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Two new species of Indian diving beetles of the genus *Neptosternus* SHARP 1882 (Coleoptera: Dytiscidae)

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A b s t r a c t : *Neptosternus annettae* sp. n. and *Neptosternus leyi* sp. n. are described from Southern India. The first species is similar to *N. starmuehlneri* WEWALKA 1973 [Sri Lanka] but differs by its distinct coloration and the form of the median lobe. The second new species resembles *N. horai* VAZIRANI 1953 [India] but differs from the latter in size, coloration and form of the male genitalia. Both species are rheobionts, and here we provide data on their habitats, including a summary of the water beetle communities recognized. The distribution of all Indian and Sri Lankan species is outlined briefly. Twelve species of the genus are now known from the Indian subcontinent.

K e y w o r d s : Coleoptera, Dytiscidae, *Neptosternus*, new species, India, habitats.

Introduction

The genus *Neptosternus* SHARP 1882 is confined to the Afrotropical and Oriental regions. It currently includes 84 species. Southeast Asian representatives were most recently revised by HENDRICH & BALKE (1997). The fauna of that region has been updated several times since (BALKE et al. 1997; BALKE & HENDRICH 1998; HENDRICH & BALKE, this volume). A total of 56 species are now known from SE Asia.

The first keys to the Indian and Sri Lankan *Neptosternus* species were published by VAZIRANI (1963 & 1968). Additional species were described by WEWALKA (1973), VAZIRANI (1975), HOLMEN & VAZIRANI (1992) and HENDRICH & BALKE (1999). The latter paper summarized the knowledge on and provided a revised key to the Indian fauna. Nevertheless, the Indian species of the genus are in need of a comprehensive revision and many species especially in tropical Southern India are still unnamed. We are currently working on such a revision, which we will however be delayed until more material becomes available from Central and Northern India, two regions which are notoriously undercollected as yet.

The present paper is based on the material collected during a field trip at the end of 1998 by the Czech entomologist David Boukal to the provinces of Kerala and Karnataka in Southern India. The object of this paper is to describe two new species and to give some notes on the habitat of the species. Together with the two new species described herein, twelve species of *Neptosternus* are now known from India and Sri Lanka.

Material and Methods

Specimens mentioned in this work are deposited in several collections which are abbreviated in the text as follows:

CBH..... Collection Michael Balke and Lars Hendrich, Berlin, Germany
 CJS.....Collection Jaroslav Stastny, Usti nad Labem, Czech Republic
 NMW Naturhistorisches Museum Wien, Vienna, Austria
 OLML..... Biologiezentrum/Oberösterreichisches Landesmuseum, Linz, Austria

The habitus drawings were produced by the Berlin artist Peter Adam. The median lobes were traced from SEMs. The style of the descriptive notes follows HENDRICH & BALKE (1995), BALKE et al. (1997) and HENDRICH & BALKE (1999).

Taxonomy

The genus *Neptosternus* SHARP is characterized by two apomorphies: prosternal process trifid (plesiomorphic character state: simple, with only one tip); posterior angles of pronotum greatly produced backwards, needle shaped and acute (plesiomorphic character state: not produced backwards, rounded).

The following species are distributed in India and Sri Lanka:

<i>N. annettae</i> sp.n.	S-India: Kerala
<i>N. biharensis</i> VAZIRANI 1962	E-India: Bihar
<i>N. boukali</i> HENDRICH & BALKE 1999	S-India: Kerala
<i>N. ceylonicus</i> HOLMEN & VAZIRANI 1990	Sri Lanka
<i>N. circumductus</i> RÉGIMBART 1899	C-India: Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttar Pra-desh
<i>N. leyi</i> sp.n.	S-India: Kerala
<i>N. horai</i> VAZIRANI 1953	India: Bihar, Manipur, Tamil Nadu, Kerala, Karnataka
<i>N. kerala</i> HENDRICH & BALKE 1999	S-India: Kerala
<i>N. rajasthanicus</i> VAZIRANI 1975	N- India: Rajasthan
<i>N. sinharajaicus</i> HOLMEN & VAZIRANI 1990	Sri Lanka
<i>N. starmuehlneri</i> WEWALKA 1973	Sri Lanka
<i>N. taprobanicus</i> SHARP 1890	S-India, Sri Lanka

Neptosternus annettae sp. n.

H o l o t y p e : ♂ : INDIA – Kerala, 10 km N Pathanamthitta, Perunad, 28.12.1998, ca. 70 m a.s.l., 09°21' N 76°50' E Boukal leg. (24). **P a r a t y p e s :** 13 specimens, same data as holotype (CBH, CJS, NMW, OLML).

E t y m o l o g y : Named for Annett Lohse (Dresden, Germany) on the occasion of her 30th birthday.

Description: Measurements (N = 10). Total length of beetle 3,85-4,10 mm (holotype 3,90 mm); length without head 3,50-3,75 mm (holotype 3,55 mm); greatest width of beetle 2,05-2,20 mm (holotype 2,1 mm).

Diagnosis: Large, broadly ovate species; body strongly flattened in lateral view.

Colour: Upper side comparatively dark; head ferrugineous; pronotum dark anteriorly and posteriorly, ferrugineous medially; elytron black with one small and two bright yellow patches (Fig. 1). Venter yellowish to castaneous brown, epipleuron ferrugineous anteriorly; appendages yellowish to ferrugineous.

Sculpture: Head covered with polygonal meshes, medially densely punctate. Pronotum densely punctate, some larger punctures visible basomedially; with microreticulation of polygonal meshes along anterior margin and laterally. Elytron with microreticulation consisting of slightly transversely oriented polygonal meshes; fine and densely punctate; some large punctures visible discally between the suture and the discal row of serial punctures. The discal row of serial punctures dense and well defined and almost forming a shallow stria; 1st and 2nd lateral rows less distinct, sutural row not present.

Male: Median lobe of aedeagus as in Fig. 3.

Affinities: *Neptosternus annettae* superficially resembles *S. starmuehlneri* WEWALKA 1973. However the latter species is smaller, more elongate and slightly arched in lateral view. Furthermore the form of the median lobe is more elongate in *N. annettae* whilst it is rather bulbiform in *N. starmuehlneri*. In size the new species is near to *N. leyi* but can easily be distinguished by the elytral colour pattern.

Distribution: Kerala, Southern India. Only known from the type locality.

Habitat: *Neptosternus annettae* was obtained from a large rocky river (Pambiyar river?), 50m wide, up to 1m deep, slowly to moderate flowing, with small "islands" (tops of small rocks, with grass vegetation), and patches of floating aquatic vegetation (cf. *Myriophyllum*) and gravel/silt deposits. Most specimens were collected among floating mats of fine tree roots and plant deposits from a shaded and steep undercut bank. The bottom consisted of sand and few larger stones (Boukal in litt.). The species co-occurs with *Neptosternus boukali*, *N. leyi* sp.n., *N. horai* (all Dytiscidae), *Hydraena* spec. (Hydraenidae), *Pelthydrus* spec. (Hydrophilidae) and *Hydrochus* spec. (Hydrochidae).

Neptosternus leyi sp. n.

Holotype: ♂: INDIA – Kerala, 10 km N Pathanamthitta, Perunad, 28.12.1998, ca. 70 m a.s.l., 09°21' N 76°50' E Boukal leg. (24). **Paratypes:** 12 specimens, same data as holotype (CBH, CJS, NMW, OLML).

Etymology: Named after Wolfgang Ley (Munich, Germany).

Description: Measurements (N = 10). Total length of beetle 3,05 – 3,40 mm (holotype 3,05 mm); length without head 2,75-3,10 mm (holotype 2,75 mm); greatest width of beetle 1,70-1,90 mm (holotype 1,7 mm).

Diagnosis: Small, broadly ovate species; body only slightly arched in lateral view.

Colour: Upper side comparably dark; head ferrugineous; pronotum dark anteriorly and posteriorly, ferrugineous medially; elytron black with one small and three bright yellow patches (Fig. 2). Venter yellowish to castaneous brown, epipleura ferrugineous anteriorly; appendages yellowish to ferrugineous.

Sculpture: Head covered with polygonal meshes, but medially densely punctate. Pronotum densely punctate, some larger punctures visible basomedially; with microreticulation of polygonal meshes along anterior margin and laterally. Elytron with strong microreticulation consisting of transversely oriented polygonal meshes; fine and densely punctate; some large punctures visible discally between suture and discal row of serial punctures. The discal row of serial punctures dense and well defined, almost forming a shallow stria; 1st and 2nd lateral rows less distinct, sutural row not present.

Male: Median lobe of aedeagus as in Fig. 4.

Affinities: With respect to the colouration of the upper side this species rather strongly resembles *N. horai*. However, the latter species is smaller (Total length of beetle 2,80-2,90 mm) and the form of the median lobe is less elongate than in *N. leyi*.

Distribution: Kerala, Southern India. Only known from the type locality.

Habitat: See *N. annettae* sp.n. The species co-occurs with *Neptosternus boukali*, *N. annettae*, *N. horai* (all Dytiscidae), *Hydraena* spec. (Hydraenidae), *Pelthydrus* spec. (Hydrophilidae) and *Hydrochus* spec. (Hydrochidae).

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Zusammenfassung

In der vorliegenden Arbeit werden zwei rheophile Schwimmkäferarten der Gattung *Neptosternus* aus dem Süden Indiens beschrieben: *N. annettae* und *N. leyi* aus der Provinz Kerala. Erstere ist dem *N. starmuehlneri* aus Sri Lanka sehr ähnlich; letztere steht in Form und Farbe dem in Indien weiter verbreiteten *N. horai* sehr nahe. Die Lebensräume der beiden neuen Arten und die dort nachgewiesenen Gemeinschaften aquatischer Käfer werden genau beschrieben. Insgesamt sind jetzt 12 Arten der Gattung aus Indien und Sri Lanka gemeldet.

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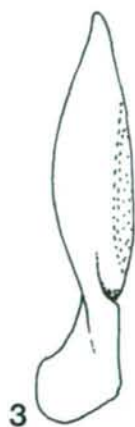
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N. annettae



N. gerdmuelleri



Fig. 1-4: 1 – Habitus and coloration of *Neptosternus annettae* sp. n. **Fig. 2** – Habitus and coloration of *Neptosternus leyi* sp. n. **Figs. 3-4** – *Neptosternus* spp. n., median lobe of aedeagus in ventral view.

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