

Female of *Cyphonocerus watarii* Satô, 1991 (Coleoptera, Lampyridae, Cyphonocerinae) from the western Honshu, Japan

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Abstract The external morphology of the adult female of the lampyrid species, *Cyphonocerus watarii* Satô, 1991, was described and illustrated based on a specimen taken from Yamaguchi Prefecture, W. Honshu, for the first time. The key to the known females of the genus *Cyphonocerus* in Japan also provided.

Key words: Lampyridae, Cyphonocerinae, *Cyphonocerus watarii*, adult female, morphology.

INTRODUCTION

Six species and one subspecies of the lampyrid genus *Cyphonocerus* Kiesenwetter, 1879, were recorded from Japan including the Ryukyu Islands (Jeng *et al.*, 1998; Kawashima *et al.*, 2003; etc.). However, the female adults of only two species, viz., *C. ruficollis* Kiesenwetter, 1879 from the mainland of Japan (Kanda, 1935) and *C. o. okinawanus* Nakane, 1983 from Okinawa-jima Is., Okinawa Isls., the middle Ryukyus (Kawashima, 2009), have only been described.

In 2010, a female adult was caught by Mr. Keisuke Kawano (The Firefly Museum of Toyota Town, Shimonoseki-shi) from Yamaguchi Prefecture, the western tip of Honshu for the first time. I was able to obtain and examined above a valuable specimen through the courtesy of him, it will be firstly described and illustrated in detail in this paper.

MATERIAL AND METHODS

The material and methods employed are the same as those noted in Kawashima (2009). The terminology is mainly following Leschen, R. A.B. *et al.* (eds.) (2010). The abbreviations used herein are as follows: BL—length of body, from anterior margin of pronotum; HW—maximum width of head, including eyes; PL—length of pronotum, along mid-line; PW—maximum width of pronotum, across just before the basal tubercles; EL—length of elytra; EW—maximum width of elytra; EHW—humeral width of elytra; HTL—length of hind tibiae.

DESCRIPTION

Cyphonocerus watarii Satô, 1991

[Japanese name: Kuro-kushihige-botaru]

(Figs. 1-4)

C. watarii M. Satô, 1991. Elytra, Tokyo, **19**: 191-193 (original description). —Jeng *et al.*, 1998. Elytra, Tokyo, **26**: 388 (revision of Taiwan and Japanese species). —Kawashima *et al.*, 2003. Jpn. J. syst. Ent., **9(2)**: 243 (~~check~~-list).

— Ohba, 2004. “Mystery of Fireflies”, Yokosuka City Mus., p. 94 (comment). — Kawano, 2006. Zenkoku-Hotaru-Kenkyū-Kaishi, (39): 51-55 (new distributional record and redescription of adult male). — Kawano, 2008. Bull. Firefly Mus. Toyota Town, (1): 63-68 (mating behavior by males). — Kawano, 2009. Bull. Firefly Mus. Toyota Town, (2): 97 (habits of pupae).

Type locality. Jooyama (城山), Munakata-shi, Fukuoka Pref., Kyushu, Japan.

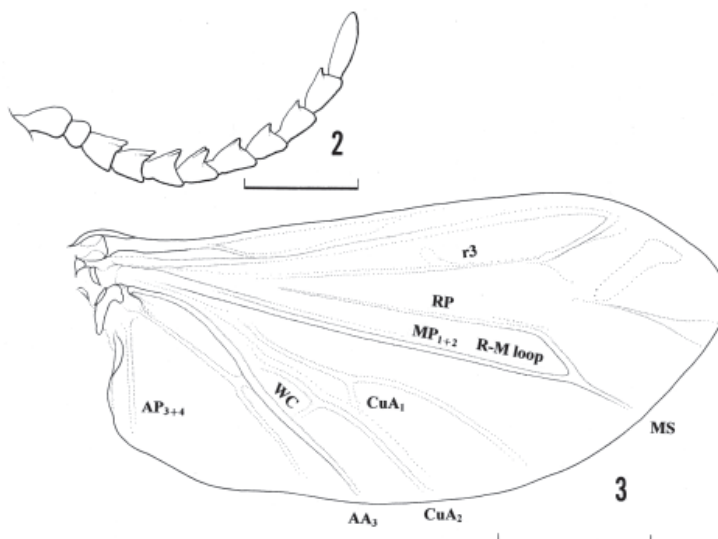
Material examined. 1♀ (in copulation), Mt. Gesan (華山), Toyota-chō, Shimonoseki-shi, Yamaguchi Pref., 9-VI-2010, K. Kawano leg. This specimen is deposited in the collection of I. Kawashima.

Coloration:— Body moderately shiny (Fig. 4), clothed with blackish subrecumbent pubescence. Body almost black including appendages. Head capsule and compound eyes black; pronotum, scutellum and elytra constantly black. Mouth parts including each palpus black, but only mandibles with dark reddish tint. Legs weakly tinged with blackish brown; only claws reddish to yellowish brown. Abdominal tergites basically blackish brown, but only distal two segments paler, tinged with yellowish brown.

Structure:— Body (Fig. 1) elongate oval, more or less convex on both dorsal and ventral sides; the surface of almost whole body weakly shiny, closely clothed with brown to blackish brown subrecumbent pubescence; antennal flagellum, maxillary and labial palpi, tibiae and tarsi moderately frosted, more densely covered with blackish minute setae.



Fig. 1. Adult female of *Cyphonocerus watarii* Satō, 1991, from W. Honshu, the mainland of Japan; dorsal view. Scale: 1.5 mm.



Figs. 2-3. Adult female of *Cyphonocerus watarii* Satô, 1991, from W. Honshu, the mainland of Japan; —right antenna (2); —right hind wing (3); all dorsal view. Scale: 0.5 mm (2); 1.0 mm (3).



Fig. 4. Adult female of *Cyphonocerus watarii* Satô, 1991, from W. Honshu, the mainland of Japan; living insect, oblique lateral view. Photo by K. Kawano.

Head rather small, a little wider than long, completely concealed by anterior margin of pronotum; Head capsule well depressed above but not so concave; anterior sockets located between eyes, rather approached from each other, oriented anterior, and not visible from dorsal side. Eyes globular and normal but rather small, well separated from each other in both dorsal and ventral sides, roundly prominent laterad, completely without any excavations. Labrum very small, narrow and transverse; the anterior angles evenly rounded. Antennae (Fig. 2) rather short and slender, barely reaching the humeral part of elytra, 11-segmented; the relative lengths of each antennomere from basal scape as follows: 1.00: 0.45: 0.68: 0.64: 0.68: 0.64: 0.77: 0.68: 0.82: 0.86: 1.41; scape clavate, more or less bent outwards; pedicel the shortest and smallest; each flagellar antennomere except terminal 9th clearly dilated towards the apex, each with two short processes towards the antero-ventral portion; 1st to 8th flagellar antennomeres continuously more or less serrate, distal 11th (9th flagellar) simple spindle-shaped, usually longer than the preceding one, 10th (8th flagellar).

Mandibles small and simple, evenly incurved with sharply pointed apices. Maxillary palpi two-segmented; distal palpomeres strongly expanded, more or less triangular or ax-shaped. Labial palpi two-segmented; distal palpomeres also well expanded as those of maxillary palpi.

Pronotum (Fig. 1) rather large compared with other congeners, semicircular in dorsal view, widest just before the base, clearly wider than head capsule and almost as wide as the humeral width of elytra; anterior margin widely arcuate and produced anteriorly, without forming anterior corner angles; basal angles minutely projected outwards, each forming a minute tubercles, but just before of them more or less constricted; basal margin clearly bisinuate, very narrowly bordered, transversely concave on both sides along the basal margin; disc relatively and closely punctate, with very shallow medio-longitudinally furrow; epipleura relatively wide, with widely expanded ventral margins. PW/HW 2.22; PW/PL 1.67; PL/PW 0.60; PW/EHW 1.00.

Scutellum (Fig. 1) relatively large, triangular with rounded apex.

Elytra (Fig. 1) complete and rather wide, conjointly about 1.7 times as long as wide; the sides widely arcuate, feebly dilated posteriorly, and then gradually convergent towards rounded apices, distinctly dehiscent, narrowly margined throughout including suture; lateral margins concealed by humeral portion and invisible dorsally; humeri weakly prominent latero-anteriorly; dorsal surface rugose, irregularly and rather closely punctate; each elytron with rather clearly three costae; elytral epipleura exist but rather narrow, less than 1/3 of elytral length, broadest near the base but gradually narrowed towards the apices. EL/PL 3.67; EL/EW 1.69; EW/PW 1.30.

Hind wings (Fig. 3) complete and normally folded in living state, venations also rather normal in Lampyridae, short and broad, about twice as long as wide, with inner posterobasal angle right and obtuse; apical field very short, less than 0.27 times of total wing length, with vague, oblique anterior macula; radial cell not complete, opened to basal portion; cross-vein r₃ present, rather long but moderately vestigial; r₄ absent; basal portion of RP very long, extending to basal third of wing; R-M loop rather narrow; medial spur (MS) short but straight; medial field with four veins; MP₃₊₄ without basal cross-vein; wedge cell (WC) weakly developed; CuA₁ elongated to CuA₂; anal lobe weakly developed; AP₃ present but rather vestigial; almost all veins rather vestigial and less pigmented, except for only MP₁₊₂ and AA₃ relatively sclerotized. Preepisternum of prothorax very shallow V-shaped or the anterior margin shallowly excavated posteriorly. Lateral sides of metasternum almost straight. Coxae sclerotized as body trunk, contiguous to each other in all pairs; pro- and mesocoxae conical; metacoxae transversely elongate along the whole length of the hind margin of preepisternum + basisternum (cf. Kawashima, *et al.*, 2005, p. 227).

Legs (Fig. 1) relatively short and slender; trochanters spindle-shaped, obliquely attached to fusiform femora; tibiae almost straight but clearly incurved at the bases, moderately flattened dorso-ventrally, each with a very small and simple tibial spurs on inner side of apex; tarsal formula 5-5-5; 1st tarsomeres usually the longest and clavate, dilated towards the apex; 4th bilobed; 5th elongate clavate and incurved. All claws not simple, each with a tooth at base.

Abdomen holoastran type, broad and moderately flattened dorso-ventrally, with seven visible segments in ventral view; sides of basal three segments gradually dilated towards the caudal, and then, gradually convergent towards the distal 7th segment, which is small, rounded triangular with rounded apex. Luminescent organs not recognized from external appearance, hardly luminescent (Kawano, pers. comm.)

Measurements in mm. BL: 5.66; HW: 0.90; PL: 1.20; PW: 2.00; EL: 4.40; EW: 2.60; EHW: 2.00; HTL: 1.10

Distribution. The western tip of Honshu (Yamaguchi Pref.) and the northern part of Kyushu (Fukuoka Pref.).

Adult season. June to July.

Immature stages. Larval stage undescribed formally. The habits of pupa were reported by Kawano (2009).

Remarks. The veins and the other structures of hind wing are basically normal as the genus *Cyphonocerus*. However, it being clearly narrower than elytra, may be unable to flight.

Key to the species of known females of the genus *Cyphonocerus* in Japan

1. Body (dorsal surface) bicolorous, pronotum reddish brown and elytra black.....
.....*C. ruficollis* Kiesenwetter, (Honshu, Shikoku and Kyushu)
- Body (dorsal surface) unicolorous, or not bicolorous at least. 2.
2. Body (dorsal surface) completely black.....
.....*C. watarii* Satô, (the western tip of Honshu and the northern part of Kyushu)
- Body (dorsal surface) dark or blackish brown.....
.....*C. okinawanus okinawanus* Nakane (Okinawa Islands, the middle Ryukyus.)

ACKNOWLEDGMENTS

I wish to express my deep thanks to Dr. T. Kishimoto (Japan Wildlife Research Center, Tokyo) for his critical reading of the original manuscript, and to Mr. K. Kawano (The Firefly Museum of Toyota Town, Shimonoseki) for his supplying valuable a specimen and kind advises in various ways.

要 約

川島逸郎：クロクシヒゲボタル♀成虫の記載。—日本産クシヒゲボタル属 *Cyphonocerus* は、現在までに、日本から6種1亜種が知られている (Jeng *et al.*, 1998; Kawashima *et al.*, 2003; その他)が、雌成虫の形態が記載されているものは2種のみである (Kanda, 1935; 川島, 2009)。最近になって、川野敬介氏 (豊田ホタルの里ミュージアム) により、クロクシヒゲボタル *C. watarii* Satô, 1991 の雌成虫が山口県において採集され、筆者に形態研究を託されたことから、本論著において、その外部形態を初めて記載した。また、日本産本属における既知の雌成虫について、種への検索表を付した。クロクシヒゲボタル雌成虫の後翅は、翅脈相を含めてほぼ完全で、正常に畳まれてはいたが、その面積は上翅よりもむしろ狭く、飛翔は不可能であろうと推察される。

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