Risiocnemis seidenschwarzi spec. nov., an endangered damselfly from Tabunan forest in Cebu, the Philippines (Odonata: Platycnemididae)

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Abstract: A new dragonfly species, *Risiocnemis seidenschwarzi* spec. nov. (holotype male: Philippines, Cebu, Tabunan, 9.ii.1999) is described, illustrated and compared with the closely related *R. rolandmuelleri* Hämäläinen. The new species appears to be endemic to Cebu, where it, as a forest stream dweller, has a very limited area left for survival. Its endangered status is emphasized and its remaining habitat in the Tabunan forest area is characterized in detail.

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Introduction

Species of the genus *Risiocnemis* are dominant damselflies along small forest streams in the Philippines, excluding the Palawan and Sulu groups of islands. At present about 40 species, belonging to two subgenera, *Risiocnemis* and *Igneocnemis*, are known (thirty of which have so far been named); see Hämäläinen & Müller (1997), Hämäläinen (1991a, 1991b). Many species are strictly endemic to one single island, but some are confined to islands of a certain faunal subregion or region. Only two species are known to be distributed in two different, neighbouring regions (Hämäläinen & Müller, 1997).

No *Risiocnemis* species were known from Cebu, until Mr Teobaldo Borromeo, who is working in the Botany Research Group of San Carlos University, found a few *Risiocnemis* (subgenus *Risiocnemis*) damselflies near the Tabunan forest on 19 November 1998.

From the West Visayan faunal region, only two species of the subgenus *Risiocnemis* are known, viz. *R. kiautai* Hämäläinen from Sibuyan Island and the more widespread *R. rolandmuelleri* Hämäläinen. *Risiocnemis rolandmuelleri* was described and illustrated in Hämäläinen (1991a), with holotype and all paratypes coming from Sibuyan, but other material from Negros and Panay was also listed as conspecific. Later, plenty of additional specimens have been collected from the latter islands, and also from Masbate and Siquijor. The present material of *R. rolandmuelleri* (over 600 specimens gathered by Mr Roland Müller; most of them now at RMNH, Leiden) shows obvious geographical variation in populations from different islands. In the original description some differing characters of the Negros populations were already presented, but their status was left open. The available new material would require a detailed study and taxonomic evaluation.

Based on the similar structures in penis and in the posterior lobe of the female prothorax, the Cebu specimens appear to be closely related to *R. rolandmuelleri* (sensu latu). However, the structure of male anal appendages and pterothoracic colour pattern in both sexes of the Cebu specimens differ so distinctly from those from other islands, that I consider them to represent a separate, new species. Although, it would certainly be better to name the Cebu taxon in connection of a comprehensive evaluation of the whole *R. rolandmuelleri* species-group, I have chosen to publish its description immediately, because the name is ur-

Fig. 1. *Risiocnemis seidenschwarzi* spec. nov. Teneral male photographed at the holotype site by F. Seidenschwarz on 5 February 1999.

gently needed for listing in "red lists" of endangered species.

The new species is named after Dr Franz Seidenschwarz, in order to recognize his achievements in studying and restoring the last remaining virgin forests in Cebu.

***Risiocnemis seidenschwarzi* spec. nov.**
(fig. 1-3)

Type material

Holotype: ♂, Philippines, Cebu, Tabunan, altitude 500 m, 9.ii.1999, leg. Teobaldo Borromeo. Deposited in the National Museum of Natural History Naturalis (RMNH), Leiden. Paratypes: 6 ♂, 1 ♀ from the same site as holotype, 19.xi.1998 (3 ♂, 1 ♀) and 9.ii.1999 (3 ♂), leg. Teobaldo Borromeo. One male paratype is deposited in Senckenberg Museum (Frankfurt am Main), one male in coll. Hämäläinen and the rest in RMNH.

Description

Species with crenulate wing apex, belonging to *Risiocnemis rolandmuelleri* species-group, defined in Hämäläinen (1991a).

Male. Head. Labrum, postclypeus and genae shining black. Anteclypeus bluish. Bluish streak between antefrons and eye margin. Frons and head above mat black, with brownish dots as in *R. rolandmuelleri*.

Thorax. Prothorax largely mat black. Pterothorax mat black, with distinct pale bluish oval markings on sides (fig. 1); that on metepisternum a little longer and more proximal than that on metepimeron. Axillary plates at wing base pale bluish. Coxae black, outer surface of femora obscurely bluish, tibiae dark brownish.

Wings. Pterostigma dark brown, a little higher than in *R. rolandmuelleri*; venation otherwise similar.

Abdomen. Black, with similar pale bluish subapical markings in segments 2-7 as in *R. rolandmuelleri*. In teneral specimens, the pale markings form complete rings (fig. 1), but in older ones, the rings are narrowly interrupted middorsally, and the ring on segment 7 gets obscure. Anal appendages shaped as in figure 2. Superiors proportionally shorter and broader as in *R. rolandmuelleri*; superiors hollowed and protruding a large ventral extension, which is directed obliquely inside. Penis furnished with broad flagella (fig. 3), resembling that of *R. rolandmuelleri*.

Measurements. Hind wing 23-25 mm; abdomen 35-37 mm.

Female. Basic colour brown. Structure of the posterior lobe of prothorax resembles that in *R. rolandmuelleri* (especially females from Siquijor). However, readily distinguished from *R. rolandmuelleri* by the lateral pale bluish markings on metepisternum and metepimeron, which are larger than in male. In the single female available, the marking on metepimeron is somewhat obscure.

Measurements. Hind wing 24.5 mm, abdomen 35 mm.

Habitat and endangered status

From the eleven largest islands (over 4000 km^2) of the Philippines, Cebu is the most denuded from the original forests. According to

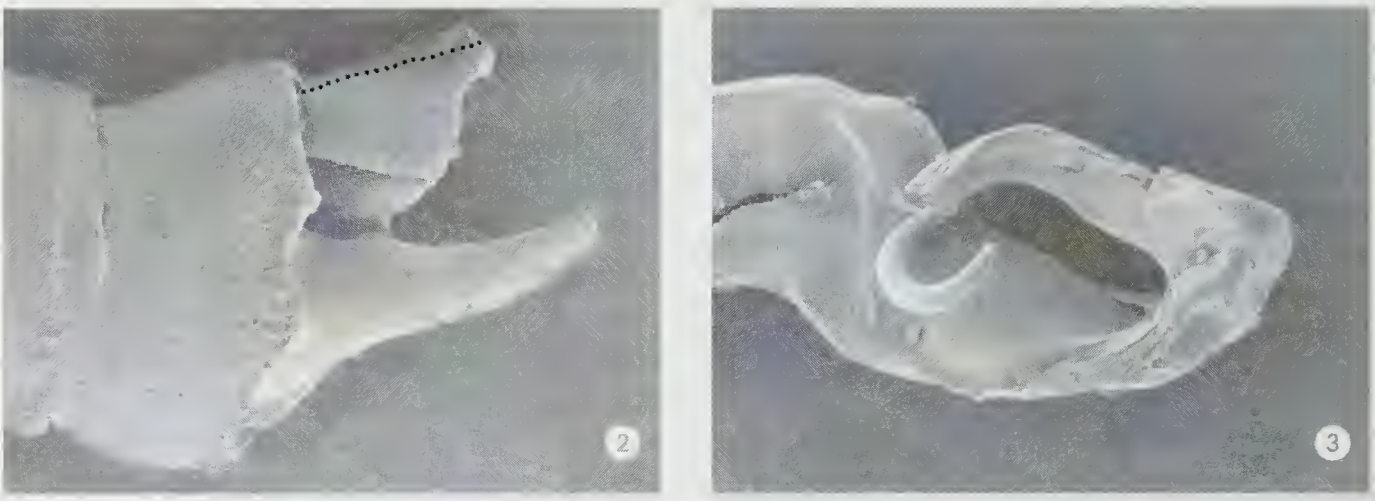

Fig. 2-3. SEM-photographs of *Risiocnemis seidenschwarzi* spec. nov. male. 2, anal appendages, right lateral view (the visible top of the left superior appendage is separated with dotted line); 3, penis, lateral view.

information received from Dr Franz Seidenschwarz (Head of Botany Research Group, University of San Carlos, Cebu City), at present only a few patches of original forests (totalling some 45 hectares) are left along the Manunggal mountain range in Central Cebu, at the altitude of 480-930 m. These remnants represent three significantly different forest types, named after the nearby settlements Tabunan, Hagnum and Cantipla. The largest patch, Tabunan forest, is on limestone, in very steep and rocky areas, where there is hardly any soil, only some humus which is accumulated in pits. Atmosphere moisture is high, but ground is very dry. The much smaller Hagnum and Cantipla forests are on shale geology, smooth topography and deep soils.

Dr Seidenschwarz (in litteris) characterized the actual habitat of *Risiocnemis seidenschwarzi* as follows. "It is a small creek, deeply carved into shale geology. The creek is situated very close to the Tabunan forest, which starts less than 50 m above the *Risiocnemis* area. The creek, 2.5 to 3.5 m wide, is partially muddy and partially rocky. The water comes from a limestone ridge above the area (Cebu Limestone Formation). Trees and shrubs grow along the creek, but outside this strip, the land is converted to pasture. The strip of vegetation is composed of remaining native trees and ferns and introduced plants (trees, crops, weeds). The trees and shrubs are growing on the upper edge whereas the ferns and weeds are located inside the small ravine. Remnants of the pristine vegetation along the creek include trees: *Ficus minahasse* (Teysm. & De Vr.) Miq., *Ficus septica* Burm.f. and *Bambusa vulgaris* Schrad. Ferns are dominant plants in the ravine, where *Risiocnemis* damselflies occur along a stretch of ca 30 m only. They seem to prefer *Pneumatopteris laevis* (Mett.) Holtt. ferns as their resting place. The damselflies usually rest near the leaf tips, with the abdomen pointing perpendicularly to the creek (fig. 1). They stay rather low, only some 30 – 120 cm above the ground".

The immediate area around the creek has earlier been covered by the Hagnum forest type, which is characterized by being occasionally flooded. One of the aims of the "Botany Research Group" is to restore the original forest around the creek. This would provide a little better chance for *R. seidenschwarzi* to survive. In the Hagnum forest, 4 km to north, another rare forest damselfly, the coenagrionid *Amphicnemis* spec. (see "comment 36" in Hämäläinen & Müller (1997)), is known to breed.

Most endemic forest damselflies in the Philippines are endangered due to the loss of suitable habitats within their range. If *R. seidenschwarzi* really is endemic to Cebu, as we have a good reason to believe, it has undoubtedly the most limited area left to survive. It may be one of the most vulnerable odonate species in the whole world.

Based on our knowledge from the fauna in

other main islands within the West Visayan faunal region, it is probable that also 1-2 species representing the subgenus *Igneocnemis* have existed in Cebu, but apparently became extinct with the loss of most forests in the island at the end of 19th century, or at the latest after the Second World War, when the only remaining large forest area in central Cebu (near Tabunan) was badly reduced.

It is worth mentioning here that the Tabunan forest is the only remaining habitat also to some other Cebu endemics, both animals and plants. Best known of these is the Cebu flowerpecker (*Dicaeum quadricolor* Tweeddale), which was discovered in Tabunan forest in 1992 (Dutson et al., 1993), after being already declared extinct. Now, it has been ranked as "the rarest bird species in the world". An other endemic rarity, known only from this area, is the Cebu cinnamon, *Cinnamomum cebuense* Kost. (Kostermans, 1986). Unfortunately the Tabunan forest has suffered significant losses of land during the past five years.

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