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***Hyphovatus* gen.n. from Southeast Asia, with description of two new species**

(Coleoptera: Dytiscidae)

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Abstract

Hyphovatus gen.n. from Southeast Asia and two new species, *H. manfredi* sp.n. (Thailand) and *H. prapatensis* sp.n. (Sumatra) are described. *Hyphydrus dimorphus* BISTRÖM (described from Thailand) is transferred to the new genus and designated as its type species. A key to the species is included.

Key words: *Dytiscidae*, *Hyphovatus*, *Hyphydrus*, new genus, new species, taxonomy, Thailand, Indonesia, Sumatra

Introduction

Material collected by Dr. Manfred Jäch (Naturhistorisches Museum, Wien) in Southeast Asia in 1988 and 1990 contained several males of *Hyphydrus dimorphus* BISTRÖM (originally described after one female) and male specimens of two new species. Subsequent studies revealed that *H. dimorphus* and the two undescribed species belong to a new genus described below.

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***Hyphovatus* gen.n.**

Type species: *Hyphydrus dimorphus* BISTRÖM, 1984

Diagnosis: *Hyphovatus* undoubtedly belongs to the *Hyphydrini*, exhibiting morphological features characteristic for the tribe. It closely resembles the genera *Hyphydrus* ILLIGER and *Hovahydrus* BISTRÖM. The new genus differs from *Hyphydrus* in having the anterior clypeal margin not distinctly bordered, in the structure of the male genitalia and in lacking a well-sclerotized spermatheca. *Hovahydrus* conforms with the new genus in the unbordered anterior clypeal margin but differs from the new genus in the male genitalia (see BISTRÖM 1982). Some species of *Desmopachria* BABINGTON agree with *Hyphovatus* gen.n. in the shape of the penis but they differ from the new genus in the morphology of the parameres and the anterior clypeal margin. The species of *Allopachria* ZIMMERMANN, *Microdytes* BALFOUR-BROWNE and *Nipponhydrus* GUIGNOT differ from the new genus mainly in the shape of the parameres.

Description: Length: 2.6 - 3.0 mm, width: 1.8 - 2.2 mm.

Habitus: Short-oval, almost globular, without distinct angle between pronotum and elytra, when observed from above.

Head: Testaceous to ferrugineous; clypeus regularly rounded, anterior margin not bordered but narrowly and slightly turned upward in the middle. Punctuation fine and very sparse in the anterior half and sometimes more rugose in the posterior half; microreticulation present on clypeus. Antennae testaceous, slender and simple.

* Contribution to the study of Dytiscidae 63.

Pronotum: Testaceous, ferrugineous along the posterior margin and sometimes along the anterior margin and on the disc. Sides slightly rounded, finely to fairly finely bordered. Punctuation fine and sparse to rugose and dense; microsculpture lacking, except on small areas laterally on the disc in *H. prapatensis* sp.n.

Elytra: Ferrugineous with testaceous markings consisting of a transverse band or a spot near the shoulder and a transverse postmedian band, often separated into spots and a preapical marking. Punctuation varies from moderately fine to coarse; no distinct rows of punctures can be discerned. Surface shiny between punctures, generally lacking microsculpture, except for some very fine wrinkles on small areas near the suture in *H. prapatensis* sp.n. Epipleura finely and sparsely punctate. Pronotal-elytral angle obtuse in lateral view.

Ventral side: Testaceous to ferrugineous; prothorax impunctate; metathorax and metacoxal plates coarsely to extremely coarsely punctate; abdomen finely and very sparsely punctate; shiny, lacking microsculpture.

Legs: Predominantly testaceous, but also ferrugineous; hind legs mostly darkened. External side of metatibia with a distinct row of punctures. Spines of metatibia equal and simple. Metatarsal claws unequal, the outer shorter than the inner one.

Males: Pro- and mesotarsomeres 1 very slightly dilated. Penis with two prongs resembling horns. Parameres wide; the sclerotized part forming an angle near the apex; apex pointed.

Females: Known of *H. dimorphus* only; very similar to male; no sclerotized spermatheca has been found.

Distribution: Southeast Asia (Thailand, Sumatra).

Biology: Slowly running rivulets in forests.

***Hyphovatus dimorphus* (BISTRÖM) comb.n.**

Hyphodrus dimorphus BISTRÖM 1984a: 21; BISTRÖM 1984b: 54.

Type locality: Fang, Thailand.

Holotype ♀: Thailand, Fang, 2.11.1979 (Zoological Museum, Copenhagen).

Material studied: 2 ♂♂, 4 ♀♀, Thailand, Khao Yai National Park, 200 km northeast of Bangkok, slowly running, shadowy brooks east of the headquarters, 1 - 2 m wide, with sandy ground, 14.XI.1988, leg. Jäch (in coll. Naturhistorisches Museum Wien, coll. Zoological Museum Helsinki and coll. Wewalka).

Diagnosis: *Hyphovatus dimorphus* is closely related to *H. manfredi* sp.n. It can be distinguished from the latter by the different colouration, by the more dense elytral punctuation and especially by the male genitalia (fig. 7 - 9): prongs of penis evenly narrowed towards apex (dorsal aspect).

Description: Length: 2.6 - 2.7 mm; width: 1.8 - 1.9 mm.

Habitus: Short-oval, almost globular, angle between pronotum and elytra indistinct when observed from above (fig. 2).

Head: Testaceous; anterior margin rounded, not bordered but narrowly and slightly turned upwards. Antero-medial of each eye with a shallow depression. Punctures fine and sparse, frontally indistinct. Microreticulation distinctly developed along the front margin.

Pronotum: Testaceous, base medially dark ferrugineous, posterior margin narrowly darkened. Sides slightly rounded, clearly bordered. Punctures fairly fine and irregular, more dense near the sides; shiny, lacking microreticulation.

Elytra: Ferrugineous with testaceous markings: a transverse band near the base reaching the side, a transverse band behind the middle reaching the side (sometimes separated into two spots) and an oblique band preapically (fig. 2). Epipleura mainly testaceous. Punctures relatively fine and

sparse. Punctuation of two kinds; coarser punctures about two times as large as finer ones. Both kinds of punctures approximately equally distributed and equally dense (fig. 4), except anteriorly at suture, where coarse punctures dominate. Shiny, lacking microsculpture. Epipleura very finely and very sparsely punctate.

Ventral side: Prothorax testaceous, otherwise testaceous to ferrugineous. Prothorax impunctate; metathorax and metacoxal plates coarsely to fairly coarsely punctate; abdomen finely to very finely and very sparsely punctate; shiny, lacking microsculpture.

Male: Pro- and mesotarsomeres 1 very slightly dilated. Penis with two prongs resembling antlers (figs. 7, 8); parameres (fig. 9).

Female: Very similar to male, no sclerotized spermatheca has been found.

Distribution: Thailand.

Biology: Small, slowly running rivulets.

Hyphovatus manfredi sp.n.

Type locality: Stream in Tham Tharn Lot National Park, western Thailand.

Holotype ♂: "W-Thailand 1990 Tham Tharn Lot NP. N Kanchanaburi (3) leg. Jäch 28./29.11." (in coll. Naturhistorisches Museum, Wien).

Diagnosis: *H. manfredi* sp.n. is closely related to *H. dimorphus*. It can be distinguished from the latter by the different colouration and finer and more sparse elytral punctuation as well as by the male genitalia (figs. 10 - 12): prongs of penis with distinct lateral modifications (dorsal aspect).

Description: Length: 2.7 mm, width: 1.9 mm. Habitus: Short-oval, almost globular, without an angle between pronotum and elytra when seen from above (fig. 2).

Head: Testaceous; anterior margin rounded, not bordered but narrowly and slightly turned upwards. Antero-medial of each eye with a shallow depression. Punctures very fine and very sparse, almost indistinct. Microreticulation distinctly present along the front margin.

Pronotum: Testaceous, base medially dark ferrugineous, anterior and posterior margin narrowly darkened and also on the disc somewhat darker. Sides slightly rounded, clearly bordered. Punctures fairly fine and irregular, more dense near the sides; shiny, lacking microreticulation.

Elytra: Ferrugineous with testaceous markings; a transverse band near the base reaching the side, two spots behind the middle (the outer one reaching the side) and an oblique preapical band (fig. 2). Epipleura mainly testaceous. Punctures relatively fine and sparse. Punctations of two kinds; coarser punctures about three times as large as finer ones. Smaller punctures approximately twice as frequent as coarser ones (fig. 5). Surface shiny, lacking microsculpture. Epipleura very finely and very sparsely punctate.

Ventral side: Prothorax testaceous, otherwise testaceous to ferrugineous. Prothorax impunctate; metathorax and metacoxal plates coarsely to fairly coarsely punctate; abdomen finely to very finely and very sparsely punctate; shiny, lacking microsculpture.

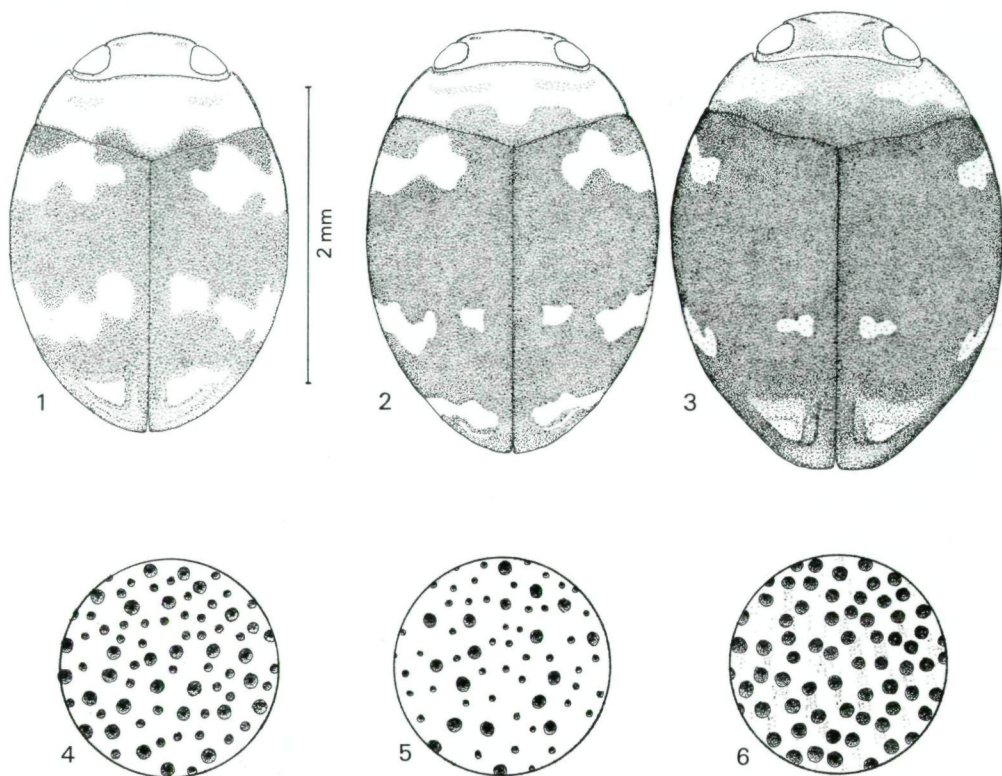
Male: Pro- and mesotarsomeres 1 very slightly dilated. Penis with two prongs resembling antlers (figs. 10, 11); parameres (fig. 12).

Female: Unknown.

Distribution: Thailand.

Biology: Rivulets.

Etymology: The species epithet is derived from the name of Dr. Manfred Jäch, who collected the type material.



Figs. 1 - 6: Body outlines and colouration (1 - 3) and elytral punctations of subbasal medial area (4 - 6): *Hyphovatus dimorphus* (1, 4), ♂ specimen (1a), ♀ specimen (1b); *H. manfredi* sp.n., holotype (2, 5); *H. prapatensis* sp.n., holotype (3, 6).

Hyphovatus prapatensis sp.n.

Type locality: Small river, ca. 3 - 5 m wide, ca. 1000 m a.s.l., flowing through dense forest, between Prapat and Lumban Julu near Lake Toba, northern Sumatra, Indonesia.

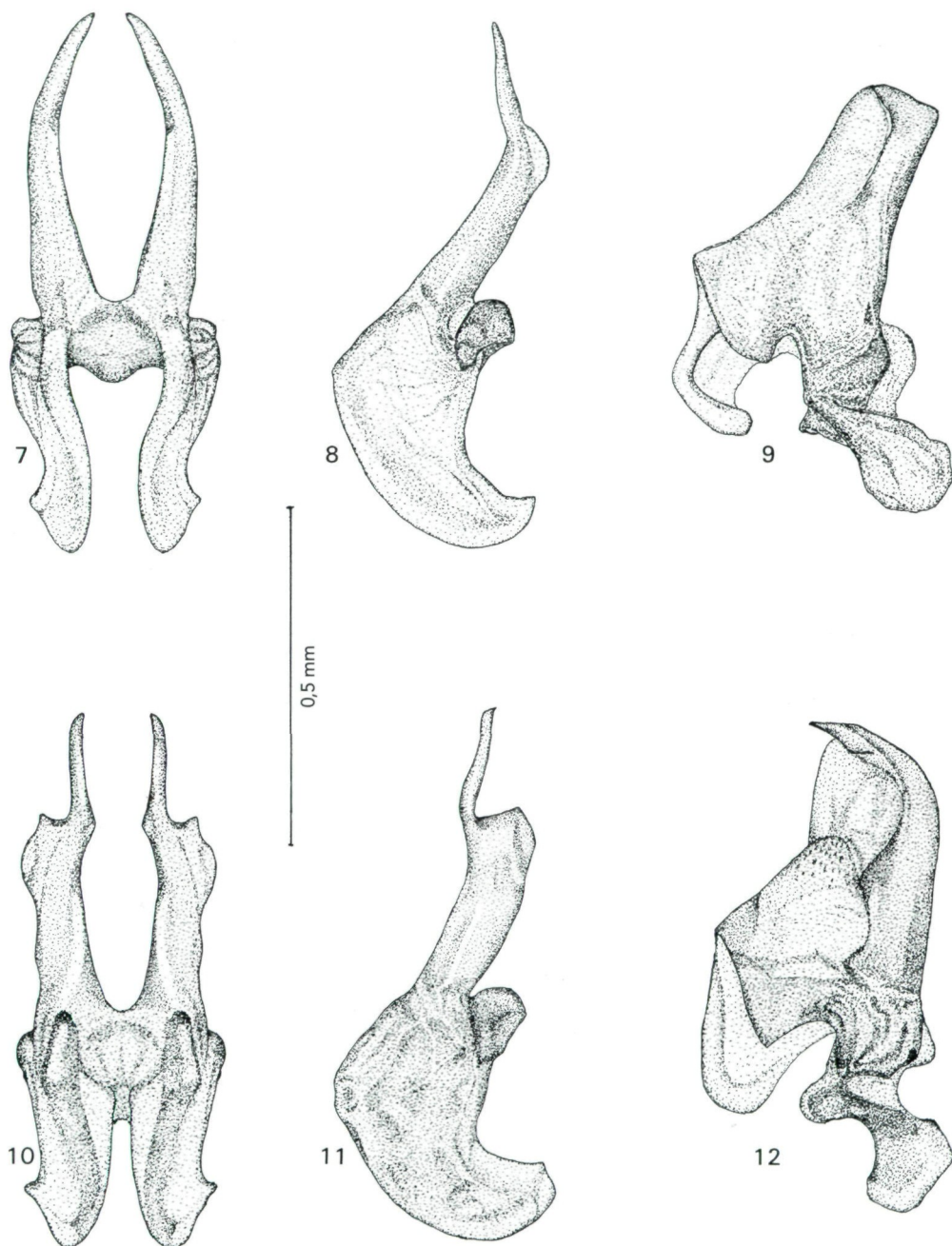
Holotype ♂: "N-Sumatra, 1990 (13) nahe Prapat, ca. 1000 m leg. Jäch, 17.2." (in coll. Naturhistorisches Museum, Wien).

Diagnosis: *H. prapatensis* sp.n. differs from *H. dimorphus* and *H. manfredi* sp.n. in the much coarser punctures on pronotum and elytra and in the elytral punctation consisting of only one kind of punctures; it also differs from these species in the darker colouration of elytra and pronotum and in the coarser punctation on the ventral side.

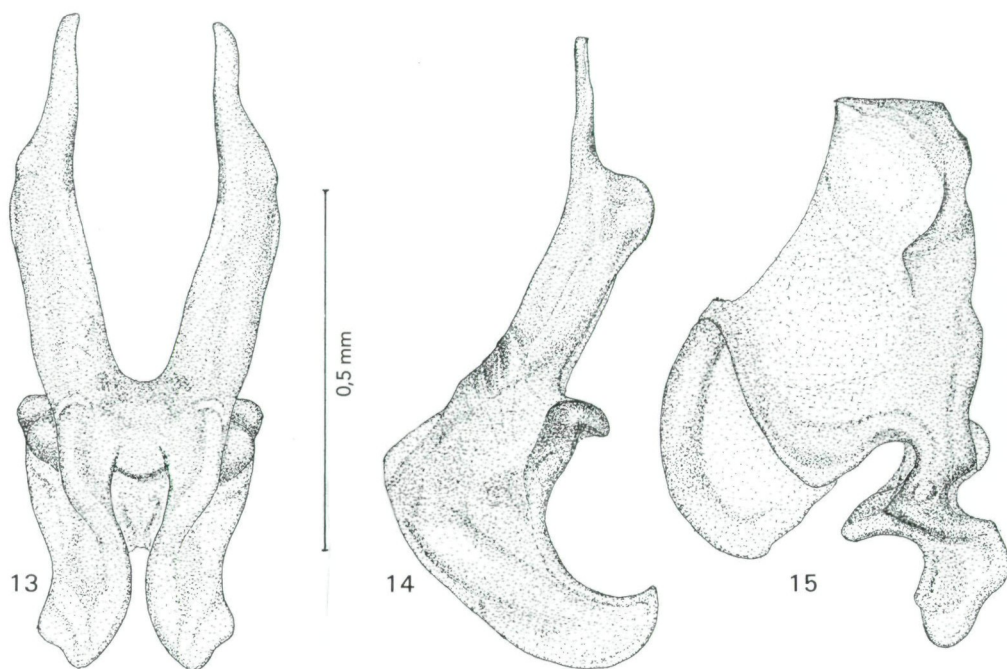
Description: Length: 3.0 mm; width: 2.2 mm.

Habitus: Short-oval, globular, without angle between pronotum and elytra when observed from above (fig. 3).

Head: Testaceous, ferrugineous along the anterior margin and between the eyes; clypeus rounded, not bordered but narrowly and slightly turned upwards in the middle. Antero-medial of each eye with a shallow oblique depression. Punctures very fine and very sparse on the anterior half and much coarser on the posterior half and near the eyes. Microreticulation distinctly present on the anterior third.



Figs. 7 - 12: *Hyphovatus dismorphus* (7 - 9): dorsal (7) and lateral (8) view of penis; right paramere (9); *H. manfredi* sp.n., holotype (10 - 12): Dorsal (10) and lateral (11) view of penis; right paramere (12).



Figs. 13 - 15: *H. prapatensis* sp.n., holotype: dorsal (13) and lateral (14) view of penis; right paramere (15).

Pronotum: Testaceous, anterior margin and the disc darkened, posterior margin broadly ferrugineous. Sides slightly rounded, finely bordered. Punctures coarse and very dense; somewhat rugose along the sides and the anterior and posterior margin; microreticulation lacking, except on a small sublateral area.

Elytra: Ferrugineous with small testaceous markings: a small oblique patch behind the shoulder reaching the side, two small spots behind the middle, the outer one reaching the side and an oblique patch extending preapically (fig. 3). Epipleura partly testaceous. Punctuation of only one kind, punctures coarse and dense (fig. 6), similar to that on the pronotum, less coarse towards the apex. Microsculpture consisting of very fine longitudinal wrinkles along the base and the suture; microsculpture lacking elsewhere. Epipleura punctate, less coarse and more sparse.

Ventral side: Prothorax testaceous, otherwise ferrugineous. Prothorax impunctate; metathorax and metacoxal plates extremely coarsely punctate; abdomen finely and very sparsely punctate; shiny, lacking microsculpture.

Male: Pro- and mesotarsomeres 1 very slightly dilated. Penis with two prongs resembling antlers (figs. 13, 14); parameres (fig. 15).

Female: Unknown.

Distribution: Sumatra.

Biology: Rivulets.

Etymology: The species epithet is derived from the place Prapat, Sumatra, the type locality of the species.

Discussion

When originally describing *Hyphydrus dimorphus* after a single female, BISTRÖM (1984a) stated that the decision to place this species in the genus *Hyphydrus* was provisional and the discovery of further specimens, including males, would show whether a new genus must be described. Accidentally, in the original description (BISTRÖM 1984a) a wrong figure of the habitus was printed. A correction was published later (BISTRÖM 1984b).

An ongoing generic revision of the tribe *Hyphydrini* by the authors will show which characters represent apomorphies for the genus and which are the closest relatives or the sistergroups of the new genus.

Key to species of *Hyphovatus* gen.n.

- 1 Head entirely testaceous; punctuation of pronotum and elytra moderately coarse; elytral punctuation of two kinds (figs. 4, 5) 2
- Head testaceous but ferrugineous between the eyes; punctuation of pronotum and elytra coarse; elytral punctuation of one kind (fig. 6) *prapatensis* sp.n.
- 2 Elytral punctuation relatively sparse; coarser punctures about three times as large as finer ones; finer punctures about twice as abundant as coarser ones (fig. 5) *manfredi* sp.n.
- Elytral punctuation relatively dense; coarser punctures about twice as large as finer ones; both kinds of punctures approximately equally distributed (fig. 4) *dimorphus*

Zusammenfassung

Hyphovatus gen.n., bestehend aus drei Arten - *H. dimorphus* (BISTRÖM), *H. manfredi* sp.n. und *H. prapatensis* sp.n. - wird beschrieben. Vorher war *H. dimorphus* der Gattung *Hyphydrus* zugeordnet. Die neue Gattung ist in Südostasien verbreitet. Die zwei neuen Arten werden beschrieben, deren Habitus und deren männliche Genitale werden abgebildet und ein Bestimmungsschlüssel wird geliefert.

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