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ECOLOGICAL OBSERVATIONS ON SPHECIDAE SPECIES OF NİĞDE PROVINCE

NİĞDE İLİ SPHECIDAE TÜRLERİ ÜZERİNE EKOLOJİK GÖZLEMLER

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ABSTRACT

This study is based on a total of 1560 Sphecidae (Insecta: Hymenoptera) specimens, 320 of which are museum materials. 1240 of these samples were collected from Niğde province between May 2006 and October 2008. In this study, insect samples were collected from the field and the behavior and ecological characteristics of these insects were observed in detail. In the field studies, ecological observations have been made and information about nesting, feeding and hunting behaviors of Sphecidae species has been determined and information has been given about their phenology. There are more than 2 million species of insects in the world. Most of these insect species have been identified, but there are insufficient studies on the behavior and ecological characteristics of these insect species. In this study, species that represent many of Sphecidae species were examined. In this way, general ecological characteristics and behavior of Sphecidae species have been learned.

Keywords: Niğde, Hymenoptera, Sphecidae, fauna, ecological observations, phenology

ÖZ

Bu çalışma, 320'si müze materyali olmak üzere toplam 1560 Sphecidae (Insecta: Hymenoptera) örneğine dayanmaktadır. Bu örneklerin 1240'ı Mayıs 2006 - Ekim 2008 tarihleri arasında Niğde ilinden toplanmıştır. Bu çalışmada, araziden böcek örnekleri toplanmış ve bu böceklerin davranışları ve ekolojik özellikleri detaylı olarak gözlenmiştir. Arazi çalışmalarında ayrıca ekolojik gözlemler yapılmış ve Sphecidae türlerinin yuvalama, beslenme ve avlanma davranışları hakkında bilgi edinilmiş ve fenolojileri hakkında bilgi verilmiştir. Dünyada 2 milyondan fazla böcek türü var. Bu böcek türlerinin çoğu tespit edilmiştir, ancak bu böcek türlerinin davranışları ve ekolojik özellikleri ile ilgili yeterli çalışma yoktur. Bu çalışmada, Sphecidae türlerinin çoğunu temsil eden türler incelenmiştir. Bu şekilde, Sphecidae türlerinin genel ekolojik özellikleri ve davranışları hakkında bilgi verilmiştir.

Anahtar Kelimeler: Niğde, Hymenoptera, Sphecidae, fauna, ekolojik gözlemler, fenoloji

1.INTRODUCTION

Sphecida first record about the family in Turkey has Lepeletier Saint Fargeau in 1845. After this work was completed in 1899 by Francis Morin collection of samples collected from Turkey but did not publish taxonomic results it obtains. Until 1902, Arnold Penther and Emerich Zederbauer collected Sphecidae samples from Kayseri and its environs. But in 1905 Kohl published the results of his work. Similarly, Jozef Fahringer published Sphecidae samples collected from the Amanos Mountains by Franz Tölg in 1913-1914. The largest contribution to Turkey Sphecida fauna as seen from the French research entomologist Source Jacques has done his research until 1967 Beaumont. In the faunistic studies conducted until 1967, 309 species were identified, 28 of which were new species. 1959 - Between 1965 Guichard, Harvey, Gusenleintn and Schwarz Sphecida samples collected in large quantities from Turkey is located in the

Budapest Museum of Natural History. Today, Turkish and foreign entomologists from Dolphus, Guyabo, Uzbek, Tüzün, Yıldırım, Ljubomirov, Gülmez and Schmid - Egger with the contribution of the number of Sphecida species detected in Turkey has reached 530 (Ljubomirov and Yıldırım 2008). There is no special study for Niğde province. Especially in the researches conducted by foreign researchers since 1967, the highest taxonomic records for Niğde province were Beamont (25 species), Ljubomirov and Yıldırım (3 species), Pulawski (2 species), Schmid - Egger (2 species), respectively. , Dolphus (1 species), Nemkow (1 species) and Hensen (1 species) are followed (Ljubomirov and Yıldırım 2008).

2.MATERIAL and METHOD

Samples collected from Niğde province, districts and villages between May 2006 and October 2008 were caught with Bug Catcher Nets and killed in jars containing ethyl acetate. A thin layer of blotting paper was placed at the bottom of the glass jars. 7-8 drops of ethyl acetate were added on blotter paper in both, three uses. The sample caught with Bug Catcher Nets was taken into the jar through the Bug Catcher Nets, and the jar was closed by closing the lid. The samples were transferred to paper boxes with forceps. The paper boxes were labeled and stored for museum material. At the stage of making the samples into museum material, the samples were first softened. Closed glass containers (desiccator) were used for softening process. Drying paper was placed in the desiccator and water was added so as not to be too wet. The dried samples were placed in desiccator. In this way, they were allowed to soften by standing in a 70% humid environment at 30° C for one night. The softened specimens were stretched on styrofoam in accordance with the rules and became museum materials. The samples dried in this way were transferred to the collection boxes with their labels. Naphthalene was added to each collection box in order to prevent the samples from spoiling. Since naphthalene will evaporate over time, it is added every year.

The distinction of specimens ready to be identified is described by Bohart and Menke (1976), Berland (1925), Bitsch et. Get. (2001), de Beamont (1949, 1951, 1953a, 1953b, 1954, 1956, 1960, 1961a, 1961b) Dollfuss (1995), Kazenas (2001a), Menke and Pulawski (2000), Nemkov (1991, 1996a, 1996b) , Pulawski (1967, 1971, 1979), Roth (1963), Schmid-Egger (2000). In addition, museum materials of the Entomology laboratory of the Department of Biology, Faculty of Science, Ankara University were used as comparison material for some samples.

3.RESULTS

3.1.Nest construction and living environments

Bohart and Menke (1976) reported that “Sphecidae species are solitary species. The leg structures are highly adapted to excavation. Bees in this group are also called digger bees dolayı because most of the species of this family are found on the soil and they make their nests by digging sand or soil. However, in the family, there are species that make their nests on the trunk or branches of trees, the spaces between the stones, use galleries opened by other insects, or attach the nest made of mud to the dwellings of trees and people . It was observed that they used holes on pre-existing soil for nest construction or lived in nests of their own. It was observed that the nests were generally built into easily digdable, sandy dried river beds. It was observed that the nests were very close to water sources, but there were no nesting in wet areas, the nests generally had more than one entry and there were more than one nesting. It is observed that the species of this family are not commonly encountered in the city centers because of the lack of soil type for the nest due to the reinforced concrete structures and asphalt, and because the insects it catches are not located in the city center. *Ammophila*, *Podalonia* species, *Sceliphron* species were found on the ground roadsides in the city centers, and in the old abandoned buildings and on the roadsides near the city center. *Bembix*, *Palarus*, *Bembecinus*, *Oxybelus*, *Gorytes*, *Argogorytes* and *Ammatomus* species are encountered in dried river beds. *Sphex* and *Podalonia* species were found in the windy high hills. *Cerceris* and *Philanthus* species generally prefer flowering plants. *Tachytes*, *Tachysphex* and *Larra* species are generally observed in dune areas close to orchards.

3.2.Hunting and nutrition

Bohart and Menke (1976) reported that adult Sphecids feed on a variety of foods. Since the mouth parts of most species are short, they receive nectar from plants with short corolla, such as Compositae, Euphorbiaceae and Umbellifera. Thus, they help pollinate flowering plants. Some species feed on sweet fluids secreted by small insects such as aphids or the body fluid of their prey. Many species of the Sphecidae family are predators. They are hunted in a wide range from spiders to flies, from grasshoppers to caterpillars. Some species lay their eggs in their prey.

In accordance with what the researchers know, it was observed that they caught and carried the flightless species such as spider and butterfly larvae to their nests. *Larra anathema* spider hunting behavior is very striking. *Larra anathema*, thanks to its superior vision and flying ability, noticed the spider between the grasses and spider caught the spider in 5 - 10 seconds despite all the escape efforts. It was found that the species of *Philantus* was quite aggressive, that if it was to be caught alive, there should not be any other species alive or dead in the capture container, otherwise it would break the other specimens. It was observed that *Bembix* species and *Bembecinus*, *Oxybelus* and *Palarus* species can be found in the same locality, although all of these species are predators, they do not harm each other.

3.3.The phenology

Sphecidae family Sphecine sub-family members *Sphex*, *Ammophila*, *Podalonia* species belonging to the genus of April-October, Philanthinae subfamily species belonging to the species *Philanthus*, *Cerceris* species belonging to the genus of Larinae subfamily species, and more intensely in August, *Bembix* and *Stizus* species belonging to Bembicinae subfamily were found between June and September. According to the observations made in the field studies, Sphecidae species were active during the hottest noon hours of the day, especially when the sun was on the peak and their numbers increased significantly. However, as they were affected by the changes in temperature during the day, it turned out that they returned to their homes in the evening and after 17.00 they were almost never seen in the field. According to the observations made in field studies, the most prominent feature of Sphecidae is that they have very large eyes compared to other groups. Besides, the bell which is very thin compared to other groups was observed as another distinguishing feature. It has been observed that in many species, a part of the abdomen is yellow or orange, Sphecids often do not fly very high above the ground because they hunt non-flightable species, most of them are dark in color and move very fast and do not make a clear sound when moving, making it difficult to capture from the terrain.

4.DISCUSSION

It can be said that detailed field studies and climatic characteristics, geological differences and vegetation structure of Niğde province are effective in giving a large number of Sphecidae species as new records in Niğde province. Sphecid habitats were taken into consideration when determining the localities to be collected in field studies. The geological and soil characteristics, climatic characteristics and vegetation structure of Niğde province were determinant in the selection of the faunistic research area of the thesis. If these features are listed;

- Niğde and geological environment is one of Turkey's most important region. The materials originating from Hasan Mountain, Keçiboğduran, Melendiz and Erciyes Mountains covered the north and northeast of the region like a quilt. The Niğde region covers the area where Taurides and Anatolides come together. There are four technostratigraphic units in Niğde province which are different in terms of lithology, structural location and precipitation. These units can be classified as Niğde group, Aladağ Group, Ulukışla-Ereğli Group and Melendiz and Quaternary Group (Gürel 1997).

- In Niğde Province, various soils have been formed due to both climate and topography differences. alluvial soils, hydromorphic alluvial soils, colluvial soils, barren soils, organic soils, brown forest soils, lime-free brown forest soils, maroon soils, brown soils, lime-free brown soils, red brown soils, vertisol soils, siorezen soils, river flood beds bare rocks and debris. Of these soil types, alluvial soils suitable for growing all kinds of plants that can adapt to the climate are mostly located in Bor and Niğde plains and some in Çamardı and Ulukışla river valley bottoms.

- Niğde is dominated by steppe vegetation. *Centaurea* (Compositae), *Descurania* (Compositae), *Chondrilla* (Compositae), *Hordeum*, *Bromus*, *Euphorbia* (Euphorbiaceae) are common plant species in steppe vegetation. Forest vegetation consists of *Quercus*, *Juniperus* and *Pinus* species. Rock vegetation is composed of xerophyte plants Hygrophyte vegetation consists of *Salix*, *Euphorbia*, *Potentilla* and *Polygonum* species (Savran, 1997).

- According to Kara (2001) evaluating and reporting the temperature, precipitation and drought data of the meteorological stations of Niğde, Yahyalı and Pozantı meteorology stations, Pozantı (Adana) is less rainy, and Niğde and Yahyalı (Kayseri) are semi-arid and wintery. cold Mediterranean climate type. The Niğde meteorology station is located in the center of the research area, while the Yahyalı and Pozantı meteorology station is located around the research area. The location and data of these meteorological stations fully reflect the climate of the research area (Kara 2001).

de Beumont (1967) and Pulawsky (1967) to the species identified in the province of Niğde, as a result of field work *Spheg minor*, *Eremochares dives*, *Psenulus schencki*, *Tachysphex (ss) subdentatus*, *Oxybelus variegatus*, *Entomognathus schmidtii*, *Bembecinus peregrin*, *Gorytes adventicus*, *Gorytes (ss) schmiedeknechti*, *Gorytes punctuosus*, *Philanthus coronatus*, *Cerceris euryanthe* species could not be detected.

In the absence of identification of species, changes in land and climate conditions, urbanization, environmental problems developing in parallel with technological developments, increase in agricultural areas and displacement of species as a result of agricultural spraying and the possibility of some of these species to be found in local habitats can be counted.

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