

### Short scientific note

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## ***Pantala flavescens* successfully breeding for the second time in Malta (Maltese Archipelago) (Odonata: Libellulidae)**

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### Abstract

After being first recorded in the Maltese Islands in 2013 and successfully breeding on the archipelago's largest island of Malta in 2020 following an unprecedented influx, *Pantala flavescens* (Fabricius 1798) has again bred successfully on the same island in 2023. 259 exuviae were found at four small reservoirs in the same valley system of Burmarrad, on the island of Malta.

**Key words:** *Pantala flavescens*, Burmarrad, exuviae, teneralis.

### Introduction

*Pantala flavescens* has in recent years been more frequently recorded in Europe where, however, it is still considered to be rare or very scarce (Kalkman & Monnerat 2015), and Dijkstra et al. (2020). Breeding has been confirmed in Cyprus where, in recent years it has become a regular visitor (Sparrow et al. 2020), Poland (Lewandowska et al. 2020), Germany (Günther 2020) and Switzerland (Henseler et al. 2019). The species was recorded breeding on Gran Canaria in the Canary Islands for the first time in winter 2022-2023 where it was confirmed that two generations were raised. It was also recorded for the first time on the Spanish mainland in 2021 (Sánchez & Conesa García 2021). After being recorded for the first time in Malta in 2013 (Degabriele 2013), followed by other records of single individuals in 2014 (Gauci 2018) and on three occasions in 2019 (Gauci 2019) and Piretta & Assandri (2019) the species appeared in good numbers and bred successfully in 2020 but was only seen on 14 occasions in 2021 and was absent in 2022 (Gauci 2022). The species re-appeared in small numbers in autumn 2023 and again bred successfully.

### Observations and discussion

In contrast to 2020, when the species had been recorded at various sites, in 2023 *Pantala flavescens* was only encountered in the valley system at Burmarrad, although

visits to a few other sites were few and far between. Rain-fall during January – August 2023 had been very scarce and most reservoirs in various valleys were dry during the hot summer months. The first significant autumn rain-fall occurred on 6 Sep and three reservoirs downstream from the lower end of Wied il-Ghasel partly filled up with water. A fourth, much larger, reservoir further down the valley already held a substantial amount of water from an unknown source and large numbers of *Ischnura genei*, *Anax imperator*, *A. parthenope*, *Orthetrum trinacria* and *Crocothemis erythraea* emerged there in July and August. The author had been away from the Islands from 24 Aug to 10 Sep and, when the Burmarrad valley system (collectively known as Wied Rihana) was revisited on 12 Sep, 4 male *Pantala flavescens* were seen. The species was subsequently present on all visits until 20 Nov. Following a six-day period of inclement weather from 22-27 Nov with rain and very strong to gale force winds, the species was not seen again. The highest number of mature males seen on any one day was of 9, but 7 were found holding territory on most days – 2 at reservoir 1, 1 at reservoir 2, 2 at reservoir 3 and 2 at reservoir 4 (Fig. 1). Although breeding was suspected, no breeding activity was encountered before 13 Oct when a tandem was seen ovipositing at reservoir 2. On the same day the first exuviae were found at the same reservoir. This reservoir only held shallow water in a small depression. In total 259 exuviae (Fig. 2) were found between 13 Oct and 10 Nov with the bulk – 187 found at reservoir 2 (Table 1). This could be due to the small



Fig. 1 – The four reservoirs where male *Pantala flavescens* were seen holding territory and from where the exuviae were collected.

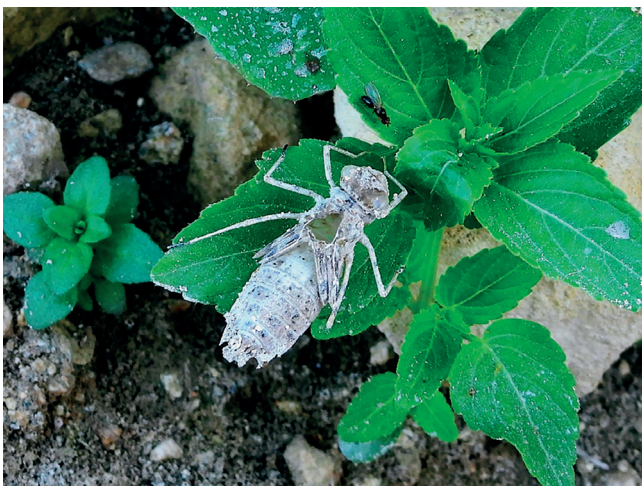


Fig. 2 – An exuvia of *Pantala flavescens*.



Fig. 3 – Two teneral specimens of *Pantala flavescens*.

**Table 1** – Total number of exuviae found at the four reservoirs.

| Date          | Total exuviae | Reservoir 1 | Reservoir 2 | Reservoir 3-north shore | Reservoir 3- south shore | Reservoir 4 |
|---------------|---------------|-------------|-------------|-------------------------|--------------------------|-------------|
| 13 Oct        | 4             | 0           | 4           | 0                       | 0                        | 0           |
| 15 Oct        | 3             | 0           | 3           | 0                       | 0                        | 0           |
| 16 Oct        | 6             | 0           | 4           | 2                       | 0                        | 0           |
| 17 Oct        | 8             | 0           | 4           | 4                       | 0                        | 0           |
| 18 Oct        | 34            | 1           | 31          | 2                       | 0                        | 0           |
| 19 oct        | 25            | 0           | 23          | 2                       | 0                        | 0           |
| 20 Oct        | 35            | 3           | 30          | 2                       | 0                        | 0           |
| 21 Oct*       | 18            | 2           | 15          | 1                       | 0                        | 0           |
| 22 Oct*       | 18            | 2           | 15          | 1                       | 0                        | 0           |
| 23 Oct        | 9             | 1           | 7           | 1                       | 0                        | 0           |
| 24 Oct        | 12            | 1           | 10          | 1                       | 0                        | 0           |
| 25 Oct        | 5             | 2           | 2           | 1                       | 0                        | 0           |
| 26 Oct        | 17            | 0           | 14          | 3                       | 0                        | 0           |
| 27 Oct        | 2             | 0           | 2           | 0                       | 0                        | 0           |
| 28 Oct        | 7             | 1           | 2**         | 1                       | 1                        | 0           |
| 29 Oct        | 12            | 1           | 6***        | 1                       | 4                        | 0           |
| 30 Oct        | 7             | 0           | 5****       | 1                       | 1                        | 0           |
| 31 Oct        | 1             | 0           | 0           | 1                       | 0                        | 0           |
| 01 Nov        | 3             | 0           | 1**         | 0                       | 1                        | 1           |
| 02 Nov        | 9             | 0           | 4**         | 0                       | 5                        | 0           |
| 03 Nov        | 12            | 0           | 3**         | 1                       | 8 <sup>1</sup>           | 0           |
| 04 Nov        | 5             | 0           | 0           | 1                       | 4 <sup>2</sup>           | 0           |
| 05 Nov        | 2             | 0           | 1**         | 0                       | 1                        | 0           |
| 06 Nov        | 1             | 0           | 0           | 0                       | 1                        | 0           |
| 07 Nov        | 2             | 1           | 1**         | 0                       | 0                        | 0           |
| 08 Nov        | 1             | 1           | 0           | 0                       | 0                        | 0           |
| 10 Nov        | 1             | 0           | 0           | 0                       | 1                        | 0           |
| <b>Totals</b> | <b>259</b>    | <b>18</b>   | <b>187</b>  | <b>26</b>               | <b>27</b>                | <b>1</b>    |

\*Co-incident – \*\* Emerged from home pond – \*\*\*3 emerged from home pond and 3 from dried out pond (mud still wet) – \*\*\*\*4 emerged from home pond and 1 from dried out pond – <sup>1</sup>2 not fresh – <sup>2</sup>1 not fresh.

size of the pool and the easy access all around it. Due to the steep sides of the other three reservoirs, making them largely inaccessible, large tracts could not be searched for exuviae. By 26 Oct reservoir 2 had almost dried up and had also in previous days started being vandalised by off-roading vehicles. The following day it was decided to check if there were any remaining larvae alive in a small patch of wet algae. 19 were collected and transferred to a pond at home from where they all subsequently emerged successfully. Although the pool was completely lacking water (but the mud was still wet) 4 larvae which I had missed emerged successfully - 3 on 29<sup>th</sup> and 1 on 30 Oct.

Breeding activity, involving copulation and oviposition was recorded 7 times between 13 Oct and 19 Nov and was always witnessed soon after my arrival at the reservoirs between 0830 and 0900 CEST. It involved a pair in copula followed by tandem oviposition, 3 tandems ovipositing and 3 instances of females ovipositing unguarded (Table 2). As had already been observed in 2020, females always oviposited very close to the shoreline. Breeding activity in Sep was probably missed as arrival at the reservoirs had previously been an hour later. In 2020 breeding activity had been recorded from 19 Aug to 18 Nov.

As was the case with the breeding habitat at Chadwick Lakes and Fiddien in 2020, the reservoirs at Burmarrad had been re-excavated during the past 1-3 years and lacked any emergent vegetation except for reservoir 4 which had vegetation, which had been flooded by rain water, sticking out from parts of it. Emergence took place mainly on dry stalks of *Mentha pulegium* and *Rumex conglomeratus* close to the water's edge, but also on green foliage of grasses and other plants, stumps of dead plants jutting out of the water and also rocks or even small stones, with most on the side first reached by the early morning sun. Most were within 1m of the water's edge but when reservoir 2 was drying out some larvae travelled up to 5.5m. They varied in height from 5cm to 60 cm with the lowest ones mostly found on small green plants, stumps and small rocks. Yet again, as was the case in 2020, teneral were only seen at the emergence site. Numbers of teneral found waiting to undertake their maiden flight (Fig. 3) varied, depending on the amount of dew present, with 11 on 18<sup>th</sup> and 12 on 22 Oct highest. There were six cases of failed emergence – 2 teneral with wings still folded and abdomen not completely expanded found dead in the water, 2 fresh teneral also dead in the water, and two teneral with badly

distorted wings. The dead teneral are suspected to have been dislodged from their emergence posts by a group of four cats which for some days were found at the water's edge on my arrival.

Despite maximum day temperatures always hovering in the low twenties right up to the first days of December, there was no sign of emergence of a second generation. Eggs from oviposition witnessed on 13<sup>th</sup> and 17 Oct would have perished as the pool dried up shortly afterwards. In laboratory-controlled experiments Ichikawa et al. (2017) found that eggs failed to hatch at 15°C, while at 20°C hatching occurred after 15-16 days. With nighttime lows of 11-14°C throughout most of November, eggs laid during the last week of October would either have failed to hatch or, if they had hatched, the resulting larvae would have perished.

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