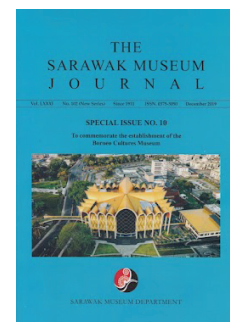




The Sarawak Museum Journal

Vol. LXXXI No. 102

December 2019



ISSN: 0375-3050  
E-ISSN: 3036-0188

**Citation:** Rory A. Dow (2019). An Annotated Checklist of the Odonata (Insecta) Known from Sarawak with Records to District Level. The Sarawak Museum Journal, LXXXI (102) : 313-422

## AN ANNOTATED CHECKLIST OF THE ODONATA (INSECTA) KNOWN FROM SARAWAK WITH RECORDS TO DISTRICT LEVEL

Rory A. Dow

### ABSTRACT

The first checklist of the Odonata (dragonflies and damselflies) of the state of Sarawak in Malaysian Borneo is presented. 303 species are included in the list. Records are given to district level. For each species, a reference to the first record from each district in which it occurs is given, except where this paper represents the first published district record, in which case this is indicated. Additionally all references for the species containing original records from Sarawak, or significant discussion of material from or relevant to Sarawak, are given. Known taxonomic issues are discussed in notes. The number of records from each district and division is summarised.

### Keywords:



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## INTRODUCTION

The Odonata (dragonflies and damselflies) is an ancient order of winged insects with aquatic larvae. They occur on every continent apart from Antarctica but are most diverse in the tropical and subtropical regions of the world. All freshwater habitats are occupied by Odonata and a few species even breed in saline waters. Unlike some insect orders, even the least interested member of the general public will have some familiarity with dragonflies, as some common, conspicuous species occur at places such as public and garden ponds or, in the tropics, even at drains and ditches in cities. This paper is a checklist, not an introduction to the order, and I have assumed that most readers will already have at least basic knowledge of these insects. I refer those seeking a more comprehensive introduction to Odonata to one of the many books now available, for instance Albert Orr's *A guide to the dragonflies of Borneo: their identification and biology* (Orr 2003) which is particularly relevant here.

A great variety of Odonata can be found in Sarawak. I list 303 species here. Some of these are the familiar species already mentioned that can be seen at ponds and drains, but many are dependent on forest habitats or other

specialised habitats for their survival. Many species are difficult to find, either because they have cryptic behaviour or because they occupy inaccessible habitats or because they are extremely local in occurrence or any combination of these factors. This list is not a guide to the ecology and general biology of these insects and little discussion of these matters is made hereafter.

A substantial proportion of the Odonata occurring in Sarawak are endemic to Borneo (see the Discussion). This list is also not a guide to identification (a field guide to the Odonata of Sarawak is in preparation) and the reader should be aware of the high proportion of endemic species when trying to use guides even from neighbouring regions to identify Odonata found in the State. Conservation issues are also not dealt with in this paper, but it is worth noting that it is intended that all named species of Odonata in the world will have an IUCN Red List assessment by the end of 2020.

I have mentioned above what this paper does not do; so what does it do? Checklists of the Odonata of Borneo have been published over the years, first by Laidlaw (1920), then Lieftinck (1954) and most recently by Orr (2003). Sarawak is now one of the better studied areas for Odonata in Southeast Asia. However no checklist for Sarawak has been published until now. This paper is intended to provide the first such checklist for Sarawak in order to provide a baseline for future research on the Odonata of the state, in particular on their taxonomy and distribution. The list is intended for professionals in the life sciences and for serious amateurs. Records are given to district level and it is hoped that this will stimulate informed citizen science efforts to further increase our knowledge at this level.

The checklist has been compiled from published records of Odonata in the odonatological literature, from my own dataset, from specimens in the Sarawak Museum collection (see Dow & Morris in this volume) and from communications with other odonatologists. I have not trawled the internet looking for photographs of Odonata taken in Sarawak, mainly because the ratio of reward to effort would be low in such an endeavour. Although such an effort would surely add a few extra district level or even division level records, they would mostly or entirely be of very common and widespread species. Many photographs on the internet have incorrect identifications attached to them and many are not reliably identifiable. Even some very common species occurring in Sarawak are difficult to identify from photographs in general and, for some groups, definite identification to species from photographs is usually impossible.