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## New records for the horse fly fauna (Diptera: Tabanidae) of Jordan with remarks on ecology and zoogeography

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**ABSTRACT:** The horse fly fauna (Diptera: Tabanidae) of Jordan is, after Israel, the richest in the Levant, with 24 known species. During the 20-year project “The Ecology and Zoogeography of the Lepidoptera of the Near East,” we regularly collected blood-feeding flies, resulting in 11 additional species of Tabanidae for Jordan. The new records are: *Atylotus quadrifarius* (Loew, 1874), *Chrysops caecutiens* (Linnaeus, 1758), *Dasyrhamphus nigrinus* (Fabricius, 1794), *Haematopota pallens* Loew, 1871, *Nemorius irritans* (Ricardo, 1901), *Philipomyia graeca* (Fabricius, 1794), *Tabanus cordiger* Meigen, 1820, *Tabanus taeniola* Palisot de Beauvois, 1806, *Tabanus quatuornotatus* Meigen, 1820, *Tabanus separatus* Efllatoun, 1930, and *Tabanus spectabilis* Loew, 1858. Most of the new records (10/11) are of Palearctic origin; of these, six are of a Mediterranean and one each of West Palearctic, Euroasiatic, Irano-Turanian, and Eremic providence. Only one species, *T. taeniola*, is an Afrotropical-Eremic element. *Journal of Vector Ecology* 36 (2): 447-450. 2011.

**Keyword Index:** Tabanidae, hosts, zoogeography, Palearctic, Levant, Jordan.

### INTRODUCTION

The family Tabanidae comprises more than 4,000 species worldwide (Chvala et al. 1972) with more than 600 species in the Palearctic alone (Chvala 1988). Although Tabanidae belong to the Suborder Brachycera, the females have similar elongated biting organs like the Culicidae, Phlebotomidae, and Ceratopogonidae in the Suborder Nematocera. Only females can pierce skin and suck blood while the males have lost their mandibles and feed on nectar and pollen alone (Rubio 2002). The females of most species also feed regularly on nectar, which they need for energy, while blood meals are mainly utilized for oogenesis (Hunter and Ossowski 1999). Some genera of the tribe Pangoniini, which specialize in feeding from deep flowers, have developed a highly elongated proboscis unsuitable for blood meals (Downes 1958).

The blood-feeding behavior of the females makes the Tabanidae a family of considerable importance, both medically and economically (Omer et al. 1998). Tabanids are not only vectors of various diseases, their appearance in large numbers and their persistent and painful bites can irritate grazing animals considerably with a resulting loss in weight and decreased milk production (Foil 1989).

### MATERIALS AND METHODS

Within the framework of the long-term project “the ecology and zoogeography of the Lepidoptera of the Near East” (Müller et al. 2005), horse flies were collected sporadically over the last 20 years in the entire southeastern Mediterranean, including Jordan. However during the last five years, the collection efforts regarding this group were significantly intensified. Without attempting quantitative analysis, horse flies were sampled from all major types of habitats within Jordan with sweep nets, malaise, and water traps (Chvala et al. 1972). The collected material was identified based on the publications of Austen (1920, 1922, 1924), Theodor (1965), Leclercq (1963, 1966, 2000), Chvala et al. (1972), Al-Talafah et al. (2004), and the Tabanidae collections of the Zoologische Staatssammlung München (ZSM), Germany, and Tel Aviv University (TAU), Israel. The definition of the chorotype is based on actual distribution patterns and corresponds to the definitions used in the book series, “The Lepidoptera of Israel” (Kravchenko et al. 2007). Voucher specimens of the discussed species are deposited in the ZSM, TAU, and the private collection of the first author.

### RESULTS

The following species are new records for the Jordanian fauna. The distribution of each species is summarized according to Chvala et al. (1972) and Chvala (1988).

*Atylotus quadrifarius* (Loew, 1874)

Type locality: Sarepta (Krasnoarmejsk); chorotype: Mediterranean-Turanian, distributed from Morocco through the north Mediterranean countries to southern Russia, the Near and Middle East to Central Asia; in the Levant known so far from Israel and Iraq. In Jordan a rare species found in the southern Jordan Valley near the Dead Sea and in wet Salinas in Azraq oasis about 100 km east of Amman. Females were observed in late April and mid-May, in the lower Jordan Valley, feeding in the late afternoon on donkeys and camels, and in early June a single male was collected early in the morning feeding on flowering *Ochradenus baccatus* Delile Resedaceae at the outskirts of Suwelma north of the Dead Sea. No specimens were obtained from malaise traps.

*Chrysops caecutiens* (Linnaeus, 1758)

Type locality: Europe; chorotype: Euroasiatic, from Europe to Turkey and Iran, through Russia to Mongolia and China; first recorded for the Levant. A rare species restricted to the Mediterranean scrubland of northwest Jordan. In Jordan and Israel, one of the few tabanid species which was regularly collected with CDC-UV traps. In early August, five females were collected after sunset with *Phlebotomus papatasi* Scopoli Phlebotomidae from the legs of a donkey near Irbid; one fly diverted and tried to feed on the leg of the collector. During the day, numerous *Chrysops flavipes* Meigen, 1804 were collected from the back of the same donkey, but they had already left the host when we observed *C. caecutiens*.

*Dasyrhamphis nigrinus* (Fabricius, 1794)

Type locality: France; chorotype: Mediterranean, increasingly common towards the south and east; in the Levant known from Syria, Israel, and Egypt. From late March to early May, females and males were regularly collected in northwest Jordan in small numbers on different types of flowering Umbelliferae and Compositae. Only two females were caught in a malaise trap in late April in the outskirts of Amman city. This species was not observed attacking man or animal.

*Haematopota pallens* Loew, 1871

Type locality: Samarkand in Uzbekistan; chorotype: East European-Turanian, from the Ukraine Turkey and Iran to Central Asia; in the Levant previously known only from Iraq. In Jordan only recorded once in large numbers in the Azraq oasis in mid-September, 2001 feeding on the legs of a camel; it easily diverted, persistently attacking the collector. During several trips we were not able to collect this species again.

*Nemorius irritans* (Ricardo, 1901)

Type locality: in present day Turkmenistan; chorotype: Irano-Turanian, from eastern Turkey through Iran and Turkmenistan to Afghanistan; in the Levant it was previously known only from Iraq. Only a single specimen was collected in late May, 1998 from a young camel in

southern Jordan, southeast of Ma'an in a dry wadi.

*Philipomyia graeca* (Fabricius, 1794)

Type locality: Northern Italy; chorotype: North Mediterranean, found from Spain to Turkey, increasingly common towards the east; this is the first record for the Levant. Rare, but over the years observed regularly from late March to mid-June in the Mediterranean hills of northern Jordan. Most specimens were collected in the morning by sweep net while feeding on Compositae.

*Tabanus cordiger* Meigen, 1820

Type locality: Austria; chorotype: West Palaearctic, from Morocco through Europe and Turkey to Iran; in the Levant it was previously known only from Iraq. A rare species, a single female was collected in late June, 2005, west of Amman in Wadi es Sir with a water trap near grazing horses.

*Tabanus taeniola* Palisot de Beauvois, 1806

Type locality: Nigeria; chorotype: Afrotropical, in Africa it is common and widespread, penetrating the Palearctic as far as northern Egypt; in Saudi Arabia it is only local. This is the first record for the Levant. In Jordan, the species was occasionally collected in malaise traps during the summer in the coastal area of Aqaba. In mid-September, 2009, hundreds of female and male *T. taeniola* were feeding in the late afternoon on flowering *Prosopis farcta* (Banks & Sol.) Mimosaceae growing in a fallow field. We observed this species at this site for three consecutive days and were regularly and persistently attacked, especially during the early afternoon. The next day all specimens vanished.

*Tabanus quatuornotatus* Meigen, 1820

Type locality: South Germany; chorotype: Mediterranean-Iranian, from Tunisia and Morocco through southern and central Europe to Turkey and Iran. This is the first record for the Levant. A single female was collected in June, 2003 with a malaise trap in grassland along the upper Yarmuk River in northern Jordan.

*Tabanus separatus* Efllatoun, 1930

Type localities: Egypt; chorotype: Central Eremic; so far only known from oases in Egypt, Tunisia, and Saudi Arabia. Two specimens were collected in June, 2007 in the late afternoon on the belly of a young camel in Wadi Rum in southern Jordan.

*Tabanus spectabilis* Loew, 1858

Type locality: Serbia; chorotype: Mediterranean-Turanian, from Morocco through southern Europe and the Ukraine to Turkey and Iran as far east as Afghanistan; in the Levant previously known only from Iraq. Altogether, three females were collected, two on the belly of a donkey during mid-summer, 2006 and the third in the same season but a year later on the leg of a horse. The specimens were collected north of Irbid in scattered woodland above 700 m.

## DISCUSSION

Little has been known about the Tabanidae fauna of Jordan (Saliba 1977, Al-Talafha et al. 2004), and only recently Al-Talafha et al. (2005) published a comprehensive checklist with 24 species. The present study adds 11 more species belonging to seven genera. The genus *Phylipomyia* Olsufjev 1964 is recorded for the first time from Jordan and the remaining Levant.

The species on the checklist of Al-Talafha et al. (2005) are mainly of Palearctic origin (22/24) and only two species, *Tabanus albifacies* Loew, 1856 and *Tabanus sufis* Jaenicke, 1867, are of an Afrotropical-Eremic distribution type with the last of the two species even extending into the West Oriental Region. In our survey we found a third Afrotropical-Eremic element, *T. taeniola*, a serious pest of cattle in Africa (Foil 1989). In Israel, a few specimens of this species were caught among tens of thousands of Tabanidae in NeotHaKikar oasis at the southern part of the Dead Sea; a single specimen was collected further north at the shore of the Sea of Galilee (unpublished data). It is not clear if the few specimens we observed in Southern Jordan near Aqaba are part of an established population or if this species is actually dispersing from Egypt along the Rift Valley towards the north. *T. seperatus* is the fifth recorded Jordanian species with an Eremic distribution pattern, but we found no additional species endemic to the Levant apart from the three previously known species *Tabanus accensus* Austen, 1920, *Tabanus rupinae* Austen, 1920, and *Tabanus pallidipes* Austen, 1920. However, three other species endemic to the Levant are also known from nearby Israel (Theodor 1965, Al-Talafha et al. 2005). It is worthwhile mentioning that there are still several common species in Israel that have so far not been found in Jordan. Some of these species were collected in the Rift Valley only a few km away from the Jordanian border (Austen 1920, 1922, 1924). It is therefore reasonable to assume that in the future a few more species will be found. The bulk of the previously known species are of Mediterranean (12/24) and West Palearctic (3) origin and this is also the case for the new records, with six Mediterranean, and one each West Palearctic, Euroasiatic, and Irano-Turanian element, respectively.

At present, the tabanid fauna of the Levant is only fragmentarily described, no valid checklists exist from Syria and Lebanon (Surcouf 1926), and in Iraq (Leclercq 1963), Israel (Theodor 1965), and Egypt (Abu El-Hassan et al. 2010) no solid surveys were performed for many decades. Even for the well-researched Saudi Arabia, Leclercq (2000) recently emphasized that there is still a great need for further investigations.

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