

**FAUNISTIC ANALYSIS OF GROUND DIGGER WASPS OF (HYMENOPTERA: SPHECIDAE) FAMILY IN THE FERGANA VALLEY**

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A B S T R A C T	K E Y W O R D S
The article presents information about the location, distribution, bioecology of species <i>Palmodes melanarius</i> , <i>Podalonia affinis</i> , <i>P.ebenina</i> , <i>Sceliphron madraspatanum</i> F, <i>Sphex funerarius</i> .	Hymenoptera, Apocrita, Apoidea, Sphecidae, <i>Sphex</i> , genus, species.

**Introduction**

The superfamily of digger wasps (Apoidea) currently includes 4 families, 276 genera, 9889 species in the world, in the Palearctic they include 4 families, 101 genera, 2302 species, in Russia - 3 families, 87 genera, 684 species [1].

The family of digger wasps (Sphecidae) is distributed throughout the world, mainly in arid, semi-arid and tropical regions, there are 19 genera and 779 species in the world, 13 genera and 260 species in the Palearctic, and 11 genera and 68 species in Russia [1].

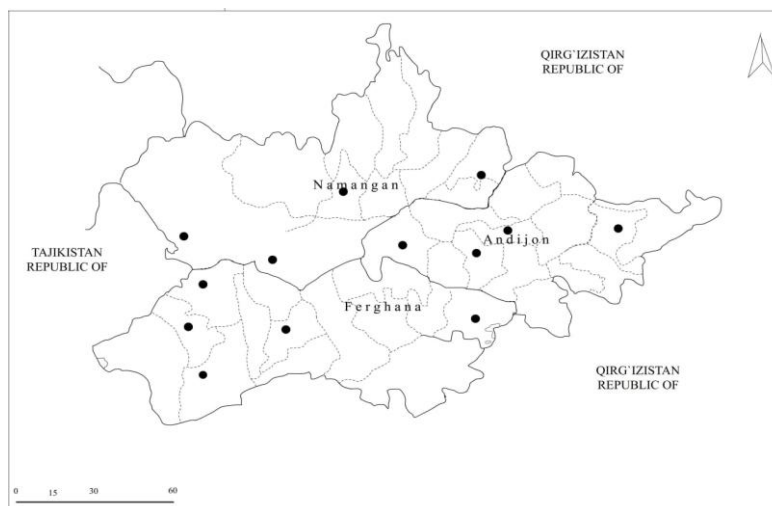
These digger wasps are found everywhere except in the cold polar regions, and are especially common in tropical and subtropical regions. For a long time, digger wasps were one family, and now they are divided into four families (*Ampulicidae*, *Heterogynaidae*, *Crabronidae* va *Sphecidae*)[2].

There are several harmful species among burrowing wasps. Among them, the wolf bee is of interest in beekeeping. The female *philanthus* (*Philanthus triangulum*) destroys up to 24 bees during the summer, and in large numbers this species can cause significant damage to beekeeping [8].

In the scientific research of Islamov Shukhrat Jurayevich on the family Sphecidae, 7 species belonging to 4 genera were registered in our Republic, and in the collection of entomology of the Institute of Zoology of the Republic of Uzbekistan it was found that there are 8 species belonging to 4 genera [3]. The purpose of this research work is to clarify information about the fauna and distribution of wasps of the Sphecidae family, common in the Ferghana Valley.

**Materials and Methods**

In 2019-2022, entomological materials were collected in the mountainous, foothill and flat regions of the Fergana Valley of the Republic of Uzbekistan (Figure 1).



**Fig. 1. Research areas**

At the collection of wasps belonging to the Sphecidae family, various insects were collected using Malese, Merike, and Barber soil traps. The Malese trap consists of three N-shaped interlocking plates and a cover that is flush with the soil surface. In addition, entomological networks of different sizes were used [5].

The technique for collecting insects with an entomological net is as follows: the entomological net is carried out over the surface of grasses, young shrubs and trees by shaking (with a quantitative score of 50 or 100) [4].

Morphological images of the collected entomological samples were obtained using various light microscopes, a digital camera ML 2000 (Meiji), microscopes and cameras Olympus CX31 and CK2V, Levenhuk T-Series, available in the laboratory of entomology and ecology of entomophages and the theoretical foundations of biomethods of research Zoological Institute of the Academy of Sciences Uzbekistan.

### **Obtained results and their analysis**

According to the results of entomological studies conducted in the Fergana Valley, 12 species belonging to 6 genera from the Sphecidae family were registered. Among the identified wasps belonging to the Sphecidae family, it was noted that the species *Sceliphron madraspatanum* F. is new to the Ferghana Valley, *Palmodes melanarius*, *Podalonia affinis*, *P.ebenina*, *Sphex funerarius* are new species for the fauna of the Republic of Uzbekistan.

Further research work included general information on the location, distribution, bioecology and original photographs of species first identified in the Ferghana Valley.

Order Hymenoptera - Hymenoptera  
Suborder Apocrita Gerstaecker, 1867  
Superfamily Apoidea Latreille, 1802  
Family Sphecidae Latreille, 1802  
Subfamily - Sphecinae  
Tribe Prionychini  
Genus *Palmodes* Kohl, 1890  
Species *Palmodes melanarius* (Mocsary), 1883

**Detection place and time:** Alami village, Mingbulok district, Namangan region, collected from camel thorn (*Alhagi maurorum*) 2♂, 1♀, coordinate points N 40.898151° E 71.669042° (Fig. 2a).

**Distribution:** Russia: European part (Southeast, North Caucasus, Republic of Crimea), Europe: Eastern Europe, North Africa, Georgia, Azerbaijan, Turkey, Syria, Iraq, Iran, Central Asia, Kazakhstan, China (Northwest) [1].

**Bioecology:** desert species. It occurs in sandy and rocky deserts, in dry meadows in the river valleys of the desert zone. adult insect (imago) can hibernate (in early spring and occasionally in autumn). The lifestyle is unknown, but it can be assumed that females build nests on the ground and hunt grasshoppers. An adult insect (imago) feeds on the nectar of flowers of various plants (*euphorbia*, *limonium*, *psoralea* l [6].

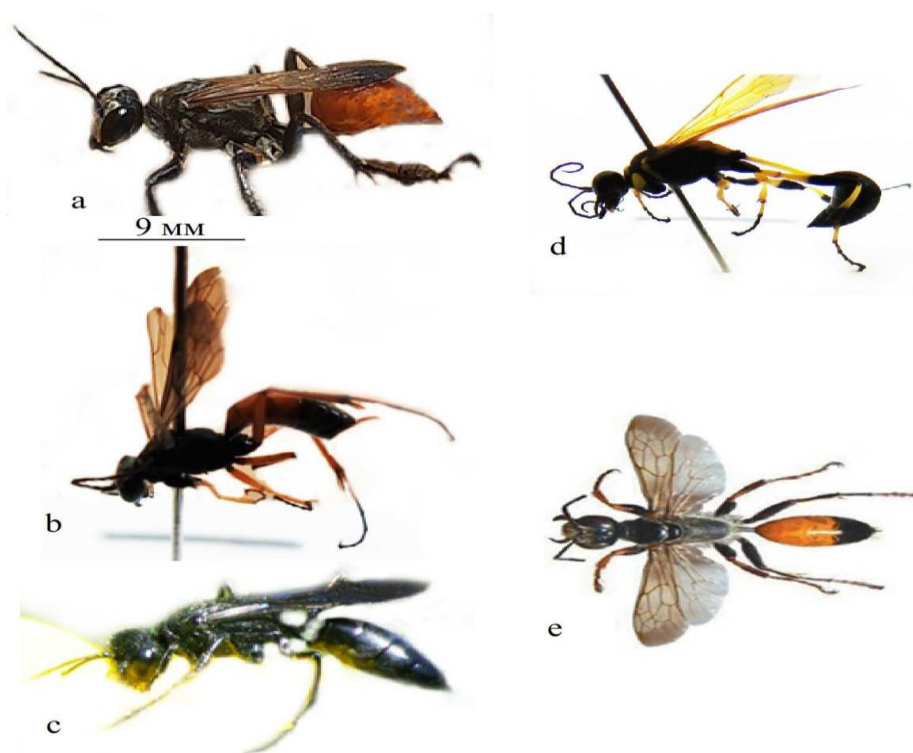


Fig. 2. Morphological appearance of wasps species belonging to the Sphecidae family: a. *Palmodes melanarius*, b. *Podalonia affinis*, c. *P. ebenina*, d. *Sceliphron madraspatanum* F, e. *SpheX funerarius*.

Order Hymenoptera Hymenoptera  
 Suborder Apocrita Gerstaecker, 1867  
 Superfamily Apoidea Latreille, 1802  
 Family Sphecidae Latreille, 1802  
 Subfamily Specinae  
 Tribe - Prionychini  
 Subfamily Ammophilinae André, 1886  
 Genus *Podalonia* Fernald, 1927  
 Species - *Podalonia affinis* (W. Kirby 1798)

**Detection place and time:** from a plant of yantak (*Alhagi maurorum*) in the village of Mirzaakhmedov, Ulugnor district, Andijan region. Collected in coordinate points (40.738053 . 71.633611°, 5♀. 2♂). (May 15, 2021), (Fig. 2b).

**Distribution:** Russia: European part (Central, South East, North Caucasus, Republic of Crimea), Ural region, Western Siberia (Omsk region, Novosibirsk region, Altai Territory), Eastern Siberia, Republic of Khakassia, Republic of Tyva, Krasnoyarsk Territory, Irkutsk region, Republic of Buryatia, Trans-Baikal Territory, Far East (Amur Region, Khabarovsk Territory, Primorsky Territory, Europe (Northern Europe, Eastern Europe), North Africa, Caucasus, Turkey, Jordan, Israel, Iran, Central Asia, Kazakhstan, Mongolia, China (north -east, north, southwest, western plateau, southeast), Korean Peninsula [1].

**Bioecology:** eurybiont species. It extends from the forest zone to deserts, from mountains to grasslands. Prefers desert biotopes. Females prey on caterpillars of butterflies (Noctuidae). The nest is built before the hunt. One cell can contain one worm [6].

Species - *Podalonia ebenina* (Spinola), 1838

**Detection place and time:** Karnaichi village, Khojabad district, Andijan region. Collected in coordinate points (40.666608° 72.562822°, 5♀. 2♂). (July 24, 2021), (Fig. 2c).

**Distribution:** Russia: European part (North Caucasus), Europe (Western Europe, Southern Europe), North Africa, Caucasus, Turkey, Syria, Jordan, Lebanon, Israel, Iraq, Iran, Afghanistan, Turkmenistan, Tajikistan, Uzbekistan, Kazakhstan [1 ].

**Bioecology:** desert view. Widely distributed in sandy and desert areas. The adult insect (imago) is active mainly in late spring and early summer. Females build a one-celled nest in the soil. Nesting is usually arranged before hunting. Butterfly worms (Noctuidae) are prey. One generation develops per year [6]. Wasps first hunt, then dig a nest. The bait is butterfly and spider worms. An adult wasp feeds on the nectar of the flowers of many desert plants. [7].

Order Hymenoptera - Hymenoptera

Suborder - Apocrita Gerstaecker, 1867

Superfamily - Apoidea Latreille, 1802

Family - Sphecidae Latreille, 1802

Genus - *Sceliphron* Klug, 1801

Species - *Sceliphron madraspatanum* (Fabricius, 1781).

**Detection place and time:** Begaabad village, Turakurgan district, Namangan region. collected by coordinate points (40.994206° . 71.513033°, 4♀, 2♂). (June 26, 2021), (Fig. 2, d).

**Distribution:** Russia: European part (South, North Caucasus, Republic of Crimea), Europe (Western Europe, Southern Europe, Eastern Europe), North Africa, Turkey, Syria, Israel, Iraq, Iran, Afghanistan, Central Asia, Kazakhstan, China (northeast, north, center, southeast, west Jebi, western plateau), Korean Peninsula, Japan (Hon, Kyu, Ryu), Southeast Asia, Africa [1].

**Bioecology:** This species is more thermophilic than *S. distillatorium*. It occurs in the desert zone, but where there are always water bodies (oases, along river valleys and near other reservoirs, in settlements, in low mountains). Females build loose multicellular nests from moist mud. Cells in the nest, length from 19 to 27 mm, width from 5 to 9 mm. Prey are representatives of the arachnid family Argiopidae, Theridiidae, Tetragnathidae and Thomisidae. One cage contains up to 27 spiders. Under favorable conditions, the development of one generation lasts 25-30 days. Wasps of the genus *Stilbum* and *Chrysis* parasitize in nests. An adult wasp feeds on the nectar of flowers of various plants: *Limonium* sp., *Euphorbia* sp., *Tamarix* spp. and others [6].

Order Hymenoptera - Hymenoptera  
Suborder - Apocrita Gerstaecker, 1867  
Superfamily - Apoidea Latreille, 1802  
Family - Sphecidae Latreille, 1802  
Subfamily - Sphecinae  
Genus - *Sphex* Linnaeus, 1758  
Species - *Sphex funerarius* Gussakovskij, 1934

**Detection place and time:** Gova village, Chust district, Namangan region. Collected from a mint plant (*Mentha*), 1♂, 2♀, collected from coordinate points N 41.000204°, E 71.234200° (June 27, 2021), (Fig. 2e).

**Distribution:** Russia: European part (Central, South East, North Caucasus, Republic of Crimea), Ural region, Western Siberia, (Omsk region, Tomsk region, Novosibirsk region, Altai Territory, East Siberian Republic of Tyva, Irkutsk region, Republic of Buryatia, Krasnoyarsk Territory, Trans-Baikal Territory Far East Khabarovsk Territory Europe (Western Europe, Southern Europe, Eastern Europe, Northern Europe), Northern Africa, Georgia, Turkey, Syria, Israel, Afghanistan, Central Asia, Kazakhstan, Mongolia, China (Northern, North- Western) [1].

**Bioecology:** Prey - large grasshoppers (Tettigoniidae) and grasshoppers (Gryllidae). 3-4 specimens of prey are deposited in one nest. An adult bee feeds on the nectar of various plants, a transpalearctic species [6].

### Conclusion

Thus, the burrowing bees of the Fergana Valley belong to the Sphecidae family, 6 genera and 12 species are registered, of which *Sceliphron madraspatanum* F is a new species to the Fergana Valley, *Palmodes melanarius*, *Podalonia affinis*, *P.ebenina*, *Sphex funerarius* are marked as a species by new species for the fauna Republic of Uzbekistan.

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