A Field Guide to the 
Dragonflies and 
Damselflies of Sri Lanka
Amila Prasanna Sumanapala
Declaration of Our Core Commitment to Sustainability

Dilmah owes its success to the quality of Ceylon Tea. Our business was founded therefore on an enduring connection to the land and the communities in which we operate. We have pioneered a comprehensive commitment to minimising our impact on the planet, fostering respect for the environment and ensuring its protection by encouraging a harmonious coexistence of man and nature. We believe that conservation is ultimately about people and the future of the human race, that efforts in conservation have associated human well-being and poverty reduction outcomes. These core values allow us to meet and exceed our customers’ expectations of sustainability.

Our Commitment

We reinforce our commitment to the principle of making business a matter of human service and to the core values of Dilmah, which are embodied in the Six Pillars of Dilmah.

We will strive to conduct our activities in accordance with the highest standards of corporate best practice and in compliance with all applicable local and international regulatory requirements and conventions.

We recognise that conservation of the environment is an extension of our founding commitment to human service.

We will assess and monitor the quality and environmental impact of its operations, services and products whilst striving to include its supply chain partners and customers, where relevant and to the extent possible.

We are committed to transparency and open communication about our environmental and social practices.

We promote the same transparency and open communication from our partners and customers.

We strive to be an employer of choice by providing a safe, secure and non-discriminatory working environment for its employees whose rights are fully safeguarded and who can have equal opportunity to realise their full potential.

We promote good relationships with all communities of which we are a part and we commit to enhance their quality of life and opportunities whilst respecting their culture, way of life and heritage.
A Field Guide to the Dragonflies and Damselflies of Sri Lanka

Amila Prasanna Sumanapala
My earliest memories of encountering dragonflies were from my years growing up surrounded by endless greenery. Fascinated by these creatures, I would task myself in catching them and would search the garden for them. But at the time I never knew that there were so many different species, each more stunning than the last, as they had all seemed to look alike. Sadly, with many years having passed since then, I have noticed that their numbers have drastically declined and it has now become almost a rare sight to see a dragonfly. With their numbers having greatly reduced the younger generations, such as my grandchildren, are surprised to hear of times when gardens would be buzzing with them.

With Dilmah Conservation venturing into the conservation of these astonishing creatures in Dilmah’s Hunuwela Estate, where two highly endangered species - Rivulet tiger and Wijaya’s Scissortail - were discovered, I soon learned of their significance and the important role they play in our day-to-day lives. I was even more fascinated to learn how they are efficient controls against nuisance or pest species such as mosquitoes. Although I wish I could learn more about them time however does not permit me to do so.

I hope that with this publication future generations will be enlightened on the importance of this species and the need for their conservation and inspire with it a new generation of enthusiasts who will take on this responsibility and help restore dragonfly populations. I congratulate the author, Amila Prasanna Sumanapala, for his dedicated work and thank him for putting together this valuable information.

Merrill J. Fernando
Founder – Dilmah Conservation
Sri Lanka Stripe-headed Threadtail - Prodasineura sita
A Field Guide to the Dragonflies and Damselflies of Sri Lanka

Amila Prasanna Sumanapala
Contents

Foreword 08
Preface 09
Acknowledgements 11

1. A Brief Introduction to Odonata (Dragonflies and Damselflies) 15
   Etymology 15
   Basic Morphology 16
   Zygoptera or Anisoptera 17
   Differentiation between the sexes 18
   Life Cycle and its Stages 19
   Reproductive Behaviour 22

2. Sri Lanka: Climate, Geography and Biodiversity 25
3. Diversity of Sri Lankan Odonata 27
4. Checklist of Sri Lankan Odonata 28

5. Odonata Conservation 33
   Threats faced by Sri Lankan Odonata 33
   Conservation Status of Sri Lankan Odonata 34
   Legal protection given to Sri Lankan Odonata 35
   Research Gaps 35
   Conservation Actions and Recommendations 36
   Habitat management for Odonata 37

How to use this book 38

6. Family and Species Profiles 40
   Family Calopterygidae 40
   Family Chlorocyphidae 43
   Family Euphauidae 48
   Family Lestidae 50
   Family Coenagrionidae 56
   Family Platycnemididae 70
   Family Platystictidae 79
   Family Aeshnidae 94
   Family Gomphidae 99
   Family Macromiidae 90
   Family Synthemistidae 113
   Family Libellulidae 115

7. Odonata Habitats 158

Glossary 166
References 168
Index 171

Scientific Names 171
Common Names 172
Sapphire Flutterer - *Rhyothemis triangularis*
1. A Brief Introduction to Odonata (Dragonflies and Damselflies)

Etymology

The insects known as dragonflies and damselflies are collectively classified in to the order Odonata. This order was named by J. C. Fabricius in 1793, and he derived its name from the Greek word for tooth, "odon" as odonates have toothed mandibles. There are two main suborders within the order Odonata. Members of these suborders, namely, Zygoptera and Anisoptera are popularly known as damselflies and dragonflies respectively. However, in general vocabulary, insects in both suborders are collectively referred to as dragonflies, even though the correct collective term should be odonates.

The term Anisoptera is derived from the two Greek words “anisos” (unequal) and “pteron” (wings). It is named so because dragonflies have two pairs of wings that are unequal in size and shape. Zygoptera has been named using the Greek words “Zygon” (attached together) and “pteron” as damselflies have almost identical pairs of wings in terms of size and shape, which fit together nicely when they are closed.

The third suborder in the order, Anisozygoptera is represented only by four extant species found in the Himalayas, China and Japan.
Basic Morphology

The morphology of an adult dragonfly or a damselfly is somewhat similar to that of a typical insect. They consist of three well-defined parts known as tagmas, namely, the head, thorax and abdomen. The head is composed of 6 segments. The compound eyes of an odonata cover most of its head. Three simple eyes, which are useful for very near vision, are located between the two compound eyes. The pair of antennae is located in front of the eyes. These antennae are very small and barely visible. The mouth parts of these exclusively predatory insects consist of a well-developed pair of mandibles, labrums and a labium.

![Figure 01 Main body parts of an adult odonate](image)

The thorax of an adult Odonata is made up of three segments. The first segment is known as the prothorax and it bears the first pair of legs. The prothorax is composed of three lobes which are known as the anterior lobe, middle lobe and posterior lobe. The second pair of legs and the forewings are attached to the second segment of the thorax, while the third pair of legs and the hindwings are attached to the third segment. The wings of odonates are membranous structures with a grid of veins. Odonata legs consist of five segments and end with two claws. Thin spines are usually present on the legs of many odonates and these help them in holding onto the prey while consuming it.

The abdomen of an odonate is made up of 10 segments. Generally, the abdomen has a shape that tapers towards the posterior end. The reproductive organs of an odonate are located in its abdomen. Males have their primary genitalia below segment 9 and secondary genitalia below segment 2 and 3. Females have their genital opening on the ventral side of segment 9. Females of the odonate species that lay eggs inside plant tissues (endophytic oviposition) have a specially-developed needle like ovipositor under segment 8 and 9. Male odonates have two pairs of prominent anal appendages at the end of their abdomen and these are called superior anal appendages (also known as cercus) and inferior anal appendages (also known as paraproct in Zygoptera and epiproct in Anisoptera). Superior anal appendages are usually more prominent and longer than the inferiors.
Zygoptera or Anisoptera

The members of the two main suborders of odonata can be distinguished by using their external morphological characters. The following table (01) lists some of the major differences which can help differentiate the two suborders.

<table>
<thead>
<tr>
<th>Character</th>
<th>Suborder Zygoptera</th>
<th>Suborder Anisoptera</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compound eyes</td>
<td>Located on either side of the head.</td>
<td>Usually touch each other. Family Gomphidae has separated eyes, but the distance between the eyes is always smaller than the diameter of an eye.</td>
</tr>
<tr>
<td>Wings</td>
<td>The two pairs of wings are almost identical in shape and size. They usually keep their wings closed along the body when at rest.</td>
<td>The hind wings are larger and have a wider base than the forewings. They usually keep their wings open, horizontally spread and perpendicular to the body when at rest.</td>
</tr>
<tr>
<td>Body shape</td>
<td>Thin and elongated.</td>
<td>Bulky and wider.</td>
</tr>
</tbody>
</table>

Table 01 - Morphological differences between adult Zygoptera and Anisoptera
Differentiation between the sexes

Differentiating between the sexes in odonata is easy in many species, as males and females have different colour patterns. However, this may not be always accurate as young males are often similar to females, and sometimes there are mature females with male colour patterns (androchrome females) and mature males with female colour patterns (gynochrome males). So far, no gynochrome males have been recorded in Sri Lanka, but androchrome females are present in several species, especially among the members of Family Libellulidae. Therefore, it is better if the separation of the odonate sexes does not entirely depend on their colouration.

The males and females of Odonata can be differentiated using several characteristics which are mainly related to their external reproductive organs. Males often have longer and more structurally complex anal appendages than the females. The secondary genitalia of males are usually clearly visible under the second and third abdominal segments. Females are easily distinguished by using their ovipositing organs located on the ventral side of abdomen segment 9. Their short anal appendages and lack of any secondary genitalia under the abdomen base also helps in their identification. Males also tend to have a more tapering and thinner abdomen in comparison to that of a female. However, this needs some experience to recognize and cannot be considered as a prominent characteristic in distinguishing the sexes.
Amila is a field biologist studying Sri Lankan biodiversity with a special interest in taxonomy, distribution and ecology of dragonflies and damselflies. With an interest in natural history developed since his childhood, he graduated from University of Kelaniya with an honours degree in Environmental Conservation and Management. He is also an active conservationist working with several volunteer groups and was the president of Young Biologists’ Association (2014-2015) and Butterfly Conservation Society of Sri Lanka (2016). He also contributes to popularize dragonflies and damselflies among the general public through social media and various activities and he spearheaded the first field workshop on Sri Lankan dragonflies which was held in 2016.

Dilmah Conservation was initiated in 2007 by Dilmah to incorporate environmental conservation efforts into the MJF Charitable Foundation, which focuses on social justice. Dilmah Conservation works towards the sustainable use of the environment in partnership with various governmental and non-governmental organisations. The pledge made by Dilmah founder Merrill J. Fernando to make business a matter of human service is deeply ingrained in the work carried out by Dilmah Conservation. For additional information visit our website at:

www.dilmahconservation.org