Two new *Risiocnemis* species from Northern Sierra Madre, Luzon, Philippines (Odonata: Platycnemididae)

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Key words: Odonata, dragonfly, *Risiocnemis corbeti*, *R. hamalaineni*, new species, Platycnemididae, Philippines, Luzon.

Abstract

Risiocnemis corbeti sp. nov. and *R. hamalaineni* sp. nov. (for both species: holotype ♂, Dipinantahikan area [16°53'39"N, 122°20'47"E], Dipagsangaan, Palanan, Isabela, Luzon, Philippines, 12-20 ix 2008, in RMNH) are described, illustrated, and diagnosed.

Introduction

Risiocnemis Cowley, 1934 is a speciose genus endemic to the Philippine archipelago, with 36 named species in two sub-genera: *R.* (*Igneocnemis*) Hämäläinen, 1991 with 20 species and *R.* (*Risiocnemis*) with 16 species (Hämäläinen 1991). It has been well characterized in recent papers treating all of the described species (Hämäläinen 1991, 2000; Gassman & Hämäläinen 2002).

This rheophilous genus is confined to areas with partial to heavy vegetation cover. It is the dominant damselfly in Philippine forests except in the Palawan biogeographic region. Recent fieldwork in the central gap area of Northern Sierra Madre Natural Park, Isabela Province, resulted in the discovery of two additional new species of the subgenus *Risiocnemis*, which are described in this paper.

Material and methods

Measurements are given in mm and drawings were made with the aid of a camera lucida. Acronyms for collections are as follows:

RJTV — Reagan Joseph T. Villanueva
RMNH — Nationaal Natuurhistorisch Museum Naturalis, Leiden, The Netherlands

Risiocnemis corbeti sp. nov.

Fig. 1

Etymology

A noun in the genitive case, named in honor of the late Philip S. Corbet.

Specimens examined

Holotype ♂: Dipinantahikan area (16°53'39"N, 122°20'47"E), Dipagsangaan, Palanan, Isabela, Luzon Island, Philippines, 12-20 ix 2008, leg. RJTV, to be deposited in RMNH. — Paratypes: 5 ♂, 3 ♀, same data as holotype, 2 ♂, 2 ♀ of which to be deposited in RMNH and 3 ♂, 1 ♀ in author's collection. Additional specimens: 9 ♂, 1 ♀, same data as holotype, in author's collection.

Male holotype

Head: Labrum, base of mandible, genae, and apical half of postclypeus shiny black; anteclypeus and basal half of postclypeus bluish; frons, antenna, and occiput matt black.

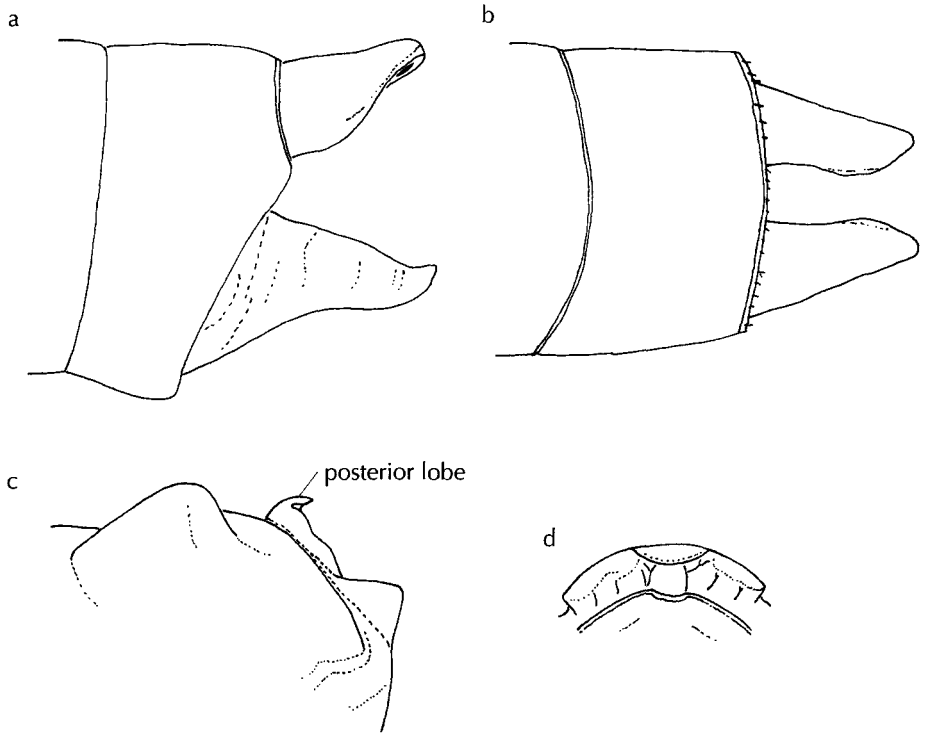

Figure 1: *Risiocnemis corbeti* sp. nov., paratypes — (a) S10 of male in lateral view; (b) same, in dorsal view; (c) prothorax of female in lateral view; (d) middle lobe of posterior lobe of female prothorax in dorsal view. Not to scale.

Thorax: Entirely matt black except bluish streak at antealar carina along posterior side of wing bases. — Legs: Outer anterior ⅔ of trochanter and femur blue, otherwise matt black including coxae, tibiae, and spines. — Wings: venation as for subgenus with arculus distal to Ax2. IR_1 at Px12 in Fw, 10 in Hw; RP_2 at Px8 in Fw, 7 in Hw; IR_2 at Px 4 in Fw, 3 in Hw; Px 20 in Fw and Hw. Pt reddish brown, oblique, with costal and subcostal sides of equal length.
Abdomen: Entirely black except dorsal sub-apical ovoid bluish white spot on S3-6. Paraproct shiny black, robust, slightly shorter than cercus, apex curved inward (Fig. 1a). Cercus whitish blue, shorter than S10, with an inward bulge in dorsal view (Fig. 1b). Sub-basal ventral process not visible laterally, long and narrow, directed ventro-medially. Distal segment of genital ligula divided into thin flat broad side lobes.
Measurements [mm]: Hw 26; abdomen 41.

Female paratypes

Same coloration as male holotype except more pronounced blue markings on femur. Prothorax with median lobe of prothorax slightly raised on dorsum, forming a pair of blunt tubercles. Middle lobe of posterior prothoracic lobe with short broad bases directed posteriorly in lateral view (Fig. 1c); in dorsal view outer border bent anteriorly with central triangular apex sharply bent posteriorly (Fig. 1d). Lateral lobes of posterior prothoracic lobe obtusely shaped.
Measurements [mm]: Hw 26-27; abdomen 37-39.

Variation in male paratypes

Lateral border of frons bluish, this coloration extending to eye margin in four specimens. Two specimens have a minute dorsal sub-apical bluish spot on S2.
Measurements [mm]: Hw 24-26; abdomen 39-40.

Diagnosis

The male of *Risiocnemis corbeti* differs from other species with an entirely black synthorax by the inward bulge of cercus in dorsal view and the sub-basal ventral process being not visible laterally (Fig. 1b); in the other black species cercus is straight in dorsal view and with well or partly visible ventral sub-basal process in lateral view. In *R. varians* Hämäläinen, 1991 and *R. serrata* (Hagen in Selys, 1863) there is also a distinct inward bulge on cercus in dorsal view, but they have bluish markings on synthorax and cercus longer than S10.

The female closely resembles that of *R. serrata*, having low, gently sloped tubercles on the median lobe of the prothorax. It differs from that species by the triangularly shaped posterior lobe of prothorax in dorsal view and entirely black synthorax.

Ecological remarks

R. corbeti was found at, and is probably confined to, streams in ultra basic forest; it was absent in nearby streams and springs draining montane habitat.

Risiocnemis hamalaineni sp. nov.

Fig. 2

Etymology

A noun in the genitive case, named after Matti Hämäläinen for his continuing support of the author's odonatological activity.

Specimens examined

Holotype ♂: Dipinantahikan area (16°53'39"N, 122°20'47"E), Dipagsangaan, Palanan, Isabela, Luzon Island, Philippines, 12-20 ix 2008, leg. RJTV, to be deposited in RMNH. — Paratype: 1 ♂, same data as holotype, in author's collection. Female unknown.

Description of male holotype

Head: Labrum, base of mandible, genae, and postclypeus shiny black; anteclypeus bluish with brownish lateral streak; frons matt black with rectangular bluish marking laterally extending to eye margin and base of antenna; rest of the head matt black.
Thorax: Entirely matt black except bluish streak at antealar carina along posterior side of wing base. — Legs: Coxae black; trochanter, femur, and tibiae pale yellow with black streak posteriorly; spines black. — Wings: venation as for genus with arculus distal to Ax2; IR_1 at Px12 in Fw and Hw, RP_2 at Px8 in Fw and Hw, IR_2 at Px 4 in Fw, 3 in Hw, Px 20 in Fw and Hw. Pt reddish brown, oblique, with costal side a third shorter than subcostal side.
Abdomen: Entirely black except dorsal sub-apical ovoid bluish white spot on S3-5, barely visible in S2 and S6. Paraproct black, narrow, as long as cercus (Fig. 2a). Cercus yellow, shorter than S10 (Fig. 2b). Ventral process partly visible laterally (Fig. 2a), elongate and narrow, directed downward, situated very basally.
Measurements [mm]: Hw 28; abdomen 43.

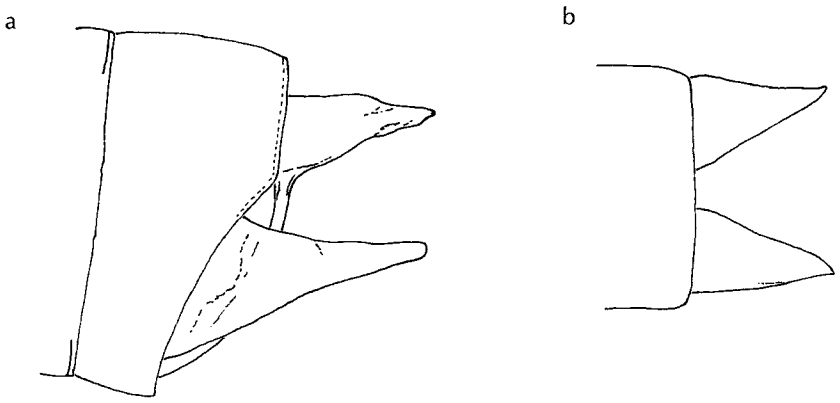

Figure 2: *Risiocnemis hamalaineni* sp. nov., holotype male — (a) S10 in lateral view; (b) S10 in dorsal view. Not to scale.

Variation in male paratype

Tip of paraproct extends beyond that of cercus in the paratype.
Measurements [mm]: Hw 26; abdomen 39.

Diagnosis

R. hamalaineni differs from other species with an entirely black synthorax in that the ventral process of the cercus is located very near the base (Fig. 2a); in other black species the ventral process is more apical. It closely resembles *R. arator* Hämäläinen, 1991, but differs from it in that the ventral process is directed straight ventrad, while in *R. arator* it is directed ventrad and basalwards. It differs from *R. kiautai* Hämäläinen, 1991 by its paraproct reaching or exceeding the tip of cercus.

Ecological remarks

This species shares the habitat of *R. corbeti*, but was found in very low numbers.

Discussion

The two new species belong to the subgenus *Risiocnemis*, characterized by arculus located distal to Ax2, crenulated wing apices, and female posterior pronotal lobe with distinct middle and lateral lobes. They raise the known number of species in this subgenus to eighteen, at least ten of which occur on Luzon.

R. corbeti belongs to the *R. appendiculata*-group, which is characterized by an unspecialized distal segment of genital ligula. Within this group it seems to be closely related to *R. kiautai* being predominantly black, though differing from that species by the shape of cercus and paraproct. The relationships of *R. hamalaineni* remain uncertain due to limited material for study available at hand. Gassmann & Hämäläinen (2002) mentioned that two undescribed species from Aurora and Quirino provinces in Luzon are present in the RMHN collection; according to them (D. Gassmann, R. Dow pers. comm.) the specimens from Quirino appear to be the same as *R. hama-laineni.*

The two new species can be easily distinguished from other species by combination of an entirely black synthorax, the shape and colour of the cercus, and the shape of the paraproct in the male. The keys provided for this subgenus by Hämäläinen (1991: 157-159) can be modified to include the new species as follows:

Addition to Hämäläinen's key to *Risiocnemis* males

1. Inner margin of cercus sinuous in dorsal view, with a distinct inward bulge at its apical third 2
1'. Inner margin of cercus straight or slightly arched in dorsal view, lacking an inward bulge 4

2. Cercus clearly shorter than S10; synthorax entirely black ..... *corbeti*
2'. Cercus clearly longer than S10; synthorax black with blue markings .... *varians*
2''. Cercus as long as or only a little longer than S10 3

Received 05 February 2009; revised 31 May 2009; accepted 24 June 2009

11. Ventral process long, well removed from the base, cercus distinctly longer than S10 ..... *appendiculata*
11'. Ventral process nearer the base 12

12. Cercus clearly shorter than S10, synthorax entirely matt black .... *hamalaineni*
12'. Cercus a little longer than S10, synthorax black with reddish brown markings in the ventral side 13

Addition to Hämäläinen's key to *Risiocnemis* females

1. Median lobe of prothorax protuberated with distinct tubercles 2
1'. Median lobe of prothorax more or less raised, but without distinct tubercles 7

2. Tubercles rather low, very gently sloping on the anterior side 3
2'. Tubercles prominent, steeply raised 4

3. Posterior lobe of prothorax with central triangular pointed apex in dorsal view; synthorax entirely black ..... *corbeti*
3'. Posterior lobe of prothorax squarish in dorsal view; synthorax reddish brown ..... *serrata*

Acknowledgements

The author is thankful to Klaas-Douwe B. Dijkstra, Rory Dow, and Dirk Gassman for their reviews of the manuscript, and for information on the Northern Sierra Madre Natural Park trip. Jan van der Ploeg and Merlijn van Weerd for allowing the author to join their fieldwork and further comments on the manuscript. The survey was conducted in the framework of the Cagayan Valley Program on Environment and Development, the academic partnership of Leiden University and Isabela State University.

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