

Libellago indica (Fraser, 1928) deleted from the list of Sri Lankan Odonata (Chlorocyphidae)

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Fraser (1928) described a new subspecies *Micromerus lineatus indica*, with type specimens from Poona, peninsular India. Discussing the distribution of *indica* Fraser wrote: "Laidlaw reports it from Ceylon, Haragama, July, and remarks on its difference from type *lineatus lineatus* Burm., from Burma and Siam". An almost identical text was included in Fraser's (1934) Odonata volume in the Fauna of British India series. Thereafter, this taxon (either as a subspecies *Libellago lineata indica* or as a full species *Libellago indica*), has been included in all published checklists of dragonflies of Ceylon or Sri Lanka and in the recent books by de Fonseca (2000) and Bedjanič & al. (2007). However, nobody has reported seeing or studying specimens of this species from Sri Lanka in the last 75 years. The only published doubt regarding its presence in Sri Lanka was that implied by Lieftinck's (1971, p. 189) comment "*L. indica* (Fraser), which is said to occur in Ceylon as well".

The listing of *L. indica* as a Sri Lankan species has been based on the following specimens.

1) A male specimen collected at Haragama by E.E. Green on 10 July 1910 and identified by Laidlaw (1924) as *Micromerus lineatus* (Burm.). Laidlaw provided an illustration of the colour pattern of the first 4 abdominal segments (dorsal view) of this specimen and he wrote "This specimen, which I have compared with a series in Mr. E.B. Williamson's collection from Candervalay, lacks the yellow tinge of the base of the wing characteristic of the males of other species from Ceylon. The brilliant canary yellow of the abdomen (segments 2-5) renders this little species very conspicuous. This species is badly in need of careful examination. Specimens from Poona and Ceylon differ strikingly from examples from Burma and Siam, & c." Without studying the specimen himself Fraser (1928) considered it to represent his new subspecies *M. lineatus indica*. De Fonseca (2000) includes 'Haragama, (7m) [July] in the species account of *L. indica*.

2) A teneral male specimen in The Sri Lanka National Museum in Colombo bearing the labels 'Madola near Opanayake. 16-23-II-33' [16-23 February 1933]. '*Libellago asiatica indica*. Det. Fraser'. [The incorrect name '*asiatica*' (pro. *lineata*) is presently crossed out]. 'Opanayake, (2)' which de Fonseca (2000) gives as a locality for *indica* refers to this specimen.

3) De Fonseca's (2000) *indica* account also gives 'Kantalai, (3, 7, 8)', 'Kottawa, (3)' and 'Nawalpitiya, (-)' as recorded localities for *indica*. These are the localities (and collecting months) presented by Kirby (1894) for specimens of '*Micromerus lineatus*' collected by J.W. Yerbury in 'Kanthalai, March 8, July 31, Aug. 8, 1892' and in 'Kottawa, April 24, 1892' and an additional specimen marked as 'Nawala-pittia (Green)'.

When the history of these '*indica*' records is evaluated, we must understand that the identifications were made before 1939 (or were simply assumptions based on earlier identifications before that date) when *Libellago adami* was recognized and described as a species.

Reidentifications

1) This old Haragama specimen is not in the collections of Natural History Museum, London (BMNH). If still available, it may be in the Indian Museum, Kolkata. Laidlaw's (1924) figure agrees with both *indica* and *adami*, but the sentence in the description: "lacks the yellow tinge of the base of the wing characteristic of the males of other species from Ceylon" points to *adami* rather than *indica*. In mature males of *indica* the base of wings is strongly tinted, whereas in *adami* it is markedly less so. The sentence "The brilliant canary yellow of the abdomen (segments 2-5) renders this little species very conspicuous" would characterize better the Burmese males of *lineata*, which Laidlaw also compared in the same connection, and he is unlikely to have stated this about the Haragama specimen. Thus we consider the Haragama specimen to represent *adami*. It should be noted that both F.C. Fraser and M.A. Lieftinck had collected long series of *Libellago* specimens at Haragama in 1932 and 1938, respectively (see Fraser 1939, Lieftinck 1940) and they both found *adami* (syn. *L. miae* Lieftinck, 1940), *greeni* and *finalis* there, but not *indica*.

2) We have recently studied the '*indica*' specimen from Opanayake preserved in The Sri Lanka National Museum in Colombo and reidentified it as *adami*. Although this teneral, incomplete specimen is in a poor condition and all natural colours have faded, the shape of the pale patches on abdominal segments 2-5 match better with *adami*; in *indica* the patches are larger in lateral view and less angular in shape.

3) We have located a number of Yerbury's specimens from Ceylon at BMNH and have found them to include male and female specimens of *L. adami* and a female specimen of an undescribed species, currently being described by Nancy van der Poorten. The specimen from Nawalapitiya (collected by Green) was not traced, but we do not believe it being different from the other specimens in the series studied by Kirby. In his *L. indica* account de Fonseca (2000) copied collecting data of the complete '*Micromerus lineatus*' series verbatim from Kirby (1894), apparently because some specimens from Ceylon collected by Yerbury had been misidentified and placed under the drawer label '*Libellago lineata indica*' at BMNH. However, most of the labels of Yerbury's specimens do not include collecting data as detailed as that given by Kirby (1894). In any case, linking these specimens to *indica* has proven incorrect.

We are now convinced that all Sri Lankan *Libellago indica* records are based on misidentified or



Fig. 1. Male of *Libellago indica*, Mattom, Thrissur District, Kerala, South India, 10 April 2007, Photo by F.K. Kakkassery.

misinterpreted specimens and that this species has never been collected in Sri Lanka. Consequently this species is deleted from the checklist of Sri Lankan odonates.

In this connection it is perhaps worth reporting that Matti Hämäläinen recently identified a number of old *Libellago* specimens from Ceylon in the Selysian collection in the Royal Belgian Institute of Natural Sciences in Brussels. Among the 22 pinned male specimens were 20 *adami* (from Candalay, Haragama, Kandis and 'Ceylon') and 2 *greeni* (Candalay and 'Ceylon'). (The 18 available female specimens were not identified due to lack of time). The specimens were without any identity labels, but in the *greeni* specimens the letter 'F.' had been added to the locality label. This might mean a preliminary identification as '*finalis*'. It should be noted that there are no specimens of *Libellago finalis* (Hagen in Selys, 1869) in Selys's collection.

Although the living males of *indica* and *adami* (Figs. 1-2) are easy to separate by the colour of the pale patches in the abdomen (citron-yellow in *indica* and grass-green in *adami*), in poorly preserved museum



Fig. 2. Male of *Libellago adami*, Hokandara, Colombo, Sri Lanka, 22 March 2007. Photo by Michael van der Poorten.

specimens the colour difference may be unclear. The known distribution of *L. adami* is presented in Fig. 3. *L. indica* occurs in peninsular India, where it still is a locally common stream species. Fraser (1934) wrote: "A very common insect throughout South India, especially in Western Ghats and Deccan".

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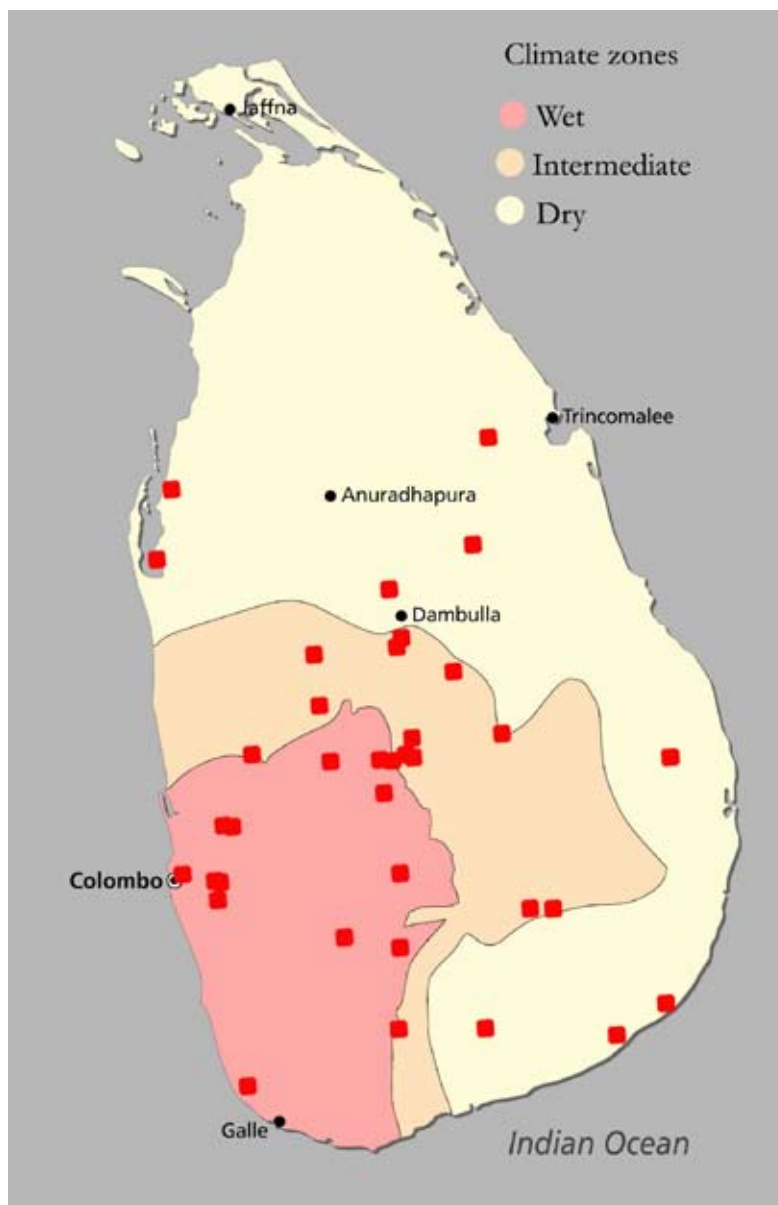


Fig. 3. Distribution of *Libellago adami* in Sri Lanka. The map combines data from Matjaž Bedjanič's database 'Distributional Atlas of the Dragonflies of Sri Lanka' which includes both published and unpublished records received from several observers and Nancy van der Poorten's database on Sri Lankan Odonata.

What is the enigmatic chlorocyphid
Rhinocypha stygia Förster, 1897
from Mt Kinabalu, Borneo?

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Introduction

Rhinocypha stygia was described by Förster (1897) based on a male and a female specimen from Mt Kinabalu in northern Borneo. These specimens, as well as the type series of the conspicuous calopterygid *Matronoides cyanoptera* Förster, 1897, were received from the insect dealers Staudinger & Bang-Haas who had acquired them from John Waterstradt. Waterstradt had visited Mt Kinabalu briefly in March 1895 and in March 1896 sent local people to collect a large number of insects from the mountain. The male specimen of *stygia* is described as having an entirely shining black body: “Tête et thorax noir de velours, abdomen noir chatoyant, surtout à la fin des segments.” The female has quite a typical chlorocyphid colour pattern, with yellow stripes on thorax and a row of yellow lateral markings along the abdomen.

Laidlaw (1915) described another *Rhinocypha* species, *R. moultoni*, from Mt Kinabalu based on a series of 4 males and 2 females collected by J.C. Moulton in September-October 1913. The male was described as having conspicuous brick-red markings on the dorsum of the abdomen and yellow lateral markings, but on the female abdomen the dorsal markings are lacking. Subsequently, in Laidlaw (1920) four additional females from the same series were discussed, at least one of them being teneral with conspicuous broad yellow markings on the abdomen. The abdomen of this teneral female was illustrated. Laidlaw wrote: “The adult female of this species resembles that of *R. stygia* Förster very closely, to judge at least by Förster’s rather brief description. But the fully adult male is so brightly coloured about the body – much more so than the female – that I do not think it possible that *stygia*, which is entirely black about the body, can be merely a very adult specimen of the same species. The four males of *moultoni* that I have been able to examine are fully mature, and it is interesting to find that they retain on the abdomen the colour-pattern characteristic of the teneral female, which is lost in the mature female. For whereas the male retains the paired dorsal spots of the abdomen from segment 2 to 9 as rich orange-red marks in addition to the yellow paired lateral marks, these dorsal marks are entirely lost in the fully adult female, but are very conspicuous in newly-emerged females as large lemon-yellow areas covering about three-quarters of the dorsum of each segment from 2 to 8; fused at their bases with the lateral system.... So that, whilst not refusing to admit the possibility of *R. stygia* being the extremely adult stage of *R. moultoni*, I do not think it at all likely, and retain here the latter species as distinct.”

Another North Bornean species, the description of which includes comparison with *stygia*, is *Rhinocypha cognata* Kimmins, 1936. Kimmins’ (1936) description was based on two males from Mt Dulit on 10 August 1932. Kimmins wrote: “Among the Oxford University Expedition material are two males which Dr. Laidlaw suggested might be Foerster’s *stygia*. They agree admirably in size but differ in colour in one or two respects. The types should be, I believe, in the Williamson Collection at Michigan, but Mrs. Gloyd, to whom I wrote, informs me that only the female type can be found. Under the circumstances, I think it wiser to describe the Oxford University Expedition material as new.” He writes further: “This species very closely resembles *Rh. stygia* Foerster, but assuming his description to be accurate, I think that the differences are sufficient to warrant the erection of another species. Foerster is very insistent that the body of *stygia* is entirely black, and unless his example was very badly discoloured, he could scarcely have failed to notice the lateral thoracic bands which are present in *cognata*.”

As can be seen from the quotations above, both Laidlaw and Kimmins were somewhat hesitant with



Fig. 1. The labels of the syntype male of *Rhinocypha stygia* found wrongly associated with an incomplete male specimen of *Rhinocypha cucullata* in Coll. Selys.

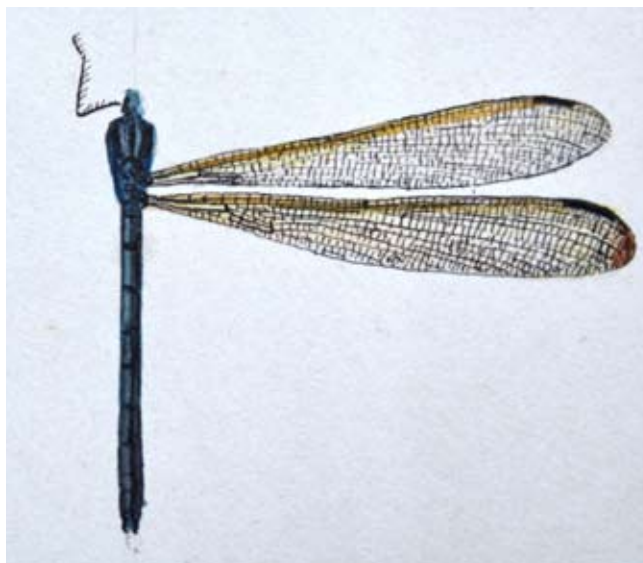


Fig. 2. Painting of the syntype male of *Rhinocypha stygia* by Guill. Severin.

their taxonomic decisions. Lieftinck (1954) listed *stygia*, *moultoni* and *cognata* as good species without comments on their status. Thereafter the first doubts on their status may have been presented by Huisman & van Tol (1989), who wrote on *stygia* and *cognata*: “both enigmatic taxa, and not unlikely synonyms”. More recent publications, raising the need to resolve the mutual status of *stygia* and *cognata*, include Orr (2001) and Orr (2003). Indeed Orr only used *cognata* in those publications, because the identity of this taxon could be readily confirmed, whereas that of *stygia* remained uncertain. Dow and Reels (2008) include *R. stygia*, but not *R. cognata* in their list of Odonata from Gunung Mulu National Park, Sarawak.

During my recent visit to the Royal Belgian Institute of Natural Sciences in Brussels for the purpose of studying the type material of Calopterygoidea in the collections of Edmond de Selys Longchamps (1813-1900), I made some interesting discoveries. I found the labels of the lost syntype male of *R. stygia* associated with a wrong specimen and a mature pair of *R. moultoni* from Mt Kinabalu, both sexes with brick-red patches on the abdomen. I also discovered a revealing colour painting made of the lost syntype male specimen of *stygia*. These findings seem finally to solve this longstanding problem on the mutual status of these three taxa.

Lost syntype male of *R. stygia*

As already pointed out by Kimmins (1936) and confirmed by Garrison & al. (2003), Förster's collection (now at UMMZ, Michigan) includes only the female syntype specimen of *stygia*.

Rather unexpectedly I found in the Selys collection a badly broken male specimen of *Rhinocypha cucullata* Selys, 1873 incorrectly associated with the original labels of the type male of *R. stygia* (Fig. 1); the labels are in Förster's handwriting. This specimen consists only of abdominal segments 1-8 and one wing glued to the label. It was placed under the identity label '*Rhinocypha stygia*' together with two other specimens, which bear Selys' identification label 'près. [near] *stygia*'; neither of them, however, being real *stygia*.

Selys and the young German zoologist Friedrich Förster (1865-1918) collaborated closely during the last few years of Selys' life. Their mutual interest focussed on Indo-australian dragonflies, and both had independently purchased material from this region from Staudinger & Bang-Haas. Förster's (1897) paper also included the description of the first female of *Matronoides cyaneipennis*, written by Selys as well as Selys' footnote comparing *stygia* with its congeners. Evidently Selys had received the male specimen of *stygia* from Förster for study and illustration, as indicated by the presence of the specimen's labels misplaced in the Selys collection. Unfortunately this specimen seems to have been permanently lost at some phase, perhaps during illustration (see below for the lost painted female). The type labels must have been associated to the wrong specimen sometime after Selys' death in 1900.

However, the story is not as grim as it might have been. Indeed it evokes a curious and ironic serendipity, for if the type specimen was indeed lost while being illustrated, we have now at least a good informative illustration of what was lost. Apparently it is not yet widely known among odonatologists that Selys commissioned colour paintings of all odonate species in his collection, except of Libellulidae (sensu stricto). A part of this prodigious portfolio (mainly 'Agrioninae' in the old Selysian sense) was executed by Selys himself, but the greater part of the remainder was painted by Guill. Severin. The portfolio includes paintings of *R. stygia* male and female (by Severin). The male illustrated (cropped in Fig. 2) undoubtedly depicts the lost syntype male of *stygia*. Some remnants of obscure bluish dorsal markings can be seen, so it could well be a somewhat discoloured mature specimen, and conspecific with *cognata*. The size of *stygia* and *cognata* male given in their descriptions is exactly the same: hindwing 21 mm, abdomen 16 mm. The painted female *stygia* specimen (also without a head) seems not to belong to the type series, since the female syntype still has its head. The illustrated female *stygia* could not be traced in the collections, but it is known that Selys also received specimens from Mt Kinabalu from Staudinger & Bang-Haas; see below.

Syntype female of *stygia*

Mark F. O'Brien kindly sent me some photographs of the syntype female of *stygia* in UMMZ (Michigan); one of them is presented here (Fig. 3). The syntype is identical with a series of 4 females, which I collected at



Fig. 3. The syntype female of *Rhinocypha stygia*. Photo by Mark O'Brien.



Fig. 4. Female of *Rhinocypha stygia* from Poring, Kinabalu national park, 18 April 1994, M. Hämäläinen leg.



Fig. 5. Male of *Rhinocypha moultoni* from 'Kina Balu, Borneo, Stgd.' in Coll. Selys, furnished with identity label 'Rhinoc. tenera, S.' by Selys (labels not shown).



Fig. 6. Female of *Rhinocypha moultoni* from 'Kina Balu, Borneo, Stgd.' in Coll. Selys, furnished with identity label 'Rhinoc. tenera, S.' by Selys (labels not shown).

Kimmins (1969) selected a male specimen as the lectotype of *moultoni*. Thus there are no direct taxonomic consequences of the fact that the two female specimens in the original type series of *moultoni* studied by Laidlaw (1915) are not conspecific with the male, but belong to *stygia*. One of these females in the collections of BMNH (London) is labelled as 'allotype' of *moultoni*. On the other hand the teneral female(s) listed and illustrated in Laidlaw (1920) is (are) real *moultoni*. My published record of 'apparent *moultoni*' from Poring at Mt Kinabalu (Hämäläinen 1994) is herewith corrected to represent *stygia*. Also my photo of '*moultoni*' female laying eggs (at Poring in April 2000) in Orr's (2003, p. 52, Fig. 57) book *Dragonflies of Borneo* shows *stygia*.

So it seems that Huisman & van Tol (1989) were correct in assuming that *stygia* and *cognata* might be synonyms. Orr (1996) used the name *stygia* for this species while describing the territorial behaviour of some chlorocyphids in

Poring in Mt Kinabalu National Park in April 1994 and April 2000 (Fig. 4). I had earlier compared my specimens with the 'allotype' of *R. moultoni* at BMNH (London), the other mature female specimen in Laidlaw's original type series and found them to agree in all respects. Thus, I am inclined to conclude that the *stygia* female and the mature female of *moultoni* (sensu Laidlaw) must refer to the same species – *stygia*.

***Stygia, moultoni* and *cognata*: connections revealed**

Laidlaw's (1920) conclusion (see above) that the colour of the dorsal side of abdomen in *moultoni* female changes to black during maturation does not seem to be correct. In Selys' collection there are a male (Fig. 5) and a female specimen (Fig. 6) of *moultoni* from Mt Kinabalu (also received from Staudinger & Bang-Haas, and undoubtedly originally acquired from John Waterstradt). These specimens bear Selys' manuscript name *Rhinocypha tenera*, but placed under an incorrect drawer label '*Libellago tenuis*, Selys n.sp.' (in Selys' handwriting). The male is fully mature and the female at least 'nearly' mature. In spite of this, the female has conspicuous brick-red patches on the dorsum of the abdomen, as in the male. There is no sign of the reddish dorsal colouring disappearing in this female specimen approaching full maturation. The colour pattern of head and thorax are almost identical to that in *stygia*, but the pterostigmata are distinctly paler than in *stygia* female (and in *moultoni* male), especially in the hindwing.



Fig. 7. *Rhinocypha stygia* male. Borneo, Sarawak, Mt Dulit, Sg. Nuam, 30 March 2006. Photo by Graham Reels.

Brunei. Unfortunately, he did not observe any courtship or mating, neither has anyone else reported seeing male and female *stygia* together. Based on the small number of specimens studied, the sexes appear to differ in size to some extent, females (hindwing 22.5-24 mm) being considerably larger than males (hindwing 19-21 mm). This is typical for most chlorocyphids. Photographs of male and female *stygia* taken in the field are presented in Figs. 7-8.

The known range of *Rhinocypha stygia* (= *cognata*) covers north-eastern Sarawak, Brunei and Sabah. The southern- and westernmost records are from the eastern slopes of Mt Dulit. It is rather common at some locations on Gunung Mulu. In Brunei it is known only from Kuala Belalong Field Studies Centre. In Sabah it is known from Poring at Mt Kinabalu, the Danum Valley and Tabin. The known altitude range is 100 – 800 m. *Rhinocypha moultoni* is much rarer species, so far it has been recorded only at Mt Kinabalu, at the altitude range 1000-1550 m. The few known records have been made in August and September.



Fig. 8. *Rhinocypha stygia* female. Borneo, Sabah, Mt Kinabalu, Poring, 29 April 2005. Photo by Rory Dow.

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