



Remarks on the genus *Penichrolucanus* Deyrolle, 1863 (Coleoptera: Lucanidae)

Luca BARTOLOZZI^{1,a} & Michele ZILIOI^{2,b}

¹Museo di Storia Naturale dell'Università degli Studi di Firenze,
sezione di Zoologia "La Specola", via Romana 17, I-50125 Florence, Italy;

²Museo Civico di Storia Naturale, Corso Venezia 55, I-20121 Milan, Italy.
E-mails: ^aluca.bartolozzi@unifi.it; ^bmichele.zilioli@comune.milano.it

Abstract. Two species of *Penichrolucanus* are examined: *P. leveri* Arrow, 1938 and *P. sumatrensis* Arrow, 1935. The Lectotype of *P. leveri* is designated. The head characters of the two species are illustrated with Scanning Electron Microscope photos for the first time. Remarks on the distribution of the two species are also given; *P. sumatrensis* is reported for the first time from Borneo and the occurrence of *P. leveri* in New Guinea is confirmed.

Riassunto. Note sul genere *Penichrolucanus* Deyrolle, 1863 (Coleoptera: Lucanidae). Vengono esaminate due specie del genere *Penichrolucanus*: *P. leveri* Arrow, 1938 e *P. sumatrensis* Arrow, 1935. Viene designato il Lectotipus di *P. leveri*. I caratteri del capo delle due specie sono illustrati per la prima volta tramite foto al Microscopio Elettronico a Scansione. Vengono inoltre fornite osservazioni sulla distribuzione delle due specie; *P. sumatrensis* viene citato per la prima volta del Borneo, mentre viene confermata la presenza di *P. leveri* in Nuova Guinea.

Key words. Lucanidae, *Penichrolucanus*, new record, Borneo, Papua New Guinea.

Introduction

The Penichrolucanini is a small tribe of Lucaninae consisting of two genera: *Penichrolucanus* Deyrolle, 1863 in the Old World and *Brasilucanus* Vulcano & Pereira, 1961 in South America.

To date the genus *Penichrolucanus* consists of nine species (BARTOLOZZI, 2015), ranging from Tibet to the Solomon Islands. These small stag beetles are less than 10 mm long, quite rare, and show peculiar morphological modifications: dorso-ventral compression of the body, fusion of tarsal segments, expansion of the ocular canthi, and reduction (in seven species) of the antennal articles from 10 to 8. The strong morphological modifications and some collecting records suggest that the species belonging to this genus are termitophilous.

The genus has been reviewed by RATCLIFFE (1984) and BARTOLOZZI (1989, 2015). In the revision of BARTOLOZZI (2015) a key is given to identify all the nine known species. Concerning *P. leveri* Arrow, 1938, the distribution map given in that paper (BARTOLOZZI, 2015: 394, Fig. 14) did not show any locality in New Guinea, despite the citation of a specimen from that island by CAMMAERTS & BOMANS (1997). The reason of this omission was some doubt concerning the identification of the material in question, since the *locus typicus* of *P. leveri* is located in the Solomon Islands. Thanks to the study of new material we have been able to verify the presence of the species in New Guinea. Further material of *P. sumatrensis* Arrow, 1935 was also available for study and is examined in this paper.

Material and methods

Specimens were studied using a Leica MZ 95 stereomicroscope. The micrographs were taken from uncoated specimens with a Jeol SM5610 LV SEM (Scanning Electron Microscope) at the Milan

Natural History Museum (Italy).

The following entomological collection abbreviations are referenced in the text:

CLB Collection Luca Bartolozzi (Florence, Italy)
 IRSNB Institut Royal des Sciences Naturelles de Belgique (Brussels, Belgium)
 MNHN Muséum national d'Histoire Naturelle (Paris, France)
 NHM Natural History Museum (London, Great Britain)

The labels are quoted *verbatim*; the symbol “/” indicates the end of a label and the beginning of the following one; some remarks are added in square brackets.

Discussion

Penichrolucanus leveri Arrow, 1938

Examined material. 1 male, here designated as Lectotype, with the following labels: Syntype [on a round label with light blue border] // Solomon Is. [printed], Guadalcanal, Mamawa, XI.1931 [handwritten], R.A. Lever [printed], Rotten wood [handwritten] // Brit. Mus., 1938-352 // *Penichrolucanus leveri* Arrow type [handwritten] // *Penichrolucanus leveri* Arrow [handwritten], M.E. Bacchus det. 1975, Syntype [printed] // BMNH(E), #607897 [printed] (NHM); 1 male, here designated as Paralectotype, with the following labels: Syntype [on a round label with light blue border] // Mamawa, Guadalcanal, Rotten wood [handwritten] // British Solomons, Nov. 1931, R.J.A.W. Lever [printed] // Brit. Mus., 1938-352// *Penichrolucanus leveri* Arrow [handwritten], M.E. Bacchus det. 1975, Syntype [printed] // BMNH(E), #607898 [printed] (NHM); 1 female, here designated as Paralectotype, with the following labels: Syntype [on a round label with light blue border] // Solomon Is. [printed], Guadalcanal, Mamawa, XI.1931 [handwritten], R.A. Lever [printed], Rotten wood [handwritten] // Brit. Mus., 1938-352// *Penichrolucanus leveri* Arrow [handwritten], M.E. Bacchus det. 1975, Syntype [printed] //BMNH(E), #607899 [printed] (NHM); 1 male, Papua New Guinea, Madang Prov., South Naru, ± 100m, 12.XI.1989, under bark (IRSNB); 3 females, Papua New Guinea, Gulf, Ivimka Res. Station, Lakekamu Basin, 120m, 7° 44' S 146° 30' E, 18.IV.2000, T. Sears & Binatung Brigade (NHM); 1 male, Solomon Islands, Malaita Island, Maluu, I.2011 (CLB).

Remarks. *P. leveri* belongs to the “*elongatus*” group of species (*sensu* BARTOLOZZI, 1989) having antennae with 10 articles (ARROW, 1938). The species lacks the two small round holes on the tip of the last antennal article which were shown for the first time by BARTOLOZZI (2015).

BACCHUS (1978: 109), while listing the type specimens of Coleoptera Lucanidae in the collections of NHM, did not designate a Lectotype among the three Syntypes of *P. leveri*, neither did BARTOLOZZI (1989) in his first revision of the genus *Penichrolucanus*. We believe that the designation of a Lectotype for this species is necessary for taxonomic purposes, according to article 74.7.3 of the International Code of Zoological Nomenclature (INTERNATIONAL COMMISSION OF ZOOLOGICAL NOMENCLATURE, 1999).

The SEM photos of heads confirm the identity of the specimens from Solomon Islands (Fig. 1) with the one from Madang (Fig. 2). The three specimens from Ivimka Research Station (Gulf Province) are extremely similar, showing only a slightly smoother anterior part of head, but - lacking a male specimen - it is impossible to check the aedeagus and to compare it to that of the Lectotype. For this reason we identify these females as *P. leveri*, awaiting the possibility to study further material in the future.

The published locality record (“Madang Province: Balek Wildlife Sanctuary, alt. 60 m, 12.IX.1989”, CAMMAERTS & BOMANS, 1997) is partially different from what is handwritten on the label under the specimen from IRSNB, but it is certainly the same specimen. We suppose that the correct, more detailed data are those written in the paper, as one of its authors (Roger Cammaerts) was also the collector of the specimen.

Penichrolucanus sumatrensis Arrow, 1935

Examined material. 1 female, Sumatra, Palembang // ex Musaeo W. Möllenkamp, 1913 (MNHN); 1 female, Sumatra: Palembang (MNHN); 1 male, Indonesia: Borneo, Kalimantan Tengah, Busang-

Rekut confl., 0°03' S 113°59' E // Flight intercept FIT5, Brendell & Mendel leg., VIII.2001, 'Barito Ulu 2001', BMNH(E), 2001-191 (NHM).

Remarks. *P. sumatrensis* belongs to the "*copricephalus*" group of species (*sensu* BARTOLOZZI, 1989) having antennae with 8 articles. The species shows (Fig. 3) two small holes on the tip of the last antennal article, as illustrated in BARTOLOZZI (2015) for other species of this group.

This species was described by ARROW (1935) based on a specimen from René Oberthür's collection, now in MNHN. Thanks to the kindness of our colleague Stéphane Boucher (MNHN) we have been able to study a "type series" of this species, consisting of two additional female specimens, all labelled "Sumatra: Palembang". One of the female specimens also has a red "Type" label but it is obvious that these two female specimens are not part of any type series, since the original description is very clear on this matter (ARROW, 1935: 124): "The unique type specimen is the property of. M. René Oberthür". The male holotype was examined by BARTOLOZZI (1989), who illustrated the aedeagus.

By comparison with specimens of *P. sumatrensis*, we have been able to verify that the specimen from Borneo (NHM) also belongs to this species, showing the frontal transversal carina interrupted mid-way and two frontal tubercles (Fig. 4). Borneo is thus a new locality record for the species, and also the first record of the genus for the Indonesian part of the island. The two other species of *Penichrolucanus* known until now for Borneo were *P. copricephalus* Deyrolle, 1863 (ARAYA *et al.*, 1994) and *P. martinii* Schenk, 2006. The first one was reported from Sabah (Kinabalu National Park) and Sarawak (Mt. Serapi; Mt. Bawang; Samunsan); the second one was described from Sabah (Crocker Range) (SCHENK, 2006).

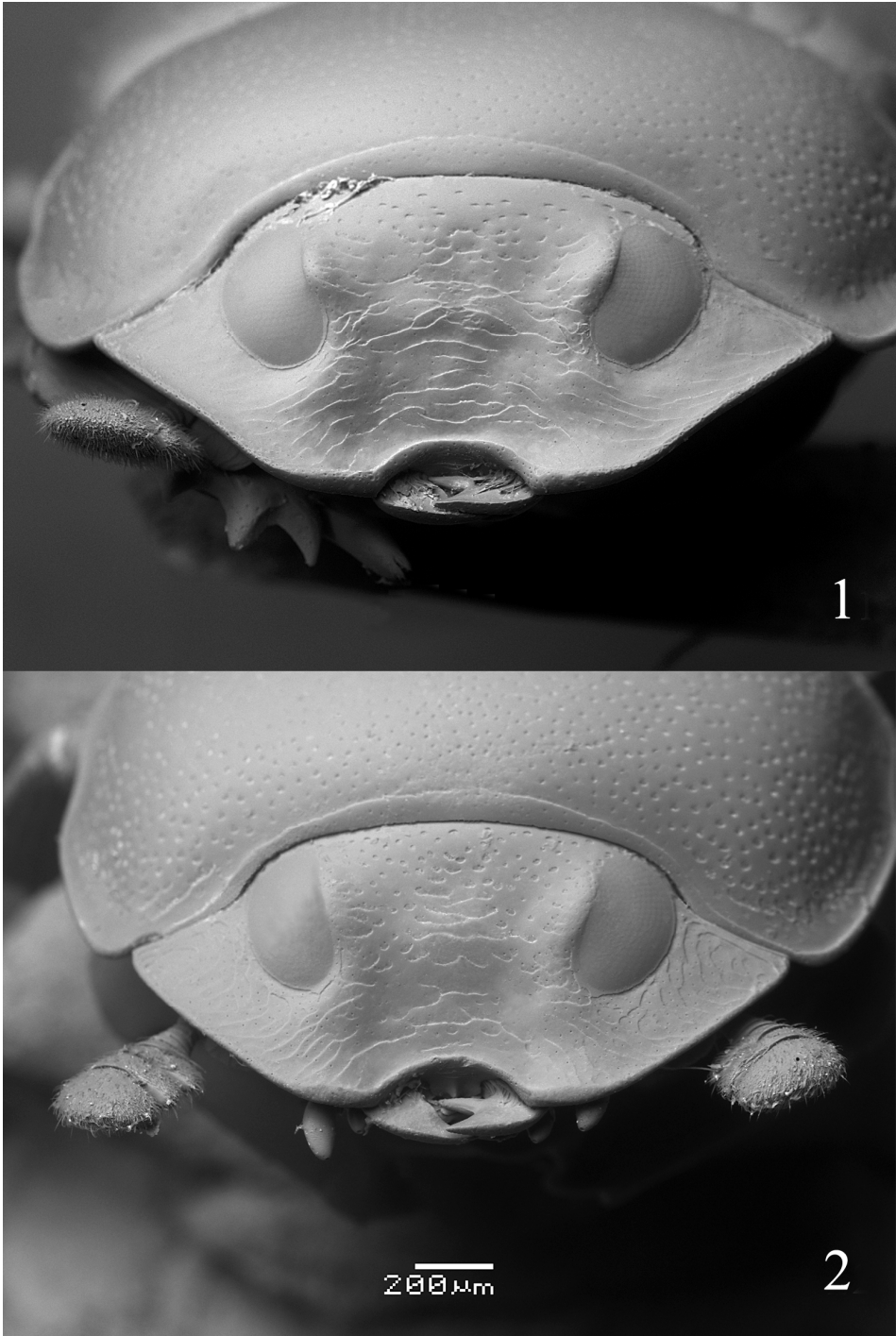
An updated map for all the known species of *Penichrolucanus* is shown in Fig. 5.

Acknowledgements

We are very grateful to our colleagues Maxwell Barclay (NHM), Stéphane Boucher (MNHN), and Alain Drumont (IRSNB) for the loan of the material examined in this paper.

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Figs 1-2. Frontal view of head of *Penichrolucanus leveri* Arrow, 1938. 1. Specimen from Solomon Islands, Malaita. 2. Specimen from Papua New Guinea, Madang.



Figs 3-4. Frontal view of head of *Penichrolucanus sumatrensis* Arrow, 1935. 3. Specimen from Sumatra, Palembang. 4. Specimen from Indonesia, Kalimantan Tengah.



Fig. 5. Distribution of the species of *Penichrolucanus*. 1 = *P. cryptonychus* (Zhang, 1988); 2 = *P. nicobaricus* Arrow, 1935; 3 = *P. copricephalus* Deyrolle, 1863; 4 = *P. elongatus* Arrow, 1935; 5 = *P. sumatrensis* Arrow, 1935; 6 = *P. martinii* Schenk, 2006; 7 = *P. hirohiro* Nagai, 2001; 8 = *P. alleni* Bartolozzi, 2015; 9 = *P. leverii* Arrow, 1938. Map ©2012 Google, Sanborn.

Received 30 October 2015

Accepted 15 January 2016