



International Journal of Zoological Investigations

Contents available at Journals Home Page: www.ijzi.net



ISSN: 2454-3055

Hydrovatus Motschulsky with Description of a New Species (Coleoptera: Dytiscidae: Hydroporinae) from Southern India

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Received: 6th October, 2020

Accepted: 9th November, 2020

Published online: 11th November, 2020

<https://doi.org/10.33745/ijzi.2020.v06i02.013>

Abstract: A new species *Hydrovatus vaziranii* n.sp. in the genus *Hydrovatus* Motschulsky (Dytiscidae: Hydroporinae) is described from south India. A key is provided to the seven species of the genus *Hydrovatus* belonging to the confertus group along with eighteen species currently known from India based on the morphological characters.

Keywords: Coleoptera, Dytiscidae, *Hydrovatus*, Apomorphy, Synapomorphy, Plesiomorphous

Citation: Senthil Kumar G., Kalaimagal P. and Issaque Madani J.: *Hydrovatus* Motschulsky with description of a new species (Coleoptera: Dytiscidae: Hydroporinae) from Southern India. Intern. J. Zool. Invest. 6 (2): 338-342, 2020. <https://doi.org/10.33745/ijzi.2020.v06i02.013>

Introduction

Hydrovatus Motschulsky is a species-rich genus with members occurring throughout southern India, Asia. A Catalogue prepared by Nilsson (2013) in which 205 species occupied the delimitation of zoogeographical regions as applied in the Afrotropical, Australian, Nearctic, Neotropical, Oriental, Pacific and Palearctic. The genus *Hydrovatus* belonging to the confertus group along with eighteen

species in which seven species are discussed now. Sharp (1882) includes the two genera *Hydrovatus* and *Queda* Sharp. Wolfe (1988) proposed unification Methlini and *Hydrovatus*, on the basis of some morphological similarities. Régimbart (1895), Guignot (1945, 1959) and Omer-Cooper (1957) have worked on the various species of *Hydrovatus* from Africa and Madagascar, Franciscolo (1979)

and Zaitzev (1972) dealt with the fauna of Europe and Palearctis, Régimbart (1899) and Vazirani (1970) dealt with the species from Oriental region. The Australian species were described by Watts (1978). Young (1956, 1963) discussed the fauna of America.

Biström (1996) has provided a complete taxonomic survey of *Hydrovatus* with diagnoses and descriptions of all recognized taxa and keys for the identification of adults. In this study, a new species *Hydrovatus vaziranii* n.sp. in the genus *Hydrovatus* Motschulsky (Dytiscidae: Hydroporinae) is described from south India.

Materials and Methods

The aquatic adephagan beetles *Hydrovatus* were collected from ponds near Kancheepuram. The D-Frame net (300 mm x 400 mm x 330 mm) with a mesh size of 0.5 mm was used for collection. The collected water beetles were preserved in 70% alcohol. Observations were made with Zm 45 TM complete zoom stereo trinocular microscope. The abdomen was carefully detached and placed in a warm solution of 10% KOH for about 10 min and washed in distilled water before dissection. The male genitalia (penis and parameres) were mounted on a card along with the insect in euparal. To make illustrations camera lucida was used. The genitalia were preserved in small vials together with the specimen in 70% alcohol as suggested by Biström (1996).

ZSI : Zoological Survey of India, Chennai. Z.S.I. Regd. No. : I/CL/7 dated 24.5.2006

Results

Key to the species of Hydrovatus – confertus group from India:

1. Male with stridulation apparatus.....2

- Male without stridulation apparatus.....*H. vaziranii* sp.n.
2. Antenna of male modified.....4
 Antenna of male not modified3
3. Punctuation on elytra quite dense.....*H. pinguis* Régimbart
 Punctuation on elytra sparse.....*H. sinister* Sharp
4. Male antenna with segments 4-11 not equally broad5
 Male antenna with segments 4-11 equally broad.....*H. stridulus* Biström
5. Stridulatory files consist of 18-22 strongly built, elevated ridges.....*H. subtilis* Sharp
 Stridulatory files consist of many minute discernable ridges.....6
6. 5th - 7th antennal segments enlarge.....*H. confertus* Sharp
 4th - 6th antennal segments enlarged.....*H. obtusus* Motschulsky

New species

Hydrovatus vaziranii Kumar, Kalaimagal and Madani, new species

Type locality: India, Tamil Nadu, Kancheepuram, Orikkai, 76 Km N Chennai.

Material examined: Holotype: ♂ 1 ex. (ZSI) ; Allotype: ♀ 1 ex. ; Paratypes: 5 ex. ; India: Tamil Nadu, Kancheepuram District, Orikkai (Palar river), 76 Km N Chennai, (N 11° 00' to 12° 00' latitudes and 77° 28' to 78° 50' longitudes) 13. xi. 2004, 6 ex.; Kilambi, 28. x. 2012, 2 ex. ; Oragadam, 27. viii. 2013, 5 ex.

Diagnosis: *Hydrovatus vaziranii* is closely related to *H. subtilis* in the antennal modification, dense punctuation on pronotum and elytra. It differs from *H. subtilis* in the absence of stridulatory apparatus; *H. subtilis* shows antennal segments 4-11 enlarged and 7th segment somewhat expanded; in the new species *H. vaziranii* the antennal segments 3-11 are enlarged, 4 and 5 are expanded; the apex of penis is hammer shaped in the lateral aspect.

Description: Length (TL): 2.5-2.9 mm, breadth: 1.5-1.9 mm. Form elongate-oval, narrow, not enlarged in the middle of elytra, apex acuminate.

Head: Rufo-ferruginous, clypeus feebly raised anteriorly, rebordered and sub-straight; the distance between the eyes not exceeding 2½ times of the maximum width of one eye; maxillary palpus and antenna ferruginous; maxillary palpus not modified; antennal segments of 3-11 enlarged, 4 and 5 segments extremely enlarged; punctuation fine and sparse, punctures separated 3-4 times of their own diameter, a series of punctures along the inner margin of eyes; reticulation fine with distinct hexagonal meshes (Fig. 1).

Pronotum: Rufo-ferruginous, anteriorly little narrower, antero-lateral angles of the pronotum slightly produced with pointed edges bearing 3 spines; transverse row of punctation along the anterior margin and also a transverse row of large setiferous punctures along the anterior margin; reticulation distinct with hexagonal meshes (Fig. 2).

Elytra: Rufo-ferruginous, without markings, sub-marginal striae from the sub-base to apex, medially intermittent, lateral marginal stria from apex to middle provided with a row of long cilia; punctation fine and double in which large ones are sparse and small ones dense separated by their own diameter, a longitudinal row of punctures along the sutural margin; reticulation as similar to head and pronotum; apices acuminate (Fig. 3).

Ventral side: Ferruginous, stridulatory apparatus absent; punctation on meso and metasternum deep; 1st and 2nd abdominal sternites with a row of small hairs.

Male genitalia: Penis narrowed towards the crochet apex (Fig. 4); parameres broader proximally and narrow towards the apex, well-sclerotized apical hook bent downwards and apically with cilia (Fig. 5).

Legs: *Proleg* ferruginous, coxa more or less sub-rounded; trochanter small, sub-triangular with 6 setae; femur long and slender, dorsally a row of tiny spines; tibia long and slender, distally dilated, spurs equal; first three tarsal segments weakly dilated with suckers, a pair of equal claws (Fig. 6).

Mesoleg: ferruginous, coxa somewhat sub-rounded; trochanter sub-triangular; femur long and slender; tibia long and slender, distally dilated; first three tarsal segments dilated, ventrally with suckers, claws equal (Fig. 7).

Hind leg: ferruginous, coxa wide and flattened; trochanter triangular, smooth; femur long and slender, strongly built and flattened, dorsal and ventral sides smooth; tibia long and slender, distally more or less dilated, tibial spur single; tarsal segments more or less equal in length, claws equal (Fig. 8).

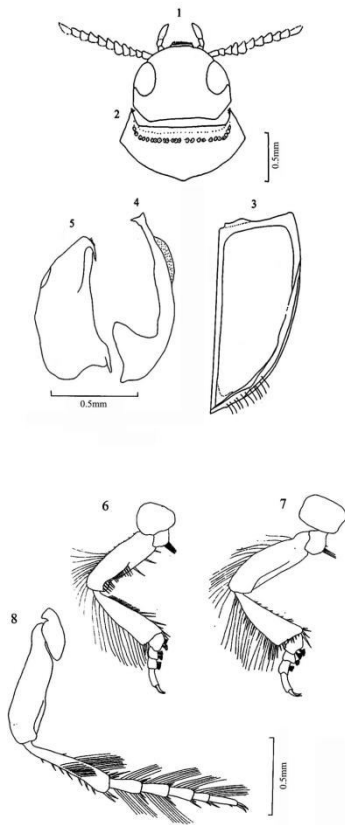
Etymology: This species is respectfully dedicated to Dr. T.G. Vazirani a pioneer aquatic Coleopterist from India.

Habitat: This species was collected in small river line steams, river lets, lakes, ponds mostly in shallow, stagnant shore parts.

Distributions: India, Tamil Nadu, Kancheepuram, Orikkai, Oragadam.

Discussion

The antenna of males of *Hydrovatus* shows much variation. In *Hydrovatus* a number of species have unmodified and slender



Figs. 1-8: *Hydrovatus vaziranii* sp. nov. (Holotype- ♂); 1 --head; 2--pronotum; 3--elytra; 4--penis - lateral aspect; 5-- paramere - lateral aspect.; 6-- posterior face of proleg; 7—mesoleg; 8 -- hindleg.

antennae but many species are with a variable number of enlarged and modified antennal segments. However the female antenna is always slender and unmodified. Antennal modifications are observed in *Hydrovatus*, *Queda* and *Laccornis* species (Wolfe and Spangler, 1985; Wolfe and Roughley, 1990). In *Hydrovatus* the modified antenna appears to be scattered among the various species groups. Biström also considered that the presence of modified antenna is an apomorphy (derived state). *H. vaziranii* sp.nov is having the male antenna which is modified and it shares the derived character along with other species (synapomorphy).

Biström (1996) is of the view that in *Hydrovatus* males the protarsal claws often

exhibit modifications in length, thickness and shape of claws are unequal. But, in *H. vaziranii* sp.nov. the male protarsal claws are equal and simple. This character is perhaps a plesiomorphous (primitive) state.

Haired penis is showing a scattered distribution in Hydradephagans. In *H. acuminatus* the penis is haired, which is an apomorphous state. In *H. vaziranii* sp.nov. the penis is nude, unlike *H. acuminatus*. Biström (1996) is of the opinion that this character of penis has evolved separately in different lineages in Dytiscidae.

The appearance of penis in *H. vaziranii* sp.nov. clearly indicates that the opinion of Biström (1996) can be accepted. An apically

strongly bent penis is observed in *H. vazirani* sp. nov., as found in many *Hydrovatus* species. This character is considered to be an apomorphic state. The observations on the specimens collected strongly indicate that it deserves to be assigned a new species.

Acknowledgement

The authors are grateful to the management of The New College, Chennai-14, India, for providing the space and encouragement to carry out the present work. The help rendered by Dr. G. Thirumalai, Scientist-E, Joint director and Officer-in-Charge, Southern Regional Station, Zoological Survey of India, Chennai-28, is acknowledged sincerely with thanks for his constant encouragement and critical analysis of the work.

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