Bahrain, Yemen, Oman, Nepal, Madagascar, Southern Turkey, Armenia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan.

32. *Dolichovespula sylvestris* (Scopoli, 1763)

Location and time of detection: Kyziltepa District, Navoi Region (40°02'45.45" N 64°51'13.23" E) 01.08.2023.

Distribution: Europe, Russia, Caucasus, Siberia, Trans-Baikal, North Africa, Korea, Japan, China, Turkey, Morocco, Georgia, Armenia, Syria, Afghanistan, Iran, Pakistan, North India, Mongolia, Central Asia, Kazakhstan, Kyrgyzstan, Uzbekistan.

33. *Vespula germanica* Fabricius, 1793

Location and time of detection: Shavat district, Khorezm region (41°39'34.8" N 60°09'38.7" E), 13.04.2022. Urgench district, Khorezm region (41°38'26.5" N 60°40'20.1" E), 24.04.2022. Urgench city, Khorezm region (41°38'51.2" N 60°40'32.5" E) 30.04.2022. Baliqchi District, Andijan Region (40°55'5.93" N 71°49'52.43" E) 17.07.2023. Ashshikul, Nukus City, Republic of Karakalpakstan (42°30′27.15″ N 59°38′25.97″ E), 05.05.2024. Botanical Garden of Tashkent City (41°20′39.53″ N 69°18′38.13″ E), 22.05.2024.

Distribution: Europe, Russia, Siberia, Altai, Far East, Baikal, Beyond Baikal, North Africa, Israel, Jordan, Lebanon, Iceland, Georgia, Armenia, Turkey, Caucasus, Middle East, Syria, Iran, Iraq, Pakistan, China, Mongolia, Korean Peninsula, North India, South Africa, Australia, Tasmania, New Zealand, North and South America, Argentina, Chile, Afghanistan, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan.

34. *Vespula rufa* Linnaeus, 1758

Location and time of detection: Pop district, Namangan region (41°8'11.93" N 70°22'45.67" E) 07.08.2022. Boka district, Tashkent region (40°47'21.43" N 69°14'10.13" E), 23.08.2023.

Distribution: Central and Northern Europe, North America, Russia, Caucasus, Sakhalin, Island, Japan, Korean, North China, Mongolia, Iran, Crimea, Turkey, Taiwan, Georgia, Nepal, Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan.

35. *Vespula vulgaris* Linnaeus, 1758

Location and time of detection: Parkent district, Tashkent region (41°18'33.36" N 69°47'48.63" E), 17.06.2023.

Distribution: Europe, Russia, Turkey, Georgia, Iran, Mongolia, China, Korean Peninsula, Japan, India, Iceland, New Zealand, Australia, Kyrgyzstan, Kazahkstan, Uzbekistan.

The identified species were classified into three subfamilies (Eumeninae, Polistinae, Vespinae) of the Vespidae family. Regarding the distribution among subfamilies, the Eumeninae subfamily was the leader with 28 species (80%), the Vespinae subfamily was the second with 5 species (14.3%), and the Polistinae subfamily was the third with 2 species (5.7%) (Table 1).

When the species ratio belonging to the genera of the Vespidae family, was studied, it was determined that 4 species (11.4%) belong to *Eumenes* genus of the Eumeninae subfamily, while the *Antepipona*, *Pseudepipona*, *Jucancistrocerus* and *Vespula* genera have three species each, the *Euodynerus*, *Eustenancistrocerus*, *Chlorodynerus* and *Polistes*

genera have two species each, and the *Ancistrocerus*, *Katamenes*, *Knemodynerus*, *Odynerus*, *Onychopterocheilus*, *Paravespa*, *Symmorphus*, *Tachyancistrocerus*, *Xanthodynerus*, *Vespa*, *Dolichovespula* genera have one species each.

According to the results of field studies conducted in 2020–2024 and an analysis of literature spanning almost 150 years, the number of species identified to date in the natural and anthropogenic territories of Uzbekistan is 122. Thus, it was determined that the true wasps in the fauna of Uzbekistan consist of 122 species belonging to 6 subfamilies and 38 genera. The species *Jucancistrocerus atrofasciatus* (Moravitz, 1885) was recorded for the fauna of Uzbekistan for the first time (Table 2, Fig. 1).

Table 1
The species composition of the Vespidae family identified in Uzbekistan during our research

Family	Subfamily	Genera	Species
Vespidae	Eumeninae	*Ancistrocerus* Wesmael, 1836	*Ancistrocerus parietum* (Linnaeus, 1758)
		Antepipona de Saussure, 1855	*Antepipona barrei* (Radoszkowski, 1893)
			Antepipona deflenda Sauders, 1853
			Antepipona specifica (Morawitz, 1895)
		Chlorodynerus Blüthgen, 1951	*Chlorodynerus arenicola* (Kostylev, 1935)
			Chlorodynerus incisipes (Kostylev, 1935)
		Eumenes Latreille, 1802	*Eumenes mediterraneus* Kriechbauber, 1879
			Eumenes sareptanus André, 1884
			Eumenes separatus Gusenleitner, 1972
			Eumenes coarctatus lunulatus Fabricius, 1804
		Euodynerus Dalla Torre, 1904	*Euodynerus strigatus* Radoszkowski, 1893
			Euodynerus rufinus Blüthgen, 1942
		Eustenancistrocerus Blüthgen, 1938	*Eustenancistrocerus askhabadensis* (Radoszkowski, 1886)
			Eustenancistrocerus amadanensis (de Saussure, 1856)
		Jucancistrocerus Blüthgen, 1938	*Jucancistrocerus consimilis* (Morawitz, 1895)
			Jucancistrocerus tachkendensis (Dalla Torre, 1889)
			Jucancistrocerus atrofasciatus (Moravitz, 1885)
		Katamenes Meado Waldo, 1910	*Katamenses dimidiatus* Brulle, 1832
		Knemodynerus Blüthgen, 1940	*Knemodynerus excellens* (Pérez, 1907)
		Odynerus Latreille, 1802	*Odynerus melanocephalus* (Gmelin, 1790)
		Onychopterocheilus Bluthgen, 1955	*Onychopterocheilus fausti* (Moravitz, 1873)
		Paravespa Radoszkoowski, 1886	*Paravespa quadricolor* (Moravitz, 1885)
		Pseudepipona Saussure, 1856	*Pseudepipona herzi* (Morawitz, 1895)
			Pseudepipona herrichii de Saussure, 1856
			Pseudepipona kostylevi Fateryga, 2022
		Symmorphus Wesmael, 1836	*Symmorphus murraris* (Linnaius, 1758)
		Tachyancistrocerus Giordani Soika, 1952	*Tachyancistrocerus schmidti* (Kokujev, 1913)
		Xanthodynerus Blüthgen, 1954	*Xanthodynerus dentipes* (Kostylev, 1940
	Polistinae	*Polistes* Latreille, 1802	*Polistes dominula* Christ, 1791
			Polistes watti Cameron, 1900
	Vespinae	*Vespa* Linnaeus, 1758	*Vespa orientalis* Linnaeus, 1771
		Dolichovespula Rohwer, 1916	*Dolichovespula sylvestris* (Scopoli, 1763)
		Vespula Thomson, 1869	*Vespula germanica* Fabricius, 1793
			Vespula rufa Linnaeus, 1758
			Vespula vulgaris Linnaeus, 1758
Total:	3	20	35

Table 2
Species composition of Vespidae wasps of Uzbekistan

Species name	In sources	During our research
Eumeninae		
Alastor ardens Kostylev, 1935	+	–
Allodynerus dignotus (Morawitz, 1895)	+	–
Allodynerus delphinalis (Giraud, 1866)	+	–
Ancistrocerus dusmetiolus (Strand, 1914)	+	–
Ancistrocerus parietum (Linnaeus, 1758)	+	+
Ancistrocerus tenellus (Kostylev, 1935)	+	–
Antepipona barrei (Radoszkowski, 1893)	+	+
Antepipona deflenda Sauders, 1853	+	+
Antepipona specifica (Morawitz, 1895)	+	+
Antepipona tekensis (Kostylev, 1935)	+	–
Antepipona varentzowi (Morawitz, 1895)	+	–
Brachyodynerus zhelochovtzevi (Kostylev, 1929)	+	–
Brachypipona longicornis (Morawitz, 1895)	+	–
Chlorodynerus arenicola (Kostylev, 1935)	+	+
Chlorodynerus incisipes (Kostylev, 1935)	+	+
Delta dimidiatipenne (de Saussure, 1852)	+	–
Eumenes affinissimus de Saussure, 1852	+	–
Eumenes asiaticus Gusenleitner, 1970	+	–
Eumenes coarctatus lunulatus Fabricius, 1804	+	+
Eumenes comberi Dover, 1925	+	–
Eumenes crimensis Bluthgen, 1938	+	–
Eumenes dubius de Saussure, 1852	+	–
Eumenes jarkandensis Blüthgen, 1938	+	–
Eumenes mediterraneus Kriechbauber, 1879	+	+
Eumenes papillarius Christ, 1791	+	–
Eumenes pomiformis Fabricius, 1781	+	–
Eumenes punctaticlypeus Giordani Soika, 1943	+	–

Species name	In sources	During our research
Eumenes sareptanus Andre, 1884	+	+
Eumenes separatus Gusenleitner, 1972	+	+
Eumenes selisi Fateryga, 2024	+	–
Euodynerus dantici Rossi, 1790	+	–
Euodynerus strigatus Radoszkowski, 1893	+	+
Euodynerus disconotatus (Lichtenstein, 1884)	+	–
Euodynerus fastidiosus (de Saussure,1853)	+	–
Euodynerus semisaecularis (Dalla Torre, 1889)	+	–
Euodynerus setosus Gusenleitner, 1970	+	–
Euodynerus cylindriventris (Kostylev, 1935)	+	–
Euodynerus pseudocaspicus Blüthgen, 1942	+	–
Euodynerus rufinus Blüthgen, 1942	+	+
Eustenancistrocerus askhabadensis (Radoszkowski, 1886)	+	+
Eustenancistrocerus amadanensis (de Saussure, 1856)	+	+
Eustenancistrocerus tegularis (Morawitz, 1885)	+	–
Hemipterochilus bembeciformis (Morawitz, 1867)	+	–
Hemipterochilus rubrosignatus (André, 1884)	+	–
Jucancistrocerus consimilis (Morawitz, 1895)	+	+
Jucancistrocerus tachkendensis (Dalla Torre, 1889)	+	+
Jucancistrocerus atrofasciatus (Moravitz, 1885)	–	+
Katamenses dimidiatus Brulle, 1832	+	+
Katamenses sichelii deSaussure, 1852	+	–
Knemodynerus excellens (Pérez, 1907)	+	+
Leptochilus ambiguus (Kostylev, 1940)	+	–
Leptochilus callidus (Kostylev, 1940)	+	–
Leptochilus chorezmicus (Kostylev, 1940)	+	–
Leptochilus crassiceps (Kostylev, 1940)	+	–
Leptochilus locuples (Giordani Soika, 1970)	+	–
Leptochilus maracandicus (Kostylev, 1940)	+	–
Leptochilus membranaceus (Morawitz, 1867)	+	–
Leptochilus oxianus (Kostylev, 1940)	+	–
Leptochilus pulcher Gusenleitner, 1995	+	–
Leptochilus rasdozskowskii André, 1884	+	–
Leptochilus sarticus Blüthgen, 1939	+	–
Microdynerus rubronotatus (Kostylev, 1940)	+	–
Microdynerus parvulus (Herrich-Schaffer, 1838)	+	–
Odynerus atropilosus Kostylev, 1940	+	–
Odynerus albopictus de Saussure, 1856	+	–
Odynerus ezechiae von Schulthess, 1924	+	–
Odynerus melanocephalus (Gmelin, 1790)	+	+
Odynerus laticinctus (Białynicki-Birula, 1926)	+	–
Odynerus fulvitarsis (Morowitz, 1895)	+	–
Odynerus nigrospinosus (Morawitz, 1895)	+	–
Odynerus shestakovae (Kostylev, 1935)	+	–
Onychopterocheilus angustipalpus (Kostylev, 1940)	+	–
Onychopterocheilus luteocinctus Blüthgen, 1955	+	–
Onychopterocheilus fausti (Moravitz, 1873)	+	+
Onychopterocheilus dallatorrei (Morawitz, 1895)	+	–
Paragymnomerus excelsus (Kostylev, 1935)	+	–
Paragymnomerus signaticollis (Morowitz, 1888)	+	–
Paragymnomerus spiricornis spiricornis (Spinola, 1808)	+	–
Paravespa grandis (Morawitz, 1885)	+	–
Paravespa quadricolor (Moravitz, 1885)	+	+
Paravespa rex (von Schulthess, 1924)	+	–
Parodontodynerus ephippium (Klug, 1817)	+	–
Pseudepipona herzi (Morawitz, 1895)	+	+
Pseudepipona herrichii de Saussure, 1856	+	+
Pseudepipona kostylevi Fateryga, 2022	+	+
Pseudepipona kozhevnikovi (Kostylev, 1927)	+	–
Pseudepipona vicina Gusenleitner, 1972	+	–
Pseudepipona sellata (Morawitz, 1885)	+	–
Pseudepipona straminea (André, 1884)	+	–
Pseudepipona falsa (Kostylev, 1927)	+	–
Pseudepipona ushinskii (Kostylev, 1940)	+	–
Pterocheilus pusillus Kostylev, 1940	+	–
Stenancistrocerus transcaspicus (Kostylev, 1935)	+	–
Stenodynerus chitgarensis Giordani Soika, 1970	+	–
Stenodynerus heptneri (Kostylev, 1940)	+	–
Stenodynerus nudus (Morawitz, 1889)	+	–
Stenodynerus trotzinai (Morawitz, 1895)	+	–
Symmorphus glasunowi Morawitz, 1895	+	–
Symmorphus murraris (Linnaius, 1758)	+	+
Tachyancistrocerus komarowi (Morawitz, 1885)	+	–
Tachyancistrocerus kostylevi Kurzenko, 1984	+	–
Tachyancistrocerus schmidti (Kokujev, 1913)	+	+
Tachyancistrocerus sorex Gusenleitner, 2012	+	–
Xanthodynerus dentipes (Kostylev, 1940)	+	+
Psiliglossa odyneroides (S.S. Saunders, 1850)	+	–
Psiliglossa pulchra Morawitz, 1895	+	–
Zethinae		
Discoelius pictus Kostylev, 1940	+	–

Species name	In sources	During our research
Masarinae		
Celonites octoannulatus (Kuznetzov, 1923)	+	–
Celonites tristiculus Kostylev, 1935	+	–
Masaris carli von Schulthess, 1922	+	–
Masaris longicornis (Kuznetzov, 1923)	+	–
Quartinia chlorotica (Morawitz, 1888)	+	–
Quartinia shestakovi Kostylev, 1935	+	–
Quartinia uzbeka Kostylev, 1935	+	–
Polistinae		
Polistes dominula Christ, 1791	+	+
Polistes gallicus (Linnaeus, 1768)	+	–
Polistes watti Cameron 1900	+	+
Vespinae		
Vespa orientalis Linnaeus, 1771	+	+
Dolichovespula sylvestris (Scopoli, 1763)	+	+
Vespula germanica Fabricius, 1793	+	+
Vespula rufa Linnaeus,1758	+	+
Vespula vulgaris Linnaeus,1758	+	+
Total:	122	35

Fig 1. The species *Jucancistrocerus atrofasciatus* (Moravitz, 1885), first identified for the fauna of Uzbekistan

Discussion

In order to form a taxonomic list of true wasps in Uzbekistan, we conducted a comparative analysis of the available data, based on almost 150 years of research and the results of our own research. According to the 2024 version of the world taxonomic systematics of the Vespidae family, we analyzed about 40 literature data from 22 researchers. From the initial research work on true wasps in Uzbekistan, E. André recorded only five species: *Euodynerus semisaecularis*, *Hemipterochilus rubrosignatus*, *Jucancistrocerus tachkendensis*, *Leptochilus rasdozskowskii* and *Pseudepipona straminea* during the years 1881–1886.

Morawitz (1895) recorded 7 species ; *Antepipona deflenda*, *A. specifica*, *Brachypipona longicornis*, *Euodynerus strigatus*, *Hemipterochilus rubrosignatus*, *Parodontodynerus ephippium* and *Symmorphus murraris*. In 1926, A. Białynicki-Birula noted the distribution of three species: *Hemipterochilus bembeciformis*, *Paragymnomerus signaticollis*, *Paravespa rex*. P. Blüthgen, 1939–1955 recorded 12 species ; *Hemipterochilus bembeciformis*, *Leptochilus rasdozskowskii*, *L. sarticus*, *Odynerus melanocephalus*, *O. laticinctus*, *Onychopterocheilus luteocinctus*, *O. fausti*, *O. dallatorrei*, *Paragymnomerus excelsus*, *Paravespa grandis*, *P. rex*, *Pseudepipona herrichii*. G. Kostylev's research conducted between 1925 and 1940 identified a total of 21 species *Ancistrocerus dusmetiolus*, *Eumenes punctaticlypeus*, *Euodynerus cylindriventris*, *Leptochilus ambiguus*, *L. chorezmicus*, *L. maracandicus*, *L. oxianus*, *Microdynerus rubronotatus*, *Odynerus atropilosus*, *Onychopterocheilus angustipalpus*, *Paragymnomerus spiricornis*, *Pseudepipona kozhevnikovi*, *P. falsa*, *P. ushinskii*, *Tachyancistrocerus schmidti*, *Discoelius pictus*, *Celonites octoannulatus*, *C. tristiculus*, *Masaris longicornis*, *Quartinia shestakovi*, *Q. uzbeka*.

Of these, *Ancistrocerus dusmetiolus* and *Leptochilus chorezmicus* were recorded for the first time in Uzbekistan, and have not been recorded by any other researcher since. A. Giordani Soika, 1970, reported that he had recorded only one species, *Katamenses sicheliide*. J. Van Der Vecht, & Fischer, 1972, recorded 28 species in their studies in this area: *Antepipona specifica*, *Eumenes asiaticus*, *E. punctaticlypeus*, *Euodynerus strigatus*, *E. semisaecularis*, *E. cylindriventris*, *Hemipterochilus bembeciformis*, *H. rubrosignatus*, *Jucancistrocerus tachkendensis*, *Katamenses sichelii*, *Leptochilus ambiguus*, *L. maracandicus*, *L. oxianus*, *L. rasdozskowskii*, *L. sarticus*, *Microdynerus rubronotatus*, *Odynerus atropilosus*, *O. melanocephalus*, *Onychopterocheilus angustipalpus*, *O. luteocinctus*, *O. dallatorrei*, *Paragymnomerus signaticollis*, *Pseudepipona straminea*, *P. falsa*, *Pseudepipona ushinskii*, *Stenodynerus heptneri*, *Tachyancistrocerus schmidti*, *T. schmidti*, *Discoelius pictus*.

A. G. Davletshina (1979) recorded two species *Vespa orientalis*, *Dolichovespula sylvestris*.

Cumming, 1989 recorded only one species: *Symmorphus glasunowi*. T. T. Kulumbetova (1999) noted 4 species: *Polistes gallicus*, *Vespa orientalis*, *Vespula germanica*, *V. rufa*.

J. M. Carpenter in his research from 1997 to 2001 noted 8 species: *Celonites octoannulatus*, *C. tristiculus*, *Masaris carli*, *M. longicornis*, *Quartinia shestakovi*, *Q. uzbeka*, *Vespula germanica*, *V. rufa*.

In 1977, Kurzenko, recorded 20 species: *Brachypipona longicornis*, *Hemipterochilus rubrosignatus*, *Jucancistrocerus consimilis*, *Katamenses dimidiatus*, *Knemodynerus excellens*, *Microdynerus rubronotatus*, *Odynerus atropilosus*, *O. albopictus*, *Odynerus melanocephalus*, *Odynerus laticinctus*, *Odynerus shestakovae*, *Onychopterocheilus dallatorrei*, *Paragymnomerus excelsus*, *P. signaticollis*, *P. spiricornis*, *Paravespa grandis*, *P. quadricolor*, *P. rex*, *Tachyancistrocerus kostylevi*, *Discoelius pictus*. Of these species, *Odynerus shestakovae*, *Tachyancistrocerus kostylevi* were recorded in this area for the first time and no one has recorded this species except this author.

L. Castro (2010) noted 15 species: *Antepipona barrei*, *A. deflenda*, *A. specifica*, *Euodynerus dantici*, *E. disconotatus*, *E. fastidiosus*, *E. semisaecularis*, *E. dantici*, *E. disconotatus*, *E. semisaecularis*, *E. rufinus*, *Katamenses sicheliide*, *Odynerus fulvitarsis*, *Paragymnomerus spiricornis*, *Stenodynerus chitgarensis*. Of these, *Euodynerus dantici*, *E. fastidiosus*, *E. rufinus*, *Stenodynerus chitgarensis* were recorded in this area for the first time and no one has recorded this species except this author.

During the years 1972–2012 J. Gusenleitner, noted 11 species: *Antepipona tekensis*, *A. varentzowi*, *Eumenes asiaticus*, *E. coarctatus lunulatus*, *E. crimensis*, *E. mediterraneus*, *E. punctaticlypeus*, *Leptochilus pulcher*, *Odynerus ezechiae*, *Stenodynerus heptneri*, *Tachyancistrocerus sorex*.

J. Oehlke (2012) recorded three species: *Eumenes asiaticus*, *E. pomiformis*, *Stenancistrocerus transcaspicus*.

In 2017 Antropov, and others noted 10 species: *Antepipona deflenda*, *Eumenes crimensis*, *Leptochilus membranaceus*, *Microdynerus parvulus*, *Odynerus albopictus*, *O. fulvitarsis*, *Paragymnomerus signaticollis*, *Paravespa rex*, *Parodontodynerus ephippium*, *Polistes dominula*.

M. V. Mokrousov (2015) noted 11 species: *Ancistrocerus tenellus*, *Eumenes mediterraneus*, *Microdynerus rubronotatus*, *Odynerus melanocephalus*, *O. laticinctus*, *Psiliglossa pulchra*, *Polistes dominula*, *P. gallicus*, *P. watti*, *Vespa orientalis*, *Vespula germanica*. Of these noted species, *Ancistrocerus tenellus*, *Psiliglossa pulchra* were noted

for the first time in Uzbekistan and not a single other author has recorded it from this area.

P. Girish Kumar (2019) and others noted only one species: *Katamenses dimidiatus*.

In the research conducted so far, A. V. Fateryga recorded a high total of 55 species from 2018 to 2024: *Alastor ardens*, *Allodynerus dignotus*, *A. delphinalis*, *Ancistrocerus parietum*, *Antepipona deflenda*, *A. varentzowi*, *Brachyodynerus zhelochovtzevi*, *Chlorodynerus arenicola*, *Ch. incisipes*, *Delta dimidiatipenne*, *Eumenes affinissimus*, *E. asiaticus*, *E. comberi*, *E. crimensis*, *E. dubius*, *E. jarkandensis*, *E. sareptanus*, *E. separatus*, *E. selisi*, *Euodynerus disconotatus*, *E. disconotatus*, *E. semisaecularis*, *E. pseudocaspicus*, *Eustenancistrocerus askhabadensis*, *E. amadanensis*, *E. tegularis*, *Hemipterochilus bembeciformis*, *Jucancistrocerus tachkendensis*, *Leptochilus callidus*, *L. crassiceps*, *L. locuples*, *L. membranaceus*, *Microdynerus parvulus*, *Odynerus albopictus*, *O. fulvitarsis*, *O. nigrospinosus*, *Paravespa rex*, *Parodontodynerus ephippium*, *Spinilabochilus desrticola*, *Pseudepipona herzi*, *P. kozhevnikovi*, *P. vicina*, *P. sellata*, *P. falsa*, *Pterocheilus pusillus*, *Stenodynerus nudus*, *S. trotzinai*, *Tachyancistrocerus komarowi*, *Xanthodynerus dentipes*, *Psiliglossa odyneroides*, *Masaris carli von*, *Quartinia chlorotica*, *Q. uzbeka*. Of these species, the author has recorded 27 species for the first time for the fauna of Uzbekistan, including *Alastor ardens*, *Allodynerus dignotus*, *A. delphinalis*, *Brachyodynerus zhelochovtzevi*, *Delta dimidiatipenne*, *Eumenes affinissimus*, *E. comberi*, *E. dubius*, *E. jarkandensis*, *E. papillarius*, *E. selisi*, *Euodynerus setosus*, *E. pseudocaspicus*, *Eustenancistrocerus tegularis*, *Leptochilus callidus*, *L. crassiceps*, *L. locuples*, *Odynerus nigrospinosus*, *Spinilabochilus desrticola*, *Pseudepipona vicina*, *Pterocheilus pusillus*, *Stenodynerus nudus*, *S. trotzinai*, *Tachyancistrocerus komarowi*, *Xanthodynerus dentipes*, *Psiliglossa odyneroides*, *Quartinia chlorotica*.

Conclusion

In conclusion, during our field studies conducted in 2020–2024, 35 species and subspecies of the Vespidae family, 3 subfamilies, 20 genera, were found in various biotopes of all natural and anthropogenic territories of the Republic of Uzbekistan. In studies of true wasps in Uzbekistan, which have a history of almost 150 years, based on the analysis of about 40 literature data by 22 researchers and the results of our own research, it was noted that the Vespidae family consists of 122 species belonging to 6 subfamilies, 38 genera. During our field research, the species *Jucancistrocerus atrofasciatus* (Moravitz, 1885) was recorded for the first time in the fauna of Uzbekistan. Of the total of 122 identified species, 37 species were recorded by only one author. Another 85 species were cited in the works of two or more authors.

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