

## In memoriam Bastiaan Kiauta (20<sup>th</sup> January 1937 – 26<sup>th</sup> March 2022)

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**Abstract.** We provide recollections and memories connected with the life of Bastiaan Kiauta and his pivotal role in developing world-wide odonatology. Additions to his odonatological bibliography and to species named in his honour are appended.

**Further key words.** Dragonfly, Odonata, Odonatologica, Societas Internationalis Odonatologica, SIO, obituary

# Henry Walter Bates' manuscripts on the Amazon Odonata in the archive of Friedrich Ris

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**Abstract.** Manuscripts on the Amazon Odonata and four letters from Henry Walter Bates were found in the private papers of Friedrich Ris at the Senckenberg Museum Frankfurt, Germany. They contain descriptions as well as sketches and coloured illustrations of Odonata collected by Bates during his eleven years (1848–1859) on the Amazon. Bates recorded about 194 species-group names and proposed 13 new genera and subgenera of Odonata. Some of these taxa were subsequently described and published by Edmond de Selys Longchamps, René Martin, and Friedrich Ris. Annotations on the genera *Oxystigma* and *Aeschnosoma* are given, and several valid species are associated with species-group names used by Bates. An annotated list of species described from specimens of Bates manuscripts is provided and corresponding labels of type specimens are noted where possible. Type specimens of *Polythore batesii*, *P. inaequalis*, *P. vittata*, *Chalcopteryx scintillans*, *Triacanthagyna satyrus*, *Aphylla dentata*, and *Progomphus intricatus* are discussed in connection with Bates' manuscripts. In addition, specimens of *Neuraeschna dentigera*, *Staurophlebia gigantula*, *S. reticulata*, and *Rhodopygia geijskesi* are discussed when associated with species names used by Bates.

**Further key words.** Dragonfly, South America, Brazil, Selys Longchamps, Senckenberg

# The Antoine Senglet collection: a major contribution to the knowledge of the odonates of Morocco from the 1960s (Odonata)

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**Abstract.** Odonata collected by Antoine Senglet in Morocco from 12.vi. to 13.vii.1967 in 28 localities are deposited in the Muséum d'histoire naturelle in Geneva (MHNG, Switzerland). The collection includes 453 imagines of 46 species and 326 exuviae of 24 species, corresponding to 73% of the presently known Moroccan Odonata fauna. It is one of the largest collections of Odonata ever made in Morocco and includes the first known evidence for *Erythromma viridulum*, *Orthetrum brunneum*, *O. cancellatum*, *Selysiothemis nigra*, and *Sympetrum sinaiticum* for Morocco. Reproduction is proven by the presence of exuviae for all these species except *E. viridulum*. The collection, which has remained undocumented for more than half a century, is comparable in scope to the contributions presented by the first two syntheses on the dragonflies of Morocco published by LIEFTINCK (1966) and DUMONT (1972). A chronological check-list of the odonate fauna of Morocco details the increase in knowledge from 1850 to the present day.

**Further key words.** Dragonfly, damselfly, check-list, distribution, North Africa, museum collection

# Sampling larvae, exuviae or adults of Odonata for ecological studies: a test of methods in permanent rivers in the Iberian Peninsula

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**Abstract.** To assess the suitability of a habitat for breeding by odonates, the best strategy is to search for exuviae or final instar larvae. However, due to their low detectability and the difficulty of sampling these stages, most studies in applied ecological research have targeted adult odonates, even though adults may be found in places unsuitable for successful breeding. Here, we tested odonate sampling methods in permanent rivers in the north-western Iberian Peninsula, focusing on three main objectives: (i) to study the degree of concordance of species lists obtained from sampling larvae, exuviae and adults; (ii) to estimate how long exuviae are available for sampling and how this time affects the results; and (iii) to analyse potential observer biases, due to the different ability of researchers to detect exuviae. We found that the time exuviae remain in place varies with taxon but is generally short (7–8 days), which could lead to under-detection. We also found that adult odonates may be found in parts of the river that have no suitable habitat for their larvae. Furthermore, we were able to find more species as exuviae than by sampling adults or larvae and some taxa, such as gomphids, were difficult to find as adults but exuviae were very commonly observed. We did not find significant differences between observers in their ability to detect and identify exuviae. Altogether, our results suggest that in some systems, recording only adults could lead to inaccurate survey results, making it essential to include exuviae to avoid sampling bias.

**Further key words.** Dragonfly, damselfly, bioindicators, sampling issues, survey bias, lotic systems

# Thermoregulatory behaviour of *Sympetrum striolatum* at low temperatures with special reference to the role of direct sunlight (Odonata: Libellulidae)

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**Abstract.** The thermoregulatory behaviour of the autumnal *Sympetrum striolatum* was studied and analysed at the end of its flying season in November from 2011 to 2021. Only on days with intense solar radiation did it leave its roosting sites in the treetops and became active at and around breeding ponds. We describe the perch site selection and body posture for basking, avoiding wind, feeding, and reproductive activities after warm-up. Ectothermic thermoregulation enabled flight largely independent of air temperature; we saw a male flying at 3.7°C and a tandem ovipositing at 6.0°C. In the afternoon all individuals returned to their roosting sites. If they were too cold for immediate take-off, they wing-whirred and flew after 2–3 minutes. Wing-whirring was performed at ambient temperatures between 3.8 and 13.6°C. We suppose that this behaviour is obligatory when insolation is insufficient, especially when the sun is blocked by clouds. The combination of ecto- and endothermic thermoregulation is considered the main key factor for this species' exceptionally effective adaptation to cold.

**Further key words.** Dragonfly, Anisoptera, ectothermy, endothermy, wing-whirring, perch site selection, warm-up, body posture, thermal imaging camera, diel pattern of activity, late flying season

***Aeshna soneharai* Asahina, 1988, *stat. rev.*,  
*bona species* – an overlooked member  
of the European fauna?  
(Odonata: Aeshnidae)**

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**Abstract.** Specimens and observations of *Aeshna mixta* Latreille, 1805, obtained in 2021 from Moscow and Moscow Province, Russia, lead us to the conclusion that what used to be regarded as this well-known Palearctic species in fact represented two species. They differ in details of the abdominal maculation, including the conspicuous dorsal mark on the second segment, the relative length of the male epiproct, and some other characters. In addition, they also differ in the mitochondrial *COI* and *COII* gene sequences (with one odd specimen of *A. mixta* from Balkan Peninsula), but not in the *ITS2* sequence. A potential hybrid male was observed. Analysis of photographic observations on the website “iNaturalist.org” suggests that the true *A. mixta* ranges in North Africa, Europe, the Caucasus, and West Asia, and extends north-east to South Ural and south-eastern Kazakhstan and east to Kashmir. The name available for the second species is *Aeshna soneharai* Asahina, 1988 *stat. rev.*, *bona species*, described from Japan in subspecies rank. This species ranges in East Europe west to the longitude of Moscow and Voronezh, in Ural, Kazakhstan, Siberia, West China, Mongolia, the Far East including Russia, Northeast China, Korea, and Japan. Both species co-occur in Russia between the Don River and South Ural, in Kyrgyzstan and in south-eastern Kazakhstan. The iNaturalist photographs suggest that outside their contact zone, both species (especially

*A. mixta* in southern Europe) exhibit some variation with respect to almost all characters that are diagnostic in Moscow Province but, on the other hand, are still identifiable using most of these characters. *Aeshna soneharai* seems not to share the swarming behaviour and the migratory abilities of *A. mixta*. The enigmatic *Aeshna lucia* Needham, 1930, is reconsidered a doubtful species rather than a synonym of *A. mixta*.

**Further key words:** Anisoptera, dragonfly, sympatry, Palaearctic, Russia, Japan, Far East, Korea

**Description of the larva of  
*Micrathyria venezuelae* De Marmels, 1989  
(Odonata: Libellulidae)**

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**Abstract.** *Micrathyria venezuelae* is a species of medium to high elevations in the Northern Cordilleras in Venezuela. The larva of *M. venezuelae* was hitherto unknown. Based on exuviae of reared specimens, the final instar larva of *M. venezuelae* is described. Exuviae of *M. venezuelae* have two parallel rows of dark spots on the dorsum of the abdomen, lack mid-dorsal hooks, and the lateral spines on S9 are short; the thorax, tibiae, and femora have three dark bands each; the prementum has 9–13 setae and the labial palps 8–11 setae. A modified differentiation to known larvae of *Micrathyria aequalis* from *M. venezuelae* is provided.

**Further key words.** Dragonfly, Anisoptera, exuvia, Venezuela, South America



**A description of the larva of  
*Matronoides cyaneipennis* Förster, 1897  
from northern Borneo  
(Odonata: Calopterygidae)**

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**Abstract.** We describe the larva of *Matronoides cyaneipennis* Förster, 1897, based on an incomplete, dried F0 specimen collected at Mt Kinabalu, Sabah, in 1964, and held at the Natural History Museum, London. Since its collection nearly 60 years ago no other specimen has come to light despite considerable searching of its habitat. Identification is by supposition, but given its provenance the identity of the specimen is not in doubt. All diagnostic features remain intact. The larva is compared with those of the related genus *Neurobasis*, especially the potentially syntopic *N. longipes* from which it differs markedly.

**Further key words.** Damselfly, Zygoptera, *Neurobasis*, Kinabalu, Sabah, Malaysia

# ***Nososticta digimu* sp. nov., a new damselfly from Papua New Guinea (Odonata: Platycnemididae)**

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**Abstract.** A new species of damselfly, *Nososticta digimu* sp. nov., is described from Southern Highlands Province, Papua New Guinea, and its affinities are discussed. It belongs to a group of *Nososticta* in which the male synthorax exhibits discrete patches of blue, and the tip of the male abdomen is blue. The new species differs from its congeners exhibiting these characters either by lacking a transverse blue frontal bar from eye to eye or by its much larger blue ante-humeral patch that extends anterior to the mesokatepisternum. *Nososticta digimu* sp. nov. represents the 85<sup>th</sup> species of the genus and is currently known only from a single location in the Digimu River catchment. The supra-specific term *Nososticta conifera* complex is introduced.

**Further key words.** Zygoptera, new species, taxonomy, Southern Highlands Province, Kikori River basin, New Guinea