

## First report of migration of *Anax ephippiger* (Odonata: Aeshnidae) in southern Jordan

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**Abstract.** A swarm of hundreds of individuals of *Anax ephippiger* was observed in Karak governorate in the southern part of Jordan on 18.iii.2025. The swarm was flying around an orchard and later settled on the olive trees. By the following day, the swarm had disappeared. This is the first documented record of swarm migration of this species in Jordan.

Further key words. Dragonfly, Anisoptera, Karak

### Introduction

Forty-six species of Odonata were reported from Jordan by KATBEH-BADER *et al.* (2004). To this list should be added *Ischnura senegalensis* (Rambur, 1842) (SCHNEIDER 1986 [map 38]; AMR *et al.*, 2013) and *Pantala flavescens* (Fabricius, 1798) (MONNERAT & HOESS 2011; WALDHAUSER 2020), whereas the occurrence of *Caliaeschna microstigma* (Schneider, 1845), a species apparently restricted to the upper reach of the Jordan River, remains to be confirmed within the Jordanian state. *Anax ephippiger* (Burmeister, 1839) has been reported by many investigators from northern to southern Jordan and Israel (SCHNEIDER 1986; KATBEH-BADER *et al.* 2002; BOUDOT *et al.* 2009, 2021). During a study conducted to review Odonata from Wadi Al-Mujib nature reserve (AMR *et al.* 2013), a total of 14 species was recorded but *A. ephippiger* was not found. This species breeds mostly in sub-Saharan Africa, the Middle East, and Southwest Asia. According to CORBET (2004), it is an obligate migrant, crossing the oceans and sporadically reaching Iceland, the Caribbean, Brazil, Thailand, and Japan (LAMBRET & BOUDOT 2013; WIJAYTHILAKA *et al.* 2014; CLEMENT *et al.* 2022).

Migrations of *A. ephippiger* sometimes occur as large swarms of individuals flying together over several hundreds of kilometres, as observed in Turkey along 220 km of the Black Sea coast in August 1995 (BOUDOT *et al.* 2009).

No reports on the migration of this species in Jordan have been published to date and most published reports in the country refer to single individuals.

### Study site and methods

The observation was made on 18.iii.2025 in Wasieh village, Karak, Jordan (31°13'15.0"N, 35°44'11.0"E), on a 0.2 ha orchard planted with olives, pomegranates, and grapes. The locality was bordered by a street and houses to the west, a building with small orchard to the south, and agricultural fields to the east and

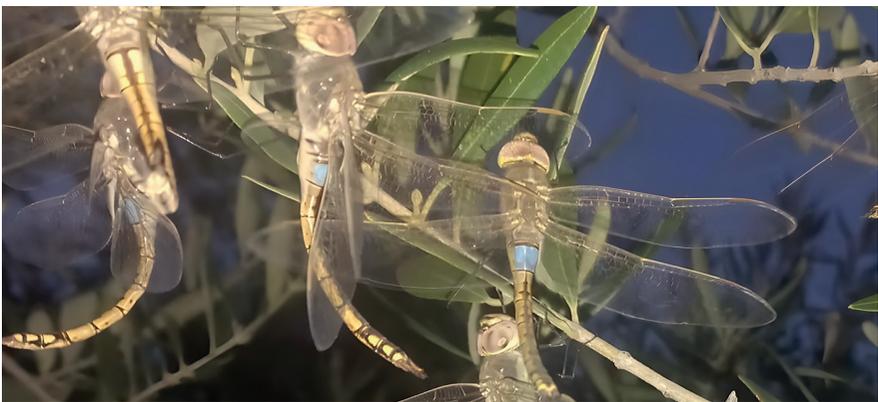
north. Al Mujib Dam and natural reserve is located 35 km to the north. At 18:45 h AST (UTC+3), just before sunset, hundreds of large dragonflies were seen flying randomly 3–5 m above the ground in and around the orchard. Specimens were collected by sweeping a net. The dragonflies began settling on the olive trees as sunset approached, between 18:56 h and 19:06 h. It was then possible to take many photographs of the perched dragonflies to document this phenomenon. The following morning, at 08:00 h, the swarm had disappeared leaving only a single individual.

Collected specimens were taken for identification to Rabba Agricultural Research Center laboratory, which belongs to National Agricultural Research Center (NARC) Jordan. One specimen was deposited at the University of Jordan insect museum for confirmation by Ahmad Katbeh-Bader.

## Results

The specimens were identified as *Anax ephippiger*. Two females and one male were examined. Figures 1–3 illustrate recognizable diagnostic characters for the species. The male *A. ephippiger* can be identified by the following traits: Overall pale brown appearance with nearly olive to brown coloured thorax and abdomen; brown eyes and frons with black bars; abdomen with a continuous dorsal blue saddle on S2.

The environmental conditions prevailing during this migration were recorded as average daily temperature 20°C, relative humidity 37%, wind speed 1 m/s and rain 0 mm, and were obtained with a digital meteorological station produced by Campbell Scientific Inc. with data logger CR 1000 located in Rabba Agricultural Research Center.



**Fig. 1.** Males and a female of *Anax ephippiger* resting on olive tree, Karak, Jordan. Photo: HM (18.iii.2025)

### Discussion

Although *A. ephippiger* has been reported previously in Jordan (SCHNEIDER 1986; KATBEH-BADER *et al.* 2002), no reports exist on the migration of a swarm of this species within the country. This observation in Karak represents the first such report and suggests that Jordan may be a transit or living area for this species. The prevailing environmental conditions during the migration clearly match the ecological requirements of this species already known in its main range in sub-Saharan Africa.



**Fig. 2.** Male and females of *Anax ephippiger* on olive tree, Karak, Jordan. Photo: HM (18.iii.2025)



**Fig. 3.** Male of *Anax ephippiger*, Karak, Jordan. Photo: HM (18.iii.2025)

This species is a powerful flier which is difficult to photograph, observe when perched, or even catch. Despite this fact, it was possible to take many photographs of the swarm at rest on the olive trees to document this migration observation, which is important in tracking the migratory pathway of this species.

An observation has been reported from neighbouring regions to the west, also in March. CEDHAGEN (1988) described a huge swarm of *A. ephippiger* on 12.iii.1986, extending for 2 km at a Red Sea beach, which settled on buildings in Eilath (Israel), and estimated the swarm to contain nearly 25 000 individuals. A female was captured and drawn but no photographs were available.

The present record in Jordan constitutes valuable information on the distribution and migratory pathway of *A. ephippiger*. Further research is needed to determine whether this species reproduces in Jordan and to evaluate its population size in the country.

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