

THE RECORD OF *ARCHIBASIS REBECCAE* KEMP, 1989 IN SINGAPORE (ODONATA: ZYGOPTERA: COENAGRIONIDAE)

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INTRODUCTION

The coenagrionid *Archibasis rebecca* belongs to the subfamily Pseudagrioninae (sprites). This subfamily is large and ubiquitous (Silsby, 2001). *Archibasis* is a small genus with only nine known species, ranging from Sundaland to New Guinea (A. G. Orr, in litt.). In Peninsular Malaysia, four *Archibasis* species are known—*Archibasis viola* Lieftinck, 1948; *Archibasis melanocyma* Selys, 1877; *Archibasis incisura* Lieftinck, 1949; and *Archibasis rebecca* Kemp, 1989. Robert G. Kemp described the rather distinctive *Archibasis rebecca* in 1989 from a stream near Batu Malim in Pahang, Peninsular Malaysia. To date, *Archibasis rebecca* has only been found within Peninsular Malaysia and is thus considered endemic to the region (Orr, 2005).

Archibasis melanocyma and *Archibasis viola* have been recorded (Norma-Rashid et al., 2008) from Singapore. This paper reports the presence of *Archibasis rebecca* in Singapore for the first time. However technically this cannot be considered the first Singapore record as M.A. Lieftinck had in fact collected a specimen from Singapore but wrongly identified it as a species of *Pseudagrion* (R. G. Kemp, pers. comm.). Unfortunately this has never been reported in any publication. In this regard, a historical account of this damselfly in Singapore is also discussed.

SIGHTING DETAILS

While conducting an odonate survey along a forest stream along Sime Track in the Central Catchment Nature Reserve on 22 May 2009, a blue male damselfly was spotted at ca. 1130 hrs perched on a fallen twig by the stream in a sunlit spot. Through binoculars, it was initially thought to be *Archibasis melanocyma*, which is rare in Singapore (Norma-Rashid et al., 2008). But due to sunlight reflecting off the flowing water preventing a clear view, I could not be sure of its identification. Thus the damselfly was collected with an insect net. Closer examination of the specimen suggested it to be either *Archibasis incisura* or *Archibasis rebecca* based on the lack of blue on abdominal segment S10. After inspecting the anal appendages with a hand lens, the specimen was thought to be mostly likely *Archibasis rebecca*. The damselfly was thus retained as a voucher specimen and its identity was subsequently confirmed by Robert G. Kemp.

SPECIMEN DETAILS

The following description is based on the male individual captured on 22. May 2009 with reference to the original description by Kemp (1989).

The male *Archibasis rebecca* is 35 mm in total length. The abdomen together with anal appendage is 29 mm long and the hindwing length is 21 mm. Laterally (Fig. 1), the thorax and synthorax are mostly blue except for the black antehumeral stripe. The eyes are black. The legs are generally black with a hint of blue at the proximal end of the femur and tibia. There is a dull brown patch on the tarsus. Abdominal segments S1, S8, and S9 are blue while only the ventral part of S2 is blue. Other than that, S3 to S7, and S10 are black. Kemp (1989) reported two blue spots on S10 and this is illustrated in Orr (2005). However blue spots are absent on this specimen so S10 is entirely black. In dorsal view, the head is mainly black with some blue extending to the front ocelli. Two prominent blue postocular spots are present. The prothorax is largely black with some blue in the middle. Two blue stripes are present on the otherwise black synthorax. S1, S8, and S9 are blue whilst S2–S7, and S10 are black. In frontal view, the eyes are black. The labrum, anteclypeus, and frons are blue whereas the postclypeus is blackish.

The anal appendages are completely black. As described by Kemp (1989), in lateral view the superior appendage is hatchet or club-shaped (Fig. 2). In dorsal view, the superior appendage is expanded to form a flange and the distinguishing flap-like medial-ventral extension of the superior appendage can be seen (Fig. 3). These characters



Fig. 1. Lateral view of male *Archibasis rebecca* specimen (ZRC.ODO.333) collected on 22 May 2009. Total length = 35 mm.



Fig. 2. Close up lateral view of the anal appendages of the male specimen. Note the hatchet or club-like superior appendage. Abdominal segments S8-S9 are blue while S10 is black.

are in accord with the original species description by Kemp (1989) and separate *Archibasis rebecca* from others in the genus. The specimen is deposited in the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research (RMBR), National University of Singapore (ZRC.ODO.333).

DISCUSSION

Archibasis rebecca was described only in 1989. Kemp (1989) noted he examined a male paratype collected by M.A. Lieftinck labeled "S. Johore, Malaya, 16-IV-63". Subsequent correspondence with Kemp revealed that he remembered borrowing a specimen from the National Museum of Natural History (Nationale Natuurisch Museum) in Leiden when he was describing the species. The specimen was collected by Lieftinck in Singapore but identified as *Pseudagrion* species (Kemp, in litt.). However this was not mentioned in Kemp (1989). It is not certain if the Singapore specimen of Lieftinck is the same as the one labeled "S. Johore". Nevertheless the specimen reported in this paper represents the



Fig. 3. Close up dorsal view of the superior anal appendages of the male specimen showing the distinguishing flap-like medial-ventral extension (arrowed).

first published record of this damselfly in Singapore. *Archibasis rebeccaе* was not noted by Murphy (1997) during his extensive Odonata survey in the nature reserves of Singapore. Although odonates have been well-researched in Singapore, this record of *Archibasis rebeccaе* highlights the fact that new discoveries are still possible. In fact, several new records have already been made within the past few years (Cheong, 2009). From a conservation management point of view, it is essential for researchers to publish any new records and to conscientiously update biodiversity information. This gives conservation managers the most current data and information to undertake appropriate conservation action. To this end, a Singapore odonate diversity paper by local dragonflies enthusiasts, aimed at updating the work by Norma-Rashid et al. (2008) is in preparation.



Fig. 4. The small sandy stream where the specimen was collected. It is in a secondary forest dominated by *Dillenia suffruticosa*.

Archibasis rebecca was collected at a small forest stream in a secondary forest (Fig. 4). The stream edge is lined with leaf litter, fallen branches and twigs. The stream substrates are mainly of fine sand and silt with a few muddy patches along the water edge. This habitat is similar to the type locality in Pahang (Kemp, 1989). Small, sandy, forest streams are rare and vulnerable habitats in Singapore. Housing estates, major roads, and expressways surround the Central Catchment Nature Reserve. Many forest streams are linked to drains and canals outside the reserve where occasionally, irresponsible construction work has resulted in the accumulation of sediment flowing into the forest streams. Because of this, the hydrology of some streams has changed significantly over time. Many of them are now shallower, muddier, and some have even become stagnant. No doubt these changes have major impacts on the sandy stream fauna such as the odonates, rare freshwater crabs and fishes. Thus the conservation and management of these streams are essential. In particular, urban developments outside the nature reserve that would impact water drainage must be sensitive to forest stream preservation and ensure all relevant stakeholders must be consulted. The discovery of *Archibasis rebecca* emphasises the need for continual surveys, dedicated efforts to publish, and also what could be lost from Singapore natural heritage without proper stream management.

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