

A review of the genus *Lacconectus* Motschulsky, 1855 from the Indian subcontinent (Coleoptera, Dytiscidae)

Autor(en): **Brancucci, Michel**

Objekttyp: **Article**

Zeitschrift: **Entomologica Basiliensia**

Band (Jahr): **25 (2003)**

PDF erstellt am: **30.04.2024**

Persistenter Link: <https://doi.org/10.5169/seals-980872>

Nutzungsbedingungen

Die ETH-Bibliothek ist Anbieterin der digitalisierten Zeitschriften. Sie besitzt keine Urheberrechte an den Inhalten der Zeitschriften. Die Rechte liegen in der Regel bei den Herausgebern.

Die auf der Plattform e-periodica veröffentlichten Dokumente stehen für nicht-kommerzielle Zwecke in Lehre und Forschung sowie für die private Nutzung frei zur Verfügung. Einzelne Dateien oder Ausdrucke aus diesem Angebot können zusammen mit diesen Nutzungsbedingungen und den korrekten Herkunftsbezeichnungen weitergegeben werden.

Das Veröffentlichen von Bildern in Print- und Online-Publikationen ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Die systematische Speicherung von Teilen des elektronischen Angebots auf anderen Servern bedarf ebenfalls des schriftlichen Einverständnisses der Rechteinhaber.

Haftungsausschluss

Alle Angaben erfolgen ohne Gewähr für Vollständigkeit oder Richtigkeit. Es wird keine Haftung übernommen für Schäden durch die Verwendung von Informationen aus diesem Online-Angebot oder durch das Fehlen von Informationen. Dies gilt auch für Inhalte Dritter, die über dieses Angebot zugänglich sind.

A review of the genus *Lacconectus* Motschulsky, 1855 from the Indian subcontinent (Coleoptera, Dytiscidae)

by Michel Brancucci

Abstract. A review of the species found on the Indian subcontinent is given. 21 species are recognised, 5 of which are described as new: *Lacconectus splendidus* sp.nov. from Meghalaya, *L. pacholatkoii* sp.nov. from Karnataka, *L. munnarensis* sp.nov. from Kerala, *L. blandulus* sp.nov. from Kerala and *L. satoi* sp.nov. from Kerala. The aedeagi and parameres are illustrated, as well as the colour pattern when required. New records and notes on previously described species are also included.

Key words. Coleoptera – Dytiscidae – *Lacconectus* Motschulsky, 1855 – Indian subcontinent – new species – distribution

Introduction

Since my revision of the genus *Lacconectus* Motschulsky, 1855 (BRANCUCCI 1986), much new material of this genus has been collected all over the Oriental Region (BRANCUCCI 1987, 1989, 2002, 2003; NILSSON 1995, NILSSON et al. 1995, HENDRICH 1998). So far as the Indian subcontinent is concerned, no less than 21 species are now recognised, 5 of which are described as new species in this paper. The present distribution of these species is as follows: Assam and Meghalaya (5), Nepal, Sikkim and West Bengal (4), Maharashtra (1), Orissa (1), southern India (8), and Sri Lanka (2). Most of the descriptions of new species are based on numerous specimens from different localities. This suggests that these species are abundant and more or less widespread, and also indicates that many parts of this country are still poorly investigated. The genus *Lacconectus* now includes 58 species.

Material

The material on which this paper is based is located in the following collections:

LH Lars Hendrich coll., Berlin
 NMB Naturhistorisches Museum Basel
 NME Naturkundemuseum Erfurt (Dr. Matthias Hartmann)
 NMW Naturhistorisches Museum Wien (Dr. Manfred Jäch)
 SMTD Staatliches Museum für Tierkunde, Dresden (Dr. Olaf Jaeger)

Taxonomy

Lacconectus holzschuhi Brancucci, 1986

Lacconectus holzschuhi Brancucci, 1986: Entomologica Basiliensia 11: 104.

Material examined. Nepal, Bagmati, Kathmandu V., Sundarijal, 20–24.VI.1989, M. Brancucci (1 ex., NMB). E Nepal, Thamur V., Dhankuta-Hile, 24–25.V.1983, M. Brancucci (1 ex., NMB). Nepal, Annapurna Mts, NO

Pokhara, 2000 m, 15.V.1993, leg. J. Schmidt (1 ex., SMTD). Nepal, Annapurna Mts, N-Pokhara, Garlang, 1500 m, 25.VII.1995, leg. O. Jäger (5 ex., SMTD). Nepal, Annapurna Mts, N. Pokhara, Garlang, 2000 m, 26.VII.1995, S. Fabrizi, J. Schmidt & O. Jäger (30 ex., SMTD and NMB). Nepal, Pokhara, Phewasee, S-Ufer unterh. Dhara, kl. tempor. Bach/ Kolk, 800–850 m, 8.V.2001, O. Jäger (6 ex., SMTD and NMB). India, Darjeeling Distr., Suruk, Baghi Tar, 700 m, 19.VII.1985, Chr. J. Rai (3 ex., NMB).

Distribution. Nepal, India: Sikkim.

Remarks. Described from the Pokhara region of Nepal, this species has been collected in abundance in that area. The few new records from central Nepal, eastern Nepal and Sikkim suggest that it may be more widespread than originally thought.

The specimens from Sikkim represent a new record for India.

Lacconectus nicolasi Brancucci, 1986

Lacconectus nicolasi Brancucci, 1986: Entomologica Basiliensia **11**: 119.

Material examined. Nepal centr., Pokhara, 3.VI.1992, Ivo Jenis (numerous specimens, NME, NMB). Nepal, Annapurna Mts, NO Pokhara, 2000 m, 15.V.1993, leg. J. Schmidt (2 ex., SMTD). Nepal Himalaya, SE-Annapurna mts., NO-Pokhara, Madi-Khola Tal, Waldbach b. Bhaise, 850 m, 15.V.1996, O. Jäger (3 ex., SMTD, NMB). Nepal, Pokhara, 800m, 30.V.–I.VI.1996, leg. Ahrens, Kulbe, Rulik (40 ex., SMTD). Nepal, Mt. Panchase, 15 km west. Pokhara, öst. exp. Bach nahe Sindhane, 1500–1700 m, 15.V.1997, O. Jäger. (13 ex., SMTD, NMB). Nepal Himalaya, S-Annapurna mts., 20 km W Pokhara, unterh. Mt. Panchase, 1800 m, 16.V.1997, torrent/bank, leg. Jäger (9 ex., SMTD, NMB). Nepal Himalaya, 20 km W Pokhara, Mt. Panchase, NE slope, 2000 m, 18.V.1997, torrent/bank, leg. Jäger (5 ex., SMTD, NMB). Nepal, Mt. Panchase, west. Pokhara, südl. exp. Bach oberh. Tute, 1900 m, 22.V.1997, O. Jäger. (8 ex., SMTD). Nepal, Pokhara, Phewasee, S-Ufer unterh. Dhara, kl. tempor. Bach/ Kolk, 800–850 m, 8.V.2001, O. Jäger (34 ex., SMTD and NMB). Nepal, Annapurna-Region, südwestl. Mardi Himal, temp. Bach zwischen Khara und Pothana, 1950 m, 9.V.2001, O. Jäger (7 ex., SMTD and NMB). Nepal, Kosi, Khandbari, 27°22' N, 87°12' E, river S of Bote Bash, 1000–1550, 2.VI.2001, NHMB-Basel Expedition to Nepal (2 ex., NMB). Nepal, Kosi, Chichila, 27°28' N, 87°14' E, 1900–2000 m, 4–5.VI.2001, NHMB-Basel Expedition to Nepal (6 ex., NMB). Nepal, Kosi, Num, 27°33' N, 87°17' E, 1550 m, 11.VI.2001, NHMB-Basel Expedition to Nepal (2 ex., NMB).

Distribution. As stated in the original description: “Nepal and India: Sikkim, West Bengal.”

Lacconectus sikkimensis Brancucci, 1989

Lacconectus sikkimensis Brancucci, 1989: Mitt. Schweiz. Ent. Ges. **62**: 109.

Material examined. India, Sikkim, Burthok, 8.IV.1990, Bhakta B. (numerous specimens, NMB).

Remarks. This species seems to be restricted to Sikkim.

Lacconectus biswasi Brancucci, 1986

Lacconectus biswasi Brancucci, 1986: Entomologica Basiliensia **11**: 121.

Material examined. NE India, Meghalaya, Nokrek n.p., 3 km S. Daribokgiri, 25°27'N, 90°19'E, 1400 m, 26.IV.1999, L. Dembický & P. Pacholátko (56 ex., NMB). NE India, Meghalaya, 30 km E Tura, 25°30' N, 90°14' E, 1150 m, 4.V.1999, L. Dembický & P. Pacholátko (1 ex., NMB).

Distribution. India: Assam, Meghalaya.

Remarks. Described from a single specimen from Assam, I can extend the distribution to Meghalaya where it seems to be very common.

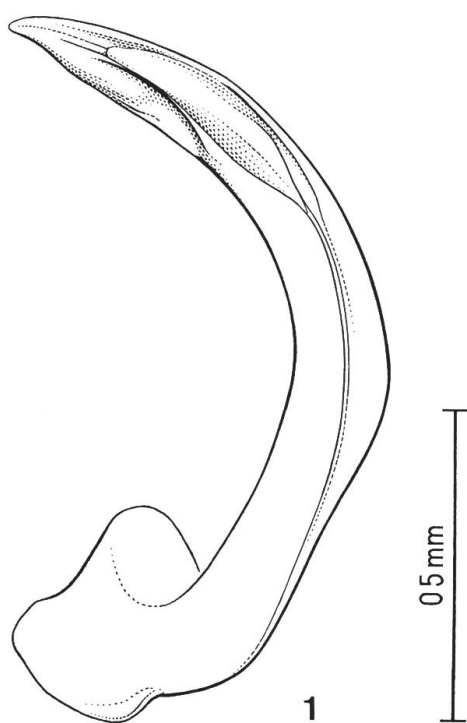
♀: Valvae short, flattened. Seta ventral and subapical.

Total length: 3.8–4.2 mm; width: 2.1–2.4 mm.

***Lacconectus gusenleitneri* Brancucci, 1986**

(Fig. 1)

Lacconectus gusenleitneri Brancucci, 1986: Entomologica Basiliensia 11: 102.



Material examined. NE India, Meghalaya, 9 km NW Jowai, 25°30'N, 92°10'E, 1400 m, 12.IV.1999, L. Dembický & P. Pacholátko (1 ex., NMB). NE India, Meghalaya, Nokrek n.p., 3 km S. Daribokgiri, 25°27'N, 90°19'E, 1400 m, 26.IV.1999, L. Dembický & P. Pacholátko (121 ex., NMB). NE India, Meghalaya, 30 km E Tura, 25°30' N, 90°14' E, 1150 m, 4.V.1999, L. Dembický & P. Pacholátko (4 ex., NMB)

Distribution. India: Assam, Meghalaya.

Remarks. This species was described from a single ♂ specimen from Assam, Garo Hills (BRANCUCCI 1986). The aedeagus was slightly damaged at its apex and the illustration was completed with a dotted line. The discovery of a further specimen from Meghalaya enables me to complete the illustration. The tip of the aedeagus in lateral view is slightly curved ventrally (Fig. 1).

♀: Valvae long, flattened. Seta lateral and subapical.

Total length: 4.6–5.2 mm; width: 2.6–2.9 mm.

A new record for Meghalaya.

Fig. 1. *Lacconectus gusenleitneri* Brancucci: aedeagus in lateral view.

***Lacconectus splendidus* sp.nov.**

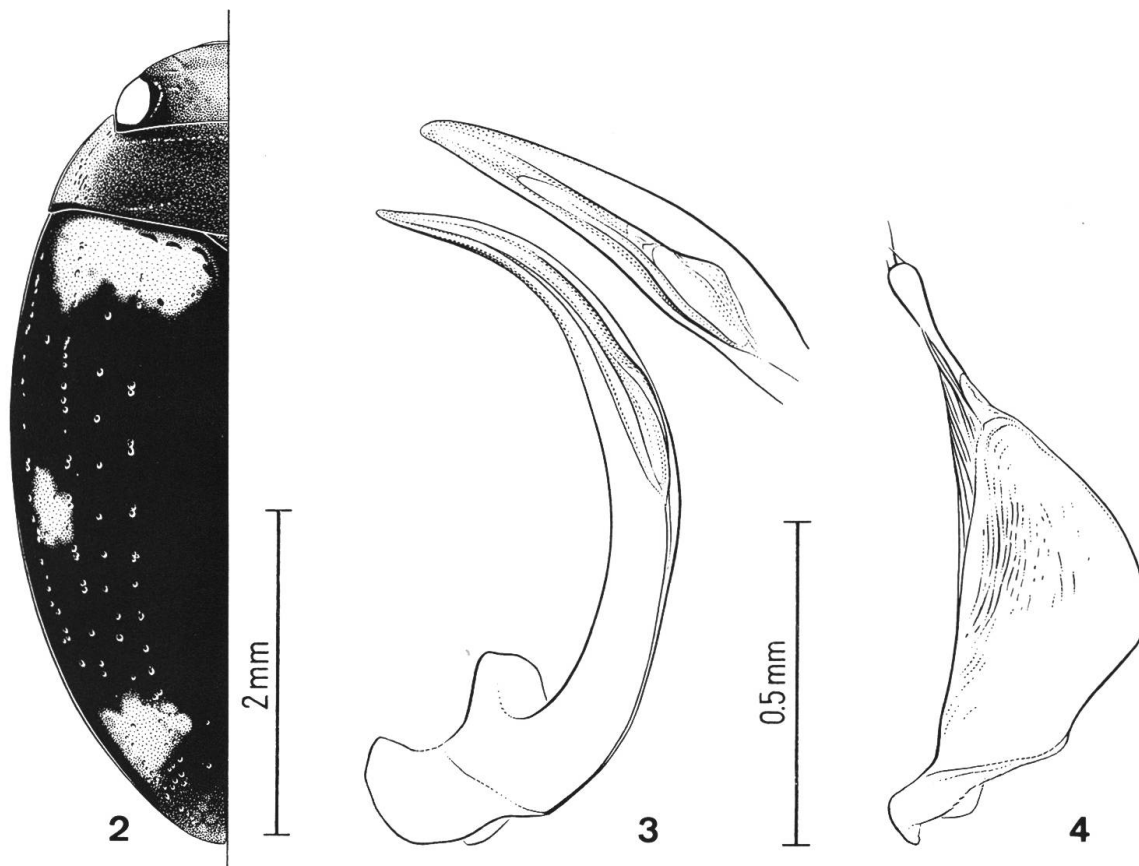
(Figs 2–4)

Material examined. Types: Holotype ♂ (NMB) and 4 paratypes (1 ♂ and 4 ♀; NMB): India, Meghalaya, Nokrek n.p., 3 km S. Daribokgiri, 25°27'N, 90°19' E, 1400 m, 26.IV.1999, L. Dembický & P. Pacholátko.

Description. Body oval, glossy, dark brown with testaceous markings.

Head dark brown, darker alongside eyes, ferrugineous on anterior half. Surface sculpture consisting of small but distinctly impressed rounded meshes and of minute punctures, particularly numerous on disc. Clypeal grooves, a row of punctures alongside eyes and a transverse depression beside eyes weakly impressed. Antennae testaceous; joints slender, the fifth 2 times as long as broad.

Pronotum dark brown, broadly ferrugineous at sides, glossy. Microsculpture consisting of small, polygonal and well-impressed meshes and of numerous minute punctures surrounded by more or less distinct petal-like meshes. Longitudinal median



Figs 2–4. *Lacconectus splendidus* sp. nov.: 2, habitus; 3, aedeagus in lateral and dorsal view; 4, right paramere.

suture distinctly visible although superficial. Anterior rows with medium-sized, well-impressed but not coalescing punctures. Punctures at middle of each latero-basal quarter and alongside lateral margins medium-sized; the former not numerous and sparse. Lateral margins finely bordered, the furrow broadly interrupted before anterior margin.

Elytra dark brown with a subbasal band laterally that is broadly interrupted before epipleura, a postmedian and a preapical spot testaceous (Fig. 2). Epipleura ferrugineous-brown. Microsculpture consisting of small polygonal meshes and of sparse minute punctures surrounded by petal-like meshes and distinctly visible up to apex; meshes more superficially impressed at base. Sutural row with some punctures on apical third and with one or two punctures on basal two-thirds. Discal row with well-spaced groups of medium-sized punctures on basal two-thirds. Sublateral rows with medium-sized and broadly-spaced punctures. A few larger punctures present in the interspaces between discal and sublateral rows.

Underside and legs ferrugineous-brown. Prosternal process broad, 1.5 times as long as broad, distinctly bordered at sides and broadly rounded at apex. Metacoxal lines represented only by deep and short stria at their mid-length. Metacoxae distinctly microreticulate; meshes large. Sternites 3, 4 and 5 very superficially reticulate, each with

sparse medium-sized and minute punctures on the middle. Anal sternite almost smooth with an oblique row of coarse and coalescent punctures on both sides of the middle. Posterior margin distinctly bordered and broadly rounded.

♂: Aedeagus, in lateral view, broadly curved, gently tapered as far as apical 3/4, where it is narrowed and curved. Apical part triangular, ending in a rounded apex (Fig. 3); in dorsal view, it is evenly tapered right up to apex. Right paramere broad (Fig. 4).

♀: Similar to ♂. Valvae elongate, cylindrical; seta subapical.

Total length: 4.9–5.1 mm; width: 2.7–2.8 mm.

Distribution. India: Meghalaya.

Differential diagnosis. This species is very closely related to *L. andrewesi* Guignot, 1952. It can be distinguished by its habitus which is more elongate (more broadly oval in *L. andrewesi*) and by its colour, with the ferrugineous parts less extensive. It also has more distinct elytral puncturation, the minute punctures are more numerous and somewhat larger, and the aedeagus is more broadly rounded at apex in dorsal view.

Derivatio nominis. A very beautiful species.

Remarks. The species most closely related to *L. splendidus* sp.nov. is *L. andrewesi*, described from northern Kanara in southern India. There are just a few characters separating these two species. I considered describing this taxon as a subspecies, but finally decided that it must be a species as there is no evidence for subspecific status.

Lacconectus freyi Guéorguiev, 1968

Lacconectus freyi Guéorguiev, 1968: Bull. Inst. Zool. Mus. 28: 39. – BRANCUCCI (1986): Entomologica Basiliensia 11: 153.

Material examined. S. India, Kerala, 15 km SW Munnar, Kallar Valley, 10°02'N, 76°58'E, 1000m, 6.–18.XII.1993, Boukal & Kejval (7) (38 ex., NMW, NMB); idem, coll. Hendrich (33 ex. LH, NMH). S India, Kerala, Kallar Valley, 1250 m, 15 SW Munnar, 10°02'N, 78°58'E, 1.–9.V.1997, L. Dembický & P. Pacholátko (18 ex., NMB). India, Kerala, Kallar Valley, 10 Km WSW Munnar, 10°03'N, 76°58'E, 1100 m, 7.I.1999, D. Boukal (50) (33 ex., NMW, NMB); Idem Coll. Hendrich (8 ex., LH). Idem 5.I.1999 (45) (9 ex., NMW, NMB). India, Kerala, 10 km W. Munnar, Peschadu-Mangulam, 10°04'N, 76°58'E, 1100 m, 6.I.1999, D. Boukal (48) (12 ex., NMW, NMB).

Remarks. This species was described from the Anamalai Hills. The new localities cited below are all situated around that region.

Lacconectus pacholatkoi sp.nov. (Figs 5–7)

Material examined. Types: Holotype ♂ (NMB) and 372 paratypes (139 ♂ and 233 ♀, NMB; 1 ♂ and 1 ♀ NMW); locality: S. India, Karnataka, W. Ghats, 18 km E Shiradi, Gundia, 12°47'N, 75°43'E, 200–500 m, 16.–21.V.2002, P. Pacholátko. 9 paratypes (3 ♂ and 3 ♀, NMW; 2 ♂ and 1 ♀, NMB): S. India, Kerala, Kallar Valley, 15 km SW Munnar, 10°02'N, 76°58'E, 1000m, 6.–18.XII.1993, Boukal & Kejval (7); 19 paratypes (7 ♂ and 9 ♀, LH; 2 ♂ and 1 ♀, NMB): Idem, Coll. Hendrich. 47 paratypes (23 ♂ and 15 ♀, NMW; 4 ♂ and 5 ♀, NMB): S-India, Kerala, Cardamon-Hills, 50 km NW Pathanamthitta, nr. Pambaiyar river, hygropetr., 09°25'N, 77°05'E, 300 m, 27.–29.XII.1993, Kejval & Boukal (12). 17 paratypes (4 ♂ and 9 ♀, NMW; 3 ♂ and 1 ♀, NMB): India, Kerala, 30.XII.1998, 30 km NNE Trivandrum, 400 m, Kallar Bridge, 08°45'N,

77°05'E, D. Boukal (26). 7 paratypes (1 ♂ und 5 ♀ ex., NMW; 1 ♂, NMB): India, Kerala, 1.1.1999, 30 km NNE Trivandrum, 400 m, Kallar Bridge, 08°45'N, 77°05'E, D. Boukal (35). 4 paratypes: (1 ♂ and 2 ♀, NMW; 1 ♂, NMB): India, Kerala, Kallar Valley, 10 Km WSW Munnar, 10°03'N, 76°58'E, 1100 m, 5.I.1999, D. Boukal (45).

Other material¹⁾: S-India, Kerala, Cardamon hills, Kallar Valley, 15 km SW Munnar, 10°02' N, 76°58' E, 6.–18.XII.1993, 1000 m, Boukal & Kejval leg./Coll. Hendrich (3 ex., LH). India, Kerala, Kallar Valley, 10 km WSW Munnar, 1100 m, 7.I.1999, 10°03' N, 76°58' E, leg. Boukal, Coll. Hendrich (l. 50) (1 ex., LH, NMB).

Description. Body oval, glossy, ferrugineous-brown with testaceous markings.

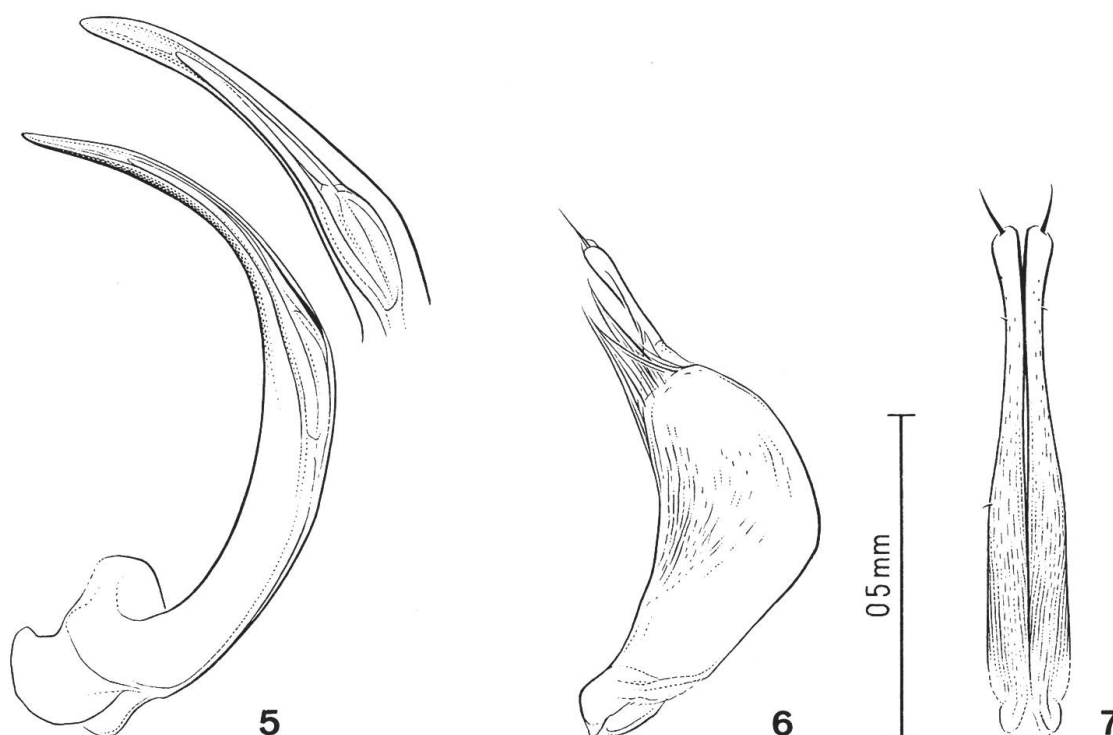
Head ferrugineous-brown, slightly paler on disc, glossy. Surface sculpture consisting of small but distinctly impressed and rounded meshes and of sparse minute punctures, particularly numerous on disc. Clypeal grooves, a row of deep punctures alongside eyes and a transverse depression beside eyes weakly impressed. Antennae testaceous; joints slender, the fifth 2.1 times as long as broad.

Pronotum ferrugineous-brown, somewhat darker on disc, glossy. Microsculpture consisting of small, rounded and well-impressed meshes and of sparsely-distributed minute punctures. Longitudinal median suture scarcely superficial. Anterior rows with medium-sized but well-impressed punctures, more spaced on middle. Punctures at middle of each latero-basal quarter and punctures alongside lateral margins medium-sized. Lateral margins distinctly bordered, furrow broadly interrupted before anterior margin.

Elytra ferrugineous-brown, with testaceous markings consisting of a sub-basal band, a postmedian spot and a preapical larger spot. Epipleura testaceous-brown. Microsculpture consisting of small, rounded and well-impressed meshes and of sparsely-distributed minute punctures. The reticulation becomes more superficial towards the rear but is still visible up to the apex. Sutural row with some punctures on apical third and with one or two punctures on basal two-thirds. Discal and sublateral rows with spaced groups of medium-sized punctures. Some larger punctures present in the interspaces between discal and sublateral rows and between sublateral and lateral rows of punctures. Underside and legs ferrugineous-brown. Prosternal process ovoid, 1.4 times as long as broad, bordered at sides and broadly rounded at apex. Metacoxal lines represented only by deep and short stria at their mid-length. Metacoxae distinctly microreticulate. Sternites 3, 4 and 5 superficially reticulate, each with sparse medium-sized punctures on the middle. Anal sternite distinctly microreticulate with an oblique row of coarse and coalescent punctures on both sides of the middle. Posterior margin finely bordered and broadly rounded.

♂: Aedeagus, in lateral view, broadly curved, distinctly tapered in apical half and ending in a narrowly rounded apex; in dorsal view, broadened at the middle and evenly tapered backwards. Apex narrowly rounded (Fig. 5). Right paramere broad (Fig. 6).

¹⁾ Some of the material from the Kallar Valley consists of young imagoes belonging to two different species: *L. pacholatkoi* sp.nov. and *L. freyi*. Mature (or older) specimens of these two species are usually clearly different: *L. freyi* is mostly larger and the elytra are brown with testaceous markings. However, it is difficult to differentiate young specimens where the colour pattern is not clear. Therefore, I preferred not to address these specimens, though determined as *L. pacholatkoi* sp.nov., as paratypes.



Figs 5–7. *Lacconectus pacholatkoï* sp.nov.: 5, aedeagus in lateral and dorsal view; 6, right paramere; 7, valvae of ♀.

♀: Similar to ♂. Valvae cylindrical with a subapical long seta (Fig. 7).

Total length: 4.3–5 mm; width: 2.4–3 mm.

Distribution. India: Karnataka, Kerala.

Differential diagnosis. This species comes near to *L. munnarensis* sp.nov. It can be distinguished by the elytral reticulation which is smaller, and by the aedeagus which in lateral view is much more broadly rounded and strongly tapered just behind middle. The characteristic aedeagus and the small size separate this species from all the other species known to occur in southern India.

L. pacholatkoï sp.nov. is also closely related to *L. freyi* and occurs often even in the same localities. The aedeagus allows an easy identification of the male, the female are however extremely difficult to recognise. *L. freyi* is somewhat larger. The meshes of the reticulation are distinctly polygonal and larger at basal part of elytra in the latter species, much smaller and rounded in *L. pacholatkoï* sp.nov.

Derivatio nominis. I dedicate this species to Petr Pacholátko (Brno, the Czech Republic) who collected this new species in Karnataka.

Remarks. Specimens from Kerala are on average larger than the one of Karnataka. I could however find no evident differences. The study of an abundant material from different localities will surely bring a solution to this remaining question.

***Lacconectus munnarensis* sp.nov.** (Figs 8–10)

Material examined. Types: Holotype ♂ and 13 paratypes (3 ♂ and 6 ♀ NMW; 3 ♂ and 1 ♀, NMB): India, Kerala, Kallar Valley, 10 Km WSW Munnar, 10°03'N, 76°58'E, 1100 m, 7.I.1999, D. Boukal (50). 3 paratypes (2 ♀, NMW; 1 ♂, NMB): S. India, Kerala, 15 km SW Munnar, Kallar Valley, 76°58'E, 10°02'N, 1000m, 6.–18.XII.1993, Boukal & Kejval (7). 8 paratypes (4 ♂ and 3 ♀, LH; 1 ♂, NMB): Idem, Coll. Hendrich. 3 paratypes (1 ♂ and 1 ♀, NMW; 1 ♂, NMB): India, Kerala, 30.XII.1998, 30 km NNE Trivandrum, 400 m, Kallar Bridge, 08°45'N, 77°05'E, D. Boukal (26).

Description. Body oval, semi-matt, dark ferrugineous-brown with testaceous markings.

Head ferrugineous-brown, slightly paler on anterior part, glossy. Surface sculpture consisting of small but distinctly impressed and polygonal meshes and of sparse small punctures, particularly numerous on disc. Clypeal grooves, a row of deep punctures alongside eyes and a transverse depression beside eyes weakly impressed; the latter very small and superficial. Antennae testaceous; joints slender, the fifth 2.2 times as long as broad.

Pronotum ferrugineous-brown, somewhat darker on disc, glossy. Microsculpture consisting of small, polygonal and well-impressed meshes and of many small punctures. Longitudinal median suture scarcely superficial. Anterior rows with medium-sized, well-impressed and coalescent punctures, more spaced on middle. Punctures at middle of each latero-basal quarter and punctures alongside lateral margins medium-sized. Lateral margins very superficially bordered, the furrow invisible on anterior half.

Elytra ferrugineous-brown, with testaceous markings consisting of a broad and irregular sub-basal band, a large, more or less developed, postmedial spot and a preapical oblique band (Fig. 8). Epipleura ferrugineous-brown. Microsculpture consisting of small, polygonal and well-impressed meshes and of sparsely-distributed small punctures; punctures denser on posterior third. Sutural row with some punctures on apical third and with one or two punctures on basal two-thirds. Discal and sublateral rows with spaced groups of medium-sized punctures. A few larger punctures present in the interspaces between discal and sublateral rows and between sublateral and lateral rows of punctures on posterior half.

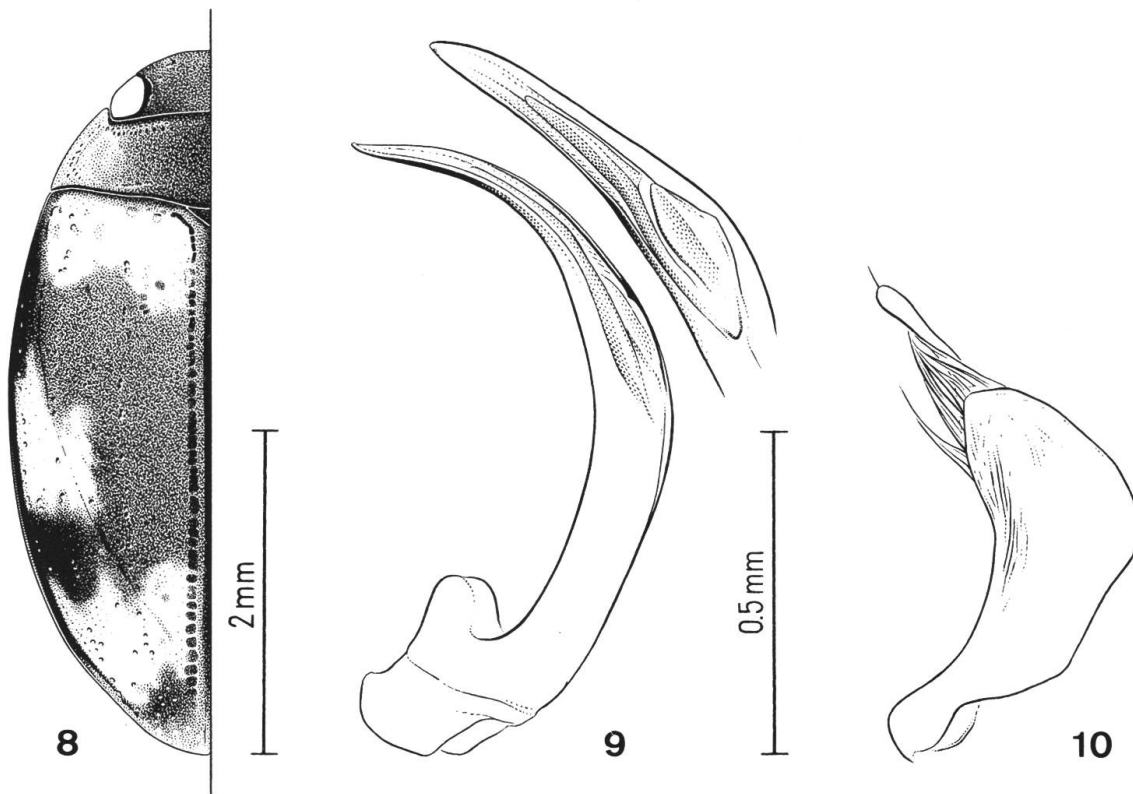
Underside and legs ferrugineous-brown. Prosternal process ovoid, 1.3 times as long as broad, bordered at sides and broadly rounded at apex. Metacoxal lines represented only by deep and very short stria at their mid-length. Metacoxae distinctly microreticulate; meshes large. Sternites 3, 4 and 5 superficially reticulate, each with sparse medium-sized punctures on the middle. Anal sternite distinctly microreticulate with an oblique row of coarse and coalescent punctures on both sides of the middle. Posterior margin finely bordered and broadly rounded.

♂: Aedeagus, in lateral view, broadly curved, distinctly tapered at apical 2/3 and ending in a narrowly rounded apex; in dorsal view, broadened at middle and evenly tapered up to the apex; right margin straight, not concave. Apex narrowly rounded (Fig. 9). Right paramere broad (Fig. 10).

♀: Similar to ♂. Valvae cylindrical, with a subapical long seta.

Total length: 4.1–4.6 mm; width: 2.4–2.6 mm.

Distribution. India: Kerala.



Figs 8–10. *Lacconectus munnarensis* sp.nov.: 8, habitus; 9, aedeagus in lateral and dorsal view; 10, right paramere.

Differential diagnosis. This species is closely related to *L. pacholatkoi* sp.nov. It can be distinguished by its smaller size, by the distinct and characteristic colour of the elytra, by the distinctly larger reticulation of the elytra (meshes larger), by the lateral margins of the pronotum which are very superficially bordered on posterior half and lack the furrow on anterior half. The aedeagus also enables the species to be easily recognised: in lateral view, it is constricted on apical quarter whereas just behind the middle in *L. pacholatkoi* sp.nov.; in the latter it is also more broadly rounded. The right margin of the aedeagus in dorsal view is straight and not concave in *L. munnarensis* sp.nov. This species is quite distinct from all the other species occurring in southern India. With a total length of 4.1–4.6 mm, it is the smallest species from that region.

Derivatio nominis. Named after Munnar (Kerala) where the species was collected.

***Lacconectus blandulus* sp.nov.** (Figs 11–13)

Material examined. Type: Holotype ♂ (NMW): India, Kerala, 30.XII.1998, 30 km NNE Trivandrum, 400 m, Kallar Bridge, 08°45'N, 77°05'E, D. Boukal (26).

Description. Body oval-elongate, glossy, ferrugineous-brown on head and pronotum, dark brown with testaceous markings on elytra.

Head ferrugineous-brown, darker alongside eyes. Surface sculpture consisting of small but distinctly impressed meshes and of minute punctures, particularly numerous on disc. Clypeal grooves, a row of punctures alongside eyes and a transverse depression beside eyes weakly impressed. Antennae testaceous; joints slender, the fifth 1.8 times as long as broad.

Pronotum ferrugineous-brown, distinctly darker on disc and median part, semi-matt. Microsculpture consisting of very small, rounded and well-impressed meshes and of minute punctures surrounded by petal-like meshes. Longitudinal median suture distinctly visible but superficial. Anterior rows with medium-sized but well-impressed punctures. Punctures at middle of each latero-basal quarter and punctures alongside lateral margins medium-sized. Lateral margins finely bordered, the furrow broadly interrupted before anterior margin.

Elytra dark brown with a subbasal band, a postmedian spot, a sublateral longitudinal narrow band and a preapical spot testaceous (Fig. 11). Epipleura completely dark brown. Microsculpture consisting of numerous, evenly distributed minute punctures on a smooth ground. Sutural row with some punctures on apical third and with one or two punctures on basal two-thirds. Discal row with spaced groups of medium-sized punctures on basal two-thirds. Sublateral row with medium-sized punctures, more spaced and grouped towards the rear. Some larger punctures present in the interspaces between discal and sublateral rows.

Underside and legs ferrugineous-brown. Prosternal process ovoid-elongate, 1.5 times as long as broad, distinctly bordered at sides and broadly rounded at apex. Metacoxal lines represented only by deep and short stria at their mid-length. Metacoxae microreticulate. Sternites 3, 4 and 5 very superficially reticulate, each with sparse, medium-sized and minute punctures on the middle. Anal sternite almost smooth with an oblique row of coarse and coalescent punctures on both sides of the middle. Posterior margin distinctly bordered and broadly rounded.

♂: Aedeagus, in lateral view, strongly curved, broadened at the middle and gently tapered up to apical part. Apical part triangular, ending in a narrowly rounded apex; in dorsal view, strongly broadened at the middle and evenly tapered backwards (Fig. 12). Right paramere broad (Fig. 13).

♀: Unknown.

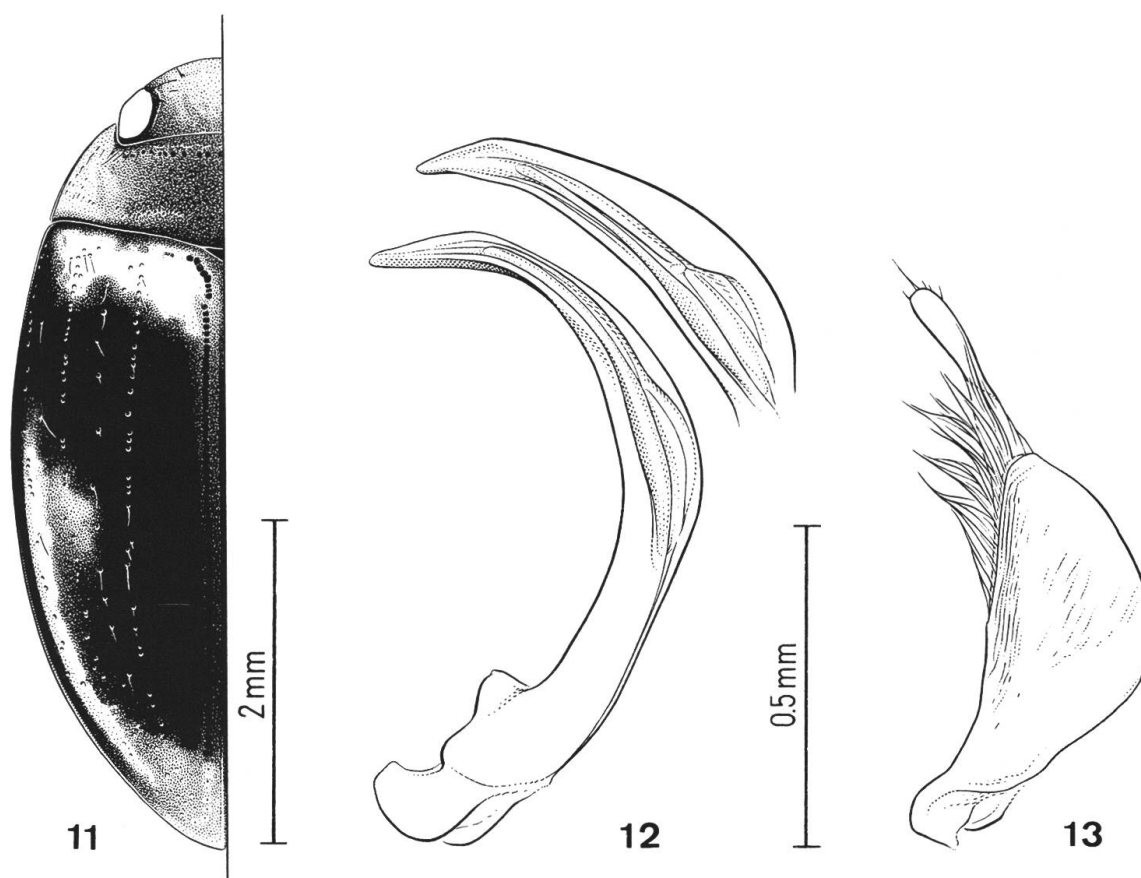
Total length: 4.9 mm; width: 2.6 mm.

Distribution. India: Kerala.

Differential diagnosis. This species is very closely related to *L. lambai* Vazirani, 1977 and both species have a very similar aedeagus. However, the new species can be distinguished by its colour, by its smaller size, and by its aedeagus which is somewhat more strongly curved in the apical part. The type-locality of this species is in the extreme south of India, whereas *L. lambai* was described from Maharashtra.

Derivatio nominis. A beautifully coloured species, compared with *L. lambai*.

Remarks. Although the differences between *L. lambai* and *L. blandulus* sp.nov. are minute, the description of this new species is well-founded. In the light of present knowledge of this genus, and particularly the restricted distribution of most species and their very characteristic habitats (watercourses in low mountains), the two taxa must



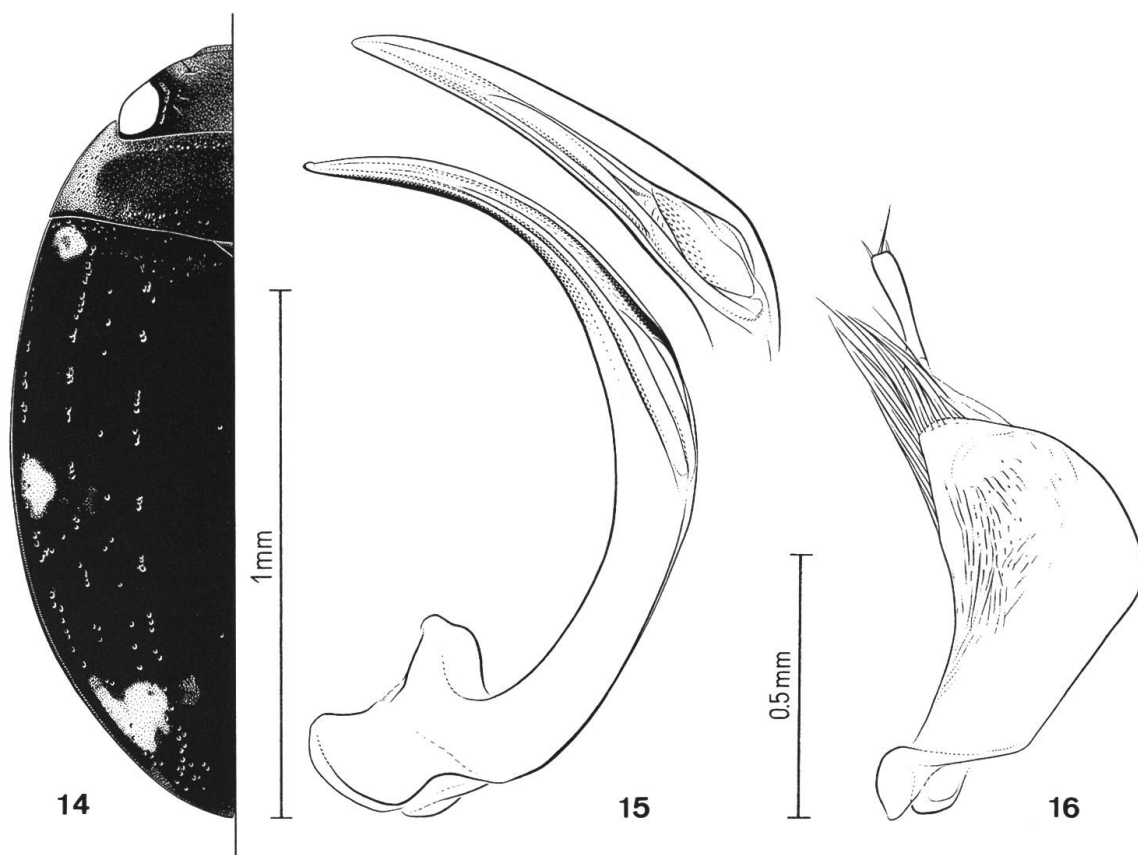
Figs 11–13. *Lacconectus blandulus* sp.nov.: 11, habitus; 12, aedeagus in lateral and dorsal view; 13, right paramere.

have been isolated for very many years; the distance between the two type localities is about 1200 km. All the specimens known from Maharashtra (VAZIRANI 1977, BRANCUCCI 1986) have the same typical testaceous colour, without any distinct markings.

***Lacconectus satoi* sp.nov.** (Figs 14–16)

Material examined. Types: Holotype ♂ (NMB) and 244 paratypes (105 ♂ and 137 ♀, NMB; 1 ♂ and 1 ♀ NMW); locality: S. India, Karnataka, W. Ghats, 18 km E Shiradi, Gundia, 12°47' N, 75°43' E, 200–500 m, 16.–21.V.2002, P. Pacholátko. 3 paratypes (1 ♂ and 2 ♀, NMW; 1 ♂, NMB): S-India, Kerala, Cardamon-Hills, 50 km NW Pathanamthitta, nr. Pambaiyar river, 09°25' N, 77°05' E, 27.–29.XII.1993, 300 m, Kejval & Boukal (12). 37 paratypes (11 ♂ and 19 ♀, NMW; 4 ♂ and 3 ♀, NMB): S. India, Kerala, 15 km SW Munnar, Kallar Valley, 76°58'E, 10°02'N, 1000 m, 6.–18.XII.1993, Boukal & Kejval (7). 21 paratypes (11 ♂ and 7 ♀, LH; 2 ♂ and 1 ♀, NMB): Idem, Coll. Hendrich. 1 paratype ♀ (NMW): India, Kerala, Kallar Valley, 10 Km WSW Munnar, 10°03'N, 76°58'E, 1100 m, 5.I.1999, D. Boukal (45). 2 paratypes (1 ♂ and 1 ♀, NMW): India, Kerala, 1.1.1999, 30 km NNE Trivandrum, 400 m, Kallar Bridge, 08°45'N, 77°05'E, D. Boukal (35).

Description. Body broadly oval, glossy, ferrugineous-brown, disc of pronotum, basal and lateral parts of elytra dark brown (Fig. 14).



Figs 14–16. *Lacconectus satoi* sp. nov.: 14, habitus; 15, aedeagus in lateral and dorsal view; 16, right paramere.

Head ferrugineous-brown, clypeus slightly paler, semi-matt. Surface sculpture consisting of small polygonal, almost rounded and well-impressed meshes and of sparse punctures on clypeus and on anterior part of frons. Clypeal grooves, a row of punctures alongside eyes and a transverse depression beside eyes coarse; the punctures large and deeply impressed. Antennae testaceous; joints short, the fifth 1.4 times as long as broad.

Pronotum ferrugineous-brown, paler at sides, glossy. Microsculpture consisting of small, polygonal and well-impressed meshes and of minute punctures. Longitudinal median suture short and deeply impressed. Anterior and lateral rows coarse. Punctures at middle of each latero-basal quarter large and partly coalescent. Lateral margins finely bordered, furrow broadly interrupted before reaching anterior border.

Elytra glossy, brown with the basal and lateral margins narrowly brownish-black (Fig. 14). Epipleura dark brown. Reticulation consisting of polygonal meshes distinctly visible at base, turning into a fine striolation by the middle and disappearing in the apical region. Elytra with a weakly shagreened lustre towards the rear. Puncturation consisting of minute punctures that are surrounded, particularly in the anterior part, by petal-like meshes. Sutural row of punctures very incomplete, consisting of large and well-spaced

punctures, particularly before middle. Discal and sublateral rows reaching almost to base, punctures large and irregularly distributed in apical third, close together and in a straight line anteriorly. Second interspace with very sparse punctures on apical half.

Underside ferruginous-brown. Prosternal process short, 1.4 times as long as broad, strongly bordered at sides and broadly rounded at apex. Metacoxal lines represented only by deep and short stria at their mid-length. Sternites 3, 4 and 5 each with a few sparse medium-sized punctures. Anal sternite microreticulate with a small depression on each side of the middle. Posterior margin distinctly bordered and broadly rounded.

♂: Aedeagus, in lateral view, evenly curved, almost constant in width, rapidly tapered in apical part and broadly rounded at tip; in dorsal view, it is also evenly tapered and pointed at apex (Fig. 15). Right paramere broad (Fig. 16).

♀: Similar to ♂. Valvae long and very narrow, narrowly rounded at apex. Seta short and lateral.

Total length: 5.1–6.0 mm; width: 3.0–3.4 mm.

Distribution. India: Karnataka, Kerala.

Differential diagnosis. This species is closely related to *L. regimbarti* Brancucci, 1986 but can easily be distinguished by its smaller size, by the meshes and the minute punctures of the elytra which are larger and distinctly more impressed. The aedeagus in lateral view is more curved in the new species, more straight in *L. regimbarti*.

Derivatio nominis. Dedicated to my colleague and friend, Prof. Dr. Masataka Satô, as this manuscript could not be ready for the special “*Satonius*” volume.

Lacconectus regimbarti Brancucci, 1986

Lacconectus regimbarti Brancucci, 1986: Entomologica Basiliensia 11: 160.

Material examined. Vorder-India, Abmednagar, Tiefermann 1914–18 (3 ex., LH, NMB). India, Tamil Nadu, Shevaroy Hills, 5 km SE Cauvery Peak, 11°48' N, 78°16' E, 26.I.1999, 1100 m, D. Boukal (89) (4 ex., NMW and NMB). India, Kerala, 1.1.1999, 30 km NNE Trivandrum, 400 m, Kallar Bridge, 08°45' N, 77°05' E, D. Boukal (35) (1 ex., NMW).

Distribution. India: Tamil Nadu, Kerala.

Lacconectus scholzi Gschwendtner, 1922

Lacconectus simoni var. *scholzi*: GSCHWENDTNER (1922): Ent. Anz. 2: 134.

Lacconectus scholzi: GSCHWENDTNER (1934): Ent. Anz. 14: 53. – BRANCUCCI (1986): Entomologica Basiliensia 11: 162.

Material examined. S India, Tamil Nadu, Kodaikanal, 20 km Madurai, 28.VIII.1989, leg. Riedel (1 ex., LH). India, Tamil Nadu, Palni Hills, Kodaikanal env., Vellagavi, 10°11' N, 77°29' E, 900 m, 13.I.1999, D. Boukal (62) (30 ex., NMW, NMB). Idem, Coll. Hendrich (7 ex., LH, NMB). India, Tamil Nadu, Palni Hills, Kodaikanal-Batlagundu rd., Machur env., 10°16' N, 77°35' E, 1200 m, 16.1.1999, D. Boukal (68). India, Tamil Nadu, Palni Hills, Perumalmalai, 10°16' N, 77°33' E, 1600 m, 12.1.1999, D. Boukal (60) (1 ex., NMW).

Distribution. India: Tamil Nadu.

Key to the *Lacconectus* species of the Indian subcontinent

1. Upper surface smooth, at most microstriolate at base. 2.
- Upper surface distinctly microreticulate or smooth with strong striae. ... 3.
2. Elytra unicolorous testaceous-brown, with the base somewhat lighter.
India (Maharashtra). *Lacconectus lambai* Vazirani
- Elytra dark brown with testaceous markings (Fig. 11).
India (Kerala). *Lacconectus blandulus* sp.nov.
3. Smaller species (3.8–5.6 mm). Elytra testaceous, entirely ferrugineous or with a brown to dark brown pattern and indistinctly delimited pattern. 4.
- Larger species (4.7–7.0 mm). Elytra dark brown to black with a more or less developed testaceous pattern. 15.
4. Elytra glossy; surface sculpture consisting of small, rounded to polygonal, and less impressed meshes. Minute punctures small and sparse, sometimes surrounded by petal-like meshes. 5.
- Elytra semi-matt; surface sculpture coarse, consisting of polygonal and well impressed meshes. Minute punctures always numerous and surrounded by petal-like meshes. 9.
5. Microreticulation on elytra replaced by a striolation on apical third. ♂: Aedeagus not developed dorso-ventrally. ♀: Valvae short, flat and narrow. 6.
- Microreticulation on elytra present and distinct up to apex. ♂: Aedeagus developed dorso-ventrally. ♀: Valvae long and cylindrical. 7.
6. Smaller species (3.8–4.2 mm). Body oval-elongate, ferrugineous-brown; elytral markings not well delimited. ♂: Aedeagus, in lateral view, broadened at apical 3/4.
India (Assam, Meghalaya). *Lacconectus biswasi* Brancucci
- Larger species (4.0–4.7 mm). Body broadly oval, ferrugineous; elytral markings distinctly visible. ♂: Aedeagus, in lateral view, gently tapered from base to apex.
Nepal, India (Sikkim, West Bengal). *Lacconectus nicolasi* Brancucci
7. Smaller species (4.1–5.0 mm). Elytra brown with distinct testaceous markings. Aedeagus, in lateral view, broadly curved and gently tapered up to apex. 8.
- Larger species (4.9–5.4 mm). Body broadly oval. Elytra ferrugineous with a lighter basal band, a postmedian and a preapical spot. ♂: Aedeagus robust, in lateral view, strongly curved at apical third, base prolonged posteriorly.
India (Anamalai Hills). *Lacconectus freyi* Guéorguiev

8. Elytral markings consisting of a testaceous subbasal band, a postmedian and a preapical spot. Meshes at apex of elytra superficial and elongate. ♂: Aedeagus, in lateral view, broadly and regularly curved (Fig. 5).
India (Karnataka, Kerala). *Lacconnectus pacholatkoi* sp.nov.
- Elytral markings consisting of a large dark brown and mottled X-pattern (Fig. 8). Meshes at apex of elytra polygonal. ♂: Aedeagus, in lateral view, strongly curved on apical third (Fig. 9).
India (Kerala). *Lacconnectus munnarensis* sp.nov.
9. Elytra striolate on apical third, meshes at least strongly elongate. 10.
- Elytra distinctly microreticulate up to apex, meshes at most slightly elongate. 12.
10. Body broadly oval, semi-matt. Microreticulation at apex of elytra still recognisable as meshes. Lateral margins of elytra at most very narrowly dark brown. 11.
- Body oval, glossy. Apex of elytra just striolate, meshes imperceptible. Lateral margins of elytra along epipleura dark brown to black. ♂: Aedeagus, in lateral view, strongly curved at its mid-length.
India (Sikkim). *Lacconnectus sikkimensis* Brancucci
11. Pronotum darkened on disc. Underside completely dark brown. ♂: Aedeagus very fine and slender.
Nepal (Rapti valley). *Lacconnectus nepalensis* Brancucci
- Elytra and pronotum uniformly ferrugineous-brown. Underside ferrugineous-brown. ♂: Aedeagus broad and broadly rounded at apex.
Burma, India (Orissa). *Lacconnectus fulvescens* Motschulsky
12. Elytra and epipleura dark brown. 13.
- Elytra and epipleura uniformly ferrugineous-brown to brown.
India (Assam). *Lacconnectus pederzanii* Brancucci
13. Antennal joints slender, the 5th at least 1.5 times as long as broad. 14.
- Antennal joints short, the 5th 1.1 times as long as broad.
India (Assam). *Lacconnectus ovalis* Gschwendtner
14. Smaller species (4.4–4.7 mm). ♂: Aedeagus, in lateral view, narrow and pointed at apex. Right paramere elongate.
Nepal. *Lacconnectus holzschuhi* Brancucci
- Larger species (4.6–5.2 mm). ♂: Aedeagus broad before apex, and narrowly rounded at apex (Fig. 1). Right paramere broad.
India (Assam, Meghalaya). *Lacconnectus gusentleitneri* Brancucci
15. Upper surface smooth or finely microreticulate, never with deep striae. 16.

- Upper surface entirely covered with dense and deep striae on a smooth ground. ♂: Aedeagus pointed at apex.
Sri Lanka. *Lacconnectus simoni* Régimbart
- 16. Elytra distinctly microreticulate. 17.
- Elytra smooth, even at base, at most very superficially microstriolate.
Sri Lanka. *Lacconnectus spangleri* Brancucci
- 17. Smaller species (4.7–5.1 mm). 18.
- Larger, broadly oval species (5.1–7.0 mm). 19.
- 18. Testaceous markings at base of elytra broad, reaching base of pronotum and epipleura.
India (Kanara). *Lacconnectus andrewesi* Guignot
- Testaceous markings at base of elytra not reaching base of pronotum and epipleura (Fig. 2).
India (Meghalaya). *Lacconnectus splendidus* sp.nov.
- 19. Elytra without or rarely with a broad subbasal band. Epipleura ferrugineous at base, dark brown on rest of surface. Microreticulation distinctly impressed, visible up to apex. Apex of aedeagus, in lateral view, not hooked dorsally. 20.
- Elytra with a distinct sub-basal band. Epipleura completely testaceous-ferrugineous. Microreticulation small and superficial, disappearing on apical third. Apex of aedeagus, in lateral view, hooked dorsally.
India (Tamil Nadu, Kerala). *Lacconnectus regimbarti* Brancucci
- 20. Smaller species (5.1–6.0 mm). Elytral microreticulation strongly impressed up to apex.
India (Karnataka, Kerala). *Lacconnectus satoi* sp.nov.
- Larger species (6.4–7.0 mm). Elytral microreticulation weak and superficial on apical third.
India (Tamil Nadu). *Lacconnectus scholzi* Gschwendtner

Acknowledgements

I should like to thank Dr. Manfred Jäch (Vienna), Dr Olaf Jäger (Dresden), Dr. Lars Hendrich (Berlin) and Dr. Matthias Hartmann (Erfurt) for the loan of interesting material collected in India and Nepal. My thanks go also to Adrian Pont (Oxford) for correcting the English of my manuscript. The illustrations for this publication were prepared by Armin Coray, and I thank him for his excellent work.

References

- BRANCUCCI M. (1986): *Revision of the Genus Lacconectus Motschulsky (Coleoptera, Dytiscidae)*. Entomologica Basiliensia **11**: 81–202.
- BRANCUCCI M. (1987): *A New Lacconectus from Thailand (Coleoptera, Dytiscidae)*. Aquatic Insects **9**(2): 93–95.
- BRANCUCCI M. (1989): *Notes on the genus Lacconectus with the description of two new species (Col., Dytiscidae)*. Mitteilungen der Schweizerischen Entomologischen Gesellschaft **62**: 107–111.
- BRANCUCCI M. (2002): *New Lacconectus Motschulsky, 1855 from Indonesia, with notes on several poorly-known species (Coleoptera, Dytiscidae)*. Entomologica Basiliensia **24**: 23–32.
- BRANCUCCI M. (2003): *Dytiscidae: II. Faunistic notes on Lacconectus Motschulsky from China and neighbouring countries, and descriptions of new species*. pp. 95–113. In: JÄCH M. A. & JI L. (eds.): *Water Beetles of China*. Vol. III. Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, Wien. pp. 572+VI.
- GUÉORGUIEV V. B. (1972): *Notes sur les Agabini (Coleoptera, Dytiscidae). II : Révision des genres Platynectes Rég. et Colymbinectes Falk*. Bulletin de l'Institut de Zoologie et Musée **34**: 33–62.
- HENDRICH L. (1998): *Dytiscidae: IV. Notes on Chinese Lacconectus Motschulsky, 1855 with description of a new species from Hainan (Coleoptera)*. pp. 101–105. In: JÄCH M. A. & JI L. (eds.): *Water Beetles of China*. Vol. II. Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, Wien, 371 pp.
- NILSSON A. (1995): *Noteridae and Dytiscidae: An Annotated check list of the Noteridae and Dytiscidae of China*. pp. 35–96. In: JÄCH M. A. & JI L. (eds.): *Water Beetles of China*. Vol. I. Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, Wien, 410 pp.
- NILSSON A., WEWALKA G., WANG L.-J. & SATÔ M. (1995): *An annotated list of Dytiscidae (Coleoptera) recorded from Taiwan*. Beiträge zur Entomologie **45**(2): 357–374.
- VAZIRANI T. G. (1977): *Notes on a collection of Dytiscidae (Coleoptera) from Maharashtra, with description of a new species*. Record of the Zoological Survey of India **73**: 123–133.

Address of author:

Dr. Michel Brancucci
Natural History Museum
Entomology Department
Augustinergasse 2
CH-4001 Basel
SWITZERLAND
E-mail: michel.brancucci@bs.ch

