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Halobates pangantihoni nov.sp. (Hemiptera, Gerridae), a new sea skater from Mindoro, Philippines

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A b s t r a c t : A new sea skater, *Halobates pangantihoni* nov.sp. from the Philippines, is described. It belongs to the *Halobates regalis* species group and is compared with the other two Philippine species of this group, *H. dianae* ZETTEL, 2001 and *H. liaoi* ZETTEL, 2005.

K e y w o r d s : Heteroptera, Halobatinae, *Halobates*, new species, Philippines.

Introduction

This paper presents the description of a new Philippine sea skater, genus *Halobates* ESCHSCHOLTZ, 1822, as part of a long-term project dealing with marine Gerromorpha (e.g., PANGANTIHON et al. 2019). Although the taxonomy of *Halobates* is well studied since the revision by HERRING (1961), in previous studies on the Philippine fauna (ZETTEL 2001, 2005) two new species of the *Halobates regalis* group (sensu ANDERSEN & WEIR 1994, CHENG 2008, ROMÁN-PALACIOS et al. 2018) have already been described. A further new species discovered at the coast of Mindoro and described as new in this paper belongs to the same species complex.

In their splendid and comprehensive study on *Halobates*, ANDERSEN & CHENG (2004) listed four *Halobates* species from the Philippines. One year later, ten species were included in a species key for the Philippines (ZETTEL 2005) presenting new species records and including two oceanic species from offshore marine territories. Complete distribution data were presented by ROMÁN-PALACIOS et al. (2018).

Material and methods

This study is based on a total of 79 adult specimens. Nymphs from the same locality were not examined. Specimens were glued on card boards, pinned, or deposited in 70% alcohol.

Acronyms of repositories:

NHMW .....Natural History Museum, Vienna, Austria

PNM .....Philippine National Museum, Manila, the Philippines

UPLB.....Museum of Natural History, University of the Philippines, Los Baños, Laguna, Philippines

ZCW .....Zettel Collection, Vienna, Austria

ZMUC .....Zoological Museum, University of Copenhagen, Denmark

Terminology follows ZETTEL (2005). A Leica WILD M10 binocular microscope (magnifications up to 128×) was used to examine specimens, take measurements, and prepare verbal descriptions. Measurements (in millimetres) refer to the maximum length or width of the respective structure, if not stated otherwise. Measurements were taken from the holotype (male) and a randomly selected paratype (female); ranges for a reduced set of structures are given for ten other paratypes of each sex.

Images: Stacked digital images (Figs 1-4) were taken with a Leica DFC450 camera attached to a Leica Z16APO optics carrier, using Leica Application Suite V3.8. Images were stacked with ZereneStacker 64-bit and processed with Adobe Photoshop 7.0. Drawings (Figs 5-14) were made by using a camera lucida fixed to a Leica WILD M10 binocular microscope. The map (Fig. 15) was manually edited with Adobe Photoshop 7.0.

Taxonomy

Halobates pangantihoni nov.sp. (Figs 1-11, 15)

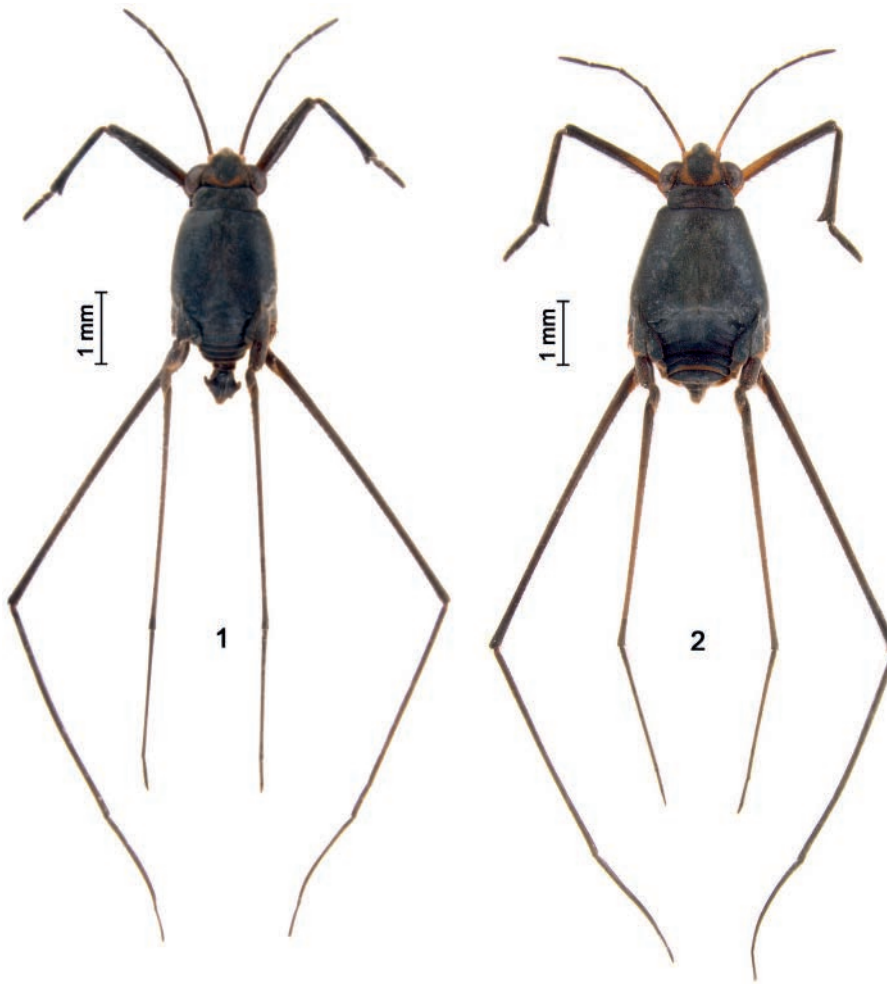
T y p e m a t e r i a l : Holotype (male; PNM) from the Philippines, Oriental Mindoro, Calapan City, Silonay, N 13°24', E 121°14', leg. C. V. Pangantihon. Paratypes (NHMW, PNM, UPLB, ZCW, ZMUC): 37 males, 41 females, collected with the holotype.

D i a g n o s i s : Blackish, small species (body length 3.5-4.0 mm; head width 1.16-1.29 mm). Base of antenna and profemur dark yellowish testaceous. First protarsomere shorter than half the length of second (ca. 0.4 times). – Male: Meso-metanotum without standing setae. Segment 8 subsymmetrical; spiracular processes on both sides angular; styliform processes boot-shaped, right one slightly longer than left one. Proctiger subsymmetrical; lateral processes strongly curved ventrad, short in dorsal aspect, slender in lateral aspect, right one hardly longer than left one. – Female: Meso-metanotum with erect setae anteromedially and posterolaterally. Mesopleuron lacking long white hairs.

D e s c r i p t i o n o f m a l e : Measurements (holotype; range of paratypes: n = 10): Body length 3.60 (3.55-3.73); maximum width (at mesacetabula) 1.50 (1.44-1.58). Head width 1.16 (1.16-1.20); eye distance at hind margin of head 0.67 (0.66-0.70). Lengths of antennomeres, I 1.16, II 0.45, III 0.39, IV 0.45. Pronotum length (median) 0.30 (0.26-0.30), width 0.89 (0.89-0.94). Lengths of leg segments: profemur 1.50, protibia 1.13, protarsus 0.17 + 0.41, mesofemur 4.23, mesotibia 3.12, mesotarsus 1.40 + 0.44, metafemur 3.51, metatibia 1.66, metatarsus 0.50.

Colour: Body mainly black. Head (Fig. 3) posterodorsally with pair of wedge-shaped pruinose marks that are narrowly connected (rarely shortly interrupted) to the yellow antennal sockets along inner eye margins. Mediotergite 7 with narrow yellow hind margin. Ventrally head, prosternum, proacetabula, large triangular marks on mesacetabula, sterna, and most of segment 8 (except apices of styliform processes) yellow. Antenna black; antennomere 1 in dorsal view with yellowish testaceous to brownish base (ventrally lighter). Legs black; coxae and trochanters yellowish, dorsally more or less infuscated; profemur with yellowish-brown base.

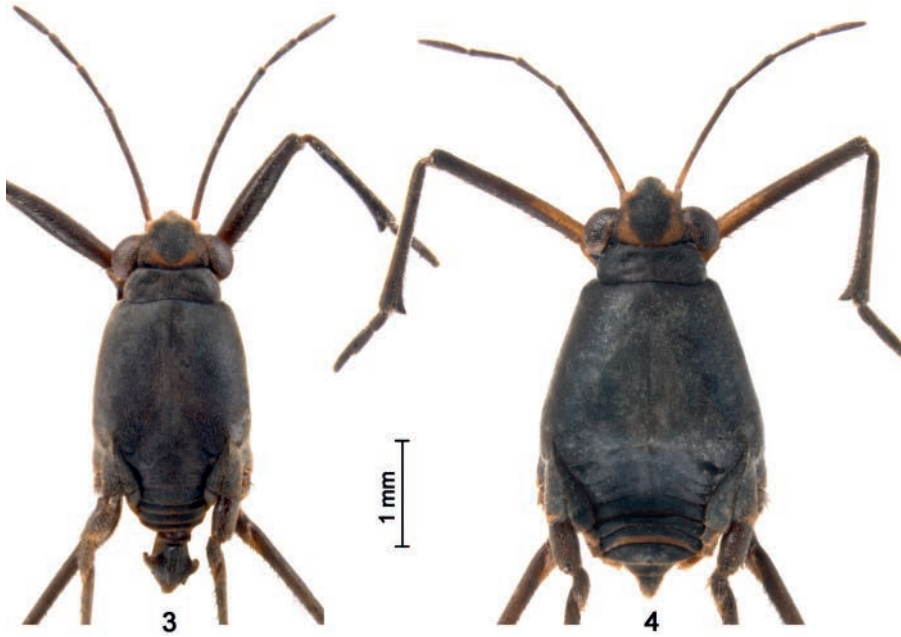
Structural characteristics: Body slender, fusiform (Figs 1, 3). Head much broader than pronotum. Posterior eye distance clearly more than half of head width. Antennomere 1 shorter than 2-4 combined. Pronotum about half as long as head, with a pair of shallow impressions. All thoracic nota without long erect setae (semierect setae on mesonotum up



Figs 1-2: *Halobates pangantihoni* nov.sp., habitus of (**1**) male and (**2**) female.

to ca 0.03 mm long). Anterior width of meso-metanotum slightly shorter than head width. Foreleg (Fig. 5): Profemur slightly incrassate, bearing two rows of stout black setae. Protibia with moderately large distal process. Protarsus hardly longer than half of tibia length, tarsomere 2 ca. 2.4 times as long as 1. Meso- and metatrochanter, meso- and metafemur with numerous black spines; meso- and metatibia with numerous shorter spines. Metatarsomeres fused. Abdomen short; segment 8 protruding. Anterior mediotergites and laterotergites without erect setae.

Segment 8 (Fig. 7): Spiracular processes symmetrical, angular in ventral, slightly tuberculate in dorsal aspect; dorsoposterior margin evenly convex; styliform processes boot-shaped, only slightly asymmetrical, the right one slightly longer than the left one; both constricted at mid-length (in lateral aspect), then moderately widened, apices elongated, narrowly rounded; their bases close together, ventrally bearing long setae.



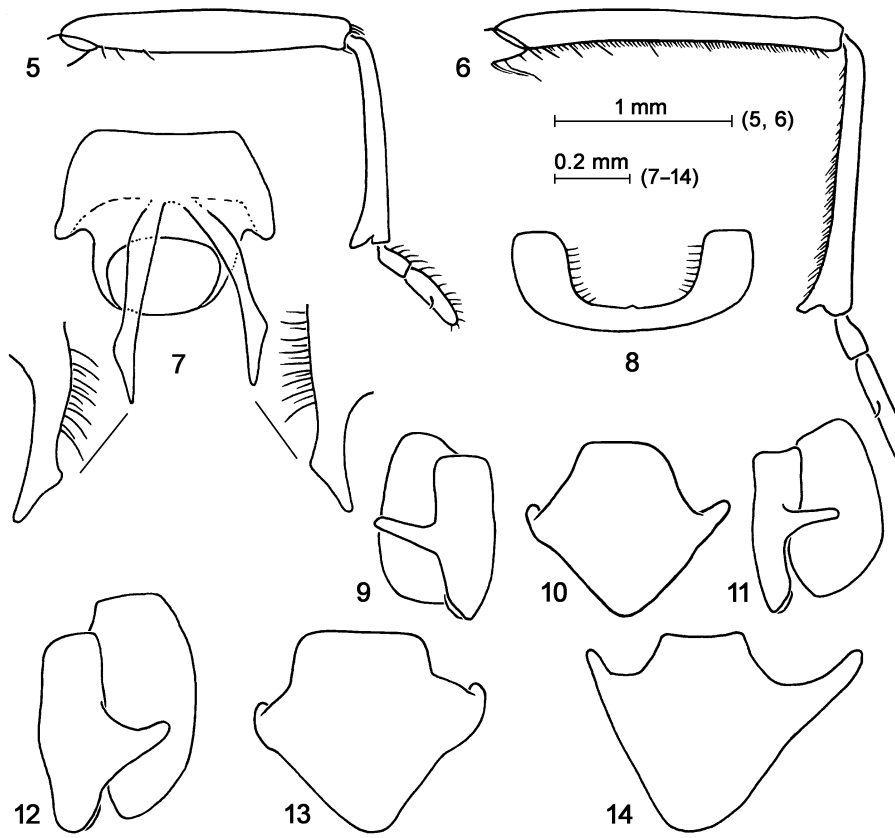
Figs 3-4: *Halobates pangantihoni* nov.sp., body of (**3**) male and (**4**) female.

Pygophore ovate, apically slightly truncate. Proctiger (Fig. 9-11) short, rhomboidal, only slightly wider than long in dorsal aspect, because lateral processes strongly curved ventrally; both subequally long, almost straight and slender.

Description of female: Measurements (range of paratypes: n = 10): Body length 3.74-3.96; maximum width (at mesacetabula) 2.02-2.15. Head width 1.24-1.29; eye distance at hind margin of head 0.70-0.75. Lengths of antennomeres (of one randomly selected paratype), I 1.21, II 0.47, III 0.41, IV 0.50. Pronotum length (median) 0.29-0.32, width 0.95-1.02. Lengths of leg segments (of one randomly selected paratype): profemur 1.82, protibia 1.45, protarsus 0.22 + 0.54, mesofemur 4.81, mesotibia 3.70, mesotarsus 1.56 + 0.47, metafemur 3.87, metatibia 2.02, metatarsus 0.59.

Colour: Similar as in male, except mesosternum largely and metasternum entirely yellow.

Structural characteristics: Body much stouter than in male (Figs 2, 4). Structures of head, antenna, and pronotum similar as in male. Anterior width of meso-metanotum hardly smaller than head width, anteromedially and posterolaterally with areas of rather long (ca. 0.1 mm), erect, black setae; rarely black setae more extended. Metacetabula also with erect black setae. Foreleg (Fig. 6): Profemur slender. Protarsus slightly longer than half of tibia length, tarsomere 2 ca. 2.6 times as long as 1. Pilosity on flexor sides of profemur and protibia longer than in male, setae on extensor side of protarsus only apically. Spines of middle and hindlegs similar as in male. Metatrochanter with a group of long hairs. Abdomen short, apically pointed (Fig. 4). Anterior mediotergites medially with a pair of very shallow, elongate impressions separated by a narrow, very blunt median ridge. Hind margin of sternum 7 (Fig. 8) with wide, concave emargination, in middle hardly visibly protruded, laterally with numerous long whitish hairs.



Figs 5-14: (**5-11**) *Halobates pangantihoni* nov.sp.: Foreleg of (**5**) male (**6**) and female; (**7**) segment 8 of male, ventral aspect, and styliform processes in lateral aspect; (**8**) sternum 7 of female, caudal aspect; (**9-11**) proctiger of male in (**10**) dorsal and (**9**, **11**) lateral aspects, with pygophore. (**12, 13**) Proctiger of *H. dianae* in (**12**) lateral aspect, with pygophore, and (**13**) dorsal aspect. (**14**) Proctiger of *H. liaoi* in dorsal aspect. Pilosity mostly omitted.

C o m p a r a t i v e n o t e s : The natural relationships of the species of *Halobates* have been studied in detail by ANDERSEN (1991), ANDERSEN & WEIR (1994), ANDERSEN & CHENG (2004), CHENG (2008) and ROMÁN-PALACIOS et al. (2018). Following the character analyses by ANDERSEN & WEIR (1994), ANDERSEN & CHENG (2004) and CHENG (2008), *H. pangantihoni* nov.sp. belongs to the *Halobates regalis* group. Most members of this group are easily recognizable by boot-shaped styliform processes of the male's segment 8, which are otherwise only present in *H. robustus* BARBER, 1925, a species from the Galapagos Islands. Hitherto, the *Halobates regalis* group contained ten species; it has a centre of radiation along the coasts of Australia and New Guinea (for distributional data see ROMÁN-PALACIOS et al. 2018). Only two species were previously recorded from the Philippines, *H. dianae* ZETTEL, 2001 and *H. liaoi* ZETTEL, 2005.

Among the species of the *H. regalis* group, only *H. pangantihoni* nov.sp., *H. dianae* and *H. liaoi* share a dimorphism in the pilosity of the meso-metanotum, by erect setae being present only in the females. This character may support a close relationship of the three

Philippine species. Present distributional data suggest that these three species have allopatric species ranges (Fig. 15), but the data are still scarce, except for *H. dianae*.

Halobates pangantihoni nov.sp. and *H. liaoi* can be immediately differentiated by the shape of the proctiger, which possesses a long, laterally directed right process in *H. liaoi* (Fig. 14). In addition, in *H. liaoi* the right styliform process is much longer than the left one, antennomere 1 and profemur are entirely black in both sexes, and the black colour on the thoracic venter of the females is much more extended than in *H. pangantihoni* nov.sp.

The characters of segment 8 and proctiger of the males of *H. pangantihoni* nov.sp. and *H. dianae* are more similar, but in *H. dianae* the styliform processes are stouter (in lateral aspect) and the lateral processes of the proctiger thicker, especially at their bases (Figs 12, 13). Both sexes of *H. dianae* have bright yellow bases of antennomere 1. In the female of *H. dianae* the erect setae are widely distributed over the entire surface of the meso-metanotum, whereas they are often restricted to rather small anteromedial and postero-lateral areas in *H. pangantihoni* nov.sp.; however, this character shows some variation in both species. Further, the female of *H. dianae* possesses long white, oblique hairs posteriorly on the mesopleuron that are lacking in both *H. pangantihoni* nov.sp. and *H. liaoi*.

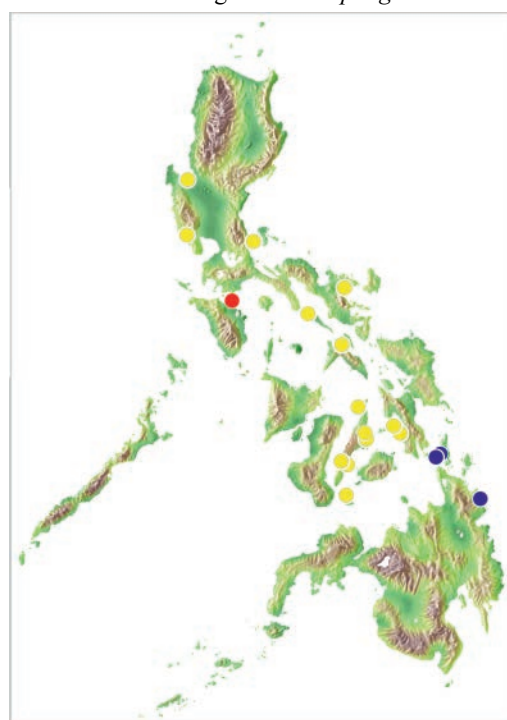


Fig. 15: Map of the Philippines with records (published and unpublished) of species of the *Halobates regalis* group: *H. pangantihoni* nov.sp. (red), *H. dianae* (yellow) and *H. liaoi* (blue).

D i s t r i b u t i o n : Philippines, north-eastern coast of Mindoro (Fig. 15).

H a b i t a t s : The new species was collected from a river mouth bordered by mangroves (C. V. Pangantihon, pers. comm.). It seems that river estuaries and coasts with mangroves

are the preferred habitats of all three Philippine species of the *Halobates regalis* group (comp. ZETTEL 2001, 2005).

E t y m o l o g y : This species is dedicated to its discoverer, Mr. Clister V. Pangantihon, an expert of Philippine aquatic Hemiptera and a skilled collector of marine Gerromorpha.

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Zusammenfassung

Ein neuer Meereswasserläufer, *Halobates pangantihoni* nov.sp., von den Philippinen, wird beschrieben. Er gehört in die *Halobates regalis*-Artengruppe und wird mit zwei weiteren philippinischen Spezies dieser Gruppe, *H. dianae* ZETTEL, 2001 und *H. liaoi* ZETTEL, 2005, verglichen.

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