

Dragonfly Group

Damsels and Dragons!!

Not an adult fairy tale, but an account of the activities of the Cyprus Dragonfly Study Group



During the preparation of the book “An introduction to the WILDLIFE of CYPRUS” it became apparent that there was only very limited information on the Odonata (dragonfly) fauna, not only on Cyprus, but in the eastern Mediterranean in general. It was therefore a potentially interesting area to study with many opportunities for new discoveries and, in 2012, the Cyprus Dragonfly Study Group (CDSG) was formed as a spin off from the Natural History Group.

The ancestors of dragonflies are amongst the most ancient of the insect groups and along with the ancestors of mayflies were flying around during the Carboniferous Period, 320 million years ago. These looked very much like the dragonflies we see today with quite literally one big difference: their size. The largest of them had wingspans of up to 75 cm (30 in) and were the largest insects ever to have lived. It is believed that they could reach this size because the oxygen level in the air during the Carboniferous was much higher than that of today. Initially the whole order Odonata (which means “toothed ones”, a reference to their very sharp serrated mandibles) was given the vernacular name “Dragonfly”. The order consists of two suborders: the Zygoptera and Anisoptera, and in the nineteenth century the zygopterans were given the common name “Damselies” but unhelpfully, no similar common name was given to the anisopterans. This has led to considerable confusion since the term “Dragonfly” may be used to cover the whole Odonata order or may just refer to the anisopterans. Separating the two groups visually is very straightforward. Zygopterans (damselies) are slender and delicate looking with their fore and hindwings being of similar size and their eyes being placed at the side of the head with a wide space between them. In anisopterans (sometimes called “true dragonflies” or just “dragonflies”) the hindwing is normally bigger than the forewing, the body is more stocky and the huge compound eyes cover most of the face, normally touching with no space between them on the top of the head.

Today there are worldwide 5958 listed species of odonates: 2941 zygopterans (damselies) and 3014 anisopterans (dragonflies). The diversity of dragonflies in Europe, however, is relatively low with a total of just 143 species (52 zygopterans (damselies) and 91 anisopterans (dragonflies)). This is mainly a consequence of the ice age, when much of Europe was covered by ice and even ice-free areas could have been too inhospitable for dragonflies.

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It seems likely that many species perished, resulting in European diversity being more impoverished than that of other temperate zones such as North America, where the mountain chains run north-south and hence southerly migration was possible during the big freeze. Furthermore, fauna on islands tend to be impoverished and unbalanced compared with that on the neighbouring mainland and Cyprus has just 37 dragonfly species, 11 zygopterans and 26 anisopterans, on its checklist. Although a modest number, this nonetheless includes some very charismatic and range-restricted species, such as *Anax immaculifrons* (the Magnificent Emperor), Europe's largest dragonfly; *Epallage fatime* (the Odalisque) and *Caliaeschna microstigma* (the Eastern Spectre).



Left: *Anax immaculifrons* (the Magnificent Emperor) male: Europe's largest dragonfly.
Right: *Epallage fatime* (the Odalisque) female.

I have often been asked "How long do dragonflies live?" – an easy question to ask but a difficult one to answer. Dragonflies are amphibiotic, spending the first part of their lives as aquatic larvae and then emerging to become terrestrial aeronauts. Their lifespan depends on the individual species and climatic conditions. The larval stage may be completed in as little as 38 days or can extend over several years. The adult stage in many cases is shorter and may be a couple of weeks, or a couple of months, but in some cases, such as our Winter Damsel, emergence is in May or June and the adult only returns to the breeding grounds to reproduce the following spring.

The focus of the CDSG thus far has been in understanding the adult stage of our dragonflies, particularly the status of the 37 species on the island's checklist, their flight seasons and distribution. Firstly a database was set up for the collection of records of dragonfly sightings. Over 50 sites island-wide were carefully selected for regular monitoring, ensuring that all the main species and all habitat types were included and that there was good geographic coverage. For anyone doing dragonfly recording in, for example, the UK, adult dragonflies do not emerge until May and then disappear by October. In Cyprus, however, dragonflies are on the wing all year round which means there is no such respite in monitoring for the recorders. The CDSG has been extremely fortunate in having over the last 10 years highly committed and dedicated recorders who have risen to the challenge.

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The rare *Ischnura intermedia* (Persian Bluetail); first discovered on Cyprus in 2013.

Top: a male.

Lower: female in the *aurantiaca* development phase

The results from this monitoring have yielded extremely valuable data. A major success was the discovery by the group of two species new to Cyprus: *Ischnura intermedia* (Persian Bluetail) and *Aeshna isocetes* (Green-eyed Hawker). The damselfly *Ischnura intermedia* is an extremely rare species and its discovery on Cyprus caused considerable international interest. It is now regarded as the island's speciality and features in the CDSG logo. Although there are 37 species on the checklist, since monitoring started 10 years ago the CDSG has been unable to find three of them (which are now considered to be locally extinct) and for two others there were only one and three records (so are considered to be extremely rare). For the remaining 32 species we were able to develop very reliable flight season data, which is not only a first for Cyprus but also for the eastern Mediterranean.

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As might be expected there were some considerable differences in the flight seasons seen in Cyprus compared with those of conspecifics seen in other parts of their ranges, mainly as a result of differing climatic conditions, which may give insights into the likely impact of climate change. A further observation was that the abundance of the species was significantly impacted by annual variations in weather, particularly rainfall. What was a little unexpected was the speed of the response: a winter of above average rainfall resulted in an above average abundance of dragonflies the following year, and below average rainfall a below average abundance. Since the annual rainfall on Cyprus has been declining on average by around one mm per year since record keeping started in 1901 in what is already a water-stressed country, this does not bode well for the future of dragonflies on Cyprus.

Having done this work a reasonable question could be “So what?”. Well, dragonflies are probably one of the best freshwater bioindicators. They are conspicuous, easy to identify and if water quality is substandard or inadequate, dragonflies will leave the area promptly – something that amphibians and fish, other freshwater bioindicators, cannot so easily do. Equally when/if the water quality improves and becomes habitable again, dragonflies will rapidly recolonise the habitat. This can be extremely valuable in confirming the effectiveness of conservation measures at the local level. Dragonflies are also very effective indicators of climate change and there has been a significant northerly expansion of many species. Initiatives are now being taken at the European level to set up continent-wide monitoring, to which the CDSG is contributing. One aim of this initiative is to establish dragonflies as an accepted European bioindicator.

The group’s work has been published in several well-respected, peer reviewed scientific journals and the group has gained international recognition. The group was invited to host the International Dragonfly Congress in Paphos in June 2021. This was postponed because of COVID restrictions but has been rescheduled for June 2023 and we look forward to hosting odonatologists from around the world then.



Trithemis arteriosa (Red-veined Darning) male. A frequent visitor to swimming pools.

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For many P3A members the main encounter with dragonflies will be those, particularly red ones, that perch on the side of swimming pools. The red one is a *Trithemis arteriosa* (Red-veined Dropwing) male, who has staked out the side of your swimming pool and claimed it as his territory, waiting hopefully for a female (yellow-coloured) to come along to mate with him. Blue dragonflies also occasionally turn up at swimming pools: these are *Orthetrum chrysostigma* (Epaulet Skimmer) males also looking for a short-term love encounter.

We are always very interested to know of any dragonfly encounters that you may have and would be keen to hear from anyone interested in carrying out dragonfly recording or who would like to know more about this fascinating group of insects.

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