

## CONTRIBUTION TO THE TAXONOMY OF PHILIPPINE MEGAPODAGRIONIDAE (ODONATA: ZYGOPTERA)

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### ABSTRACT

A new species of megapodagrionid damselfly, *Argiolestes baltazarae* Gapud & Recuenco-Adorada, is described from the Northern Sierra Madre Natural Park, Philippines. The original description of *A. realensis* Gapud & Recuenco is modified to distinguish the two closely related species. The male of *Rhinagrion philippinum* (Selys) is described. Illustrations and a key to Philippine species of Megapodagrionidae are provided.

**Key words:** *Argiolestes baltazarae*, *Argiolestes realensis*, *Rhinagrion philippinum*, damselflies, Odonata, Megapodagrionidae.

### INTRODUCTION

Since the discovery of *Argiolestes realensis* Gapud & Recuenco (1993), the knowledge of Philippine species of the damselfly family Megapodagrionidae has remained meager. The existing collections remain inadequate, despite the extensive material accumulated by Mueller (Haimailainen & Mueller, 1997). Several trips to Cebu and the Northern Sierra Madre Natural Park in March and July, 2000, respectively, have provided new information about this family.

### KEY TO PHILIPPINE SPECIES OF MEGAPODAGRIONIDAE

1. Wings with 1 row of cells below  $Cu_2$ ; anal crossing at base of short wing stalk; wings slender, greatest width of hindwing not more than 5 mm ..... *Rhinagrion philippinum*
- Wings with 2-4 rows of cells below  $Cu_2$ ; anal crossing remote from base of long wing stalk; wings much broader at middle, greatest width of hindwing at least 7 mm (*Argiolestes*) ..... 2
2. Forewing with 2 rows of cells below  $Cu_2$ ; hindwing with 2-3 rows of cells below  $Cu_2$ ; inferior abdominal appendages with moderately broad base, distal lobes slender and longer than bases, almost parallel to each other ..... *A. realensis*
- Forewing with a combination of 2 and 3 rows of cells below  $Cu_2$ ; hindwing with a combination of 2, 3 and 4 rows of cells below  $Cu_2$ ; inferior abdominal appendages with robust and broad bases, distal lobes slender but shorter than their bases and divergent from each other ..... *A. baltazarae*, **n.sp.**

Received 12 September 2001; accepted 20 September 2001.

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1. *ARGIOLESTES BALTAZARAE* Gapud & Recuenco-Adorada, new species  
Figs. 1a, c, e, f; 2a-e

**Description. Male.** Body 50-52 mm long, generally dark brown above and pale brown to testaceous below. Head generally dark brown to fuscous, including eyes, with light brown areas as follows: small area anterior to median ocellus, outer side of lateral ocelli, tip of antennophores, postocular lobes, depressed area of frons, anteclypeus, posterior area of labrum, sometimes anterior margin of labrum (Fig. 1a). Head beneath pale brown to testaceous; mandibles dark brown, with testaceous outer and inner margins. Antennal segment I dark brown, lighter at base, ant II brown, ant III and IV dark brown.

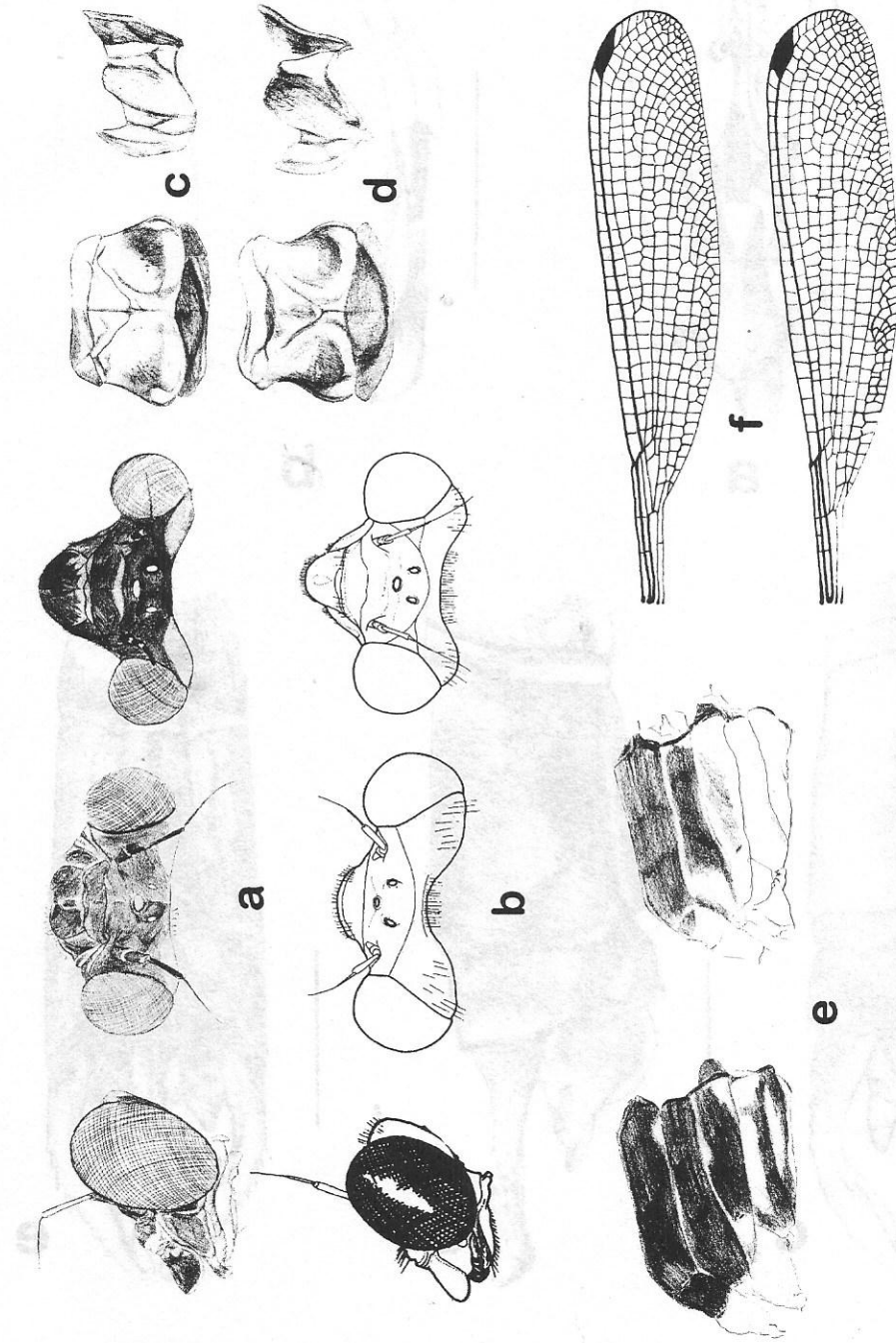
Pronotum generally brown to light brown with transverse dark brown area on anterior lobe; median lobes largely brown, slightly darker on outer areas; posterior lobe almost entirely dark brown (Fig. 1c). Mesepisternum of synthorax fuscous, mesepimeron brown on proximal and distal areas, much darker at middle area; metepisternum brown to testaceous, seldom with dark tint; metepimeron light brown to testaceous (Fig. 1e). Mesoscutum and metapostnotum dark brown to fuscous. Venter of thorax testaceous.

Wings hyaline, pterostigma dark brown (Fig. 1f). Arculus opposite or slightly beyond 2<sup>nd</sup> antenodal vein (An); radial sector (Rs) arising opposite tail end of subnodus (Sn); third median vein (M<sub>3</sub>) arising opposite Sn; 2<sup>nd</sup> median vein (M<sub>2</sub>) usually arising opposite or slightly beyond 8<sup>th</sup> or 9<sup>th</sup> postnodal vein (Pn) in forewing and 7<sup>th</sup> Pn in hindwing; postnodals varying from 25/24 to 29/26 in forewing and 23/22 to 26/26 in hindwing. Pterostigma acute at inner posterior angle and outer anterior angle, with 2 1/2 to 3 cells below it; intercalary veins along distal radial and median areas; quadrangle and subquadrangle as in *A. realensis*. Cubitoanal vein (Ac) proximal to halfway between 1<sup>st</sup> and 2<sup>nd</sup> An, closer to 1<sup>st</sup> An; 2<sup>nd</sup> cubital vein (Cu<sub>2</sub>) arising remotely away from Ac, merged with marginal vein for a greater part into a long stalk, with 2-3 rows of cells below in forewing and 2-4 cells below in hindwing. Forewing, 36-37 mm and hindwing, 35.5-36.5 mm long. Hindwing 7mm at widest.

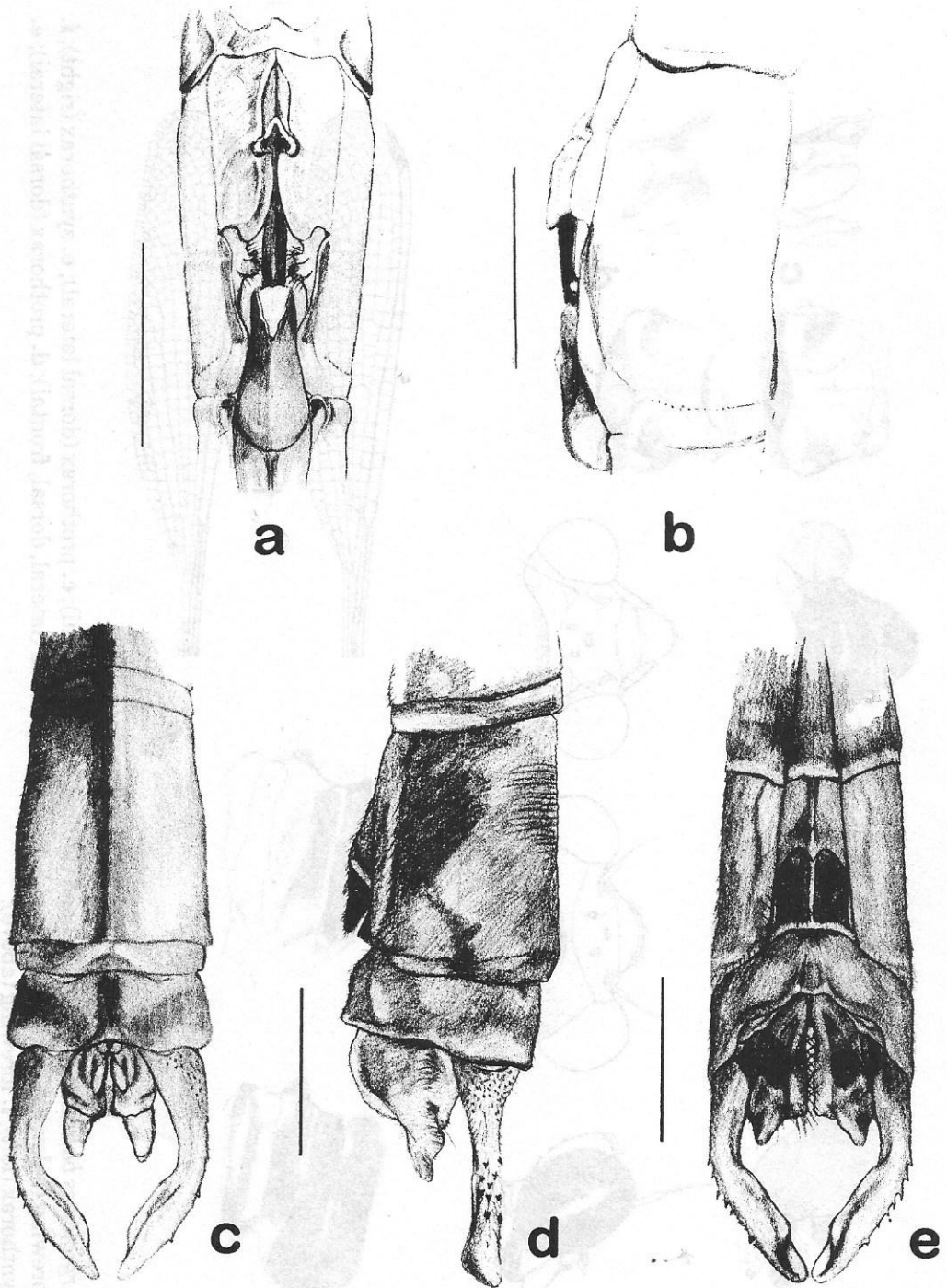
Legs short, brownish throughout; with spiny setae on femora and tibiae; setae on fore femora gradually becoming longer distally, on middle and hind femora subequal; on tibiae long, gradually becoming shorter distally.

Abdomen generally brownish, anterior and posterior margins of segments lighter, darker ventrally and paler laterally; abd 8, 9, and 10 dark brown. Secondary male genitalia with quadrate anterior hamules, posterior hamules small, bilobed, and setaceous (Figs. 2a, b). Anal appendages very dark brown (Figs. 2c-e); superior appendages elongate, arcuate, more than twice as long as inferior appendages, convergent distally and broader beyond middle, notched at inner apical area, with short spines on outer lateral areas; inferior appendages with very broad bases, distal lobes slender and shorter than their bases, divergent from each other.

**Material examined.** HOLOTYPE ♂, on vegetation close to forest floor, near stream in lowland forest, beside Catalangan River, Digsinan, Barangay Disulap, Sitio San Isidro, San Mariano, Isabela, within Northern Sierra Madre Natural Park, 1-4 July 2000, V.P. Gapud; PARATYPES, 6 ♂♂, same data; all deposited in the Entomological Museum, Museum of Natural History, U.P. Los Baños.



**Figure 1.** *Argiolestes baltazararae*, n. sp.: **a.** head (lateral, dorsal, frontal); **c.** prothorax (dorsal lateral); **e.** synthorax (right); **f.** forewing (below). *A. realensis* Gapud & Recuenco: **b.** head (lateral, dorsal, frontal); **d.** prothorax (dorsal lateral); **e.** synthorax (left); **f.** forewing (above).



**Figure 2.** *Argiolestes baltazarae*, n.sp. a-b. male secondary genitalia: a. ventral; b. lateral view; c-e. abdominal tip of male: c. dorsal; d. lateral; e. ventral view.

**Etymology.** This species is named after Dr. Clare R. Baltazar, first Filipino lady entomologist, National Scientist, and mentor, in honor of her substantial contributions to Philippine systematic entomology.

**Distribution.** Philippines: Luzon: Northern Sierra Madre Natural Park, Isabela.

**Remarks.** At first glance, this species looks almost identical to *A. realensis* Gapud & Recuenco (1993) from Real, Quezon. However, it differs from the latter in the patterns of darkness of the prothorax, synthorax and apical area of the abdomen, the greater number of rows of cells below  $Cu_2$  in both wings, and the configuration of the anal abdominal appendages, particularly the inferior appendages. It is probably widespread in the lowland forests of the Northern Sierra Madre corridor. *Argiolestes baltazarae* has the same habitat as *A. realensis*. However, since the lowland forest in which the adults were encountered was close to the river, some individuals were found at the periphery of the forest. Their sluggish flight made it easy to capture them. As in *A. realensis*, some adults were seen far away from the small stream which was covered with undergrowth vegetation. They were also encountered at the upper part of the stream where it widened into a typical mountain stream lined with rock boulders and with sand and gravel substrate.

## 2. *ARGIOLESTES REALENSIS* Gapud & Recuenco Figs. 1b, d-f; 3

*Argiolestes realensis* Gapud & Recuenco 1993. Philipp. Ent. 9 (2):155, figs. 1-4.

**Redescription. Male.** Body 44-55 mm long, generally brown to dark brown above, pale brown to testaceous below. Head fuscous, including eyes (Fig. 1b), with light brown to brown areas as follows: small area anterior to median ocellus, post-ocular lobe, tip of antennophores, depressed area of frons, anteclypeus, and anterior margin of labrum. Head beneath pale brown to testaceous, mandibles fuscous. Antennal segment I dark brown, lighter distally; ant II brown, ant III-IV dark brown.

Pronotum almost entirely dark brown to fuscous, brownish only on median area between anterior and middle lobes and posterior outer area of middle lobes (Fig. 1c). Mesepisternum and mesepimeron of synthorax fuscous; metepisternum dark brown, lighter at proximal and distal areas; metepimeron brown (Fig. 1e). Mesonotum and metapostnotum dark brown to fuscous. Venter of thorax testaceous.

Wings hyaline, pterostigma dark brown (Fig. 1f). Arculus beyond 2<sup>nd</sup> An; Rs arising beyond Sn;  $M_3$  arising at Sn;  $M_2$  arising opposite or slightly beyond 8<sup>th</sup> Pn in forewing and opposite 6<sup>th</sup> or 7<sup>th</sup> Pn in hindwing; postnodals varying from 22/20 to 23/22 in forewing and 21/20 to 22/20 in hindwing. Pterostigma acute at inner posterior angle and outer anterior angle, with 2 1/2 cells below; intercalary veins along distal radial and medial areas; quadrangle elongate, anterior side more than three times as long as basal side, posterior side slightly longer than anterior side; subquadrangle twice as long as quadrangle; Ac proximal to halfway between 1<sup>st</sup> and 2<sup>nd</sup> An, closer to 1<sup>st</sup> An;  $Cu_2$  arising remotely away from Ac, merged with marginal vein for a greater part into a long stalk, with 2 rows of cells below in forewing and 2-3 rows of cells below in hindwing. Forewing 32.5-36.5 mm and hindwing 31.5-35 mm long. Hindwing 7 mm at widest.

Legs short, brown throughout, except dark brown tibiae; fore femoral setae gradually becoming longer distally; middle and hind femoral setae subequal; tibiae setae long, gradually becoming shorter distally.

Abdomen generally brownish, anterior and pronotal margins of abdominal segments light brown. Secondary male genitalia with quadrate anterior hamules, pos-



terior hamules small, setaceous (Figs. 3a, b). Anal appendages brown to light brown (Figs. 3c-d); superior appendages elongate, convergent distally, slightly broadened beyond middle, notched at inner apical area, with short spines on outer lateral areas; inferior appendages moderately broad at bases, distal lobes slender, as long as their bases, parallel to each other.

**Female.** As originally described (Gapud & Recuenco, 1993). Body 41-48 mm long.

**Material examined.** HOLOTYPE♂, forest floor, National Botanic Garden, Real Quezon, 26 March 1986, V.P. Gapud; ALLOTYPE♀, same locality, 8 April 1987, V.P. Gapud; PARATYPES, 2♂♂, same locality, 26 March 1986, V.P. Gapud; 7♂♂, 2♀♀, 9 April 1988, V.P. Gapud; in Entomological Museum, Museum of Natural History, U.P. Los Baños. ADDITIONAL MATERIAL: 3♂♂, National Botanic Garden, Real Quezon, 8 May 1992, V.P. Gapud; in Gapud collection, Department of Entomology, U.P. Los Baños.

**Distribution.** Philippines: Luzon: National Botanic Gardens, Real, Quezon.

**Remarks.** This species is likely confined to the Northern Quezon corridor, while *A. baltazarae* appears to be widespread in the Sierra Madre Range. It is highly probable that *Argiolestes* occurs throughout the mountain ranges along the eastern side of Luzon from Cagayan to Quezon. It is not certain, however, whether the single male obtained by Mueller from Quirino (Haimailainen & Mueller 1997) represents a different species. Only a continued exploration will resolve the actual number of species of *Argiolestes* in this part of Luzon. Based on several field collections in the Bicol region, the genus has not been encountered there.

### 3. *RHINAGRION PHILIPPINUM* (Selys)

Figs. 4 a-h

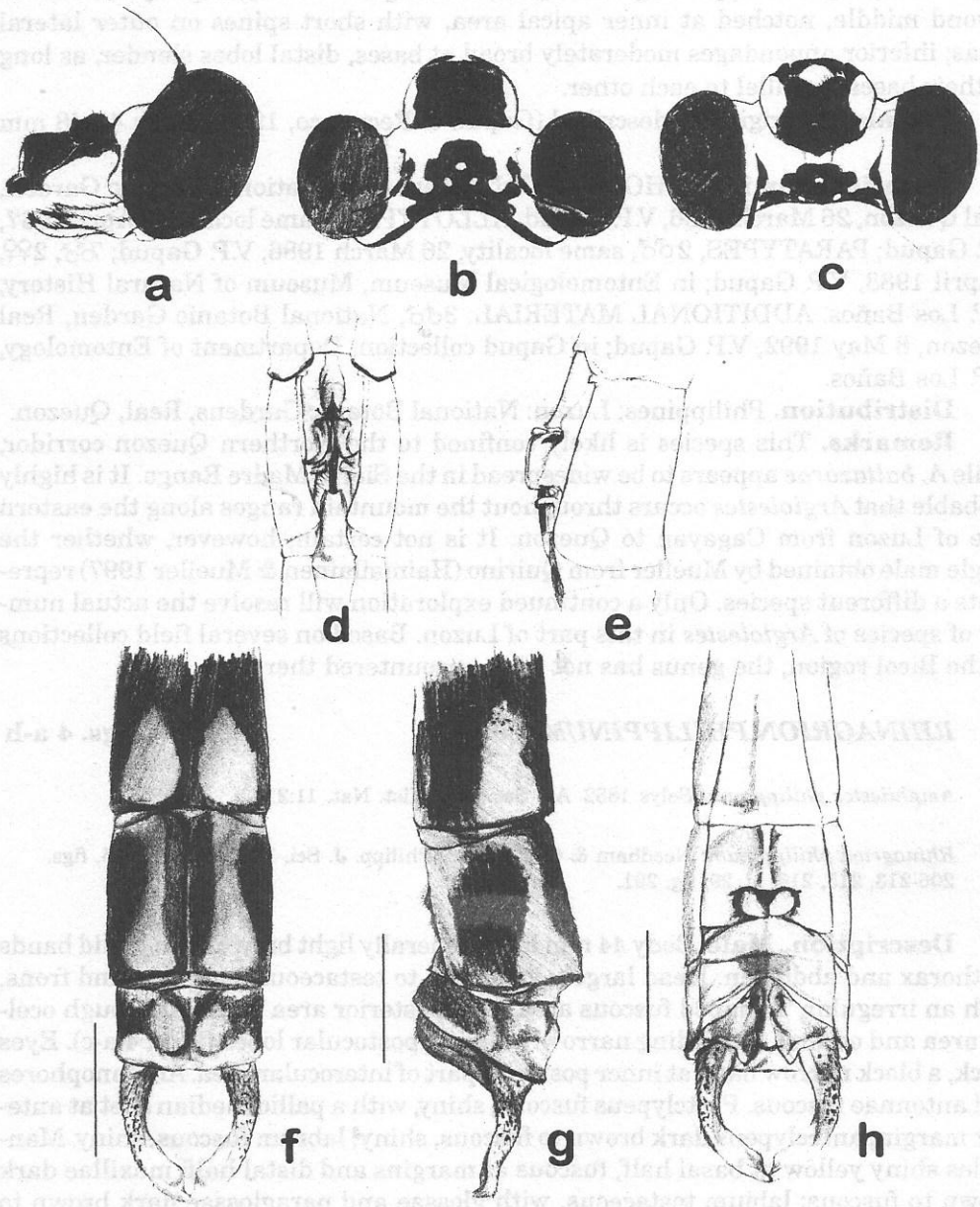
*Amphilestes philippinum* Selys 1882. An. Soc. Esp. Hist. Nat. 11:21

*Rhinagrion philippinum*: Needham & Gyger 1939. Philipp. J. Sci. 70 (3):266, Pl. 15, figs. 206-213, 215, 216; pl. 29, fig. 291.

**Description. Male.** Body 44 mm long, generally light brown with pallid bands on thorax and abdomen. Head largely yellowish to testaceous on vertex and frons, with an irregular, T-shaped fuscous area from posterior area of frons through ocellar area and occiput, extending narrowly toward postocular lobes (Figs. 4 a-c). Eyes black, a black narrow band at inner posterior part of interocular area. Antennophores and antennae fuscous. Postclypeus fuscous, shiny, with a pallid median spot at anterior margin; anteclypeus dark brown to fuscous, shiny; labrum fuscous, shiny. Mandibles shiny yellow at basal half, fuscous at margins and distal half; maxillae dark brown to fuscous; labium testaceous, with glossae and paraglossae dark brown to fuscous distally.

Pronotum with brown and yellow pattern as follows: anterior lobe brown, color extending to median area between it and middle lobes; middle lobes brown at anterior area, the rest yellowish; posterior lobe yellow. Prosternum testaceous, with fuscous spot between fore coxae. Synthorax light brown, metepisternum largely yellow, metepimeron yellow at posterior margin.

Wings hyaline, pterostigma brown. Arculus opposite 2<sup>nd</sup> An; Rs arising opposite tail end of Sn; M<sub>3</sub> arising before Sn; M<sub>2</sub> arising opposite 7<sup>th</sup> Pn in forewing and



**Figure 4.** *Rhinagrion philippinum* (Selys). **a-c.** head of male: **a.** lateral; **b.** dorsal; **c.** frontal view; **d-e.** male secondary genitalia: **d.** ventral; **e.** lateral view; **f-h.** abdominal tip of male: **f.** dorsal; **g.** lateral; **h.** ventral view.

beyond 5<sup>th</sup> Pn in hindwing; postnodals 15/15 in forewing and 15/14 in hindwing. Pterostigma acute at inner posterior angle and outer anterior angle, with 2 1/2 cells below; intercalary veins fewer, at distal radial and medial areas; quadrangle short, anterior side about 1 1/2 times as long as basal side, slightly longer than distal side, posterior side slightly longer than anterior side. Cubito-anal vein (Ac) nearer 2<sup>nd</sup> An than 1<sup>st</sup> An, situated at base of stalk from which Cu<sub>2</sub> arises; Cu<sub>2</sub> with 1 row of cells below it. Forewing 27.5 mm and hindwing 27 mm long. Hindwing 5 mm at widest.

Legs yellow, dark brown to fuscous at juncture of femora and tibiae; tibial apices dark brown; tarsi fuscous. Setae dark brown; fore femoral setae longer at middle; middle and hind femoral setae subequal; tibial setae long, gradually becoming shorter distally.

Abdomen generally brown, with a pair of yellowish longitudinal bands on abdominal segments 3-9, leaving middorsal line brownish, pallid bands more dorsal on abdominal segment 10, extending laterally to posterior margin (Figs. 4 f-g). Male secondary genitalia with quadrate anterior hamules (Figs. 4 d-e), posterior hamules small, setaceous. Anal appendages light brown (Figs. 4 f-h); superior appendages arcuate, touching at apical area, strongly notched at inner apex, apices dark brown; inferior appendages dark brown, with very broad bases, distal lobes minute, connate.

**Female.** As described by Needham and Gyger (1939). Body 41-43 mm long.

**Material Examined.** One ♂, 5♂♂, vegetation along edge of forest near river, Kawasan Falls, Badian, Cebu, 29 March 2000, V.P. Gapud; in Gapud collection, Department of Entomology, U.P. Los Baños.

**Distribution.** Philippines: Luzon; Mindoro; W.Visayas; E.Visayas; Mindanao.

**Remarks.** The male of *R. philippinum* is described fully for the first time. Contrary to Needham & Gyger (1939), the male of this species differs from the female in the fuscous pattern of the head. While this pattern continues up to the anterior margin of the frons in the female, it is interrupted at midway and does not reach the anterior frontal margin in the male. Furthermore, the body color of the male is much lighter than that of the female.

Originally described from Bohol by Selys (1882), *R. philippinum* was later recorded from Los Baños, Laguna by Needham & Gyger (1939). Several years back, specimens of the same species were collected by students from Mt. Palaypalay, Batangas. More recently, Haimailainen & Mueller (1997) added Mindoro, Masbate, Samar, Bohol and Mindanao as part of its distribution range. The present paper adds Cebu as a new record. Based on current knowledge, this species appears to be widespread in the Philippines, except Palawan. However, whether it also occurs in the Cordillera and Sierra Madre mountain ranges and the Bicol region remains uncertain.

#### ACKNOWLEDGEMENTS

The senior author is deeply grateful to the Conservation International - Philippines, which funded the field validation survey of the fauna of Northern Sierra Madre Natural Park, with the senior author as part of the team. Appreciation is equally extended to Mr. William Oliver and Ms. Mirasol Pedregosa of the Cebu Biodiversity Conservation Foundation, Inc. (CBCF) for supporting his travel and collecting trips to different parts of Cebu.

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