

## ***Calilestes* and *Lestomima*, junior synonyms of *Rhipidolestes* (Odonata: Megapodagrionidae)**

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### **ABSTRACT**

*Calilestes pallidistigma* and *Lestomima flavostigma*, both sole representatives of their respective genera, are shown to belong to the genus *Rhipidolestes*. *Rhipidolestes flavostigma* comb. nov. is determined to be a junior synonym of *R. truncatidens*. *R. pallidistigma* comb. nov. is deemed to be a valid species.

### **INTRODUCTION**

The genus *Rhipidolestes* Ris, 1912 is a subtropical Asian genus of damselflies currently holding 23 species. Species of *Rhipidolestes* occur from north Burma, through Thailand, Laos and Vietnam eastwards to the southern parts of Japan (Wilson 2000; Wilson & Xu 2007). The genus is placed within Megapodagrionidae or sometimes, together with the monotypic genus *Pseudolestes* Kirby, 1900, in Pseudolestidae. The monophyly of the genus is however not disputed. Males of almost all species can easily be recognised as belonging to the genus *Rhipidolestes* by the dorsal, often large and sometimes bifid, tubercle on segment nine. This modification on segment nine is not found in any other genus of Zygoptera and can therefore be considered an apomorphy for the genus. The genus is also easy to identify based on wing venation having two sometimes three antenodal cross-veins, R4 closer to arculus than to nodus and fields between IR2 and R3, between R3 and IR3, and between IR3 and R4 at distal end containing each 3 or more rows of cells. This combination of venational characters is only shared by *Pseudolestes mirabilis* Kirby, 1900. In the field, males of most species can easily be recognised on 'jizz' as they are the only Asian damselflies which rest with open wings, have bright yellow or reddish-yellow legs and entirely black abdomens, although exceptions include *R. truncatidens* Schmidt, 1931, and *R. yangbingi* Davies, 1998 which

possess dark legs. Most species also possess dark wingtips. The only potential pitfall is *Priscagrion kiautai* Zhou & Wilson, 2001, which also rests with open wings, has yellow legs and dark wingtips but can be distinguished from *Rhipidolestes* easily based on its blue S9 and S10.

Within the distributional range of *Rhipidolestes* two monotypic genera, *Calilestes* Fraser, 1926 and *Lestomima* May, 1933, have been described which, already in their descriptions, were stated to be close to *Rhipidolestes*. Both of these are only known from their original description. *Calilestes pallidistigma* was described by Fraser (1926) as a new genus and a new species. The description was based on a single teneral male collected by Mr. H. Stevens on 26 April 1924 at Ngai Tio, Tonkin, presently known as Ngai Cho (22°40'N, 103°35'E), Lao Cai province, northern Vietnam. The genus *Lestomima* containing the single species *flavostigma* was described by May (1933) based on two teneral males from the collection of Ris which were captured at Wen-Tu-Wei in the Chinese province of Guangdong. In order to reassess the taxonomic status of these genera, the type material of both genera was studied and compared with *Rhipidolestes*.

## METHODS AND MATERIAL

Wing venation is based on the modified Tillyard-Fraser system of Watson & O'Farrell (1991).

**Specimens of *Calilestes pallidistigma* studied:** Holotype ♂. Vietnam, Lao Cai Province, Ngai Tio, 26 April 1924, leg. H. Stevens, Natural History Museum, London (BMNH). The specimen bears three labels: (1) written "*Podolestes pallidistigma* sp. nov. (type) (F.C.F.)"; (2) printed "Tonkin: Ngai-Tio. 4,800 ft. 26 iv.1924. H. Stevens;" (3) printed "Sladen Godman Trust Exped. B.M. 1924-460." The specimen lacks the left fore wing and S7-10.

**Specimens of *Lestomima flavostigma* studied:** Holotype ♂, paratype ♂, China, Guangdong Province, Wen-Tu-Wei, 18 July, leg. Mell, Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt a.M. (NMSF). Label on holotype: „*Lestomima flavostigma* May 1933 [Senckenbergiana, 15, 345, (1933)] Wen-Tu-Wei (prov. Kwang-Tung). (leg. Mell). Slg.-Nr. 52. Typus! (Odon 22), 7250.“ Both specimens are teneral, lack the last abdominal segments including the appendages and one lateral horn of the ligula of the holotype is broken and lost. The precise location of Wen-Tu-Wei could not be traced.

## *Calilestes* A JUNIOR SYNONYM OF *Rhipidolestes*

In the description of the genus *Calilestes* Fraser (1926) mentions that “the position of the origin of Miii [= R4] and RS [= IR3] separates it from all other genera of the

Legion *Podagrion* [Megapodagrionidae] except *Rhipidolestes*, and from this genus it is separated by the longer Cui [CuP] and Cuii [Anal vein], and by the presence of intercalated sectors between them and between Cuii [Anal vein] and hinder border of wing.” The first part of Fraser’s statement is correct. However the characters stated to separate it from *Rhipidolestes* are present in several species of this genus. The length of CuP and the Anal vein and the presence of intercalated sectors between them seems to be correlated with the width of the wings. In species with broad wings the number of extra cells increases and the longitudinal veins become longer. It could be argued that these characters could be used to split the genus into *Rhipidolestes* and *Calilestes*, with the latter including several ‘broad-winged’ species of *Rhipidolestes*. It is however not likely that this would indeed reflect their taxonomic affinity. Although useful, wing characters only, are often a feeble base to define genera and should be used with caution. Recent examples of studies in which a former overemphasis on venation was shown to have led to incorrect conclusions include Dijkstra & Vick (2006) for *Neodythemis* Karsch, 1889 and *Micromacromia* Karsch, 1890 (Libellulidae), van Tol (2005) for *Drepanosticta* Laidlaw, 1917 and *Protosticta* Selys, 1885 (Platystictidae) and Pessacq (2008) for *Protoneura* Selys, 1857 (Protoneuridae).

It is likely that taxonomists describing new species of *Rhipidolestes* would not have taken *Calilestes* into account and for this reason we tried to establish if one of the species of *Rhipidolestes* described since 1926 is a synonym of *R. pallidistigma* comb. nov. The tip of the abdomen was already lacking when the original description was made so the dorsal projection on segment nine and the caudal appendages, both important for the species identification in *Rhipidolestes*, could not be studied. The main characters available for *R. pallidistigma* are the shape of the ligula and the pattern on the face. In the original description it is incorrectly stated that the labrum is black. The labrum is however yellow with a blue gloss, which makes the whole, anterior part of the head yellow coloured. The ligula is not described in the original description but was studied in the type, although only partially visible. Species occurring in Vietnam and adjacent Chinese province Guangxi are: *R. owadai* Asahina, 1997 from northern Vietnam, *R. alleni* Wilson, 2000 and *R. laui* Wilson & Reels, 2003, both from Guangxi. No records of *Rhipidolestes* are known from the Chinese province Yunnan, although the genus undoubtedly occurs there. All these have the anterior of the head largely yellow but the former two have widely different ligula. The ligula of *R. pallidistigma* was found to resemble that of *R. laui*. However the ligula of *R. pallidistigma* has a triangular projection on each of the lateral horns, which is directed towards the apex of the head of the ligula, like the ones depicted for *R. fascia* Zhou, 2003 (see Zhou 2003). Based on this difference *R. pallidistigma* is considered to be a valid species. The holotype is not a fully mature specimen and it likely the pterostigma would be become darker yellow or reddish-brown in mature specimens. Also it is possible that more mature specimens of *R. pallidistigma* would develop dark wingtips.

***Lestomima flavostigma* A JUNIOR SYNONYM OF  
*Rhipidolestes truncatidens***

When describing the genus *Lestomima*, May (1933) noted that the basal origin of veins M3-Rs [R4-IR3] are almost like a lested but that the other characters showed that it was very likely not a lested. He continued by stating that the rest of the venation looks strongly like *Rhipidolestes* and that the combination of the following characters in venation define the genus after which he gives a list of 16 venation characters. These characters are illustrated by a good photograph of the wings made by F. Ris. Comparing this figure with figure of the wing of *R. truncatidens* given in Schmidt (1931) the venation appears to be identical. As mentioned above for the genus *Calilestes* those characters given for *Lestomima* are all correlated with the width of the wings and not considered to be of generic value. *Lestomima* is therefore considered to be a junior synonym of *Rhipidolestes*. At the time of the original description the last segments, including the appendages of both the holotype and the paratype were missing. So, as in *Calilestes*, the main available characters are the pattern on the head and the ligula. In *Rhipidolestes flavostigma* comb.nov., the labrum is black, a condition only found in *R. truncatidens*, *R. bidens* Schmidt, 1931, *R. yangbingi* Davies, 1998, and *R. fascia* Zhou, 2003. When comparing the drawing of the ligula of *R. flavostigma* given in the original description with the holotype it was found to be imprecise. The median incision of the ligula head was found to be less deep and the angle under which the lateral horns are placed on the ligulas' head was found to be less sharp. Except for *truncatidens* all above mentioned species have, at least based on published drawings, a clearly different shaped ligula. The wing venation, the pattern on the head and the shape of the ligula of *R. flavostigma* is identical with that *R. truncatidens*. Based on this we consider *R. flavostigma* to be a junior synonym of *R. truncatidens*. The types of *R. flavostigma* and *R. truncatidens* were both collected by R. Mell. The type series of *R. truncatidens* consist of six males, four of which have the location given as Canton, the old name for Guangzhou, Guongdong province, and it is quite possible that this material was collected in the same area as the material of *R. flavostigma* and that R. Mell sent specimens of the same series to both E. Schmidt and to F. Ris. The other two males included in the type series are from Tscha-jiusan, a locality that we failed to locate. As far as we know no type has been selected for *R. truncatidens*. In *R. truncatidens* the tips of the wings become smoky brown and the pterostigma becomes yellow with darker outer borders. The types of *R. flavostigma* are teneral, which explains why the darker wing pattern is not present.

## DISCUSSION

The inclusion of *Calilestes pallidistigma* in *Rhipidolestes* brings the total known species of this genus to 24. Many of the species have small ranges and are endemic to islands or mountain ranges and it is likely that numerous new species are to be found. The identification to species level can be difficult although a male key to the species is now available (Wilson & Xu 2007). Many different authors have described species of *Rhipidolestes* and the illustrations of the appendages and ligulas are of variable type and quality. A review of the whole genus including SEM pictures of the ligula of species is therefore desirable.

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