

## New data on Vespid wasp fauna of Jordan (Hymenoptera, Vespidae)

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**A b s t r a c t :** Authors present the new finds of Vespid wasps of Jordan. The data for two species of Vespinae, two species of Polistinae, and four species of Eumeninae are given. The finds of *Vespa germanica* (FABRICIUS 1793), *Polistes gallicus* (LINNÉ 1767), *Polistes dominulus* (CHRIST 1791), *Delta l. lepeleterii* (SAUSSURE 1853), *Rhynchium oculatum* FABRICIUS 1781 ssp. *hebraeum* GIORDANI-SOIKA 1952, and *Eumenes m. mediterraneus* KRIECHBAUMER 1879 are first data to Jordan. Moreover, the find of *Delta l. lepeleterii* (SAUSSURE 1853) is first to the Middle East. Comparison with some neighbouring countries is discussed.

**K e y w o r d s :** Hymenoptera, Vespidae, Jordan, Middle East, faunistics.

### Introduction

Knowledge of social wasp fauna of the Middle East is uneven. The social wasps were studied in three surrounding countries: Israel (BYTINSKI-SALZ & GUSENLEITNER 1971), Egypt (ZALAT 1992), and Saudi Arabia (predominantly southern parts, RICHARDS 1984). On the other hand, only fractional data (1-3 species) are available from other three countries (Lebanon, Syria, Iraq). The only species (*Vespa orientalis*) was known from Jordan (CARPENTER & KOJIMA 1997, HADDAD et al. 2005). As *V. orientalis* represents very big problem for beekeepers (RICHARDS 1984, HADDAD et al. 2005), we started to collect data for better knowledge of Jordan Aculeate fauna from both faunistic and bee-protecting purposes. Solitary wasps (Eumeninae) are long-term studied in the Middle East, the data from Jordan were published by GIORDANI-SOIKA (1970) and GUSENLEITNER (2001).

This paper summarizes the first data on social wasps (Vespidae: Polistinae and Vespinae) and brings several new information on solitary wasps (Vespidae: Eumeninae).

### Material and methods

The whole material was collected by sweeping net. Wasps were trapped predominantly on flowers by Omar Adwan (=OA), Ahmad Bataynah (=AB), and Hanna Mdanat (=HM). All wasps were identified by Libor Dvořák, Eumeninae were revised by Josef Gusenleitner.

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### List of localities

Jordan occupies a position on the eastern margin of the Mediterranean climatic zone of the eastern Mediterranean. It has a wide range of physical parameters Altitudes ranges from -392 m at Dead Sea level to the 1754 m of Jebel Rum; the climate varies from sub humid Mediterranean in the north-west of the country with rainfall of about 630 mm to desert conditions with less than 50 mm over a distance of about 100 km away. Also rainfall amounts decrease from north to south and from west to east.

- 1) Al-Adasea, -142 m a.s.l., 31°49'16.0" N, 35°40'28.5" E, semidesert, 21.8.2006, OA, AB.
- 2) Dead Sea, -378 m a.s.l., 31°35'24.9" N, 35°33'33.0" E, warm semidesert, 21.8.2006, OA, AB.
- 3) Ghore Al-Safi, -370 m a.s.l., 31°2'17.75" N, 35°48'7.85" E, very hot area with good vegetation cover annual weeds, citrus and palm orchards under irrigation, in addition to the vegetable crops seasonally, 31.8.2006, OA, AB, HM.
- 4) Rabba, 928 m a.s.l., 31°16'27.9" N, 35°44'31.1" E, cultivated area with olive trees, and many annual weeds appear yearly, in addition to wheat and barley cultivation, 21.8.2006, OA, AB, HM..
- 5) Wadi Ben Hammad, 614 m a.s.l., 31°16'47.8" N, 35°40'57.2" E, vegetation cover includes annual weeds grew every year in addition to the olive orchards and vegetable cultivation, 22.8.2006, OA, AB, HM.
- 6) Seal Al-Karak, 688 m a.s.l., 31°11'56.9" N, 35°41'40.6" E, stream with many perennial shrubby plants as Clammy Inula also many other annual plants, 22.8.2006, OA, AB, HM.
- 7) Al Waseah, 1011 m a.s.l., 31°13'14.8" N, 35°44'13.3" E, olive and grape orchards and cultivated with wheat seasonally, 22.8.2006, OA, AB, HM.
- 8) Al Karak Palace, 1000 m a.s.l., 31°18'4.2" N, 35°45'21" E, olive orchard, 22.8.2006, OA, AB, HM.
- 9) Al-Tannor Dam, 423 m a.s.l., 30°57'39.2" N, 35°44'49.9" E, stream with many perennial shrubby plants, 22.8.2006, OA, AB.
- 10) Al-Shoubak station, 1451 m a.s.l., 30°30'37.7" N, 35°31'58.0" E, apple and stone fruits orchards with many annual weeds, 23.8.2006, OA, AB.
- 11) Dana Reserve, 1388 m a.s.l., 30°41'50.3" N, 35°34'47.7" E, montaneous forest of vast biological diversity, the total number of species recorded so far consists of 690 plants, 23.8.2006, OA, AB.
- 12) Tafeela City, 1003 m a.s.l., 30°50'05.9" N, 35°37'21.9" E, good vegetation cover surrounded by many buildings, 23.8.2006, OA, AB.
- 13) Al Na'aban near Afra, 870 m a.s.l., 30°54'45.8" N 35°41'36.0" E, semidesert, 23.8.2006, OA, AB.
- 14) Hammat Afra, 267 m a.s.l., 30°58'38" N, 35°40'21.3" E, valley with different kinds of trees and shrubs, 23.8.2006, OA, AB.
- 15) Al-Moujeb Dam, 158 m a.s.l., 31°26'45.8" N, 35°49'1.0" E, planted forest trees and annual weeds, 23.8.2006, OA, AB.
- 16) Al-Azraq, 521 m a.s.l., 31°50'03.4" N, 36°49'13.6" E, an unique wetland located in the heart of the arid Jordanian eastern desert, a reserve with ca. 150 species of vascular plants, 3.9.2006, OA.
- 17) Maru, 534 m a.s.l., 32°36'26.0" N, 35°54'5.0" E, many trees and shrubs, 27.8.2006, AB.
- 18) Kofor Soom, 520 m a.s.l., 32°40'16.7" N, 35°48'19.1" E, a wadi with many water springs and many trees (especially pomegranate), shrubs and annual plants, 27.8.2006, AB.

- 19) Khanasry, 701 m a.s.l., 32°24'16.5" N, 35°60'32.6" E, semi arid region with many desert plants, 28.8.2006, AB.
- 20) Ras Moneef, 1119 m a.s.l., 32°23'17.7" N, 35°48'7.75" E, the highest region in the northern part of Jordan with many forest trees, fruit trees and many annual plants, 5.9.2006, AB.
- 21) Sharhabeel, -260 m a.s.l., 32°31'7.68" N, 35°36'41.73" E, close to the Jordan River, many citrus orchards with many shrubs and annual weeds, 30.8.2006, AB.
- 22) Hashamite University, 600m a.s.l., 32°06'7.6" N, 36°11'27.9" E, desert with desert plants, many spiny plants, and cultivated landscaping plants, 14.8.2006, AB.

### List of species

Note: queen and worker caste was not separated in Vespinæ and Polistinae.

*Vespa orientalis* LINNÉ 1771 – Oriental species distributed from northern Africa and southeast Europe across Turkey and Arabian Peninsula to India and Nepal (ARCHER 1989, CARPENTER & KOJIMA 1997). Accidentally introduced into different parts of the world (see DVORÁK 2006 for review). CARPENTER & KOJIMA (1997) mentioned this species from Jordan; several localities published HADDAD et al. (2005). Jordan localities: 1 (2♀♀), 2 (9♀♀), 3 (4♀♀), 4 (5♀♀), 5 (6♀♀), 6 (3♀♀), 7 (4♀♀), 8 (3♀♀), 9 (5♀♀), 10 (5♀♀), 11 (10♀♀), 12 (2♀♀), 13 (5♀♀), 14 (4♀♀), 15 (2♀♀), 17 (2♀♀), 18 (9♀♀), 19 (7♀♀), 21 (7♀♀), 22 (6♀♀). Widespread species throughout all Middle East and very common in Jordan where it occupy different stands from -378 up to 1451 m a.s.l.

*Vespa germanica* (FABRICIUS 1793) – Widely distributed species known from Europe, Asia excluding SW, and N Africa. Introduced into Iceland, New Zealand, Australia, Tasmania, Ascension Island, South Africa, Chile, Argentina, Canada, and USA (ARCHER 1989, CARPENTER & KOJIMA 1997). Jordan localities: 8 (3♀♀), 10 (2♀♀), 11 (1♀), 20 (7♀♀). Together with foregoing species, the commonest Vespine wasp of the Middle East. Known from forest and orchards biotopes only higher than 1000 m a.s.l. from Jordan. The first data to Jordan.

*Polistes gallicus* (LINNÉ 1767) – This species occurs in S and central Europe, Ukraine, Russia, Caucasus region, N Africa, Turkey, Israel to Turkmenistan, Mongolia, China (CARPENTER 1996). Jordan localities: 4 (3♀♀), 5 (1♂, 2♀♀), 6 (3♀♀), 8 (4♀♀), 10 (7♀♀), 11 (5♀♀), 12 (1♀), 15 (3♀♀), 17 (5♀♀). All Jordan specimens belong to largely yellow coloured form usually published as *Polistes omissus* (WEYRAUCH 1939) by former authors (e.g. BYTINSKI-SALZ & GUSENLEITNER 1971). This species was trapped at different stands throughout the whole country except lowermost situated parts. The first data to Jordan.

*Polistes dominulus* (CHRIST 1791) – Widely distributed species known from Europe, N Africa, and Asia from Turkey, Israel to Russia, Turkmenistan, Mongolia, Iran, India, and China. *P. dominulus* was introduced into Australia, Chile, and N America (CARPENTER 1996). Jordan localities: 8 (1♂, 2♀♀). Jordan female specimens belong to the colour form with completely yellow clypeus. The first data to Jordan.

*Delta l. lepeleterii* (SAUSSURE 1853) – The species occurs in tropical and south Africa, Somalia, Egypt, and N Yemen (ZALAT et al. 1992). Jordan localities: 12 (1♀). The first data to Jordan and the whole Middle East.

*Delta hottentottus* (SAUSSURE 1852) ssp. *elegans* (SAUSSURE 1852) – Middle East subspecies known from Arabia, Israel, Persia, and Egypt. Jordan localities: 15 (1♀). This species was published from Jordan by GIORDANI-SOIKA (1970) and GUSENLEITNER (2001).

*Rhynchium oculatum* FABRICIUS 1781 ssp. *hebraeum* GIORDANI-SOIKA 1952 – East Mediterranean subspecies. Jordan localities: 15 (2♂♂). The first data to Jordan.

*Eumenes m. mediterraneus* KRIECHBAUMER 1879 – This species occurs in Mediterranean area, N Africa, W and central Asia. Jordan localities: 4 (1♀). The first data to Jordan.

## Discussion and conclusions

Jordan social wasp fauna (Vespinae, Polistinae) is similar to faunas of Israel (BYTINSKI-SALZ & GUSENLEITNER 1971) and Egypt (ZALAT 1992) (presence of Palaearctic elements plus *Vespa orientalis*) while fauna of Saudi Arabia differs by presence of other Oriental species of the genera *Polistes*, *Ropalidia*, and *Belongaster* (RICHARDS 1984). More data from Lebanon, Syria, and Iraq are needed because poor knowledge on social wasp faunas of these countries.

The commonest species is Oriental Hornet *Vespa orientalis* which was found at practically all localities (20), the second common species is paper wasp *Polistes gallicus* (9 localities). The German Wasp *Vespula germanica* was trapped only four times at higher elevations, the paper wasp *Polistes dominulus* was trapped only once.

The occurrence of paper wasps *Polistes nimpha*, *P. associus*, *P. sulcifer* and *P. atrimandibularis* in Jordan is possible too because their occurrence in Israel and/or Egypt (BYTINSKI-SALZ & GUSENLEITNER 1971, ZALAT 1992, CARPENTER 1996, YILDIRIM & KOJIMA 1999).

The social wasp faunas of Syria and Iraq can be richer than those of Egypt, Jordan and/or Israel due to their neighbourhood with more NW (Turkey) and NE (Iran) situated countries with larger species composition.

The solitary wasp fauna (Eumeninae) of Jordan is relatively poor in comparison with near situated Israel (BYTINSKI-SALZ & GUSENLEITNER 1971) and Egypt (ZALAT et al. 1991, 1992). GIORDANI-SOIKA (1970) published finds of 9 species only. GUSENLEITNER (2001) added 15 new species. We have three other species in our material.

According to present knowledge, the Jordan Vespidae fauna comprises two species of social wasps (Vespinae), two species of paper wasps (Polistinae), and 27 species of solitary wasps (Eumeninae).

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## Zusammenfassung

Für die jordanische Fauna wurden zwei Vespinae, zwei Polistinae und vier Eumeninae nachgewiesen (Hymenoptera, Vespidae). *Vespula germanica* (FABRICIUS 1793), *Polistes gallicus* (LINNÉ 1767), *Polistes dominulus* (CHRIST 1791), *Delta l. lepeleterii* (SAUSSURE 1853), *Rhynchium oculatum* FABRICIUS 1781 ssp. *hebraeum* GIORDANI-SOIKA 1952 und *Eumenes m. mediterraneus* KRIECHBAUMER 1879 sind Erstnachweise für Jordanien, *Delta l. lepeleterii* (SAUSSURE 1853), zudem neu für den Mittleren Osten. Die Situation der angeführten Arten in benachbarten Staaten wurde diskutiert.

## References

- ARCHER M.E. (1989): A Key to the world species of the Vespinae (Hymenoptera). — Research monograph of the College of Ripon and St John **2** (1): 1-41, **2** (2): 1-34.
- BYTINSKI-SALZ H. & J. GUSENLEITNER (1971): The Vespoidea of Israel (Hymenoptera). — Israel Journal of Entomology **6**: 239-299.
- CARPENTER J.M. (1996): Distributional checklist of species of the genus *Polistes* (Hymenoptera: Vespidae; Polistinae; Polistini). — American museum novitates **3188**: 1-39.
- CARPENTER J.M. & J. KOJIMA (1997): Checklist of the species in the subfamily Vespinae (Insecta: Hymenoptera: Vespidae). — Natural History Bulletin of Ibaraki University **1**: 51-92.
- DVOŘÁK L. (2006): Oriental hornet *Vespa orientalis* LINNAEUS, 1771 found in Mexico (Hymenoptera, Vespidae, Vespinae). — Entomological Problems **36** (1): 80.
- GIORDANI-SOIKA A. (1970): Contributo alla conoscenza degli Eumenidi del Medio Oriente (Hym.). — Boll. Mus. Civ. Venezia **20-21**: 27-183.
- GUSENLEITNER J. (2001): Über Eumeniden-Arten aus Jordanien (Hymenoptera, Vespoidea, Eumenidae). — Linzer biologische Beiträge **33** (1): 233-238.
- HADDAD N.J., FUCHS S., HADDADEN J. & J.-P. KOPELKE (2005): Record of *Sphecophaga vesparum* Curtis, a natural enemy of *Vespa orientalis* in northern Jordan. — Zoology in the Middle East **35**: 114-116.
- RICHARDS O.W. (1984): Insects of Saudi Arabia. Hymenoptera: Fam. Vespidae (Social wasps of the Arabian peninsula). — Fauna of Saudi Arabia **6**: 423-440.
- YILDIRIM E. & J. KOJIMA (1999): Distributional checklist of the species of the family Vespidae (Insecta: Hymenoptera; Aculeata) of Turkey. — Natural History Bulletin of Ibaraki University (3): 19-50.
- ZALAT S.M. (1992): The Vespidae (social wasps) of Egypt. — J. Egypt. Ger. Soc. Zool. **9** (D): 247-258.
- ZALAT S., ABO-GHALIA A., GILBERT F. & NAGAT SHAUMAR (1991): Taxonomic studies of the Egyptian Eumeninae (Order: Hymenoptera). — J. Egypt. Ger. Soc. Zool. **7** (B): 515-540.
- ZALAT S., ABO-GHALIA A., GILBERT F. & NAGAT SHAUMAR (1992): II. Taxonomic studies of the Egyptian Eumeninae (Order: Hymenoptera). — Bull. Ent. Soc. Egypt. **70**: 99-127.
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