Revision of Oriental *Monolepta* and related groups of leaf beetles (Coleoptera: Chrysomelidae: Galerucinae)

Dissertation

Zur
Erlangung des akademischen Grades
eines
Doktors der Naturwissenschaften
des
Fachbereich 3: Mathematik/Naturwissenschaften
der
Universität Koblenz-Landau

vorgelegt
am. 09. März 2012
von Izfa Riza Binti Hazmi
geb. am 27. Mai 1983 in Malaysia

Referent: Prof. Dr. Thomas Wagner
Koreferent: Prof. Dr. Bernhard Misof

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Foreword and Acknowledgements

Bismillahirrahmanirrahim..

I have never thought of staying abroad for quite some years. It was all started when I got a position to be a tutor of Insect Systematic in the Centre of Environmental Science and Natural Resources, Faculty of Science and Technology, the National University of Malaysia. Being that time, I was not sure what am I going to do for the next few years, but one thing that I knew is that I have to further my doctorate study. Mohamed Salleh Mohamed Said a former Professor and taxonomist who were actively worked on Chrysomelidae of Malaysia and Indonesia have met me one day. It was since some years that he was retired from his service in the University. He was talked to me, and from this conversation on, he has influenced me to study chrysomelid beetle. The mass materials of chrysomelids beetle that were place in our Centre for Insect Systematic (CIS) laboratory need somebody to take over. Taking consideration that one of my colleague is in Holland furthering her PhD in systematic of Ichneumonoidea, I have decided to study the systematics of chrysomelid beetles, and left back the Ichneumonidae that has been the subject of my master thesis.

Being known Mohamed Salleh Mohamed Said, he has linked me to Thomas Wagner, whom he himself never meets. I have contacted Thomas Wagner and he was willingly to accept me as his doctorate student. It was the starter, and Thomas Wagner has organized a lot of stuff for me, and on March 2008 I came over to Germany.

It was along four years, and we have co-operated in this study and the first result was published in three journal articles. Those three published article, one article that has been submitted and one article in state of manuscript was compiled and here is the dissertation of my doctorate study.

Grabbing this opportunity, I would like to extend my warm thanks to:

The Almighty God for giving me all the strength, patience, health and endurance to accomplish my study successfully. Alhamdulillah..

Prof. Dr. Thomas Wagner for accepting me as a PhD student and with patient and without fail has guided me all the way through this path being a doctorate student. Personally for me, this is not an easy way and a lifetime experience. Thanks also for being such a helpful and very nice supervisor ever. I adore you a lot!

Not being forgotten, thanks also to Prof. Dr. Bernhard Misof who kindly agreed to be my second referee.

Prof. Mohammad Salleh Mohammed Said for the advice that you have gave me, and interest that you have shared with me.

All the staffs from the Institute of Natural Science Biology, Universität Koblenz: Dr. Adanne Girma, Mrs. Brigitte Nilow-Lange, Mrs. Carolin Thiel, Mrs. Dagmar Savelsberg, Dr. Dorothee Killman, Prof. Dr. Eberhard Fischer, Dr. Inger Theisen, Dr. Jutta Meiyer, Dr. Katja Rembold, Prof. Dr. Ulrich Sinsch and others whom I didn't write here. Thank you for the encouragement and helps through everything, and all the nice memories that I will always bear in my mind. This is a wonderful working place for me..

My family is the most valuable gift that I ever have. A million thanks I would say for always pray and supporting me all the way during my study. I miss all of you so much, and being home again is the moment that I have wait so long since sometimes. There were nothing that I could give in return for the unconditionally love, and I dedicate this thesis to all of you, my parent, Mr. Hazmi Jahan and Mdm. Reslah Ngadan, and all my siblings, Izul, Izza, Izri, Izfairuz, Izwan, Izatul and Iqmal.

Living away from home, friends are very important in adding colours to my life. Not forgotten, I would like to say thanks to Arifah and her family, Jenifer, Jolanta, Layla and her family, Marlia, Rahyla, Samina and her family, all my Sutera Kapas usrahmate and all Malaysian

friends in Germany (you know who you are). Thanks for always dropping by in Koblenz, and for all the care, laughter, love and joy that we have shared. I wish all the best to all of you, and of course, we will keep this friendship and hope to see each other again back in Malaysia later.

Thanks also to all the staff in Centre for Insect Systematic (CIS) laboratory in Malaysia for accompanying me in material collection back in a year before I came here, Mr. Ruslan and Mr. Fauzi who came with me to the field. Not forgotten, Prof. Dr. Idris Abd Ghani for his support, Dr. Salmah who always care, and all the labmates in CIS laboratory.

Last but not least, thanks to the Malaysian Ministry of Higher Education and the National University of Malaysia for providing a scholarship and study leaves for me. It was since several years, and I'll pay back my service in return.

I am nor better far from perfect, thus I like to ask forgiveness towards my all wrongdoing to everyone. What goes around comes around, and I am not the best person neither i'm capable to pay back all the kindness that everyone has hospitalized me. May the best and good things shower everyone all the way..

Terima Kasih and Danke Schön!

Izfa Riza Binti Hazmi
09 March 2012,
Uni-Koblenz.

Revision of Oriental *Monolepta* and related groups of leaf beetles (Coleoptera: Chrysomelidae: Galerucinae)

Introduction

The Chrysomelidae are one of the most diverse insect groups, particular in tropical forests. There are at least 35,000 species recorded in this beetle family according to more conservative estimation or more than 60,000 according to more progressive ones (Reid 1995a). Since a long time, this beetle group has drawn a lot of attention in research especially in taxonomy, systematics, ecology and biogeography, as well as molecular studies in present days (Sota & Hayashi 2004, Nokkala & Nokkala 2004, Cox 1996, Gómez-Zurita et al. 2007, Stapel et al. 2008, Gross & Schmidtberg 2009, Mohamedsaid 2009, 2011). Being phytophagous, chrysomelids include many established and potential agricultural pests. The most well known is the Colorado potato beetle (*Leptinotarsa decemlineata* Say, 1824), a major pest of potatoes worldwide (Bishop & Grafius 1996). Besides their agricultural significance, the biodiversity of leaf beetles is also a direct indicator of diversity in ambient flora (Kalaichelvan 2000).

Taxonomic and systematic studies of Chrysomelidae have been initiated by Fabricius (1781) when he described some hundreds of insects in his “Species Insectorum”. At that time, most of larger Chrysomelidae were assigned to only two genera: *Chrysomela* for broad-bodied and *Crioceris* for slender-bodies species (Wagner 2007). It was along the time that studies on this particular family has intensified, and numbers of described chrysomelids increased, up to 22,978 species in the “Coleopterum Catalogous” by Weise (1910–1940) (Schmitt 1996).

Galerucinae is the second largest subgroup of chrysomelid beetle that can be identified by their specific characters (White 1983). There are about 520 genera described, and the estimation of species varied among authors, but in the range of 5,000 species to 6,300 species (Gillespie et al. 2008, Stapel et al. 2008, Scherz & Wagner 2007). In the earlier years, Wilcox (1973) has listed 5,802 species of Galerucinae distributed over the whole

world that time, an increase of 57 % compared to the number of described species by Weise 1924. Since Wilcox's compilation, the Zoological Record has listed 512 more species descriptions in Galerucinae, resulting in an increase of 71 % against 1924 (Schmitt 1996). Until the most recent catalogue, at least over 13,000 species of Galerucinae are recorded all over the world (Riley et al. 2002).

A subgroup of the Galerucinae with elongated basi-metatarsus and without significant depression on the pronotum has been classified to a group called “Monoleptites” (Wilcox 1973). It was firstly assigned by Chapuis (1875) but during that time, only a small number of taxa were included. Until the catalogue compiled by Wilcox (1973), there were a total of 34 genera listed in this group. Only 13 genera are recorded to be occur in the Oriental Region, and six are endemic to it (Table 1). When assigning the taxa in “Monoleptites”, Wilcox has commented that the classifications of genera in this group are unsatisfactory and uncertain, and thus he proposes to revise this group in future.

“Delimitation of genera in this group and assignment of the species into genera need revision. The present classification of Monolepta, Luperodes, Candezea and many other genera in this group is most unsatisfactory. Genera have not been adequately delimited; type species of many genera have not been considered have not been considered in placing new species even when a type had been designated, and no two entomologist have held the same concepts of the genera. Consequently, with further study, many species will be transferred to genera other than the one in which they are now placed.” (Wilcox 1973).

According to the Coleopterum Catalogous and data of subsequent authors e.g. (Mohamedsaid 2004), the number of described species in “Monoleptites” has been increased. It was along the time that studies on this particular group has increased, and particularly in the late of the nineteenth to the early twentieth century, many species have been newly described, and *Monolepta* became the most species rich genus in “Monoleptites” and also in all Galerucinae (Fig. 1). In accordance of that, several taxonomist have actively worked on beetles of this group in South East Asia, for instance, Kimoto (1989), Medvedev (2005) and Mohamedsaid (1993, 1997, 1998, 2000a, b, 2001, 2002, 2005). These taxonomists have studied the fauna in different parts of South East Asia, for instance Medvedev (2005) in Philippines Island, and Kimoto in China, Taiwan, Thailand,

Table 1. List of genera and number of species of “Monoleptites” that occurred in the Oriental Region after Wilcox (1973); endemic taxa are marked with *.

	Genera	Number of species (worldwide)	Number of species (Oriental Region)
1.	*Calomicrus*	68	5
2.	*Luperodes*	99	45
3.	*Metroidea*	19	2
4.	*Priapina**	1	1
5.	*Monolepta*	~ 600	259
6.	*Arcastes**	9	9
7.	*Neolepta**	11	11
8.	*Nadrana**	9	9
9.	*Candezea*	98	32
10.	*Paleosepharia*	32	20
11.	*Desbordesius**	1	1
12.	*Trichosepharia**	1	1
13.	*Macrima*	12	7

Cambodia, Laos and Vietnam while Mohamedsaid works on the galerucines of Malaysia and Indonesia (Fig. 2). Tracing back the comments of Wilcox (1973), none of authors that mentioned above have seriously taken his words into account.

Description of the new species was based on previous typological concept, and not considered the modern phylogenetic principles. Thus, the species status need to be checked and the whole group need to be revised. In most of these studies the identification of species was based on the external morphological characters and coloration pattern only (Jacoby 1908, Maulik 1919, 1926, 1936, Gressit & Kimoto 1961, 1963), but in particular the coloration pattern are varied among species of these beetles. Sharp & Muir (1912) while studying the genital structures in Coleoptera have illustrated the internal structures of some chrysomelids for the first time and have stressed its taxonomic significance, but these characters for species delimitation have been not considered for a long time. As it was shown by Wagner (1999, 2003) that genitalic characters of both sexes possess not only valuable characters for species identification but also delimitation of genera in the sense of

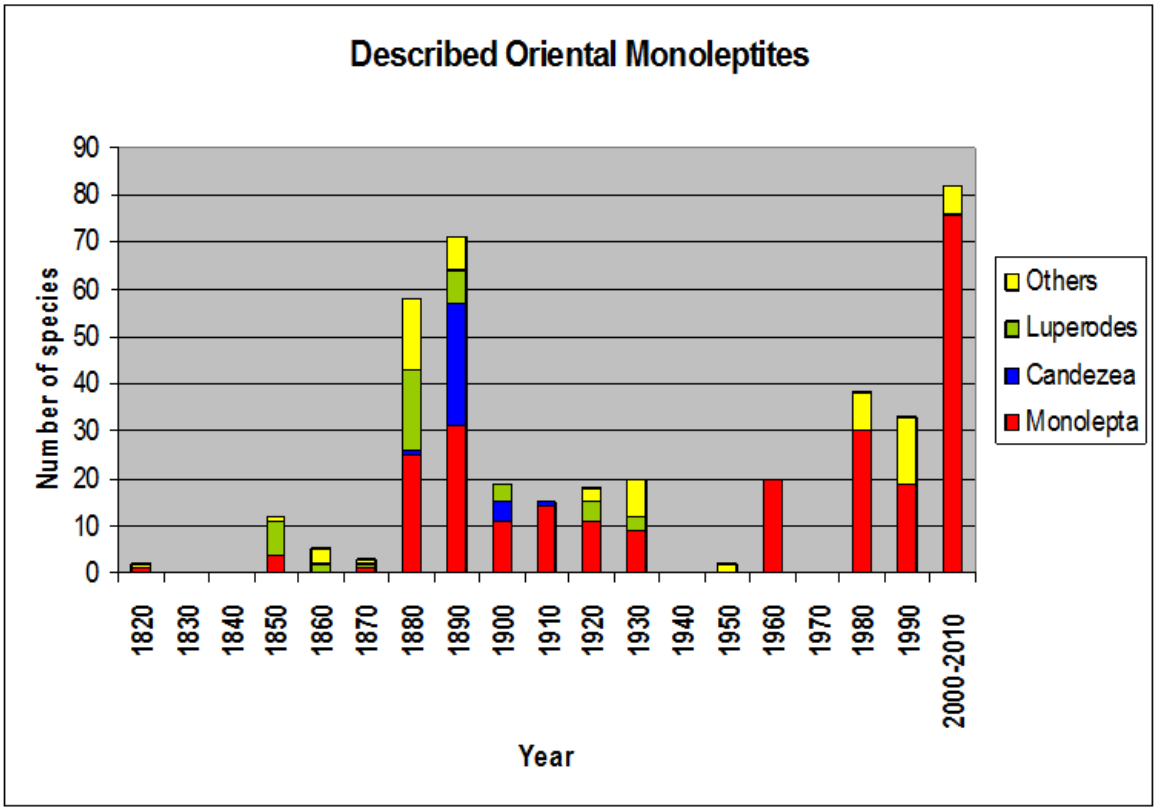

Fig. 1. The numbers of described Oriental "Monoleptites" per decade. (Sources: Wilcox 1973, Kimoto 1990, Mohamedsaid 2001, 2004, 2005).

monophyletic groups. Wagner has started the revision on the "Monoleptites" of the Afrotropical region in 1999, and has led to many changes in the systematic placement of certain taxa. His core interest in *Monolepta* for instance has established a new concept of *Monolepta*, and resulted in many newly described genera for monophyletic taxa like e. g. the diverse *Afromaculepta* Hasenkamp & Wagner, 2000 and *Afrocandezea* Wagner & Scherz, 2002 (Scherz & Wagner 2007). Besides *Monolepta*, Wagner has also revised for instance the diverse afrotropical taxa *Candezea* Chapuis, 1879 (Wagner & Kurtscheid 2005), *Bonesoides* Laboissiere, 1925 (Freund & Wagner 2003), *Afrocrania* Hincks, 1949 (Middelhauve & Wagner 2001, Wagner 2007), and *Galerudolphia* Hincks, 1949 (Bolz & Wagner 2005).

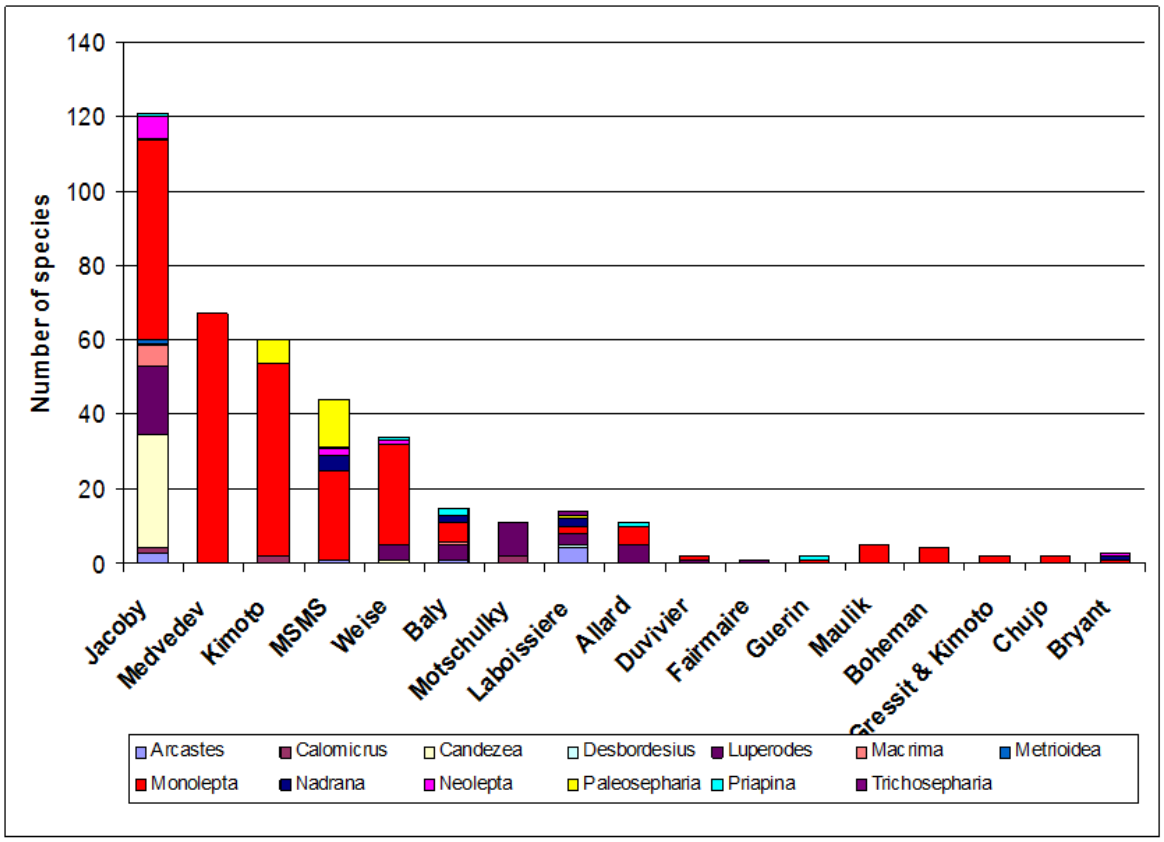

Fig. 2. List of authors who have worked on Oriental "Monoleptites", and numbers of species described (1820–2010). (Sources: Wilcox 1973, Kimoto 1990, Mohamedsaid 2001, 2004, 2005).

Objectives

The objectives of this study can be summarised as below:

1. To revise the species of *Monolepta* from the Oriental region with focus on the Sundaland area; redescriptions of the valid species, including the genitalic characters, for many species for the first time.
2. To define the species limits, to provide a checklist and geographic distribution of all species of *Monolepta* known from Sundaland.
3. To revise other groups of the "Monoleptites" from the Oriental Region.

Material and Methods

Revision of few taxa in “Monoleptites” from Oriental region meanwhile has started about four years back. Primary type specimens were studied and photographed, and several thousands of further specimens have been loaned from several Museums and collection Institution. A total of approximately 13,700 labelled specimens from several major collections have been examined in this study. The collection and institution that are involved are listed. The acronyms used and curators that are involved are written in bracket (Table 2). For each species that was newly described or redescribed, a standard set of figures is given. These include illustrations of the coloration (dorsal view), including the right antenna, where black coloration is indicated by black, yellow coloration by white, red coloration by light grey, and brown by dark grey shading. The antennomeres of males and females, dorsal, ventral and lateral view of the median lobe including the endophallic structures, spermathecae of three females (if available) and bursa-sclerites (if available) usually of one female are figured. Measurements were made for external characters. Absolute measurements are: total length from the clypeus to apex of the elytron, length of the elytron, maximal width of both elytra (usually in the middle or posterior third of the elytra), and width of the pronotum. Relative measurements are: length to width of the pronotum, maximal width of both elytra to length of the elytron, length of the second to third antennomeres, and length of the third to fourth antennomeres. A number of specimens measured are given in the description under “total length”. Further materials examined are listed, and all label data are re-written. For location data, geographical coordinates were given in degree and minute. These coordinates were mostly taken from Google Earth. The distribution maps have been produced by ArcGis.

Results

The first group that was revised within my study is *Ochralea* Clark, 1865 (Hazmi & Wagner 2010a). It was described by monotypy of *O. nigricornis* Clark, 1865, and was erected for galerucines which having a large body size, with elongated basi-metatarsus. Weise (1924) has synonymised *Ochralea* with *Monolepta*. Subsequent authors like Maulik (1936), Hincks (1949) and Wilcox (1973) have accepted it as junior synonym of *Monolepta*, while only Laboissiere (1932) claimed that *Ochralea* is a distinct genus. Since the description of *O. nigricornis* Clark, 1865, several other *Ochralea* species have been newly described. The last

Table 2. List of collection and institutions that are involved and approximately number of beetle specimens examined (Acronym and responsible curators in bracket).

Collection/Institutions (curators)	Number of specimens
The Natural History Museum, London (BMNH; S. Shute)	5000
Nationaal Natuurhistorisch Museum, Leiden (NNML; F. van Assen)	3000
Institute Royal des Sciences Naturelle de Belgique, Brussel (IRSN; P. Limbourg)	2000
Center for Insect Systematics, UKM, Malaysia (UKM; R. Yusop)	2000
Museum für Naturkunde der Humboldt Universität, Berlin (MNHU; J. Frisch, J. Willers)	1000
Collection of Jan Bezděk, Bruno (CJB)	350
Swedish Museum of Natural History Stockholm (NHRS; Bert Viklund)	200
Museum of Comparative Zoology, Harvard University (MCZH)	20
Museo Civico di Storia Naturale, Genova (MCSNG; Dr. R. Poggi)	30
Collection of Haruo Takizawa, Japan (CTJ)	50
Zoological Institute of the University of Coimbra (Portugal) (ICTZ; Th. Baptista)	30
Zoological Museum, Moscow State University (ZMMU; Lev Medvedev).	20
Total	13,700

one before the genus was synonymized is *O. imitans* Jacoby, 1894, and the total number of *Ochralea* by that time was ten species. With an exception of *O. marginata* which was transferred to *Nadrana* Baly, 1865 by Laboissiere (1936), all other species have been transferred to *Monolepta* by various authors (Weise 1924, Maulik 1936). I have checked the type specimen of most species that were originally described in *Ochralea* and there is no doubt that this genus is clearly distinct from *Monolepta*. Weise (1924) has synonymised *Galeruca nigripes* (Olivier, 1808) with *O. nigricornis* Clark, 1865 and the valid name of the species is *O. nigripes* (Olivier, 1808). Out of ten species originally described in this genus, only this species remain valid and *O. pectoralis* is a new synonym of *O. nigripes*. Additionally, *Monolepta wangkliana* Mohamedsaid, 2000 is very closely related to *O. nigripes* and need to be transferred to *Ochralea*.

The second genus where the revision is still published is *Arcastes* Baly, 1865 (Hazmi & Wagner 2010b). It was erected for galerucines with a peculiar shape of antennae, where the third to seventh antennomere are enlarged and widened. When Baly introduced this new genus, he described *A. biplagiata* as genotype by original designation and monotypy. The genus-name was then quoted by subsequent authors (Jacoby 1884, Laboissiere 1929, 1932, Mohamedsaid 2000), and eight further species of *Arcastes* have been described so far, up to the year 2000 by Mohamedsaid. I have checked the genitalic characters of *A. biplagiata*, and most of the type species of other *Arcastes*. *Arcastes biplagiata* possesses a peculiar shape of the median lobe and asymmetrically arranged endophallic structures. These peculiar characters are very useful to delimit this genus from the others. Therefore, only three valid species remain in *Arcastes*, while two new synonyms are found and four other species need to be transferred to other genera.

While checking the genitalic characteristics of type species of *Arcastes sanguinea*, the median lobe as well as the spermatheca of this species possesses strong differences to *A. biplagiata*. The species was redescribed and transferred in a monotypic new genus *Rubrarcastes* Hazmi & Wagner, 2010c.

The fourth genus that was already revised is *Neolepta* Jacoby, 1884. It was originally described on base of only two species by that time, *N. biplagiata* and *N. fulvipennis*. Jacoby has not designated a type species of the genus, and Maulik (1936) did it later, with the designation of *N. biplagiata*. Jacoby in his original description has only commented that *Neolepta* is very close and similar to *Monolepta* Chevrolat, 1837 and *Candezea* Chapuis, 1879. Subsequent authors have described further eight species, and transferred one species from *Luperodes* to it, summing up the total number of eleven described species in *Neolepta*. I have checked the genitalic characters of the type, *N. biplagiata* and have found out that the median lobe is not incised apically and stronger sclerotised ventral carinae with an apical hook close to the apex occur. Out of all described species, only two are closely related to the genero-type, *N. sumatrensis* (Jacoby, 1884) new combination and *N. quadriplagiata* Jacoby, 1886 that will remain in this group after the revision. All other species need to be transferred to other genera, including the newly described *Paraneolepta* and *Orthoneolepta*.

The last distinct paper of this thesis presented the results on *Monolepta* Chevrolat, 1837. The massive number of *Monolepta* from the entire Oriental Region, with about 260 described species names is a more long-life project and not practicable within a PhD-study. Thus I have focused on the species of *Monolepta* known from the Sundaland area in this work. This area comprise Malaysia (Peninsular Malaysia and the East Malaysian states of Sarawak and Sabah in northern Borneo), Singapore at the tip of the Malay Peninsula, Brunei Darussalam and all of the western half of the megadiversity country of Indonesia, including Kalimantan (the Indonesian portion of Borneo, Sumatra, Java and Bali). Sulawesi though not listed in the sub-region of Sundaland is included here, since it has also strong influence with the other galerucine fauna of Sundaland area. Despite, it is located eastwards of Wallace-line.

A comprehensive revision including the study of the primary types of the described species, has never been done for *Monolepta* from this sub-region, while new species have also been described in the last decade (e. g. Mohamedsaid 1993, 1997, 1998, 1999, 2000a,b, 2001, 2002, 2005). On base of the most current species lists of Mohamedsaid (2001, 2004, 2005), and Kimoto (1990), the number of valid species described from this region is about 72. After my revision, only thirteen valid species can remain in *Monolepta* in the sense of the generotype *M. bioculata* (Wagner 2007), while seven species have been found as new synonyms, three have been already transferred to other genera and further 49 species need to be transferred to other genera.

Nowadays, molecular studies have been embraced by a lot of scientist, as well in systematic and taxonomic works of insects. Due to the limited time and materials available, I have carried out this revision only on the outer morphological and genital characters in defining species and genera. However, the type material of many species and in particular their genitalic characters have been herein studied for the first time in a comprehensive revision of these beetles. This study has led to a delimitation of species and genera under the principles of phylogenetics. Hopefully, in the near future, the revision of Oriental “Monoleptites” that joint both morphological and molecular methods can be done. Finally, it is also hoping that this study could be a benchmark for the forthcoming revision on other groups of Oriental Galerucinae

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Curriculum Vitae

Personal details

Name:	Izfa Riza Binti Hazmi
Home address:	3-27B, Jalan Tenaga 20, Taman Tenaga Kajang, 43000 Kajang, Selangor, Malaysia.
Correspondence address:	School of Environmental & Natural Resources Sciences, Faculty of Science & Technology, National University of Malaysia, 43600 Bangi, Selangor, Malaysia.
Phone:	0060-(0)3-8925-4505
Fax:	0060-(0)3-8925-3357
Email:	izfariza.hazmi@yahoo.com / izf_riz@ukm.my
Sex:	Female
Date of Birth:	27th May 1983
Place of Birth:	Roban, Malaysia
Nationality:	Malaysian
Marital Status:	Single

Employment

Junior lecturer at School of Environmental & Natural Resources Sciences, Faculty of Science & Technology, National University of Malaysia.

Educational background

2008 – 2012:	PhD candidate in Department of Integrated Natural Sciences – Biologie, University of Koblenz-Landau, Germany. PhD disertation entitled "Revision of Oriental *Monolepta* and related groups of leaf beetles (Coleoptera: Chrysomelidae: Galerucinae)" supervised by Prof. Dr. Thomas Wagner.
2006 – 2007	Master in Entomology at Faculty of Science and Technology, the National University of Malaysia.

2003 – 2006	Bachelor study in Biology at Faculty of Science and Technology, the National University of Malaysia.
2001 – 2002	Science Matriculation (Pre-University).
1994 – 2000	High school and general qualification for University entrance.

Publication

Hazmi, I. R. & Wagner, Th. (2010a). Revalidation and revision of *Ochralea* Clark, 1865 (Coleoptera: Chrysomelidae: Galerucinae) from the Oriental Region. Zootaxa, 2530: 47-59.

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Conference/Seminar attended

Mitgliederversammlung des Internationalen entomologischen Vereins e.V (Annual meeting for International Entomologist), 27 February, 2010, Darmstadt, Germany.

The 2010 International meeting of the Association for Tropical Biology and Conservation, 19-23 July, 2010, Bali, Indonesia.

'Annual Conference of the Society for Tropical Ecology', 21-24 February, 2011, Frankfurt, Germany.

Additional skills

Computer skills	Excellent proficiency in using computer application packages such as MS Word, MS Excel, PowerPoint.
Language skills	Bahasa Melayu (native); and English (good).

Erklärung

Hiermit erkläre ich,

- dass ich die eingereichte Dissertation selbstständig verfasst habe und alle von mir für die Arbeit genutzten Hilfsmittel in der Arbeit angegeben sowie die Anteile etwaig beteiligter Mitarbeiter sowie anderer Autoren klar gekennzeichnet sind;

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Koblenz, 09 March 2012 **Izfa Riza Binti Hazmi**

Appendix 1

Revalidation and revision of *Ochralea* Clark, 1865 (Coleoptera: Chrysomelidae: Galerucinae) from the Oriental Region

Hazmi, I. R. & Wagner, Th. 2010(a). Revalidation and revision of *Ochralea* Clark, 1865 (Coleoptera: Chrysomelidae: Galerucinae) from the Oriental Region. Zootaxa, 2530: 47–59.

As the first author of this article, I declare that most of the technical works: loaning, sorting, dissection and drawing have been done by me under supervision of Thomas Wagner.

Zootaxa 2530: 47–59 (2010)
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

Revalidation and revision of *Ochralea* Clark, 1865 (Coleoptera: Chrysomelidae: Galerucinae) from the Oriental Region

IZFA RIZA HAZMI & THOMAS WAGNER*

University of Koblenz-Landau, Department of Integrated Natural Sciences – Biologie, Universitätsstr. 1, D-56070 Koblenz, Germany. E-mail: thwagner@uni-koblenz.de

*32nd contribution to the taxonomy, phylogeny and biogeography of the Galerucinae

Abstract

Ochralea was described by Clark in 1865 for a very large Oriental galerucine with elongate basal metatarsomeres. Subsequently, nigh more species were described in this genus. It was synonymised with *Monolepta* by Weise in the Catalogue to the Galerucinae in 1924, and accepted as such by most subsequent authors. Whilst revising the type species of *Monolepta*, *M. bioculata* (Fabricius, 1781), it became clear that *Ochralea* was a distinct genus. The revalidation and redescription of this genus, containing two valid species, is here proposed. *Ochralea nigripes* (Olivier, 1808) has one recognised junior synonym and *Ochralea nigricornis* Clark, 1865, and two new synonyms *Ochralea pectoralis* Harold, 1880 **syn. nov.** and *Monolepta erythromelas* Weise, 1922 **syn. nov.** This species is abundant and widely distributed in south-east Asia from Bengalia and Bangladesh to southern China, the Philippines and Sulawesi. *Ochralea wangkliana* (Mohamedsaid, 2005) **comb. nov.**, is only known from a few specimens collected around Wang Kelian Perlis, Malaysia. Redescriptions of the genus and the two species are given, including illustrations of external and genital characters, and a distribution map.

Key words: Galerucinae, *Ochralea*, *Monolepta*, Oriental region, revalidation, revision, taxonomy, redescription, new synonym, new combination

Introduction

Galerucinae with slender legs and the basal metatarsomere much longer than the four remaining metatarsomeres together, have been assigned to the "Section Monoleptites" sensu Wilcox (1973). This typological group (Wagner, 2004) includes *Monolepta* Chevrolat, 1837, one of the most speciose genera in the Chrysomelidae. This group is also very diverse in the Oriental Region with about 260 described nominal species (Wilcox, 1973; Mohamedsaid, 2004). The taxonomic and systematic status of most of its species is poorly known, and many of the genera of the group are in need of revision.

Some taxa of the "Monoleptites" from tropical Africa have recently been revised (e. g. Wagner 2007a, b), but this work needs to also embrace other parts of the Old World tropics. We therefore recently started revising the galerucines from the Oriental Region.

Non-homogeneous generic delimitation and inconsistent classification by different authors is clearly illustrated by the genus *Ochralea* Clark, 1865. This genus was described by Clark in 1865 for a very large Oriental galerucine with elongate basal metatarsomeres, and synonymised with *Monolepta* by Weise (1924). With exception of Laboissiere (1932), who claimed that *Ochralea* was distinct from *Monolepta*, subsequent authors (Maulik, 1936; Hincks, 1949; Wilcox, 1973) listed the genus as a junior synonym of *Monolepta*. Considering the revision of the type species of *Monolepta*, *M. bioculata* (Fabricius, 1781), and studies of genitalic patterns (Wagner, 2007a), it became clear that Laboissiere (1932) was correct, and *Ochralea* is clearly distinct from *Monolepta*.

Ochralea was established by Clark (1865) on the basis of some characters that distinguish it from *Adorium* Fabricius, 1801, to which it shows some superficial similarities, but the latter is now a junior

Accepted by G. Morse: 12 Jun. 2010; published: 8 Jul. 2010

synonym of *Oides* Weber, 1801. It may be readily separated from *Oides* by its form, which is generally narrower and more elongate; maxillary palpi with the apical joint elongate and pointed towards the apex, not short and rounded as in *Oides* (*cf.* Oliv. Hist. Nat. viii. Plate 92, *bis*, 1 *e*) (Clark, 1865); thorax which is less transverse; unguiculi of the apical tarsomere appendiculate and not bifid as is generally found in species of *Oides*; and parapleurae on the underside of the body more elongate, with the pleurae of the mesosternum, which in *Adorium* give a posteriorly rounded form to the parapleurae, almost obsolete.

Besides the type species, nine other species of galerucines were described in *Ochralea*, all from the Oriental Region. These are: *O. ceylonica* Harold, 1880, *O. straminea* Harold, 1880, *O. pectoralis* Harold, 1880, *O. marginata* Jacoby, 1884, *O. fulva* Baly, 1886, *O. divisa* Jacoby, 1889, *O. pallida* Jacoby, 1892; *O. rufobasalis* Jacoby, 1892, and *O. imitans* Jacoby, 1894. With the exception of *O. marginata*, which was transferred to *Nadrana* Baly, 1865 by Laboissiere (1936), all the others were transferred to *Monolepta* by various authors (Weise, 1924; Maulik, 1936). We checked *O. nigripes* (Olivier, 1808) and the type material of the other species that has been described in *Ochralea* and of similar morphology as *Monolepta wangkliana* Mohamedsaid, 2005 and found that only two of them belong to *Ochralea*. Apart from a redescription of the genus, redescriptions of the two species are given, including illustrations of external and genitalic characters, and a distribution map.

Material and methods

A standard set of figures is given for each species. These include illustrations of the dorsal habitus and coloration of the right antenna, where black is indicated by black, yellow by white, and red by grey shading; the 4 basal antennomeres of males and females; dorsal and lateral view of the median lobe including the endophallic structures, and ventral view of the median lobe without the endophallic structures; spermathecae for two to three females and bursal-sclerites. For the redescription of the genus, illustrations of the ventral view of the head, pro-, meso-, and metathorax, female and male abdomen, left legs in ventral view, and of the right hind wing in dorsal view, are given.

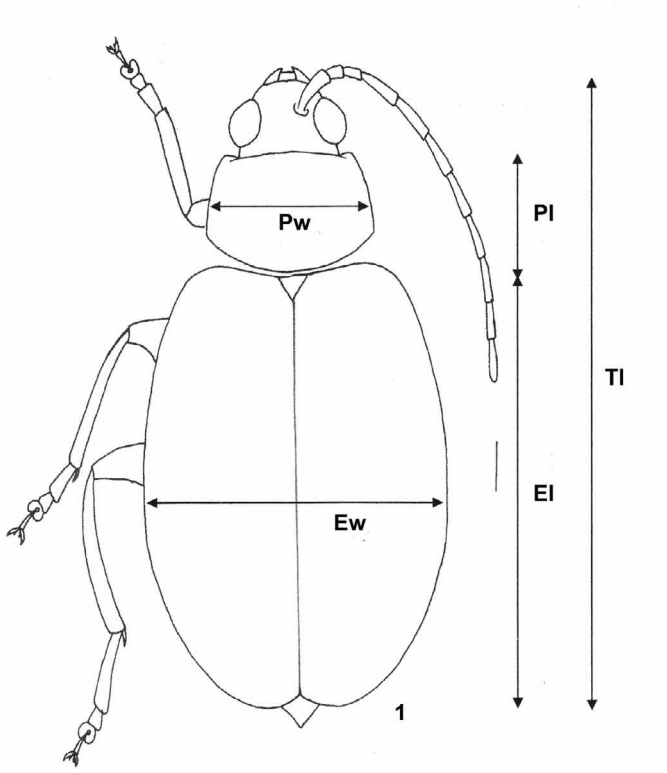


FIGURE 1: Morphometric measurements taken with: **El**. length of elytron, **Ew**. maximum width of both elytra, **Tl**. total length, **Pl**. length of pronotum, **Pw**. width of pronotum. Scale bar: 1 mm.

Morphometric measurements were made for external characters. Absolute measurements are: total length from the clypeus to apex of the elytron (Tl), length of elytron (El); maximal width of both elytra (usually in the middle or posterior third of the elytra) (Ew); length of pronotum (Pl); and width of pronotum (Pw) (fig. 1). Relative measurements are: length to width of pronotum, maximal width of both elytra to length of elytron, length of second to third antennomere, length of third to fourth antennomere, and length of metatarsus to length of metatibia. The number of specimens measured is given in the description under "total length".

The subsequent redescriptions are based on labelled specimens from the following collections (table 1) with the acronyms used, and responsible curators following, in brackets: The Natural History Museum, London (BMNH; S. Shute); Institute Royal des Sciences Naturelle de Belgique, Brussels (IRSN; P. Limbourg); Center for Insect Systematics, UKM, Malaysia (UKM; R. Yusop), Nationaal Natuurhistorisch Museum, Leiden (NNML; Fred van Assen); Museum für Naturkunde der Humboldt Universität, Berlin (MNHU; J. Frisch, J. Willers); and Swedish Museum of Natural History, Stockholm (NHRS; Bert Viklund).

TABLE 1. Numbers of material examined and collections investigated.

Collections	*O. nigripes* (Olivier, 1808)	*O. wangkliana* (Mohamedsaid, 2005)
BMNH	304	-
IRSN	16	-
UKM	75	3
NNML	104	-
MNHU	119	-
NHRS	10	-
Total	**628**	**3**

For locality data, geographical coordinates are given in degrees and minutes. These coordinates were mostly taken from Google Earth. The distribution map for *O. nigripes* was produced using ArcGIS®.

Ochralea Clark, 1865

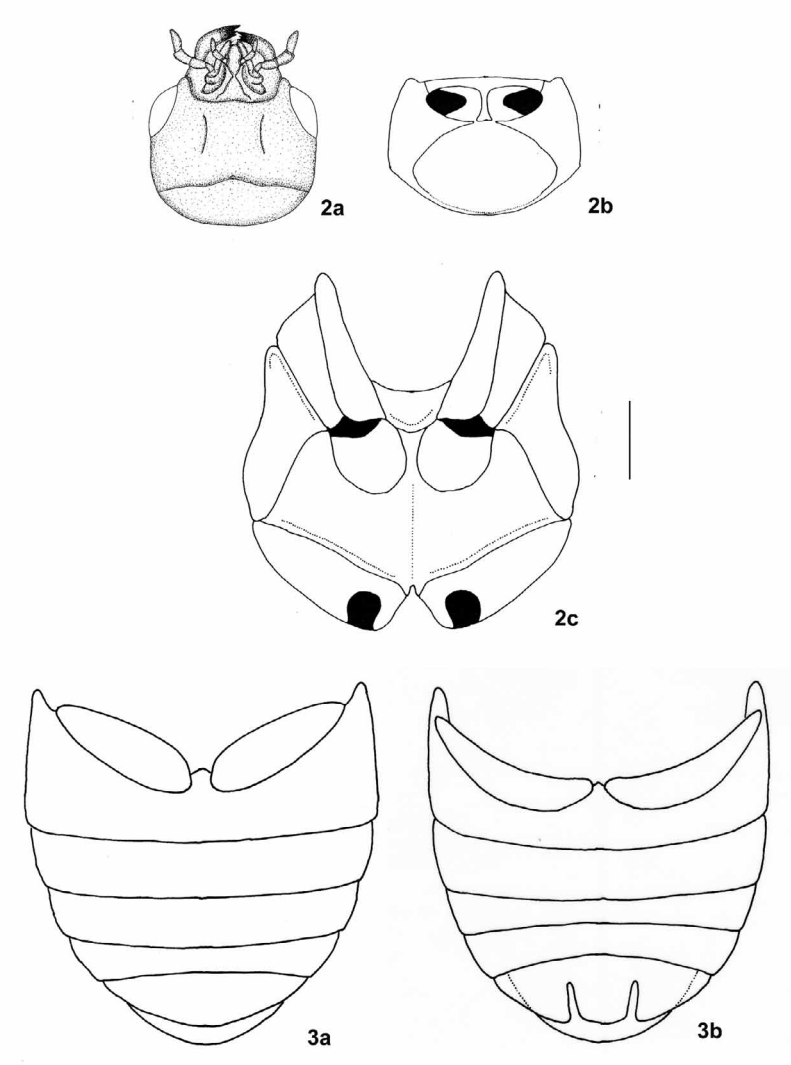
Type species: *Ochralea nigricornis* Clark, 1865 by monotypy.

Redescription. Total length: 7.75–14.40 mm

Head: Pale yellow or brownish, but black in about 20 % of material examined. Very finely punctate, with significant transverse impression between the posterior third of eyes, and a short median impression. Eyes large, strongly convex (fig. 1). Labial and maxillary palpi slender (fig. 2a), yellow or brown basally, occasionally darker towards apex. Labrum yellowish, brownish or blackish and occasionally much darker in the middle. Mandibles yellow or brown basally, and blackish towards the apex. Antennae entirely pale yellow in about 45 % of material examined; pale yellow with one to two apical antennomeres contrasting brown to black in all specimens with black head and prothorax (20 %); or only the basal three antennomeres pale to reddish-yellow and others dark brown to black (35 %). Antennae filiform, slender, extending to about the middle of the elytron (figs 1, 7, 12); first antennomere club shaped, second shortest, third antennomere about one third to slightly longer than second; length ratio of second to third antennomere 0.67–0.90 (mean: 0.83); fourth broader, about twice the length of the third, length ratio of third to fourth antennomere 0.37–0.50 (mean: 0.45; figs 8, 13).

Thorax: Pronotum transverse, narrowing slightly towards the anterior, broadest in the middle, protruding slightly at posterior angles (figs 7, 12). Shiny, smooth, and finely punctured without any transverse depression, but often with insignificant shallow longitudinal impression from the posterior angle in the basal third of pronotum. Pronotum usually yellow or yellowish-red, but black in about 20 % of material examined. Pronotal width 2.80–4.20 mm (mean: 3.76), length to width ratio 0.62–0.73 (mean: 0.66).

Scutellum large, triangular, impunctate, yellow, reddish-yellow or pale brown. Procoxal cavities partly open (fig. 2b). Mesothorax and metathorax yellow to brown. Mesosternum broad (fig. 2c). Elytra entirely pale yellow to yellow (in old specimens more brownish) in about 60 % of material; reddish-yellow throughout in 20 %; in specimens with black head and pronotum yellowish-red to reddish-brown with apical quarter dark brown to black.



FIGURES 2–3: *Ochralea nigripes* (Olivier, 1808), **2:** Ventral view: **a**: head, **b**: prothorax, **c**: meso-and metathorax. Scale bar: 1 mm; **3:** Ventral view of abdomen: **a**: female, **b**: male.

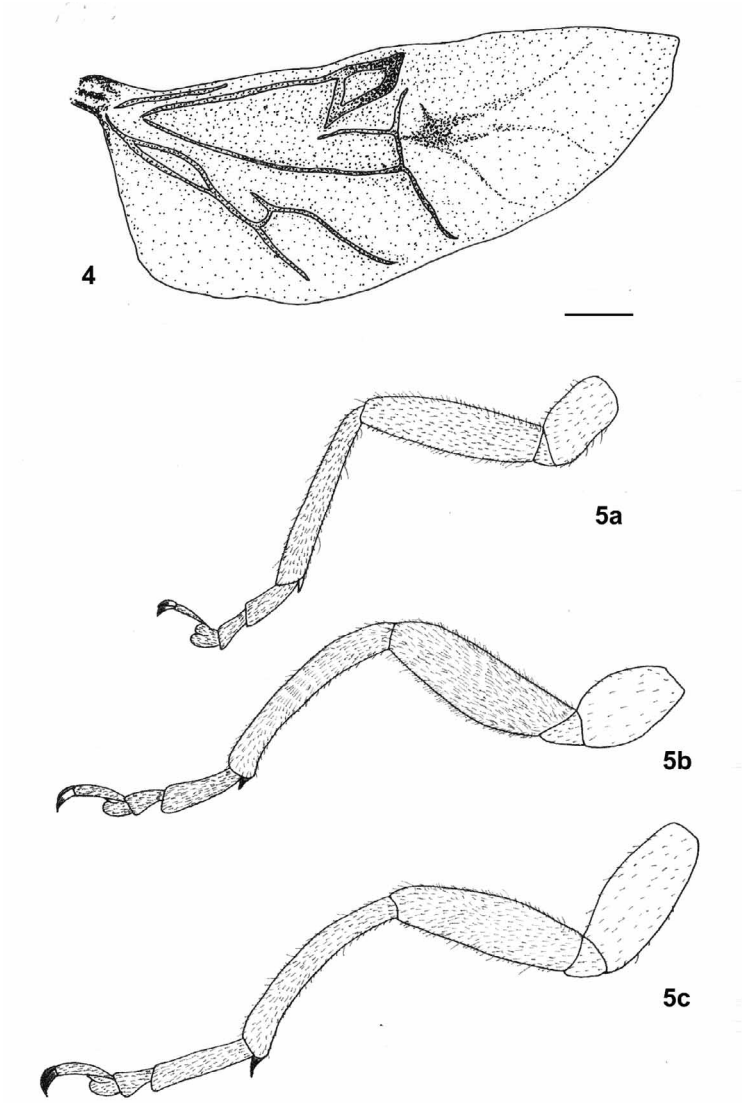
Elytral punctation slightly coarser and denser than that of pronotum. Elytral length 6.00–10.60 mm (mean: 9.14), maximal width of both elytra together 4.70–7.00 mm (mean: 6.16 mm), ratio of maximal width of both elytra together to length of elytra 0.62–0.80 (mean: 0.67). Alae fully developed (fig. 4). Legs long and slender, basal metatarsomere elongate (fig. 5). Pale yellow to reddish-yellow throughout in about half of material examined; others with coxa to femur yellow contrasting with the brown to black tibia and tarsus, all specimens with black head and pronotum of this coloration.

Abdomen: Pale yellow to brownish, but black in specimens with black head and pronotum. Last visible sternite in females rounded at apex, but with two deep parallel incisions, one on either side, in males (fig. 3).

Male genitalia: Outline of the median lobe and endophallic structures symmetrically arranged. Median lobe elongate, moderately curved ventrally, with basal half broad in dorsal view, tapering in the apical half, apex deeply incised. Endophallic sac clearly visible, endophallus with three pairs of spiculae in the middle. Tectum not incised apically, nearly reaching the apex of the median lobe (figs 9, 14).

Female genitalia: Spermatheca with a spherical nodulus, strongly sclerotized, with long and strongly curved cornu, terminating in a cap like structure or rounded (figs 10, 15). One or two pairs of bursal sclerites, with sclerotized spines (figs 11, 16).

Distribution: Recorded from most east Asian countries, including Malaysia, Indonesia, Philippines, Cambodia, Burma, Myanmar, Thailand, Brunei, Laos, Vietnam, Singapore, northwards to Southern China, westwards to Bangladesh and eastern India, eastwards to Sulawesi and and as far as the Wallace-line (fig. 6).



FIGURES 4–5: *Ochralea nigripes* (Olivier, 1808), dorsal view of right hind-wing; **5:** Ventral view of left legs: **a**. prothoracic, **b**. mesothoracic, **c**. metathoracic. Scale bar: 1 mm.

Diagnosis: *Ochralea* are relatively large galerucines (7.75–14.40 mm body length) with elongate basal metatarsomeres that distinguish them from most other galerucines of the same size. Other galerucine taxa with strongly elongate basal metatarsomeres, like *Candezea* Chapuis, 1879 (5.70–8.10 mm; Wagner & Kurtscheid, 2005) and *Monolepta* (3.00–7.50 mm; Wagner 2007a) are considerably smaller. The dorsal coloration is either entirely yellow to yellowish- or brownish-red, but one distinct variation of *O. nigripes* has a black head, pronotum and apical quarter of the elytra. Such uniform coloration only occurs in a few species of *Monolepta* and *Candezea*, which usually have contrasting dorsal coloration, with transverse bands and spots.

The second and third antennomeres of *Ochralea* are short and almost the same size, as in *Monolepta*, which was the crucial character responsible for the synonymisation of these taxa by Weise (1924). The length ratio of the second to the third antennomere in *Ochralea* is 0.67–0.90, 0.82–1.10 in *Monolepta*, but differs in

Candezea where it is 0.49–0.63. The pronotum of *Ochralea* is comparatively narrow, with a length to width ratio of 0.62–0.73, which is similar to the 0.52–0.65 of *Monolepta*, but significantly different from the species of *Candezea*, which have a much broader pronotum of 0.42–0.59. The procoxal cavities are partly open (fig. 2) as in most species of *Monolepta* and *Candezea*.

The median lobe of *Ochralea* is deeply incised apically, while it is not incised and usually rounded in *Monolepta* and carinated ventrally in *Candezea*. The tectum is not incised in *Ochralea* and *Monolepta*, but bears an incision in *Candezea*. The endophallic sac is clearly visible in *Ochralea*, with endophallic structures consisting of pairs of strong spiculae, similar to those in *Candezea*, but very different from the three distinct types of endophallic spiculae in *Monolepta*. The shape of the spermatheca of *Ochralea* resembles that of *Monolepta* (Wagner, 2007a) with exception of the cap-like structure of the cornu, but is quite different from *Candezea* (Wagner & Kurtscheid, 2005).

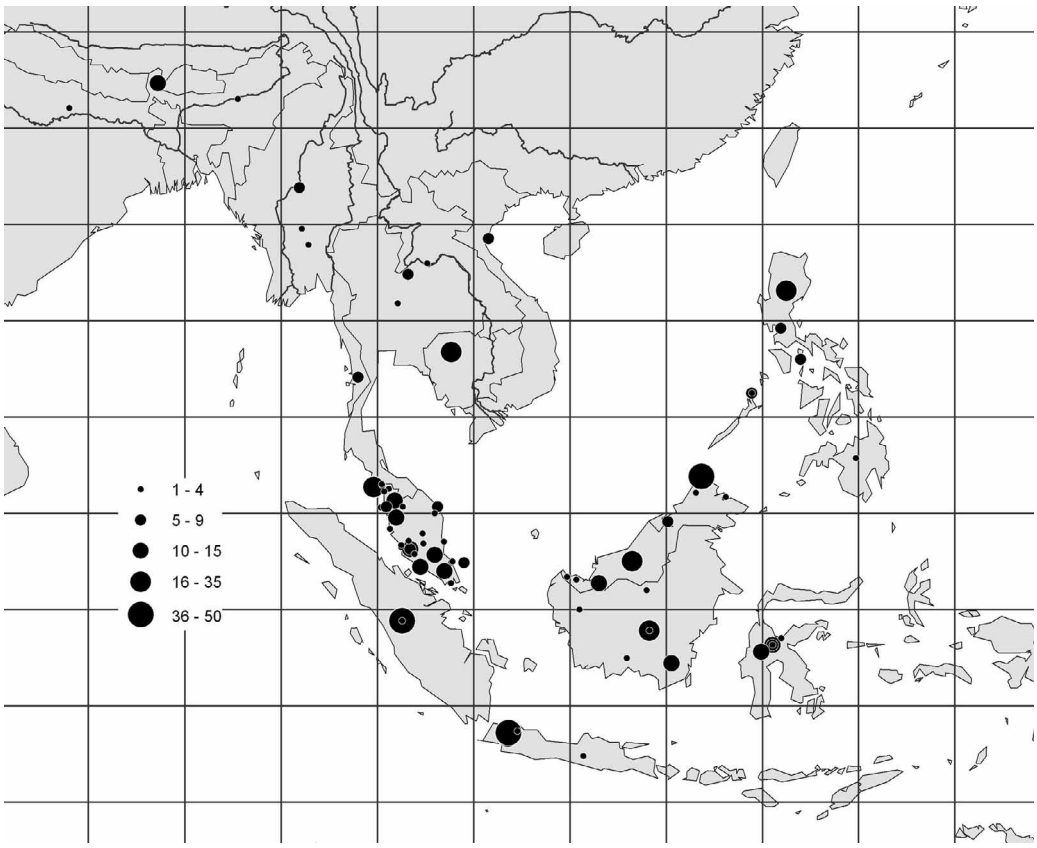


FIGURE 6: Distribution of *Ochralea nigripes* (Olivier, 1808).

Discussion: Besides the type species, nine other species of galerucines have been described in *Ochralea*. These are: *O. ceylonica* Harold, 1880; *O. divisa* Jacoby, 1889; *O. fulva* Baly, 1886; *O. pallida* Jacoby, 1892; *O. pectoralis* Harold, 1880; *O. rufobasalis* Jacoby, 1892; *O. straminea* Harold, 1880; *O. imitans* Jacoby, 1894; *O. marginata* Jacoby, 1884. With an exception of the latter, which was transferred to *Nadrana* by Laboissiere (1936), all the other species were transferred to *Monolepta* by various authors (Weise, 1924; Maulik, 1936). Next to the type species, we also checked type material of the other taxa listed above, and found out that *O. pectoralis* Harold, 1880 is a junior synonym to *O. nigripes* (Olivier, 1808), and the others are not con-generic with *Ochralea*. Details on their morphology and transfer to other genera will be dealt with in subsequent publications.

On the other hand we checked some large species of *Monolepta* and *Candezea* and found that the recently described *Monolepta wangkliana* Mohammedsaid, 2005 needs to be transferred to *Ochralea*. Finally, this genus comprises only two valid species which are subsequently redescribed.

Redescription of species

***Ochralea nigripes* (Olivier, 1808)**
Figs 2–11

= *Galeruca nigripes* Olivier, 1808: 648
= *Ochralea nigricornis* Clark, 1865: 144 (Weise 1924)
= *Ochralea pectoralis* Harold, 1880: 149: syn. nov.
= *Monolepta erythromelas* Weise, 1922: syn. nov.

Total length: 7.75–13.50 mm (mean: 11.19 mm, n = 30)

Head, thorax, abdomen: Characters concerning shape, coloration, and punctuation for this species are almost identical to those described for the genus. There are only minor differences in measurements of external characters: length ratio of second to third antennomere, 0.67–0.86 (mean: 0.76); length ratio of third to fourth antennomere, 0.37–0.47 (mean: 0.42; Fig. 7, 8). Pronotal width 2.80–3.85 mm (mean: 3.44 mm), length to width ratio 0.62–0.73 (mean: 0.68). Elytral length: 6.00–10.35 mm (mean: 7.98 mm), maximal width of both elytra together, 4.70–6.80 mm (mean: 5.42 mm), ratio of maximal width of both elytra together to length of elytra 0.62–0.80 (mean: 0.67; fig. 7). Figs 7–11, strongly reduce size of the figs, in particular Fig. 8, optimal size (comparability) when all figure numbers are in the same size.

Male genitalia: Median lobe moderately curved, tectum almost reaching the apex of the median lobe and covering the endophalllus. Endophallic sac clearly visible, with three pairs of spiculae (fig. 9).

Female genitalia: Spermatheca with a strongly sclerotized, spherical nodulus, with a long and strongly curved cornu terminating in a cap-like structure (fig. 10). Two pairs of strongly sclerotized bursal sclerites, with sclerotized spines (fig. 11).

Diagnosis: *Ochralea nigripes* shows considerable colour variation (fig. 7), but only specimens with a pale yellowish dorsum and femora, and black tibiae and tarsi (fig. 7b) can be confused with *O. wangkliana*. The latter species is larger than *O. nigripes*, with on average a narrower pronotum, and elytra that are on average slightly broader. However, since the morphometric data for the few known specimens of *O. wangkliana* fall within the range of *O. nigripes*, only examination of the genitalia in both sexes will reveal a reliable species diagnosis. For details see diagnosis of *O. wangkliana*.

Distribution: This species is widely distributed in many east Asian countries, such as Malaysia, Indonesia, Philippines, Cambodia, Burma, Myanmar, Thailand, Brunei, Laos, Vietnam, Singapore, northwards to Southern China, westwards to Bangladesh, eastwards to Sulawesi and as far as the Wallace-line (Fig. 6).

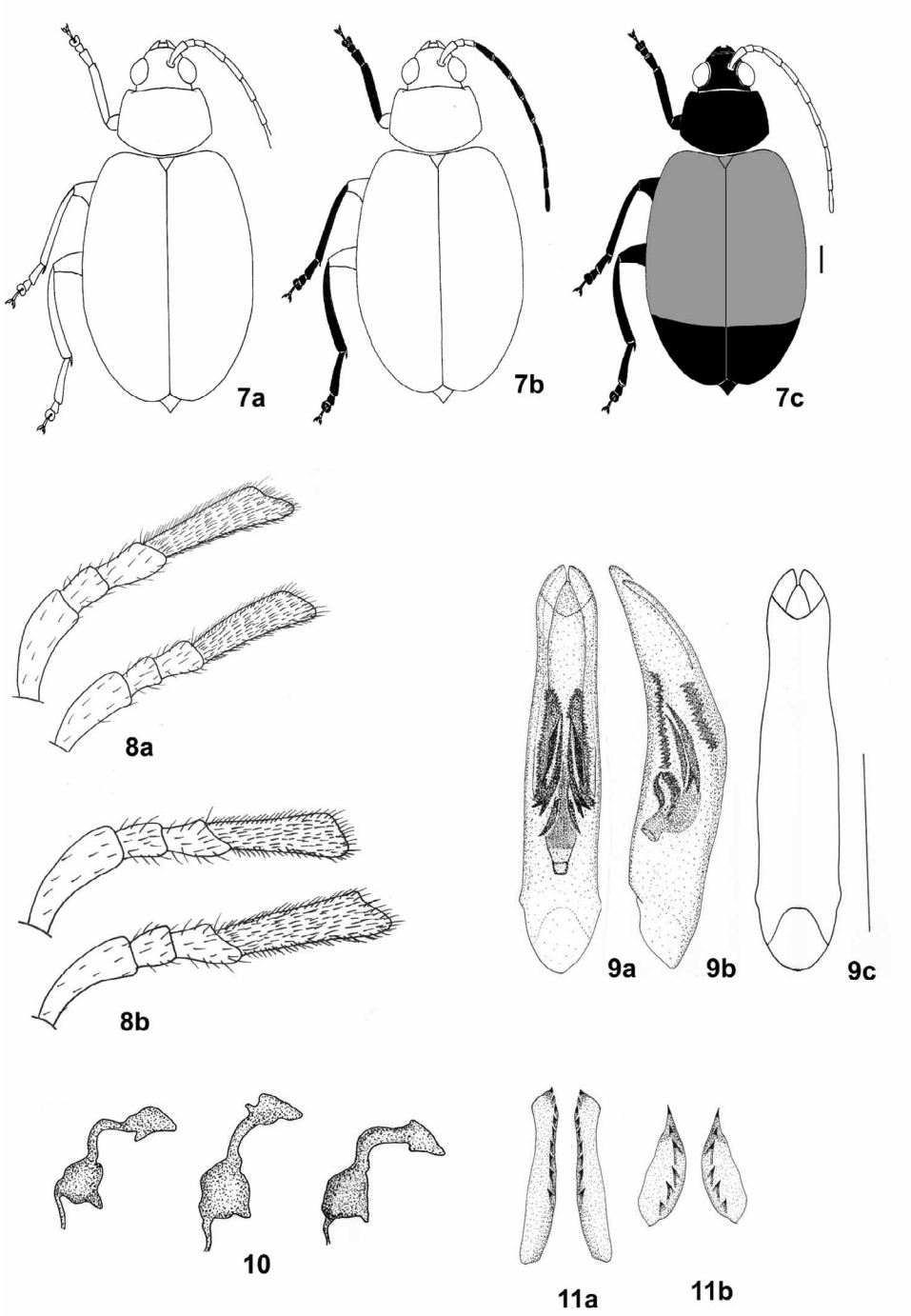
Type material examined: *Galeruca nigripes*: Type material should be in MNHN (Horn et al. 1990), but is not available to us. We adapt Weise's (1924) statement that this species is synonym with *O. nigricornis*, which type material is available.

Ochralea nigricornis: Holotype, ♀ "Penang / Ochralea nigricornis Clark Type / Ochralea nigricornis Clark / 67.56" (BMNH); Type locality: Malaysia, 5°20'N/100°29'E. Clark mentioned more than one specimen in his original description "In my own cabinet and that of Mr. Baly", but there is only one specimen with collection data of the original description available in BMNH, including the word "type" in Baly's handwriting on the identification label, which is a holotype by indication.

Monolepta erythromelas: Replacement name for *Ochralea pectoralis* Harold, 1880 (transferred to *Monolepta* by Weise 1922) not *Monolepta pectoralis* Bohemann, 1959.

Ochralea pectoralis: Holotype, "Tamiang VI, Ochralea pectoralis Har." (MNHU); Type locality: Indonesia, Sumatra, 2°28'S/103°54'E. Harold gave no number of specimens in this original description, but there is no indication of more than one, and the only available specimen in MNHU can be treated as holotype.

Weise (1922) also cited *Monolepta concolor* Boheman, 1859 as synonym, but he has most likely never seen the type specimen from NHRS. This is a small beetle of about 5 mm total length and does neither belong to *Ochralea* nor to *Monolepta*.



FIGURES 7–11: *Ochralea nigripes* (Olivier, 1808). **7:** Habitus, dorsal colour patterns (white: yellow; grey: red; black: black) Scale bar: 1 mm; **8:** Basal antennomeres, **a**. two different females; **b**. two different males; **9:** Median lobe, endophallus inverted: **a**. dorsal, **b**. lateral; **c**. ventral (without endophallic spiculae); **10.** Spermathecae of three different females showing variation; **11:** Bursal sclerites, view from inner side: **a**. ventral, b. dorsal. Scale bar: 1 mm.

Other material examined. Bangladesh: 3 ex., Bengal, Buxar Duars, D. Nowrojee, V.1907, 25.34°N/84.01°E (BMNH); 1 ex., Assam Valley, Doherty, Fry Coll. 1905.100, 26°30'N/92°45'E (BMNH). – **Brunei:** 5 ex., Brunei, Kuala Belalong FSC, dipterocarp forest, 1991–173, VI.1991, N. Mawdsley, 4°34'N/115°7'E (BMNH). – **Burma:** 2 ex., Burmah, 8525, 1°50'S/120°31'E (BMNH); 2 ex., Burmah, Karen Mts., Doherty, Fry Coll. 1905.100, 1°50'S/120°31'E (BMNH); 1 ex., Celebes, IX.1923, C. J. Brooks Coll., 1°50'S/120°31'E

(BMNH); 1 ex., Burmah, Andrewes Bequest, B. M. 1922–221, 1°50'S/120°31'E (BMNH); 1 ex., Burmah (BMNH); 4 ex., Tenasserim, Javoy, Doherty, Fry Coll., 1905.100, 1°50'S/120°31'E (BMNH); 1 ex., Tenasserim, Thagala, IV.1887, Fea (BMNH); 1 ex., Toungoo, Andrewes Bequest, B. M. 1922–221, 1°50'S/120°31'E (BMNH); 1 ex., Tenasserim, Thagala, Fea, IV.1887, 81662, 12°4'N/99°1'E (MNHU). – **Cambodia:** 27 ex., Cambodia (Siem Reap), Kbal spean, 28.V.2005, day catch, I. Var & P. Grootaert, 13°22'N/103°50'E (16 ex. BMNH, 11 ex. IRSN). – **India:** 7 ex., E. India 21°N/98°E (BMNH); 15 ex., Gopaldhara, Rungbong Vall., Sikkim, H. Stevens 1916–218, 27.33°N/88.62°E (BMNH). – **Indonesia:** 8 ex., Sulawesi Utara, Dumoga-Bone N. P., II.–III., IX.1985, Project Wallace, at light, 1°50'S/120°31'E (BMNH); 9 ex., Java, Depok, G. E. Bryant, IV. 1909, G. Bryant Coll. 1919–147, 6°23'S/106°49'E (BMNH); 8 ex., Celebes, Sharp Coll. 1905–313, 1°50'S/120°31'E (BMNH); 2 ex., Java, Buitenzorg, C. W. Andrews 98–20, 6°35'S/106°47'E (BMNH); 1 ex., E. Coast Sumatra, Doerian Moelan, Briendjei. Lt. R. Coughtrie, 1915–184, 0°35'S/101°18'E (BMNH); 2 ex., Java, Wallace, 7°36'S/110°42'E (BMNH); 4 ex., Sumatra, Merang, Doherty, Fry Coll. 1905–100, 0°45'N/98°49'E (BMNH); 5 ex., Sumatra, Lambang, Buxton, Fry Coll. 1905–100, 0°45'N/98°49'E (BMNH); 1 ex., Sulawesi Tengah, nr. Morowali, Ranu river area, I.–IV.1980, S. L. Sutton, C. J. Rees, B. M. 1980–281, 1°S/121°E (BMNH); 1 ex., Java, 7°30'S/111°15'E (BMNH); 3 ex., SUMAT, Jacoby Coll., 1909–28°, 0°N/102°E (BMNH); 1 ex., Java, Bulterong, S. 1924, 7°30'S/111°15'E (IRSN); 1 ex., Celebes, IX.1923, C. J. Brooks Coll., 1°50'S/120°31'E (BMNH); 1 ex., K. V. H. Java, 7°36'S/110°42'E (NNML); 7 ex., Java, Occident, Sukabumi, 2000 1893, H. Fruhstorfer, 7°36'S/110°42'E (NNML); 2 ex., Java, Orient, Montes Tengger, 4000 1890, H. Fruhstorfer, 7°36'S/110°42'E (NNML); 8 ex., Borneo Exped. Dr. Nieuwenhuis, Mahakkam 1894, 1°6'S/114°8'E (NNML); 2 ex., Borneo, Setput 1903, N. E. Puper, 1°6'S/114°8'E (NNML); 4 ex., Dr. B. Hagen. Tandjong Morawa, Serdang, (N.O.Sumatra), 0°35'S/101°E (NNML); 3 ex., N. E. Sumatra, Deli, Kuala Simpang, A. Collart, 0°35'S/101°18'E (NNML); 5 ex., Java, Depok, ex collection J. J. de Voes Tot, Nederveen capel, 6°23'S/106°48'E (NNML); 1 ex., Sulawesi, Dumoga bone NP; edwards sucamp, at light, 664, 29.IV.1985, 1°50'S/120°31'E (NNML); 1 ex., Buitenzorg, 19.X.1928, J. V. D. Vecht, 6°35'S/106°47'E (NNML); 1 ex., P. Buitenzorg, Tandjong Riok, Feb. 09, 6°35'S/106°47'E (NNML); 7 ex., Samanga, S. Celebes, Nov. 1895, H. Fruhstoefer, 3°11'S/120°26'E (NNML); 2 ex., Nierst, Depok, 1899, 6°23'S/106°48'E (NNML); 2 ex., Buitang, Java, ex collection, J. J da Voes Tot, Nederveen capel, 7°36'S/110°42'E (NNML); 7 ex., Sumatra, Manna, M. Knappert, 0°45'N/98°49'E (NNML); 13 ex., Nierstratsz, Depok 1899, 6°23'S/106°48'E (NNML); 1 ex., Krawang, Java, L. D.V., 6°18'S/107°17'E (NNML); 1 ex., W. Celebes, Paloe, Dec. 1936, Dr. J. V. D. Vecht, 2°12'S/119°56'E (NNML); 9 ex., Depok, W. Java, V.–VII.1932, W. C. V. Heurn, 6°23'S/106°48'E (NNML); 2 ex., Depok, Java, 3.VIII.1931, Fr. A. Th. H. Verbeek, 6°23'S/106°48'E (NNML); 20 ex., W. Java, Buitenzorg, VI.–VIII.1931, W. C. Hauern, 6°35'S/106°47'E (NNML); 1 ex., Sumatra, Deyr, 40824, 0°35'S/101°18'E (MNHU); 1 ex., Java, Dr. Will, 7°36'S/110°42'E (MNHU); 2 ex., Borneo, 1°6'S/114°8'E (MNHU); 10 ex., Java, Buitenzorg, Kemner, 6°35'S/106°47'E (NHRS). – **Laos:** 1 ex., Laos, Vien, V. 1915, R. Vitalis de Salvaza 17°58'N/102°36'E (BMNH); 1 ex., Laos, Xien Khou, III.1915, R. Vitalis de Salvaza 17°58'N/102°36'E (BMNH). – **Malaysia:** 8 ex., Sarawak. Foot of Mt. Dulit, Junction of rivers, Tinjar & Lejok, IX.–X.1932, secondary forest 2°33'N/113°E (BMNH); 25 ex., W. Sarawak, Quop, G. E. Bryant, II.–IV.1914, G. Bryant Coll. 1919-147 2°33'N/113°E (BMNH); 4 ex., Sarawak, Ulu Akar, P. de F. Coll, XI.1914 2°33'N/113°E (BMNH); 6 ex., Sarawak, Long Sup, Baram River, X.1920, J. C. Moulton 1°21'N/111°31'E (BMNH); 2 ex., Malay Peninsular, Kuala Terengganu, VI.1926, Mr. C. B. Klosi Coll. F.M.S Museum, 5°20'N/103°9'E (BMNH); 4 ex., S. E. Borneo, Pengaron, 1904–150, 1°6'S/114°8'E (BMNH); 70 ex., N. Borneo, Kudat, IX.1927, C. B. K. & H. M. P., F. M. S. Museum, 6°53'N/116°50'E (BMNH); 1 ex., Pulo Penang, Lower Siam, IV.1911, 5°20'N/100°29'E (BMNH); 6 ex., Borneo, Baly Coll., 1°6'S/114°8'E (BMNH); 6 ex., Penang, Bowring 63.47, 5°20'N/100°29'E (BMNH); 1 ex., Malacca, Baly Coll., 2°12'N/102°15'E (BMNH); 2 ex., Malay, Castelu, Fry Coll. 1905–100, 3°8'N/101°42'E (BMNH); 2 ex., W. Sarawak, Mt. Matang, G. E. Bryant, XII.1913, 1.55°N/110.35°E (BMNH); 3 ex., Sarawak, Baram River, Long Akar,

X.1920, J. C. Moulton 1°21'N/111°31'E (BMNH); 1 ex., Sarawak, Baram River, Lio Matu, X.1920, J. C. Moulton 1°21'N/111°31'E (BMNH); 2 ex., Sarawak, Baram, IX.1920, J. C. Moulton 1°21'N/111°31'E (BMNH); 1 ex., Sarawak, Borneo, Trusan, 1915, H. W. Smith, 6°26'N/117°41'E (BMNH); 3 ex., Pulau Tioman. S. China Sea, B/T Sedugong 1000, V.1927, N. Smedly 2°49'N/104°11'E (BMNH); 7 ex., Pulau Aor, S. China Sea, IV.–V.1927, N. Smeldy, 2°26'N/104°31'E (BMNH); 2 ex., Pulo Tioman, VII.1915, V. K. Coll. (BMNH); 6 ex., Malay Penin., Kuala Terengganu, VI.1926, Mr. C. B. Klasss, Coll. F.M.S. Museum, 5°20'N/ 103°9'E (BMNH); 1 ex., Malaya, Perlis, Bukit Jermeh, III.1936, H. M. Pendlebury, F.M.S. Museum, 6°30'N/ 100°15'E (BMNH); 1 ex., Malaya, Perlis, Arau, III.1936, H. M. Pendlebury, F.M.S. Museum, 6°26'N/ 100°16'E (BMNH); 3 ex., West Sarawak, Lundu, I.1914, G. E. Bryant, 1°40'N/109°51'E (BMNH); 11 ex., Sarawak, C. J. Brooks, B.M. 1928–193, 2°30'N/113°15'E (BMNH); 1 ex., Sarawak, 1907–1909, C. J. Brooks, B.M. 1936–681, 2°30'N/113°15'E (BMNH); 1 ex., Sarawak, Shelford, 1900–117, 2°30'N/113°15'E (BMNH); 1 ex., Sarawak, Lundu, IV.1913, 1°40'N/109°51'E (BMNH); 1 ex., Sarawak, Semenggok Forest, VI.1968, Vincent H., 2°30'N/113°15'E (BMNH); 13 ex., Fed. Malay States, 1909, C. J. Brooks, B.M. 1931-570, 3°8'N/ 101°42'E (BMNH); 1 ex., W. Sarawak, Puak, V.1914, G. E. Bryant, G. E. Bryant Coll. 1919-147, 2°30'N/ 113°15'E (BMNH); 1 ex., N. W. Borneo, 95–226, 1°N/114°E (BMNH); 1 ex., Malay Penin, Kedah, Alor Setar, Gunung Keriang, IV.1928, H.M. Pendlebury, Coll. F. M. S. Museum, 6°7'N/100°22'E (BMNH); 1 ex., Sandakan, Atkinson Coll., 92–3, 5°50'N/118°7'E (BMNH); 2 ex., Malacca, Whitehead, Fry Coll. 1905–100, 2°12'N/102°15'E (BMNH); 6 ex., Borneo, Pengaron, Doherty, Fry Coll.1905-100, 1°N/114°E (BMNH); 2 ex., Borneo, German Mission, Fry Coll. 1905–100, 1°N/114°E (BMNH); 2 ex., Borneo N, Whitehead, Fry Coll. 1905-100, 1°N/114°E (BMNH); 8 ex., Perak, Doherty, Fry Coll. 1905–100, 4°45'N/101°E (BMNH); 1 ex., Malaysia, P. S. A Is. Siantan, IX.1925, Ex. F. M. S. Museum, B.M. 1955-354, 3°8'N/101°42'E (BMNH); 2 ex., Malay Penin, Selangor, Bukit Kutu, IX.1932, H. M. Pendlebury, 3.35°N/101.25°E (BMNH); 1 ex., Perak, F. M. S. Batang Padang, I.1925, H. M. Pendlebury, 5.33°N/101.33°E (BMNH); 1 ex., Gombak Forest, VIII.1968, 3.25°N/101.25°E (BMNH); 1 ex., West Borneo, Putus Sibau am obereh Kapuas, Eing. Nr. 6 1926, 0°N/110°30'E (IRSN); 1 ex., Borneo, Melawifloss b. Nanga Kruab, 9.XI.1924, 1°N/114°E (IRSN); 1 ex., Dindings, 96–85 (BMNH); 11 ex., SAR, Baly Coll., 4°11'N/100°39'E (BMNH); 10 ex., Malaysia, Johor, Endau Rompin, VI.2007, B. H. Izfa, 2°N/103.5°E (UKM); 1 ex., Kedah, Langkawi, Kg. Kok, IV.1993, Ismail, Sham, Yusof 6°21'N/99°48'E (UKM); 1 ex., Kedah, Langkawi, I.1989, Ismail 6°21'N/99°48'E (UKM); 1 ex., Kedah, Baling, H. L. Bukit Weng, VI.1994, Ismail, Ruslan, Yusof, 5.67°N/120°31'E (UKM); 1 ex., Kedah, Langkawi, Kampong Kilim, II.1994, Ismail, Zabidi & Ruslan 6°21'N/99°48'E (UKM); 1 ex., Pahang, Kuala Lompat, IV.–V.1986, Pelajar Thn., 3.43°N/102.4°E (UKM); 2 ex., Pahang, Pulau Tioman, IX.1999, Ismail & Sham 2°49'N/104°11'E (UKM); 1 ex., Pahang, Pulau Tioman, Paya, IV.1993, Zabidi, Sham & Razali 2°49'N/ 104°11'E (UKM); 9 ex., Malaysia, Sarawak, Spaoh, I.2008, B. H. Izfa, 1.46°N/111.47°E (UKM); 1 ex., Terengganu, Setiu, H. Lipur Peladang, V.1994, Ismail & Zabidi, 5°N/103°E (UKM); 1 ex., Pahang, Ekspedisi Rompin-Endau, V.1989, Ismail & Nor 3.53°N/103.47°E (UKM); 1 ex., Selangor, Kuala Kubu Bharu, Pertak, IV.1997, Ismail & Ruslan 3.57°N/101.65°E (UKM); 1 ex., N. Sembilan, Beranang- Lenggeng Jeram Kedah, V.1993, Sham, Ismail, Yusuf 2°52'N/1010°56'E (UKM); 1 ex., Pahang, Jerantut, Hutan Lipur Sg Salam, VIII.1996, Ismail & Muzammil 3°56'N/102°22'E (UKM); 1 ex., Pahang, Kuala Lompat, III.1998, Salleh et al. 3.43°N/102.4°E (UKM); 1 ex., Johor, Mersing, 2.II.1980, Arishah 2°26'N/103°50'E (UKM); 10 ex., Kedah, Baling, Lata Bayu, 15.VI.1994, Ismail, Ruslan & Yusuf 5°40'N/100°55'E (UKM); 10 ex., Bukit Weng, 16.VI.1994, Ismail, Ruslan & Yusuf 5.67°N/100.92°E (UKM); 8 ex., Langkawi, 10.–14.I.1989, Ismail 6°21'N/99°48'E (UKM); 1 ex., Kuala Nerang, Gunung Janing, 16.VI.1994, Ismail, Ruslan & Yusuf 6°15'N/ 100°36'E (UKM); 12 ex., Langkawi, Kg. Kilim, 5.II.1994, Ismail, Sham & Yusuf 6°21'N/99°48'E (UKM); 1 ex., Kinabalu, Borneo, 828,6°4'N/116°33'E (MNHU); 1 ex., Balabak, Borneo, 7°N/117°1'E (MNHU); 6 ex., Malakka, Perak, 2°12'N/102°15'E, (MNHU). – **Philippines:** 5 ex., Philippine Is., E. M. Ledyard, B. M. 1925–491, 13°N/122°E (BMNH); 1 ex., Philippine Is., Mindanao, Bugo, Misamis Or. B. M. 1937–107 7°51'N/

124°51'E (BMNH); 1 ex., Manila, E. Coll., 14°36'N/120°58'E (BMNH); 2 ex., Phil. Is, E. Coll. Thomson 13°N/122°E (BMNH); 1 ex., Phillip. Island, Fry Coll. 1905–100 13°N/122°E (BMNH); 1 ex., Luzon, Sharp Coll. 1905.313, 16°33'N/121°15'E (BMNH); 29 ex., Luzon, J. Roseler, 29.IX.1908, 16°33'N/121°15'E (MNHU); 2 ex., Phillipines, Palawan Island, Olanguan River, 50–400 m, 30.V.1991, R. A. Muller leg et. Coll, 11°14'N/119°27'E (NNML). – **Singapore:** 1 ex., Singapore 1°21'N/103°49'E (BMNH). – **Thailand:** 1 ex., Siam 15°53'N/101°4'E (BMNH); 1 ex., Lower Siam, Pulo Butang, IV.1911, R. H. Coll., 5°18'N/100°11'E (BMNH); 1 ex., Siam, Setul, H. N. Bidley, 1910–264 15°53'S/101°4'E (BMNH); 1 ex., Siam, Bowring 63.47 15°53'N/101°4'E (BMNH); 1 ex., Siam, Coll. Nonfried 15°53'N/101°4'E (IRSN); 3 ex., Bankau Siam, III.1921, R. van Veon, 15°53'N/101°4'E (NNML); 5ex., Thailand, Loei, Na-Hao, field res stat, 15.–18.V.2003, banana trap, J. Constant & K. Smets, 17°25'N/101°36'E (IRSN). **Vietnam:** 1 ex., Tonkin, Chana, 1916, R. Vitalis de Salvaza, 19°16'N/105°19'E (BMNH); 1 ex., Tonkin, Hoabinh, A. de Cooman, B. M. 1940–13, 19°16'N/105°19'E (BMNH); 7 ex., Riviere Claire, Haut Tonkin, Madon, R. Mus. Hist. Nat. Belg. I. G. 12.595, 19°16'N/107°19'E (IRSN); 9 ex., Tonkin, Than-Moi, Juni-Juli, H. Fruhsdorfer, 19°16'N/107°19'E (MNHU).

***Ochralea wangkliana* (Mohamedsaid, 2005), comb. nov.**
Figs 11–16

= *Monolepta wangkliana* Mohamedsaid, 2005: 390.

Redescription. Total length: 12.40–14.40 mm (mean: 13.2 mm, n = 3)

Head: Pale yellow or brownish. Very finely punctate, with a significant transverse impression between the posterior third of eyes, and a short median impression. Eyes large, strongly convex (Fig. 12). Labial and maxillary palpi slender, yellow basally, occasionally brownish towards the apex. Labrum and tip of mandible brown to black. Antenna filiform, elongate, three basal antennomeres pale to reddish-yellow and others dark brown to black. Length ratio of second to third antennomere, 0.85–0.92 (mean: 0.90); length ratio of third to fourth antennomere, 0.45–0.52 (mean: 0.49; fig. 13).

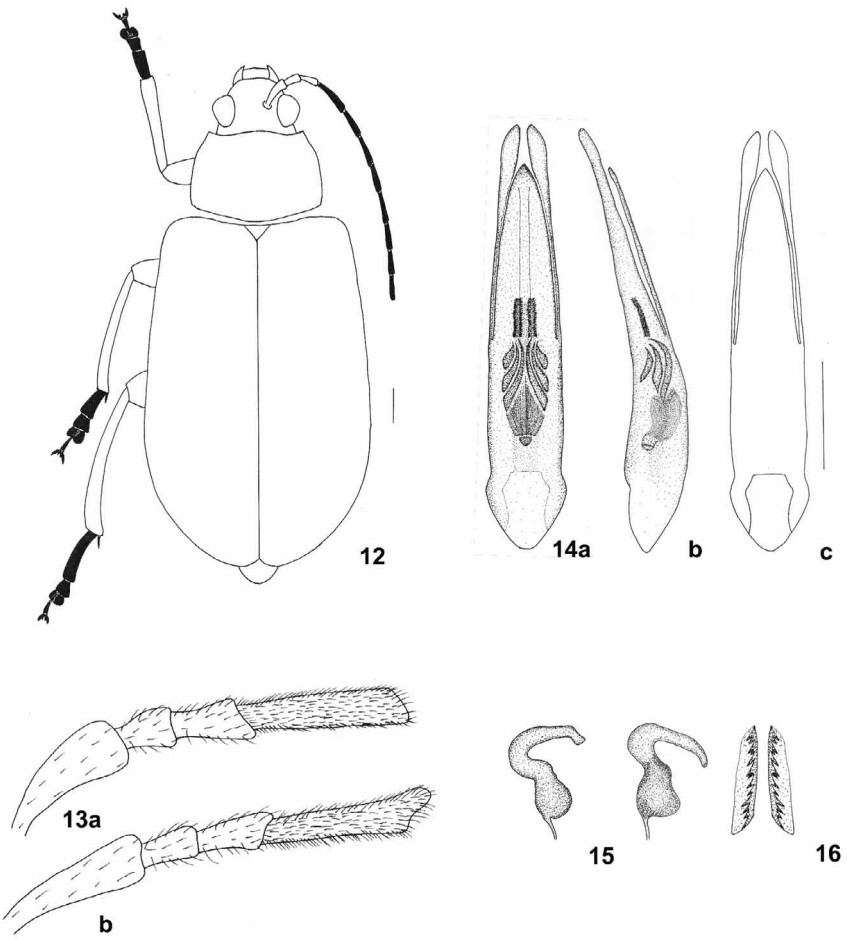
Thorax: Pronotum narrow, smooth, finely punctate, convex from side to side, without any depression, yellow. Pronotal width 4.05–4.20 mm (mean: 4.08), length to width ratio, 0.63–0.65 (mean: 0.64; fig. 12), smooth and finely punctate. Scutellum triangular, impunctate, yellow. Elytra densely and significantly more coarsely punctured than pronotum, yellow. Elytral length, 9.65–10.60 mm (mean: 10.30 mm), maximal width of both elytra together, 6.80–7.00 mm (mean: 6.90 mm), ratio of maximal width of both elytra together to length of elytra 0.66–0.68 (mean: 0.67; fig. 12). Meso- and metathorax yellow. Legs long, and slender. Coxa and femur yellow, tibia and tarsi contrasting black.

Abdomen: Yellow. Last visible sternite in females slightly convex at the apex, but with two deep, parallel incisions, one on either side, in males.

Male genitalia: Median lobe very elongate and moderately curved, the basal half broad, and the apical half tapering towards the apex in dorsal view. Deeply incised at the apically with the basal orifice rounded. Tectum not reaching the apex of the median lobe (Fig. 14).

Female genitalia: Spermatheca strongly sclerotized, particularly nodulus, cornu strongly curved and more or less rounded apically (fig. 15). One pair of poorly sclerotized bursal sclerites (fig. 16).

Diagnosis: *Ochralea wangkliana* has the same colouration as about one third of the *O. nigripes* specimens examined. It is characterized by completely pale yellow to yellow dorsum, underside, three basal antennomeres, coxae and femora, and contrasting dark brown to black apical antennomeres, tibiae and tarsi. *Ochralea wangkliana* are much larger, and *Ochralea* specimens longer than 13.5 mm belong to this species. The best character to distinguish the two species is the median lobe, which is less curved and deeply incised apically, with the tectum not extending to the apex in *O. wangkliana* (fig. 14). The median lobe in *O. nigripes* is more strongly curved, shorter, and the tectum almost reaches the apex of the median lobe (fig. 9). The endophallic armature is similar.



FIGURES 12–16: *Ochralea wangkliana* (Mohamedsaid, 2005): **12:** Habitus, dorsal colour patterns (white: yellow; black: black); **13:** Basal antennomeres: a. female; b. male; **14:** Median lobe, endophallus inverted: a. dorsal, b. lateral; c. ventral (without endophallic spiculae); **15:** Spermathecae of two different females showing variation; **16:** Bursal sclerites, view from inner side. Scale bar: 1 mm.

The spermatheca of *O. nigripes* has the cornu terminating in a cap-like structure (fig. 10), whilst it is rounded in *O. wangkliana* (fig. 15). The bursal sclerites are very similar to *O. nigripes* (fig. 11), but consist of only one pair of slecrites (fig. 16). It is possible that *O. wangkliana* may only represent very large specimens of *O. nigripes*, and the differences found in external measurements and genital structures are caused by allometric effects. However, we think that the differences particularly in the shape of the median lobe, spermatheca and number of bursal sclerites, support a distinct species.

Distribution: Only known from Wang Kelian Perlis, Malaysia

Type material examined: Holotype: ♂, Perlis, Kaki Bukit W. Kelian, 9 Dec 92, Zabidi, Sham, Saiful & K'din (UKM); Type locality: Malaysia, 6°40'N/100°11'E. Paratypes: 2 ♀, Perlis, Taman Negeri Wang Kelian, 29 Sept.–4.Oct 1999, Zabidi, Ismail & Azman (UKM), 6°40'N/100°11'E.

Acknowledgements

Many thanks to the curators listed in the material and methods chapter who made material available to us.

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Weise, J. (1924) Chrysomelidae: Galerucinae. *In*: Junk, W. (ed.), *Coleopterorum Catalogus*, 78, 1–225, Junk, 's Gravenhage.

Wilcox, J. A. (1973) Chrysomelidae: Galerucinae, Luperini: Luperina. *In*: Junk, W. (ed.), *Coleopterorum Catalogus, Supplementa*, 78 (3), 433–664. Junk, 's-Gravenhage.

Appendix 2

Revision of *Arcastes* Baly, 1865 from the Oriental region (Coleoptera: Chrysomelidae: Galerucinae)

Hazmi, I. R. & Wagner, Th. 2010 (b). Revision of *Arcastes* Baly, 1865 from the Oriental Region (Coleoptera, Chrysomelidae, Galerucinae). Zookeys*,* 42: 79–99.

As the first author of this article, I declare that most of the technical works: loaning, sorting, dissection and drawing have been done by me under supervision of Thomas Wagner.

ZooKeys 42: 79–99 (2010)
doi: 10.3897/zookeys.42.336
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Revision of *Arcastes* Baly, 1865 from the Oriental Region (Coleoptera, Chrysomelidae, Galerucinae)

Izfa Riza Hazmi, Thomas Wagner*

Institut für Integrierte Naturwissenschaften (Biologie), Universität Koblenz-Landau, Universitätsstr. 1, 56070 Koblenz, Germany

Corresponding author: *Thomas Wagner* (thwagner@uni-koblenz.de)

Academic editor: *A. Konstantinov* | Received 21 November 2009 | Accepted 11 March 2010 | Published 1 April 2010

Citation: Hazmi IR, Wagner T (2010) Revision of *Arcastes* Baly, 1865 from the Oriental Region (Coleoptera, Chrysomelidae, Galerucinae). Title. ZooKeys 42: 79–99. doi: 10.3897/zookeys.42.336

Abstract

The species of the genus *Arcastes* Baly, 1865 from Oriental Region are revised. The type species is *A. biplagiata* Baly, 1865 by original designation. The genus *Arcastes* was erected by Baly based on a peculiar shape of the antennae. Subsequently, eight other species have been described in this genus. Up to now this genus was not revised, in particular the male and female genitalia have not yet been studied. Studies of the type material revealed, that *A. biplagiata* possess a very peculiar shape of median lobe and endophallic structures. Next to the genotype, only two valid species remain in this genus: *Arcastes suturalis* Jacoby, 1884 (with *A. ismaili* Mohamedsaid, 2000 as new synonym), and *Arcastes dimidiata* Laboissière, 1929. *Arcastes sumatrensis* Jacoby, 1884 is a new junior synonym of *Neolepta biplagiata* Jacoby, 1884. All other species need to be transferred to other genera that will be subject of the ongoing revision of the Oriental Galerucinae. Distribution of the three species of *Arcastes* is restricted to Singapore, Malaysia, and Indonesia, southward to Java. In this paper we provide redescriptions of the genus and the valid species, including illustrations of external and genitalic characters, photographs of the primary type specimens, distribution maps and a key.

Keywords

Galerucinae, *Arcastes*, Oriental region, revision, taxonomy, redescription, new synonym

* 33rd contribution to the taxonomy, phylogeny and biogeography of the Galerucinae

Introduction

The genus *Arcastes* was established by Baly in 1865 when he described *Arcastes biplagiata* Baly, 1865, which he originally designated as the genotype. Wilcox (1973) placed it in the section "Monoleptites" due to the strongly elongated basi-metatarsus. Since the introduction of the genus, eight species have been described: *A. sanguinea* Jacoby, 1892 from Perak (Malaysia), *A. sumatrensis* Jacoby, 1884 from Sumatra, *A. suturalis* Jacoby, 1884 from Sumatra, *A. dimidiata* Laboissière, 1929 from Siberut Island (Indonesia), *A. astridae* Laboissière, 1932 from Sumatra, *A. nigripennis* Laboissière, 1932 from Borneo, *A. tectonae* Laboissière, 1932 from Java, and *A. ismaili* Mohamedsaid, 2000 from Sabah (Malaysia).

Baly (1865) and subsequent authors assigned species to *Arcastes* based on merely external morphological characters, in particular the enlarged third to seventh antennomeres. After checking the genitalic patterns of the species named above and many other oriental "Monoleptites", it became clear that the median lobe has a peculiar outer shape and asymmetric endophallic structures. Both characters are very useful to delimit this genus from others, while enlarged medial antennomeres also occur in some species of *Monolepta* and *Neolepta*.

Only three species remain in *Arcastes* based mainly on characters of the genitalic structures of the type species. *Arcastes sumatrensis* Jacoby, 1884 is a new junior synonym of *Neolepta biplagiata* Jacoby, 1884. All other species need to be transferred to other genera that will be subject on the ongoing revision of Oriental Galerucinae. An illustration of external and genitalic characters are presented here for these taxa, photographs of the primary type specimens, distribution maps and a key are also included.

Materials and methods

A standard set of figures is given for each species. These include illustrations of the coloration (dorsal view), including the right antenna, where black coloration is indicated by black, yellow coloration by white, red coloration by light grey, and brown by dark grey shading.

The antennomeres of males and females, dorsal, ventral and lateral view of the median lobe including the endophallic structures, spermathecae of three females (if available) and bursa-sclerites (if available) usually of one female are figured. For the redescription of the genus, illustrations of the pro-, meso- and metathorax, female and male abdomen, right legs in ventral view and of the right hind wing in dorsal view are given.

Measurements were made for external characters. Absolute measurements are: total length from the clypeus to apex of the elytron, length of the elytron, maximal width of both elytra (usually in the middle or posterior third of the elytra), and width of the pronotum. Relative measurements are: length to width of the pronotum, maximal width of both elytra to length of the elytron, length of the second to third antennomer-

es, and length of the third to fourth antennomeres. A number of specimens measured is given in the description under "total length". Further materials examined are listed, and all label data are exactly re-written.

The subsequent redescriptions are based on labelled specimens from the following collections (Table 1). Acronyms used and responsible curators in brackets: The Natural History Museum, London (BMNH; S. Shute); Institute Royal des Sciences Naturelle de Belgique, Brussels (IRSN; P. Limbourg); Museum of Comparative Zoology, Harvard University (MCZH); Museum für Naturkunde der Humboldt Universität, Berlin (MNHU; J. Frisch, J. Willers); Swedish Museum of Natural History Stockholm (NHRS; Bert Viklund); Nationaal Natuurhistorisch Museum, Leiden (NNML; F. van Assen); Center for Insect Systematics, UKM, Malaysia (UKM; R. Yusop), Collection of Jan Bezděk, Bruno (CJB).

For location data, geographical coordinates were given in degree and minute. These coordinates were mostly taken from Google Earth. The distribution maps have been produced by ArcGis.

Redescription *Arcastes* Baly, 1865

Type species. *Arcastes biplagiata* Baly, 1865 by original designation.

Total length. 4.45–7.35 mm (mean: 5.67)

Head. Brownish-red to red. Very finely punctuated, with significant transverse impression between posterior third of eyes. Eyes large, strongly convex (Fig. 1). Labial palpi slender and maxillary palpi enlarged, occasionally dark brown to black (Fig. 2a). Labrum pale to dark brown and occasionally blackish in middle. Mandible pale yellow to dark brown and blackish towards apex. Antennae elongated, extended to apical third of elytra (Fig. 1); third to terminal antennomere densely covered by bristle-like setae. First to eighth or ninth antennomeres black, two to three terminal antennomeres contrasting pale yellow to yellowish-brown, only in *A. dimidiata* two basal antennomeres also yellowish. First antennomere club-shaped, second shortest, third antenno-

Table 1. Numbers of material examined and collections investigated.

Collections	***A. biplagiata* Baly, 1865**	***A. suturalis* Jacoby, 1884**	***A. dimidiata* Laboissière, 1929**
BMNH	37	40	5
IRSN	3	3	–
UKM	–	39	–
NNML	24	27	–
MCZH	–	1	–
MNHU	3	3	–
NHRS	1	–	–
CJB	12	5	–
Total	**80**	**118**	**5**

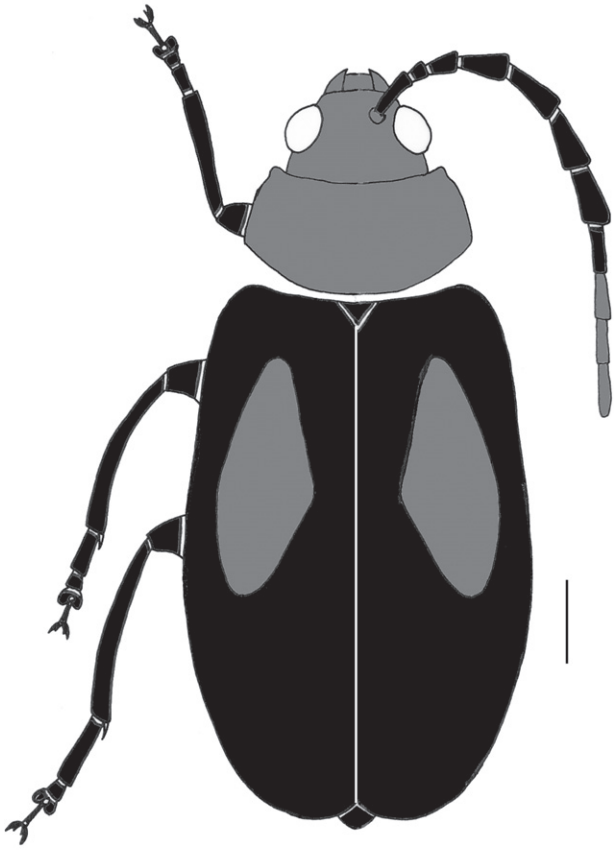

Figure 1. *Arcastes biplagiata* Baly, 1865. Dorsal colour pattern. scale bar: 1 mm (same for all following Figures)

mere about two times longer than second; ratio length of second to third antennomere 0.50–0.57 (mean: 0.54); third to seventh antennomere broad, significantly enlarged, ratio length of third to fourth antennomeres 0.60–0.70 (mean: 0.65), eighth to eleventh antennomeres much slenderer (Figs 8, 14, 20).

Thorax. Pronotum transverse, very broad, broadest in middle, anterior angle significantly protruding, posterior angle slightly marked, pronotum with deeply impressed line along lateral margins (Fig. 1). Brownish-red to red as head, shiny, smooth, and finely punctuated, without transverse depression. Pronotal width 1.55–2.25 mm (mean: 1.90), ratio length to width 0.48–0.57 (mean: 0.53). Scutellum large, triangular, impunctate, brownish, red or black. Procoxal cavities partly open (Fig. 2b). Meso- and metathorax reddish-brown to black. Metasternum broad (Fig. 2c). Elytra elongated, either black throughout, or black with longitudinal yellowish-red spot on disc of each elytron, or black with yellowish to reddish suture that in some species reaches

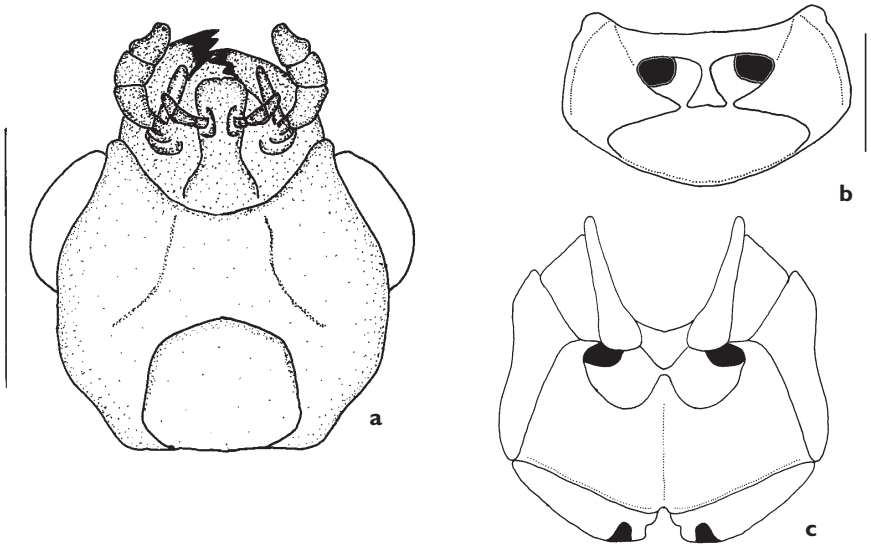

Figure 2. *Arcastes biplagiata* Baly, 1865. **a** Head **b** prothorax **c** meso- and metathorax, ventral view.

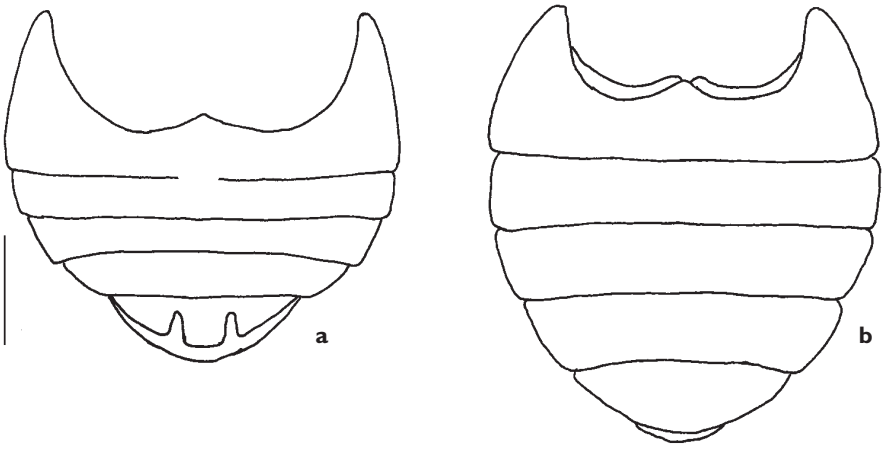

Figure 3. *Arcastes biplagiata* Baly, 1865. Abdomen, ventral **a** male **b** female.

up to one third of each elytron, or basal third completely red and apical two thirds black. Elytra shiny, punctation fine, irregular, slightly coarser and denser than that of pronotum. Elytral length 3.80–5.90 mm (mean: 4.73), maximum width of both elytra together 1.50–4.00 mm (mean: 2.79), ratio of maximum width of both elytra together to length of elytra 0.61–0.72 (mean: 0.66). Alae fully developed (Fig. 4). Legs long and slender, basi-metatarsus elongated (Fig. 5), coxa and trochanter reddish like underside, femur, tibia and tarsus black throughout, tibia with dense and fine setae.

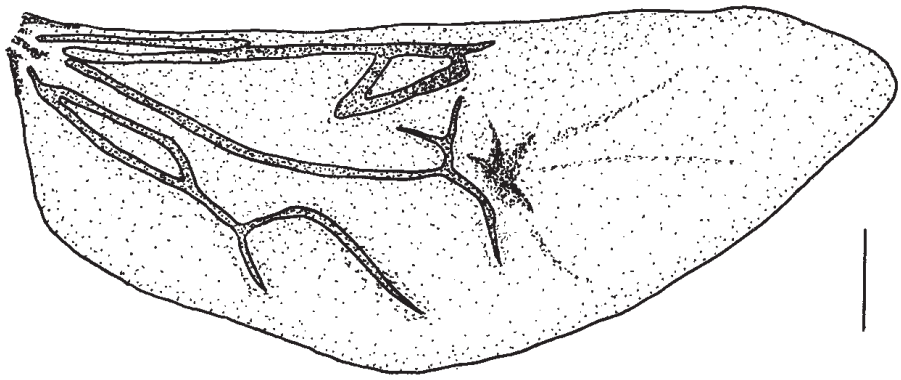

Figure 4. *Arcastes biplagiata* Baly, 1865. Hindwing, right, dorsal view.

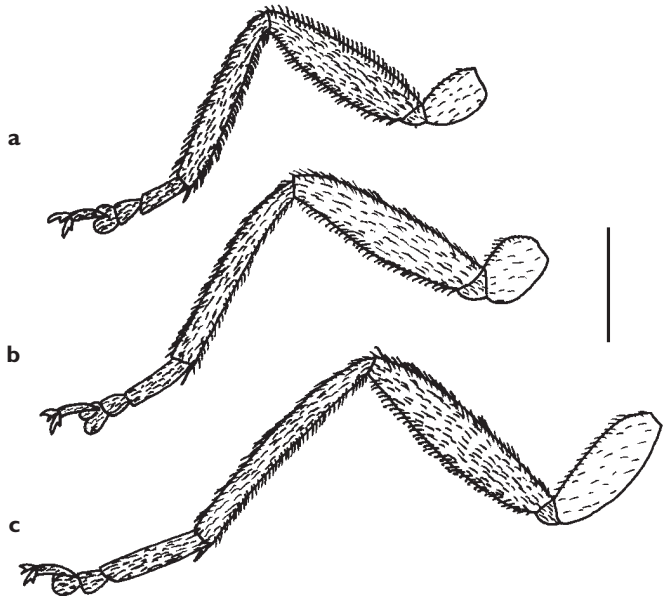

Figure 5. *Arcastes biplagiata* Baly, 1865. Legs: **a** prothoracic **b** mesothoracic **c** metathoracic.

Abdomen. Pale yellow to reddish-brown, occasionally darker in middle, and seventh sternite usually dark brown to black. Last visible sternite in females rounded at apex, and in males with two deep, parallel-sided incisions (Fig. 3).

Male genitalia. The outer shape of median lobe is symmetrical, strongly sclerotized, apex tapered, slightly rounded and not incised. Orifice wide, more or less circular to slightly rectangular. Endophallic structures asymmetrically arranged, ventral spiculae hammer-like, median spiculae narrower, slender, lateral spiculae enlarged and slender, with claw-like small spine medially and tube-like, curved spines. Tectum not

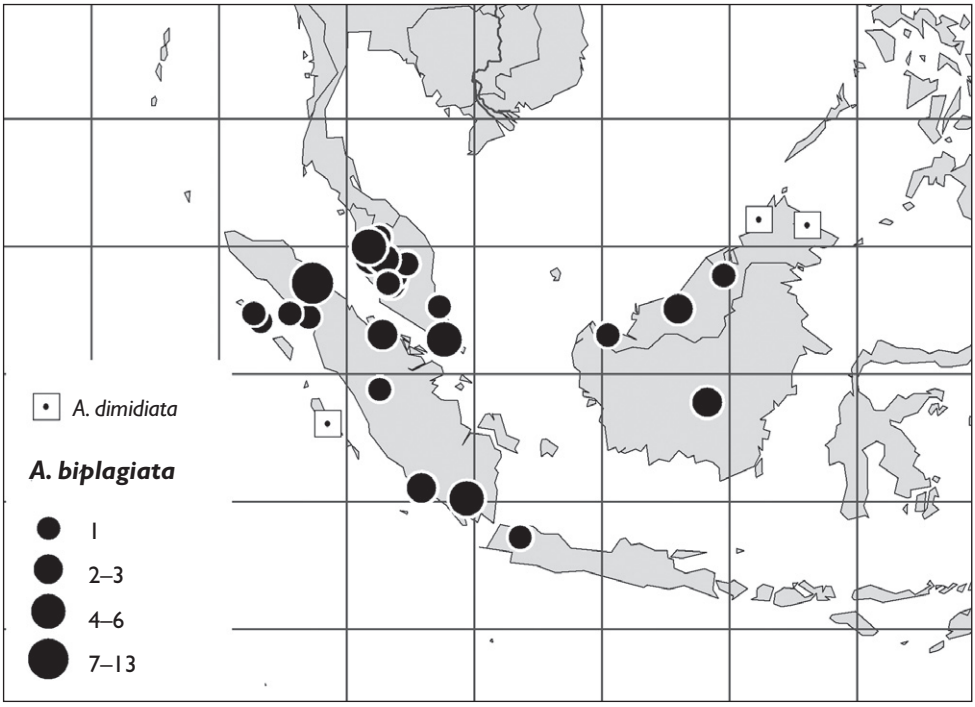

Figure 6. Distribution of *Arcastes biplagiata* Baly, 1865 and *A. dimidiata* Laboissière, 1929

incised at apex, almost reaching apex of the median lobe, constricted at middle part and enlarged at base (Figs 9, 15, 21).

Female genitalia. Spermatheca with oval to slender and elongated nodulus. Middle part long and slightly curved, cornu long and curved (Figs 10, 16, 22). Without stronger sclerotized bursa sclerites.

Distribution. The species are restricted to South-East Asia and up to now only recorded from Singapore, Malaysia (Peninsular) and Indonesia (Borneo, Sumatra), southwards to Java (Figs 6, 17).

Diagnosis. Beetles of the genus *Arcastes* are medium sized Galerucinae with strongly elongated basi-metatarsus, without pronotal impressions, reddish head and pronotum and usually contrasting black antennae, legs and elytra, the latter often with yellowish to red spots, suture or base. The significantly enlarged third to eighth antennomeres are very characteristic. *Arcastes* is the most similar to *Neolepta* Jacoby, 1884, with the type species, *Neolepta biplagiata* Jacoby, 1884, looking very similar to *Arcastes biplagiata* at the first glance. Antennae of these beetles are similar with slightly to strongly enlarged antennomeres in the middle, while terminal antennomeres in *Neolepta* are also black, the basal two antennomeres are reddish, and much slenderer than in *Arcastes*. The dorsal coloration is also similar, but *N. biplagiata* posses a pale yellowish transverse band or nearly circular spot in the middle of each elytron. The genitalic patterns of both sexes possess very strong differences. Asymmetric endophallic spiculae of certain shape

Figure 7. *Arcastes biplagiata* Baly, 1865. Photographs of the lectotype of *A. biplagiata* Baly, 1865 **a** with labels **b** detail.

(Figs 9, 15, 21) as in *Arcastes* are a unique pattern in oriental galerucines with elongated basi-metatarsus, while the median lobe in *Neolepta*, as in *Monolepta*, and *Candezea*, is narrower and has symmetrically arranged endophallic spiculae which are much smaller (cf. Wagner 2001, Wagner and Kurtscheid 2005). The shape of spermatheca of *Arcastes* resembles that of *Monolepta*, but in *Arcastes* it lacks sclerotized bursa-sclerites, while in *Monolepta* there are two distinct types of this structure. Also *Neolepta* and *Candeza* have strongly sclerotized bursa-sclerites.

The pronotum of *Arcastes* (ratio length to width 0.48–0.57), is on average broader than in *Monolepta* and *Neolepta* (0.52–0.65), and within the range of *Candezea* (0.42–0.59). Procoxal cavities are similarly structured (partly open) in all these genera. The third antennomere of *Arcastes* is roughly twice as long as the second (ratio length of second to third antennomere: 0.50–0.57), which is similar to *Candezea* (0.49–0.63) but different from *Neolepta* and *Monolepta* which both have the second and third antennomere of about equal length (0.82–1.10). While *Candezea* have strongly elongated, slender antennomeres, *Arcastes* species can be clearly differentiated by the enlarged median ones.

Redescriptions of species

Arcastes biplagiata Baly, 1865

Arcastes biplagiata Baly, 1865: 147

Total length. 4.45–7.35 mm (mean: 5.96 mm, n=12)

Head. Reddish-brown to red. Antennae entirely black and only the terminal three antennomeres usually contrasting pale yellow to reddish (Figs 1, 7). Ratio of length of second to third antennomeres 0.50–0.57 (mean: 0.53); third to seventh antennomeres enlarged, ratio of length of third to fourth antennomeres 0.60–0.67 (mean: 0.63), eighth to eleventh antennomeres very slender (Fig. 8).

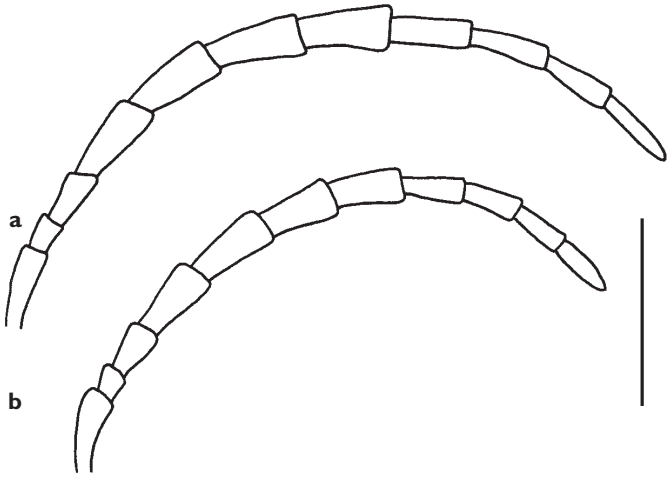

Figure 8. *Arcastes biplagiata* Baly, 1865. Antennae: **a** male **b** female.

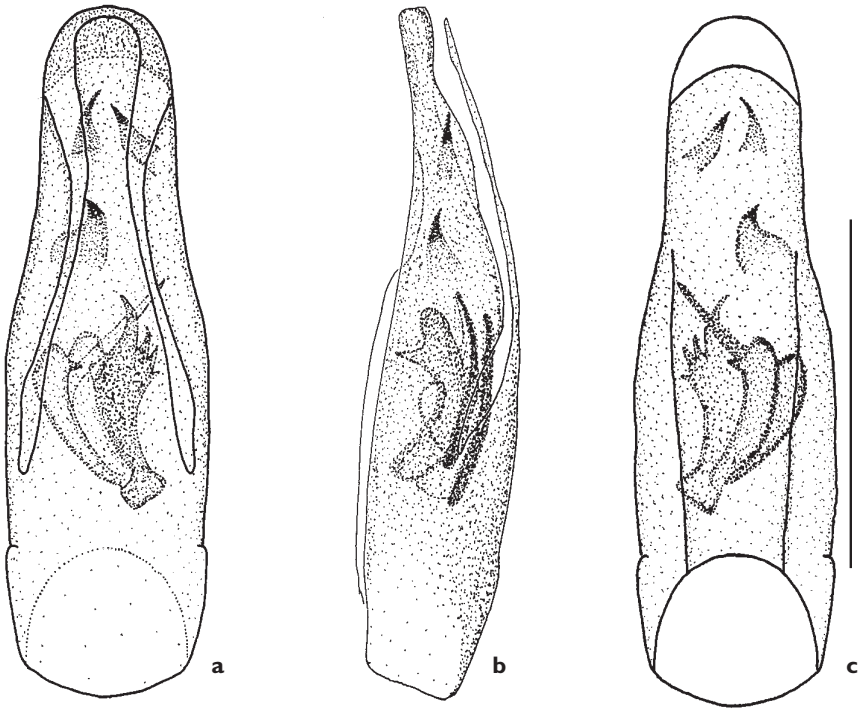

Figure 9. *Arcastes biplagiata* Baly, 1865. Median lobe: **a** dorsal **b** lateral **c** ventral.

Thorax. Pronotal width 1.65–2.25 mm (mean: 1.94 mm), ratio length to width 0.48–0.57 (mean: 0.53). Elytra elongated, black with two longitudinal reddish to yellowish-red oval spots in basal half (Figs 1, 7), in few specimens enlarged up to apical

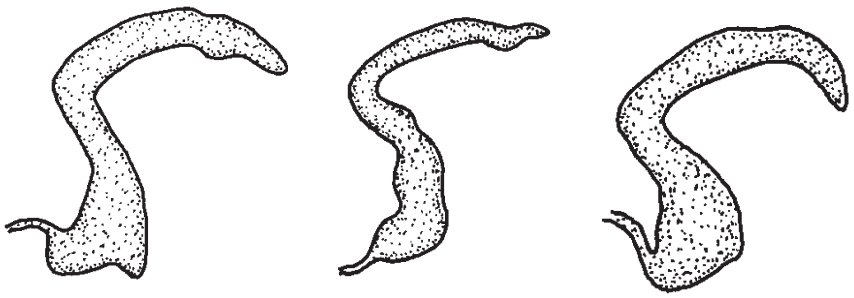

Figure 10. *Arcastes biplagiata* Baly, 1865. Three different spermathecae.

third of elytron. Elytral length 3.80–5.90 mm (mean: 4.93 mm), maximal width of both elytra together 2.50–3.60 mm (mean: 3.15 mm), ratio of maximal width of both elytra together to length of elytra 0.61–0.67 (mean: 0.64).

Abdomen. Pale yellow to brown, occasionally darker on middle, last sternite usually dark brown to black.

Male genitalia. Outer shape of median lobe symmetrical, strongly sclerotized, apex tapered and insignificantly rounded, not incised. Endophallic structure asymmetrical, ventral spiculae large, hammer-like, median spiculae long, slender, lateral spiculae enlarged, with claw-like small spine medially, only one present. Three big spurs located at upper part of endophallic spiculae, most distal one near apex. Tectum not incised at apex, almost reaching apex of median lobe, constricted at middle part and enlarged at base (Fig. 9).

Female genitalia. Spermatheca with slender to oval nodulus. Middle part long and slightly curved, cornu long and curved (Fig. 10).

Distribution. Malaysia, Singapore and Indonesia (Borneo Island and Sumatra), southwards to Java (Fig. 6).

Diagnosis. *Arcastes biplagiata* is the most similar in body outline and general coloration to *A. suturalis*, but the latter has either completely black elytra or a yellowish to yellowish-red spot beyond the scutellum that can be stretched along the entire suture or can be enlarged to a broad reddish sutural band (Figs 11, 12, 13), while *A. biplagiata* has only elongated spots on the disc of each elytron (Figs 1, 7). Endophallic armature of *A. biplagiata* is also different from the other two species of this genus (Fig. 9).

Type material. Lectotype: ♂, "Singapore, Baly Coll." (BMNH) (Fig. 7). Type Locality: Singapore, 1°21'N/103°49'E. – Paralectotype: 1 male, same data as lectotype (BMNH). Baly gave no data on the number of specimens in his description. There are at least two specimens available in BMNH, and we herein designate a lectotype to fix the name on a single specimen.

Further material examined. *Indonesia.* 3 ex., Sumatra, Manna, M. Knappert, Coll Vath, 4°27'S/102°59'E (NNML); 1 ex., Dr. B. Hagen, Tandjong Morawa, Serdang, N.O. Sumatra, 1°21'N/103°49'E (NNML); 1 ex., Java, Dolok Bara, Coll.

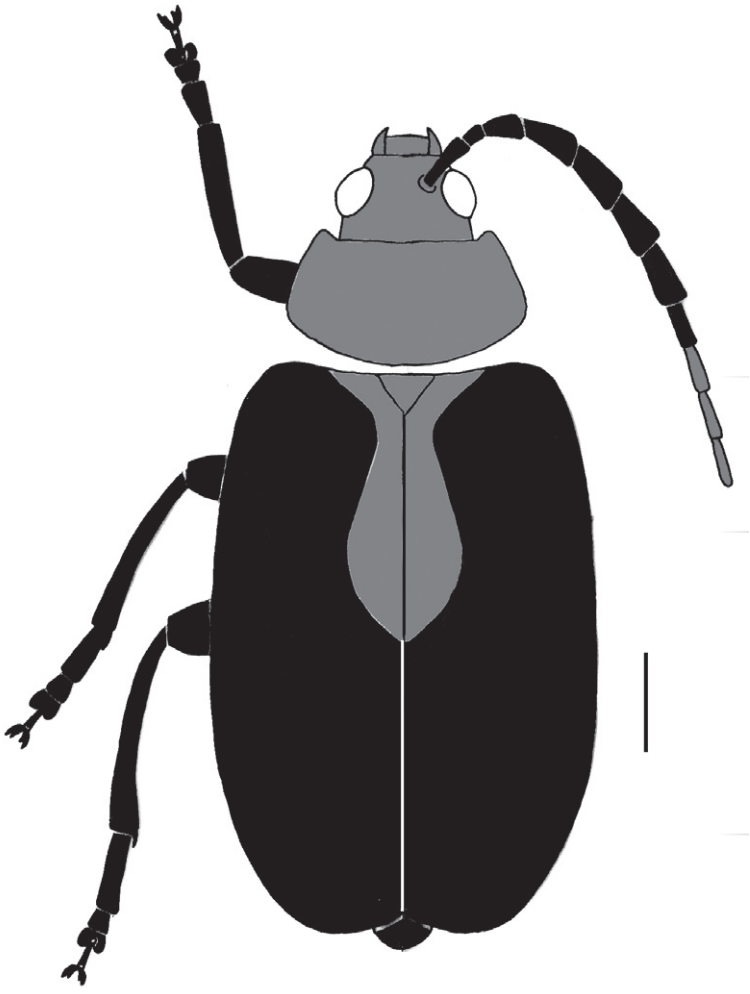

Figure 11. *Arcastes suturalis* Jacoby, 1884. Dorsal colour pattern

Vath, 6°23'S/106°48'E (NNML); 13 ex., N. E. Sumatra, Deli, Kuala Simpang, VIII.1953, A. Sollart, Lowland forests, Museum Leiden, 3°33'N/98°40'E (NNML); 2 ex., Bandar Baroe, Sumatra, J. J. D. V., 0°45'N/98°49'E (NNML); 1 ex., Dolok, Baros, Sumatra, 2°14'N/98°31'E (NNML); 1 ex., Sinabang, Sima, lur Sum, II.1913, Edw. Jacobson, 2°4'N/96°22'E (NNML); 1 ex., Puru Babi, Sima, sum 4.1913, Edw. Jacobson, 2°4'N/96°39'E (NNML); 2 ex., Sumatra, Lampung BBS Np, Way Canguk, Primary Forest, 30.X.2001 (H7), leg. K. Smets, 4°52'S/104°43'E (IRSN); 1 ex., Dohrn, Sumatra, Soekaranda, 71489, 0°37'S/94°29'E (MNHU); 1 ex., Nord Sumatra, Singkil, 17.IX.1972, D. Erber leg., 2°22'N/97°46'E (MNHU); 1 ex., Sumatra, 0°35'S/101°20'E (NHRS); 3 ex., S Sumatra, Lampung prov., Bukit Barisan Selatan, N.P. ±600 m, 5km SW, 7.–17.II.2000, Liwa, J. Bezděk leg., 5°4'S/104°4'E

Figure 12. *Arcastes suturalis* Jacoby, 1884. Photographs of the lectotype of *A. suturalis* Jacoby, 1884: **a** with labels **b** detail.

Figure 13. *Arcastes suturalis* Jacoby, 1884. Photographs of one paratype of *A. ismaili* Mohamedsaid, 2000: **a** with labels **b** detail.

(CJB); 2 ex., E Sumatra, Riau prov., Bukit Tiga Puluh N.P. 18.–25.I.2000, J. Bezděk leg., 0°50'S/102°26'E (CJB). –*Malaysia*. 4 ex., Perak F. M. S., Larut Hills, 3700–4600 ft, 24th Feb. 1932, H. M. Pendlebury, 5°N/100°53'E (BMNH); 2 ex., Pahang, F. M. S., Cameron Highlands, 4500–5000 ft, 18/06/1935, H. M. Pendlebury, 4°30'N/101°28'E (BMNH); 2 ex., Bukit Kutu Selangor, April 1915, 3000–3400, 3°33'N/101°43'E (BMNH); 1 ex., Perak, Maxwell Hill, 04/1–15 August, 1908, 5°N/100°53'E (BMNH); 1 ex., Malay Penin. Perak, F. M. S., 2000 ft, Aug. 30 1922, 4°48'N/101°9'E (BMNH); 1 ex., Penang, 1500–2428, May 1917, 5°22'N/101°17'E (BMNH); 6 ex., Gunong Kledang, Perak, 2646, Nov. 1916, Ex. FMS Museum, B. M. 1955–354, 4°35'N/101°1'E (BMNH); 1 ex., Semangko Pass, Selangor, Pahang, 2700, March 1912, 3°33'N/101°37'E (BMNH); 2 ex., Borneo, 1°6'S/114°8'E (BMNH); 1 ex., Malay Penin, Pahang, FMS, Gunong Benom, 6300ft, 3rd August 1925, I. H. N Evans, 3°50'N/101°55'E (BMNH); 1 ex., Sarawak, 4th division, Gn.

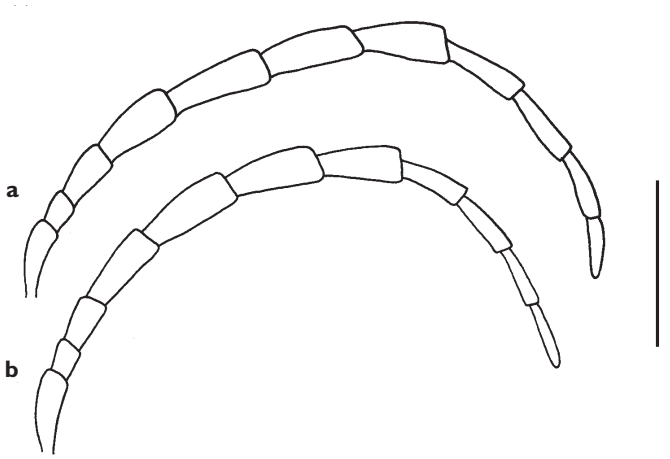

Figure 14. *Arcastes suturalis* Jacoby, 1884. Antennae: **a** male **b** female.

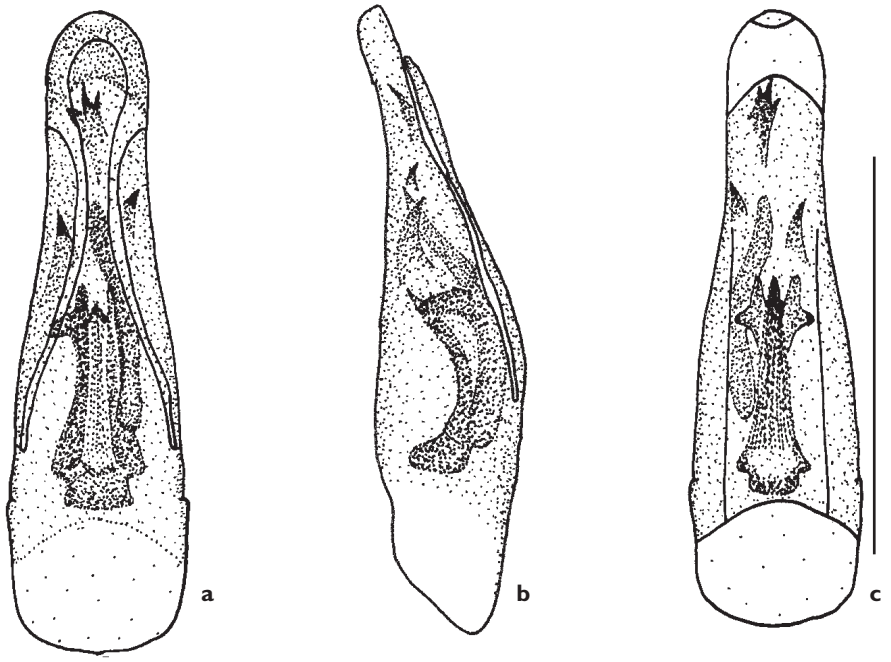

Figure 15. *Arcastes suturalis* Jacoby, 1884. Median lobe: **a** dorsal **b** lateral **c** ventral.

Mulu NP, Below Camp 4, lower montane forest, P. M. Hammond & J. E. Marshall, V.–VIII.1978, B.M. 1978–49, 3°52'N/114°46'E (BMNH); 3 ex., Quop, W. Sarawak, III.–IV 1914, G. E. Bryant, 1°33'N/101°24'E (BMNH); 1 ex., Sarawak, J. E. A. Lewis, 1910–116, 2°33'N/113°E (BMNH); 1 ex., Pahang, Taman Negara, 1.–13.III.1984, L. Jessop, B. M. 1984–230, 4°19'N/102°23'E (BMNH); 1 ex., Pa-

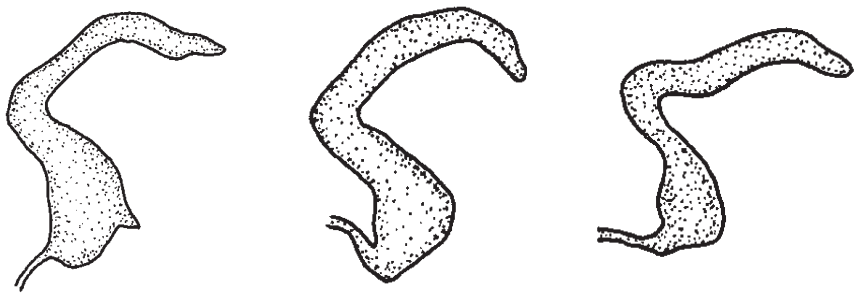

Figure 16. *Arcastes suturalis* Jacoby, 1884. Three different spermathecae.

hang, Gunong Jasar, 4000–5000 ft, 6.X.–14.XI.1980, 4°29'N/101°16'E (BMNH); 1 ex., Johor, Endau Rompin, 1.–4.VI.2007, 2°38'N/103°39'E (BMNH); 1 ex., Matang, 3 1/2 mile, Sarawak, 8.V.1909, 1°32'N/110°15'E (BMNH); 2 ex., Sarawak, 2°33'N/113° (BMNH); 1ex., Mal., Baly Coll. (ST), 4°12'N/101°58'E (BMNH); 1ex., Malacca, Perak, Jachan V., 2°12'N/102°15'E (MNHU); 1 ex., Malaysia, prov. Pahang, Tasik Chini (Lake), primaval forests surrouding lake, 2.–5.III.2007, V. Hula, L. Purchart, Růžička F., 3°23'N/102°55'E (CJB); 2 ex., Malaysia, Perak, 1200 m, 25 km near Ipoh, Banjaran Titiwangsa, Mts. Korbu, 6.–12.V.2007, M. Říha, leg., 4°56'N/101°38'E (CJB); 2 ex., Malaysia, Pahang distr., 30 km NE Raub, Lata Lembik, 200–400 m, 22.IV.–15.V.2002, E. Jendek & O. Šauša leg., 3°56'N/101°38'E (CJB); 2 ex., Malaysia, Taman Negara NP, Kuala Tahan, primaval forests, 5.–9. III.2007, V. Hula, L. Purchart, Růžička F., 4°19'N/102°20'E (CJB). – *Singapore.* 2 ex., 7.VIII.1922, F. N. Coll, 1°21'N/103°49'E (BMNH); 1 ex., Sime Forest, Mal. Trap, station 25131, 20.V.2005, leg. P. Grootaert, 1°21'N/103°49'E (IRSN).

Arcastes suturalis Jacoby, 1884

Arcastes suturalis Jacoby, 1884: 217.
= *A. ismaili* Mohamedsaid, 2000: 282; syn. n.

Total length. 4.70–6.35 mm (mean: 5.30, n=12)

Head. Reddish-brown to red. Details of mouthparts and impressions on vertex like the description of the genus. Antennae entirely black and only the terminal three antennomeres usually contrasting pale yellow to reddish (Figs 11, 12). Shape of antennomeres like the description of the genus. Ratio length of second to third antennomere 0.50–0.57 (mean: 0.54), ratio length of third to fourth antennomere 0.67–0.70 (mean: 0.68), apical three antennomeres significantly slenderer (Fig 14).

Thorax. Shape and coloration of pronotum and scutellum like in the description of the genus (Figs 11, 12, 13). Pronotal width 1.55–2.10 mm (mean: 1.80 mm), ratio

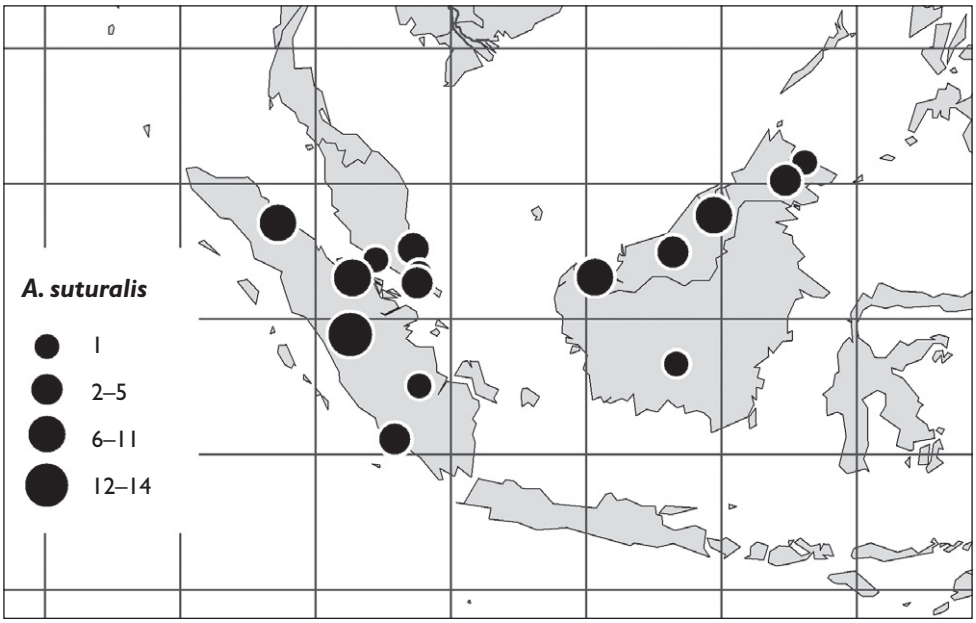

Figure 17. Distribution of *A. suturalis* Jacoby, 1884.

length to width 0.50–0.55 (mean: 0.53). Scutellum in about one third of material studied black, others brown, red or yellowish-red. Elytra elongated, black throughout in 35 % of the material examined, about 10 % with yellowish scutellar elytral spot, 50 % with entirely yellowish-red suture, and remaining material with enlarged yellowish-red elytral disc like in the specimens of *A. ismaili* (Fig. 13). Elytral length 3.80–5.05 mm (mean: 4.40 mm), maximal width of both elytra together 1.50–3.30 mm (mean: 2.40 mm), ratio of maximal width of both elytra together to length of elytra 0.63–0.69 (mean: 0.66). Underside and legs like in the description of the genus.

Abdomen. Pale yellow to brown on the sides of sternites, dark brown to black in the middle, terminal sternite usually completely black.

Male genitalia. The outer shape as in the description of the genus. Endophallus with three spur located at the upper part, the biggest one next to the lateral spiculae. Tectum not incised at apex, slender, almost reaching towards the apex of the median lobe (Fig. 15).

Female genitalia. Spermatheca with slender to oval nodulus. Middle part moderately long and slightly curved, cornu long and curved (Fig. 16).

Distribution. Recorded from Malaysia, Singapore and Indonesia (Fig. 17).

Diagnosis. *Arcastes suturalis* can be distinguished from the other two species of *Arcastes* by the elytral coloration, which is either completely black, or posses a yellowish to reddish sutural coloration that can be occasionally enlarged to pale a yellowish elytral disc. No specimen examined had longitudinal elytral stripes as it is typical for *A. biplagiata* (Figs 1, 7). Finally a check of genitalia can confirm the identification (Figs 9, 15).

Type material. *Arcastes suturalis*: Lectotype: ♂, "*Arcastes suturalis* Jac./ Dr. B. Hagen, Tandjong Morawa Serdang, (N.O. Sumatra)." (Fig. 12) (NNML). Type locality: 1°21'N/103°49'E. – Paralectotypes: 11 ex., same data as lectotype (NNML), and at least one additional type specimen is deposited in MCZH. We herein designate a lectotype to fix the name on single specimen. – Invalid types: 2 ex. from Sumatra, Lianggas, and Soekaranda, Januar 1894, Dohrn (MNHU) are labelled as co-type, but are not from the type series.

Arcastes ismaili: Holotype: ♂, "Malaysia, Sabah, Danum, Ekspedisi Gunung Danum, 6–12.vi.1989, Ismail" (Fig. 13) (UKM). Holotype by original designation. Type locality: 5°8'N/117°24'E. – Paratypes: 7 ♂, 9 ♀, same data as holotype; 1 ♀, Sabah, Lembah Danum, 21.VIII.1989, Salleh, Ismail & Nor; 2 ♂, 1 ♀, 16.–19.V.1991, Zaidi, Ismail & Ruslan; 1 ♂, 1 ♀, 27.–31.VIII.1991, Salleh, Zaidi, Mail & Lan; 1 ♂, 3 ♀, 17.–20.IV.1992, Ismail, Yusuf & Razali; 4 ♂, 2 ♀, 22.–25.VIII.1992, Ismail, Yusuf & Sham; 1 ♂, 5.–8.XII.1992, Ismail, Yusuf & Razali. Due to the original publication, the holotype is deposited in the Center for Insect Systematics, Universiti Kebangsaan Malaysia, Bangi (UKM), and two pairs of paratypes (2 ♂, 2 ♀) in the Insect Collection, Forest Research Centre, Sandakan, Sabah.

Further material examined. *Indonesia.* 1 ex., Borneo, Kalimantan Tengah, Busang/Rekut. Confl. FIT, Primary Forest, Brendell/Mendel, August 2001, 1°40'S/113°22'E (BMNH); 1 ex., Bari, Jan. 190?, Jacoby Coll. 1909–28a, 0°31'S/104°30'E (BMNH); 1 ex., Soekaranda, Januar 1894, Dohrn, 0°37'S/94°29'E (NNML); 2 ex., Sumatra, Manna 1902, M Knap Pert., 4°27'S/102°59'E (NNML); 1 ex., Dohrn, Sumatra. Lianggagas, 0°37'S/94°29'E (NNML); 3 ex., Medan, Sumatra, J. J. D. V, 3°30'N/98°37'E (NNML); 9 ex., N. E. Sumatra, Deli, Kuala Simpang, VIII 1953, A. Sollart, Lowland forests, Museum Leiden, 3°33'N/98°40'E (NNML); 1 ex., Dohrn, Sumatra, Lianggagas, co-type, 0°37'S/94°29'E (MNHU); 1 ex., Soekaranda, Januar 1894, Dohrn, co-type, 0°37'S/94°29'E (MNHU); 1 ex., Tamiang, Sumatra, 2°29'S/103°54'E (MNHU). – *Malaysia.* 10 ex., Sarawak, 4th Division, Gn. Mulu NP, nr Base Camp, 50–100 m, P. M. Hammond & J. E. Marshall, V.–VIII.1978, B. M. 1978–49, 3°52'N/114°46'E (BMNH); 11 ex., Quop, W. Sarawak, II.–IV.1914, G. E. Bryant, G. Bryant 1919–147, 1° 33'N/101°24'E (BMNH); 6 ex., Mt. Matang, W. Sarawak, Dec. 1913, G. F. Bryant, G. Bryant coll. 1919–147, 1.55N/110.35E (BMNH); 3 ex., Sarawak, C. J. Brooks, B. M. 1928–193, 2°30'N/113°15'E (BMNH); 1 ex., Sarawak, 1907–1909, C. J. Brooks, B. M. 1936–681 (BMNH); 2 ex., Mt. Matang, 3 1/2 mile, 8.V.1909, Sarawak, J. E. A Lewis, 1910–116, 1.55N/110.35E (BMNH); 1 ex., N. Borneo, Samawang, Nr. Sandakan, July 1927, 5°50'N/118°6'E (BMNH); 1 ex., Johor, Kota Tinggi, 27.XI.2007, M. Y. Ruslan, 1°43'N/103°54'E (UKM); 4 ex., Johor, Endau Rompin, 1.–4.VI.2007, B. H. Izfa, 2°38'N/103°39'E (UKM); 1 ex., Malaysia, prov. Pahang, Tasik Chini (Lake), primaval forests surrouding lake, 2.–5.III.2007, V. Hula, L. Purchart, Růžička F., 3°23'N/102°55'E (CJB); 1 ex., Malaysia, Pahang prov., Taman Negara, N.P., Kuala Tahan, 14.III.2007, Igt. Jiří Foit, 4°19'N/102°20'E (CJB); 1 ex., Pahang, Hutan Simpan Kuala Lompat, 24–26.V.1990, Zaidi, Ismail & Ruslan,

3°41'N/102°13'E (CJB); 2 ex., Malaysia, Taman Negara NP, Kuala Tahan, primaval forests, 5–9.III.2007, V. Hula, L. Purchart, Růžička F., 4°19'N/102°20'E (CJB). – *Singapore.* 3 ex., Nee Soon, 14.X.2005, Swamp Forest, Malaise trap 1, station 25388, leg. P. Grootaert, 1°21'N/103°49'E (IRSN).

Arcastes dimidiata Laboissière, 1929

Arcastes dimidiata Laboissière, 1929: 92.

Total length. 4.70–6.80 mm (mean: 5.85, n=5)

Head. Reddish-brown to red. Details of mouthparts and impressions on vertex like the description of the genus. Basal two and terminal two to three antennomeres yellowish-red, some specimens also with black antennal base (Figs 18, 19). Shape of antennomeres like description of the genus, but median antennomeres less enlarged. Ratio length of second to third antennomere 0.50–0.57 (mean: 0.53), ratio length of third to fourth antennomere 0.60–0.70 (mean: 0.66; Fig. 20).

Thorax. Shape and coloration of pronotum and scutellum like in the description of the genus (Figs 18, 19). Pronotal width 1.70–2.20 mm (mean: 1.99 mm), ratio length to width 0.53–0.55 (mean: 0.54). Basal third of elytra entirely reddish-brown to red, apical two third black (Figs 18, 19). Elytral length 4.00–5.90 mm (mean: 5.04 mm), maximal width of both elytra together 2.90–4.00 mm (mean: 3.46 mm), ratio of maximal width of both elytra together to length of elytra 0.66–0.70 (mean: 0.68). Underside and legs like in the description of the genus, some specimens also with reddish femur.

Abdomen. Pale yellow to brown, occasionally darker on middle, and last sternite usually dark brown to black.

Male genitalia. The outer shape as in the description of the genus. Endophallus with three spurs located at the upper part, the biggest one next to the lateral spiculae. Tectum not incised at apex, slender, almost reaching towards the apex of the median lobe (Fig. 21).

Female genitalia. Spermatheca with oval to elongated nodulus. Middle part more less long and slightly curved, cornu long and curved (Fig. 22).

Distribution. Recorded from Sabah (Borneo) and western Sumatra (Fig. 6).

Diagnosis. *Arcastes dimidiata* can be easily differentiated from *A. biplagiata* and *A. suturalis* by the elytral coloration. The basal elytral third is reddish and strongly contrasting with the black two terminal thirds, while it possess neither a pale suture nor elytral spots (Figs 1, 11, 18).

Type material. Holotype, 1 ♂, "Siberut Island, West Sumatra, Sept. 1924, G. B. K and N. S, *Arcastes dimidiata* Laboissière, 1929" (Fig. 19) (BMNH). Holotype by monotypy. Type locality: 1°55'S/99°17'E.

Further material examined. *Malaysia.* 1 ex., N. Borneo, Samawang, Nr. Sandakan, 14th July. 1927, Ex. F. M. S. Museum. B. M. 1955–354, 5°50'N/118°6'E

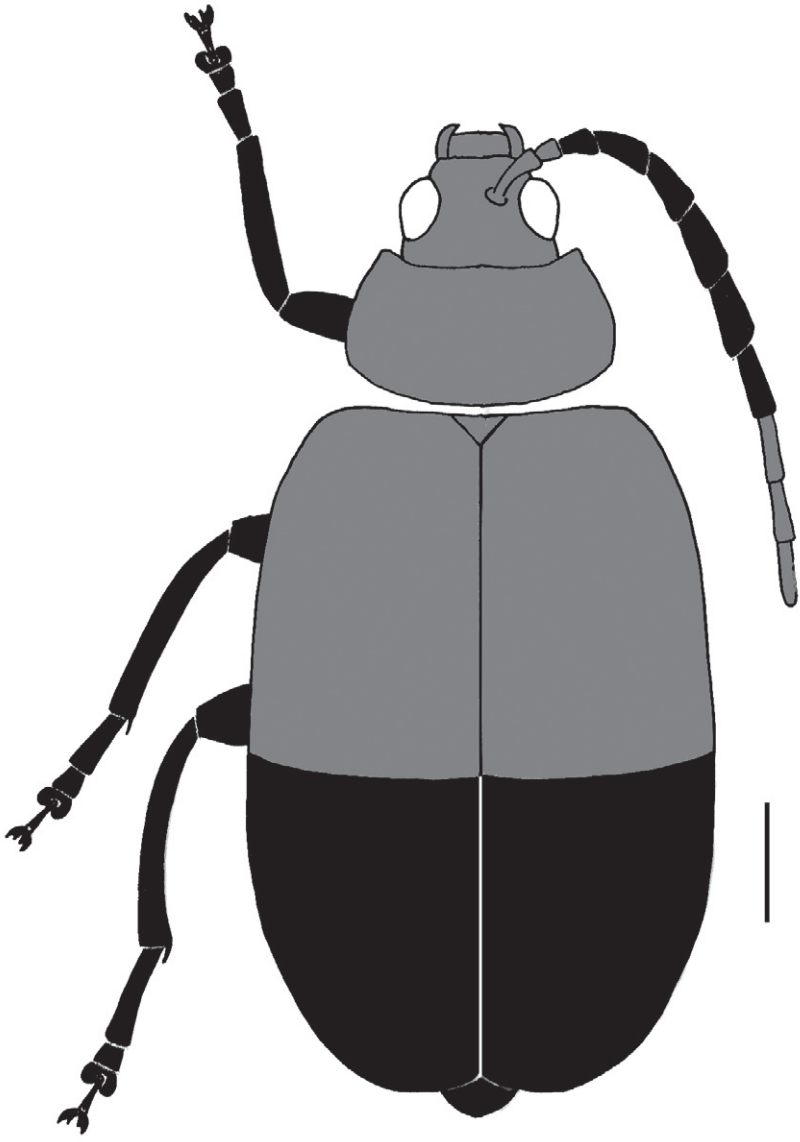

Figure 18. *Arcastes dimidiata* Laboissière, 1929. Dorsal colour pattern.

(BMNH); 2 ex., N. Borneo, Mt. Kinabalu, Pinosuk Plateau, 14.–17.III.1964, 5,225 ft, Royal Soc. Exped., col. S. Kueh, B. M. 1964–250, 6°4'N/116°33'E (BMNH); 1 ex., Borneo. Kinabalu, Jacoby Coll. 1909–28a, 6°4'N/116°33'E (BMNH).

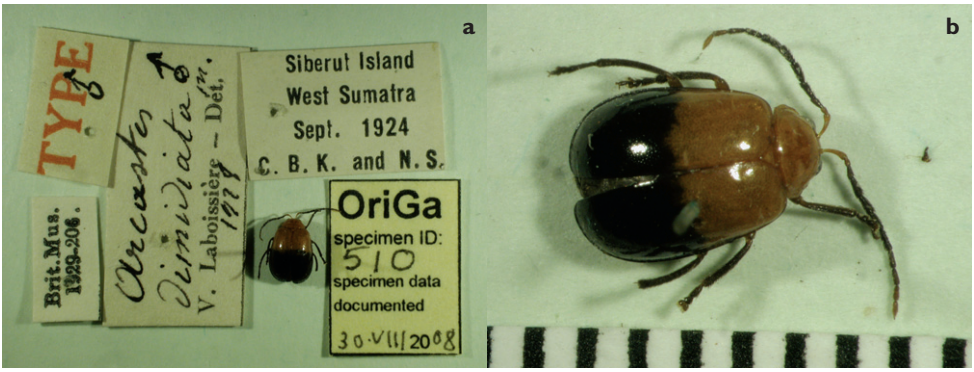

Figure 19. *Arcastes dimidiata* Laboissière, 1929. Photographs of the holotype *A. dimidiata* Laboissière, 1929: **a** with labels **b** detail.

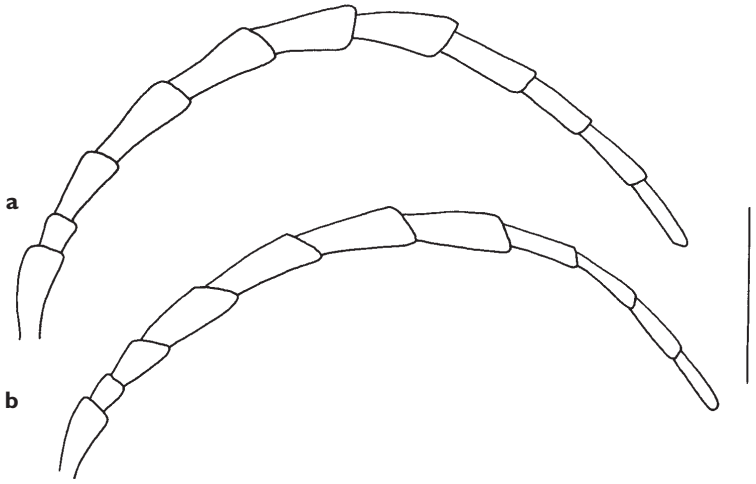

Figure 20. *Arcastes dimidiata* Laboissière, 1929. Antennae: **a** male **b** female.

Identification key of *Arcastes*

1. Elytra usually with yellowish to red spots or suture, rarely entirely black; first to seventh antennomere black, outer antennomeres usually contrasting pale yellow to reddish **2**
– Basal third of elytra reddish-brown to red, apical two third black, basal two and terminal two to three anntennomeres yellowish-red..... ***A. dimidiata***
2. Each elytron with median, usually longitudinal reddish to yellowish-red oval spots in the basal half, in few specimens enlarged up to the apical third of elytron ..... ***A. biplagiata***
– Elytra black throughout or with yellowish scutellar elytral spot, yellowish-red suture, or rarely with enlarged yellowish-red elytral disc..... ***A. suturalis***

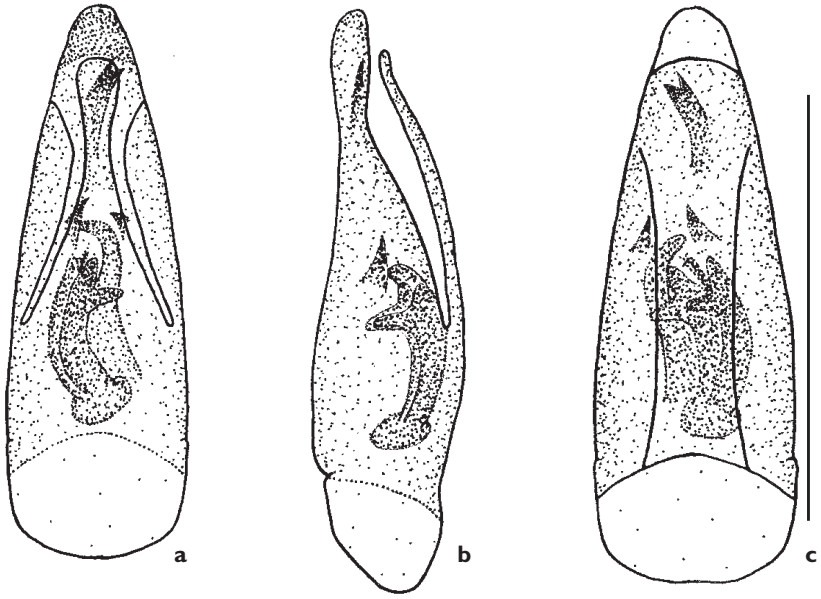

Figure 21. *Arcastes dimidiata* Laboissière, 1929. Median lobe: **a** dorsal **b** lateral **c** ventral.

Figure 22. *Arcastes dimidiata* Laboissière, 1929. Two different spermathecae.

Acknowledgements

We indebted appreciation to all curators listed above for giving us the possibility to work with the material. This study was part of the research thesis of the first author, funded by the Malaysian Ministry of Higher Education as a student scheme scholarship.

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Appendix 3

Rubrarcastes gen. nov., a new group of Oriental galerucine leaf beetles (Coleoptera: Chrysomelidae: Galerucinae)

Hazmi, I. R. & Wagner, Th. 2010 (c). *Rubrarcastes* gen. nov., a new group of Oriental galerucine leaf beetles (Coleoptera: Chrysomelidae, Galerucinae). Entomologische Zeitschrift, 120: 85–88.

As the first author of this article, I declare that most of the technical works: loaning, sorting, dissection and drawing have been done by me under supervision of Thomas Wagner.

Rubrarcastes gen. nov., a new group of Oriental galerucine leaf beetles (Coleoptera: Chrysomelidae, Galerucinae)

● Izfa Riza Hazmi & Thomas Wagner*

Abstract. In an ongoing revision of the Oriental Galerucinae related to *Monolepta* Chevrolat, 1837, *Arcastes sanguinea* Jacoby, 1892 could be found as very different in genitalic characters of both sexes from the type species of *Arcastes*, *A. biplagiata* Baly, 1865, and to other oriental galerucine genera. It is herein transferred to the monotypic new genus, *Rubrarcastes* gen. nov. The external and genitalic characters of *Rubrarcastes sanguinea* (Jacoby, 1892) are figured, photographs of the primary type including all labels, and a distribution map are provided. The species is restricted to South East Asia.

Zusammenfassung. In Rahmen einer langfristigen Revision der orientalischen Galerucinae aus der Verwandtschaft um *Monolepta* Chevrolat, 1837 erwies sich *Arcastes sanguinea* Jacoby, 1892 besonders hinsichtlich ihrer Genitalstrukturen beider Geschlechter als verschieden von der Typusart der Gattung, *A. biplagiata* Baly, 1865. Auch in alle anderen bekannten Gattungen orientalischer Galerucinae ließ sich die Art nicht einordnen. Deswegen errichten wir hier die monotypische *Rubrarcastes* gen. nov., mit *Rubrarcastes sanguinea* (Jacoby, 1892) als bisher einzigem Vertreter. Ektoskelettale und genitalmorphologische Merkmale werden umfassend illustriert, Fotos des primären Typus und eine Verbreitungskarte werden abgebildet.

Key words. Coleoptera, Chrysomelidae, Galerucinae, *Arcastes*, taxonomy, new genus, South-East Asia, Oriental Region.

Introduction

Arcastes was established with the description of *A. biplagiata* Baly, 1865 which is the genotype by monotypy. Next to some other species, *A. sanguinea* Jacoby, 1892, based on the specimen from Perak (Malaysia) was described about thirty years later. Within our revision of *Arcastes* (Hazmi & Wagner in press), the delimitation of this group to other galerucine groups was possible by the peculiar shape of the male genitalia. *Arcastes* possess a short, broad, apically blunt median lobe with asymmetric endophallic structures that exclusively occur in this group. *Arcastes sanguinea* share some ektoskelettal characters with *Arcastes*, as the broad median antennomeres, but due to its isolated phylogenetical position, it need to be transferred to distinct taxon, and we redescribe it here as type species of the monotypic *Rubrarcastes* gen. nov.

Materials and methods

The subsequent redescription of *Rubrarcastes sanguinea* (Jacoby, 1892) is based on 181 specimens from the following collections; acronyms used, responsible persons and number of specimens in brackets: The Natural History Museum, London (BMNH; S. Shute; n = 10); Nationaal Natuurhistorisch Museum, Leiden (NNML; F. van Assen; n = 75); Center for Insect Systematics, UKM, Malaysia (UKM; R. Yusop; n = 87); Institute Royal des Sciences Naturelle de Belgique, Brussels (IRSN; P. Limbourg; n = 2); Swedish Museum of Natural History Stockholm (NHRS; B. Viklund; n = 1); Collection of Jan Bezděk, Brno (CJB; n = 6).

For morphometric data, 15 specimens were measured, and means are given. Absolute measurements were made of total length from the clypeus to apex of the elytron, length of elytron, maximal width of both elytra, and width of pronotum. Relative measurements are the length to width of pronotum, maximal width of both elytra to length of elytron, length of second to third antennomere, and length of third to fourth antennomere. Figures include illustrations of the colour pattern (dorsal view), with right antennae, and left legs (fore, mid, hind). Genital structures are given in detail, including an overview of male and female genitalia and details.

Rubrarcastes gen. nov.

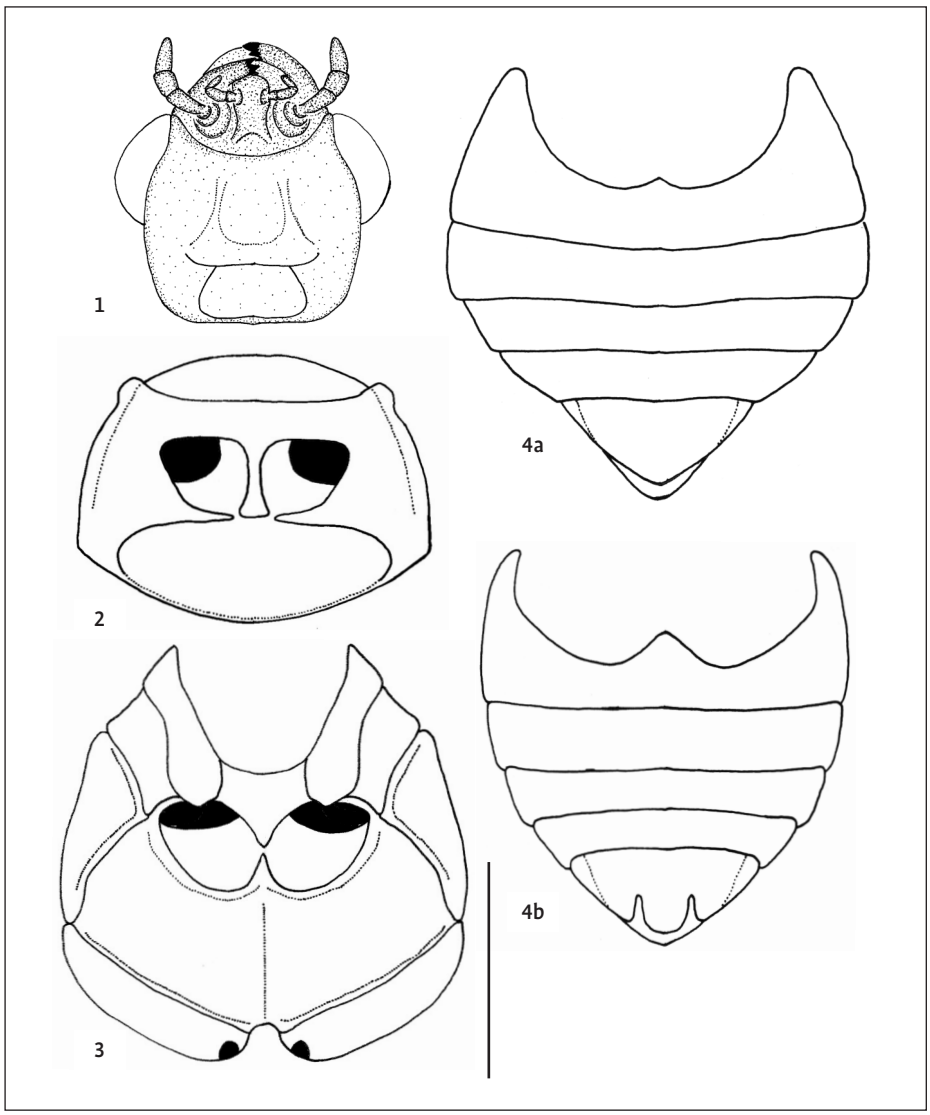
Type species. *Arcastes sanguinea* Jacoby, 1892: 88; herein designated.

Etymology. Combination of rubra (latin: red) and *Arcastes*.

Description. *Total length.* 5.60–7.60 mm (mean: 6.37 mm).

Head. Brownish-red to red. Very finely punctuated, with significant transverse impression between the posterior third of eyes, and a short median impression. Eyes large, strongly convex (Figs 1, 8). Labial palpi slender and maxillary palpi slightly enlarged (Fig. 1), occasionally dark brown to black. Labrum pale to dark brown and occasionally blackish in the middle. Mandibulae pale yellow to dark brown, and blackish towards the apex. Antennae elongated, third to terminal antennomere with very dense and rough cover of partly bristle-like setae, extended to the apical third of the elytra. First to ninth or tenth antennomere black, the underside often contrasting dark brown, outer one or two antennomeres usually contrasting brownish to red (Fig. 8). First antennomere club shaped, second shortest, third antennomere about two times longer than second, ratio length of second to third antennomere 0.43–0.57 (mean: 0.46), ratio length of third to fourth antennomere 0.60–0.80

* 31st contribution to the taxonomy, phylogeny and biogeography of the Galerucinae



Figs 1–4. External characters of *Rubrarcastes sanguinea* (JACOBY, 1892). **1.** Head. **2.** Prothorax, ventral view. **3.** Meso- and metathorax, ventral view. **4.** Abdomen, ventral, **a.** Male, **b.** Female. Scale bar: 1 mm.

(mean: 0.71), third to seventh antennomere broad, significantly enlarged. Antennomeres in males (Figs 6b, 8) are much broader than in females (Fig. 6a).

Thorax. Pronotum transverse, very broad, broadest near the posterior angles, anterior angle significantly protruding, posterior angle slightly marked (Figs 2, 8). Shiny, smooth, and finely punctuated, without any transverse depression. Pronotum brown to red. Pronotal width 1.80–2.05 mm (mean: 1.91), ratio length to width 0.62–0.68 (mean: 0.66). Scutellum large, triangular, impunctate, brown to red. Procoxal cavities partly open (Fig. 2). Meso- and metathorax brown to red. Metasternum broad (Fig. 3). Elytra elongated, entirely brown to red. Elytra with deep punctuation, slightly coarser and denser than that of pronotum, often with irregular impressed stria in particular at the disc. Elytral length 4.50–5.75 mm (mean: 5.08), maximal width of both elytra together 3.00–3.90 mm (mean: 3.45), ratio of maximal width of both elytra together to length of elytron 0.65–0.72 (mean: 0.68). Alae fully developed (Fig. 5). Legs long and slender, basi-metatarsus elongated, claws bifid (Fig. 7), coxa and trochanter brown to red, femur, tibia and tarsus black throughout, in particular tibia with dense and fine setae.

Abdomen. Brown to red. Last visible sternite in females rounded at the apex (Fig. 4a), and in males with two deep, parallel-sided incisions (Fig. 4b).

Male genitalia. The outer shape and endophallic structure of median lobe are symmetrically arranged; basal half parallel-sided, apical half strongly narrowed, apex not incised (Figs 9a, b), significantly curved in lateral view (Fig. 9c). The pointed tectum is reaching up to the terminal fifth of the median lobe. Endophallus with three to four pairs of spiculae, apical one with strong spines (Figs 9a, c).

Female genitalia. Spermatheca with very slender, more tube like, elongated nodulus. Middle part long, slightly curved, cornu long and curved (Fig. 10). Without stronger sclerotized bursa sclerites.

Distribution. Restricted to Southeast Asia and mainly known from Malaysia (Perak and Pahang), Borneo and Singapore, westward to north-east Sumatra (Fig. 12).

Diagnosis. *Rubrarcastes* gen. nov. are medium sized, dorso-ventrally compressed Galerucinae with elongated basi-metatarsus. It shows high overlap in external characters to *Arcastes* that possess the same type of enlarged median antennomeres, is of similar size (*Arcastes*, total length 4.45–7.35 mm; *Rubrarcastes* 5.60–7.60 mm), and has the procoxal cavities also partly open. The pronotum of *Rubrarcastes* is less broad (pronotal length to width 0.62–0.68) than in *Arcastes* (0.48–0.57). The dorsal coloration of *Rubrarcastes* is unicolorous brownish-red to red, while *Arcastes* possess predominately black upper side or at least elytra, usually with elytral spots, rarely with bicolorous elytra. The elytra of *Rubrarcastes* are deeply and coarser punctuated, making the surface duller. The Punctuation appears often as irregular impressed striae at least on the elytral disc, what differs significantly from *Arcastes* where the elytral punctuation is fine, irregularly punctuated and the surface shiny.

Significant differences can be also found in the genital structures of both sexes. The outer shape of the median lobe in dorsal view of *Rubrarcastes* gen. nov. is slender, and strongly narrowed towards the apex, while species of *Arcastes* have much broader and shorter median lobes. The endophallic structures are symmetrically arranged in *Rubrarcastes* gen. nov., a pattern that usually occur in most Galerucinae, but has strong spiculae that are asymmetrically arranged in *Arcastes*. The female genitalia are also different, since *Arcastes* has a spematheca with large, spherical nodulus and relatively short cornu, while the nodulus in *Rubrarcastes* gen. nov. is much smaller, and the cornu longer.

Monolepta and *Neolepta* Jacoby, 1884 can be both easily distinguished by the roughly equal length of the second and third antennomere (0.82–1.10; *Rubrarcastes* gen. nov. 0.43–0.57), which is similar to *Candezea* Chapuis, 1879 (0.49–0.63) but species of these group are much more dorso-ventraly bulged have very elongated and slender antennomeres and very different genitalic characters (Wagner 2007, Wagner & Kurtscheid 2005).

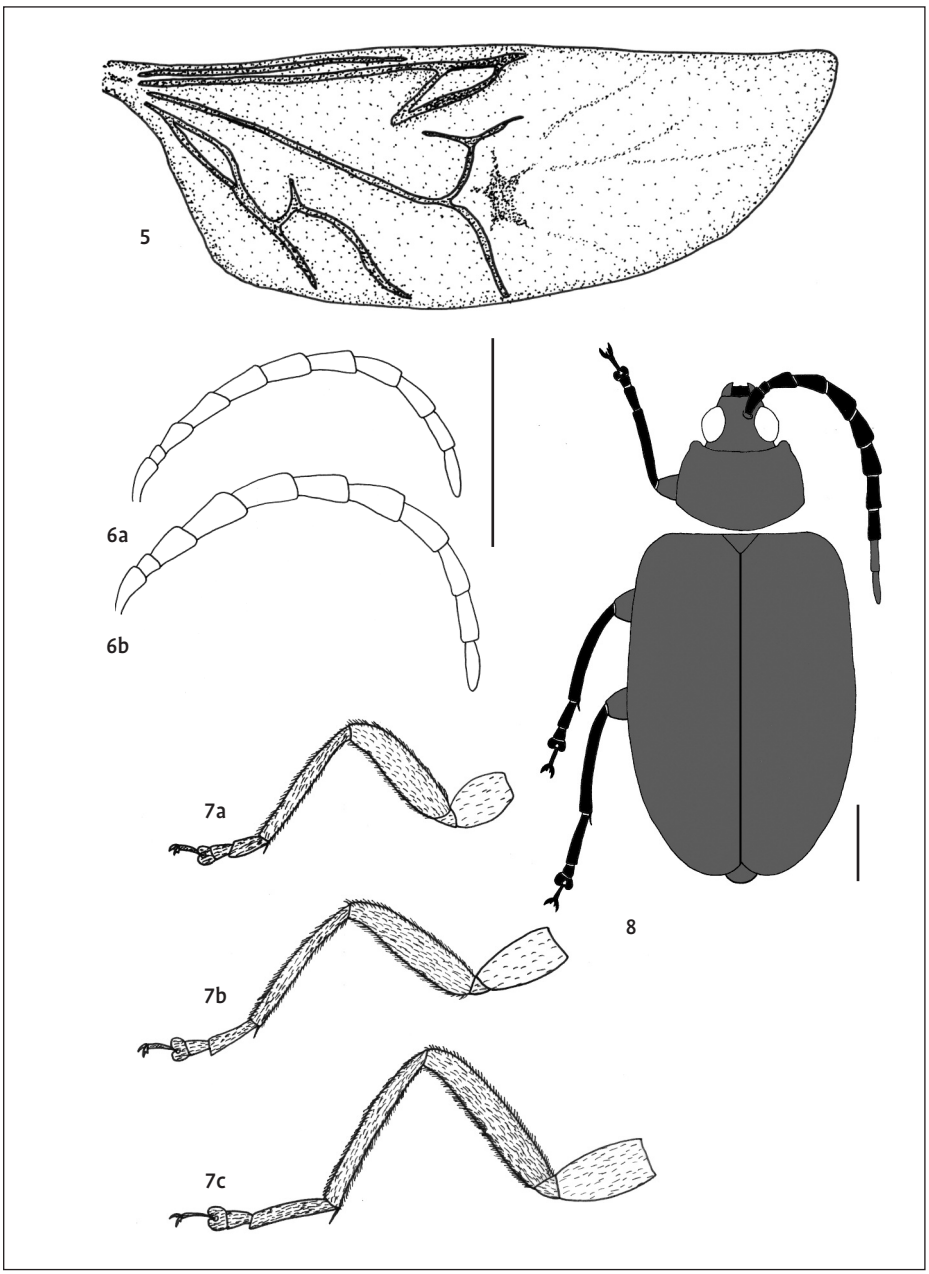
Rubrarcastes sanguinea (Jacoby, 1892); comb. nov.

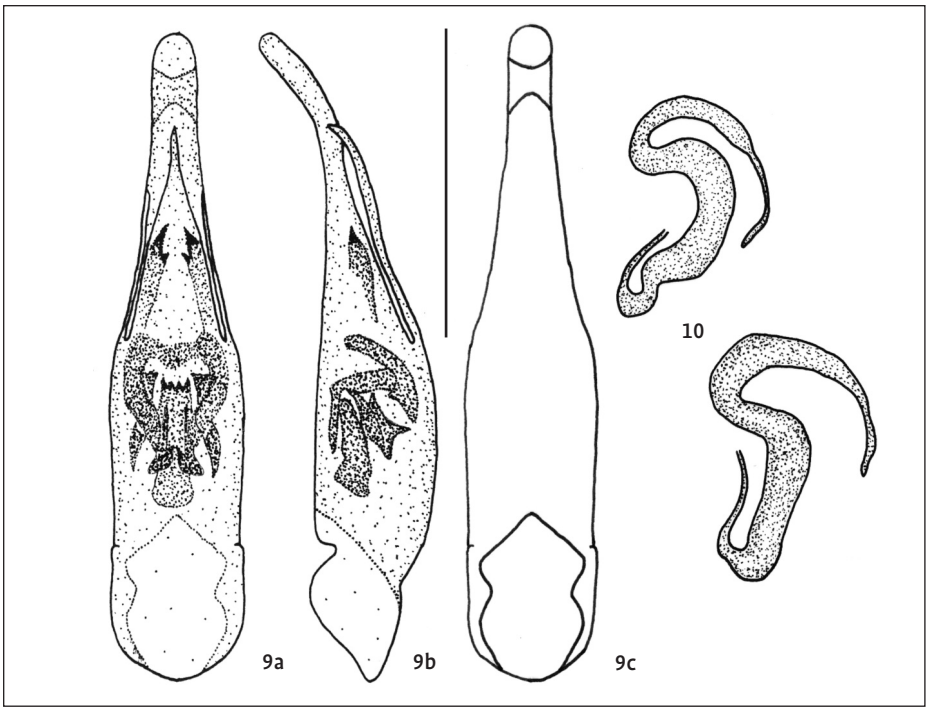
Only known species with the characters of the genus.

Holotype. ♂, "Perak Malacca / Jacoby Coll. 1909–28a / Arcastes sanguinea Jac. Type / Type H.T." (BMNH). Holotype by designation since only one of three available specimens from the type locality has a label indicating the type status. Type locality: 4°48'N / 101°9'E.

Paratypes. 2 ♂, same data as holotype (BMNH).

Further materials examined. **Indonesia.** 1 ex., Borneo exped., G. Kenepi, Pondok, I.1892, 1°6'S / 114°08'E, Dr. J. Bittik (BMNH); 75 ex., N.E. Sumatra, Deli, Kuala Simpang, Lowland Forest, 3°34'N / 98°40'E, V.1953, A. Sollaart (NNML); 2 ex., Sumatra, Lampung, BBS NP, Way Canguk, Primary forest, 4°33'S / 105°24'E, 30.X.2001, K. Smets (IRSN). – **Malaysia.** 1 ex., Pahang, Taman Negara, 4°19'N / 102°23'E, 1.–13.III.1984, L. Jessop, B.M. 1984–230 (BMNH); 1 ex., N. Sembilan, Pasoh, 3°N / 102°20'E, 23.–29.X.1989, Ruslan, Razali & Soed (UKM); 1 ex., N. Sembilan, Pusat Pertanian Cembung, 2°52'N / 102°15'E, Ismail & Md Nor (UKM); 1 ex., Selangor, Banting, 2°48'N / 101°30'E, 2.X.1989, Ismail & Ruslan (UKM); 2 ex., N. Sembilan, Gemencheh, 2°35'N / 102°24'E, 14.–16.VII.1990, Zaidi, Ismail & Zabidi (UKM); 4 ex., Johor, G. Ledang, 2°22'N / 102°37'E, 8.–9.XI.1990, Zaidi, Zabidi & Ruslan (UKM); 2 ex., Johor, Gunung Ledang, 19.–23.VI. 1993, Yusof, Saiful & Meor (UKM); 1 ex., N-Sembilan, Lenggeng, Kuala Kelawang, Jeram Toi, 2°52'N / 101°59'E, 17.–22.V.1993, Sham, Yusof & Saiful (UKM); 1 ex., N-Sembilan, Hu-





Figs 5–8. External characters of *Rubrarcastes sanguinea* (Jacoby, 1892). **5.** Hindwing, right, dorsal view. **6.** Antennae, **a.** Male, **b.** Female. **7.** Legs, **a.** Prothoracic, **b.** Mesothoracic, **c.** Metathoracic. **8.** Dorsal colour pattern. Different scale bar for Fig. 8 and other figures, each: 1 mm.

Figs 9, 10. Genitalic characters of *Rubrarcastes sanguinea* (Jacoby, 1892). **9.** Median lobe, **a.** Dorsal, **b.** Lateral, **c.** Ventral, without endophallic structures. **10.** Two different spermathecae. Scale bar: 1 mm.

Fig. 11. Photographs of the lectotype of *Arcastes sanguniea* Jacoby, 1892. **a.** Detail, **b.** With labels.

tan Simpan Gemencheh, 23.–24.I.1993, Ismail & Ruslan (UKM); 1 ex., N-Sembilan, Hutan Simpan Linggi, 2°24'N / 101°59'E, 1.–3.III.1991, Ismail & Ruslan (UKM); 2 ex., Pahang, Bt Rengit, 3°30'N / 102°8'E, 21.VI.1987, Meor (UKM); 2 ex., Pahang, Meran Hutan Lipur Teladas, 3°35'N / 102°46'E, 17.VI.1992, Ismail, Yusof, Sham & Razali (UKM); 1 ex., Pahang, Tasik Bera Kg Lubuk Kedi, 3°7'N / 102°36'E, 4.–8.V.1993, Sham, Razali & Saiful (UKM); 1 ex., Kedah, Gunung Jerai, 200 m, 5°47'N / 100°26'E, 28.V.1990, Mohd Salleh (UKM); 1 ex., Johor, G Ledang, 8.–9.XI.1990, 2°22'N / 102°37'E, Zaidi, Zabidi & Ruslan (UKM); 3 ex., Selangor, Sg Buloh, 3°13'N / 101°34'E, 19.III.1990, Ismail (UKM); 12 ex., Selangor, Bukit Cerakah, 18.III.1990, 3°14'N / 101°24'E, Ismail (UKM); 1 ex., Perak, Bukit Larut, 5°N / 100°53'E, 4.–6.XI.1991, Ismail & Ruslan (UKM); 3 ex., Kedah, Baling Lata Bayu, 5°39'N / 100°54'E, 19.VII.1994, Salleh, Ismail & Ruslan (UKM); 3 ex., Terengganu, Hutan Simpan Sekayu, 4°57'N / 102°58'E, 19.VI. 1992, Ismail, Yusof, Sham & Razali (UKM); 7 ex., Kedah, Baling, HL Bukit Hijau, 6°10'N / 100°28'E, 15.VI.1994, Ismail, Ruslan & Yusof (UKM); 5 ex., N-Sembilan, Pasoh Hutan FRIM, 3°8'N / 102°20'E, 29.–31.VII.1994, Ismail, Ruslan & Saiful (UKM); 19 ex., Sabah, Lembah Danum, 5°8'N / 117°24'E, 4.IV.1989 / 20.VIII.1989 / 4.–7.XII.1990 / 27.–31.VIII.1991 / 17.–20.IV.1992, Ismail et al. (UKM); 9 ex., Sarawak, Taman Negara Lambir, 4°39'N / 114°9'E, 25.–29.VI.1993, Ismail, Ruslan & Zabidi (UKM); 4 ex., Sarawak, Semenggok, 1°23'N / 110°20'E, 19.–21.XI.1991, Salleh, Zaidi & Ismail (UKM); 1 ex., Borneo, Sandakan, 5°50'N / 188°5'E, Baker (NHRS). – **Singapore.** 2 ex., 1°21'N / 103°49'E, H. N. Kindley, 97–240 (BMNH).

Acknowledgements. We indebted appreciation to all curators that involved with the materials, who made it possible for us to work with it. They are listed in the material chapter. This study was part of the research thesis of the first author funded by the Malaysian Ministry of Higher Education as a student scheme scholarship.

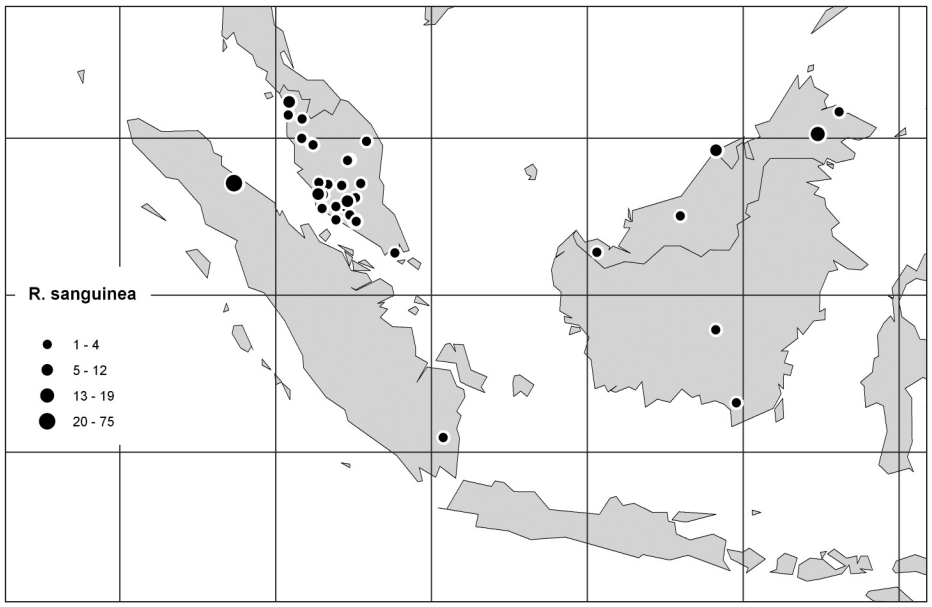


Fig. 12. Distribution of *Rubrarcastes sanguinea* (Jacoby, 1892).

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● Izfa Riza Hazmi & PD Dr. Thomas Wagner, Institut für Integrierte Naturwissenschaften – Biologie, Universität Koblenz-Landau, Universitätsstr. 1, 56070 Koblenz, Germany; E-Mail: thwagner@uni-koblenz.de

Appendix 4

Revision of *Neolepta* Jacoby, 1884 and related galerucines from the Oriental region, including description of two new genera (Coleoptera: Chrysomelidae: Galerucinae)

This paper is submitted to the Raffles Bulletin of Zoology and being in review.

As the first author of this article, I declare that most of the technical works: loaning, sorting, dissection and drawing have been done by me under supervision of Thomas Wagner.

Revision of *Neolepta* Jacoby, 1884 and related galerucines from the Oriental Region, including description of two new genera (Coleoptera: Chrysomelidae: Galerucinae)

Abstract

The Oriental galerucine taxon *Neolepta* Jacoby, 1884 is revised. With very few exceptions, the descriptions by preceding authors have been based on external characters only. After our studies, that also include genital structures, only *N. biplagiata* Jacoby, 1884 and *N. quadriplagiata* Jacoby, 1886 remain as valid species out of the original eleven species described in this genus. Furthermore, *Arcastes sumatrensis* Jacoby, 1884 is a senior synonym of *N. biplagiata* Jacoby, 1884 which valid name is *N. sumatrensis* (Jacoby, 1884), new combination. We describe *Paraneolepta* new genus to place *Ochralea marginata* Jacoby, 1884, which is similar to *Neolepta* in some external characters, but possess strong differences in the shape and endophallic armature of the median lobe. Next to *P. marginata*, *Luperodes limbella* Baly, 1886 and *Ochralea imitans* Jacoby, 1894 with its junior synonym *Monolepta aemula* Weise, 1922 are transferred to *Paraneolepta* new genus. *Neolepta fulvipennis* Jacoby, 1884 has been found to be strongly different in genital characters to *Neolepta* and *Paraneolepta* new genus. Due to its isolated phylogenetical position, it is herein transferred to *Orthoneolepta* new genus, including *Neolepta banggiensis* Mohamedsaid, 1997 as further species. The distribution of the species of these three genera is restricted to South-East Asia. We provide descriptions or redescriptions of the genera and redescriptions of the species, including illustrations of external and genital characters, photographs of the primary type specimens and distribution maps.

Keywords. – Galerucinae, *Neolepta*, *Paraneolepta, Orthoneolepta,* Oriental region, revision, taxonomy, redescription, new combination, new genus, lectotype.

Introduction

Galerucinae with slender legs, elongated basi-metatarsus and without significant pronotal depressions are assigned to the “Sectio Monoleptites” sensu Wilcox (1973). As commented

by Wilcox himself, the classification and taxonomic status of the whole group was very unsatisfactory and a revision of the Oriental species was started recently (Hazmi & Wagner, 2010a, b, c). Studies on several groups of Monoleptites have revealed that there are several species which need to be transferred to other taxa according to their phylogenetical position.

Neolepta was established by Jacoby (1884) when he described two species, *N. biplagiata* Jacoby, 1884 and *N. fulvipennis* Jacoby, 1884. In his original description, Jacoby not designated a genotype and Maulik (1936) did it later with *N. biplagiata* (Jacoby, 1884). He mentioned only few external characters to distinguish *Neolepta* from *Monolepta* Chevrolat, 1837 and *Candezea* Chapuis, 1879: *"On account of the long first tarsal joint and closed coxal cavities, the genus proposed here is closely allied to the genus Monolepta and still more closely to Candezea Chapuis. From Candezea it is further distinguished by the transversely impressed thorax"* (Jacoby, 1884: 222). *Neolepta* has only been recorded from the Oriental region, with one exception of the *N. unifasciata* Jacoby, 1886 from New Guinea. The other described species of *Neolepta* are *N. biplagiata* Jacoby, 1884 (Sumatra), *N. multicolorata* Jacoby, 1884 (Sumatra), *N. fulvipennis* Jacoby, 1884 (Sumatra), *N. quadriplagiata* Jacoby, 1886 (Sumatra), *N. nigrotibialis* (Allard, 1889) (Cambodia), *N. ruficollis* Jacoby, 1892 (Burma), *N. spilota* Weise, 1922 (Sumatra), *N. basalis* Bryant, 1954 (Burma), *N. banggiensis* Mohamedsaid, 1997 (Sabah), and *N. bukit* Mohamedsaid, 2001 (Selangor). We have studied most of the type specimens of *Neolepta* and herein give the first time detailed descriptions of the genital patterns. Only two valid species out of originally eleven described species are remain, *N. sumatrensis* (Jacoby, 1884) new combination and *N. quadriplagiata* Jacoby, 1886. All other species need to be transferred to other genera. Some of them in this publication and others will be subject on the ongoing revision of Oriental Galerucinae.

Ochralea marginata Jacoby, 1884 was meanwhile transferred to *Nadrana* by Laboissiere (1936). When checking the genital characters, we found that the median lobe of this species possesses a slightly similar character to the median lobe of *Neolepta*, but the latter is with stronger sclerotized ventral spur and a ventral carina. The spermatheca possesses a small nodulus, and consists of two sclerotised bursa sclerites. We therefore describe *Paraneolepta* new genus to place *Ochralea marginata* Jacoby, 1884, which is herein also designated as the genotype. Next to *Ochralea marginata*, *Luperodes limbella* Baly, 1886 and *Ochralea imitans* Jacoby, 1894 with its junior synonym *Monolepta aemula* Weise, 1922

are also transferred to this new genus. Distribution of the three species is up to now only recorded from Brunei, Malaysia (Peninsular) and Indonesia (Borneo, Sumatra), southwards to Java.

Neolepta fulvipennis Jacoby, 1884 possess also a characteristic distinct type of genital structures, strongly different from *Neolepta* and *Paraneolepta* new genus. Most peculiar is the apically deep incised median lobe. In females there is one pair of hooked bursa sclerites, a type that is not found in other groups. Due to its probably isolated phylogenetical position, it need to be also transferred to a distinct taxon, and we redescribed it here as type species of *Orthoneolepta* new genus. *Neolepta banggiensis* Mohamedsaid, 1997 are also transferred to this new genus.

Material and Methods

A standard set of figures is given for each species. These include illustrations of the coloration (dorsal view), including the right antenna, where black coloration is indicated by black, yellow coloration by white, red coloration by light grey, and brown by dark grey shading.

The antennomeres of each one male and female, dorsal and lateral view of the median lobe including the endophallic structures, ventral view of median lobe without endophallic structure, spermathecae of three females (if available) and bursa-sclerites (if available) usually of one female are figured. For the redescription of the genus, illustrations of the pro-, meso- and metathorax, female and male abdomen and right hind wing in dorsal view are given.

Measurements were made for external characters. Absolute measurements are: total length from the clypeus to apex of the elytron, length of the elytron, maximal width of both elytra (usually in the middle or posterior third of the elytra), and width of the pronotum. Relative measurements are: length to width of the pronotum, maximal width of both elytra to length of the elytron, length of the second to third antennomeres, and length of the third to fourth antennomeres. A number of specimens measured are given in the description under “total length”. Further materials examined are listed, and all label data are exactly re-written.

The subsequent redescriptions are based on labelled specimens from the following collections as listed in tables 1, 2 and 3. Acronyms used and responsible curators in brackets: The Natural History Museum, London (BMNH; S. Shute); Institute Royal des Sciences Naturelle de Belgique, Brussels (IRSN; P. Limbourg); Museum of Comparative Zoology, Harvard University (MCZH); Museo Civico di Storia Naturale, Genova (MCSNG; Dr. R. Poggi), Museum für Naturkunde der Humboldt Universität, Berlin (MNHU; J. Frisch, J. Willers); Swedish Museum of Natural History Stockholm (NHRS; Bert Viklund); Nationaal Natuurhistorisch Museum, Leiden (NNML; F. van Assen); Center for Insect Systematics, UKM, Malaysia (UKM; R. Yusop) and Collection of Jan Bezděk, Bruno (CJB).

For location data, geographical coordinates were given in degree and minute. These coordinates were mostly taken from Google Earth. The distribution map has been produced by ArcGis.

Taxonomy

Redescription of *Neolepta* Jacoby, 1884

Type species. *Neolepta biplagiata* Jacoby, 1884: 223; designated by Maulik (1936).

Total length. 4.85–5.75 mm (mean: 5.23 mm)
Head. Reddish-brown. Impunctate, with significant transverse impression between posterior third of eyes. Eyes large, strongly convex. Labial palpi slender and maxillary palpi enlarged (Fig. 1a), occasionally dark brown to black. Labrum and mandible brown to red. Antennae elongated, extended to the apical third of elytra (Figs 2, 10); third to terminal antennomere densely covered by bristle-like setae. First and second basal antennomere contrasting reddish-brown, third to terminal antennomere black. First antennomere club-shaped, second antennomere a bit shorter than third antennomere; ratio length of second to third antennomeres 0.75–0.80 (mean: 0.76); ratio length of third to fourth antennomeres 0.40–0.50 (mean: 0.44); the median antennomeres insignificantly widened in *N. sumatrensis* but rather slender in *N. quadriplagiata*.
Thorax. Pronotum transverse, anterior angle rounded and slightly thickened, posterior margin rounded, sinuate at each side (Figs 2, 10). Reddish-brown as head, shiny and finely punctuated with a transverse depression beyond the middle of the base. Pronotal width

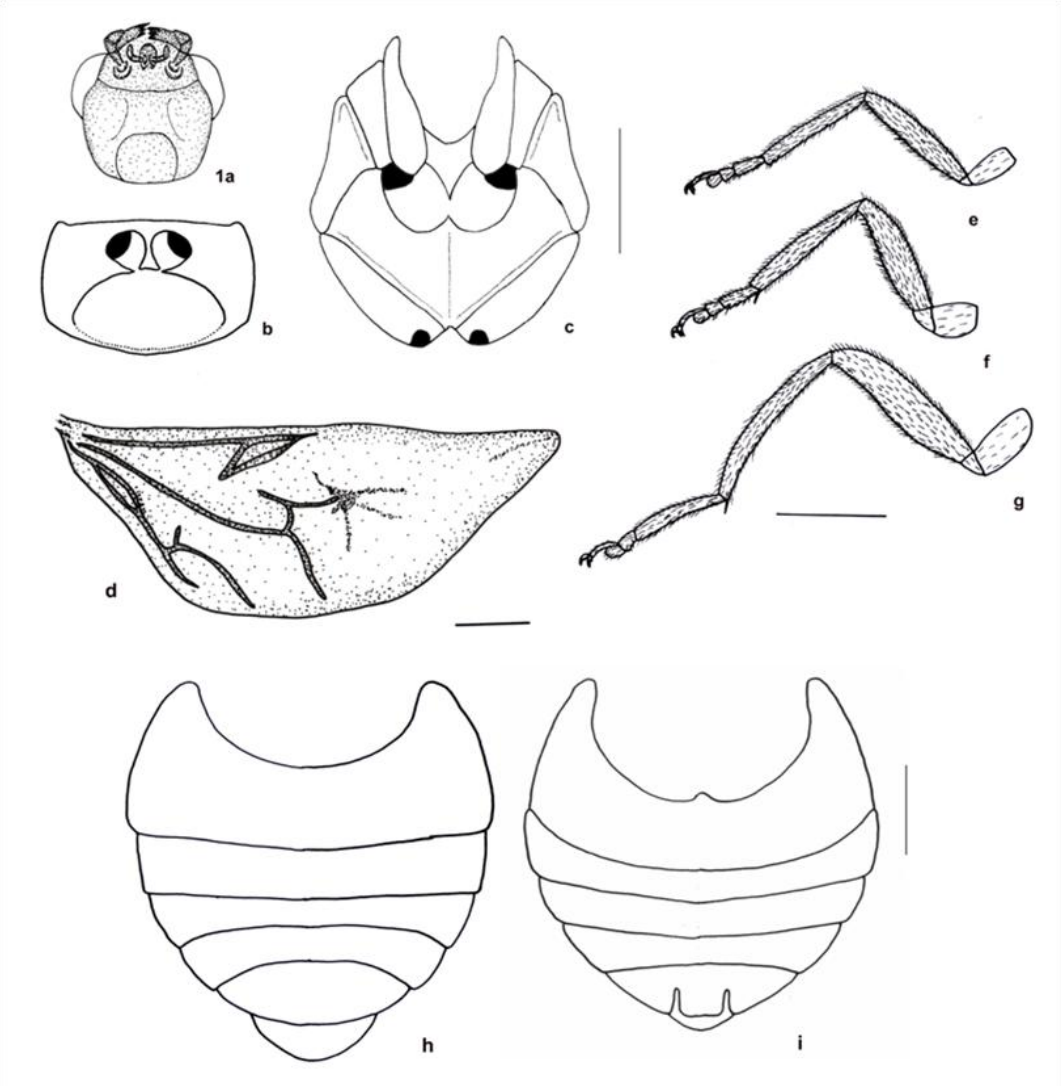


Fig. 1. *Neolepta sumatrensis* (Jacoby, 1884). – (a) head; (b) prothorax; (c) meso- and metathorax, ventral view; (d) hindwing, right, dorsal view; (e) prothoracic leg; (f) mesothoracic leg; (g) metathoracic leg; (h) female abdomen; (i) male abdomen. Scale bar: 1 mm.

1.50–1.75 mm (mean: 1.62), ratio length to width 0.52–0.60 (mean: 0.56). Scutellum triangular, impunctate, reddish-brown. Procoxal cavities nearly closed (Fig. 1b). Meso- and metathorax brown to red. Metasternum broad (Fig. 1c). Elytra finely punctuated, black with transverse yellowish spot on the disc of each elytron, two spots on *N. sumatrensis* (Fig. 2) and four spots on *N. quadriplagiata* (Fig. 10). Elytral length 3.80–4.50 mm (mean: 4.15), maximal width of both elytra together 2.00–3.30 mm (mean: 2.93), ratio of maximal width of

both elytra together to length of elytra 0.69–0.76 (mean: 0.72). Alae fully developed (Fig. 1d). Legs long and slender, basi-metatarsus elongated (Figs 1e-g), entirely reddish-brown, black tibia and tarsus in *N. quadriplagiata.*

Abdomen. Pale yellow to reddish-brown. Last visible sternite in females rounded at apex (Fig. 1h) and in males with two deep, parallel-sided incisions (Fig. 1i).

Male genitalia. The median lobe is symmetrical, parallel-sided at base and insignificantly narrowed towards apex. Apically not incised and carinated ventrally (Figs 4a, b; 12a, b). Tectum long, broad to narrow and became pointed at apex, and reaching the tip of the median lobe (Figs 4a, b; 12a, b.). Endophallus consist of a bundle of long, slender and straight median spiculae. A stronger sclerotized ventral carina with an apical hook close to the apex occurred on the apical third of the median lobe. Median lobe curved in lateral view (Fig. 4b). Sacculus clearly visible (Figs 4, 12).

Female genitalia. Spermatheca with small nodulus, and usually strongly curved, slender cornu (Figs 5, 13). Two pairs of bursa sclerites, weakly sclerotized with strong spines (Figs 6, 14).

Distribution. The species of this group are restricted to South-East Asia and they are up to now only recorded from Singapore, Malaysia (Peninsular) and Indonesia (Borneo, Sumatra), southwards to Java (Fig. 7).

Diagnosis. *Neolepta* are medium size galerucines (4.85–5.75 mm) with strongly elongated basi-metatarsus, reddish-brown head and pronotum, and usually contrasting black antennae. The elytral coloration is often with transverse yellowish spots (Figs 2, 10). *Neolepta* is most similar to *Arcastes* Baly, 1865 with the type species, *N. biplagiata* Jacoby, 1884 looking very similar to *A. biplagiata* Baly, 1865 at a first glance. The similarities of certain morphological characters between these two groups have been reported in the revision of *Arcastes* (Hazmi & Wagner 2010a).

The pronotum of *Neolepta* is on average less broad (0.52–0.60) than in *Arcastes* (0.48–0.57; Hazmi & Wagner 2010a) and *Candezea* (0.42–0.59; Wagner & Kurtscheid 2005), but in the same range as *Monolepta* of which these three genera are also listed in the Monoleptites. A significant transverse pronotal-basal depression occurred in *Neolepta*, but not in the other three genera. The significant widened third to eight antennomeres are characteristic for all species of *Arcastes*, but in *Neolepta*, the antennae are slender and only *N. sumatrensis* has insignificantly widened median antennomeres.

The second antennomere is slightly shorter than the third in *Neolepta* (ratio length of second to third antennomeres 0.75–0.80), about the same range as in *Monolepta* (0.82–1.10) but very different to *Arcastes* (0.50–0.57) and *Candezea* (0.49–0.63) of which third antennomere is roughly twice as long as the second. *Arcastes* with a certain shape of endophallic spiculae. In *Neolepta*, only the median spiculae occurred, while in *Monolepta* and *Candezea* three distinct pairs of spiculae occurred (median, ventral and lateral spiculae). In *Neolepta*, the stronger sclerotized ventral spur with an apical hook occurred, and the median lobe is carinated ventrally as in *Candezea*. The shape of the spermatheca of *Neolepta* resembles that of *Candezea*, with long curved cornu, but in *Neolepta* two pairs of bursa sclerites occurs, while in *Candezea* only one pair exist. There are also two pairs of bursa sclerites in *Monolepta*, but they are lacking in *Arcastes*.

Redescriptions of species

***Neolepta sumatrensis* (Jacoby, 1884), new combination**

Arcastes sumatrensis Jacoby, 1884: 47–48.

= *Neolepta biplagiata* Jacoby, 1884: 223; new syn.

Total length. 4.85–5.75 mm (mean: 5.23 mm, n=15).

Head. Reddish-brown, impunctate, first and second antennomeres contrasting reddish-brown, third to outer antennomere black (Figs 2, 8, 9). Ratio length of second to third antennomeres 0.75–0.80 (mean: 0.76); median antennomeres insignificantly widened, ratio length of third to fourth antennomeres 0.40–0.50 (mean: 0.44), terminal are more slender (Fig. 3).

Thorax. Pronotum reddish-brown, pronotal width 1.50–1.75 mm (mean: 1.62), ratio length to width 0.52–0.60 (mean: 0.56). Elytra black with transverse yellowish spot on the disc of each elytron, not quite extending to either margin (Figs 2, 8, 9). Elytral length 3.80–4.50 mm (mean: 4.15), maximal width of both elytra together 2.00–3.30 mm (mean: 2.93), ratio of maximal width of both elytra together to length of elytra 0.69–0.76 (mean: 0.72). Legs reddish-brown.

Abdomen. Pale yellow to reddish-brown.

Male genitalia. Median lobe parallel-sided, rounded at apex, not incised, apex carinated ventrally in the middle. Tectum broad and became lanceolate at apex. Endophallus with one distinct type of spiculae, median spiculae long, slender and straight (Fig. 4).

Table 1. Numbers of material examined and collection investigated for *Neolepta*.

Collections	*N. sumatrensis* (Jacoby, 1884)	*N. quadriplagiata* Jacoby, 1886
BMNH	33	4
CJB	1	2
IRSN	1	1
MCSNG	7	4
MCZH	-	1
MNHU	5	-
NNML	32	3
NHRS	2	-
Total	**81**	**15**

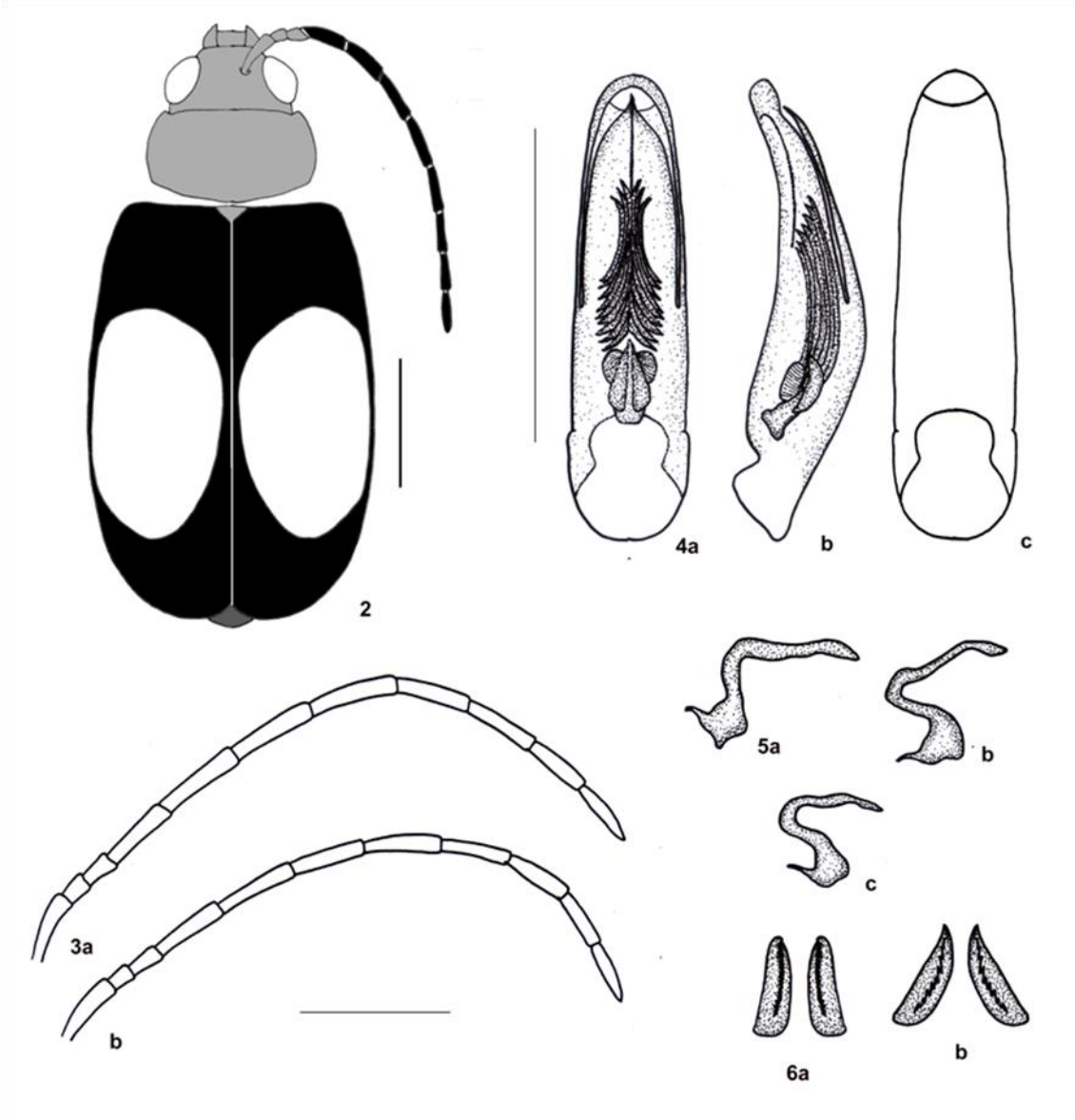
Female genitalia. Like description of the genus (Figs 5, 6).

Distribution. *Neolepta sumatrensis* is up to now known from Sumatra and some part of Peninsular Malaysia and Borneo (Fig. 7).

Diagnosis. *Neolepta sumatrensis* can be differentiated from *N. quadriplagiata* by the dorsal coloration. *Neolepta sumatrensis* are often with one transverse yellowish oval spot on each elytron while *N. quadriplagiata* has two yellowish oval spots on each elytron. As written by Jacoby (1884) in his original description, *N. sumatrensis* has a more transverse prothorax than other species. It is true that ratio pronotal length to width of *N. sumatrensis* is on average larger (0.52–0.60) than for *N. quadriplagiata* is (0.59–0.61). Characteristic for *N. sumatrensis* are also the widened median antennomeres in both sexes (Fig. 3), while *N. quadriplagiata* are only slender antennomeres (Fig. 11). The median lobe and the tectum of *N. sumatrensis* (Fig. 4) are broader than in *N. quadriplagiata* (Fig. 12).

Type material. *Arcastes sumatrensis*: Holotype: Female, “Spj, 4.77 / Arcastes sumatrensis Jac.“ (NNML) (Fig. 8). Type locality: Indonesia, Soepajang 0°27'S/100°54'E. Holotype by original indication “single specimen from Soepajang (Sumatra-Expedition)”.

Neolepta biplagiata: Lectotype, Male, “Dr. B. Hagen. Tandjong Morawa, Serdang, N. O. Sumatra / *Neolepta biplagiata* Jac.“ (NNML) (Fig. 9). Type locality: Indonesia, Tandjong Morawa, 0°35’S/101°18’E. Jacoby gave no number on the specimens he studied, but there are 16 specimens with labels from the type locality available. Thus we herein designate a lectotype to fix the name on single specimen. Paralectotypes: 15 ex., same data as



Figs 2–6. *Neolepta sumatrensis* (Jacoby, 1884). – 2. dorsal colour pattern; 3. antennae, (a) male; (b) female; 4. median lobe: (a) dorsal; (b) lateral; (c) ventral; 5. three different spermathecae; 6. two pairs of bursa sclerites. Scale bar: 1 mm.

lectotype (7 ex. BMNH, 8 ex. NNML). – Invalid types: 1 ex. from Sumatra, Si-Rambé, 6°11'S/106°48'E, XII.90–III.91, E. Modigliani in MCZ and 2 ex. from Dohrn, Sumatra, Soekaranda, 0°37'S/104°29'E, 71484 in MNHU are labelled as co-type, but are not from the type series.

Further material examined. – **Indonesia.** 3 ex., Sumatra, Collect. Duvivier, Arcastes sumatrensis Jacoby (IRSN; NNML; BMNH); 15 ex., Sumatra, Manna, 4°27'S/102°59'E, M.

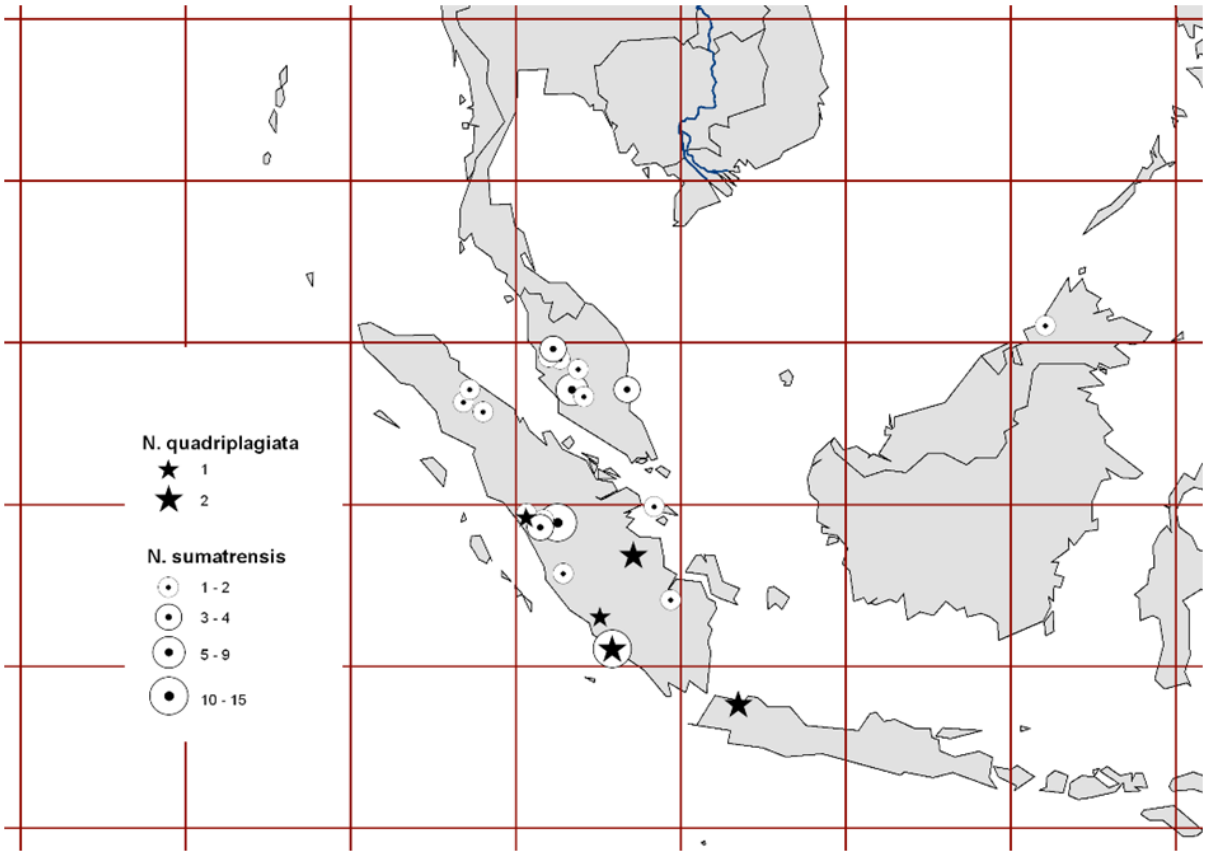
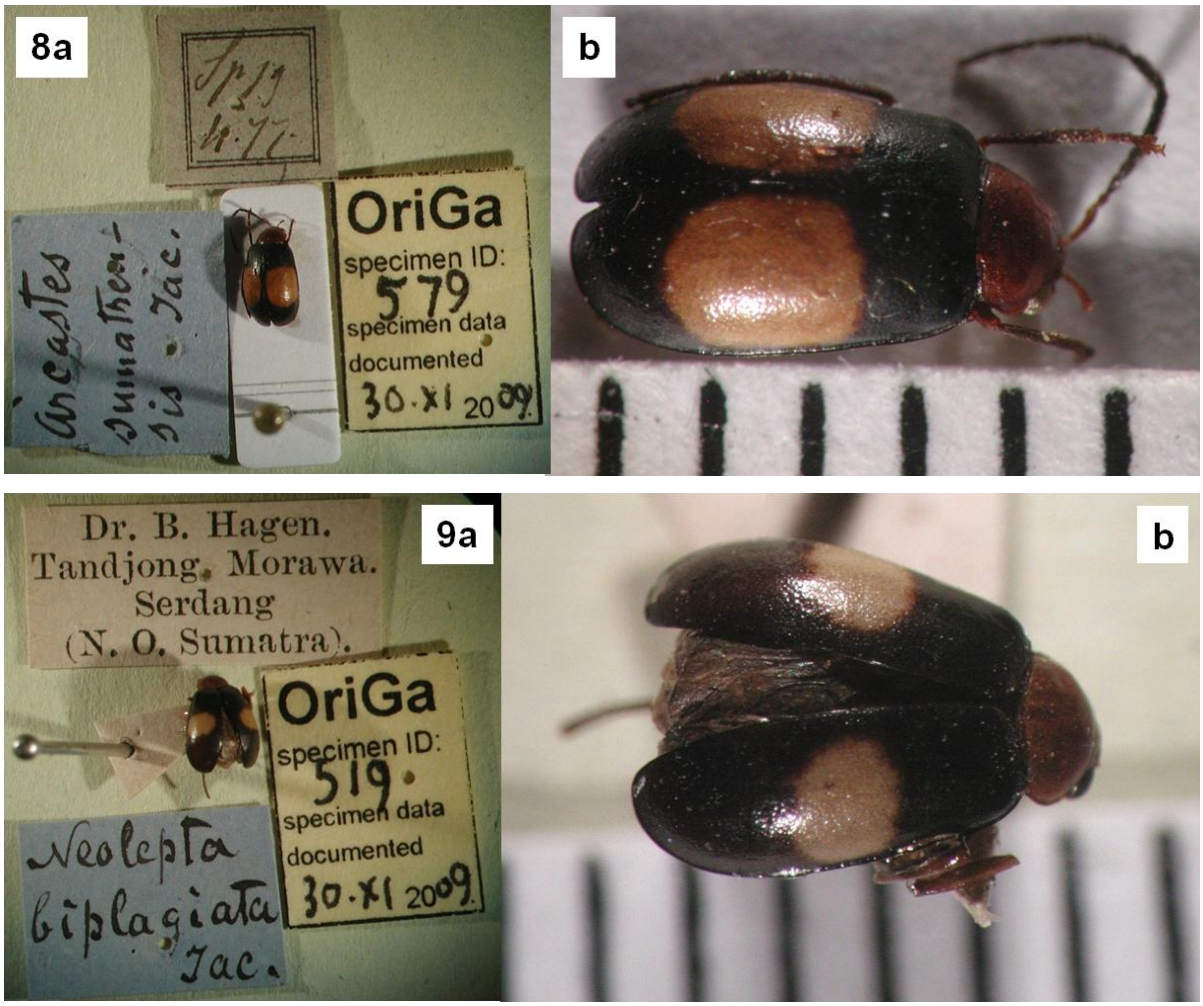


Fig. 7. Distribution of *N. sumatrensis* (Jacoby, 1884) and *N. quadriplagiata* Jacoby, 1886.

Knappert, Coll. Veth (NNML); 2 ex., Sumatra, Palembang, 2°59'S/104°45'E, M. Knappert, Coll. Veth (NNML); 1 ex., SVL, Deli, 3°35'N/98°39'E, Coll. Veth (NNML); 2 ex., Sumatra, Ajer Mantoior, Agosto 1878, O. Beccari (MCSNG); 1 ex., Sumatra, Sungei-Bulu, Sett. 1878, O. Beccari (MCSNG); 1 ex., Soekaranda, 0°37'S/104°29'E, Januar 1894, Dohrn (BMNH); 1 ex., W. Sumatra, Liman Manis b. Padang, 0°25'S/101°34'E, 8.I.09, Schoede S. G (MNHU); 1 ex., West Sumatra, Batu Insel Mentawei Gruppe, 0°25'S/101°34'E, 16.I.09, H. Schoede (MNHU); 2 ex., Sumatra, Fort cte kock, 0°17'S/100°22'E, X.1913, Edward Jacobson (BMNH, NNML); 1 ex., Sumatra, Siolak Daras, Korinchi Valley, 3100 ft, 2°08'S/101°29'E, March 1914 (BMNH); 1 ex., Sumatra, Sandaran Agong, Korinchi Lake, 2450 ft, 2°08'S/101°29'E, May & June 1914 (BMNH); 1 ex., N. E. Sumatra, Deli, Penatangsiantar Balimbingan Est., forest 600 m, 3°35'N/98°39'E, VIII.1953, A. Sollaart (NNML); 1 ex., N. Sumatra, Toba Plateau Tiga Dolok, Holzweg Eins, ca. 950 m, 2°55'N/99°03'E, 20.VI.1972, J. Krikken, no. 20 (NNML); 1 ex., West Sumatra, Pulau Tello, 0°04'S/98°13'E, Nov. 1924, C. B. K. and N. S. (BMNH); 3 ex., Sumatra, Pagherang Pisang, 0°35'S/101°20'E, X.90, III.91, E. Modigliani (BMNH), Teste



Figs 8–9. Photographs of the primary type: a. with labels, b. detail. – **8.** *Arcastes sumatrensis* Jacoby, 1884. **9.** *Neolepta biplagiata* (Jacoby, 1884).

Jacoby (MCSNG); 1 ex., Brastagi, Sumatra, 3°11'N/98°28'E, Mjöberg (NHRS); 1 ex., N. O. Sumatra, Deli, 3°35'N/98°39'E, L. Martin S., 86977 (MNHU); 1 ex., Sumatra, Si-Rambe, 6°11'S/106°48'E, XII.90-III.91, E. Modigliani (MCSNG). – **Malaysia.** 1 ex., West Sumatra, 0°44'S/100°48'E, Jacoby coll. 1909-28a (BMNH); 4 ex., Semangko pass Selangor-Pahang, 2700', 3°35'N/103°24'E, March 1912, Ex. F. M. S. Museum, B. M. 1955-354 (BMNH); 9 ex., Malay Penin., Selangor, Bukit Kutu, 3300 ft, 3°33'N/101°43'E, 19.III.1931, 27.IX.1932, H. M. Pendlebury (BMNH); 1 ex., Pahang, F. M. S. Cameron Highland, Gunung Kial, 5000 ft, 4°30'N/101°23'E, 27.VII.1938 (BMNH); 1 ex., Perak, Gunong Kledang, 4°35'N/101°01'E, 2646, Nov. 1916 (BMNH); 3 ex., Perak, 4°48'N/101°09'E, Doherty, Fry coll. 1905.100 (BMNH); 1 ex., Kampong, 1450 m, 21.I.1981 (NHRS); 1 ex., Pahang, Genting Highland, 2

km top, 3°22'N/102°06'E, 2.VIII.1992, C. W. & L. B. O' Brein (Coll. Provo utah); 1 ex., Borneo, Sabah, W Crocker Range E, West of Apin Apin, 5°34'N/116°05'E, leg. Snizek, II.2000 (CJB).

***Neolepta quadriplagiata* Jacoby, 1886**

Neolepta quadriplagiata Jacoby, 1886: 99–100.

Total length. 5.00–5.25 mm (mean: 5.11 mm, n=8)

Head. Reddish-brown, impunctate. First and second basal antennomeres contrasting brown-reddish, third to outer antennomeres black (Figs 10, 15). Ratio length of second to third antennomeres 0.75–0.88 (mean: 0.79); median to terminal antennomeres are slender, ratio length of third to fourth antennomere 0.40–0.44 (mean: 0.41) (Fig. 11).

Thorax. Pronotum reddish-brown. Pronotal width 1.30–1.45 mm (mean: 1.40 mm), ratio length to width 0.59–0.62 (mean: 0.61). Elytra black at base, a broad yellowish spot occupies the anterior half of the disc, extending nearly to either the outer margin, the anterior edge of this spot is obliquely rounded near the suture, another smaller and triangular spot is placed near the apex of each elytron (Figs 10, 15). Elytral length 4.00–4.25 mm (mean: 4.15), maximal width of both elytra together 2.60–3.00 mm (mean: 2.84), ratio of maximal width of both elytra together to length of elytra 0.63–0.70 (mean: 0.68). Coxa and femur reddish-brown, tibia and tarsus black.

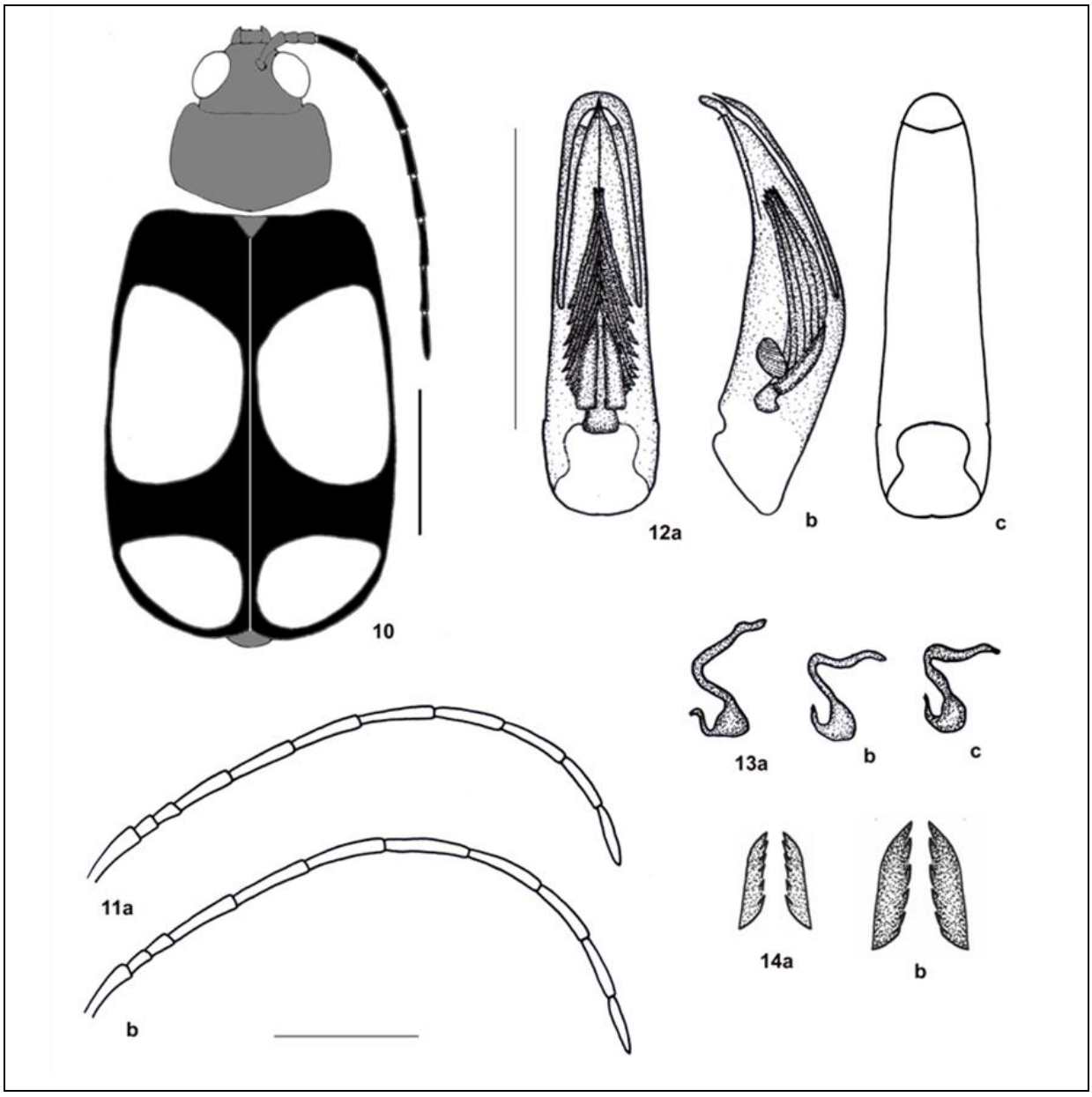
Abdomen. Pale yellow to reddish brown.

Male genitalia. Median lobe not incised, apex carinated ventrally in the middle. Tectum narrow, became pointed at apex. Endophallus consist of only median spiculae; long, slender and straight. Stronger sclerotized ventral spur with apical hook occurred at the apical first of the median lobe. Several basal endophallus structure at the bottom, close to sacculus (Fig. 12).

Female genitalia. Like description of the genus (Figs 13, 14).

Diagnosis. Median antennomeres of *N. quadriplagiata* are rather slender while *N. sumatrensis* are insignificantly widened. The median lobe of *N. quadriplagiata* (Fig. 12) is quite similar to *N. sumatrensis*, but the latter has a broadened tectum (Fig. 4).

Type material. Lectotype: “Sumatra Mt. Singgalang, Luglio 1878. O. Beccari / *Neolepta 4plagiata* Jac., / 1st Jacoby Coll. / Type 18314” (MCZ; Fig. 15). 4 ex., Syntype: same data as lectotype (MCSNG). Type locality: Indonesia, Singgalang, 0°24'S/100°21'E. Jacoby gave no number on the specimens he studied, but there must be more than one concerning the



Figs 10-14. ***Neolepta quadriplagiata*** **Jacoby, 1886. –** 10. dorsal colour pattern; 11. antennae, (a) male; (b) female; 12. median lobe: (a) dorsal; (b) lateral; (c) ventral; 13. two different spermathecae; 14. two pairs of bursa sclerites. Scale bar: 1 mm.

original description, and we herein designate a lectotype to fix the name on a single specimen.

Further material examined. – **Indonesia.** 2 ex., Sumatra, Korinchi Peak, 7300 ft, 1°35'S/103°36'E, May 1914, Ex. F. M. S. Museum, B. M. 1955–354 (BMNH); 7 ex., Sumatra, Si-Rambe, 6°11'S/106°48'E, XII.90–III.91, E. Modigliani (BMNH; IRSN; MCSNG); 2 ex.,

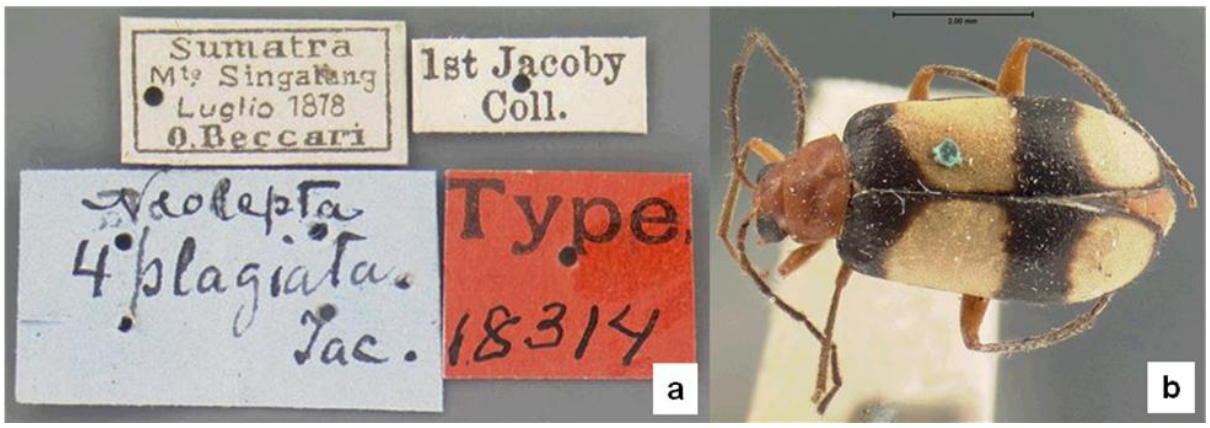


Fig. 15. Photographs of the lectotype of *N. quadriplagiata* Jacoby, 1886; a. with labels, b. detail (photo from website http://insects.oeb.harvard.edu/mcz/).

Sumatra, Manna, 4°27'S/102°59'E, 1902, M. Knappert, Coll. Veth (NNML); 1 ex., N. Sumatra, Bivouac Two, Mt. Bandahara, no 24 ca 1430 m, submontane Multistratal evergreen forest, 3°44'N/97°43'E, 5.–10.VII.1972, J. Krikken, at light (NNML); 1 ex., Sumatra Barat, Mt. Singgalang, ca 15 km Bukit Tinggi, 2100 m, 0°24'S/100°21'E, 12.II.1996, leg. C. Zorn (CJB); 1 ex., W. Sumatra, Bengkulu prov., nr. Curup, Bukit Kaba Mt., 1000–1500 m, 3°29'S/102°36'E, 30.I.–3.II.2000, J. Bezdek leg. (CJB).

***Paraneolepta* new genus**

Type species. *Ochralea marginata* Jacoby, 1884: 55–56; herein designated.

Etymology. Combination of para (latin: next to) and *Neolepta.*

Total length. 6.65–10.10 mm (mean: 7.43 mm)

Head. Pale yellow to reddish-brown. Impunctate, with significant transverse impression between posterior third of eyes. Eyes large, convex. Labial palpi and maxillary palpi slender (Fig. 16a). Labrum yellow to brown and black at apex. Mandibulae brownish. Antennae slender, entirely black and only the first basal antennomeres contrasting reddish-brown, extended to the apical third of the elytra (Figs 17, 25, 31). Third to terminal antennomere with very dense and rough cover of partly bristle-like setae. First antennomere club shaped; second antennomere a bit shorter than third antennomere; ratio length of second to third antennomere 0.75–0.86 (mean: 0.81); ratio length of third to fourth antennomere 0.40–0.50

(mean: 0.45) (Figs 18, 26, 32).

Thorax. Pronotum transverse, lateral and posterior margin evenly rounded, the anterior angles slightly thickened (Figs 17, 25, 31), often with transverse depression beyond the middle of the base. Pronotum pale yellow to reddish-brown. Pronotal width 1.65–2.70 mm (mean: 2.14), ratio length to width 0.60–0.63 (mean: 0.62). Scutellum triangular, impunctate, yellow to black. Procoxal cavities nearly closed (Fig. 16b). Meso- and metathorax yellowish to blackish. Mesosternum broad (Fig. 16c). Elytra strongly punctuated, punctuation slightly coarser and denser than that of pronotum, entirely yellow to brown, sutural and lateral margin narrowly black. Elytral length 4.60–8.10 mm (mean: 5.90), maximal width of both elytra together 3.20–5.40 mm (mean: 4.14), ratio of maximal width of both elytra together to length of elytra 0.65–0.74 (mean: 0.71). Alae fully developed (Fig. 16d). Legs long and slender, basi-metatarsus elongated (Figs 16e-g), yellow to brown, tibiae and tarsi blackish. In particular tibia with dense and fine setae.

Abdomen. Pale yellow to brown. Last visible sternite in females rounded at apex (Fig. 16h) and in males with two deep, parallel sided incisions (Fig. 16i).

Male genitalia. The median lobe symmetrical and usually insignificantly narrowed towards apex, not incised apically. Tectum broad at base, vary from long to short and became lanceolate at apex (Fig. 19a). The endophallus consist of a bundle of laterally arranged long, slender and straight median spiculae. At the bottom of median spiculae, with distinct endophallus structure. Sacculus clearly visible (Figs 19, 27, 33).

Female genitalia. Spermatheca with slender and elongated nodulus. Middle part long and slightly curved, cornu long, curved, arrow-like widened beyond apex (Figs 20, 28, 34), with a pair of sclerotized bursa sclerites (Figs 21, 29, 35).

Distribution. The genus is restricted to South-East Asia and up to now only recorded from Brunei, Malaysia (Peninsular) and Indonesia (Borneo, Sumatra), southwards to Java (Fig. 22).

Diagnosis. *Paraneolepta* new genus are relatively large galerucines with a strongly elongated basi-metatarsus, pale yellow to reddish-brown head and pronotum and usually contrasting black antennae with slender antennomeres. The pronotum is coarsely punctuated and a transverse depression beyond the middle of the base occurred. The dorsal coloration is without spots and bands, entirely yellow to brown, but the elytral suture and the elytral lateral margin are often narrowly black lined (Figs 17, 25, 31). *Paraneolepta* new genus resembles *Neolepta* and *Orthoneolepta* new genus. Among these three groups, *Paraneolepta* new genus is largest in term of the body length (6.65–10.10 mm; *Neolepta*

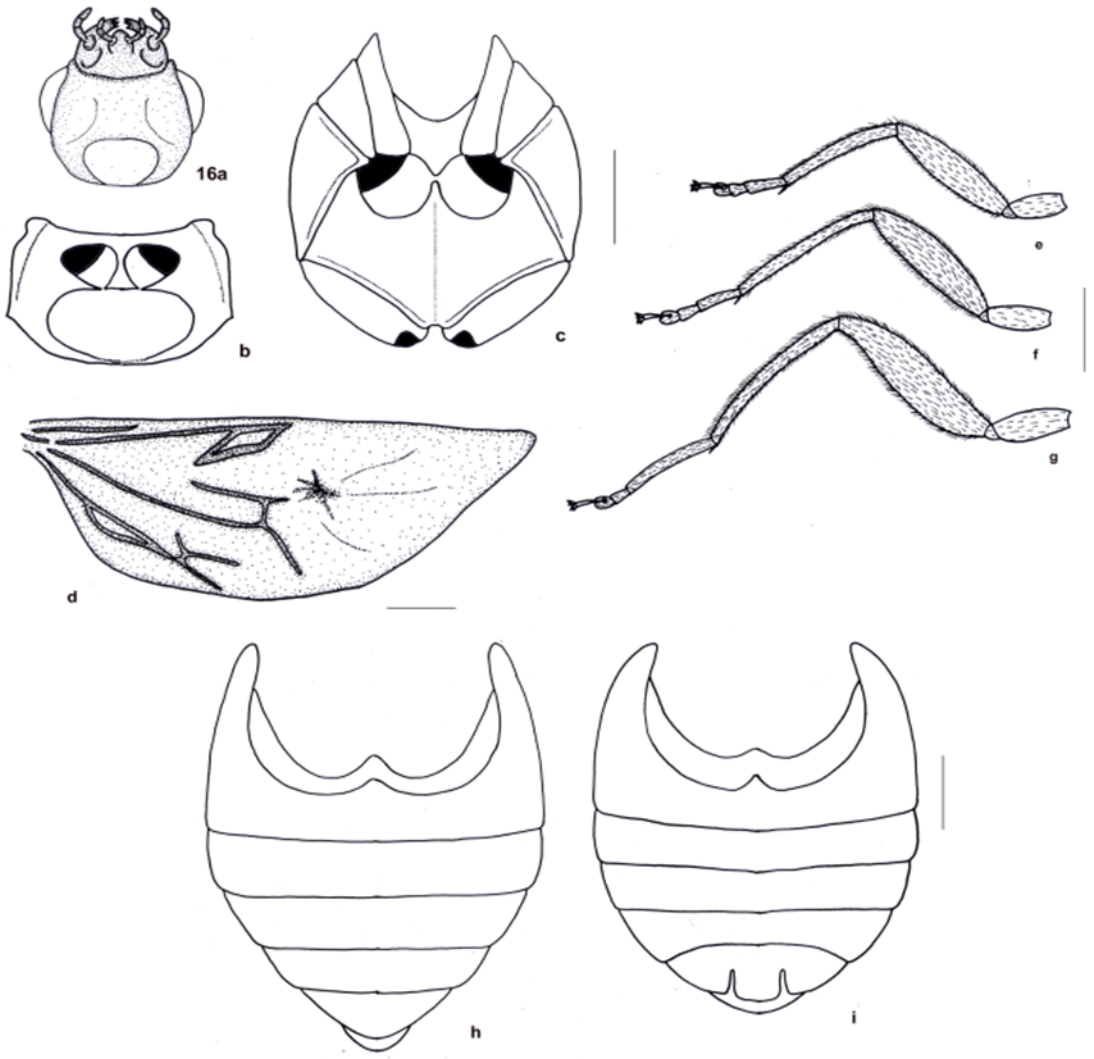


Fig. 16. *Paraneolepta marginata* (Jacoby, 1884). - (a) head; (b) prothorax; (c) meso- and metathorax, ventral view; (d) hindwing, right, dorsal view; (e) prothoracic leg; (f) mesothoracic leg; (g) metathoracic leg; (h) female abdomen; (i) male abdomen.

4.85–5.75 mm; *Orthoneolepta* new genus 4.50–5.75 mm). The antennomeres of *Paraneolepta* new genus are slender while in *Neolepta*, the median antennomeres are insignificantly widened, and they are strongly widened in *Orthoneolepta* new genus. The second antennomere of *Paraneolepta* new genus is somewhat shorter than third antennomere (ratio length of second to third antennomere: 0.75–0.86) (Figs 18, 26, 32), similar to *Neolepta* (0.75–0.80) (Figs 3, 11) while in *Orthoneolepta* new genus varied from short to more or less the same length (0.60–1.00) (Figs 39, 46). Third to terminal

antennomere densely covered by bristle-like setae and extended to the apical third of elytra in these three groups.

The pronotum of *Paraneolepta* new genus are transverse and comparatively less broad (0.60–0.63), like in *Orthoneolepta* new genus (0.59–0.65) compared to *Neolepta* (0.52–0.60). The depression beyond the middle of the base occurred in these three groups, but the punctuation is coarsest in *Paraneolepta* new genus. Besides many similarities among these three groups, they can be clearly distinguished by the genital characters in both sexes. The median lobe of *Paraneolepta* new genus are without apical incision (Figs 19, 27, 33) as in *Neolepta*, but the latter is with stronger sclerotized ventral spur and carinated ventrally (Figs 4, 12). In comparison with *Orthoneolepta* new genus, the median lobe has a deep incision apically (Figs 40, 47). The endophallus consist of a bundle of laterally arranged long, slender and straight median spiculae in these three groups. The median lobe of *Paraneolepta* new genus is bigger and longer than in *Neolepta*, and narrower towards the apex.

The spermatheca is the same shape for *Paraneolepta* new genus (Figs 20, 28, 34) and *Orthoneolepta* new genus (Figs 41, 48). Spermatheca with small, slender and elongated nodulus and middle part slightly curved. For *Neolepta,* the nodulus is rounded and usually possess a strongly curved cornu (Figs 5, 13). Bursa sclerites showed a different shape (Figs 6, 14, 21, 29, 35, 42, 49).

Table 2. Numbers of material examined and collection investigated for *Paraneolepta* new genus.

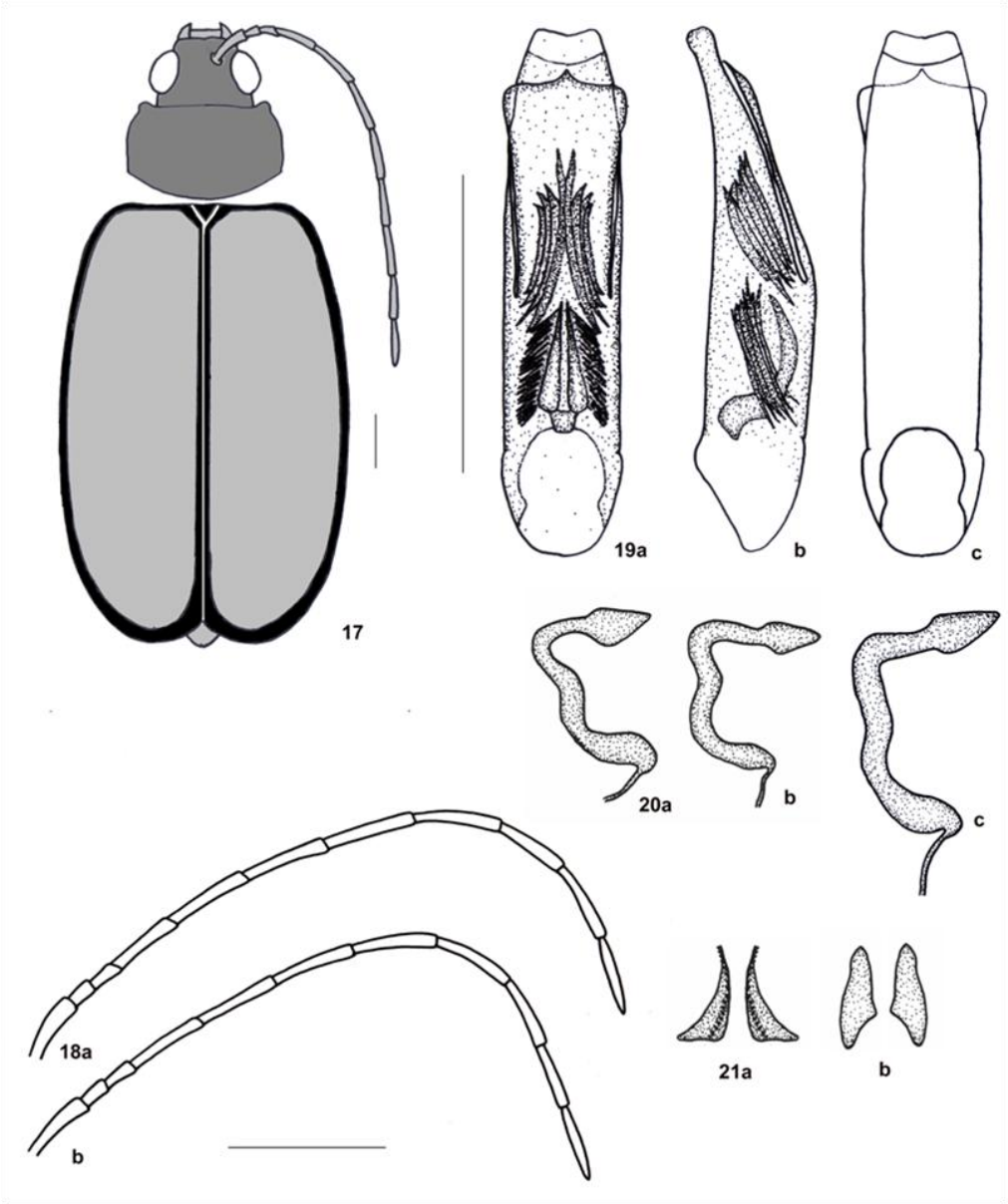
Collections	***P. marginata* (Jacoby, 1884)**	***P. limbella* (Baly, 1886)**	***P. imitans* (Jacoby, 1894)**
BMNH	5	38	23
CJB	-	6	-
NHRS	-	1	1
NNML	44	-	4
UKM	-	10	5
Total	**49**	**55**	**33**

Redescriptions of species

***Paraneolepta marginata* (Jacoby, 1884) new combination**

Ochralea marginata Jacoby, 1884: 55–56.
Luperodes marginata Baly, 1886: 30–31; new synonym.
Luperodes cincta Weise, 1921: 30; replacement name for *Luperodes marginatus* Baly, 1886; new synonym.

Total length. 7.10–10.10 mm (mean: 8.45; n=10).
Head. Reddish-brown, impunctate. Antennae pale brown (Fig. 17). Ratio length of second to third antennomere 0.83–0.86 (mean: 0.85); slender, ratio length of third to fourth antennomere 0.43–0.50 (mean: 0.47) (Fig. 18).
Thorax. Pronotum pale brown to reddish-brown, finely punctuated. Pronotal width 2.25–2.70 mm (mean: 2.46), ratio length to width 0.60–0.63 (mean: 0.61). Scutellum black. Elytra entirely yellow to brownish, sutural and lateral margin narrowly black. Elytral length 1.40–1.65 mm (mean: 1.51), maximal width of both elytra together 2.25–2.70 mm (mean: 2.46), ratio of maximal width of both elytra together to length of elytra 0.65–0.70 (mean: 0.67). Legs entirely pale yellow to brownish.
Abdomen. Pale yellow to brown.
Male genitalia. Median lobe is broad at middle and slightly narrowed towards apex and not incised apically. Tectum broadened at apex and with a fine, pointed tip (Fig. 19a). Endophallus consist of a bundle of laterally arranged long, slender and straight median spiculae. At the bottom of the median spiculae, several basal endophallus structures. Sacculus clearly visible (Fig. 19).
Female genitalia. Spermatheca like description of the genus (Fig. 20), two pairs of bursa sclerites like Fig. 21.
Distribution. This species was often collected at Sumatra Island, and occurred also in Java (Fig. 22).
Diagnosis. *Paraneolepta marginata* is on average the largest species of this group (7.10–10.10 mm). The antennae are slender and entirely pale yellow to brown. The body colouration is brownish with narrowly black suture, and punctuation of the pronotum are coarse. The median lobe is larger and broad from base to apex, tectum is also broadened at the tip. The spermatheca are big and two pairs of bursa sclerites evenly sclerotised.



Figs 17-21. *Paraneolepta marginata* (Jacoby, 1884). – 17. dorsal colour pattern; 18. antennae, (a) male; (b) female; 19. median lobe: (a) dorsal; (b) lateral; (c) ventral; 20. three different spermathecae; 21. two pairs of bursa sclerites. Scale bar: 1 mm.

Type material. *Ochralea marginata*: Lectotype, Male, "Soerol., 4.18 / Ochralea marginata Jac." (NNML; Fig. 23). Type locality: Indonesia, Soerol, 0°35'S/101°20'E. Jacoby (1884) stated that there are at least two specimens when he described the species. Thus we designate a lectotype to fix the specimen that available to us.

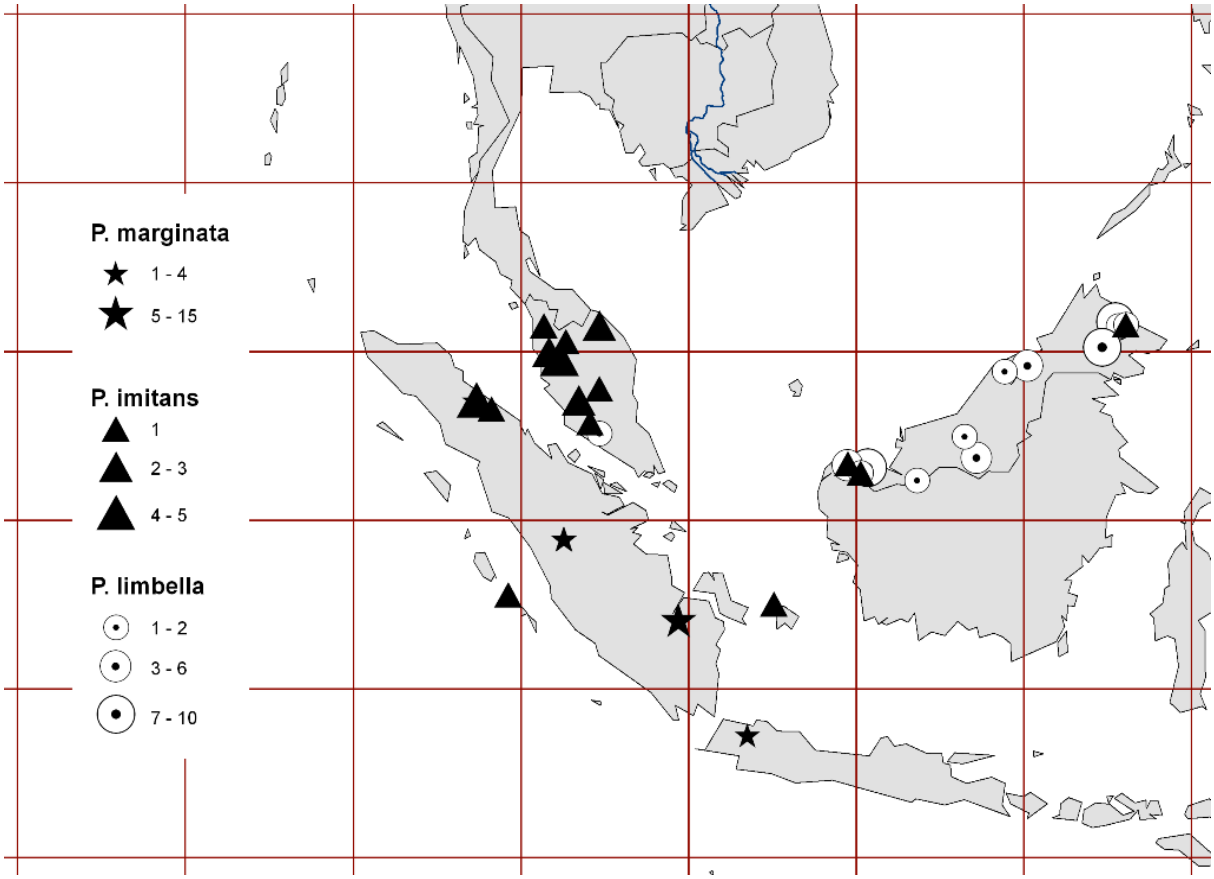
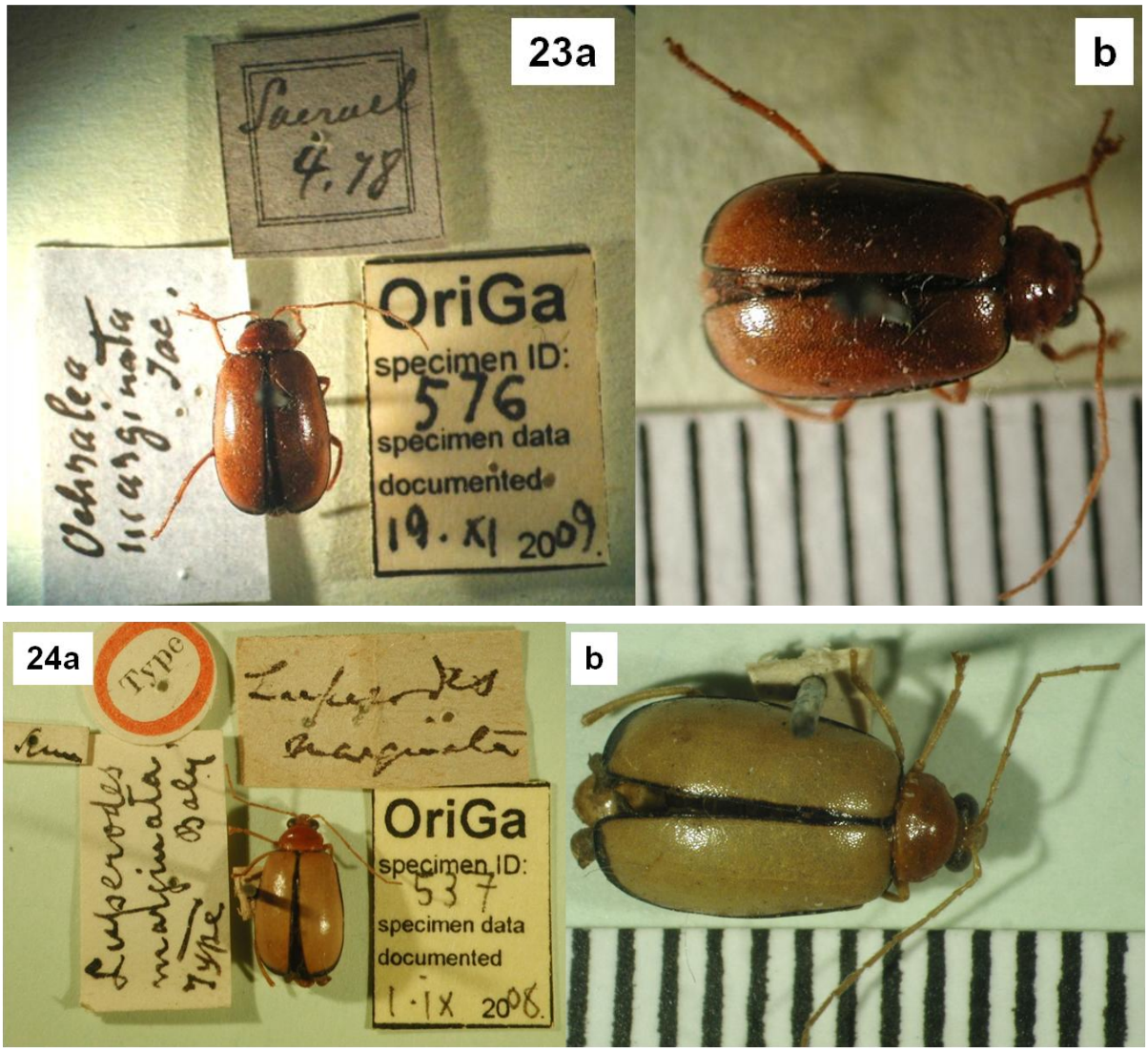


Fig. 22. Distribution of *P. marginata* (Jacoby, 1884), *P. limbella* (Baly, 1886) and *P. imitans* (Jacoby, 1894)

Luperodes marginata: Holotype, “Suma. / Luperodes marginata / Type / Luperodes marginata Baly, Type“ (BMNH ; Fig. 24). Type locality: Indonesia, Sumatra. Baly gave no number on the specimens he studied, but there are three specimens available, and only one of them carries a label with “type”, which can be treated as holotype by indication. – Paratypes, 2 ex., Sumatra, Baly coll. (BMNH).

Further material examined. – Indonesia. 16 ex., Sumatra, Museum Leiden, ex. collection, J. J. de Vos tot, Nederveen Cappel (NNML); 15 ex., Sumatra, Palembang, 2°59'S/104°45'E, M. Knappert, Coll. Vth. (NNML); 5 ex., Dr. B. Hagen, Tandjong Morawa Serdang (N. O. Sumatra), 0°35'S/101°18'E (NNML); 1 ex., Java, Wallace, 6°23'S/106°48'E, 67.56 (NNML); 1 ex., Jacoby coll. 1909-28a (BMNH); 2 ex., Sumatra, S. E. coast, Laut Tador, 90 m, 3°32'N/99°04'E, 2.–5.VIII.1950, E. Straatman leg. (NNML); 4 ex., N. E. Sumatra, Deli, Seleleh, Kuala Limpang, Medang Ara State, 3°34'N/98°40'E, III.1954, A. Sollaart (NNML).



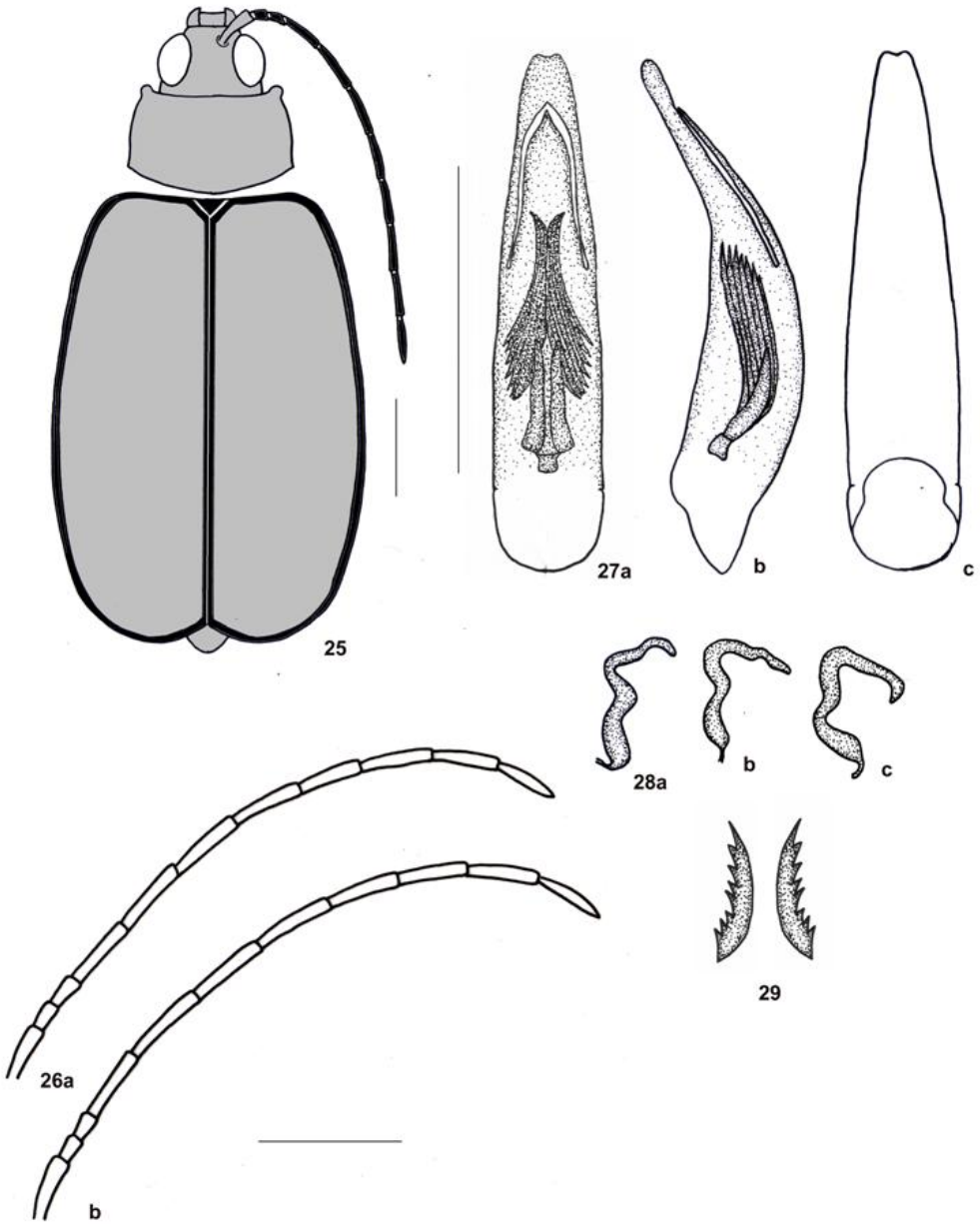
Figs 23–24. Photographs of the primary type: a. with labels, b. detail. – **23.** *Ochralea marginata* Jacoby, 1884. **24.** *Luperodes marginata* Baly, 1886.

***Paraneolepta limbella* (Baly, 1886) new combination**

Luperodes limbella Baly, 1886: 30.

Total length. 6.00–7.50 mm (mean: 6.81; n=10)

Head. Pale yellow to brown, impunctate. Antennae entirely black and only the first basal antennomeres usually contrasting pale yellow to brown (Fig. 25). Ratio length of second to



Figs 25–29. *Paraneolepta limbella* (Baly, 1886). – 25. dorsal colour pattern. 26 antennae, (a) male; (b) female. 27. median lobe: (a) dorsal; (b) lateral; (c) ventral. 28. two different spermathecae. 29. one pair of bursa sclerites. Scale bar: 1 mm.

third antennomere 0.75–0.83 (mean: 0.79); ratio length of third to fourth antennomere 0.40–0.50 (mean: 0.44) (Fig. 26).

Thorax. Pronotum pale yellow to brown. Pronotal width 1.65–2.35 mm (mean: 1.99), ratio length to width 0.60–0.63 (mean: 0.62). Scutellum usually black, but at least in 30 % of the

specimens examined, scutellum are yellowish and in that case, the elytra are entirely yellow to brown without further narrowly black sutural as in the other specimens, with sutural and lateral margin narrowly black. Elytral length 4.60–5.90 mm (mean: 5.25), maximal width of both elytra together 3.20–4.30 mm (mean: 3.79), ratio of maximal width of both elytra together to length of elytra 0.70–0.74 (mean: 0.72). Legs brownish, tibiae and tarsi blackish.

Abdomen. Yellow to brown.

Male genitalia. Median lobe symmetrical, parallel sided, insignificantly narrow towards apex, not incised apically. Tectum short, broad at base, and became lanceolate at apex (Fig. 27a). Endophallus consist of a bundle of laterally arranged long, slender and straight median spiculae. At the bottom of median spiculae, several basal endophallus structure. Sacculus clearly visible (Fig. 27).

Female genitalia. Spermatheca like description of the genus (Fig. 28), one pair of bursa sclerites like Fig. 29.

Distribution. Recorded from Borneo, Brunei, Peninsular Malaysia (Fig. 22).

Diagnosis. *Paraneolepta limbella* is the most similar in body outline and general colouration to *P. imitans*. The differences on both species can be obtained by genital structures. The median lobe of *P. limbella* is much narrowed towards the apex (Fig. 27), while for *P. imitans*, the median lobe is much broader at the apex (Fig. 33). The spermatheca of both species are similar, but only one pair of bursa sclerites in *P. limbella* (Fig. 29), while two pairs in *P. imitans* (Fig. 35).

Type material. Holotype, “Luperodes limbella / Singa. / Type / Luperodes limbella Baly type / Baly Coll.“ (BMNH; fig. 30). Type locality: Singapore, 2°38'N/103°39'E. Baly gave no number on the specimens he studied, but there are three specimens available, and only one of them carries a label with “type”, which can be treated as holotype by indication.

Further material examined. – **Brunei.** 5 ex., Temburong District, Ridge NE of Kuala Belalong, 4°37'N/115°8'E, 300 m, X.1992, 125 W MV Light Trap, J. H. Martin coll., BMNH(E) 1992-172 (BMNH); 1 ex., Labi, Bukit Teraja 60 m, Mxt. Dipt. Forest, 4°25'N/114°27'E, B.M.1983-39, Light trap 3, 25 m above ground, 23.VIII.79, S. L. Suttor (BMNH). – ***Malaysia*****.** 6 ex., Sarawak, Kapit dist., Sebong, Baleh riv., 1°54'N/113°38'E, 9-21.III.1994, J. Horak leg. (CJB); 3 ex., Sarawak, Mt. Matang, 1.55°N/110.35°E, 13.XII.–14.I.1914, G. E. Bryant Coll. 1919-147 (BMNH); 7 ex., Quop, W. Sarawak, 1°33'N/101°24'E, G. E. Bryant, III.–IV.1914 (BMNH); 8 ex., N. Borneo, Samawang, Nr. Sandakan, jungle, 5°55'N/117°46'E, 13.VII.1927, C. B. K & H. M. P., F. M. S. Museum (BMNH); 2 ex., N. Borneo, Bettotan, Nr. Sandakan,

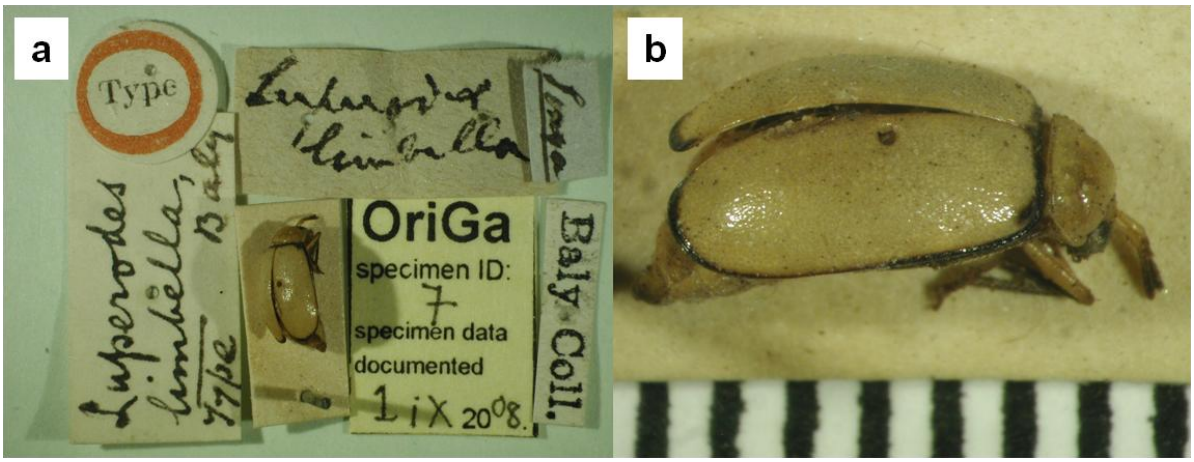


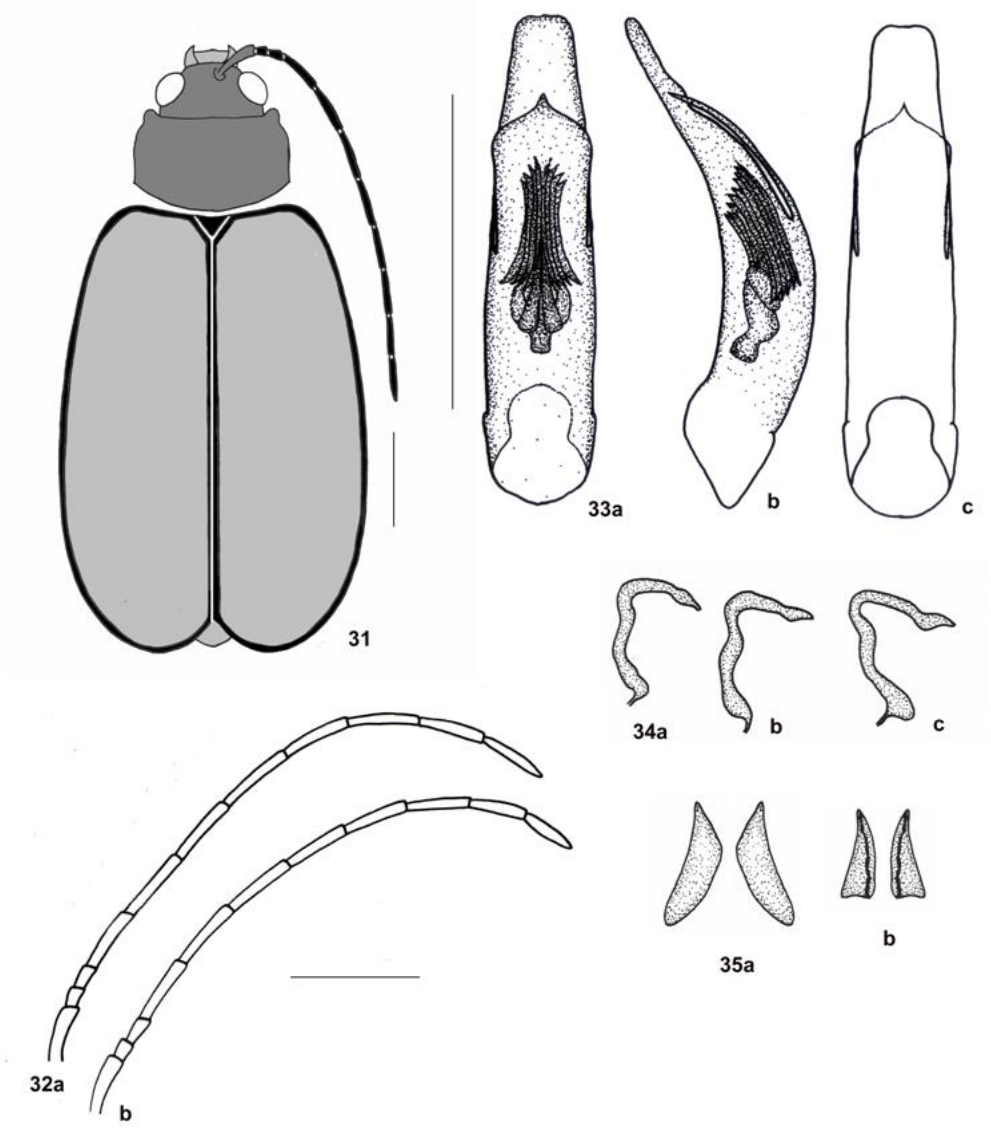
Fig. 30 Photographs of the holotype of *P. limbella* (Baly, 1886); a. with labels, b. detail.

5°47'N/117°52'E, 2.VIII.1927, C. B. K. & H. M. P., F. M. S. Museum (BMNH); 6 ex., W. Sarawak, Lundu, 1°40'N/109°48'E, I.1914, G. E. Bryant (BMNH); 2 ex., Sarawak, 2°30'N/113°15'E, 1907–1909, C. J. Brooks, B.M.1936-681, Wallace, Baly coll., (BMNH); 1 ex., Sarawak, Bau, 1°25'N/110°9'E, 18.VII.–1.VIII.1909, C. J. Brooks, B.M.1936-681 (BMNH); 1 ex., Fed. Malay State, 1909, C. J. Brooks, B. M.1931-570 (BMNH); 5 ex., Sabah, Lembah Danum, 5°08'N/117°24'E, 3.–5.XII.1916, 8.IX.1994, 27.–31.VIII.1991, Salleh, Zaidi, Mail, Lan (BMNH); 1 ex., N. Sembilan, Gemencheh, 2°35'N/102°24'E, 4.–6.VIII.1990, Zabidi (UKM); 4 ex., Sabah, Danum Valley, 5°08'N/117°24'E, 6.–15.V.2007, B. H. Izfa leg. (UKM); 1 ex., Sarawak, Lanjak Entimau, 1°11'N/111°51'E, 28.–29.II.1992, Zaidi (UKM); 1 ex., Sandakan, Borneo, 5°50'N/118°3'E, Baker (NHRS).

***Paraneolepta imitans* (Jacoby, 1894) new combination**

Ochralea imitans Jacoby, 1894: 321.
Monolepta aemula Weise, 1922: 107; new synonym.

Total length. 6.65–8.00 mm (mean: 7.03; n=10).
Head. Reddish-brown, impunctate. Antennae entirely black and only the first basal antennomeres usually contrasting reddish-brown (Fig. 31). Ratio length of second to third antennomere 0.80–0.83 (mean: 0.81); ratio length of third to fourth antennomere 0.42–0.46 (mean: 0.44) (Fig. 32).
Thorax. Pronotum reddish-brown, coarsely punctuated. Pronotal width 1.80–2.25 mm



Figs 31–35. *Paraneolepta imitans* (Jacoby, 1894). – 31. dorsal colour pattern. 32. antennae, (a) female; (b) male. 33. median lobe: (a) dorsal; (b) lateral; (c) ventral. 34. two different spermathecae. 35. two pairs of bursa sclerites. Scale bar: 1 mm.

(mean: 1.98), ratio length to width 0.60–0.63 (mean: 0.61). Scutellum black. Elytra entirely yellow to brown, sutural and lateral margin narrowly black. Elytral length 5.00–6.25 mm (mean: 5.51), maximal width of both elytra together 3.60–4.50 mm (mean: 3.95), ratio of maximal width of both elytra together to length of elytra 0.69–0.74 (mean: 0.72). Legs yellow to brown, black line along dorsal part of femur, tibiae and tarsi blackish.

Abdomen. Yellow to pale brown.

Male genitalia. Median lobe insignificantly narrowed towards apex, where it is blunt (Fig. 33a). Tectum parallel-sided, which short, pointed tip, much shorter than the ventral part (Fig. 33b).

Female genitalia. Spermatheca like description of the genus (Fig. 34), two pairs of bursa sclerites like Fig. 35.

Distribution. Recorded from Peninsular Malaysia, Borneo and Sumatra (Fig. 22).

Diagnosis. The body size and colouration of *Paraneolepta imitans* is most similar to *P. limbella*. The differences on both species can be obtained clearly by median lobe and bursa sclerites. The tectum of median lobe of *P. limbella* is shorter and narrowed towards the pointed tip (Fig. 27) while in *P. imitans* is broader at base, and pointed at the tip of it (Fig. 33). Two pairs of bursa sclerites present in *P. imitans* (Fig. 35) and only one pair of bursa sclerites in *P. limbella* (Fig. 29).

Type material. Lectotype, female, “Type H. T / Perak / *Ochralea imitans* Jac. / Jacoby Coll. 1909-28a,” (BMNH; Fig. 36). Type locality: Malaysia, Perak, 4°48'N/101°09'E. Jacoby gave no number on the specimens he studied, but there must be more than one concerning the original description, and we herein designate a lectotype to fix the name on single specimen.

Further material examined. – **Indonesia.** 1 ex., N. O. Sumatra, Tebing Tinggi, 3°19'N/99°09'E, Dr. Schulteiss, Coll. Kraatz (BMNH); 1 ex., Dinding Island, 2°30'N/107°35'E, H. N. Ridley, 1900–111 (BMNH); 1 ex., Sipora Island, West Sumatra, 2°13'S/99°40'E, X.1924, C. B. K. and N. S. (BMNH); 4 ex., North East Sumatra Deli, Kuala Simpang, Medang Ara Estate, lowland forest, 3°34'N/98°40'E, II–III.1954, A. Sollaart, (NNML). – **Malaysia.** 1 ex., Sarawak, Bau, 1°25'N/110°09'E, 27.IX.–15.X.1909, C. J. Brooks, B.M.1936-681 (BMNH); 6 ex., Malaya, Doherty, Perak, 4°48'N/101°09'E, Fry Coll. 1905–100 (BMNH); 1 ex., Lundu, West Sarawak, 1°40'N/109°48'E, I.1914, G. E. Bryant (BMNH); 6 ex., Malay Penin., Selangor, Bukit Kutu, Foot of hill, 3500 ft., 5500 ft., 3°33'N/101°43'E, IV.1915, 5–10.IX.1929, H. M. Pendlebury (BMNH); 1 ex., Malay Penin., Pahang, F. M. S, Batu Balai Jerantut, 3°56'N/102°22E, 19.III.1927 (BMNH); 1 ex., Perak, F. M. S. Larut Hills, 3700–4000 ft., 5°N/100°53'E, 11.II.1932, H. M. Pendlebury (BMNH); 1 ex., Baly Coll. (BMNH); 2 ex., Malay Penin., Pahang, F. M. S., Fraser Hill, 4200 ft., 5°N/100°53'E, 22.VII.1936 (BMNH); 1 ex., Sandakan, Borneo, 5°50'N/118°03'E, Baker (NHRS); 1 ex., N. Sembilan, K. Kelawang, 2°56'N/102°05'E, 16.VI.1987, Salleh & Ismail (UKM); 1 ex., Perak, Temenggor, 5°19'N/101°22'E, Ekspedisi MNS-Belum, 29–30.I.1994, Salleh & Ismail (UKM); 2 ex., Kelantan, Pasir Putih, J. Linang, 5°49'N/102°22'E, 28.V.1994, Ismail & Zabidi (UKM); 1 ex., Kedah, Sik, Hutan Lipur Lata Mengkuang, 5°48'N/100°44'E, 15.VI.1994, Ismail et al. (UKM).

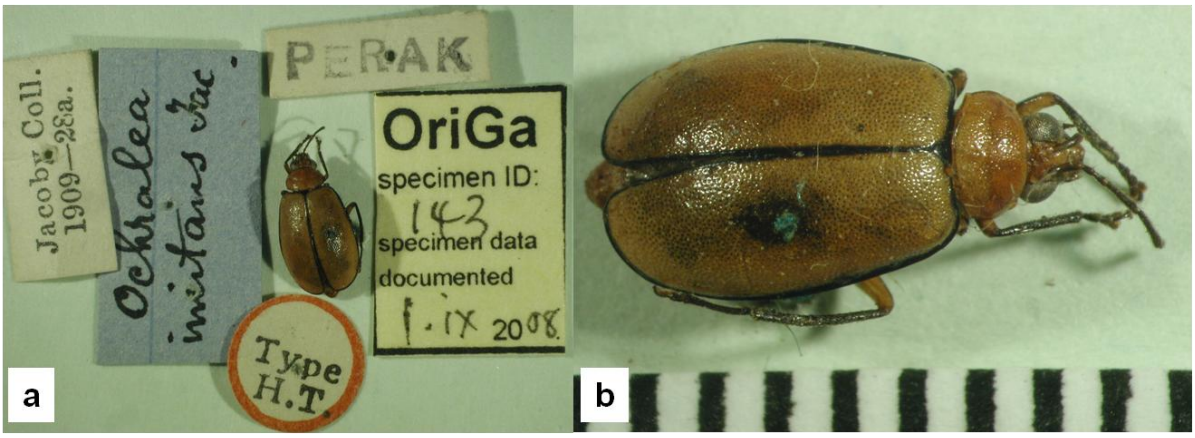


Fig. 36. Photographs of the lectotype of *P. imitans* (Jacoby, 1894); a. with labels, b. detail.

***Orthoneolepta* new genus**

Type species. *Neolepta fulvipennis* Jacoby, 1884: 222–223; herein designated.

Etymology. Combination of ortho (latin: straight to) and *Neolepta.*

Total length. 4.50–5.75 mm (mean: 5.12 mm).

Head. Brown to reddish-brown. Impunctate, with significant transverse impression between posterior third of eyes. Eyes small, convex. Labial palpi slender and maxillary palpi enlarged (Fig. 37a), occasionally dark brown. Labrum and mandibulae contrasting dark brown. Antennae elongated, extended to the apical third of the elytra (Figs 38, 45), the median antennomeres significantly broadened. Antennae entirely black and only the first basal antennomeres usually contrasting reddish-brown. First antennomere club shaped; second and third antennomere varied from a bit shorter to more or less the same length; ratio length of second to third antennomere 0.60–1.00 (mean: 0.79); ratio length of third to fourth antennomere 0.30–0.50 (mean: 0.42) (Figs 39, 46).

Thorax. Pronotum transverse, broad, with a transverse depression beyond the middle of the base, anterior margin concave and posterior margin broadly rounded (Figs 39, 46). Pronotum brown to reddish-brown. Pronotal width 1.30–1.80 mm (mean: 1.56), ratio length to width 0.59–0.65 (mean: 0.62). Scutellum triangular, impunctate, reddish-brown to black. Procoxal cavities nearly closed (Fig. 37b). Meso- and metathorax reddish-brown to black. Metasternum broad (Fig. 37c). Elytral strongly punctuated, punctuation partly arranged in longitudinal rows, entirely yellow to reddish-brown and in *N. banggiensis*, sutural and lateral

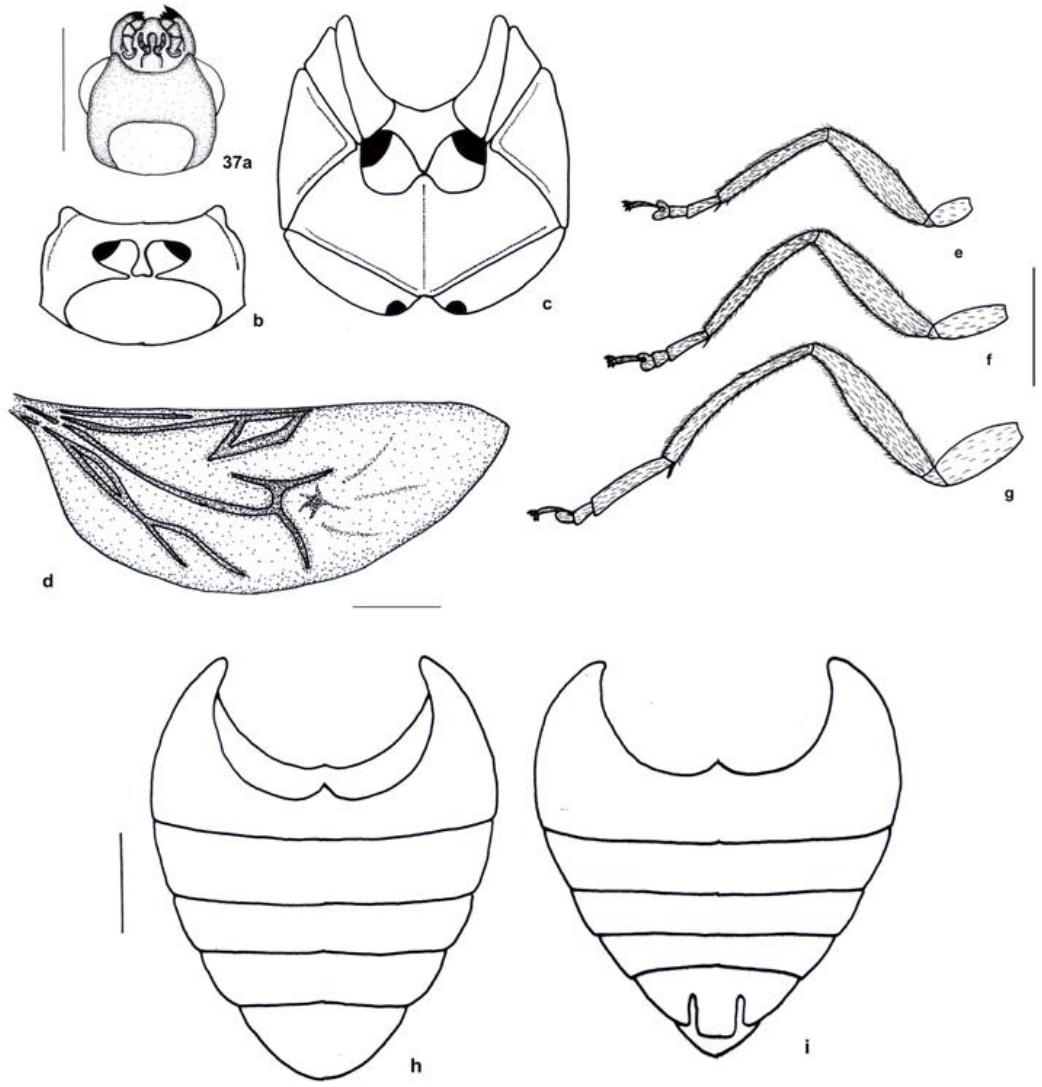


Fig. 37. *Orthoneolepta fulvipennis* (Jacoby, 1884). – (a) head; (b) prothorax; (c) meso- and metathorax, ventral view; (d) hindwing, right, dorsal view; (e) prothoracic; (f) mesothoracic; (g) metathoracic leg; (h) female abdomen; (i) male abdomen. Scale bar: 1 mm.

margin narrowly black. Elytral length 3.50–4.80 mm (mean: 4.16), maximal width of both elytra together 2.50–3.40 mm (mean: 2.92), ratio of maximal width of both elytra together to length of elytra 0.67–0.72 (mean: 0.70). Alae fully developed (Fig. 37d). Legs long and slender, basi-metatarsus elongated (Fig. 37e-g), blackish throughout and in *O. fulvipennis*, coxa and trochanter contrasting brown to reddish-brown. In particular tibia with dense and

fine setae.

Abdomen. Pale yellow to red. Last visible sternite in females rounded at apex (Fig. 37h), and in males with two deep, parallel-sided incisions (Fig. 37i).

Male genitalia. The median lobe is symmetrical, parallel-sided at base and usually narrowed towards apex. Apically incised. Tectum long, broad at base and became pointed at apex. As *Neolepta*, endophallus consist of bundle of laterally arranged long, slender and straight median spiculae. At the bottom of median spiculae, several basal endophallus structure. Sacculus clearly visible (Figs 40, 47).

Female genitalia. Spermatheca with small, slender and elongated nodulus. Middle part long and slightly curved, cornu long and curved (Figs 41, 48). Two pairs of bursa sclerites; one spiny and sclerotized and one other of hook shaped, attached together (Figs 42, 49).

Distribution. Restricted to Malaysian Peninsula, Sumatra and Borneo (Fig. 43).

Diagnosis. *Orthoneolepta* new genus are medium sized (4.50–5.75 mm), dorsoventrally bulged galerucine with strongly elongated basi-metatarsus and transverse depression on pronotum. The punctuation on elytra is coarser than that of pronotum. The dorsal coloration is yellow to reddish-brown, and in certain species, sutural and lateral margin of elytra are narrowly black (Figs 38, 45). As the genotype of this genus *O. fulvipennis* are transferred from *Neolepta*, most of the character of this genus resembles to *Neolepta*. The pronotum of both groups are with transverse depression, but it is comparatively less broad (0.59– 0.65) in *Orthoneolepta* new genus than in *Neolepta* (0.52–0.60). The second and third antennomere of *Orthoneolepta* new genus varied from a bit shorter to more or less the same length (ratio length of second to third antennomere: 0.60–1.00) (Figs 39, 46), about similar to *Neolepta*, of which the second antennomere is a bit shorter (0.75–0.80) (Figs 3, 11), but in *Orthoneolepta* new genus, the fourth to sixth antennomere are significantly widened. The procoxal cavities are nearly closed in both groups (Figs 1b, 37b).

Besides the similarities, the differences in both group can be obtained on the genital characters. The median lobe are incised apically in *Orthoneolepta* new genus (Figs 40, 47) and not incised in *Neolepta* and *Paraneolepta* new genus (Figs 4, 12, 19, 27, 33). The spermatheca are the same shape with *Paraneolepta* new genus, but two pairs of bursa sclerites; one spiny and sclerotized and one other pair of hook-shaped occurred in *Orthoneolepta* new genus and very characteristic for this group (Figs 42, 49).

At the first glance, *O. fulvipennis* look very similar with *Rubrarcastes sanguinea* (Jacoby, 1892; Hazmi & Wagner 2010b) with the punctuation coarser and reddish-brown dorsal coloration. Both species can be misidentified at a first glance, but the crucial characters that can distinguish both species are the second and third antennomere of *Rubrarcastes* (0.43–0.57) are not of the same length as in *Orthoneolepta* new genus (0.60–1.00). The median lobe of these two groups are also different, which *Orthoneolepta* new genus are incised apically and spermatheca are also of different shape.

Table 3. Numbers of material examined and collection investigated for *Orthoneolepta* new genus.

Collections	***O. fulvipennis*** **(Jacoby, 1884)**	***O. banggiensis*** **(Mohamedsaid, 1997)**
BMNH	31	39
CJB	1	-
NHRS	1	3
NNML	9	-
MCSNG	2	-
MNHU	5	-
UKM	-	10
Total	**49**	**52**

Redescriptions of species

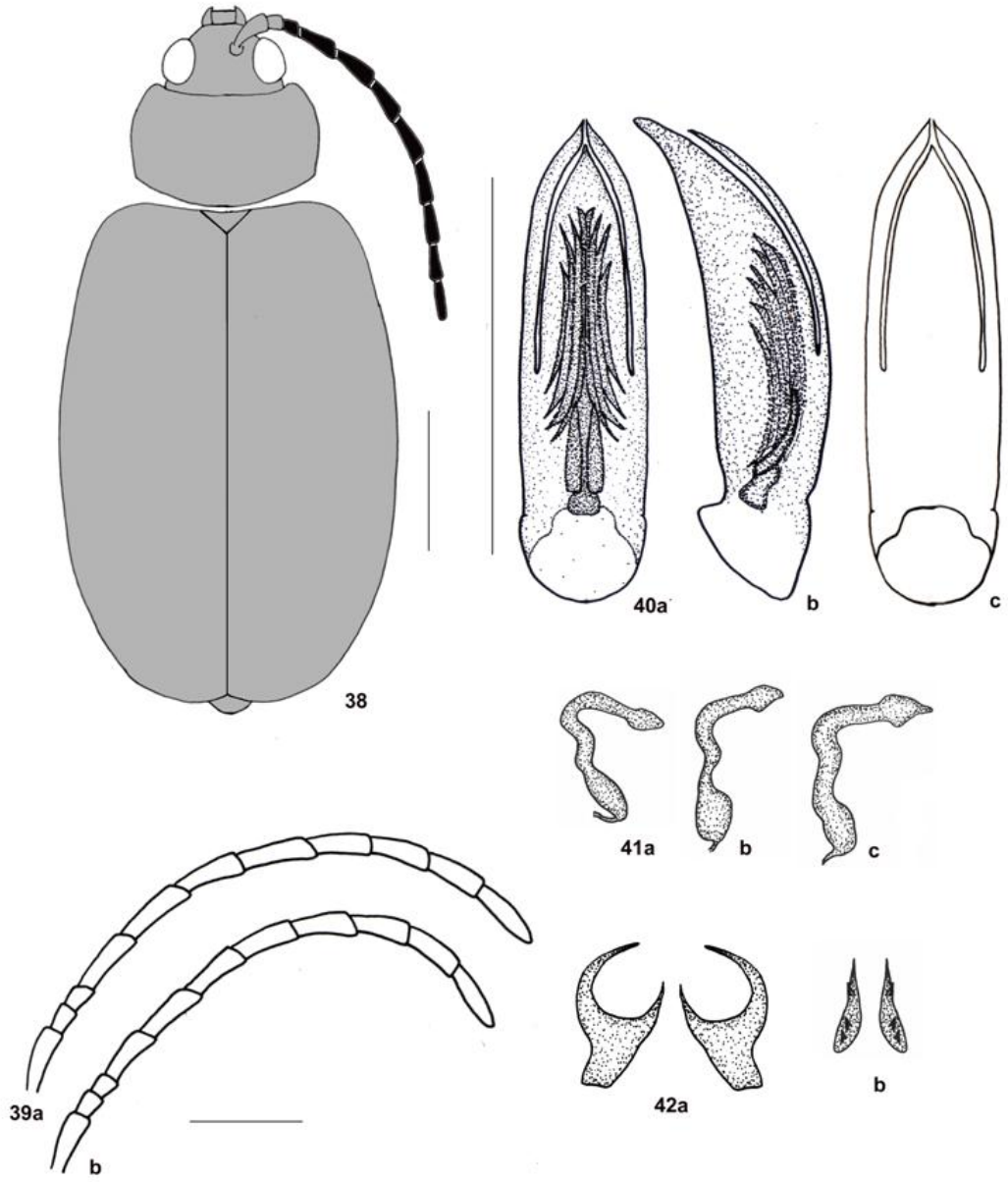
***Orthoneolepta fulvipennis* (Jacoby, 1884) new combination**

Neolepta fulvipennis Jacoby, 1884: 222–223.

Total length. 4.75–5.60 mm (mean: 5.20 mm; n=10)

Head. Brown to reddish-brown. Impunctate. First basal antennomeres contrasting reddish-brown, second to outer antennomere usually black (Fig. 38). Ratio length of second to third antennomere 0.60–0.75 (mean: 0.73); widened, insignificantly enlarged, ratio length of third to fourth antennomere 0.38–0.50 (mean: 0.45) (Fig. 39).

Thorax. Pronotum brown to reddish-brown. Pronotal width 1.50–1.70 mm (mean: 1.57 mm),



Figs 38-42. *Orthoneolepta fulvipennis* (Jacoby, 1884). – 38. dorsal colour pattern. 39. antennae, (a) male; (b) female. 40. median lobe: (a) dorsal; (b) lateral; (c) ventral. 41. three different spermathecae. 42. two pair of bursa sclerites. Scale bar: 1 mm.

ratio length to width 0.59–0.63 (mean: 0.61). Scutellum brown to reddish-brown. Elytral entirely brown to reddish-brown (Fig. 38), coarsely punctuated, punctuation partly arranged in longitudinal rows. Elytral length 3.90–4.60 mm (mean: 4.27), maximal width of both elytra

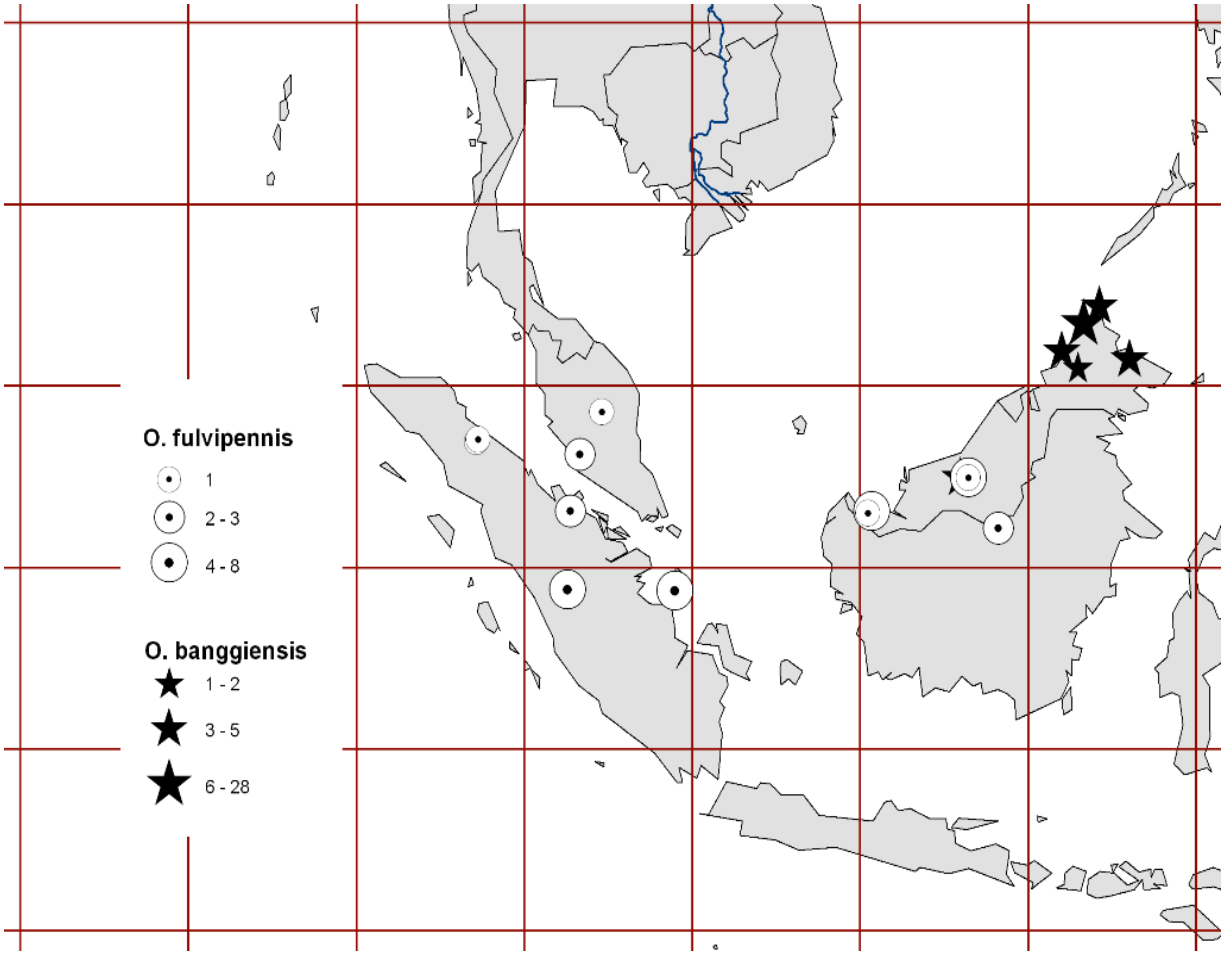


Fig. 43 Distribution of *O. fulvipennis* (Jacoby, 1884) and *O. banggiensis* (Mohamedsaid, 1997)

together 2.70–3.30 mm (mean: 2.95), ratio of maximal width of both elytra together to length of elytra 0.67–0.71 (mean: 0.69). Legs blackish, except coxa and trochanter contrasting brown to reddish-brown. In particular tibia with dense and fine setae.

Abdomen. Brown to red.

Male genitalia. Median lobe broad, incised apically. Tectum long, broad and became pointed at apex. Median spiculae consist of laterally arranged slender structures. At the bottom of median lobe, several basal endophallus structure of plate like structured present, and sacculus can visibly seen (Fig. 40).

Female genitalia. Spermatheca with small, slender and elongated nodulus. Middle part long and slightly curved, cornu long and curved (Fig. 41). Two pairs of bursa sclerites; one spiny and sclerotized and one other pair of hook-shaped, bigger in size (Fig. 42).

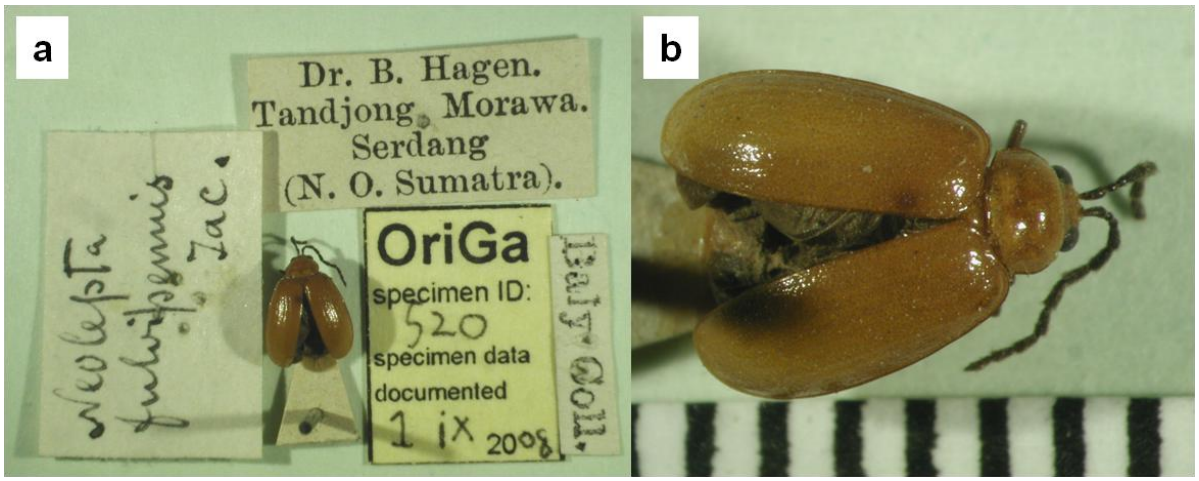


Fig. 44 Photographs of the lectotype of *O. fulvipennis* (Jacoby, 1884); a. with labels, b. detail.

Distribution. Distributed throughout Borneo, Sumatra and Peninsular Malaysia (Fig. 43).

Diagnosis. *Orthoneolepta fulvipennis* resembles *Rubrarcastes sanguinea* (Jacoby, 1892) from coloration and antennomeres (both possess widened medium antennomeres), but *O. fulvipennis* posses second and third antennomere almost the same length (ratio length of second to third antennomere 0.60–1.00) differed to *R. sanguinea* which third antennomere longer than second antennomere (0.43–0.57). Median lobe and spermatheca are different between these two species. From *O. banggiensis*, *O. fulvipennis* can be differentiated by the dorsal coloration. Elytral entirely brown to reddish-brown in *O. fulvipennis* (Fig. 38) while often the sutural and lateral margin narrowly black on yellow to dark brown elytra of *O. banggiensis* (Fig. 45).

Type material. Lectotype, "Neolepta fulvipennis Jac. / Dr. B. Hagen. Tandjong Morawa Serdang (N. O. Sumatra) / Baly coll." (NNML; Fig. 44). Type locality: Indonesia, Sumatra 0°35'S/101°18'E. Jacoby gave no number of the specimens he studied, but there are several specimens from the type locality available, and thus we herein designate a lectotype to fix the name on single specimen. – Paralectotypes, 5 ex., same data as lectotype (NNML). – Invalid types: 1 ex., "Soekaranda, 0°37'S/104°29'E, Januar 1894, Dohrn, 71490", and 1 ex., "Dohrn,Sumatra, Lianggas, 0°37'S/94°29'E, 71491, Arcastes sanguinea" in MNHU are both labelled as co-type, but are not from the type series.

Further material examined. – **Indonesia.** 1 ex., Medan, Sumatra, 3°30'N/98°37'E, J. J. D. V., Museum Leiden ex. Collection J. J. de Vos tot Nederveen Cappel (NNML); 3 ex., Soekaranda, 0°37'S/104°29'E, Januar 1894, Dohrn, 380., Arcastes sanguinea Jac. (MNHU); 1 ex., N. E. Sumatra, Deli, Kuala Simpang, Semadan Estate, 3°34'N/98°40'E, XI. 1954, A. Sollaart, lowland forest (NNML); 1 ex., Soekaranda, 0°37'S/104°29'E, J. V. Hasselt (NNML); 6 ex., Sumatra, Forides, Baly Coll. (BMNH). – **Malaysia.** 1 ex., Sarawak, Matang, 4 1/2 miles, 1°32'N/110°15'E, 6.VI.1909, J. E. A. Lewis 1910–116 (BMNH); 3 ex., Fed. Malay States: 3°08'N/101°42'E, 1909, C. J. Brooks, B. M. 1931-570 (BMNH); 6 ex., Mt. Matang, W. Sarawak, 1.55°N/110.35°E, XII. 1913, I.1913, III.1914, G. Bryant Coll. 1919–147 (BMNH); 2 ex., Quop, West Sarawak, 1°33'N/101°24'E, III.1914, G. Bryant Coll. 1919-147 (BMNH); 2 ex., Borneo, Mahakam (BMNH); 3 ex., Sarawak, 2°30'N/113°15'E, C. J. Brooks, B. M. 1928-193 (BMNH); 8 ex., Borneo, Banja, 2°30'N/113°15'E, German mission, Fry Coll. 1909.100 (BMNH); 1 ex., Long Navang, Borneo, 2°30'N/113°15'E, Mjöberg (NHRS); 1 ex., Taman Negara NP Kuala Tahan, primaval forests, 4°19'N/102°20'E, 5.–9.III.2007, V. Hula, Puchart, L. Ruzicka, F. (CJB); 2 ex., Borneo, Sarawak, 1865-86, Coll. Soloria (MCSNG).

***Orthoneolepta banggiensis* (Mohamedsaid, 1997) new combination**

Neolepta banggiensis Mohamedsaid, 1997: 198.

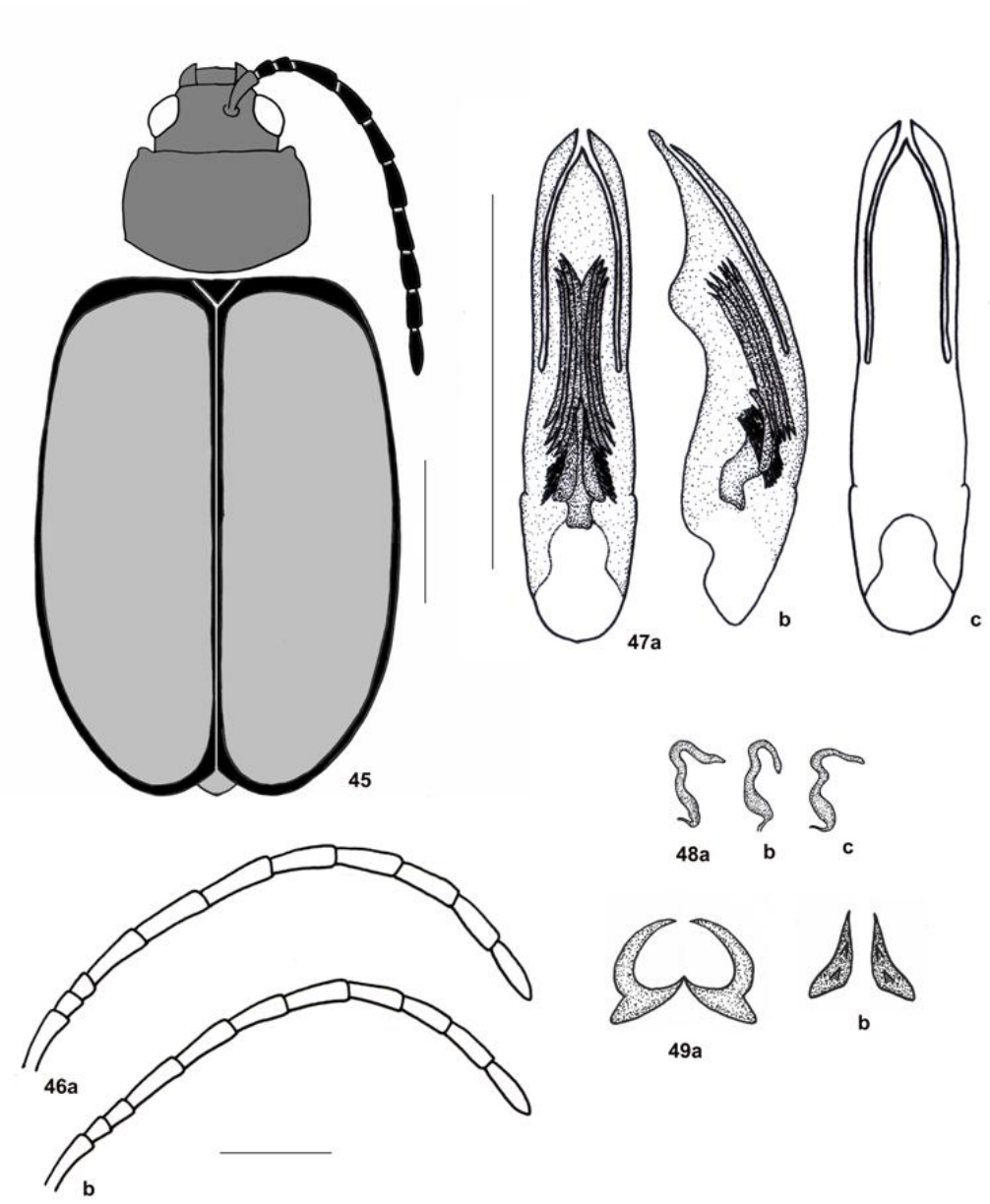
Total length. 4.50–5.75 mm (mean: 5.03; n=10)

Head. Brown to reddish-brown. Impunctate. Antennae entirely black and only the first basal antennomeres usually contrasting brown (Fig. 45). Ratio length of second to third antennomere 0.75–1.00 (mean: 0.86); ratio length of third to fourth antennomere 0.30–0.50 (mean: 0.39) (Fig. 46).

Thorax. Pronotum brown to reddish-brown. Pronotal width 1.30–1.80 mm (mean: 1.55), ratio length to width 0.61–0.65 (mean: 0.63). Scutellum black. Elytra entirely yellow to dark brown, sutural and lateral margin narrowly black (Fig. 45). Elytral length 3.50–4.80 mm (mean: 4.05), maximal width of both elytra together 2.50–3.40 mm (mean:
2.88), ratio of maximal width of both elytra together to length of elytra 0.68–0.72 (mean: 0.70). Legs black throughout.

Abdomen. Pale yellow to brown.

Male genitalia. Median lobe are less broad than in *O. fulvipennis* and narrowed towards the apex. Apically incised. Tectum are long and broadened at base and became pointed at



Figs 45–49. *Orthoneolepta banggiensis* (Mohamedsaid, 1997). – 45. dorsal colour pattern. 46. antennae, (a) male; (b) female. 47. median lobe: (a) dorsal; (b) lateral; (c) ventral. 48. three different spermathecae. 49. two pair of bursa sclerites. Scale bar: 1 mm.

apex. Endophallus as *O. fulvipennis* are consist of laterally arranged slender median spiculae. The basal endophallus structures are present (Fig. 47).

Female genitalia. Nodulus of spermatheca small, slender and elongated, middle part and cornu long and curved (Fig. 48). Two pairs of bursa sclerites; one spiny and sclerotized and one other pair of hook-shaped, bigger in size (Fig. 49).

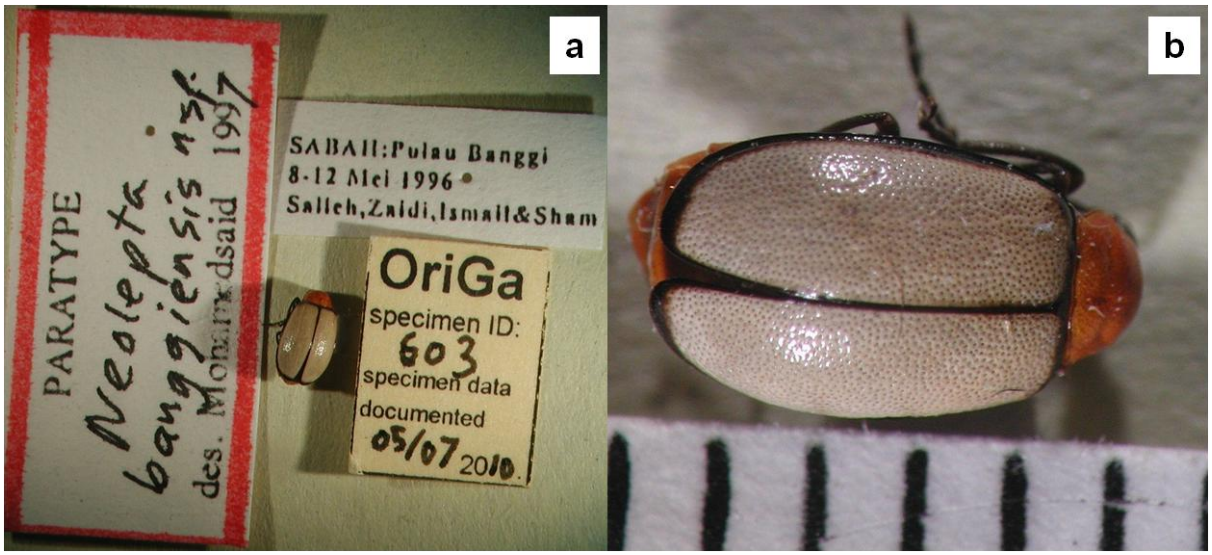


Fig. 50 Photographs of the lectotype of *O. banggiensis* (Mohamedsaid, 1997); a. with labels, b. detail.

Distribution. Only known from northern Borneo (Fig. 43).

Diagnosis. *Orthoneolepta banggiensis* can be differentiated from dorsal colouration with *O. fulvipennis*. The elytra of *O. banggiensis* are often with sutural and lateral margin narrowly black, and in *O. banggiensis*, the scutellum are black while brown to reddish-brown in *O. fulvipennis* (Figs 38, 45). The median lobe is quite similar (Figs 40, 47) and bursa sclerites of *O. banggiensis* are bit smaller than *O. fulvipennis* (Figs 42, 49). The punctuation of *O. fulvipennis* is coarser.

Type material. Holotype, “Holotype Neolepta banggiensis n. sp. Des Mohamedsaid 1997 / Sabah: Pulau Banggi, 8-12.V.1996, Salleh, Zaidi, Ismail & Sham” (UKM). – 5 Paratypes, same data as holotype (UKM; Fig. 50). Type locality: Malaysia, Sabah, 7°16’N/117°09’E.

Further material examined. – **Malaysia.** 1 ex., Lundu, West Sarawak, 1°40’N/109°48’E, Jan. 1914, G. E. Bryant (BMNH); 28 ex., N. Borneo, Kudat, 6°49’N/116°43’E, 2-27.VIII.1927, 1-18.IX.1927, Ex. F. M. S. Museum, B. M. 1955-354 (BMNH); 6 ex., Borneo (BMNH); 3 ex., Sarawak, 2°33’N/113°E, C. J. Brooks, B. M. 1928-193 (BMNH); 1 ex., Sabah, 5 m, S. Mt. Trus Madi, 1800 ft, 5°33’N/116°30’E, 18-28.VIII.1977, M. E. Bacchus, B. M. 1978-48 (BMNH); 3 ex., Sabah, Pulau Gaya, 6°01’N/116°01’E, 26-30.IX.1991, Zaidi & S. Abin (UKM); 2 ex., Sabah, Lembah Danum, 5°08’N/117°24’E, 3-5.XII.1991, 17-20.XI.1994, Ismail, Sham & Ruslan (UKM); 3 ex., Borneo, Sandakan, 5°50’N/118°03’E, Baker (NHRS).

General Discussion

Neolepta, *Paraneolepta* new genus and *Orthoneolepta* new genus are three related groups of galerucines with strongly elongated basi meta-tarsus, reddish-brown head and pronotum and usually contrasting black antennae. The size varies from medium to large (4.50–10.10 mm) and the second and third antennomere are bit shorter to more less the same length in these three groups (0.60–1.00). The antennomeres of *Paraneolepta* new genus are slender, while in *Neolepta* the median antennomeres are insignificantly widened and they are strongly widened in *Orthoneolepta* new genus. The elytra and pronotum are punctuated and depression occurred beyond the middle of the base of pronotum. For the dorsal coloration, only *Neolepta* has the transverse spots, but in the other two genera are with narrowly black lined on the lateral margin and suture. The procoxal cavities are nearly closed and metasternum is broad. Scutellum triangular, impunctate and varies from reddish-brown to mainly black. Legs are long and slender, usually yellow to reddish brown and particularly tibiae and tarsi black, but in *Orthoneolepta* new genus, only coxa and trochanter are brownish.

The last visible sternite in females is rounded at apex, and in males it possesses two deep, parallel-sided incisions in all three genera. The median lobe is symmetrical and parallel-sided, not incised in *Neolepta* and *Paraneolepta* new genus but with deep incision apically in *Orthoneolepta* new genus. The endophallic structure consists of only one median pair of spiculae, but some further differentiation occurred and could be refer in the diagnosis of the genus. The shape of spermathecae is more or less the same in *Paraneolepta* new genus and *Orthoneolepta* new genus, but latter possesses hook-shaped bursa sclerite which is very peculiar for the genus. In these three related groups, two pairs of bursa sclerites exist.

Acknowledgements

We indebted appreciation to all curators listed above for giving us the possibility to work with the material. This study was part of the research thesis of the first author, funded by the Malaysian Ministry of Higher Education as a student scheme scholarship.

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Appendix 5

Revision of *Monolepta* Chevrolat, 1837 from the Sundaland area (Coleoptera: Chrysomelidae: Galerucinae)

This paper is in stage of a manuscript and will be submit to Zootaxa.

As the first author of this article, I declare that most of the technical works: loaning, sorting, dissection and drawing have been done by me under supervision of Thomas Wagner.

Revision of *Monolepta* Chevrolat, 1837 from the Sundaland area (Coleoptera: Chrysomelidae: Galerucinae)

Introduction

Monolepta Chevrolat 1837 is the largest genus in the Galerucinae and has a wide distribution in the tropical and subtropical regions of the world. Wilcox (1973) has listed about 600 species of the genus worldwide. At least 260 species are recorded from the Oriental region, and about 72 species occurred in Sundaland area (Kimoto 1990; Mohamedsaid 2001, 2004, 2005). Particularly in the Oriental Region, the genus has been studied by several authors (Maulik 1936; Gressitt and Kimoto 1963; Kimoto 1989; Mohamedsaid 2004).

For many years, the limitation and status of *Monolepta* are uncertain. Maulik (1936) for instance has realized about this problem but decided to maintain the status quo and provided two sets of key for *Monolepta*; one for species with a pronotal depression and another one without pronotal depression. Wilcox (1973) has also indirectly commented about the inhomogeneous classification and systematic of *Monolepta* and some other genera in “Monoleptites” and propose to revise this group in the future.

Despite so many species that has been subsequently described in *Monolepta*, a revision that taking all described species into account, has never been done so far. It was started in 1999 when Wagner has begun to revise the Afrotropical species of this group. Wagner has started his revision including the genotype, *M. bioculata* (Fabricius, 1781) and introduces the new concept of the genus. As a result of his intensive revision, a total changes in number of species of *Monolepta* in Afrotropical area has been done. Out of 180 species originally described in *Monolepta* from Africa, only 50 valid species are remained, 40 species are new synonyms, and 90 species need to be transferred to other genera. In the other hand, 50 new species are newly described (Wagner 2007).

The revision by Wagner (overviews in 1999, 2004) was not only the first step taken in revising *Monolepta,* but as well the first step in describing the genitalic characteristic of

Monolepta. The previous authors with very few exceptions have only depended on external morphology and coloration pattern, but the coloration patterns are highly variable within species (Wagner 2003). The taxonomic significance of genitalic characteristics in species identification has generally been stressed by Sharp and Muir (1912), but the intensive study in particular for this chrysomelids has not been taken so deeply until then.

A revision of *Monolepta* on a worldwide scope is a gigantic task. Revision on a selected geographical area is a step in the right direction. The Oriental region consist of the Indian subcontinent including Pakistan, south of the Pamir and the Himalayas, Myanmar (Burma), Indochinese and Malay Peninsulas, Indonesia including Malay Archipelago (the East Indies) to Timor and Sulawesi (Celebes), the Philippines, Taiwan, southern China from the Tsinling Mountains and the Tibetan Scarp and southern Japan (Brown 1973). Due to the massive number of *Monolepta* from the entire Oriental Region, with about 260 described species names, this is a more long-life project and not practicable within a PhD-study. Thus I have focused the species of *Monolepta* known from the Sundaland area in this work. This area comprise of Malaysia (Peninsular Malaysia and the East Malaysian states of Sarawak and Sabah in northern Borneo), Singapore at the tip of the Malay Peninsula, Brunei Darussalam and all of the western half of the megadiversity country of Indonesia, including Kalimantan (the Indonesian portion of Borneo, Sumatra, Java and Bali). Sulawesi though not listed in the sub-region of Sundaland is included here, since it has also strong influence with the other galerucine fauna of Sundaland area. Despite, it is located eastwards of Wallace-line.

On base of the most current species lists of Mohamedsaid (2001, 2004, 2005), and Kimoto (1990), the number of valid species described from this region is 72. After my revision, only thirteen valid species can remain in *Monolepta* in the sense of the generotype *M. bioculata* (Wagner 2007), while seven species have been found as new synonyms, three have been already transferred to other genera, and further 49 species need to be transferred to other genera. Furthermore, eight species are newly described. The description and redescription of species are provided in this paper. The checklists and status of *Monolepta* from Sundaland area and identification key are also included.

Materials and Method

A total of 2328 labelled specimens from several major collections have been examined in this study (Table 1). Fresh material is also included, but the number are far little than dried and labelled specimens. The acronyms of collection and institution that are involved in this study are explained as below and responsible curators are written in bracket.

The Natural History Museum, London (BMNH; M. Barclay, S. Shute); Collection of Jan Bezděk, Bruno (CJB); Collection of Haruo Takizawa, Japan (CTJ); Zoological Institute of the University of Coimbra (Portugal) (ICTZ; Th. Baptista); Institute Royal des Sciences Naturelle de Belgique, Brussel (IRSN; P. Limbourg); Museum of Comparative Zoology, Harvard University (MCZH); Museum für Naturkunde der Humboldt Universität, Berlin (MNHU; J. Frisch, J. Willers); Swedish Museum of Natural History Stockholm (NHRS; Bert Viklund); Nationaal Natuurhistorisch Museum, Leiden (NNML; F. van Assen); Center for Insect Systematics, UKM, Malaysia (UKM; R. Yusop); Zoological Museum, Moscow State University (ZMMU; Lev Medvedev).

A standard set of figures is given for each species. These include illustrations of the coloration (dorsal view), including the right antenna, where black coloration is indicated by black, yellow coloration by white, red coloration by light grey, and brown by dark grey shading. The antennomeres of males and females, dorsal, ventral and lateral view of the median lobe including the endophallic structures, spermatheca of three females (if available) and bursa-sclerites (if available) usually of one female are figured. Measurements were made for external characters. Absolute measurements are: total length from the clypeus to apex of the elytron, length of the elytron, maximal width of both elytra (usually in the middle or posterior third of the elytra), and width of the pronotum. Relative measurements are: length to width of the pronotum, maximal width of both elytra to length of the elytron, length of the second to third antennomeres, and length of the third to fourth antennomeres. A number of specimens measured are given in the description under “total length”. Further materials examined are listed, and all label data are re-written. For location data, geographical coordinates were given in degree and minute. These coordinates were mostly taken from Google Earth. The distribution maps have been produced by ArcGis.

Table 1. The total numbers of materials examined (collections in alphabetical order of the acronym).

	BMNH	CJB	CTJ	IRSN	ICTZ	NNML	MNHU	MCZH	NHRS	UKM	ZMMU	Total
Monolepta bifasciata (Hornstedt, 1888)	195	8	2	85	29	206	116	1	36	10	5	**693**
M. rubra (Gyllenhal, 1808)	1	-	-	-	-	51	2	1	-	-	-	**55**
M. signata (Olivier, 1808)	249	8	3	128	-	180	18	-	22	8	11	**616**
M. flavofasciata Jacoby, 1889	5	-	-	-	-	-	-	1	1	7	-	**14**
M. orientalis Jacoby, 1889	62	-	-	47	-	-	19	1	1	4	-	**136**
M. marginicollis Jacoby, 1896	52	1	1	-	-	6	-	-	3	4	-	**67**
M. militaris Jacoby, 1896	6	1	-	-	-	6	-	1	4	1	-	**19**
M. rufipennis Jacoby, 1899	9	-	-	-	-	-	-	-	-	1	-	**10**
M. jacobyi Weise, 1908	72	7	-	2	-	110	18	-	6	3	-	**218**
M. hageni Weise, 1916	36	-	-	-	-	15	-	1	4	19	-	**75**
M. zonula Weise 1916	37	1	2	-	-	3	-	1	-	3	-	**47**
M. tiomanensis Mohamedsaid, 1999	7	-	1	-	-	1	-	-	1	12	-	**22**
M. putri Mohamedsaid, 2001	-	-	2	-	-	1		-	-	2	-	**5**
M. bruneiensis new sp.	7	-	-	-	-	-	-	-	-	-	-	**7**
M. empatbulat new sp.	13	-	-	-	-	-	-	-	-	-	-	**13**
M. hitam new sp.	38	-	-	-	-	-	-	-	-	-	-	**38**
M. kuninghitam new sp.	51	-	-	-	-	-	-	-	-	-	-	**51**
M. marginicolloides new sp.	4	1	-	-	-	3	-	-	-	1	-	**9**
M. mohamedsaidi new sp.	104	-	-	-	-	5	-	-	1	-	-	**110**
M. ranuensis new sp.	109	-	-	-	-	-	-	-	-	-	-	**109**
M. sulawensis new sp.	14	-	-	-	-	-	-	-	-	-	-	**14**
Total	1071	27	11	261	29	587	173	7	79	75	16	**2328**

Taxonomy

Description and redescription of species from Sundaland area

***Monolepta bifasciata* (Hornstedt, 1788)**

Figs 1–10

Chrysomela bifasciata Hornstedt, 1788: p. 3 (Jacoby, 1884: p. 53).

= *Cryptocephalus multicolor* Gmelin, 1790: p. 1712 (Weise, 1924, p. 166).

= *Crioceris quadrinotata* Fabricius, 1801: p. 460 (Weise, 1924, p. 166).

= *Luperodes latefasciata* Motschulsky, 1858: p. 104 (Maulik, 1936, p. 408).

= *Monolepta rubrosignata* Boheman, 1859: p. 182 (Weise, 1924, p. 166).

= *Monolepta parvonotata* Jacoby, 1886: p. 97, new syn.

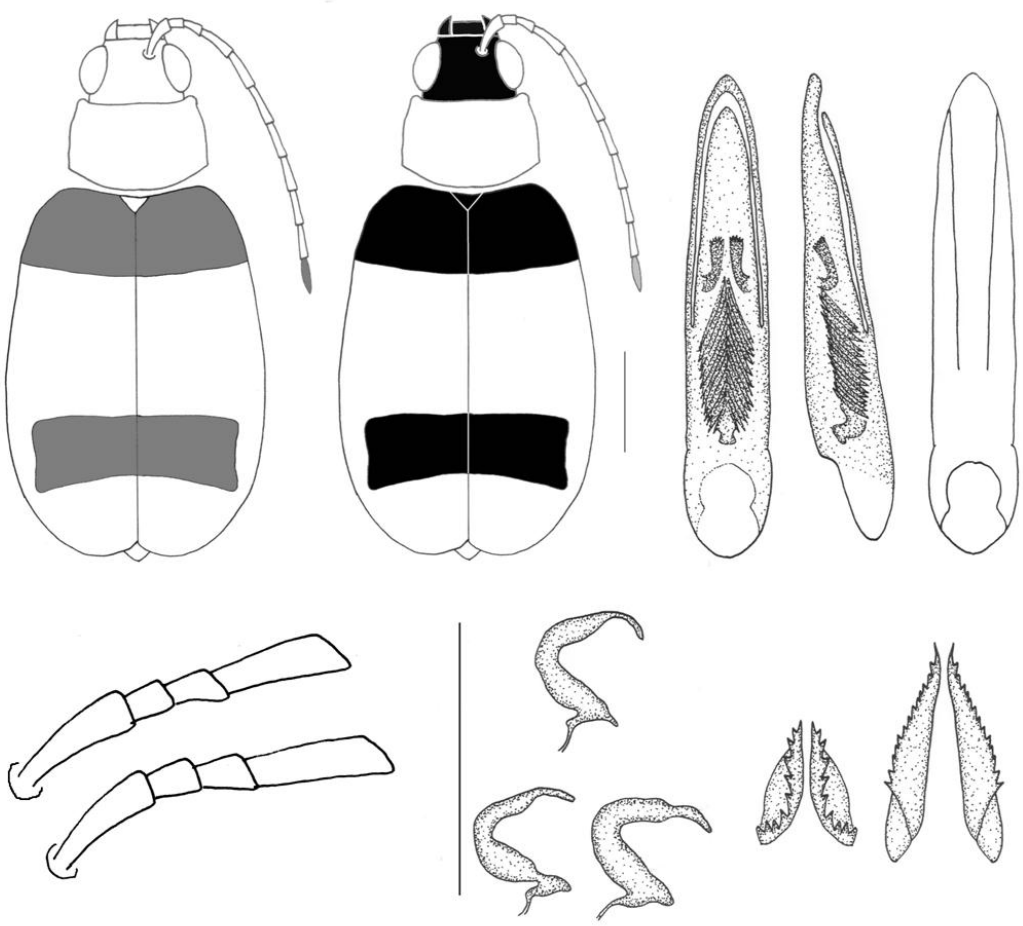
= *Monolepta mustaphai* Mohamedsaid, 1997: p. 204, new syn.

= *Monolepta entimauensis* Mohamedsaid, 1998: p. 248, new syn.

Total length. 3.70–5.10 mm (mean: 4.40 mm; n=10).

Head. Finely punctuated, varied from pale yellow-brownish to blackish. Labrum and mandible yellow-brownish. Some specimens with black vertex, labrum and mandible blackish. Antennae slender, extending to the middle of elytra, yellowish, last antennomere partly brownish (Fig. 1). First antennomere club shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.75–1.00 (mean: 0.88); ratio length of third to fourth antennomere: 0.43–0.57 (mean: 0.50) (Fig. 2), second antennomere to terminal antennomere with very fine, yellow setae.

Thorax. Pronotum impunctate, broader on posterior, yellow-brownish. Pronotal width: 1.15–1.65 mm (mean: 1.40), ratio length to width: 0.61–0.65 (mean: 0.63). Scutellum yellow-brownish to black, meso- and metathorax pale yellow or black. Elytron yellow. Across the basal one third of elytra, brown-reddish or black band stretch to humerus and lateral margin. On the third basal, either stripe or spot on each elytra occurred, and the coloration as the band on the first basal of elytra. In some specimens from Sulawesi Island, the transverse band are reduced and fainted, and the entire elytra yellowish. Elytra length 2.90–4.00 mm (mean: 3.45), maximal width of both elytra together 2.00–2.80 mm (mean: 2.40), ratio of maximal width of both elytra together to length of elytra 0.68–0.72 (mean: 0.70) (Fig. 1). Legs yellow to pale brownish, and the basal of coxa, partly black.



Figs 1–5. *Monolepta bifasciata* (Hornstedt, 1888). – 1. dorsal colour pattern; 2. antennae, (a) male; (b) female; 3. median lobe: (a) dorsal; (b) lateral; (c) ventral; 4. three different spermathecae; 5. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

Abdomen. Pale yellow to brown.

Male genitalia. Median lobe parallel-sided, and becomes narrow towards apex. Tectum long, broad, but not reaching the apex of median lobe. Only two types of spiculae visibly clear (lateral and median), while ventral spiculae weakly sclerotised. Lateral spiculae of V-shaped with lobe-like at apex; median spiculae consist of long and slender filamentous-like (Fig. 3a, b). Sacculus occurs on the basal one third (Fig. 3c).

Female genitalia. Spermatheca with very small nodulus, middle part and cornu long and curved, evenly sclerotised (Fig. 4). Dorsal part of bursa sclerites with strong spine at the outer margin, ventral part elongated almost double the height of dorsal part, with smaller

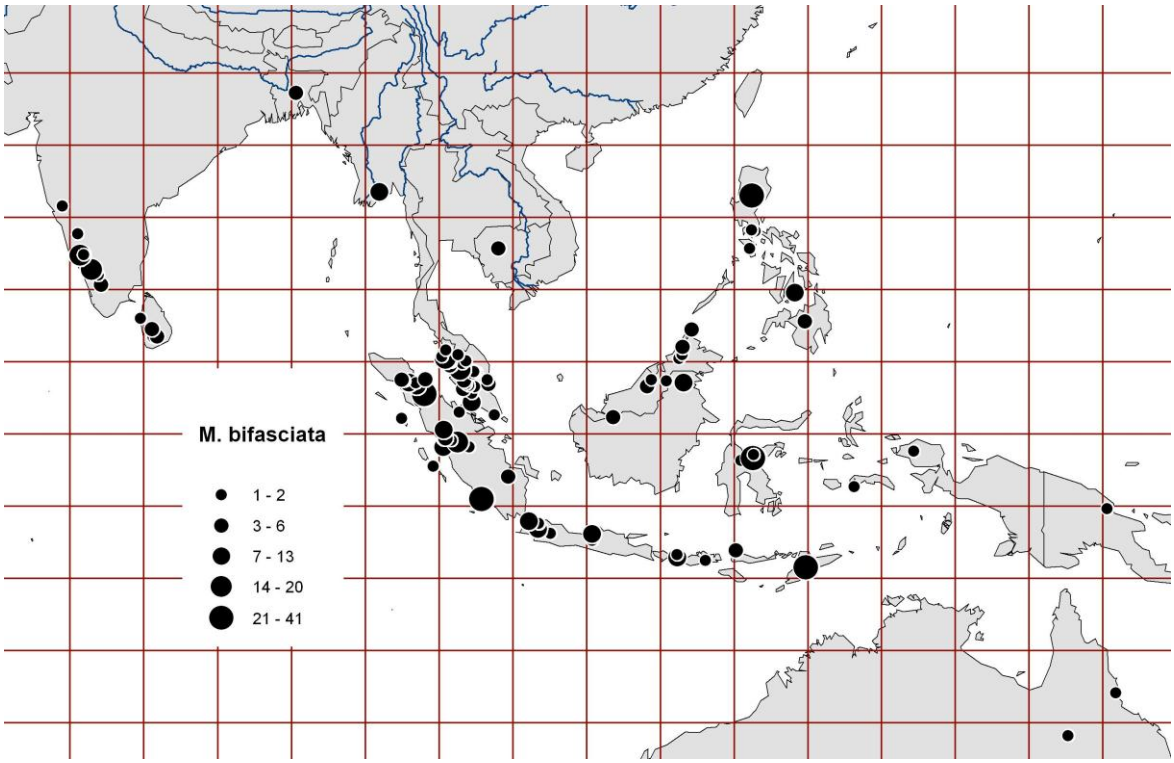


Fig. 6. Distribution of *M. bifasciata* (Hornstedt, 1888).

spines at the outer margin (Fig. 5).

Distribution. This species is widely distributed in South East Asia, southward to New Guinea and few specimens are from Australia as well (Fig. 6).

Diagnosis. *Monolepta bifasciata* is peculiar for its coloration. The elytron of this species is yellowish, with two transverse bands (Fig. 1), and in some specimens the bands are reduced, occurs in specimens from Sulawesi Island. Transverse elytra bands are also occur in *M. flavofasciata* and *M. orientalis*, but in these two species bands are much wider or bicolorous (Figs 27, 34). The genitalic characters of this species are most similar to *M. rubra* and *M. kuninghitam* new sp.,since all three species lacks the ventral spiculae in median lobes (Figs 3, 13, 112) and the spermathecae possess a very small nodulus (Figs 4, 14, 113). In term of the body size, *M. rubra* (4.50–6.00 mm) is on average bigger than *M. bifasciata* (3.70–5.10 mm) and *M. kuninghitam* new sp. (3.70–4.35 mm) while in other aspect like the ratio length to width of pronotum, *M. bifasciata* (0.61–0.65) and *M. rubra* (0.64–0.68) have broad pronotum, while in *M. kuninghitam* new sp., the pronotum is narrowed (0.70–0.72). The second and third antennomere are almost the same length in *M.*

bifasciata and *M. rubra*, while in *M. kuninghitam* new sp., the second antennomere is shorter than third antennomere.

Type material.

Chrysomela bifasciata: Type material is not available to me. I adapt Maulik's (1936) statement that *Luperodes latefasciata* Motschulsky, 1858 is synonym with this species, which type material is available.

Cryptocephalus multicolor: Type material is not available to me. I adapt Weise's (1924) statements that this species is synonym with *M. bifasciata* (Hornstedt, 1788).

Crioceris quadrinotata: Type material is not available to me. I adapt Weise's (1924) statements that this species is synonym with *M. bifasciata* (Hornstedt, 1788).

Luperodes latefasciata: Lectotype: Luperodes latefasciata Motsch., Ind. Or. (ZMMU) (Fig. 7). Paralectotypes: 4 ex., same data as lectotype (ZMMU). Motschulsky gave no data on number of specimens in his original description, but there is indication that at least more than one specimen. I herein designate a lectotype to fix the name on a single specimen.

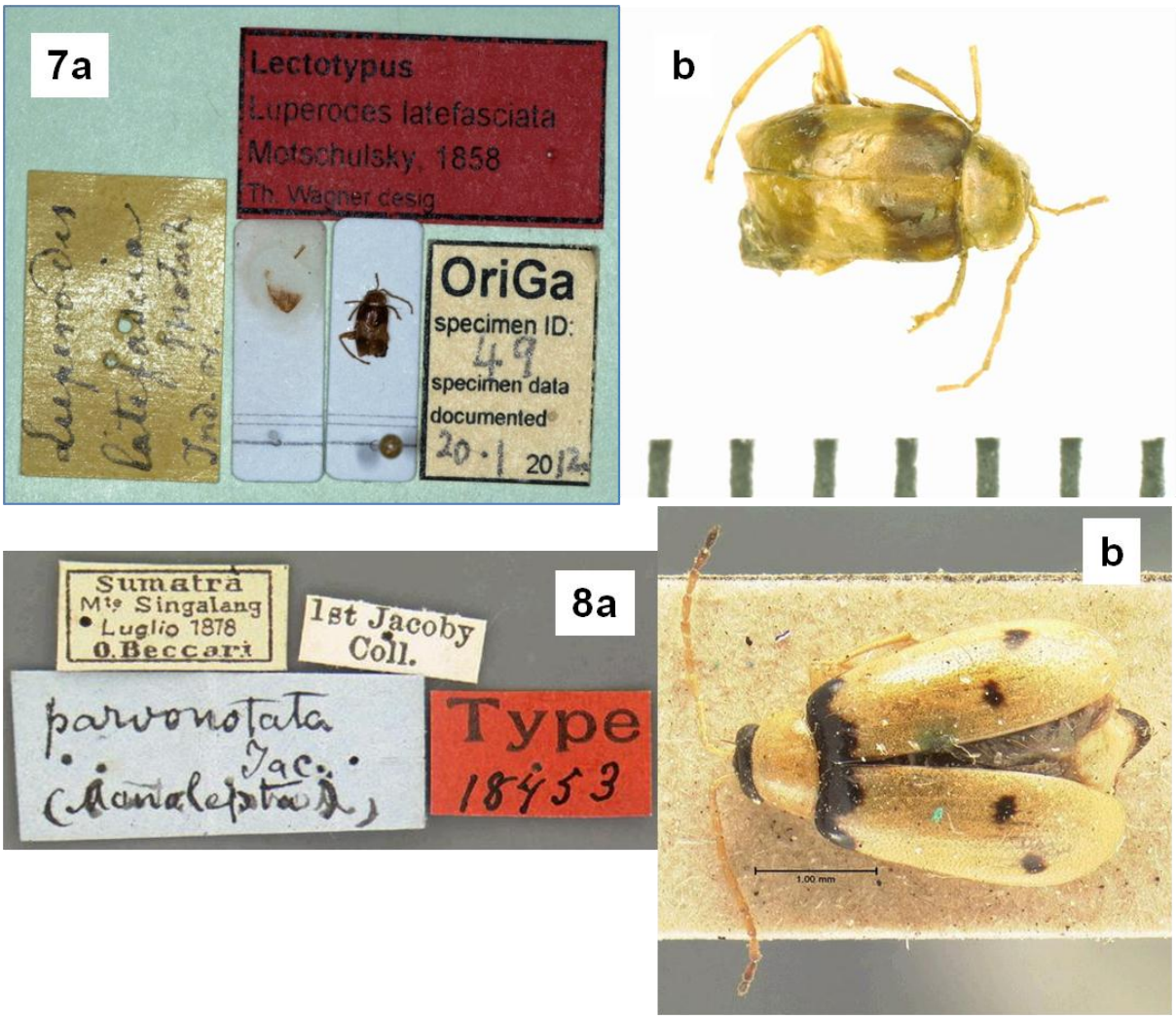
Monolepta rubrosignata: Type material is not available to me. I adapt Weise's (1924)statement that this species is synonym with *M. bifasciata* (Hornstedt, 1788).

Monolepta parvonotata: Holotype: Type 18453, parvonotata Jac. (Monolepta), Sumatra, Mt. Singgalang, Luglio 1878, O. Beccari, 1st Jacoby Coll. (MCZH) (Fig. 8). Type locality: 0º23'S/100º19'E. Jacoby gave no number of specimens in his original description, but there is no indication of more than one, and the only available specimen in MCZH can be treated as holotype.

Monolepta mustaphai: Holotype: Malaysia, Sabah, Pulau Banggi, 8.–12.V.1996, Salleh, Zaidi, Ismail & Sham (UKM) (Fig. 9). Paratypes: 3 ex., same data as holotype (UKM). Type locality: 7º16'N/117º09'E.

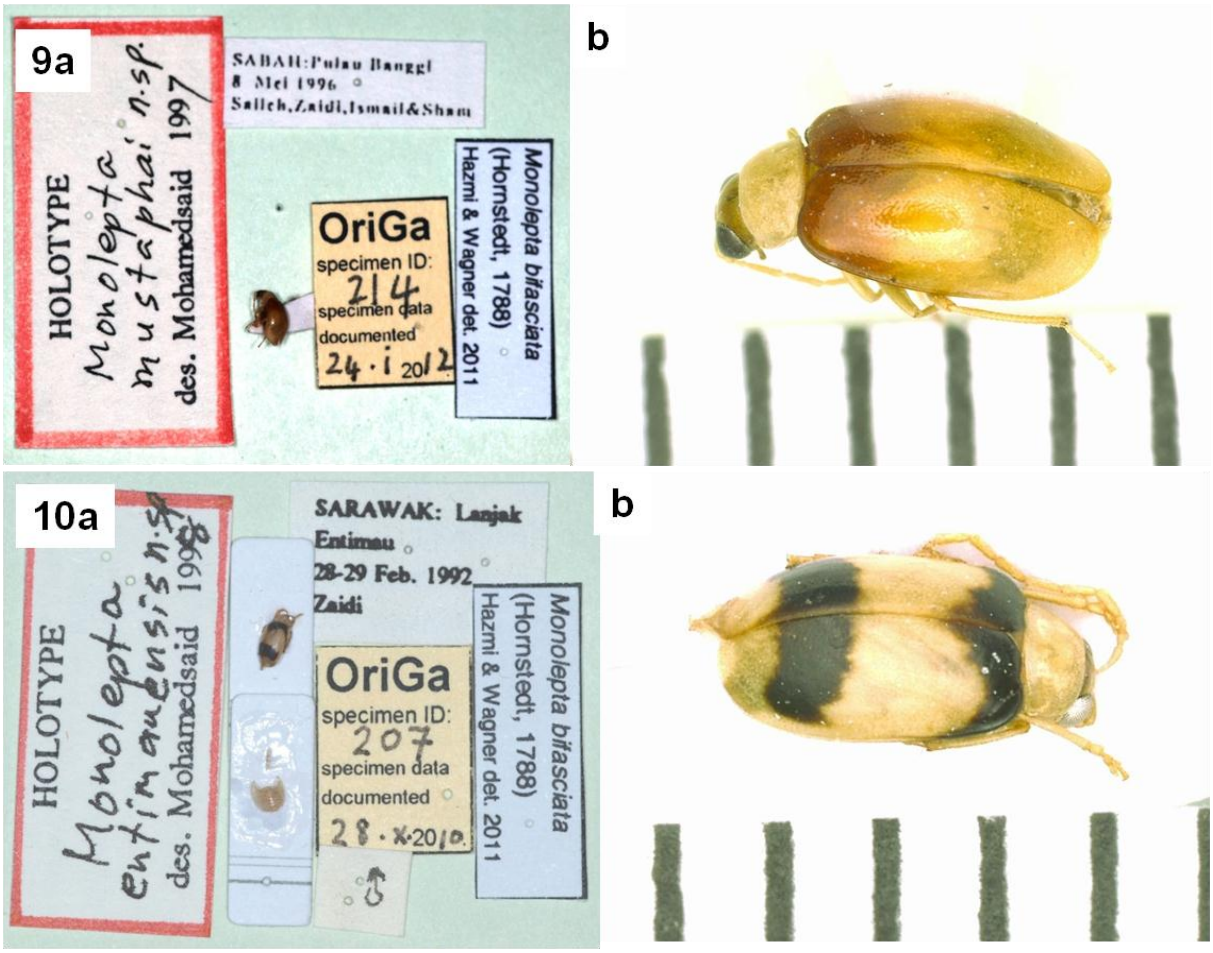
Monolepta entimauensis: Holotype: Sarawak, Lanjak Entimau, 28.–29.II.1992, Zaidi, Monolepta entimauensis, des Mohamedsaid 1998 (UKM) (Fig. 10). Paratypes: 7 ex., same data as holotype (UKM). Type locality: 1º11'N/111º51'E.

Further materials examined. – **Australia.** 1 ex., Australia, N. Queensland, 4.XII.1938, Redlynch (BMNH); 2 ex., Australia, Qid. Tully, Mission Beach, 23.VIII. 1976, D. C. Geijskes (NNML). – **Bangladesh.** 1 ex., Bengal, Mandar, 23º41'N/90º21'E, VII.91, Cardon (IRSN); 2 ex., Belgaum, 15º51'N/74º30'E (BMNH); 3 ex., Bengal, Sarda, 23º41'N/90º21'E, F. W. C (BMNH). – **Burma.** 9 ex., Burma, Rangoon, 16º48'N/96º0'E, V.10–33, H. E. Andrewes (BMNH). – **Cambodia.** 3 ex., Cambodia, Prek Toal (Tonie Sap Lake), 12º55'N/104º03'E,



Figs 7–8. Photographs of the primary type: a. with labels, b. detail. – 7. *Luperodes latefasciata* Motschulsky, 1858. 8. *Monolepta parvonotata* Jacoby, 1886. (Photos from the website http://insects.oeb.harvard.edu/mcz/).

27.V.2003, Light trap, Leg, J. Constant et al. (IRSN). – **India.** 1 ex., South India, Shimoga, 1865 ft., 13º55'N/75º34'E, 25.V.1936, P. S. Nathan (BMNH); 10 ex., South India, Nilgiri Hills, Cherangode, 11º25'N/76º30'E, (3500p), II.1950, Susai Nathan P. (IRSN); 2 ex., South India, Coimbatore, 11º01'N/76º58'E, 2.IX.1950, P. Susai Nathan (IRSN); 17 ex., South India, S. Coorg-Ammanit, 3100 ft., 12º25'N/75º44'E, II.–XI.1952, P. S. Nathan (IRSN); 4 ex., South India, 3500 ft., Anamalai Hills, Chinchona, V.1964, P. Susai Nathan (NNML); 1 ex., S. Indien, Anamalai Hills, Cinchona 350 ft., IV.1967, P. S. N (MNHU); 2 ex., India, Malabar, Fry Coll.



Figs 9–10. Photographs of the holotype: a. with labels, b. detail. – 9. *Monolepta mustaphai* Mohamedsaid, 1997. 10. *Monolepta entimauensis* Mohamedsaid, 1998.

1905.100 (BMNH); 6 ex., Nilgiri Hills, 11º25'N/76º30'E (BMNH). – **Indonesia.** 1 ex., Sumatra, Jacoby Coll. 1909-28a (BMNH); 4 ex., Sumatra, 0º35'S/101º20'E, Collect. Duvivier (IRSN); 7 ex., Fort de Kock Weyers, Collect. Duvivier (IRSN); Fort de Kock, Sumatra, 0º18'S/100º22'E, XII.1924, leg E. Jacobson (NNML); 11 ex., Java, Buitenzorg, 6º35'S/106º47'E, 250 m, 10.X.1919, L. G. E. Kalshoven, No. 736 (IRSN); 9 ex., Medan, 3º35'N/98ºE, Mjöb. (NHRS); 1 ex., Sumatra, Pea Ragia, 0º35'S/101º20'E, X.1890, E. Modigliani (IRSN); 1 ex., Sumatra, Tjinta Radja, Mjöberg (NHRS); 8 ex., Sumatra, Brastagi, 3º22'N/98º34'E, Mjöberg (NHRS); 2 ex., Sumatra, Kota Tjane, Mjöberg (NHRS); 1 ex., Mt. Gede, 6º46'S/106º57'E, 1400 m, Kemner (NHRS); 10 ex., Sulawesi Tengah, Solato R.,

Taronggo, 1º45'S/121º40'E, 27–30.III.1980, M. J. D. Brendell (BMNH); 28 ex., Sulawesi Tengah, Nr. Morowali, Ranu Lakes, 6º14'S/106º49'E, 27.I.–28.IV.1980, M. J. D. Brendell (BMNH); 1 ex., Indonesia, Sumatra Utara, 15km S. Brastagi, 3º22'N/98º34'E, 21.III.1992, B. Gustafsson et. al (NHRS); 2 ex., Java occident, 4000 ft., 1893, H. Fruhstorfer (BMNH); 1 ex., Sunda-Inseln West Flores, VI.1927, leg. Rensch (MNHU); 1 ex., Java, Batavia, 6º12'S/106º50'E, Grabowsky S. V (MNHU); 2 ex., Sumatra exp., 1927, Rensch (MNHU); 1 ex., S. O. Borneo, Grabowsky S. V (MNHU); 1 ex., W. Sumatra, Kambang 23.–24.XI.08, Schoede S. G (MNHU); 1 ex., Sumatra Utara, Aekpopo alt. 1600m, 13.III.1995, Maruyama K. leg (CTJ); 2 ex., Java (MNHU); 1 ex., Indonesia, Sumatra Utara, Silalahi, 4.V.1999, S. Tsuyuki leg. (CTJ); 1 ex., Sumatra, Mt. Singgalang, 0º23'S/100º19', Luglio 1878, O. Beccari, 1st Jacoby Coll. (MCZ); 1 ex., M. Flores, Rana Mese, 20.–30.XI.1927, leg. Dr. Rensch (MNHU); 13 ex., West Lombok, Narmada, 8º34'S/116º11'E, 14.–20.III.1927, Rensch S. G (MNHU); 2 ex., Lombok Segare, 8º22'S/116º10'E, 5.VI.27, Rensch S. G (MNHU); 2 ex., O. Borneo, Pajau River, Mjöberg (NHRS); 1 ex., North Central Sulawesi, 1º25'S/121º22'E, V.1980 (BMNH); 2 ex., Sumatra, Pagherang Pisang, X.90.–III.91, E. Modigliani (BMNH); 3 ex., Flores, 8º03'S/120º09'E, Wallace (BMNH); 4 ex., Sumatra, Balighe, X.90.–XII.91, E. Modigliani (BMNH); 2 ex., Fraserpet, Coorg., F. R. I. Sandal, II.30, Insect Survey (BMNH); 1 ex., Sumatra, Sungai Penok, Korinchi Valley, 2600 ft., III.1914 (BMNH); 2 ex., Sumatra, Fort de Kock, 920 M, III.1921, leg. E. Jacobson (BMNH); 1 ex., Sipora Island, West Sumatra, 2º13'S/99º40'E, X.1924, C. B. K and N. S (BMNH); 1 ex., Sumatra, Si Rambe, 6º11'S/106º48'E, XII.90.–III.91, E. Modiglianii (BMNH); 1 ex., Indonesia, Sulawesi Utara, Dumoga Bone NP, site 14 1140m, 7.–8.III.1985, J. D. Holloway (BMNH); 7 ex., Java, Semarang, 6º58'S/110º25'E, rec.1973, P. H. V. Doesburg; E. R Jacobson (NNML); 6 ex., Java, G. Oengaran, 31.IX.33, P. H. V. Doesburg (NNML); 29 ex., Sumatra, Manna, 4º30'S/102º58'E, 1902, M. Knappert, Coll. Veth (NNML); 1 ex., Java, Pelabokan Patoe, 1923, A. E. Kerkhoven (NNML); 3 ex., Java, 1921, Madioen, Paroembangan, A. E. Kerkhoven (NNML); 4 ex., O. K. Sumatra, Dolokmerangir, coll. V. Eldik (NNML); 10 ex., Java, Propeoek-Tegal, IX.1909, Valek Lucassen (NNML); 1 ex., Palembang, Sumatra, 2º59'S/104º45'E, M. Knappert (NNML); 2 ex., Java, Delanggoe, W. Grippeling; N. C. Pilpers (NNML); 25 ex., North Sumatra, Toba plateaue, Tigadolok, Holzweg Drei, 2º50'N/99º3'E, 20.VI.1972, J. Krikken (NNML); 1 ex., North Sumatra, Bivouac Two, Mt. Bandahara, 3º44'N/97º43E, 5.–10.VII.1972, J. Krikken (NNML); 6 ex., North Sumatra, Alas Valley,

Gumpang, 3.77ºN /97.5ºE, 11.VI.1972, J. Krikken (NNML); 3 ex., North Sumatra, Alas Valley, Kutatjane, Tanah Merah; Balelutu, 3º31'N/97º47'E, 3.–9.VIII.1972, J. Krikken (NNML); 10 ex., Java, Bantam; Preanger, de Vos; IX.1909, Valck Lucassen (NNML); 16 ex., Sumatra, Deli, 3º35'N/98º39'E, d Bury (NNML); 1 ex., Semarang, 6º58'S/110º25'E, Coll. Veth (NNML); 1 ex., Bandong, 6º54'S/107º36'E, Coll. Veth (NNML); 1 ex., Lombok, 8º39'S/116º19'E, Coll. Veth (NNML); 1 ex., Celebes, 1º50'S/120º31'E, Coll. Veth (NNML); 8 ex., Soerol, 0º35'S/101º20'E, Coll. Veth (NNML); 1 ex., Maero Laboe, Coll. Veth (NNML); ex., Soepajang, 0º27'S/100º54'E, Coll. Veth (NNML); 2 ex., N. O. Sumatra. Tandjong Morawa, Serdang, 0º35'S/101º18'E, Dr. B. Hadgen (NNML); 1 ex., Rawas, 1º11'S/132º13'E (NNML); 1 ex., Nias, 1º07'N/97º31'E, J. D. Pasteur (NNML); 8 ex., Sumatra, Padang, 0º57'S/100º21'E, J. D. Pasteur (NNML); 2 ex., Serdang, Sumatra, 0º55'S/102º4'E, Schag (NNML); 3 ex., Boengamas, Palembang, 2º59'S/104º45'E, J. C. Hasselt (NNML); 1 ex., Batavia, 6º12'S/106º50'E, Semme Link (NNML); 1 ex., Soekaranda, Kampong, 0º37'N/94º29'E, J. C. van Hasselt (NNML); 1 ex., N. Sulawesi, Dumoga Bone NP between base camp and Mopuya, 1º50'S/120º31'E, 16.VIII.1985, J. Huijbregts (NNML); 3 ex., Medan, 3º30'N/98º37'E, 1918, F. C. van Heurn, leg. W. C. van Heurn, don. (NNML); 2 ex., Ambon Island, 3º40'S/128º10'E, 24.II.1964, A. M. R. Wegner (NNML); 3 ex., Java, Gedeh (MNHU); 1 ex., Mt. Banahao, 20.VI.1914, G. Boettcher (MNHU); 1 ex., G. Oerangan, Java, III.1906, Drescher (MNHU); 1 ex., N. O. Sumatra, Prov. Langkat, 1906, leg E. Heinze (MNHU); 2 ex., O. Soembawa, Dormpoe, 24.–25.V.1927, leg. Rensch (MNHU); 3 ex., Sunda, Exp. O. Flores, Geli Moetoe, 14.–20.VII.1927, leg. Rensch (MNHU); 9 ex., Sunda, Exp. Lombok, Narwada, 14.III.1927, leg. Rensch (MNHU); 4 ex., Sunda-Ins., W-Flores, Rana Mese, 20.–30.VI.1927, leg. Rensch (MNHU); 3 ex., Sumat., Matur.; Fort De Kock, X.1913, Edw. Jacobson; Coll. Veth (NNML); 2 ex., Java, Preang, Tjigembong, VIII.15, B. Corporaal (NNML). – **Malaysia.** 11 ex., Borneo, Long Navang, 3º35'N/116º38'E, Mjöberg (NHRS); 1 ex., Malacca, 2º12'N/102º15'E, Coll. Chapuis (IRSN); 3 ex., Perak, 4º48'N/100º48'E, Sharp Coll. (BMNH); 3 ex., Sarawak, foot of Mt. Dulit, junction of rivers Tinjar & Lejok, 3º20'N/114º8'E, 9.VIII.1932 (BMNH); 1 ex., Sarawak, Puak, 3º48'N/114º26'E, 3.V.14, G. E. Bryant (BMNH); 2 ex., Malay Penin., Kuala Lumpur, Maxwell road, 3º08'N/101º41'E, 10.I.1916 (BMNH); 16 ex., Pahang, F. M. S. Cameron Highland, 500 ft., 4º30'N/101º28'E, VI.–VII.1935, H. M. Pendlebury (BMNH); 1 ex., W. Sarawak, Quop, 1º33'N/101º24'E, III.1914, G. E. Bryant (BMNH); 16 ex., Penang, Bowring 63.47 (BMNH); 1 ex., Perak, F. M.

S. Larut Hills, 3700 ft., 5Nº/100º53'E, II.1932, H. M. Pendlebury (BMNH); 5 ex., Pahang, F. M. S. Fraser Hill, 4200 ft., 3º46'N/101º45'E, VI.1936, H. M. Pendlebury (BMNH); 4 ex., Malaya, Kuala Lumpur, 3º8'N/101º41'E, VI.1935, Ex. F. M. S. (BMNH); 2 ex., Malay Penin, Selangor-Pahang, 3º30'N/101º31'E, I.1915 (BMNH); 1 ex., Malaya, Pahang F. M. S., Pekan, 3º30'N/103º23'E, 25.IV.1939 (BMNH); 1 ex., Pahang, F. M. S. Sungai Tembeling, 4º18'N/102º36'E, XI.1922 (BMNH); 1 ex., Malay Penin., Kuala Kangsar, 4º46'N/100º56'E, 9.XI.1943 (BMNH); 2 ex., Pahang, Bentong, 3º31'N/101º54'E, 22.XII.1931 (BMNH); 1 ex., Malaya, Pahang nr Karak, Chintamani, 3º24'N/102º02'E, VIII.1935 (BMNH); 1 ex., Pahang, Kuala Tahan, 4º22'N/102º24'E, XI.1921, F. N. Chasen Coll. (BMNH); 1 ex., Malaya Peninsula, Barnam R., A. M. Lea & wife (BMNH); 1 ex., Malay Penin., Kedah-Perak, 5º52'N/100º31'E, III.1928 (BMNH); 1 ex., Malay Penin., Kuantan, 3º49'N/103º19'E, 10.II.22, G. H. Corbett et al. (BMNH); 1 ex., Sarawak, Bario, 3º44'N/115º28'E, 2.XII.1965, Coll. G. H. L. Rotschild (BMNH); 1 ex., Pahang, Cameron Highland, Tanah Rata, 4º28'N/101º22'E, 25.IX.1986, Ismail & Md. Nor (UKM); 1 ex., Pahang, T. Bera, 3º19'N/102º27'E, 1.–3.XI.1990, Ruslan (UKM); 1 ex., Perak, Bukit Larut, 4º47'N/100º45'E, 9.IX.1986, Salleh & Ismail (UKM); 1 ex., Perak, Banding, 5º32'N/101º19'E, 29.–30.VII.1991, Ismail et. al (UKM); 1 ex., Kelantan, 5º06'N/101º53'E, Coll. Veth (NNML); 3 ex., Malaysia, Pahang prov. Kuala Tahan, 4º19'N/102º20'E, 6.–9.XI.1999; 5.–9.III.2007, P. Kocarek leg.; V. Hula et al. (CJB); 4 ex., Malaysia, West Pahang, 35km see Ipoh, 1500 m, Cameron Highlands, Tanah Rata, 4º30'N/101º28'E, 21.–24.IV.2001, M. Riha leg. (CJB); 1 ex., Malaysia, W. Perak, 1200 m, 25km, N. E. Ipoh, Banjaran Titiwangsa Mts. Koribu, 4º56'N/101º38'E, 6.–12.V.2001, M. Riha leg. (CJB); 9 ex., Malakka, Perak, 2º12'N/102º15'E (MNHU); 1 ex., Malaysia, Negeri Sembilan, Johol, 2º52'N/102º15'E, 1.III.1987, T. K. Philips (Coll. Prov. Utah); 3 ex., Malaysia, Sabah, Pulau Banggi, 7º16'N/117º9'E, 8.–12.V.1996, Salleh, Zaidi, Ismail & Sham (UKM); 1 ex., Nord-Borneo, Coll. Waterstradt (MNHU); 1 ex., Sabah, Mt. Trus Madi, 1800 ft., 5º33'N/116º31'E, 18.–28.VIII.1977 (BMNH); 2 ex., Sabah, Keningau area Tenom, alt. m 0230, 5º15'N/116º19'E, 23.XI.1987, Krikken & Rombaut (NNML). – **New Guinea.** 16 ex., Papua, Kokoda, IX.1933, 1,200–1,300 ft., L. E. Cheesman (BMNH); 1 ex., New Guinea, Madang Dist., Finisterre Mts., Damanti 3550 ft., 2.–11.X.1964 (BMNH); 1 ex., Papua, Mafulu, 4000 ft., I.1934, L. E. Cheesman (BMNH); 23 ex., Neth., New Guinea Exp. Star Range, 1260 m, IV.–IX.1959, C. v. Heyningen (NNML). – **Philippine.** 5 ex., N. Luzon, Semper, 17º36'N/118º12'E, Coll. Chapuis (IRSN); 1 ex., Philippinen, Luzon, Benguet,

Kabayan, 16º33'N/121º15'E, 21.XI.1997, L. F. Leg, Mey et al. (MNHU); 11 ex., Luzon Benguet, La Trinidad, 16º33'N/121º15'E, V.1914, G. Roettcher (MNHU); 1 ex., Los Banos, 14º10'N/121º13'E, P. I. Baker (NHRS); 3 ex., Phillipp., 16º23'N/121º13'E, Jacoby Coll. 1909-28a (BMNH); 1 ex., Philippine Island, 1919 (Coll.Prov. Utah); 4 ex., Philippine Island, Jacoby Coll. 1909-28a.990 (BMNH); 3 ex., Luzon, Jagor, 16º33'N/121º15'E, 58402 (MNHU); 26 ex., Philippine, 16º33'N/121º15'E, Luzon (MNHU); 6 ex., Philippine, Mindanao, 7º51'N/124º51'E (MNHU). – **Singapore.** 1 ex., Singapore, 1º21'N/103º49'E, 97–74, H. N. Ridley (BMNH). – **Sri Lanka.** 1 ex., Ceylon, Polonnarowa, 7º55'N/81º0'E, 27.II.1906, leg. H. Schoede (MNHU); 3 ex., Ceylon, 7º18'N/80º36'E, II.1884, Mus. Columbo (MNHU); 1 ex., Ceylon, Henaratgoda, XII.89, H. P. Green (BMNH); 4 ex., Ceylon, Diyatalawa; Kandy, 5º15'N/100º29'E, VI.–IX.1908, G. E. Bryant; T. B. F (BMNH). – **Thailand.** 2 ex., Penin. Siam, Patalung Trang, 3.V.1924, I. H. N. Evan (BMNH). – 9 ex., Bohol, Semper, 9º50'N/124º10'E, Coll. Chapuis (IRSN); 12 ex., Restit. 1885; Coll. Chapuis (IRSN); 2 ex., Natal, Coll. Duvivier (IRSN); 1 ex., Mindoro, 95-226 (BMNH); 1 ex., Wellesley Prov., 1904-105, H. N. Ridley (BMNH); 7 ex., Jawanlagiri, Ayur,Denkanikota, North Salem, III–VII.30, F.R.I. Sandal, Insect Survey (BMNH); 2 ex., Tringano (BMNH); 1 ex., Bogawantalawa, III–IV.82 BMNH); 1 ex., Syria, Sharp Coll. 1905–313 (BMNH); 5 ex., Japanoeli, A.L.v.H, Coll. Veth (NNML); 1 ex., Getassan, 1100 M., rec.1973, P.H.V. Doesburg (NNML); 29 ex., Raimundo, Timor, No 549 (ICTZ); 1 ex., Sunda–Exp., Semongkat Batos-Lanteh-Gbg., N–Hang, 400m, 10.I.27, leg. Rensch (MNHU); 1 ex., Puttalam, 1899, W. Horn (MNHU).

***Monolepta rubra* (Gyllenhal, 1808)**

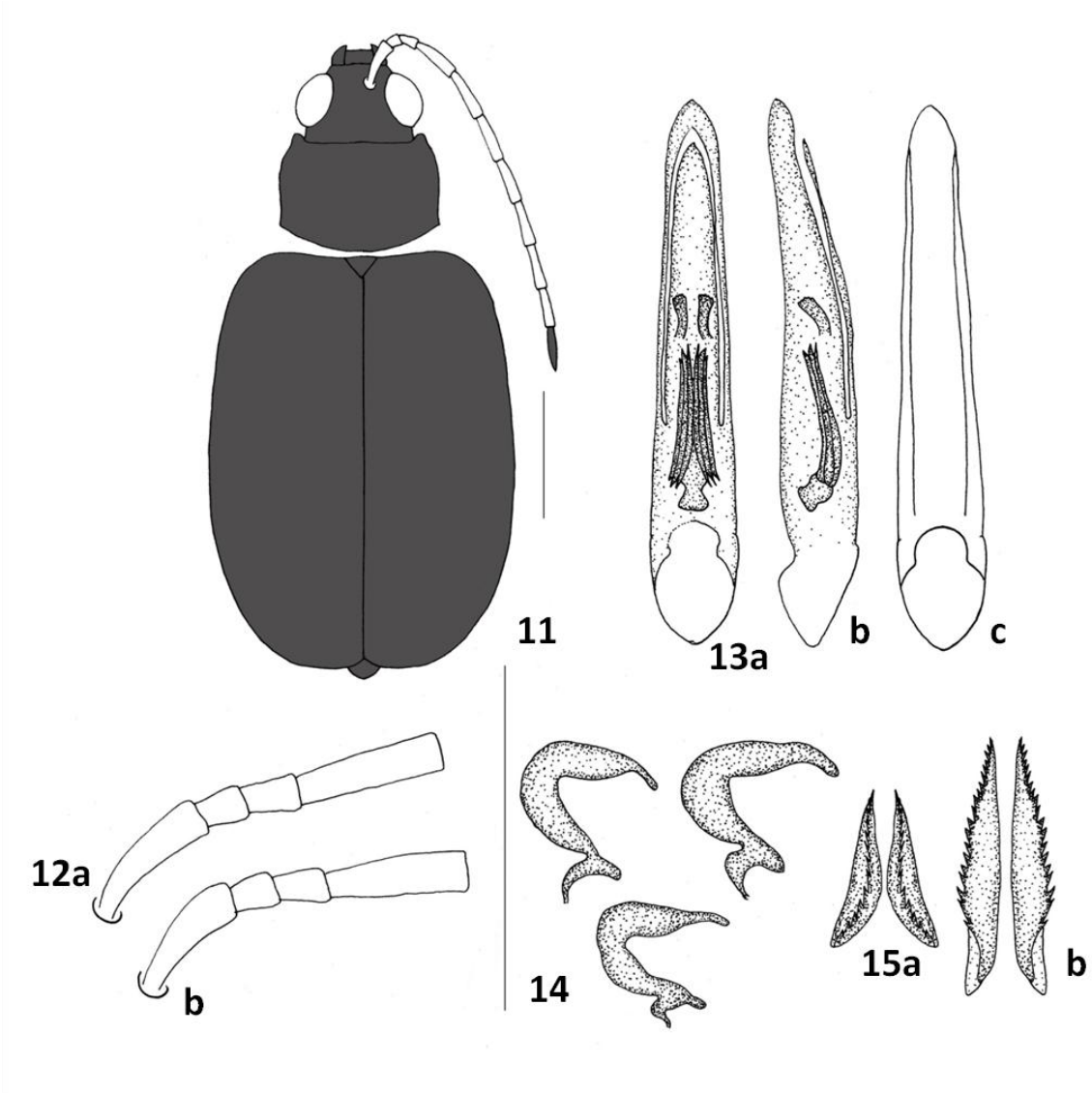
Figs 11–17

Crioceris rubra Gyllenhal, 1808: p. 272 (Chevrolat, 1837: p. 407).

= *Luperodes javanensis* Jacoby, 1887: p. 234 (Bowditch, 1925: p. 253).

Total length. 4.50–6.00 mm (mean: 5.31 mm; n=10).

Head. Impunctate, entirely brown. Labrum and mandible dark brown. Antennae slender, extending to the middle of elytra, yellow brownish, terminal antennomere partly dark-brown (Fig. 11). First antennomere club shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.75–1.00 (mean: 0.83); ratio



Figs 11–15. *Monolepta rubra* (Gyllenhal, 1808). – 11. dorsal colour pattern; 12. antennae, (a) male; (b) female; 13. median lobe: (a) dorsal; (b) lateral; (c) ventral; 14. three different spermathecae; 15. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

length of third to fourth antennomere: 0.38–0.56 (mean: 0.42) (Fig. 12), second antennomere to terminal antennomere with very fine setae.

Thorax. Pronotum finely punctuated, entirely dark brown, surface convex especially the apical area. Pronotal width: 1.40–1.70 mm (mean: 1.58), ratio length to width: 0.64–0.68 (mean: 0.66). Scutellum, meso- and metathorax dark brown. Elytron entirely dark brown to

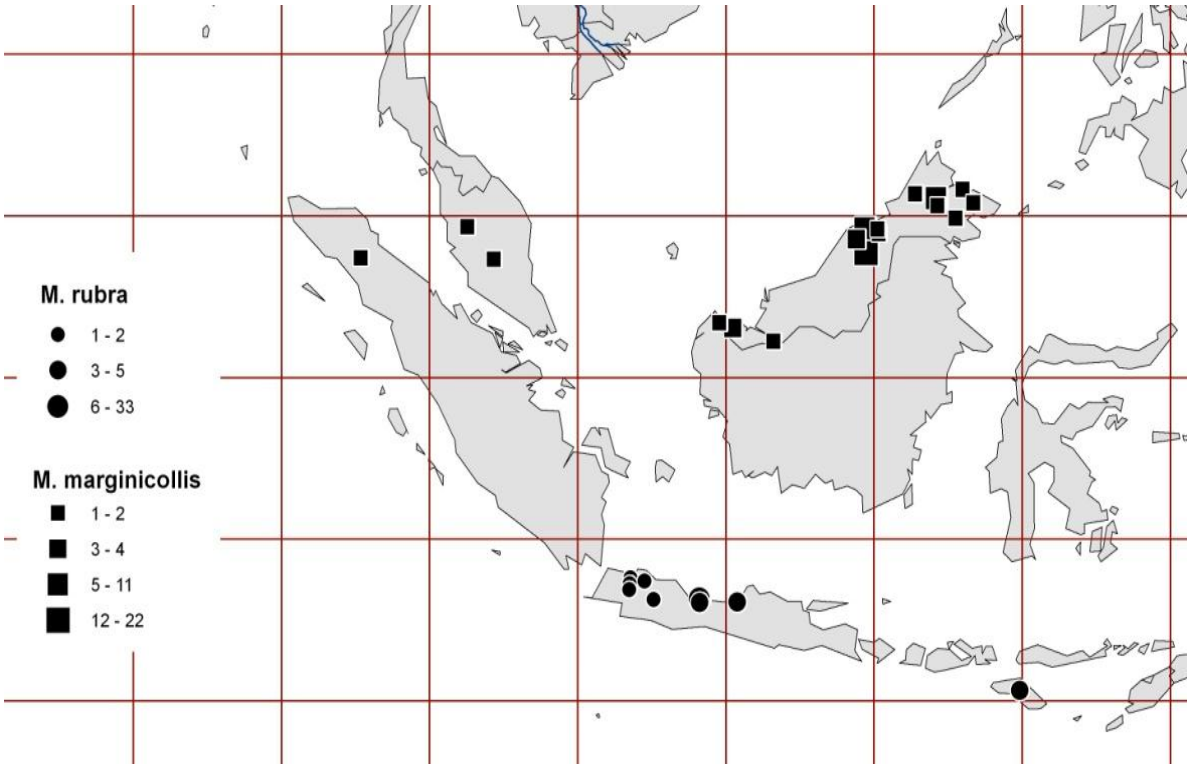


Fig. 16. Distribution of *M. rubra* (Gyllenhal, 1808) and *M. marginicollis* Jacoby, 1896.

black outer margins. Elytra length 3.65–4.30 mm (mean: 3.94), maximal width of both elytra together 2.50–3.00 mm (mean: 2.77), ratio of maximal width of both elytra together to length of elytra 0.68–0.72 (mean: 0.70) (Fig. 11). Legs fulvous.

Abdomen. Dark brown.

Male genitalia. Median lobe slender, parallel-sided and becomes narrow towards apex. Tectum long and almost reaching the apex of the median lobe. Ventral spiculae weakly sclerotised and invisibly clear. Lateral spiculae club-shaped, lobe-like at apex, median spiculae long and slender filamentous-like. Several basal structures occurs (Fig. 13).

Female genitalia. Spermatheca with very small nodulus, middle part and cornu long and curved (Fig. 14), very similar to spermatheca of *M. bifasciata* (Fig. 4). Two pairs of bursa sclerites, both with strong undulate at the outer margins (Fig. 15).

Distribution. This species is widely distributed in Java Island, and also occurred in Borneo (without further detail) (Fig. 16).

Diagnosis. *Monolepta rubra* is characterized by medium size and unicolorous dark brown dorsum coloration. *Monolepta rufipennis* and *M. sulawensis* new sp. are the most similar on

Fig. 17. Photographs of the lectotype of *Luperodes javanensis* Jacoby, 1887; a. with labels, b. detail. (Photos from website http://insects.oeb.harvard.edu/mcz/).

coloration with *M. rubra*, but these two species have reddish-brownish elytron (Figs 52, 135). The body length of *M. rubra* on average is medium (4.50–6.00 mm) and *M. sulawensis* new sp. is smaller (3.70–4.25 mm), while *M. rufipennis* on average bigger (4.75–6.35 mm). The pronotum of the other two species is broader (*M. rufipennis* 0.61–0.64; *M. sulawensis* new sp. 0.60–0.64) than pronotum of *M. rubra* (0.64–0.68). The median lobe of *M. rubra* is slender and lack of ventral spiculae, as well in *M. rufipennis,* but in *M. sulawensis* new sp. three different spiculae occurred (Figs 13, 54, 137) and spermatheca of *M. rubra* and *M. rufipennis* have small nodulus but relatively more curve in *M. rufipennis. Monolepta sulawensis* new sp. has rounded nodulus (Figs 14, 55, 138).

Type material.

Crioceris rubra: Type material is not available to me. I adapt Bowditch's (1925) statement that *Luperodes javanensis* Jacoby, 1887 is synonym with this species, which type material is available.

Luperodes javanensis: Lectotype: Batavia, Luperodes javanensis Jac., Type, Type 18105, Sythoff, Batavia, Java (MCZH) (Fig. 17); Paralectotype: 1 ex., same data as lectotype

(NNML). Type locality: 6º10'S/106º51'E. Jacoby wrote in the original description that two specimens were studied. I herein designate a lectotype to fix the name on a single specimen.

Further materials examined. – **Indonesia.** 2 ex., Nierst, Depok, 6º23'S/106º48'E, 1899, Coll. Veth (NNML); 33 ex., Java, Proepoek Tegal, 6º52'S/109º08'E, IX.1909, Valck Lucassen (NNML); 4 ex., Java, Slawi Tegal, 6º59'S/109º08'E, IX.1909, Valck Lucassen (NNML); 3 ex., Indonesia, Soemba Northcoast, 9º41'S/119º58'E, IV.1930, W. C. van Heurn (NNML); 5 ex., Java, Semarang, 6º58'S/110º25'E, E. R Jacobson (NNML); 1 ex., Bandong, 6º54'S/107º36'E, Coll. Veth (NNML); 2 ex., West Java, Krawang ds Randas-dengklok, 6º18'S/107º17'E, 2.XI.1951, leg L.V.L (NNML). – **Malaysia.** 1 ex., Sarawak (BMNH); 2 ex., Borneo, German Mission, 56358, Martin Schmidt S. V. (MNHU).

***Monolepta signata* (Olivier, 1808)**

Figs 18–26

Galeruca signata Olivier, 1808: p. 665 (Jacoby, 1889, p. 229).

= *Crioceris neglecta* Sahlberg, 1829: p. 29 (Maulik, 1936, p. 410).

= *Luperodes quadripustulatus* Motschulsky, 1858: p 105 (Maulik, 1936, p. 410).

= *Luperodes hieroglyphicus* Motschulsky, 1858; p. 104, new syn.

= *Monolepta elegantula* Boheman, 1859 (Weise, 1913, p. 229), new syn.

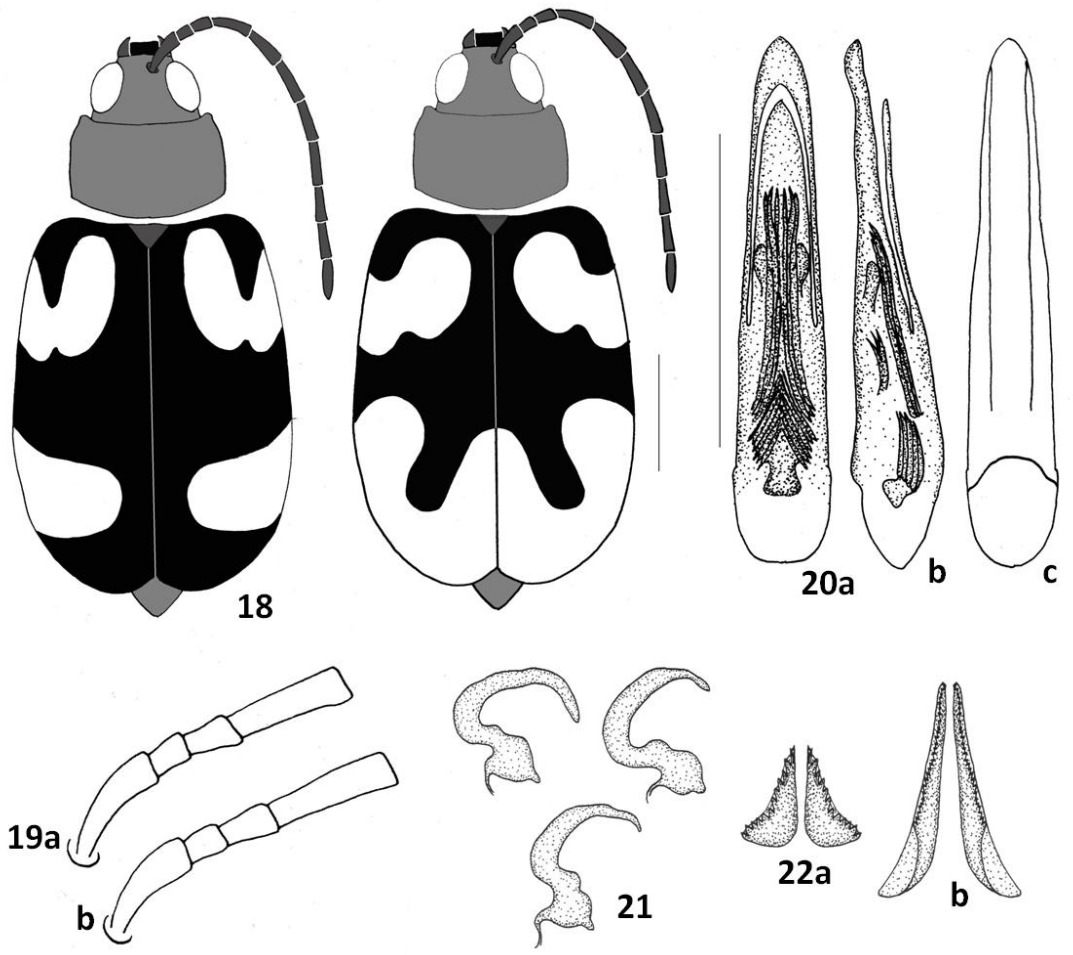
= *Luperodes quadriguttata* Fairmaire, 1887 (Weise, 1924, p. 333), new syn.

= *Monolepta picturata* Jacoby, 1896: p. 292, new syn.

Total length. 3.50–5.25 mm (mean: 4.47 mm; n=10).

Head. Impunctate, pale brown to reddish-brown. Labrum dark brown and mandible partly black. Antennae slender and extending to the middle of the elytra, dark brown to black, only three basal antennomere pale yellow (Fig. 18). First antennomere club shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.67–1.00 (mean: 0.77); ratio length of third to fourth antennomere: 0.38–0.50 (mean: 0.45) (Fig. 19).

Thorax. Pronotum finely punctuated, pale brown to reddish-brown. Pronotal width: 1.15–1.55 mm (mean: 1.35), ratio length to width: 0.60–0.63 (mean: 0.61). Scutellum brown to black, meso- and metathorax black. Elytron brown to black, characterize by circular humeral



Figs 18–22. *Monolepta signata* (Olivier, 1808). – 18. dorsal colour pattern; 19. antennae, (a) male; (b) female; 20. median lobe: (a) dorsal; (b) lateral; (c) ventral; 21. three different spermathecae; 22. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

and preapical yellow spots. Elytra length 2.90–3.60 mm (mean: 3.32), maximal width of both elytra together 2.00–2.80 mm (mean: 2.40), ratio of maximal width of both elytra together to length of elytra 0.72–0.75 (mean: 0.73) (Fig. 18). Coxa pale yellow to brown, base of femur partly brown and blackish towards terminal, and tibiae blackish.

Abdomen. Pale yellow to brown.

Male genitalia. Median lobe parallel-sided at basal half and becomes narrow towards apex. Tectum long, but not reaching the apex of median lobe. Lateral spiculae of C-shaped, median spiculae long and slender filamentous-like, and another short filamentous-like on

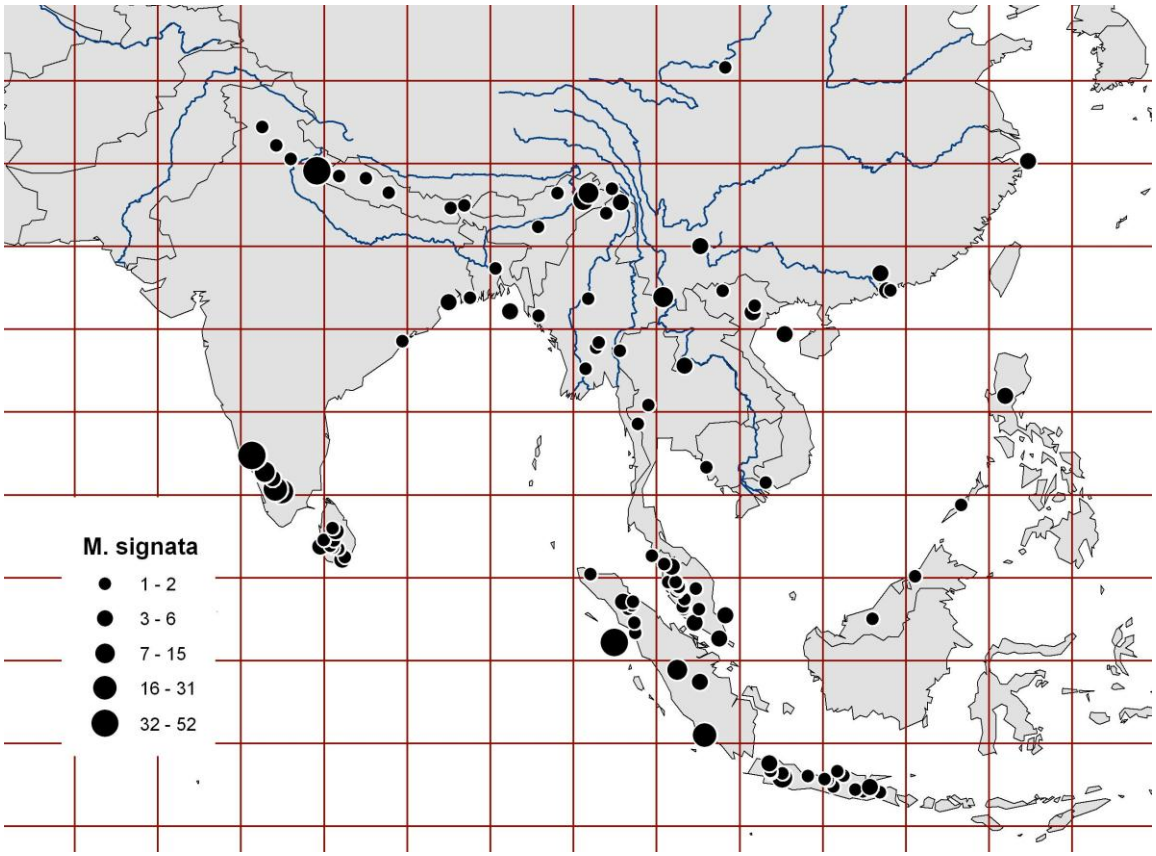


Fig. 23. Distribution of *M. signata* (Olivier, 1808).

basal, and ventral spiculae only visible from ventral view, club-shaped with jagged at apex. Sacculus occurs at the basal (Fig. 20).

Female genitalia. Spermatheca with rounded nodulus and short slender tube-like protruding from nodulus, middle part and cornu are long and curved, and blunt hook-shaped at apex (Fig. 21). Two pairs of bursa sclerites present, dorsal part with spine at outer margin and ventral part longer, almost two times the height of dorsal bursa sclerite, with fine undulate at the outer margin (Fig. 22).

Diagnosis. *Monolepta signata* varies from small to medium-sized. According to wide geographical distribution, this species shows a high variety in coloration pattern. Characteristic are the brownish to black elytron with circular humeral and preapical yellow spots (Fig. 18). *Monolepta zonula*, *M. empatbulat* new sp. and some specimens of *M. mohamedsaidi* new sp. resemble the coloration of this species particularly the circular yellowish spot on elytra (Figs 73, 98, 123), but head usually black contrasting the yellow

pronotum, while in *M. signata*, head and pronotum of same coloration, usually pale brown to reddish brown. The total length of *M. signata* varies from 3.50–5.25 mm, quite similar to *M. zonula* (3.50–4.90 mm) while *M. empatbulat* new sp. (3.25–3.80 mm) and *M. mohamedsaidi* new sp. (3.25–4.00 mm) are on average smaller. The genitalic characters are quite different among these four species, and could further check under the description of each species (Figs 20, 75, 100, 124).

Distribution. This species is widely distributed all over the Oriental region, up to Guinea and Australia (Fig. 23).

Type material.

Galeruca signata: Type material is not available to me. I adapt Maulik's (1936) statement that *Luperodes quadripustulatus* Motschulsky, 1858 is synonym with this species, which type material is available.

Crioceris neglecta: Type material is not available to me. I adapt Maulik's (1936) statement that this species is synonym with *M. signata* (Olivier, 1808).

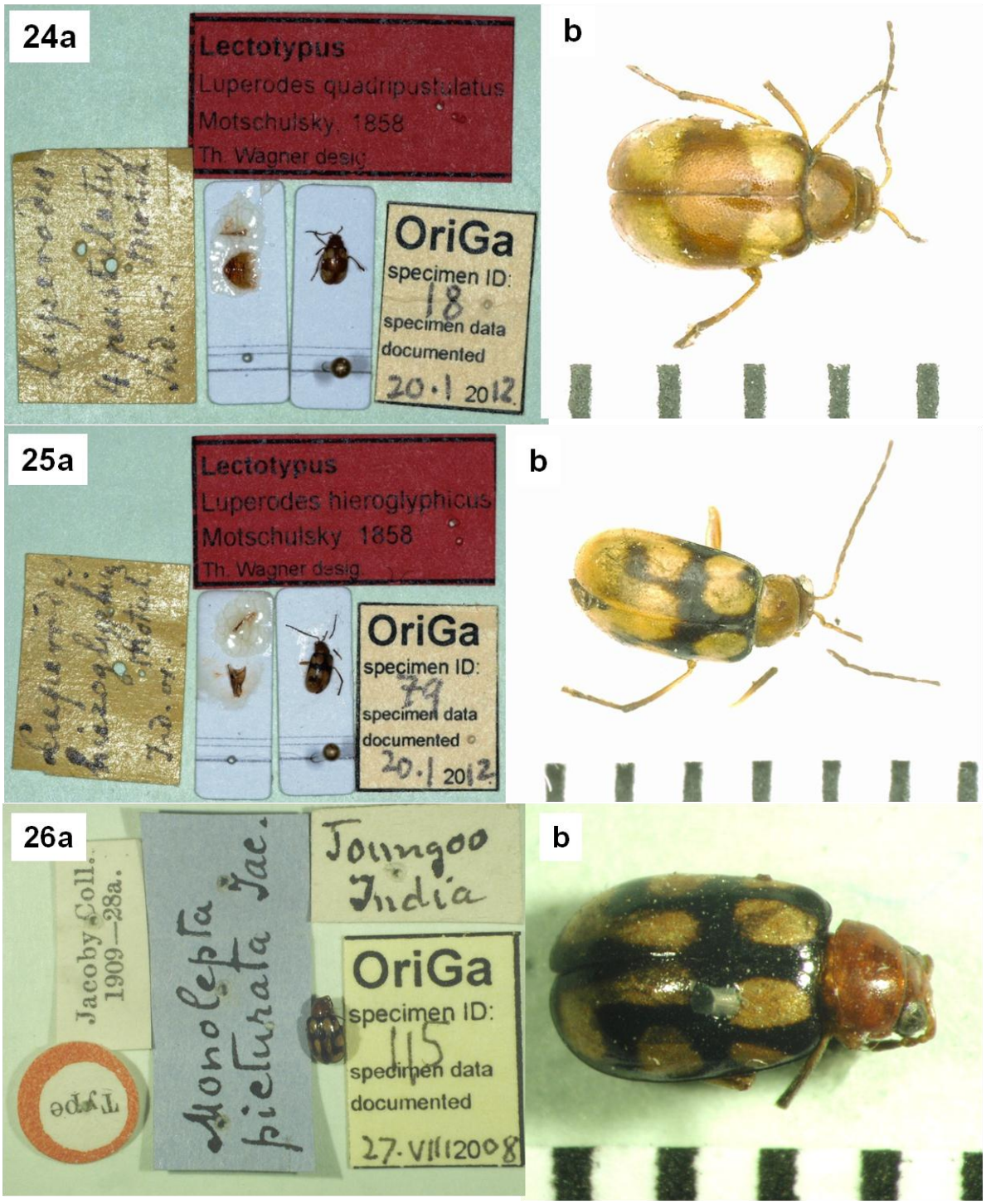
Luperodes quadripustulatus: Lectotype: Luperodes 4pustulatus Motsch., Ind. Or. (ZMMU) (Fig. 24). Paralectotypes: 4 ex., same data as lectotype (ZMMU). Motschulsky gave no data on number of specimens in his original description, but there is indication that at least more than one specimen. I herein designate a lectotype to fix the name on a single specimen.

Monolepta hieroglyphica: Lectotype: Luperodes hieroglyphicus Motsch., Ind. Or (ZMMU) (Fig. 25). Paralectotypes: 5 ex., same data as lectotype (ZMMU). Motschulsky gave no data on number of specimens in his original description, but there is indication that at least more than one specimen. I herein designate a lectotype to fix the name on a single specimen.

Monolepta elegantula: Type material is not available to me. I adapt Maulik's (1936) statement that this species is synonym with *M. hieroglyphica* (Motschulsky, 1858), and *M. hieroglyphica* is new synonym with *M. signata* (Olivier, 1808).

Luperodes quadriguttata: Type material is not available to me. I adapt Maulik's (1936) statement that this species is synonym with *M. hieroglyphica* (Motschulsky, 1858), and *M. hieroglyphica* is new synonym with *M. signata* (Olivier, 1808).

Monolepta picturata: Holotype: M. picturata Jacoby 1896, Type, Toungoo India, Monolepta picturata Jac., Jacoby Coll. 1909-28a (BMNH) (Fig. 26). Type locality: 18º56'N/96º25'E. Jacoby gave no number of specimens in his original description, but there is no indication of more than one, and the only available specimen in BMNH can be treated as holotype.



Figs 24–26. Photographs of the primary type: a. with labels, b. detail. – 24. *Luperodes quadripustulatus* Motschulsky, 1858. 25. *Luperodes hieroglyphicus* Motschulsky, 1858. 26. *Monolepta picturata* Jacoby, 1896.

Further materials examined. – **Bangladesh.** 7 ex., Bengal, Sarda, F.W.C. (BMNH); 3 ex., Belgaum, Andrewes Bequest, B.M. 1922-221 (BMNH); 1 ex., Bengal, 21º56'N/88º51'E, Sunderbans, F.W.C, H.G. Champion Coll. B.M. 1953-156 (BMNH); 3 ex., Bengal, Mandar, 21º41'N/87º33'E, VII.91, P. Cardon, Coll. Duvivier (IRSN). – **Burma.** 1 ex., Birmania, Shwego Myo, X.1885, Fea (IRSN); 1 ex., Carin, Cheba, 19º13'N/96º35'E, I.88, I. Fea (IRSN); 1 ex., Upper Burma, Seingkhu Valley, 28.5ºN/97.35ºE, 1926, P. Kingdon Ward (BMNH); 1 ex., Upper Burma, Mali Kha Valley, 1926, P. Kingdon Ward (BMNH); 4 ex., Tenasserim, Malvedaung, 30m S. of YE, 15.–25.XI.34 (BMNH); 6 ex., Burma, Mishmi Hills, 28º14'N/95º59'E, 1935, M. Steele (BMNH); 1 ex., Upper Burma, Hkamti Long, IV.–V.1935 (BMNH); 6 ex., Upper Burma, Nam Tai Valley, 27º42'N/97º54'E, 2.VIII.1938, R. Kaulback (BMNH); 1 ex., Burmah, 21º54'N/95º57'E, Andrewes Bequest, B. M. 1922-221 (BMNH); 3 ex., Tenasserim, Javoy, Fry Coll. (BMNH); 1 ex., Tharrawaddy, Burma, 17º39'N/95º48'E, 1902.294 (BMNH); 1 ex., U. Burma, Kyauktau, 20º51'N/92º58'E, Sehwebo Dn. HGC (BMNH); 1 ex., Burma, Toungoo, 18º56'N/96º25'E, 1902.294 (BMNH). – **Cambodia.** 1 ex., Cambodia, Peal-Leap, 11º42'N/103º02'E, V.1950 (BMNH). – **China.** 4 ex., China, Kanton, 23.4ºN/113.5ºE, 1.–30.X.1916, leg. H. Weigold (MNHU); 2 ex., SW. China, Yunnan, 4.VIII.1922, Prof. J.W. Gregory (BMNH); 1 ex., S.W. China, Yunnan, 25º02'N/102º42'E, 1.VIII.1922. Prof J.W. Gregory (BMNH); 2 ex., China, Anoy, 35º51'N/104º11'E, 1923, S. F. Light (BMNH); 2 ex., Fokien (MNHU); 3 ex., China-Yunnan Prov., Lijian env., 25º02'N/102º42'E, 10.VIII.1995, J. Scheider lgt. (CJB); 3 ex., Chusan Is., China, 30º10'N/122º24'E, J. J. Walker (BMNH); 10 ex., China, Yunnan, Menghai, 21º58'N/100º28'E, 6.–10.III.1999, River, Leg. P. Grootaert (IRSN); 3 ex., China (BMNH). – **Hong Kong.** 5 ex., Hong Kong, 22º22'N/113º56'E, Walker Coll. (BMNH); 2 ex., Hong Kong; Tai Lung Farm, IX-XI.1965, I. W. B. Thornton, 92-54 (BMNH); 1 ex., Hong Kong, 22º23'N/114º6'E, Stimpson (NNML); 1 ex., Hong Kong, 22º23'N/114º6'E, 92-54 (BMNH). – **India.** 32 ex., India, C. Almora; Ranikhet; Kumaon, W. Almora, 29º35'N/79º39'E, 5.–8.16, H. G. C. (BMNH); 14 ex., U. Gumti Val., W. Almora Dn. 29º35'N/79º39'E, Augt. 1917; Apr. 19, H.G.C. Champion Coll., B.M. 1953-156 (BMNH); 1 ex., India, Bhowali, Nr. Naini Tal, 4500 ft., 29º22'N/79º31'E, 21.X.1934 (BMNH); 4 ex., Assam, Mishmi Hills, Delai Valley, Taphlogam, 28º14'N/95º59'E, 7.XI.1936 (BMNH); 1 ex., India, Dacca, 23º42'N/90º22'E, 7.IX.1945, D. Leston, B.M. 1945-86 (BMNH); 13 ex., S. India, Nilgiri Hills, Cherangode, 3500 ft., 11º25'N/76º30'E, X.1950, P. Susai Nathan (IRSN); 45 ex., S. India, S. Coorg Ammanit, 3100

ft, 12º25'N/75º44'E, XI.1950–II.1952, P. Susai Nathan (IRSN); 4 ex., S. India, Coimbatore, 11º1'N/76º58'E, VII.1950, P. Susai Nathan (IRSN); 1 ex., British-Nepal Exped., 1950 (BMNH); 1 ex., Nepal, Rimi, 29º07'N/82º34'E, 1000 ft., 28.IX.1952 (BMNH); 1 ex., West Nepal, Silgarhi-Doti, Kali Gad, 29º16'N/80º59'E, 26.VII.1953, J.B. Tyson (BMNH); 24 ex., S. India, Kodaikanal Pulney Hills, 6500 ft, 10º12'N/77º30'E, V.1953, P. S. Nathan (IRSN); 1 ex., Nepal, Pokhara, 3000 ft., 28º15'N/83º58'E, 12.IV.1954, J. Quinlan (BMNH); 9 ex., Assam, Sudiya, Doherty, 27º50'N/95º40'E, Fry Coll. (BMNH); 4 ex., Assam, Patkai Mt., 21º05'N/91º13'E, Doherty (BMNH); 2 ex., India, Malabar, 10º15'N/75º14'E, Doherty, Fry Coll. (BMNH); 14 ex., India, Baly Coll. (BMNH); 2 ex., N. E India, Arunachal PR. 8km S Jamiri. SESSA vicinity, 28º14'N/94º4'E, 26.V.–4.VI.2005, L. Dembicky leg. (BMNH); 1 ex., S. India, Nilgiri Hills, 11º25'N/76º30'E, TV Champbell (BMNH); 6 ex., India, Haldwani Div., Kumaon, 29º13'N/79º31'E, H. G. C. (BMNH); 1 ex., Punjab, Kangra Vall., 1903-37 (BMNH); 2 ex., Dahra Dun, U. P. India, 30º18'N/78º2'E (BMNH); 1 ex., India, Punjab, Simla, 31º6'N/77º10'E, E. C. Ansorgee, B. M. 1922-455 (BMNH); 14 ex., Nilgiri Hills, 11.35ºN/76.42ºE, H. I. Andrewes (BMNH); 2 ex., Sikkim, Gopaldhara, Rungbong Vall., H. Steven (BMNH); 2 ex., Travancore, Wallardi, 37ºN/144.89ºE, Collection J. Achard (BMNH); 1 ex., Himalaya, Chaubattia, Almora District, 6-7000 ft., 29º35'N/79º39'E, S.R. Archer, 1920-175 (BMNH); 1 ex., Taplejung District, Sengu 27º21'N/87º40'E, c 6200' (BMNH); 1 ex., Assam, 26º12'N/92º56'E, Doherty (BMNH); 1 ex., Deli, 3º35'N/98º39'E, S. V. L (NNML). – **Indonesia.** 1 ex., Java Orient, Montes Tengger, 4000ft, 1890, H. Fruhstrofer (NNML); 31 ex., Sumatra, Manna, 4º30'S/102º58'E, 1902, M. Knappert; Museum Leiden, ex. Collection J.J. de Vos tot Nederveen Cappel (NNML); 11 ex., Nias Island, Schreiber, 1º07'N/97º31'E, Sharp Coll. 1905-313 (BMNH); 1 ex., Slawi Tegal, Java, 6º59'S/109º08'E, 1909, Valck Lucassen (NNML); 3 ex., Java, Nongkodjadjar, 7º38'S/112º54'E, Jan. 1911, E. Jacobson (NNML); 1 ex., Java, Mount Salak, 7º46'S/112º56'E, 400 M, 1921, L.G.E. Kalshoven (IRSN); 1 ex., Java, Tengger, 6º58'S/111º17'E, 4000, Coll. Duvivier (IRSN); 1 ex., Java, 24.XII.1925 (IRSN); 1 ex., Sumatra, Mjoberg, Kota Tajne (NHRS); 3 ex., C. Java, Kedae Pagar, Saemang, 800m, 2.III.32, D.V.L (NNML); 5 ex., Sumatra, Mjoberg, Brastagi, 1º17'S/102º40'E (NHRS); 6 ex., Sumatra, Mjoberg, Medan, 3º35'N/98ºE (NHRS); 2 ex., Sumatra, Mjoberg, Tjinta Radja (NHRS); 1 ex., Sumatra, Mjoberg, Perdagangan (NHRS); 1 ex., Java, 7º36'S/110º42'E, (NHRS); 1 ex., Sumatra, Siboga, 1º44'N/98º46'E, X.90–III.91, E. Modiglianii (BMNH); 3 ex., Sumatra, Pagherang Pisang, X.90–III.91, E. Modiglianii (BMNH);

1 ex., Sumatra, Nias, 1º07'N/97º31'E, Fry Coll. 1905.100 (BMNH); 1 ex., Sumatra, Soekaranda, Dohrn, Jacoby Coll. 1909-28a (BMNH); 5 ex., Java, K.R.H. (NNML); 1 ex., W. Java (NNML); 4 ex., Java, Batavia, 6º12'S/106º50'E, Sythoff (NNML); 2 ex., Bandar Baroe, Sumatra, 5º15'N/96º04'E, J.J.d.V (NNML); 1 ex., Java, Preange, Tjigembong, 6º42'S/110º56'E, J. B. Corporaal (NNML); 15 ex., N.O. Sumatra, Tandjong Morawa Serdang, 0º35'S/101º18'E, Dr. B. Hadgen (NNML); 40 ex., Nias, 1º07'N/97º31'E, J.D. Pasteur (NNML); 1 ex., Java, Kraksakun (NNML); 3 ex., Java, Kerkhoven, 1921, (Panoembang, ardayasari) (NNML); 14 ex., Java, Ardja-Sari, Preanger; 7º03'S/107º38'E, P. F. Sitjhorf (NNML); 1 ex., 23.VII.1938, H. M. Pendlebury (BMNH); 1 ex., Tangk-Prahoe, 6.VI.1933, P. H. V. Doesburg (NNML); 1 ex., Java, G. Oengaran, 7º11'S/110º20'E, v. Doesberg (NNML); 1 ex., Java, G. Kawi, 7º55'S/112º27'E, Juli 1934, v. Doesberg (NNML); 1 ex., Bremi (Probulingga), 7º58'S/113º29'E, 1000m, XI.1934, W. C. v. Heuton, Museum Leiden ex. Collection, S. J. van Ooststroom, rec. 1982 (NNML); 1 ex., G. Gede, Pontiek, 6º46'S/106º56'E 1485m, 2.V.1948, Dr. L. Kalshoven (NNML); 2 ex., West Java, Puntjak, 6º39'S/106º56'E, 1400m, 27.IX.1953 J. van. Der Vocht (NNML); 1 ex., Java, Ameyer (NNML); 1 ex., Java, Lembang, 6º49'S/107º37'E, Juni 33, v. Doesburg (NNML); 1 ex., Kediri, 7º49'S/112º0'E, Java de Vos (NNML); 6 ex., W. Java, Tjibadas, 7.19ºN/107.36ºE V.1950, v. Ooststroom, Museum Leiden ex. Collection, S. J. van Ooststroom, rec. 1982 (NNML); 1 ex., Central Java, 7º09'S/110º08'E, 4.III.27, 2093m, Rensch (MNHU); 1 ex., Java Central, Bandar, 7º09'S/110º08'E, 550m at light, 20.I.1998, R. Cervenka lgt. (CJB); 1 ex., N. Sumatra, Susuk, 3º09'N/98º21'E, 29.V.1994, leg. Muruyama (CTJ); 1 ex., N. Sumatra, Silalahi alt. 1600m nr D. Toba, 2º19'N/98º43'E, 2.V.1998, leg. Muruyama (CTJ); 1 ex., Sumatra, Brastagi, 3º22'N/98º34'E, Mjoberg (NHRS). – **Japan.** 1 ex., Japan, 36º12'N/138º15'E, C. Lewis 1910-320 (BMNH). – **Malaysia.** 1 ex., Sarawak, Bidi, 2º33'N/113º01'E, 28.I.1909, C. J. Brooks, B. M. 1936-681 (BMNH); 4 ex., Malacca, 2º19'N/102º20'E, Coll. Duvivier; Coll. Chapuis (IRSN); 1 ex., Bengal Occ. Betana, 1890, Coll. Duvivier (IRSN); 1 ex., Malay Penin., Selangor F. M. S., Gombak Valley, 3º17'N/101º38'E, 17.X.1921, H. M. Pendlebury (BMNH); 2 ex., Pahang, F. M. S. Kuala Tahan, 4º22'N/102º24'E, 19.XI.1922, H. M. Pendlebury (BMNH); 1 ex., South China Sea, Pulau Tioman, Sedagong, 900', 2º47'N/104º10'E, V.1927, N. Smedly (BMNH); 1 ex., Malay Penin., Kedah Perak, 5º53'N/100º31'E, 23.III.1928 (BMNH); 1 ex., Perak, F. M. S. Larut Hills, 4500 ft., 4º47'N/100º45'E, 20.II.1932, H. M. Pendlebury (BMNH); 1 ex., Malay Penin,

Pahang, Fraser's Hill, 3º46'N/101º45'E, 25.X.1933, Pine trees (BMNH); 3 ex., Pahang, F.M.S. Cameron Highlands, 4800 ft., 4º29'N/101º23'E, 22.VI.1935; 1 ex., Malaysia, Pulau Tioman, 2º47'N/104º10'E, TEKEK, 24.III.1987, T.E. Leiler (NHRS); 1 ex., Malaysia, Tapah, 4º12'N/101º15'E, 27.II.1974, Y. Kiyoyama (BMNH); 1 ex., Malaysia, Cameron Highlands, 4º29'N/101º23'E, 6.I.1982 (BMNH); 1 ex., N. Borneo Exp., Sabah, Interior zone, 5.1ºN/115.59ºE, 16 km of Tenom Agric. Res. Station along Sg. Pegalan, 5.1ºN/115.59ºE, 200, 23.XI.1987, J. Huisman & R. de Jong (NNML); 1 ex., Malay Penin., Kuala Lumpur, 3º08'N/101º41'E (BMNH); 1 ex., Malaysia, Fraser Hill, 3º46'N/101º45'E, 21.II.1991, RM exped. (NHRS); 1 ex., Kedah, Langkawi, Lubuk Semilang, 6º21'N/99º47'E, 8.–10.XII.1992, Zabidi et al.(UKM); 2 ex., Perak, Banding, 4º47'N/101º11'E, 2.XI.1991, Ismail et al. (UKM); 3 ex., Perak, Pangkalan Hulu, 5º42'N/100º59'E, XI.1991II.1993, Ismail et al. (UKM); Pahang, Tasik Bera, Pos Iskandar, 3º07'N/102º36'E, 4.–8.V.1993, Sham et al. (UKM); 1 ex., Pahang, Pulau Tioman, 2º47'N/104º10'E, 18.–21.IX.1999, Ismail & Sham (UKM). – **Philippine.** 1 ex., Palawan, P. Princess, 9º26'N/118º22'E, Baker (NHRS); 4 ex., Luzon, 16º'N/121º'E, 38765 (MNHU). – **Singapore.** 4 ex., Singapore, 1º21'N/103º49'E, C.J. Saunders, B.M. 1933-227 (BMNH). – **Sri Lanka.** 3 ex., Ceylon, 7º52'N/80º46'E, T.B. Tetcher 1909-80 (BMNH); 1 ex., Ceylon, Halupahani, Haldummulle, 6.76ºN/80.88ºE, 1904-171 (BMNH); 3 ex., Ceylon, A. Rutherford, 1914-482; TB Fletcher, 1909-80 (BMNH); 4 ex., Ceylon, Hambantona, 6º07'N/81º07'E, IX.90, H.P Green, 1916-157 (BMNH); 1 ex., Ceylon, Kalawewa, 8º01'N/80º33'E, 14.II.1953 (BMNH); 1 ex., Ceylon, Dickoya 20km WSW, Nuwara Eliya, 6º52'N/80º36'E, 28.III.1973, leg G. Benick (MNHU); 2 ex., Sri Lanka NWP Kur. D Pannala, 2.II.1974, P.I. Perrson NRM (NHRS); 4 ex., Ceylon, Colombo on Coast level, 6º56'N/79º50'E, 7.–27.IV.82, G. Lewis, 1910-320 (BMNH); 1 ex., Ceylon, Kandy, 7º17'N/80º38'E, 1546-1727 ft., 17.–23.II.82, G. Lewis, 1910-320 (BMNH); 1 ex., Kitulgalle, 6º59'N/80º25'E, 1700 ft., 17.–20.I.82 (BMNH); 1 ex., S. Sri Lanka near Tissamaharama, 90km near NE of Matara, 6º17'N/81º17'E, 14.III.1994, Z. Kajval lgt. (CJB); 3 ex., Ceylon (MNHU). – **Thailand.** 1 ex., C. Siam, 150m, Kwae Nov River. Exp. Niki, 14º19'N/98º57'E, 23.IV.–5.V., J.K. Jonkers 1946 (NNML);); 21 ex., S. India, Annamalai Hills Cinchona, 10º02'N/77º07'E, 3500ft, V.1952, IV.1964, V.1968, P. Susai Nathan (NNML); 2 ex., Thailand, 25km NM v. Lan-Sak, 15º27'N/99º34'E, IX.1990 (MNHU); 2 ex., N. Thailand, Mae Hong San env. Ban Huai Po, 18º44'N/97º52'E, 1700m, 24.–30.VI.1993, J. Schneider lgt (CJB); 3 ex., Thailand, Loei Chiang Khan, 17º50'N/101º45'E, 11.II.1999, Silt, leg P. Grootaert (IRSN); 4

ex., Siam, Renong, Doherty (BMNH);. – **Vietnam.** 6 ex., Hanoi, 21º02'N/105º51'E, 1903, Coll. Veth (NNML); 8 ex., Tonkin, Hoa Binh; Hanoi, II.–VI.1917; VIII.1918, R.V. de Slavaza (BMNH); 1 ex., Tonkin, Bao Ha, X.–XII.1923, H. Stevens (BMNH); 3 ex., Tonkin, Thai-Nien Basin of Fleuve Rouge, 1924, H. Stevens (BMNH); 1 ex., Annam, Phuc-Son, Nov–Dez, H. Fruhstorfer (NNML); 2 ex., Central Tonkin Chiern-Hoa, Aug. Sept., H. Fruhstorfer (NNML); 1 ex., Tonkin, 19º45'N/107º45'E, Coll. Mandon (IRSN); 2 ex., Haut-Tonkin, Madon, Riviere Claire, 19º45'N/107º45'E (IRSN); 2 ex., Hanoi, 21º1'N/105º51'E (IRSN); 1 ex., Saigonh (IRSN); 1 ex., Vietnam, Prov. Lao-Cai, 22º20'N/104ºE, 1900m, 26.IX.1963, leg. MAI (MNHU); 1 ex., Vietnam N., Huong Son Prov. Ha Son Bin, 21º27'N/105º59'E, 26.–29.IV.1991, Strand J. lgt. (CJB). – 5 ex., Coll. Duvivier; Coll. Chapuis (IRSN); 5 ex., Barway, P. Cardon, Coll. Duvivier (IRSN); 2 ex., Berhampur (BMNH); 1 ex., Da-laen-saen nr Nong-po, Walker Coll. 93-18 (BMNH); 1 ex., vR-d, Jad. Bov, Coll. Veth (NNML); 4 ex., Soereol, 7.78 (NNML).

***Monolepta flavofasciata* Jacoby, 1889**

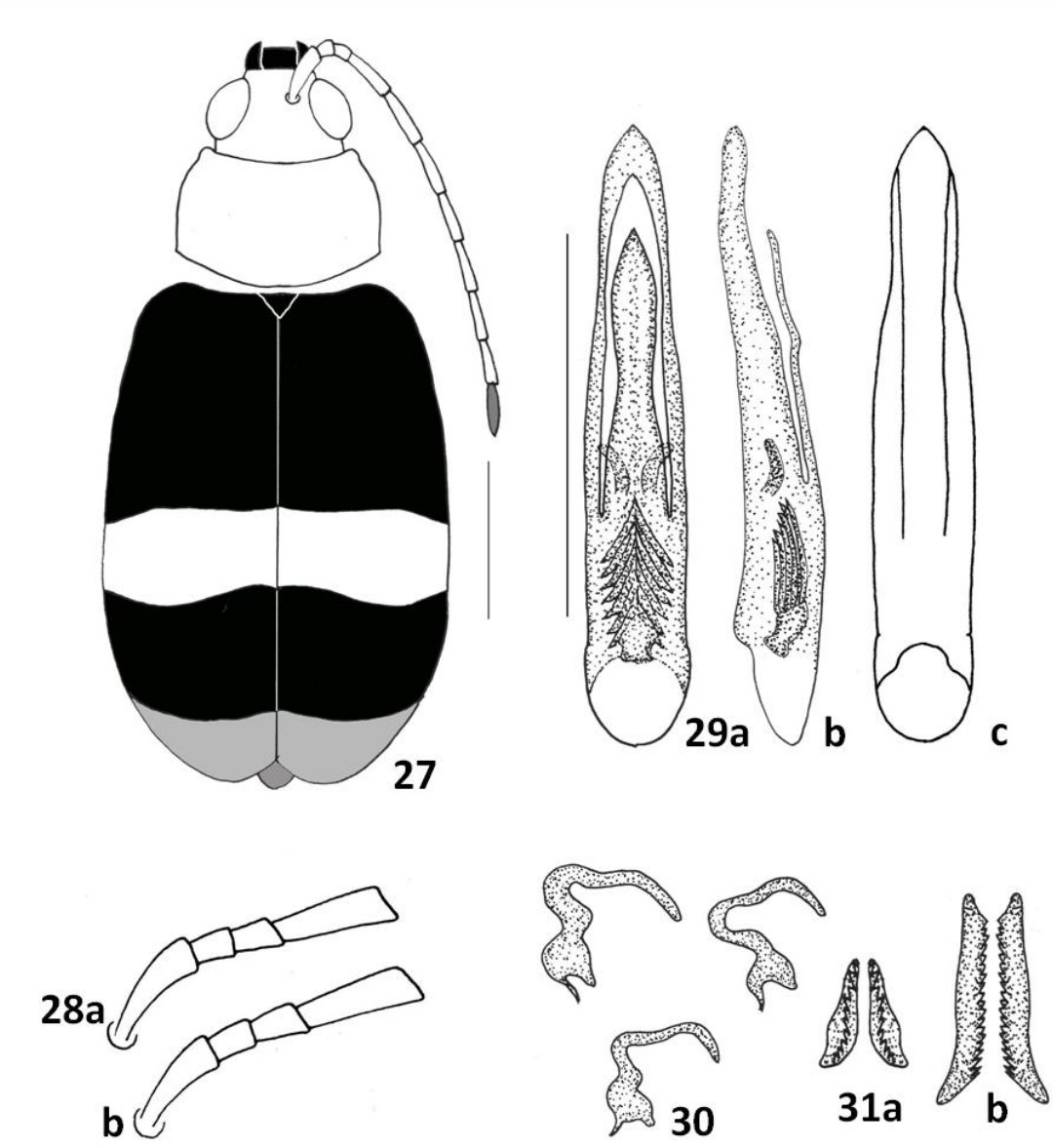
Figs 27–33

Monolepta flavofasciata Jacoby, 1889: p. 229.

Total length. 4.30–5.80 mm (mean: 5.05 mm; n=10).

Head. Finely punctuated and entirely pale yellow. Labrum and mandible black. Antennae slender and extending almost to the middle of the elytra, pale yellow and only terminal antennomere partly dark brown (Fig. 27). First antennomere club shaped, second and third antennomere almost the same length; ratio length of second to third antennomere: 0.75–1.00 (mean: 0.88); ratio length of third to fourth antennomere: 0.44–0.50 (mean: 0.47) (Fig. 28).

Thorax. Pronotum impunctate, entirely pale yellow, parallel-sided and a bit widened posteriorly. Pronotal width: 1.40–1.80 mm (mean: 1.60), ratio length to width: 0.56–0.58 (mean: 0.57). Scutellum, meso- and metathorax black. Elytron finely punctuated, black with a broad yellowish transverse band on the middle and brown-reddish band on apical. Elytra length 3.40–4.60 mm (mean: 4.00), maximal width of both elytra together 2.50–3.30 mm (mean: 2.90), ratio of maximal width of both elytra together to length of elytra 0.72–0.74 (mean: 0.73) (Fig. 27). Fore leg yellow, mid and hind leg blackish.



Figs 27–31. *Monolepta flavofasciata* Jacoby, 1889. – 27. dorsal colour pattern; 28. antennae, (a) male; (b) female; 29. median lobe: (a) dorsal; (b) lateral; (c) ventral; 30. three different spermathecae; 31. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

Abdomen. Pale brown.

Male genitalia. Median lobe of this species is comparatively small. The median lobe slender, parallel-sided at basal and narrow at the apical half. Tectum short and narrow at

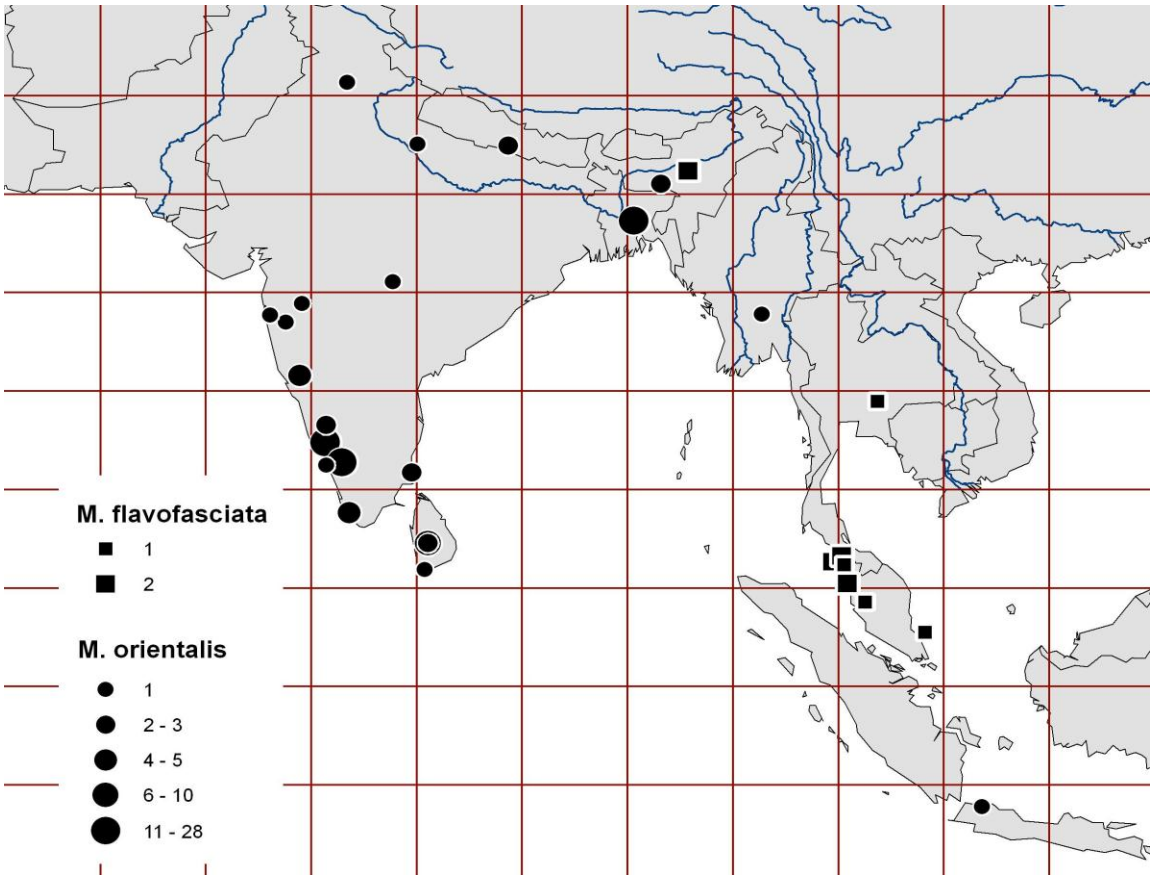


Fig. 32. Distribution of *M. flavofasciata* Jacoby, 1889 and *M. orientalis* Jacoby, 1889.

the apical half, from lateral view, folded at the basal half of tectum. Ventral groove parallel sided towards basal. Ventral spiculae weakly sclerotised and invisibly clear, while lateral spiculae tube-like structure, curving to the margin side, and median spiculae consist of long and slender filamentous-like. Sacculus occurs at the basal of median lobe (Fig. 29).

Female genitalia. Spermatheca with rounded nodulus, and short slender tube-like protruding from the nodulus, median part is slender and very long, cornu curved and at the apex, blunt hook-shaped (Fig. 30). Bursa sclerites consist of two pairs, dorsal part is smaller and ventral part is elongated and finely undulate at the outer margins (Fig. 31).

Diagnosis. *Monolepta flavofasciata* is most similar to *M. orientalis*. Both species are medium size (*M. flavofasciata* 4.30–5.80 mm; *M. orientalis* 4.10–5.80 mm) and have transverse yellowish band in the middle of elytra. *Monolepta flavofasciata* has narrow yellowish transverse band while *M. orientalis* has broader yellowish transverse band (Figs 27, 34). The differences between these two species can be seen on the coloration of

Fig. 33. Photographs of the lectotype of *Monolepta flavofasciata* Jacoby, 1889; a. with labels, b. detail. (Photos from the website http://insects.oeb.harvard.edu/mcz/).

scutellum, which is black in *M. flavofasciata* and brown-reddish in *M. orientalis*. The characteristic of median lobe are different (Figs 29, 36) and spermatheca possesses rounded nodulus in both species (Figs 30, 37).

Distribution. This species is distributed in Eastern India, Malaysia and Thailand (Fig. 32).

Type material. Lectotype: Birmania, Fea x 1885, 1st Jacoby Coll., Monolepta flavofasciata Jac., Type 18444 (MCZH) (Fig. 33). Jacoby gave no data on number of specimens in his original description, but there is indication that at least more than one specimen was studied. I herein designate a lectotype to fix the name on a single specimen.

Further materials examined. – India. 2 ex., Assam, Palkai, 26º12'N/92º56'E, Fry Coll. 1905.100, Doherty (BMNH). **– Malaysia.** 1 ex., Penang, 5º15'N/100º29'E, G. E. Bryant, XI.1913 (BMNH); 1 ex., Malay Penin. Kedah, Alor Star, Gunong Keriang, 6º11'N/100º19'E, 1.IV.1928 (UKM); 1 ex., Malay Penin. West Coast, Langkawi Is., 6º21'N/99º48'E, 25.IV.1928 (BMNH); 1 ex., Perak, Tapah, Lata Iskandar, 4º19'N/101º19'E, 3.–4.IV.1990, Zaidi, Ismail, Ruslan (UKM); 1 ex., Pahang, Pulau Tioman, 2º47'N/104º08'E, 16.–18.VIII.1994, Ismail & Jazmi (UKM); 2 ex., Kedah, P. Langkawi, Lubuk Sembilang, 6º21'N/99º48'E, 20.V.1995, Ismail, Ruslan & Sham (UKM); 2 ex., Perlis, Taman Negeri Wang Klian, 6º40'N/100º11'E, 29.IX.–4.X.1999, Zaidi, Ismail, Azman (UKM); 1 ex., Island of Penang, 5º15'N/100º29'E, Baker (NHRS). **– Thailand.** 1 ex., E. Thailand, Nakhon Ratchasima Prov., Sakaerat Biosphere Reserve, 14º30'N/101º55'E, VI.1995, BMNH (E) 1997–07, Ghazoul & Inward.

***Monolepta orientalis* Jacoby, 1889**

Figs 34–39

Monolepta orientalis Jacoby, 1889: p. 227.

= *Monolepta konbiriensis* Duvivier, 1891: p. 47 (Maulik, 1936: p. 407).

Total length. 4.10–5.80 mm (mean: 4.68 mm, n=10).

Head. Impunctate, entirely yellow-brownish. Labrum and mandible black. Antennae slender, extending almost to the middle of elytra, entirely yellow-brownish, last antennomere a bit blackish at apex (Fig. 34). First antennomere club-shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.75–1.00 (mean: 0.97); ratio length of third to fourth antennomere: 0.30–0.44 (mean: 0.37) (Fig. 35).

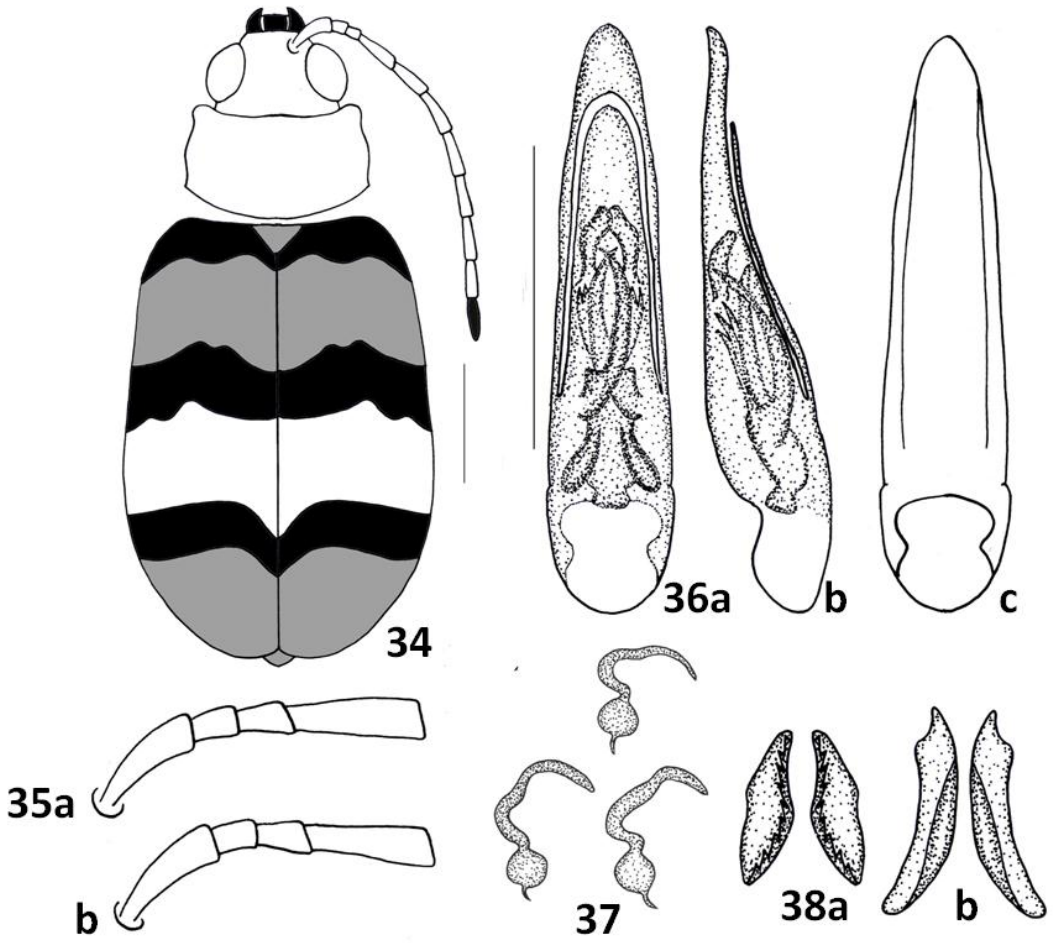
Thorax. Pronotum finely punctuated, entirely yellow-brownish. Pronotal width: 1.20–1.80 mm (mean: 1.52), ratio length to width: 0.55–0.59 (mean: 0.58). Scutellum brown-reddish. Meso- and metathorax brown-reddish and partly black. Elytron brown-reddish with a broad yellowish transverse band placed immediately below the middle, bounded above and below by a narrow black band, and another narrow black band is placed across the basal margin. In few specimens, elytra black with one transverse brown-reddish band on the first basal. Elytra length 2.90–4.50 mm (mean: 3.68), maximal width of both elytra together 2.10–3.50 mm (mean: 2.73), ratio of maximal width of both elytra together to length of elytra 0.70–0.78 (mean: 0.74) (Fig. 34). Legs yellow-brownish, the four posterior femora spotted with black, the posterior tibiae nearly entirely black.

Abdomen. Brown-reddish.

Male genitalia. Median lobe parallel-sided, broad on basal and becomes narrow towards apex. Tectum long but not reaching the apex of median lobe. The differentiation of three spiculae visibly clear. Lateral spiculae elongated, median spiculae long and curved to the middle, like horn on dorsal view. Ventral spiculae elongated club shaped, jagged at apex. Sacculus occurs at the basal of median lobe (Fig. 36).

Female genitalia. Spermatheca comparatively small, nodulus small and rounded. Median part and cornu long and curve (Fig. 37). Two pairs of bursa sclerites present, evenly sclerotised (Fig. 38).

Diagnosis. *Monolepta orientalis* can be easily distinguished by the coloration pattern on the elytron. The tricolorous on elytron is mostly similar to *M. flavofasciata*. The size (*M. orientalis* 4.10–5.80 mm; *M. flavofasciata* 4.30–5.80 mm) and ratio length to width of pronotum (*M.*



Figs 34–38. *Monolepta orientalis* Jacoby, 1889. – 34. dorsal colour pattern; 35. antennae, (a) male; (b) female; 36. median lobe: (a) dorsal; (b) lateral; (c) ventral; 37. three different spermathecae; 38. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

orientalis 0.55–0.59; *M. flavofasciata* 0.56–0.58) is also not much different between these two species. Despite of the similarity, some differences occur especially on the coloration of underside, brown-reddish and partly black in *M. orientalis* and usually black in *M. flavofasciata.* The characteristic of median lobe are very different between these two species (Figs 29, 36).

Distribution. This species is widely distributed in the north-western part of Oriental region, especially in India (Fig. 32).

Type material.

Monolepta orientalis: Lectotype: Monolepta orientalis Jac., India, 1st Jacoby Coll., Type 18437 (MCZH) (Fig. 39). Jacoby gave no data on number of specimens in his original description, but there is indication that at least more than one specimen was studied. I herein designate a lectotype to fix the name on a single specimen.

Monolepta konbiriensis: Type material is not available to me. I adapt Maulik's (1936) statement that this species is synonym with *M. orientalis* Jacoby, 1889.

Further materials examined. – **Bangladesh.** 18 ex., Bengal, Mandar, 23º41'N/90º21'E, VII.91, P. Cardon (IRSN); 5 ex., Belgaum, 15º51'N/74º30'E, 91 (BMNH); 2 ex., Bengal, 23º41'N/90º21'E (BMNH). – **Burma.** 1 ex., N. Toungoo, L. Burma, 18º56'N/96º25'E, XII.26, H. G. C. (BMNH). – **Indonesia.** 1 ex., Batavia, Tanjong Priok, 6º07'S/106º52'E, 90-80 (BMNH). – **Malaysia.** 1 ex., Malay Penin., West Coast, Langkawi Is., 6º21'N/99º47'E, 28.IV.1928 (BMNH); 1 ex., Kedah, Pulau Langkawi, H. Teluk Datai, 6º23'N/99º42'E, 20.V.1992, Ismail et al. (UKM); 1 ex., Pahang, Pulau Tioman, 2º47'N/104ºE,16.–18.VIII.1994, Ismail & Jasmi (UKM); 2 ex., Perlis, Taman Negeri Wang Klian, 6º40'N/100º11'E, 29.IX.–4.X.1999, Zaidi et al. (UKM); 1 ex., Malay Penin., (BMNH); 1 ex., Island of Penang, 5º15'N/100º29'E, Baker (NHRS). – **India.** 1 ex., India, Deolali, 19º28'N/74º37'E, 1.I.1922, Maj. J. E. M. Boyd (BMNH); 28 ex., South India, S. Coorg-Ammatti, 3100 ft., 12º25'N/75º44'E, II.–XI.1952, P.S. Nathan (IRSN); 1 ex., India, 20º35N/78º57E (IRSN); 1 ex., S. Indien, Anamalai Hills, Cinchona 3500 ft., V.1967, P. S. N. (MNHU); 2 ex., South India, Karnataka State, Chikmagalur, 13º18'N/75º46'E, V.82, 4000ft., T. R. S. Nathan (CJB); 3 ex., Nepal, Chitwan Nat. Pk., 700', 27º29'N/84º24'E, 3.–6.VI.1983, Sauraha, at MV light (BMNH); 1 ex., North Indien, 600 m Uttar Pradesh, Shiwalik Kette, 13 km SW Dehra Dun, 27º34'N/80º05'E, 20.VIII.1985, J. Schulze (MNHU); 1 ex., India, Kerala, 27 km S. Calicut, Univ. Calicut Botanical Garden, 11º15'N/75º46'E, 6.X.1985, N. F. Johnson, D. C. Darling (CJB); 1 ex., N. India, Chandigar, 30º43'N/76º46'E, VIII.1986, K. Werner (MNHU); 1 ex., India, Pune, 18º31'N/73º51'E, II.–IX.1997, H. V. Ghate, IIE 23765 (BMNH); 1 ex., Kanara (BMNH); 2 ex., Khasia Hills, 25º34'N/91º39'E (BMNH); 1 ex., Bombay, 18º54'N/73º05'E (BMNH); 1 ex., Nandidrug, S. India, T. V. C (BMNH); 19 ex., Nilgiri Hills, 11º25'N/76º30'E, G. F. Hampson, H. L. Andrewesi, A. K. Weld Downing, 94-89 (BMNH); 2 ex., South India, Pondicherry State. 10º55'N/79º50'E, Karikal (MNHU); 1 ex., South Mysore, H. L. Andrewes (BMNH); 4 ex., Travancore, Wallardi, Collection J. Achard (BMNH); 1 ex., Nilgiri Hills, 11º25'N/76º30'E, A. K. Weld Downing (BMNH). – **Sri Lanka.** 1 ex., Ceylon,

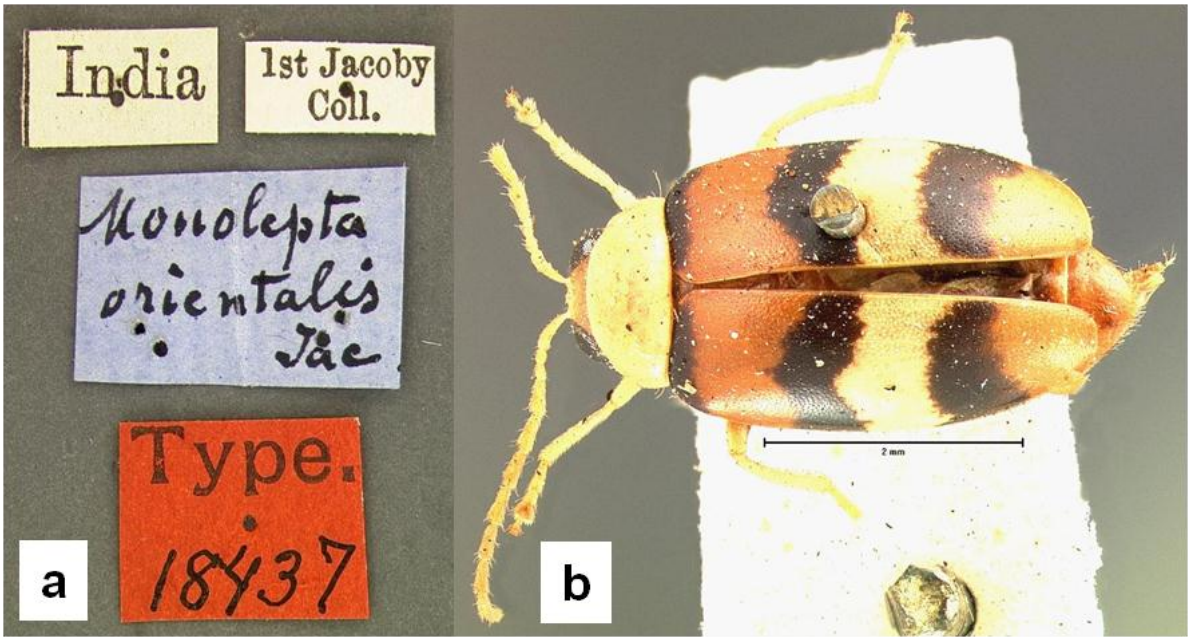


Fig. 39. Photographs of the lectotype of *Monolepta orientalis* Jacoby, 1889; a. with labels, b. detail. (Photos from the website http://insects.oeb.harvard.edu/mcz/).

Weligama, 5º58'N/80º26'E, 1899, W. Horn (MNHU); 10 ex., Ceylon, Kandy, 7º18'N/80º36'E, VI.–IX.1907/1916, G. E. Bryant (BMNH); 3 ex., Ceylon, 7º18'N/80º36'E, 30388 (MNHU). 4 ex., Ayur, North Salem, VII.–II.1930/31, F. R. I. Sandal, Insect Survey (BMNH); 2 ex., Fraserpet, Coorg., VII.1930, F. R. I. Sandal, Insect Survey (BMNH); 3 ex., Konbi (MNHU); 7 ex., Band., Horn (MNHU).

***Monolepta marginicollis* Jacoby, 1896**

Figs 40–44

Monolepta marginicollis Jacoby, 1896: p. 485.

Total length. 3.25–4.00 mm (mean: 3.55 mm, n=10).

Head. Impunctate, yellow-brownish, and vertex with short central black stripe. Labrum and mandible black. Antennae slender, extending almost to the middle of elytra, blackish, and only three basal antennomere yellow-brownish (Fig. 40). First antennomere club shaped, third antennomere a bit longer than second antennomere; ratio length of second to third

antennomere: 0.67–0.75 (mean: 0.73); ratio length of third to fourth antennomere: 0.38–0.44 (mean: 0.42) (Fig. 41).

Thorax. Pronotum finely punctuated, yellow-brownish, margin narrowly black and often longitudinal fulvous black band in the middle. Pronotal width: 1.00–1.20 mm (mean: 1.06), ratio length to width: 0.60–0.64 (mean: 0.62). Scutellum, meso- and metathorax blackish. Elytron finely punctuated, yellow-brownish, margin black. A black spot extending from basal suture to a bit on shoulder, fainted longitudinal darkish stripes on the disc of elytra. Elytra length 2.45–2.85 mm (mean: 2.68), maximal width of both elytra together 1.80–2.10 mm (mean: 1.96), ratio of maximal width of both elytra together to length of elytra 0.71–0.74 (mean: 0.73) (Fig. 40). Legs entirely yellow-brownish.

Abdomen. Yellow-brownish.

Male genitalia. Median lobe slender, parallel-sided. Tectum long, but not reaching the apex of median lobe, ventral groove parallel-sided towards basal. Lateral spiculae of spur and horn-like at the apical one third of median lobe. Median spiculae long and slender, at basal half, and short-slender filamentous-like close to sacculus, ventral spiculae club shaped and jagged at apex. Sacculus clearly visible at the basal one third of median lobe (Fig. 42).

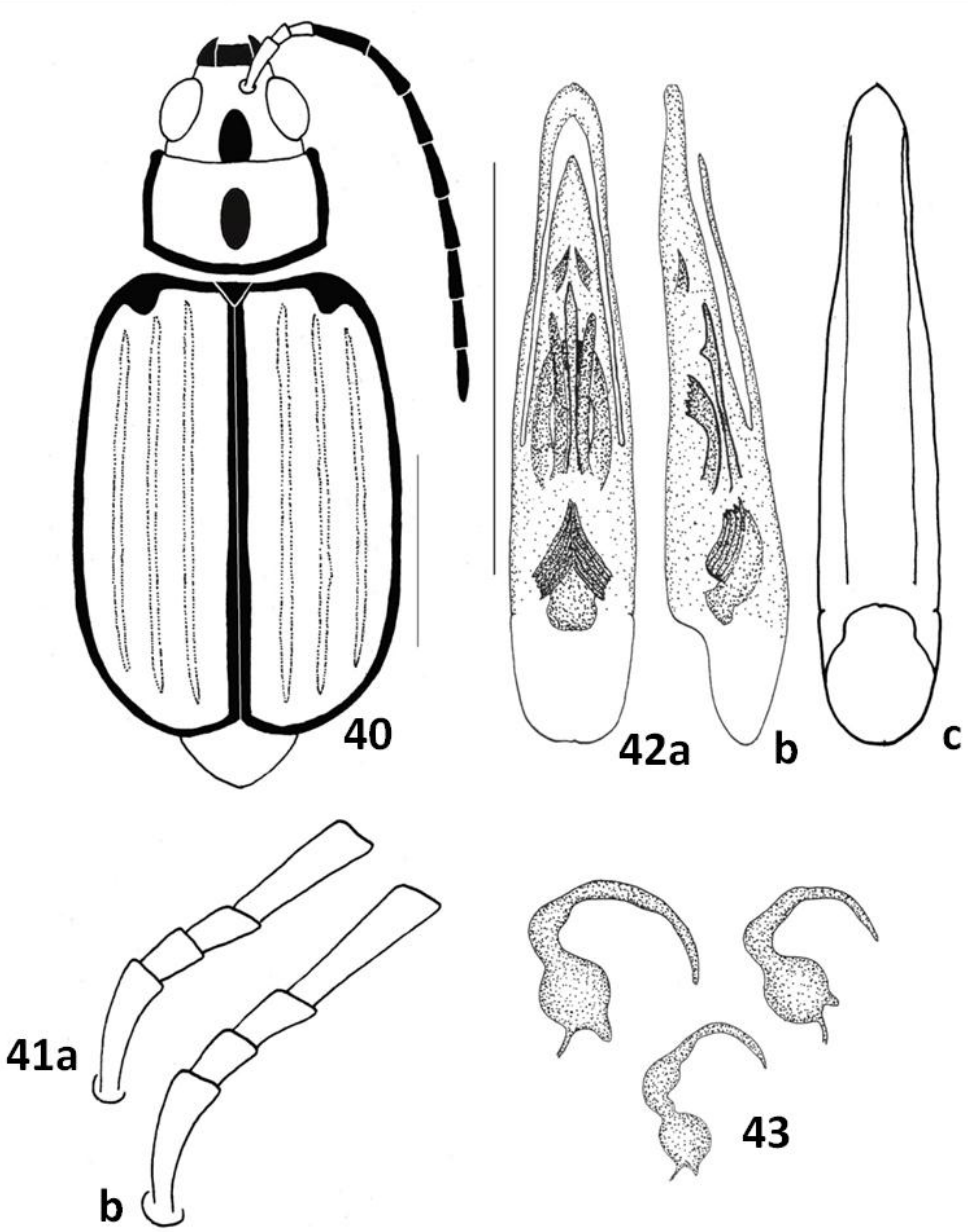
Female genitalia. Spermatheca with rounded and comparatively big nodulus. Cornu long and curved (Fig. 43). Bursa sclerite weakly sclerotised and not visible.

Diagnosis. *Monolepta marginicollis* looks very similar to *M. marginicolloides* new sp. at the first glance. Both species have yellow elytron with a stripy appearance and narrow black on outer elytra margins and suture (Figs 40, 116). The antennae in both species are blackish and only the three basal antennomere yellowish. *Monolepta marginicollis* is on average smaller (3.25–4.00 mm) than *M. marginicolloides* new sp. (3.70–5.10 mm). Other characters that could differentiate these two species is *M. marginicollis* has yellow-brownish head and vertex with short central black stripe, while *M. marginicolloides* new sp. has black head. The characteristic of median lobe is very different between these two species (Figs 42, 118).

Distribution. This species is distributed in Borneo, Malay Peninsular and Sumatra (Fig. 16).

Type material. Lectotype: Co-type, Museo Civ. Genoa, Sumatra Si-Rambe, XII.90–III.91 E. Modigliani, Monolepta marginicollis Jac., Jacoby Coll. 1909-28° (BMNH) (Fig. 44). Type locality: 6º11'S/106º48'E. Jacoby wrote in the original description, “in both specimens before me” indicate that two specimens were studied. I herein designate a lectotype to fix the name on a single specimen.

Further materials examined. – **Brunei.** 4 ex., Brunei, Labi, Bukit Teraja 60 m, Mxt. Dipt.



Figs 40–43. *Monolepta marginicollis* Jacoby, 1896. – 40. dorsal colour pattern; 41. antennae, (a) male; (b) female; 42. median lobe: (a) dorsal; (b) lateral; (c) ventral; 43. Three different spermathecae. Scale bar: 1 mm.

Forest, 4º18'N/114º26'E, 21.VIII.79, B. M. 1983-39, Light trap 1, 75m above ground, S. L. Sutton (BMNH); 1 ex., Brunei, Kuala Belalong F. S. C., Dipterocarp Forest, 4º29'N/115º11'E, 16.VI.91, N Mawdsley NM 292 (BMNH); 2 ex., Brunei, Temburung District Ridge, N. E. of

Fig. 44. Photographs of the lectotype of *Monolepta marginicollis* Jacoby, 1896; a. with labels, b. detail.

Kuala Belalong, 4º37'N/115º8'E, 300 m, X.1992, 125W MV Light Trap, J. H. Martin, BMNH(E)1992-172 (BMNH). – **Indonesia.** 1 ex., N. Sumatra, Bivouac Two, Mt Bandahara, 3º44'N/97º43'E, 5.–10.VII.1972, J. Krikken (NNML). – **Malaysia.** 3 ex., Mt. Matang, West Sarawak, XII.1913–II.1916, G. E. Bryant (BMNH); 1 ex., Malay Penin, Kedah Peak, 16.III.1928 (BMNH); 1 ex., Sarawak, Engkelili, 1º8'N/111º39'E, 27.VIII.67, Vincent Coll. (BMNH); 11 ex., Sabah, Tawau Plat. 1300 ft., 8 m S. Telupid, 5º35'N/117º07'E, 8.IX.1977, M.E. Bacchus, B. M. 1978-48 (BMNH); 19 ex., Sarawak, 4th. Division Gn. Mulu NP, nr. Base Camp 50–100 m., 3º55'N/114º46'E, V.–VIII.1978, P. M. Hammond & J. E. Marshall, B. M.1978-49 (BMNH); 3 ex., Sarawak, Gunong Mulu Nat. Park, 3º55'N/114º47'E, R. G. S. Exped. 24.VI.1977/78, J. D. Holloway et al., B. M.1978-206 (BMNH); 7 ex., Brunei, Bukit Sulang nr Lamunin, 4º39'N/114º44'E, 20.VIII.–10.IX.82, N. E. Stork, B. M. 1982-388 (BMNH); 1 ex., Sabah, Sandakan, Sepilok F. R. (obs tower), 5º51'N/118º0'E, 1.XI.1987, Krikken & Rombaut (NNML); 1 ex., Malaysia-SW, Sabah nr Long Pa Sia (west), 5º20'N/117º10'E, c.1200 m, 2.–14.IV.1987, C. v. Achterberg (NNML); 2 ex., Malaysia, S.E. Sabah nr Danum Valley Field C. 5º25'N/118º23'E, 15.–25.III.1987, C. v. Achterberg & D. Kennedy (NNML); 1 ex., N. Borneo, Sabah, 60 km of Lahad Datu DVFC, EO sg. Segama, 4º58'N/117º48'E, 18.X.1987, J. Huisman & R. de Jong (NNML); 1 ex., Pahang, Kuala Lompat, 3º41'N/102º11'E, 26.–27.VIII.1990, Fog Malathion, Mahbob (UKM); 1 ex., Sabah, Lembah Danum, 5º25'N/118º23'E, 3.–5.XII.1991, Zaidi et al. (UKM); 1 ex., N. Borneo, Trus Madi, 5º43'N/116º25'E, 11.IV.1993, H. Karube (CTJ); 1 ex., Sarawak, Lundu, T. Negara Gunung Gading, 1º44'N/109º50'E, 22.–27.IV.94, Salleh dan Ismail (UKM); 3 ex., Borneo, Mt.

Tibang, 1700 m, Mjoberg (NHRS); 1 ex., Malaysia, W. Perak, 25 km NE Ipoh, Banjaran Titiwangsa Mts. Korbu, 4º41'N/101º18'E, 6.–12.V.2001, M. Riha (CJB).

***Monolepta militaris* Jacoby, 1896**

Figs 45–51

Monolepta militaris Jacoby, 1896: p. 484.

Total length. 3.70–5.40 mm (mean: 4.55 mm; n=10).

Head. Impunctate, entirely yellow-brownish. Labrum and mandible black. Antennae slender, extending to the middle of the elytra, yellowish and only two terminal antennomere brownish (Fig. 45). First antennomere club shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.75–1.00 (mean: 0.88); ratio length of third to fourth antennomere: 0.33–0.50 (mean: 0.41) (Fig. 46).

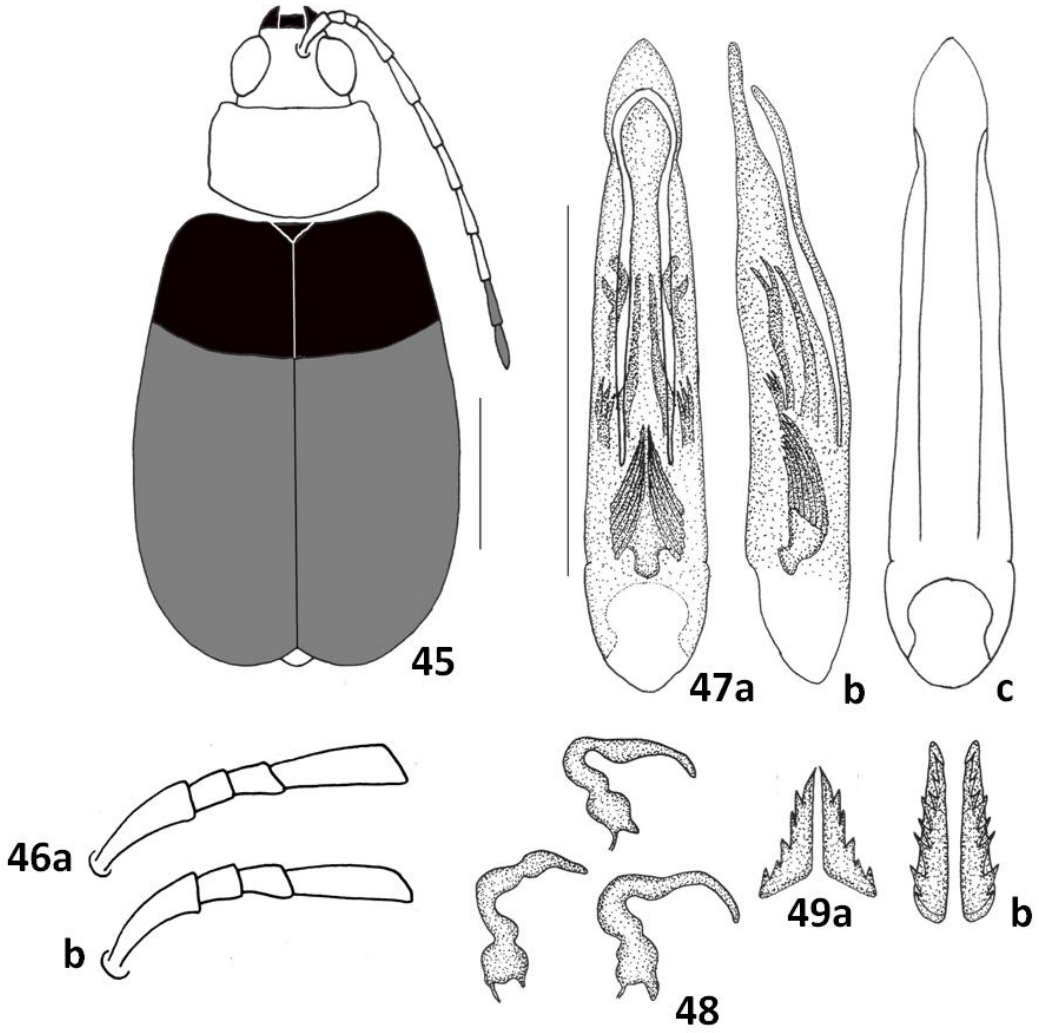
Thorax. Pronotum finely punctuated, entirely yellow-brownish. Pronotal width: 1.20–1.60 mm (mean: 1.34), ratio length to width: 0.65–0.67 (mean: 0.66). Scutellum, meso- and metathorax black. Elytron brown-reddish, black transverse band stretch-across the basal one third of elytra. Elytra length 3.00–4.10 mm (mean: 3.56 mm), maximal width of both elytra together 2.30–2.75 mm (mean: 2.66 mm), ratio of maximal width of both elytra together to length of elytra 0.73–0.77 (mean: 0.75) (Fig. 45). Legs fulvous, only coxa and femur black-reddish.

Abdomen. Yellow-brownish.

Male genitalia. Median lobe slender, parallel-sided at basal, narrow at one third of apical, and slightly conical towards apex. Tectum long, and narrow at the basal third, almost rounded at apex, ventral groove parallel sided towards first basal. Lateral spiculae elongated at basal and apex of C-shaped, median spiculae long and slender on basal half, and another short-slender filamentous-like close to sacculus, ventral spiculae of club-shaped, jagged at the apex. Sacculus occurs at basal (Fig. 47).

Female genitalia. Spermatheca with rounded and comparatively small nodulus. Middle part and cornu long, and very curve, blunt hook-shaped at the apex (Fig. 48). Two pairs of bursa sclerites present, both with strong spiky at the outer margins (Fig. 49).

Diagnosis. *Monolepta militaris* characterize by brown-reddish elytron, and similar to this species is *M. rufipennis* that has reddish-brown elytron, but *M. militaris* has black transverse



Figs 45–49. *Monolepta militaris* Jacoby, 1896. – 45. dorsal colour pattern; 46. antennae, (a) male; (b) female; 47. median lobe: (a) dorsal; (b) lateral; (c) ventral; 48. three different spermathecae; 49. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

band at base, narrow up to one third of elytra length (Fig. 45) while in *M. rufipennis*, the entire elytron is unicolorous (Fig. 52). The head and pronotum is yellow to yellowish-brown contrasting the brown-reddish elytron in *M. militaris*, and black head and pronotum contrasting the reddish-brown elytron in *M. rufipennis*. On average, *M. militaris* is smaller (3.70–5.40 mm) than *M. rufipennis* (4.75–6.35 mm). The pronotum of *M. militaris* is less broad (0.65–0.67) than *M. rufipennis* (0.61–0.64), and the genitalic characters are very

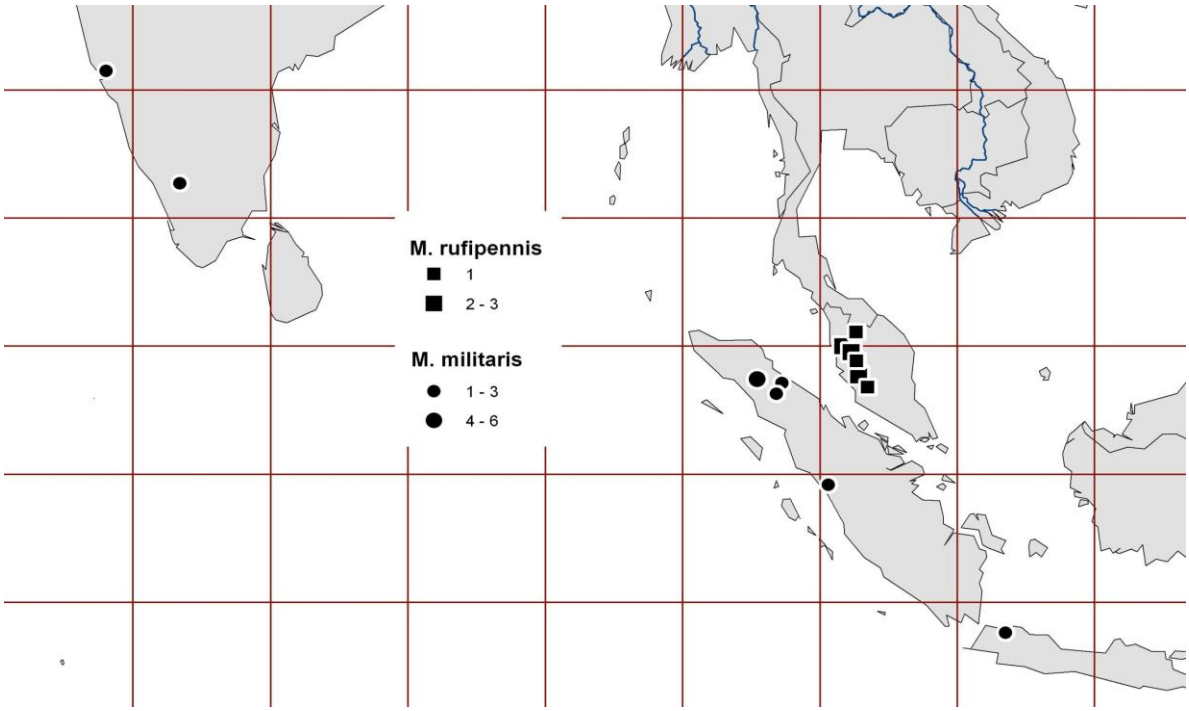


Fig. 50. Distribution of *M. militaris* Jacoby, 1896 and *M. rufipennis* Jacoby, 1899.

different between these two species (Figs 47, 48, 54, 55).

Distribution. This species is distributed in South East Asia and few specimens from India (Fig. 50).

Type material. Lectotype: Sumatra Si-Rambe, XII.90–III.91 E. Modigliani, Monolepta militaris Jac., Type, Jacoby Coll. 1909-28a (BMNH) (Fig. 51). Paralectotypes: 4 ex., same data as lectotype (3 ex., BMNH; 1 ex., MCZH). Type locality: 6º11'S/106º48'E. Jacoby gave no data on the number of specimens in his original description, but there are at least five specimens available in BMNH and MCZH, and i herein designate a lectotype to fix the name on a single specimen.

Further materials examined. – **India.** 1 ex., India, occ. Centr. GOA prov, 15º47'N/74º02'E, 12.–14.VIII.2002, P. Sipek & M. Fikacek (CJB). – **Indonesia.** 6 ex., N. Sumatra, Bivouac two Mt. Bandahara, 3º45'N/97º45'E, 5.–10.VII.1972, J. Krikken (NNML); 4 ex., Sumatra, Singalang, Sibajakvulkan, 0º25'S/100º20'E, Mjöberg (NHRS). – **Malaysia.** 1 ex., N. Sembilan, Gemencheh, 2º35'N/102º24'E, 5.VIII.1990, Mahbob, Fog Perigen (UKM).

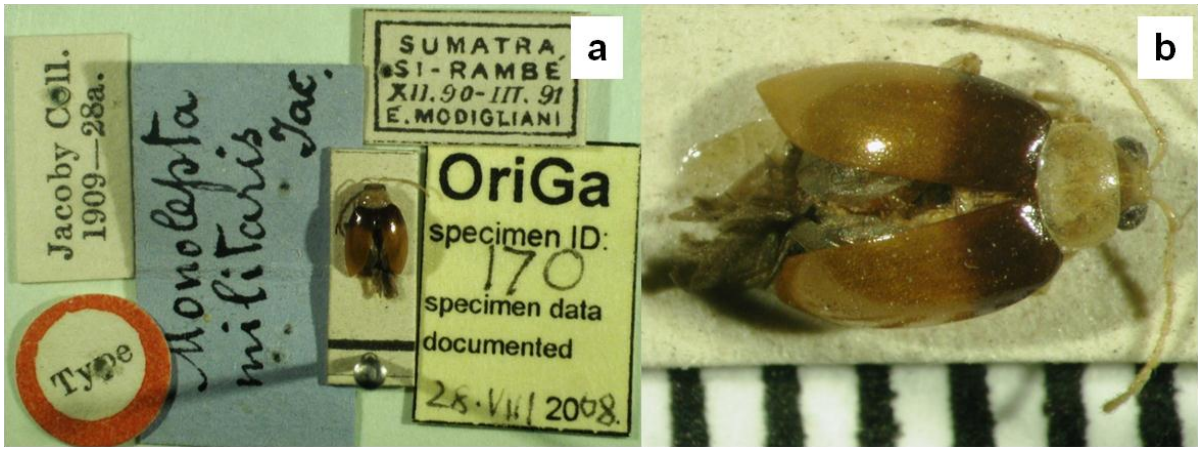


Fig. 51. Photographs of the lectotype of *Monolepta militaris* Jacoby, 1896; a. with labels, b. detail.

***Monolepta rufipennis* Jacoby, 1899**

Figs 52–57

Monolepta rufipennis Jacoby, 1899: p. 325.

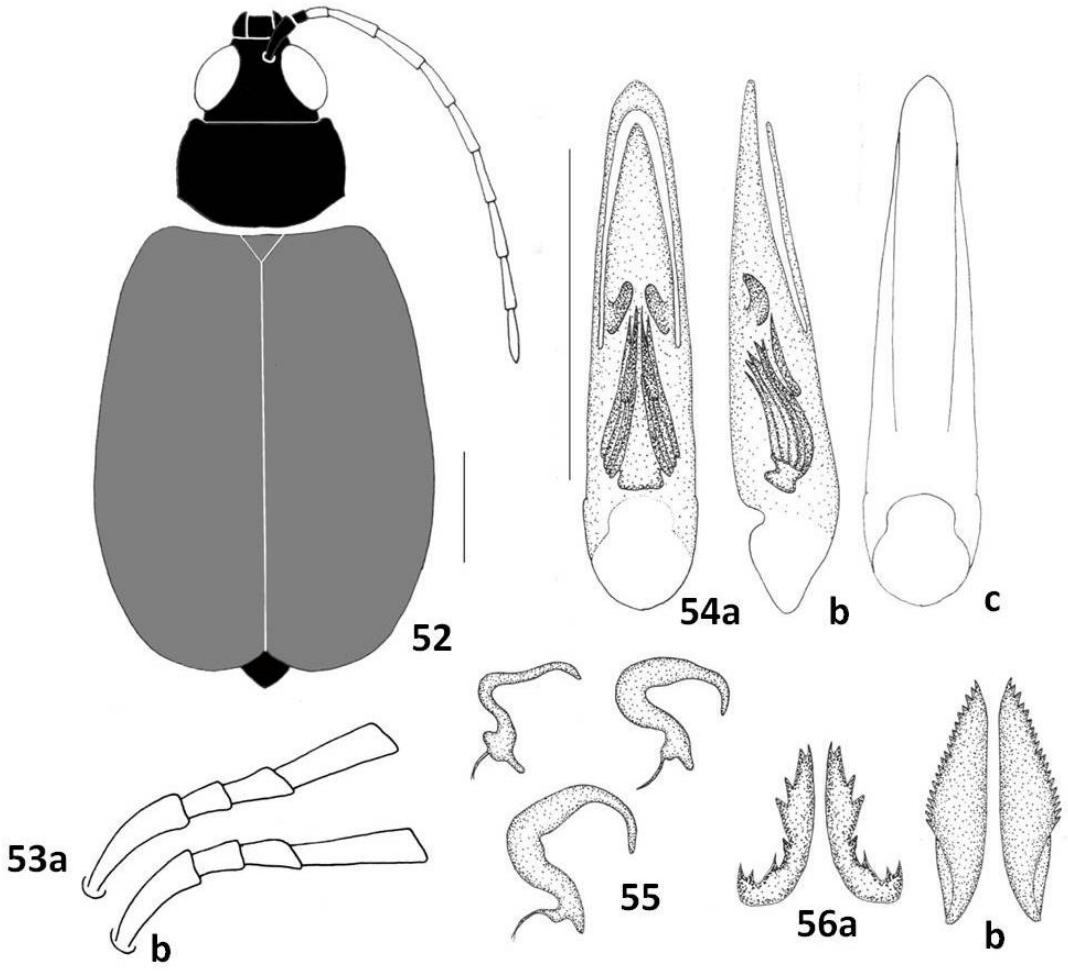
Total length. 4.75–6.35 mm (mean: 5.61 mm; n=10).

Head. Impunctate, entirely black. Labrum and mandible black. Antennae slender, extending beyond the middle of elytra, yellow brownish and only the two basal antennomere black (Fig. 52). First antennomere club-shaped, third antennomere slightly longer than second antennomere; ratio length of second to third antennomere: 0.80–0.83 (mean: 0.81); ratio length of third to fourth antennomere: 0.46–0.50 (mean: 0.48) (Fig. 53).

Thorax. Pronotum impunctate, entirely black, shiny, surface rather convex. Pronotal width: 1.35–1.90 mm (mean: 1.64), ratio length to width: 0.61–0.64 (mean: 0.62). Scutellum brown-reddish. Meso- and metathorax black. Elytron entirely reddish-brown, close and strongly punctured, widened posteriorly. Elytra length 4.30–5.05 mm (mean: 4.57), maximal width of both elytra together 3.20–3.70 mm (mean: 3.39), ratio of maximal width of both elytra together to length of elytra 0.73–0.75 (mean: 0.74) (Fig. 52). Legs entirely blackish.

Abdomen. Blackish.

Male genitalia. Median lobe slender, parallel-sided, becomes narrow and often rounded towards apex. Tectum is broad at basal and becomes conical towards apex, ventral groove



Figs 52–56. *Monolepta rufipennis* Jacoby, 1899. – 52. dorsal colour pattern; 53. antennae, (a) male; (b) female; 54. median lobe: (a) dorsal; (b) lateral; (c) ventral; 55. three different spermathecae; 56. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

narrow towards basal. Lateral spiculae of club-shaped, median spiculae long and slender filamentous-like, and one pair of short at the apical part of median spiculae. Ventral spiculae weakly sclerotised and not clearly visible in this species. Sacculus occur at the basal (Fig. 54).

Female genitalia. Nodulus of spermatheca is small, and short slender tube like protruding from nodulus. Middle part and especially cornu long and curve (Fig. 55). Two pairs of bursa

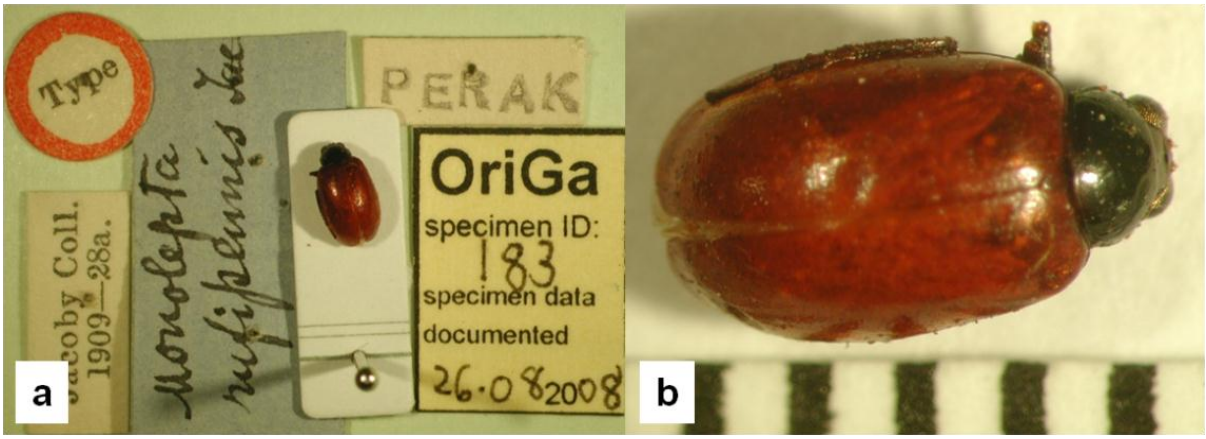


Fig. 57. Photographs of the lectotype of *Monolepta rufipennis* Jacoby, 1899; a. with labels, b. detail.

sclerites present, dorsal bursa sclerite highly sclerotised and big spur at the outer margin, ventral part elongated, undulated at outer margin (Fig. 56).

Diagnosis. *Monolepta rufipennis* can be distinguished from other *Monolepta* species by the black head and pronotum contrasting the reddish-brown elytron. Some *Monolepta* species from Sundaland area also have a black head but rarely with black pronotum. The similar species to *M. rufipennis* is *M. rubra* and *M. sulawensis* new sp., but these two later species have brownish-red elytron. The body length of *M. rufipennis* (4.75–6.35 mm) on average similar to *M. rubra* (4.50–6.00 mm) while *M. sulawensis* new sp. (3.70–4.25 mm) is on average smaller. The pattern of spermatheca in this species resembled *M. bifasciata*, *M. rubra* and *M. kuninghitam* new sp. (Figs 4, 14, 55, 113), but the median lobe is very different (Figs 3, 13, 54, 112).

Distribution. This species is distributed in Malay Peninsular of Malaysia (Fig. 50).

Type material. Lectotype: Type, Perak, Monolepta rufipennis Jac., Jacoby Coll. 1909-28a (BMNH) (Fig. 57). Type locality: 4º48'N/101º09'E. Jacoby gave no data on number of specimen in his description, but there is indication that at least more than one specimen was studied. I herein designate a lectotype to fix the name on a single specimen.

Further materials examined. – **Malaysia.** 2 ex., Perak, F. M. S. Larut Hills, 3700 ft., 5ºN/100º53'E, VIII.1908; 2 ex., Perak, Doherty, 4º48'N/101º09'E, Fry Coll. 1905.100, 1909-28a (BMNH); 1 ex., Malay Penin, Selangor, Gombak Valley, 3º25'N/101º47'E, 11.X.1921, H. M. Pendlebury (BMNH); 3 ex., Perak, F. M. S. Batang Padang Jor Camp, 3º54'N/101º26'E,

31.V.–5.VI.1923, H. M. Pendlebury (BMNH); 14.II.1932, H. M. Pendlebury (BMNH); 1 ex., Pahang, F. M. S. Cameron's Highlands, 4000–4500 ft., 4º27'N/101º22'E, 15.VI.1935, H. M. Pendlebury (BMNH); 1 ex., Perak, Temenggor, Ekspedisi MNS-Belum, 5º35'N/101º21'E, 10.–15.V.1994, Ismail & Sham (UKM).

***Monolepta jacobyi* Weise, 1908**

Figs 58–64

Replacement name for *Monolepta basimarginata* Jacoby, 1884: p. 54 a junior homonym of *Galleruca basimarginata* Boisduval, 1835 that was transferred to *Monolepta* by Weise (1908).

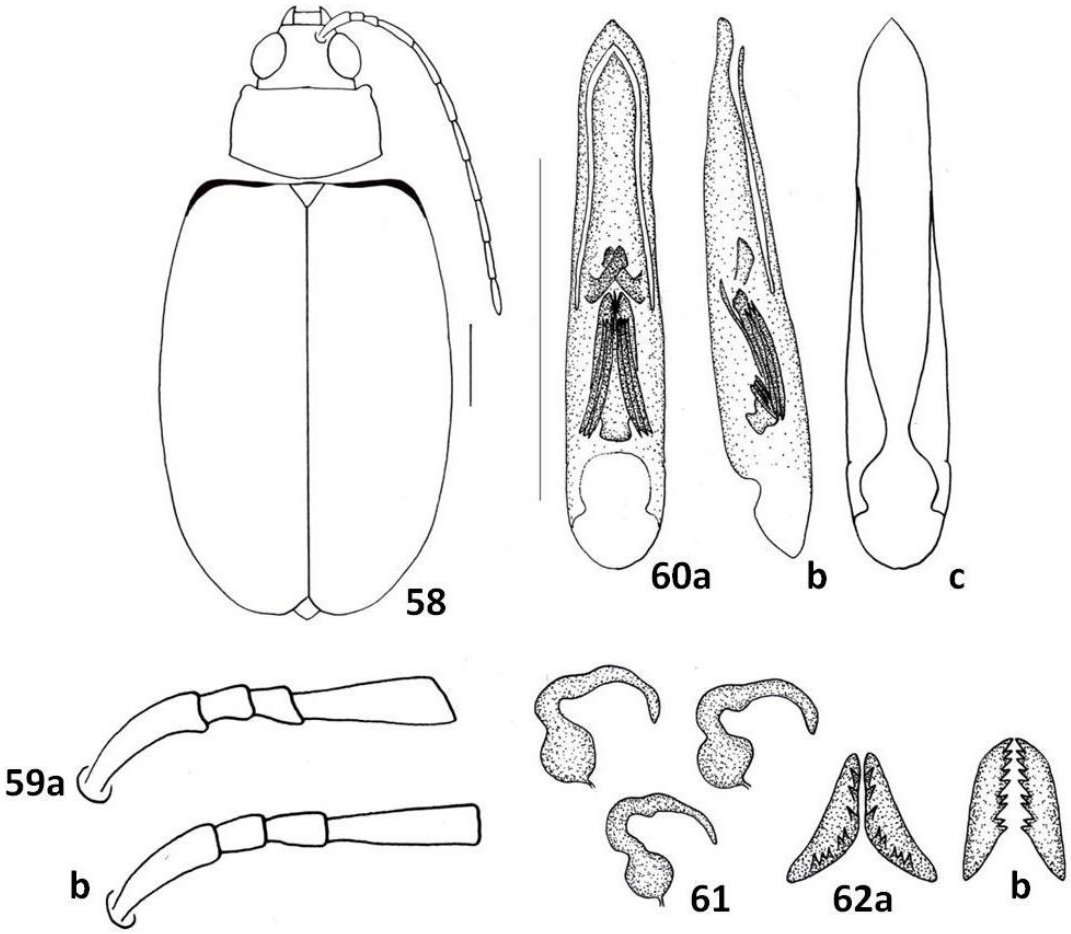
Total length. 6.40–7.70mm (mean: 6.86 mm; n=10).

Head. Finely punctuated, entirely pale yellow to brown. Labrum and mandible brown. Antennae slender, extending beyond the middle of elytra, entirely yellow and last antennomere dark brown towards apex (Fig. 58). First antennomere club-shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.80–1.00 (mean: 0.92); ratio length of third to fourth antennomere: 0.36–0.45 (mean: 0.40) (Fig. 59).

Thorax. Pronotum sparsely punctuated, entirely yellow-brownish, surface slightly convex. Pronotal width: 2.00–2.25 mm (mean: 2.12), ratio length to width: 0.59–0.61 (mean: 0.60). Scutellum yellow-brownish. Meso- and metathorax black. Elytron yellow-brownish, basal margin black, sometimes extend to the lateral margin as far as the anterior half, and surface extremely fine punctuated. Elytra length 5.25–6.00 mm (mean: 5.61), maximal width of both elytra together 3.50–4.00 mm (mean: 3.79), ratio of maximal width of both elytra together to length of elytra 0.66–0.70 (mean: 0.68) (Fig. 58). Legs yellow-brownish.

Abdomen. Yellow-brownish.

Male genitalia. Median lobe parallel-sided, long and slightly conical towards apex. Tectum long and almost reaching the apex of median lobe, broad at base and slightly narrow towards apex, ventral groove slightly narrow at the basal half and continuously convergent to the orifice. Lateral spiculae V-shaped, lobe-like at apex, median spiculae long and slender filamentous-like. Ventral spiculae club-shaped, elongated and lobe-like at apex. Sacculus occur at the basal of median lobe (Fig. 60).



Figs 58–62. *Monolepta jacobyi* Weise, 1908. – 58. dorsal colour pattern; 59. antennae, (a) male; (b) female; 60. median lobe: (a) dorsal; (b) lateral; (c) ventral; 61. three different spermathecae; 62. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

Female genitalia. Spermatheca with rounded and relatively big nodulus, median part long and curve cornu (Fig. 61). Two pairs of bursa sclerites highly sclerotised. Dorsal and ventral bursa sclerites are almost the same size, and with strong spine at the outer margins (Fig. 62).

Diagnosis. *Monolepta jacobyi* (total length 6.40–7.70 mm) is one of the largest *Monolepta* species from Sundaland area. This unicolorous yellowish species with basal margin black looks similar to *M. kuninghitam* new sp. and *M. putri*, but the size of *M. kuninghitam* new sp. (3.70–4.35 mm) and *M. putri* (4.60–4.90 mm) is usually smaller than *M. jacobyi*. These three species has black line on basal margin of elytra, but in *M. kuninghitam* new sp. and *M. putri*,

it stretches up to the shoulder and humerus of the species (Figs 58, 87, 110). The pronotum is broader in this species (0.59–0.61) than *M. putri* (0.64–0.65), while *M. kuninghitam* new sp. has narrowed pronotum (0.70–0.72). The characteristic of median lobe is very different between *M. jacobyi* and *M. kuninghitam* new sp. (Figs 60, 112).

Distribution. This species is distributed in South East Asia, from the Phillippines in the North, Sumatra in the West and Irian Jaya in the East (Fig. 63).

Type material. *Monolepta basimarginata*: Lectotype: Rawas, 5.78, Monolepta basimarginata Boisd. (NNML) (Fig. 64). Type locality: 2º31'S/102º54'E. Paralectotypes: 11 ex., Ma. Loe, 10.77; 1 ex., same data as lectotype (NNML). Jacoby gave no data on number of specimens in his original description, but he wrote several specimens from few localities were studies. There are at least 13 specimens available in NNML that fits the locality of type, and I herein designate a lectotype to fix the name on a single specimen.

Further materials examined. – **Indonesia.** 14 ex., Java, Ardja-Sari, 6.91ºS/107.67ºE, Preanger (NNML); 3 ex., Java, Banjoewangi, 8º12'S/114º22'E, 1910, Mac Gillavry (NNML); 24 ex., Sumatra, 4º27'S/102º59'E, M. Knappert (NNML); 5 ex., Java, Nongkodjadjar, I.1911, E. Jacobson (NNML); 1 ex., Java, 1921, Kerkhoven (NNML); 1 ex., Spjg., 0º27’S/100º54’E, 10.77 (NNML); 3 ex., Java, Malang, 7º58'S/112º37'E, A. Koller (NNML); 1 ex., Java, Piep (NNML); 1 ex., Sumatra, Palembang, 2º59’N/104º45'E, M. Knappert (NNML); 1 ex., East Java, Soerabaja and surroundings, 7º17'S/112º44'E, 1938, W.C. van Heurn (NNML); 7 ex., N. Sulawesi, Mt. Ambang nr Kotamobagu, 0º44'N/124º18'E, 20km E of alt. m. ca. 1000, 28.–29.V.1985, J. Huijbregts (NNML); 5 ex., Sumatra, Solok, 0º48’S/100º38’E, P.O. Stolz (NNML); 1 ex., Indonesia, W. Java, Poentjak-pas, ca. 1000m, Onderneming "Tjiliwoeng", VI.1932, W. C. van Heurn (NNML); 4 ex., Sumatra, Padang, 0º58'S/100º37'E, J.D. Pasteur (NNML); 12 ex., Borneo Exped.; Borneo, Poelau Sibau, VI.94, Dr. J. Bultirofer (NNML); 3 ex., Java occident., Pengalengan 4000', 6º12'S/106º56'E, 1893, H. Fruhstorfer (NNML); 1 ex., Palembang, Boengamas, 2º59'S/104º45'E, G. van Hassen (NNML); 1 ex., C Sulawesi, Lore Lindu NP Dongi Dongi Shelter, 1º31'S/120º11'E, alt. 940 m, 3.–9.XII.1985, J. Krikken (NNML); 2 ex., Java occident., Mons Gede 4000', 6º46'S/106º57'E, VIII.1892, H. Fruhstorfer (NNML); 1 ex., Java occident., Sukabumi, 6º55'S/106º55'E, 1893, H. Fruhstorfer (NNML); Java, Moeria, 16.VII.33, P.H.V. Doesburg (NNML); 1 ex., W. Java (NNML); 1 ex., West Sumatra, Siberut Island, 1º22’S/98º54’E, IX.1924, C.B.K. & N.S (BMNH); 13 ex., Sipora Island, West Sumatra, 2º10'S/99º41'E, X.1924, C.B.K. & N.S; H.H. Karny (BMNH); 2 ex., Sumatra, Pagherang-Pisang, X.90.–III.91, E. Modigliani (BMNH); 4 ex., Sumatra, Siolak

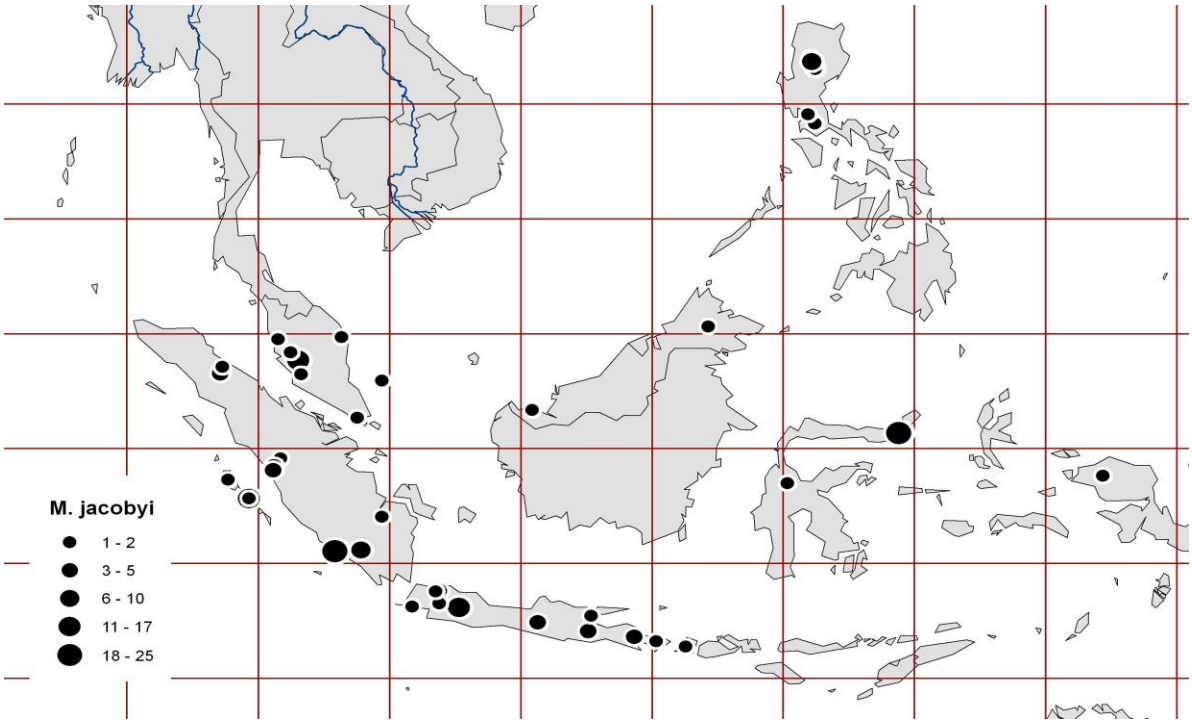


Fig. 63. Distribution of *M. jacobyi* Weise, 1908.

Daras, Korinchi Valley, 3100 ft., III.1914 (BMNH); 4 ex., Java, 7º35'S/110º42'E, Baly Coll. (BMNH); 25 ex., Indonesia, Sulawesi Utara, Danau Modat, 1200 m near Kotamobagu, 0º43'N/124º27'E, VIII.1985 (BMNH); 1 ex., Sumatra, Sir S. Raffles (BMNH); 3 ex., Sumatra, Sibolangit, 3º18'N/98º35'E, Mjoberg (NHRS); 2 ex., Medan, 3º35'N/98º40'E, Mjoberg (NHRS); 1 ex., Lombok, 8º39'S/116º19'E, Carl Auriv (NHRS); 1 ex., Indonesia, Bali, 8º24'S/115º11'E, 19.–21.III.2007, B. H. Izfa leg. (UKM); 1 ex., Java, Desa Kembangan, 6º14'S/106º48'E, Drescher (MNHU); 2 ex., Sumatra (MNHU); 2 ex., Mentawei Sipora, 2º10'S/99º41'E, V.–VI.94, Modiglianii (MNHU); 6 ex., S Sumatra, Lampung Prov., Bukit Barisan Selatan, 5º4'S/104º4'E, 7.–17.II.2000, Liwa, J. Bezdek leg. (CJB). – **Malaysia.** 1 ex., Malaysia, S. W. Sabah nr Long Pa Sia (East) ca. 1000m, 5º20'N/117º10'E, 25.XI.–7.XII.1987, C. v. Achterberg (NNML); 5 ex., Perak, F. M. S. Jor camp, 3º54'N/101º34'E, VIII.–IX.1922, E. Seimun (BMNH); 12 ex., Perak, F. M. S. Batang Padang, Jor Camp, 3º54'N/101º34'E III.1924, F. M. Pendlebury (BMNH); 1 ex., Malaya, Terengganu, Jerangau Estate, 4º54'N/103º11'E, 7.II.1966, Dept. of Agriculture (BMNH); 1 ex., Malay Penin., Selangor F. M. S., Kuala Lumpur, Batu Caves, 3º15'N/101º40'E, IX.1921, H. M. Pendlebury (BMNH); 1 ex., Perak, 4º48'N/100º48'E, Doherty (BMNH); 2 ex., Perak, Tapah, Lata

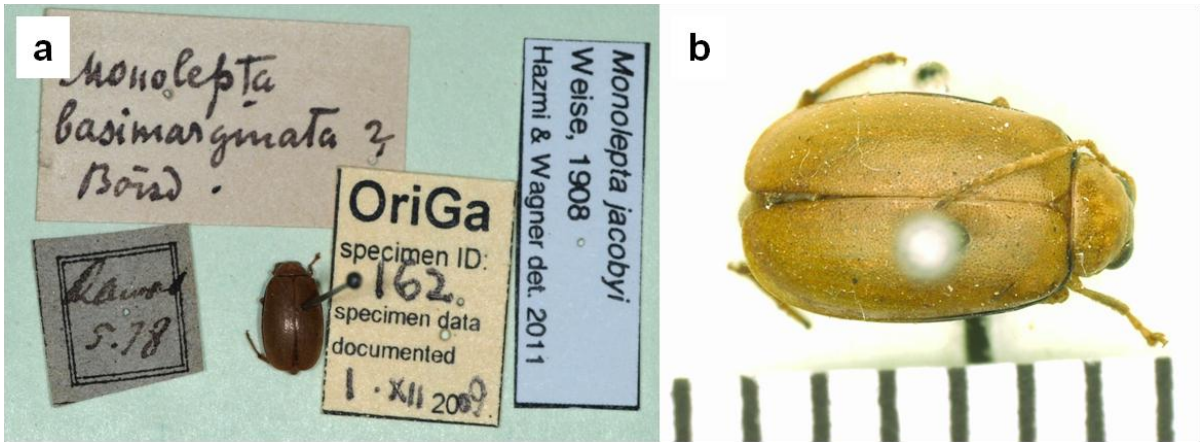


Fig. 64. Photographs of the lectotype of *Monolepta basimarginata* Jacoby, 1884; a. with labels, b. detail.

Iskandar, 4º12'N/101º15'E, 3.–4.IV.1990; 15.IX.1995, Ismail & Ruslan (UKM); 1 ex., Borneo, Sarawak, Kuching, Bako National Park, 1º43'N/110º28'E, 5.V.1999, P. Vortruba (CJB). – **Philippine.** 4 ex., Luzon, Id. Nueva Viscaya, Sta. Fe. Dalton Pass, 16º35'N/121º15'E, 900m, 8.–12.VI.1991, Rolland A. Muller legit (NNML); 1 ex., Philli. Island (BMNH) ; 1 ex., Los Banos, 14º10'N/121º14'E, P. I. Baker (NHRS);1 ex., Luzon, 16º33'N/121º15'E, Semper (IRSN); 1 ex., Coll. Duvivier (IRSN) ; 2 ex., Philippine, N. Luzon, Mts. Prov. Chatel, 17º02'N/121º03'E, 24.IX.–14.X.1988, leg Cerny & Schintlmeister (MNHU); 10 ex., Philippine, N. Luzon, Ifugao Banaue vic., 16º54'N/121º06'E, 22.IX.–16.X.1988, leg. Cerny & Schintlmeister (MNHU); 1 ex., Manila 14º35'N/120º59'E (MNHU). – **Singapore**. 2 ex., Singapore, 1º21'N/103º49'E, C. J. Saunders, B.M. 1933-227 (BMNH).

***Monolepta mentawiensis* (Jacoby, 1896)**

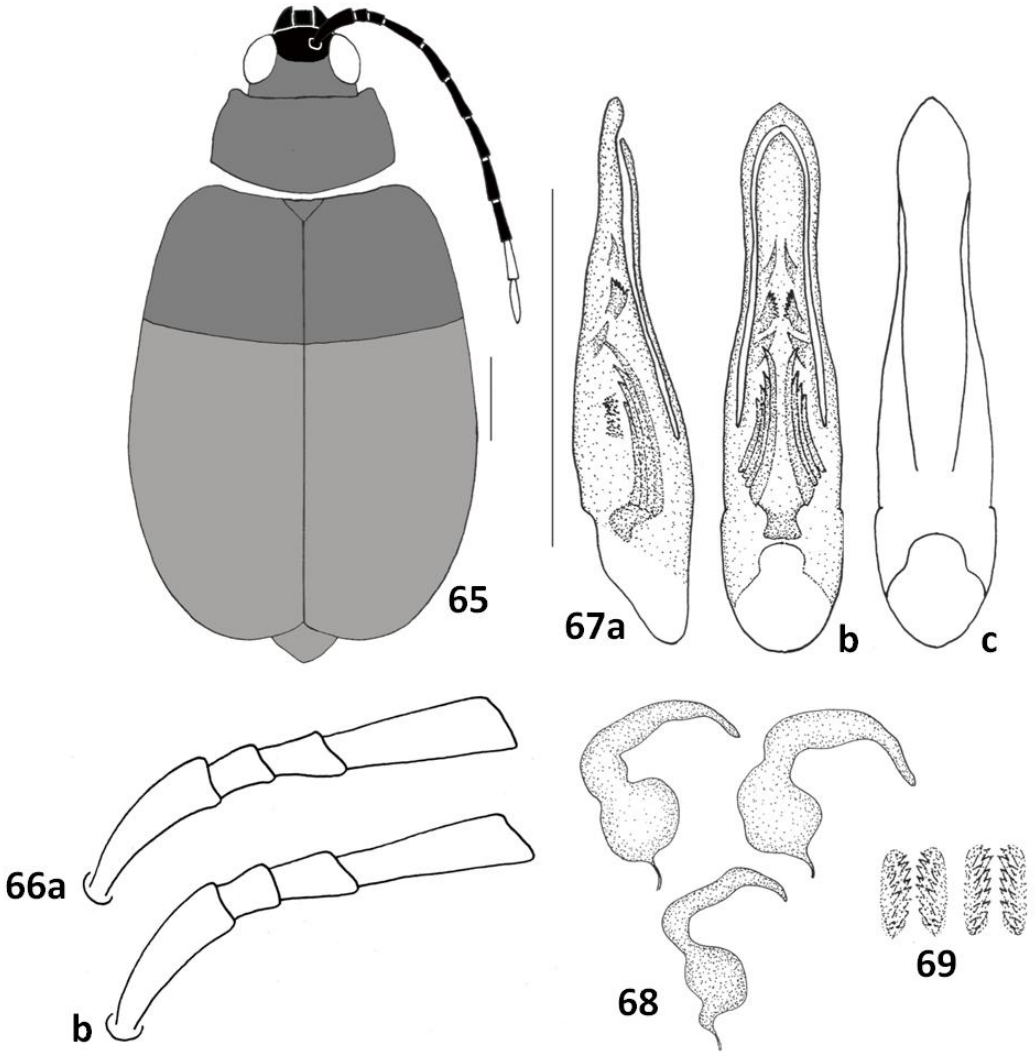
Figs 65–72

Candezea mentawiensis Jacoby, 1896: p. 143, new syn.

Monolepta hageni Weise, 1916: p. 40 (replacement name for *M. basalis* Jacoby, 1884: p. 55 not Harold, 1880: p. 26).

Total length. 4.90–6.25 mm (mean: 5.91 mm, n=10).

Head. Impunctate, brown-reddish and frons partly black downward to labrum. Labrum and



Figs 65–69. *Monolepta mentawiensis* (Jacoby, 1896). – 65. dorsal colour pattern; 66. antennae, (a) male; (b) female; 67. median lobe: (a) dorsal; (b) lateral; (c) ventral; 68. three different spermathecae; 69. bursa sclerites. Scale bar: 1 mm.

mandible black. Antennae slender, extending almost to half of the elytra, either entirely yellow-brownish or black with two apical antennomere brownish (Fig. 65). First antennomere club-shaped, second and third antennomere almost of the same length; ratio length of second to third antennomere: 0.75–1.00 (mean: 0.80); ratio length of third to fourth antennomere: 0.38–0.50 (mean: 0.42) (Fig. 66).

Thorax. Pronotum finely punctuated, entirely brown-reddish and posterior side rounded and broadened. Pronotal width: 1.60–2.00 mm (mean: 1.84), ratio length to width: 0.53–0.57 (mean: 0.55). Scutellum, meso- and metathorax brown-reddish. Elytron distinctly widened behind, brownish with brown-reddish transverse basal band, extend to the apical third of elytron. Elytra length 3.90–5.00 mm (mean: 4.68), maximal width of both elytra together 2.80–3.70 mm (mean: 3.49), ratio of maximal width of both elytra together to length of elytra 0.70–0.78 (mean: 0.74) (Fig. 65). Legs brown-reddish.

Abdomen. Brown-yellowish.

Male genitalia. Median lobe sub-parallel, broad at basal and narrow on the apical half, slightly conical towards apex, dorsoventrally compressed. Tectum broad at base and becomes rounded at apex, ventral groove slightly narrow towards basal (Fig. 67c). Lateral spiculae consist of club-shaped and lobed-like at apex, another pair of lateral spiculae spur-like at apical half, median spiculae of long and slender filamentous-like, and ventral spiculae of spur-like at the middle half of median lobe. Sacculus occurs at basal (Fig. 67 a, b).

Female genitalia. Spermatheca with rounded and big nodulus, middle part short, and cornu curve (Fig. 68). Bursa sclerites weakly sclerotised, club-shaped and small spur on surface (Fig. 69).

Diagnosis. *Monolepta mentawiensis* is quite similar to *M. bruneiensis* new sp. from the dorsal coloration. Both species are peculiar with brown-reddish pronotum and brownish elytron, but in *M. mentawiensis*, it has brown-reddish transverse basal band on apical third of elytra, while in *M. bruneiensis* new sp. lack of this (Figs 65, 92). Underside of both species is brown-reddish. *Monolepta mentawiensis* (4.90–6.25 mm) is average bigger than *M. bruneiensis* new sp. (3.75–4.70 mm). The frons downward to labrum and mouthpart is partly black in *M. mentawiensis* while in *M. bruneiensis* new sp. brown-reddish as head. The second and third antennomere of *M. mentawiensis* is almost the same length, but in *M. bruneiensis* new sp. third antennomere a bit shorter than second antennomere. The characteristic of median lobe are quite different between these two species (Figs 67, 94).

Distribution. This species is distributed in Sumatra, Borneo, Malaysia, Thailand and Singapore (Fig. 70).

Type material.

Monolepta hageni: Type material is not available to me. I adapt Weise's (1924) statement that *M. basalis* Jacoby, 1884 is synonymy with this species, which type material is available.

Monolepta basalis: Lectotype: Ma Loe II.77, Sumatra Exped., Type 18461, 1st Jacoby Coll.

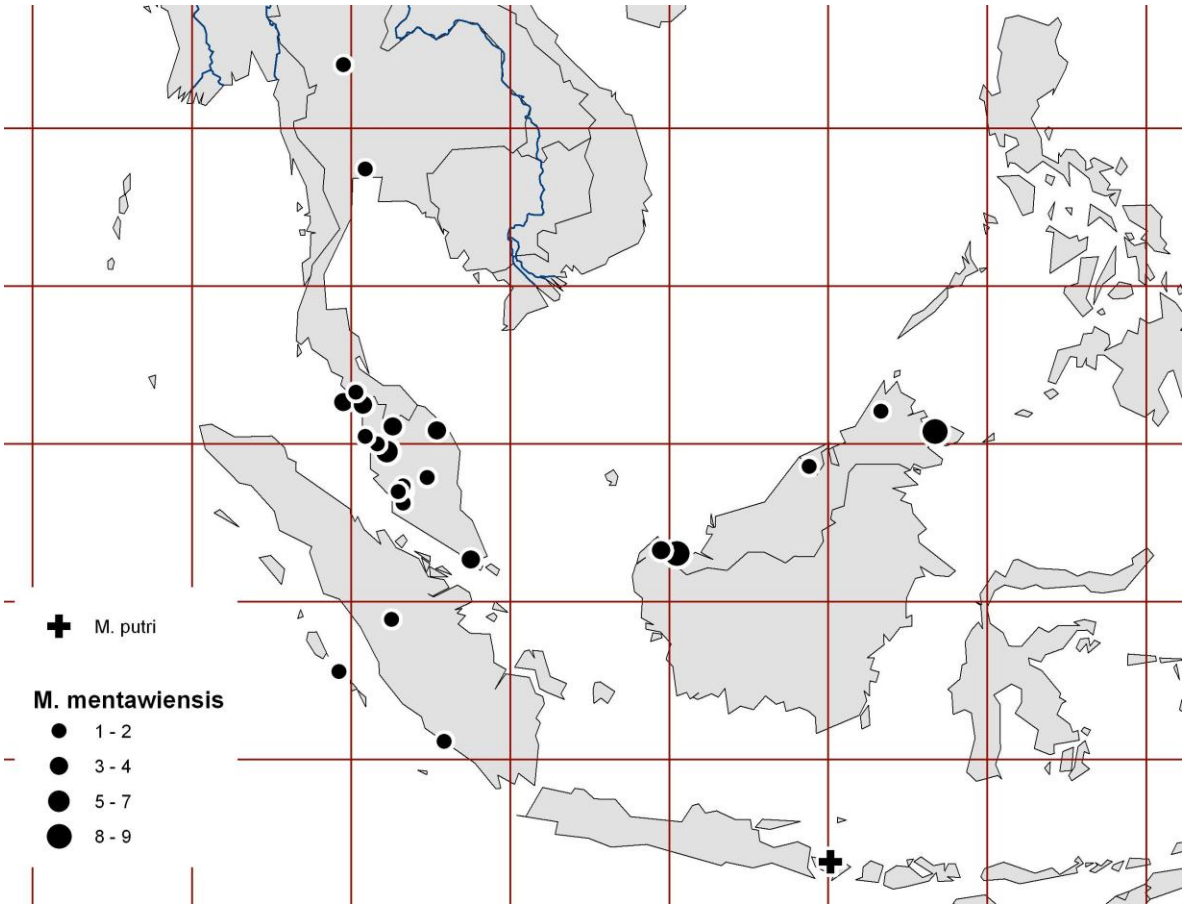
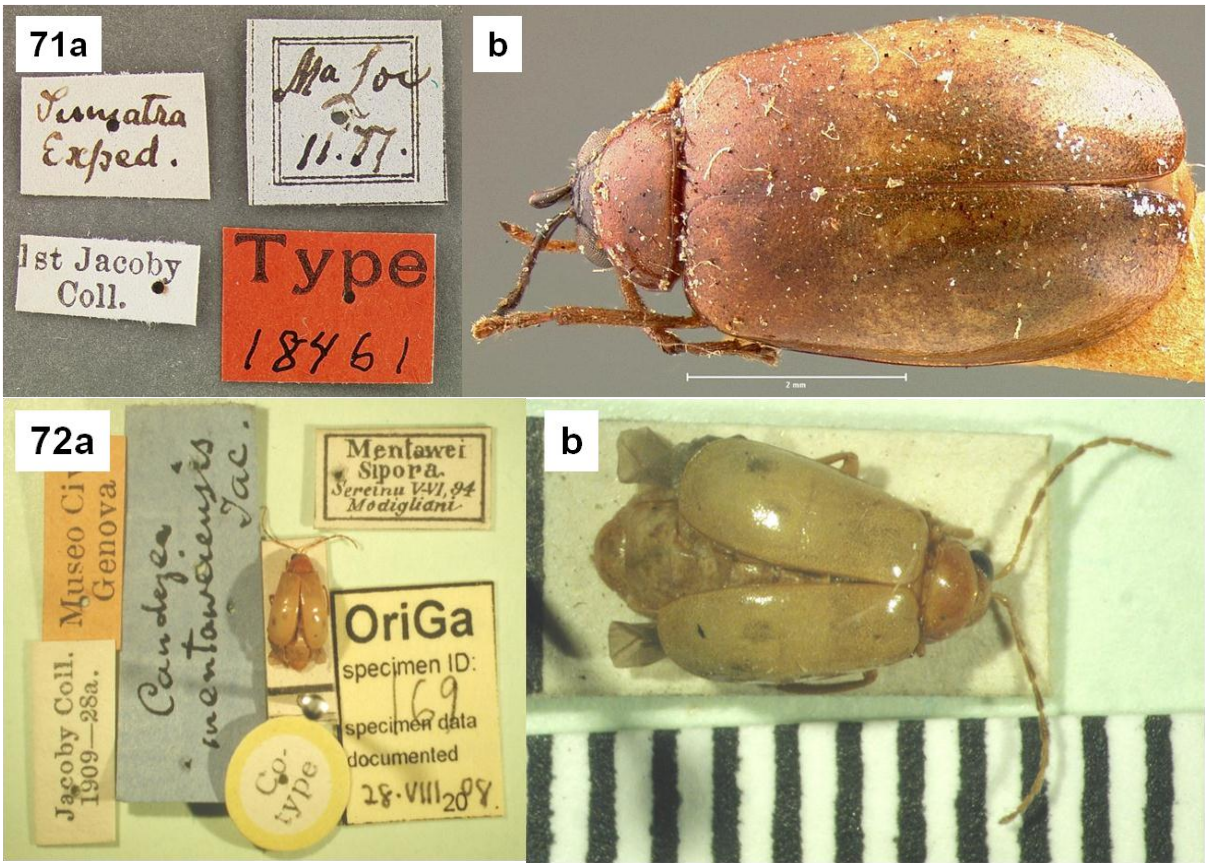


Fig. 70. Distribution of *M. mentawiensis* (Jacoby, 1896) and *M. putri* Mohamedsaid, 2001.

(MCZH) (Fig. 71). Paralectotypes: 4 ex., same data as lectotype (NNML), 1 ex., Spjg II.77 (NNML). Jacoby gave no data on the number of specimens in his original description, but he wrote several specimens from few localities. There are at least six specimens available in MCZH and NNML that fits the locality of type, and I herein designate a lectotype to fix the name on a single specimen.

Monolepta mentawiensis: Holotype: Co-type, Mentawei Sipora Sereinu V.–VI. 94 Modigliani, Museo Civ. Genova, Candezea mentawiensis Jac., Jacoby Coll. 1909-28a (BMNH) (Fig. 72). Type locality: 2º10'S/99º41'E. Jacoby gave no number of specimens in his original description, but there is no indication of more than one, and the only available specimen in BMNH can be treated as holotype.

Further materials examined. – **Brunei.** 1 ex., Brunei, Labi, Bukit Teraja, 4º18'N/114º26'E, 60 m, 23.VIII.79, S.L. Sutton (BMNH). – **Indonesia.** 1 ex., Sumatra Exped., Jacoby Coll.



Figs 71–72. Photographs of the primary type: a. with labels, b. detail. – 71. *Monolepta basalis* Jacoby, 1884. (Photos from the website http://insects.oeb.harvard.edu/mcz/). 72. *Monolepta mentawiensis* (Jacoby, 1896).

1909-28a (BMNH); 1 ex., Sumatra, Manna, 4º27'S/102º59'E, M. Knappertt., Coll. Vett (NNML); 7 ex., Sumatra, Moera Laboe, XI.1877 (NNML); 1 ex., Sumatra, Moera Laboe, X.1877 (NNML); 1 ex., N. O. Sumatra, Tandjong Morawa, Serdang, 0º35'S/101º18'E, Dr. B. Hagen (BMNH); 1 ex., Mentawei, Sipora, 2º13'S/99º40'E, V.–VI.94, Modigliani, Jacoby Coll. 1909-28a (BMNH). – **Malaysia.** 7 ex., Perak, 4º48'N/101º09'E, Doherty, Fry Coll. 1905.100; Jacoby Coll. 1909-28a (BMNH); 1 ex., West Sarawak, Mt. Matang, 1º34'N/110º16'E, 16.–30.XII.1913, G. E. Bryant (BMNH); 1 ex., West Sarawak, Mt. Matang, 1º34'N/110º16'E, I.1914, G. E. Bryant (BMNH); 5 ex., W. Sarawak, Mt. Matang, 1º34'N/110º16'E, 16.–30.XII.13; I.1914, G. E. Bryant (BMNH); 3 ex., W. Sarawak, Lundu, 1º40'N/109º48'E, I.1914, G. E. Bryant (BMNH); 2 ex., Borneo (BMNH); 1 ex., Malay Penin, Selangor-Pahang, 2700 ft., 3º30'N/101º31'E, I.1915, ex. F. M. S. B. M. 1955-354 (BMNH); 2 ex., Peninsular Siam,

Nakon Sri Tamarat, Khao Ram, 1500-2900 ft., 17º01'N/99º49'E, 28.II.1922, H. M. Pendlebury (BMNH); 3 ex., Malay Penin. Kedah nr Jitra, catchment area, 6º15'N/100º25'E, 4.–7.IV.1928, H. M. Pendlebury (BMNH); 1 ex., Malay Penin, Pahang, F. M. S., Fraser Hills, 4200 ft., 3º42'N/101º41'E, 11.IX.1931, H. M. Pendlebury (BMNH); 1 ex., East Borneo, Sanga Sanga, 1907-203, H. D. Jansen (BMNH); 1 ex., Sarawak, Bidi, 4.II.1909, C. J. Brooks, B. M. 1936-681 (BMNH); 1 ex., Sarawak, Matang, 1º34'N/110º17'E, 10.V.1909. C. J. Brooks, B. M. 1936-681 (BMNH); 1 ex., Malaya, Kuala Lumpur Gardens, 3º08'N/101º41'E, 18.XII.1938, H. M. Pendlebury (BMNH); 1 ex., Malay Penin, West Coast, Langkawi Island, 6º21'N/99º49'E, 30.IV.1928 (BMNH); 1 ex., Malay Penin, Selangor, Bukit Kutu, 3500 ft., 3º33'N/101º43'E, 18.III.1931, H. M. Pendlebury (BMNH); 2 ex., Perak, F. M. S. Larut Hills, 3700 ft., 5º01'E/100º53'E, 14.II.1932, H. M. Pendlebury (BMNH); 1 ex., Malaysia, Pahang, Taman Negara, 3º58'N/102º26'E, 1.–13.III.1984, L. Jessop (BMNH); 1 ex., Sabah, Poring, 6º02'N/116º42'E, 6.XI.1986, F. Abang (UKM); 1 ex., Borneo, Baly Coll. (BMNH); 1 ex., Penang, 5º15'N/100º29'E, (Lamb.), Pascoe Coll. (BMNH); 1 ex., Sabah, nr Danum Valley Field, 5º25'N/118º23'E, 20.VI.–12.VII.1987, C. v. Achtherberg & D. Kennedy (NNML); 1 ex., Kedah, Langkawi, Lubuk Sembilang, 6º21'N/99º48'E, 7.IV.1993, Ismail, Sham, Yusof (UKM); 1 ex., Perak, Temenggor, Ekspedisi MNS-Belum, 5º33'N/101º20'E, 29.XI.1993, Ismail, Yusof, Bidi & Saiful (UKM); 1 ex., Perlis, Wang Kelian, 6º40'N/100º11'E, 19.VII.1994, Salleh, Ismail & Ruslan (UKM); 3 ex., Terengganu, Setiu, H. Lipur Peladang, 5º27'N/102º45'E, 27.V.1994, Ismail & Zabidi (UKM); 1 ex., Kedah, Pulau Langkawi, Gunung Raya, 933 m, 6º21'N/99º48'E, 21.V.1995, Ismail, Ruslan & Sham (UKM); 1 ex., Malaysia, Sabah, Danum Valley, 5º25'N/118º23'E, 6.–15.V.2007, B. H. Izfa leg (UKM); 2 ex., Malaysia, Sabah, Danum Valley, 5º25'N/118º23'E, 11.IX.2007, B.H. Izfa leg (UKM); 4 ex., Malaysia, Perak, Royal Belum, 5º35'N/101º21'E, 11.IX.2007, B. H. Izfa leg. (UKM); 5 ex., Sabah, Lembah Danum, 5º25'N/118º23'E, 16.–19.V.1991; 27.–31.VIII.1991; 3.–5.XII.1991; 22.–25.VIII.1992; 6.–15.V.2007, Ismail, et al. (UKM); 4 ex., Borneo, Mt. Tibang, Mjoberg (NHRS). – **Singapore.** 2 ex., Singapore, 1º21'N/103º49'E, 97-109, H. N. Ridley (BMNH); 1 ex., Singapore, 1º21'N/103º49'E, H. N. Ridley, 97-109 (BMNH). – **Thailand.** 1 ex., Siam, Renong, 13º45'N/100º29'E, Doherty, Fry Coll. 1900.100 (BMNH).

***Monolepta zonula* Weise, 1916**

Figs 73–79

Monolepta fasciatipennis Jacoby, 1892: p. 983 (replacement name for *M. albofasciata* Jacoby, 1889: p. 228)

Monolepta zonula Weise, 1916, p. 40 (replacement name for *M. fasciatipennis* Jacoby, 1892: p. 983, not Blackburn 1888: p. 180).

Total length. 3.50–4.90 mm (mean: 4.36 mm, n=10).

Head. Finely punctuated, entirely blackish. Labrum and mandible blackish. Antennae slender, extending almost to middle of the elytra, yellowish, the extreme apex of the last antennomere blackish (Fig. 73). First antennomere club shaped, second and third antennomere of the same length; ratio length of second to third antennomere: 0.67–1.00 (mean: 0.97); ratio length of third to fourth antennomere: 0.38–0.43 (mean: 0.42) (Fig. 74).

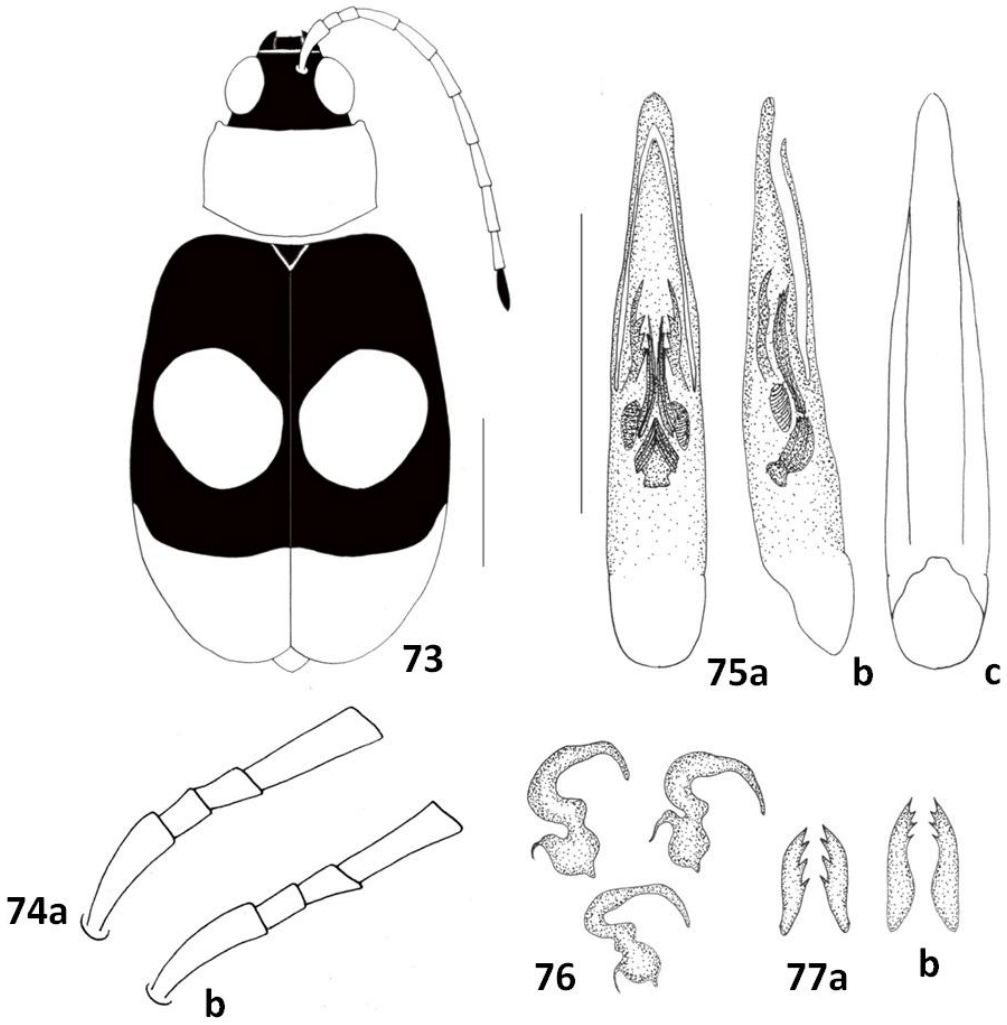
Thorax. Pronotum impunctate, pale yellow to brown, transversely convex, and the sides slightly rounded. Pronotal width: 1.05–1.55 mm (mean: 1.32), ratio length to width: 0.61–0.64 (mean: 0.63). Scutellum, meso- and metathorax black. Elytron finely punctuated, black with two yellow discs on the middle and posterior margin are yellow-brownish. Elytra length 2.75–3.85 mm (mean: 3.34), maximal width of both elytra together 2.00–2.80 mm (mean: 2.43), ratio of maximal width of both elytra together to length of elytra 0.71–0.75 (mean: 0.73) (Fig. 73). Legs yellow-brownish.

Abdomen. Pale yellow to brown.

Male genitalia. Median lobe slender, parallel-sided, and becomes narrow and conical towards apex. Tectum long, broad at basal and becomes very narrow towards apex, ventral groove parallel towards basal. Lateral spiculae club-shaped usually with big spur at apex, median spiculae consist of long and slender filamentous-like, another short and slender filamentous-like at the basal half, and ventral spiculae weakly sclerotised, like sac of filamentous-thread. Sacculus occurs at basal (Fig. 75).

Female genitalia. Spermatheca with rounded nodulus, and short slender tube like protruding from nodulus, median part long and cornu curved (Fig. 76). Two pairs of bursa sclerites present, both with strong spike at the outer margins (Fig. 77).

Diagnosis. *Monolepta zonula* looks similar to *M. signata*, *M. mohamedsaidi* new sp. and *M. empatbula*t new sp. These four species have black elytron with circular yellowish spot, at least on basal half of elytra (Figs 18, 73, 98, 123a), and in *M. zonula*, the apical quarter



Figs 73–77. *Monolepta zonula* Weise, 1916. – 73. dorsal colour pattern; 74. antennae, (a) male; (b) female; 75. median lobe: (a) dorsal; (b) lateral; (c) ventral; 76. three different spermathecae; 77. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

of elytron completely yellow including suture. Head is usually black contrasting yellow pronotum in *M. zonula, M. mohamedsaidi* new sp. and *M. empatbula*t new sp. while pale brown to reddish-brown in *M. signata.* From *M. mohamedsaidi* new sp. and *M. empatbula*t new sp., *M. zonula* can be differentiated by the size, which is on average larger (3.50–4.90 mm) compared to *M. mohamedsaidi* new sp. (3.25–4.00 mm) and *M. empatbula*t new sp. (3.25–3.80 mm). In the other hand, the characteristic of median lobe are very different

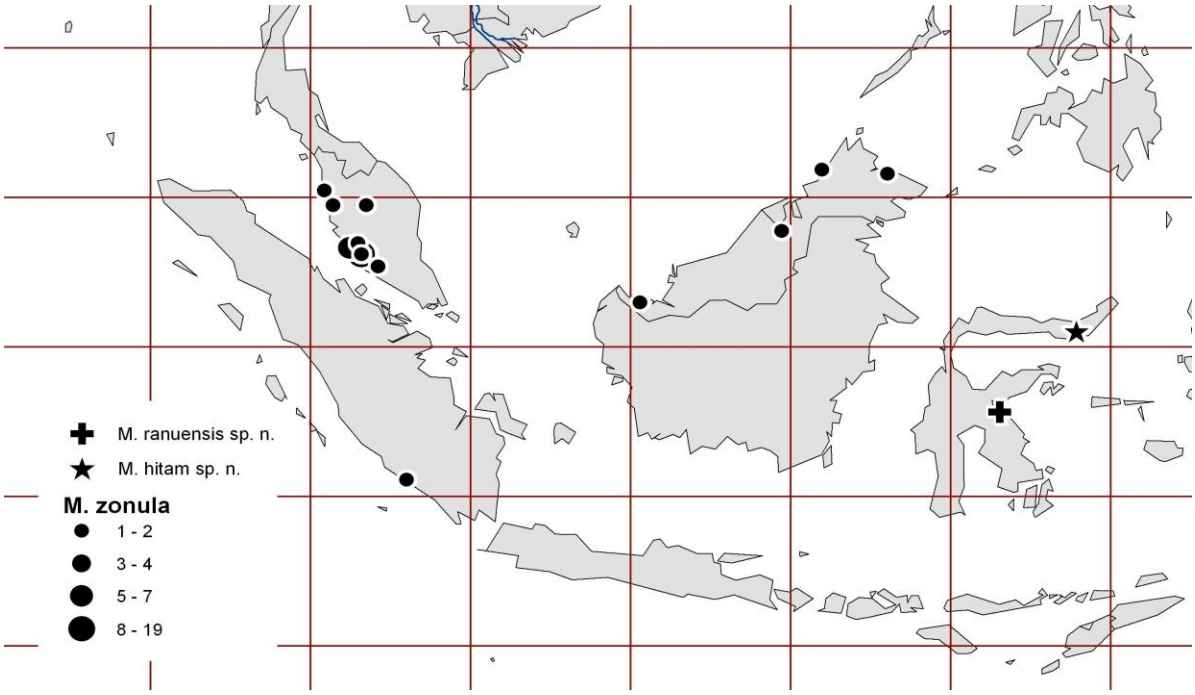


Fig. 78. Distribution of *M. zonula* Weise, 1916, *M. hitam* new sp. and *M. ranuensis* new sp.

between these four species (Figs 20, 75, 100, 125).

Distribution. This species is distributed in Peninsular Malaysia, Borneo, and Sumatra (Fig. 78).

Type material. Lectotype: Bhamo, Birmania, Fea VIII 1886, Jacoby Coll., Monolepta albofasciata Jac., Type 18443 (MCZH) (Fig. 79). Type locality: 24º15'N/97º14'E. Jacoby gave no data on number of specimens in his description, but there is indication that at least more than one specimen was studied. I herein designate a lectotype to fix the name on a single specimen.

Further materials examined. – **Indonesia.** 2 ex., Sumatra, Manna, 4º27'S/103º01'E, 1902, M. Knappert (NNML); 1 ex., Java Occ., M. G. Piepers (NNML). – **Malaysia.** 7 ex., Malay Penin., Kuala Selangor, 3º20'N/101º15'E, IX.1912, Expd. Agrc. Dept. (BMNH); 4 ex., Malay Penin, Blackwater Est Klang, 3º02'N/101º26'E, VI.1916, Expd. Agrc. Dept. (BMNH); 1 ex., Malay Penin, Selangor-Kuala Lumpur, 3º30'N/101º31'E, 1929, H. M. Pendlebury (BMNH); 1 ex., West Malaysia, Perak, Maxwell Hills, 4º47'N/100º45'E, 3700-4500 ft., 13.II.1932, H. M. Pendlebury (BMNH); 1 ex., Malay Penin, Negeri Sembilan, Port Dickson, 2º32'N/101º48'E, 21.II.1933 (BMNH); 1 ex., Kuching, 1º31'N/110º20'E, J. E. A. Lewis, 1910-116 (BMNH); 1

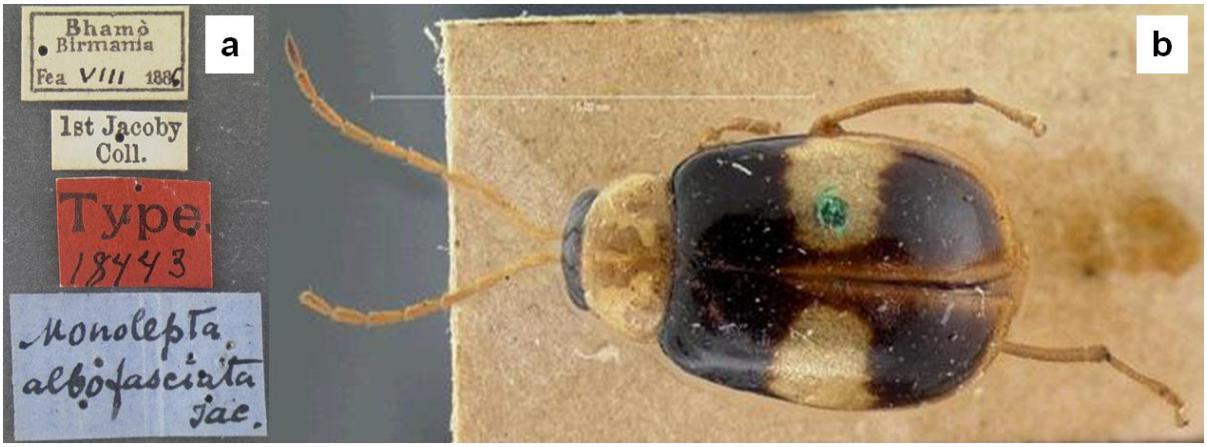


Fig. 79. Photographs of the lectotype of *Monolepta albofasciata* Jacoby, 1889; a. with labels, b. detail. (Photos from the website http://insects.oeb.harvard.edu/mcz/).

ex., Sarawak, Gunong Mulu Nat. Park, 3º55'N/114º46'E, R. G. S. Exped. 24.VI.1977/78, J. D. Holloway et al., B.M.1978-206 (BMNH); 1 ex., Sandakan, 5º50'N/118º03'E, C. V. Creagh, 96-197 (BMNH); 19 ex., Malay Penin, Kuala Lumpur, 3º06'N/101º39'E, Expd. Agrc. Dept. (BMNH); 1 ex., Penang, 5º25'N/100º29'E, J. E. A. Lewis, 1910-116 (BMNH); 2 ex., GAP Malaysia, 21.III.1974, Y. Kiyoyama (CTJ); 1 ex., Sabah, Pulau Manukan, 5º58'N/116ºE, 1.X.91, Zaidi & S. Abin (UKM); 1 ex., Kuala Lumpur, Jln. Pantai Baru, 3º06'N/101º39'E, 11.II.1982, R. Sulaiman (UKM); 1 ex., N. Sembilan, Hulu Bendul, 2º44'N/102º08'E, 27.I.89, Kamaruzaman (UKM); 1 ex., West Malaysia, Perak, Maxwell Hills, 4º47'N/100º45'E, 900-1000 m, 12.–16.I.1995, S. Beevar (CJB).

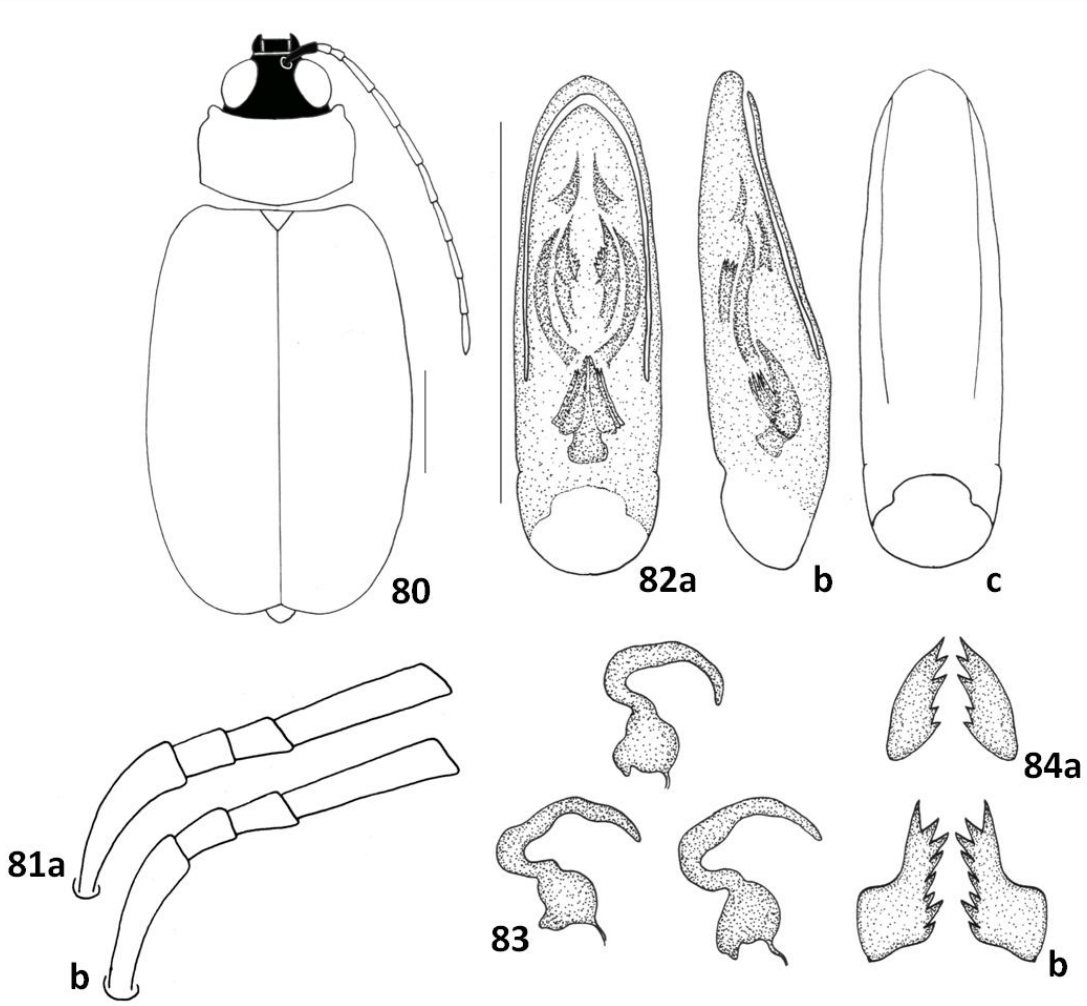
***Monolepta tiomanensis* Mohamedsaid, 1999**

Figs 80–86

Monolepta tiomanensis Mohamedsaid, 1999: p. 247.

Total length. 4.75–6.15 mm (mean: 5.56 mm; n=10).

Head. Finely punctuated, entirely blackish. Labrum and mandible black. Antennae slender, extending almost to middle of the elytra, yellowish and only first basal antennomere partly black (Fig. 80). First antennomere club shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.75–1.00



Figs 80–84. *Monolepta tiomanensis* Mohamedsaid, 1999. – 80. dorsal colour pattern; 81. antennae, (a) male; (b) female; 82. median lobe: (a) dorsal; (b) lateral; (c) ventral; 83. three different spermathecae; 84. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

(mean: 0.88); ratio length of third to fourth antennomere: 0.27–0.45 (mean: 0.36) (Fig. 81).

Thorax. Pronotum entirely pale yellow, transversely convex, anterior side broadened. Pronotal width: 1.40–1.80 mm (mean: 1.64), ratio length to width: 0.57–0.61 (mean: 0.59). Scutellum, meso- and metathorax yellow. Elytron yellowish, coarsely punctuated. Elytra length 3.60–4.50 mm (mean: 4.14), maximal width of both elytra together 2.50–3.20 mm (mean: 2.83), ratio of maximal width of both elytra together to length of elytra 0.66–0.70 (mean: 0.68) (Fig. 80). Legs entirely yellowish.

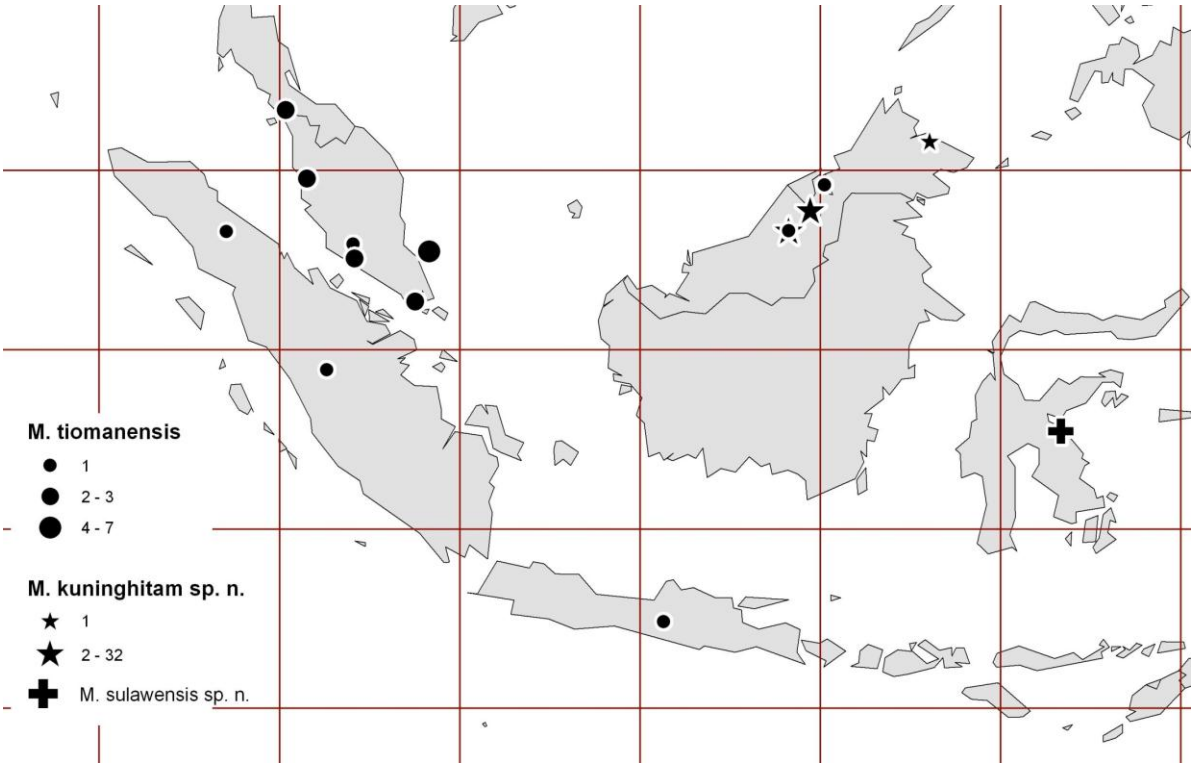


Fig. 85. Distribution of *M. tiomanensis* Mohamedsaid, 1999, *M. kuninghitam* new sp. and *M. sulawensis* new sp.

Abdomen. Yellow.

Male genitalia. Median lobe short, very broad, parallel-sided at basal half and becomes rounded towards apex. Tectum broad and mostly reaching the apex of median lobe, ventral groove parallel sided towards basal. The clear differentiation of three spiculae visible. Lateral spiculae consist of two pairs of spur-like at the apical half, median spiculae consist of long and curved horn-shaped, and short slender filamentous-like at the basal half, and ventral spiculae club-shaped, jagged at apex. Sacculus occurs at basal (Fig. 82).

Female genitalia. Spermatheca with rounded nodulus, short slender tube-like protruding, median part long, and cornu curve (Fig. 83). Two pairs of bursa sclerites presents, both with strong spines at the outer margin (Fig. 84).

Diagnosis. *Monolepta tiomanensis* has unicolorous yellowish elytron (Fig. 80), very similar like *M. jacobyi*, but later with basal margins black (Fig. 58). The antenna is yellowish in both species, except the first antennomere partly black in *M. tiomanensis* while the last antennomere dark brown in *M. jacobyi*. On average, *M. tiomanensis* is smaller (4.75–6.15

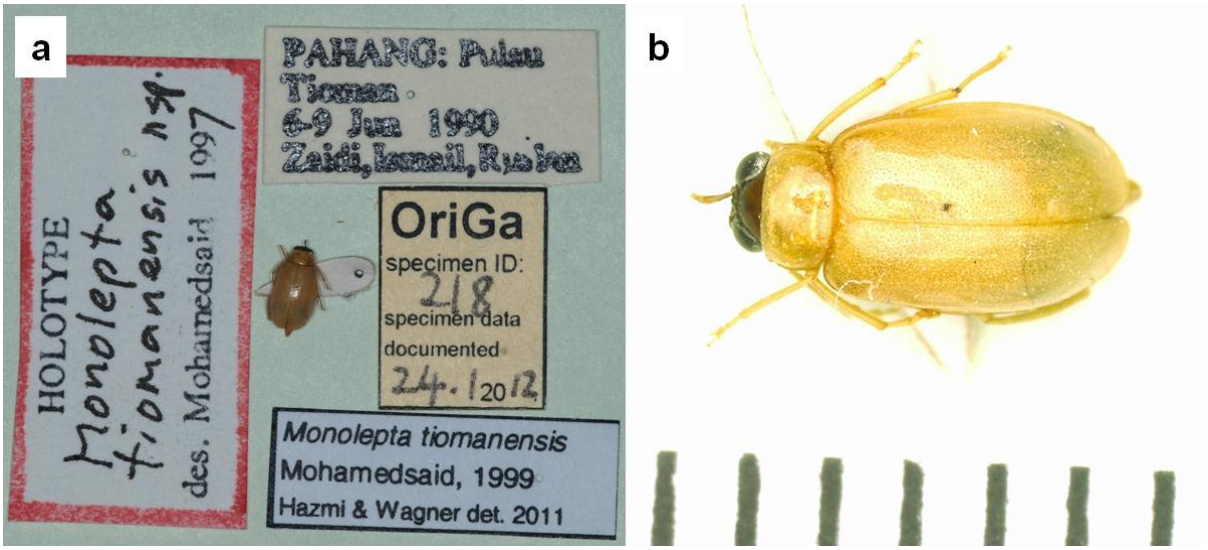


Fig. 86. Photographs of the holotype of *Monolepta tiomanensis* Mohamedsaid, 1997; a. with labels, b. detail.

mm) than *M. jacobyi* (6.40–7.70 mm). The head of *M.tiomanensis* is black contrasting the pale yellow pronotum, and underside is yellowish, while in *M. jacobyi* head is pale yellow to brown, and underside is blackish. The characteristic of median lobe is very different between these two species. Median lobe is very broad in *M. tiomanensis* and slender in *M. jacobyi*, and the structure of endophallic spiculae also very different (Figs 60, 82).

Distribution. This species is distributed in Borneo (Malaysia, Brunei), Singapore and Indonesia (Sumatra and Java) (Fig. 85).

Type material. Holotype: Pahang, Pulau Tioman, 6.–9.VI.1990, Zaidi, Ismail, Ruslan (UKM) (Fig. 86). – Paratypes: 2 ex., same data as holotype (UKM). Type locality: 2º47'N/104º'E.

Further materials examined. – **Brunei.** 1 ex., Brunei, Temburong District, ridge NE of Kuala Belalong, 4º37'N/115º8'E, 300 m, X.1992 (BMNH). – **Indonesia.** 1 ex., Sibolangit, Sumatra: 3º18'N/98º34'E, Mjöberg (NHRS); 1 ex., Java, Gg. Moeria, Tjolo 700–1000m, 7º36'S/110º42'E, 28.XII.73, Museum Leiden, P. H. v Doesburg Collectie Van Doesburg, rec. 1973 (NNML); 1 ex., Sumatra Utara, Pasar Baru, 0º35'S/101º20'E, 26.III.1996, K. Maruyama (CTJ). – **Malaysia.** 2 ex., Perak, F. M. S. Batang, Padang Jor Camp, 4º48'N/100º48'E, 11.III.1924/1925, H. M. Pendlebury (BMNH); 1 ex., South China Sea, Pulau Tioman, Sedagang at light, 2º47'N/104º10'E, V.1927, N. S. M. R. H (BMNH); 1 ex., Sarawak, Mt. Dulit, 4000 ft., 3º20'N/114º09'E, 21.X.1932, Moss Forest (BMNH); 3 ex., Pahang, Pulau

Tioman, 2º47'N/104º'E, 22.–28.IV.1993, Zaidi et al. (UKM); 2 ex., Perlis, Kaki Bukit, Wang Kelian, 6º40'N/100º'E, 7.XII.1992; 19.VII.1994, Zabidi et al. (UKM); 1 ex., N. Sembilan, Serting Ulu, 2º59'N/102ºE, 30.III.1995, Ismail & Ruslan (UKM); 3 ex., N. Sembilan, Rembau, Gunong Datok, 2º34'N/102º03'E, 30.VIII.1995, Ismail & Sham (UKM). – **Singapore.** 2 ex., Singapore, 1º21'N/103º49'E, H. N. Ridley, 1904/3 (BMNH).

***Monolepta putri* Mohamedsaid, 2001**

Figs 87–91

Monolepta putri Mohamedsaid, 2001: p 137–169.

Total length. 4.60–4.90 mm (mean: 4.74 mm; n=4).

Head. Impunctate, yellowish. Labrum and mandible blackish. Antennae slender, extending to the middle of eltytra, entirely yellowish (Fig. 87). First antennomere club-shaped, second and third antennomere approximately the same length; ratio length of second to third antennomere: 0.75–1.00 (mean: 0.88); ratio length of third to fourth antennomere: 0.38–0.44 (mean: 0.41) (Fig. 88).

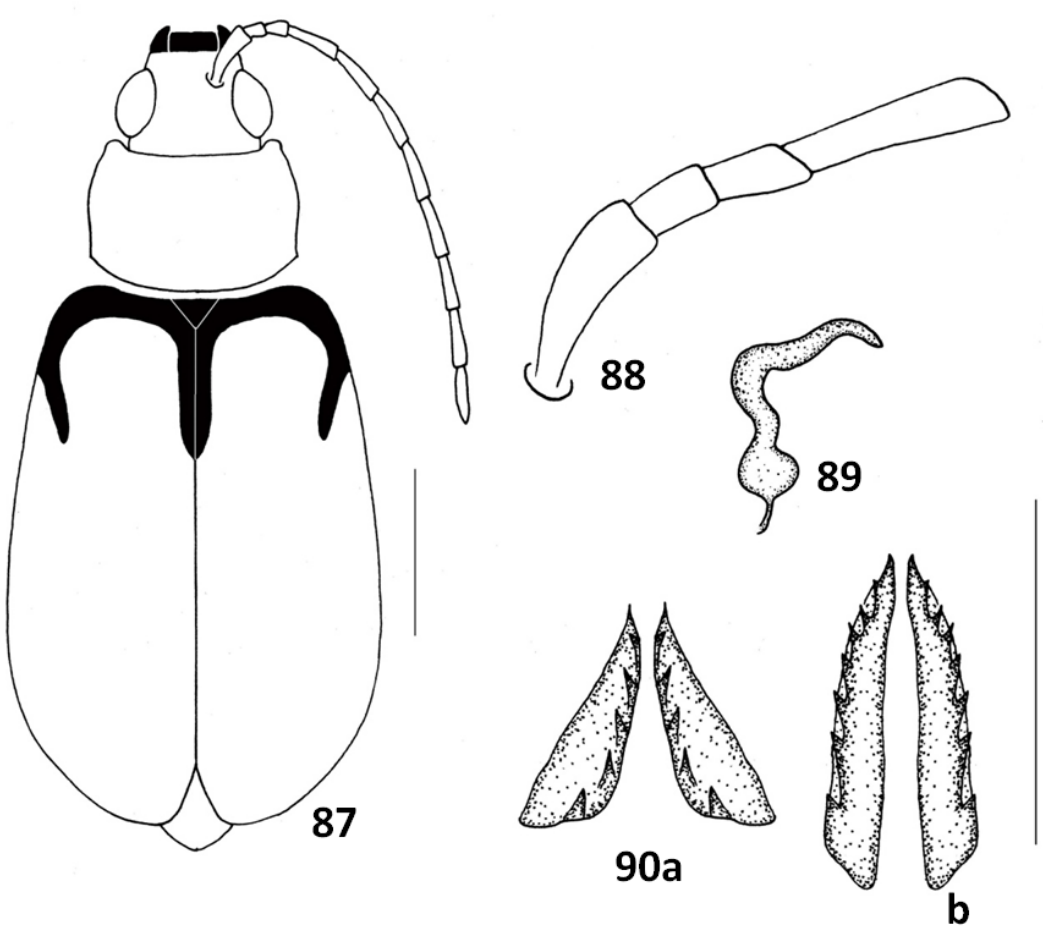
Thorax. Pronotum impunctate, parallel-sided, entirely yellowish, surface weakly depressed. Pronotal width: 1.40–1.45 mm (mean: 1.41), ratio length to width: 0.64–0.66 (mean: 0.65). Scutellum, meso- and metathorax blackish. Elytron entirely yellowish, basal margin, humerus, basal one-fourth of lateral margin and basal one fourth of suture black. Elytra length 3.60–3.80 mm (mean: 3.71), maximal width of both elytra together 2.50–2.70 mm (mean: 2.63), ratio of maximal width of both elytra together to length of elytra 0.70–0.72 (mean: 0.71) (Fig. 87). Legs yellow.

Abdomen. Yellowish.

Male genitalia. Not known.

Female genitalia. Spermatheca with rounded nodulus. The median part is long and cornu curved (Fig. 89). Two pairs bursa sclerites present, the dorsal is smaller than ventral, both with strong spine at the outer margins and highly sclerotised (Fig. 90).

Diagnosis. *Monolepta putri* looks most similar to *M. kuninghitam* new sp. These two species have unicolorous yellowish elytron with basal margins stretches to humerus black, but in later species with exception black tips (Figs 87, 110). Head and pronotum are yellowish, and mouthparts are black in both species. The differences between *M. putri* and *M.*



Figs 87–90. *Monolepta putri* Mohamedsaid, 2001. – 87. dorsal colour pattern; 88. antennae, (a) male; (b) female; 89. spermathecae; 90. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

kuninghitam new sp. are, the antenna of *M. putri* is yellowish, while in *M. kuninghitam* new sp. is black and only three basal antennomere yellow-brownish, and pronotum of *M. putri* (0.64–0.65) is broad while in *M. kuninghitam* new sp. is narrowed (0.70–0.72). The characteristic of spermatheca as well very different, which the nodulus of *M. putri* (Fig. 89) is rounded, and in *M. kuninghitam* new sp. (Fig. 113) is very small, which similar to *M. bifasciata* and *M. rubra* (Figs 4, 14).

Type material. Holotype: Indonesia, Bali, Asah Panji, Lake Tamblingan, 6.V.1998, H. Takizawa (CTJ). **Paratypes**: same data as holotype, 1 female (UKM) (Fig. 91), same data, except 20.IX.1998, 1 female (UKM). Type locality: 8º15'S/115º05'E.

Further materials examined. – Indonesia. 1 ex., same data as holotype, except

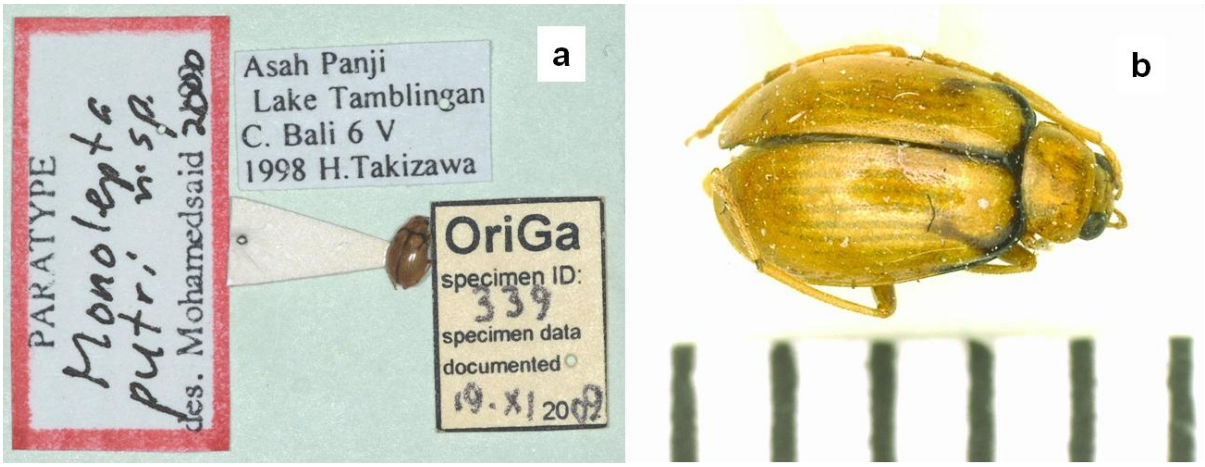


Fig. 91. Photographs of the paratype of *Monolepta putri* Mohamedsaid, 2000; a. with labels, b. detail.

25.V.2005 (UKM), 1 ex., C. Bali, Candikuning: Kebun Raya, alt m 1400, 27.–31.X.1991, Krikken, Huijbregts, de Vries, multistr. evergr. forest (degraded) (NNML).

***Monolepta bruneiensis* new sp.**

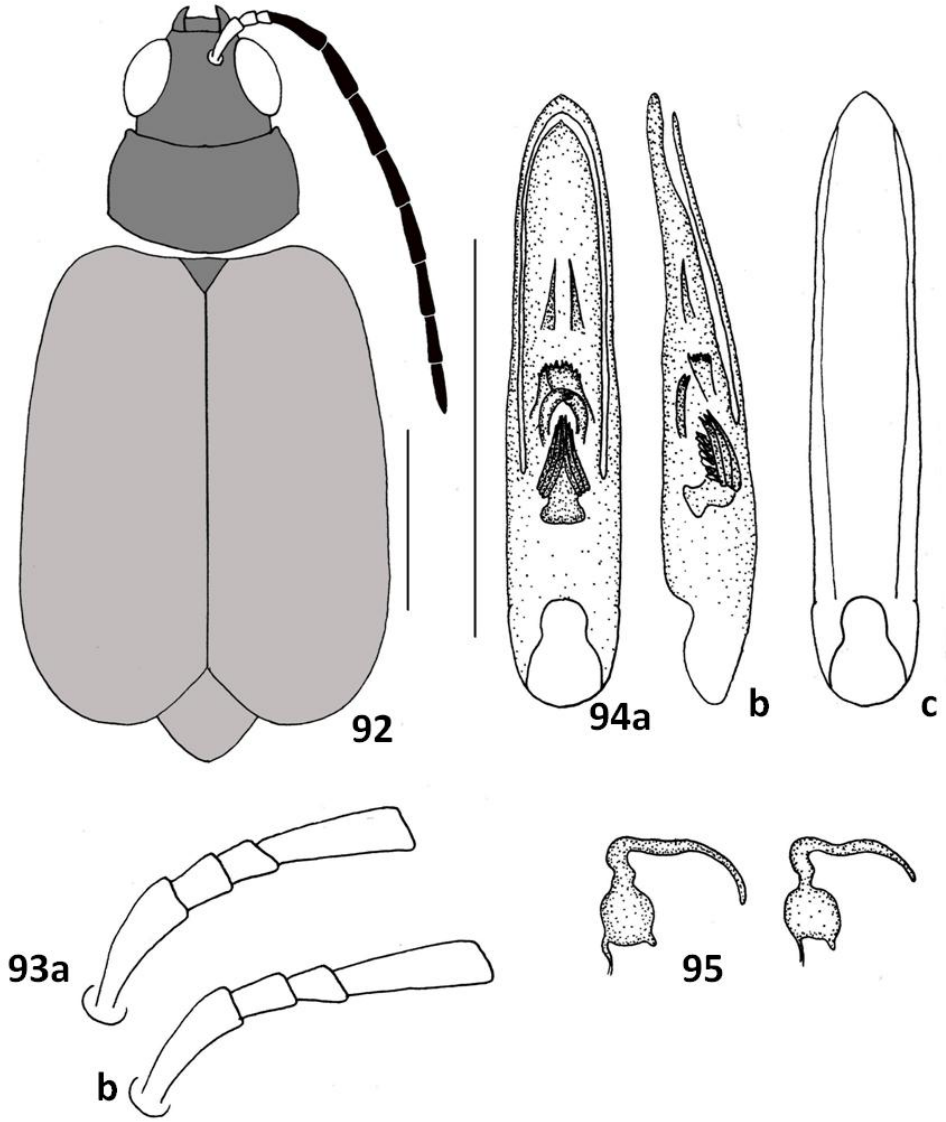
Figs 92–97

Etymology. The name of the new species refers to the type locality where it exclusively occurs.

Total length. 3.75–4.70 mm (mean: 4.26 mm; n=7).

Head. Impunctate, entirely brown-reddish and shiny. Labrum and mandible brown-reddish as head, apical a bit darker. Antennae slender, extending almost to the middle of elytra, blackish and only three basal antennomere yellow-brownish (Fig. 92). First antennomere club-shaped, second and third antennomere of the same length, and in some specimens, third antennomere a bit shorter than second antennomere; ratio length of second to third antennomere: 1.00–1.50 (mean: 1.25); ratio length of third to fourth antennomere: 0.25–0.29 (mean: 0.27) (Fig. 93).

Thorax. Pronotum entirely brown-reddish, broad, and parallel-sided. Pronotal width: 1.15–1.30 mm (mean: 1.24), ratio length to width: 0.56–0.58 (mean: 0.57). Scutellum, meso- and metathorax brown-reddish. Elytron entirely pale-brownish. Elytra length 2.90–3.55 mm



Figs 92–95. *Monolepta bruneiensis* new sp. – 92. dorsal colour pattern; 93. antennae, (a) male; (b) female; 94. median lobe: (a) dorsal; (b) lateral; (c) ventral; 95. two different spermathecae. Scale bar: 1 mm.

(mean: 3.19), maximal width of both elytra together 2.20–2.70 mm (mean: 2.46), ratio of maximal width of both elytra together to length of elytra 0.75–0.79 (mean: 0.77) (Fig. 92). Legs entirely yellow-brownish.

Abdomen. Brown-yellowish.

Male genitalia. Median lobe slender, parallel-sided at basal and becomes rounded towards

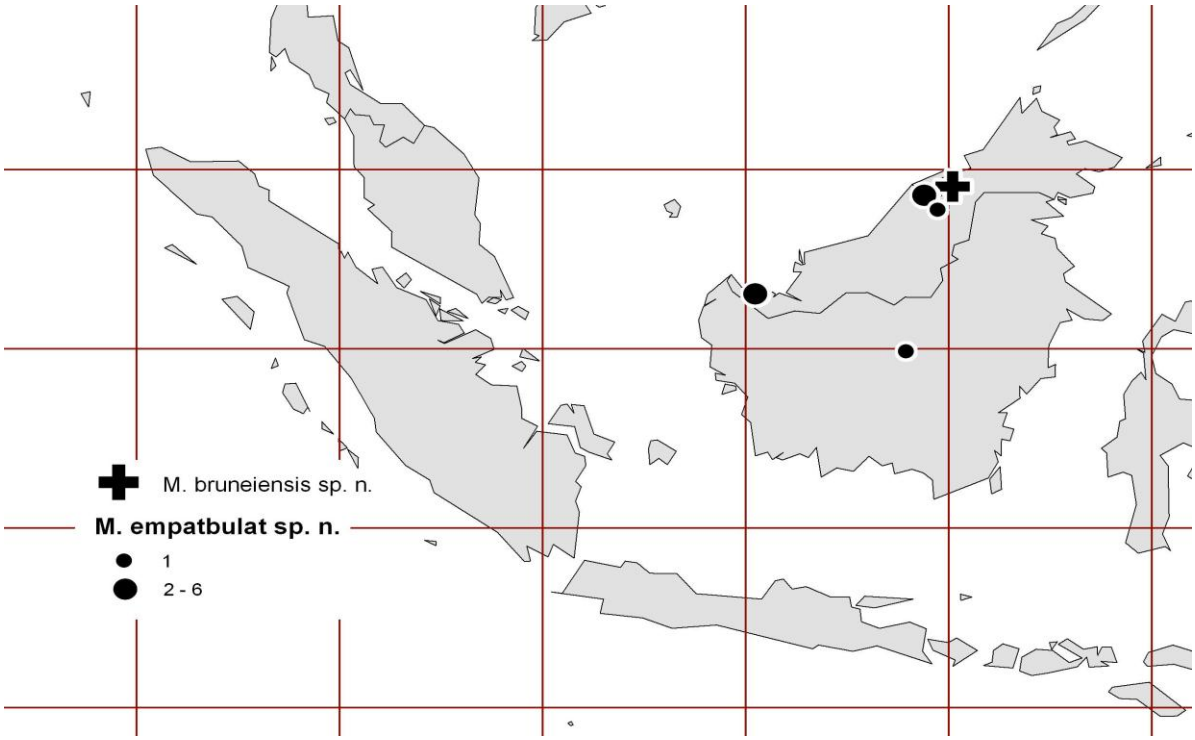


Fig. 96. Distribution of *M. bruneinesis* new sp. and *M. empatbulat* new sp.

apex. Tectum long, but not reaching the apex of median lobe, ventral groove narrow towards basal. The three differentiations of spiculae clearly visible. The lateral spiculae spur-like at the apical half, median spiculae club-shaped and jagged at apex, flip to each other, another short and slender filamentous-like at basal, and ventral spiculae elongated basal club-shaped, jagged at apex, smaller than median spiculae. Sacculus occurs at basal (Fig. 94).

Female genitalia. Spermatheca with big and rounded nodulus, short slender tube-like protruding, median part short, cornu long and curved (Fig. 95). Bursa sclerites weakly sclerotised, and not visible.

Diagnosis. *Monolepta bruneiensis* new sp. is most similar in body coloration to *M. mentawiensis*. Both species have brown-reddish pronotum and pale-brownish elytron, but later has brown-reddish transverse basal band on apical half of elytron (Fig. 65), while in *M. bruneiensis* new sp. lack of this (Fig. 92). The underside of body in both species is similar in coloration, brown-reddish, but the mouthpart of *M. bruneiensis* new sp. is brown-reddish as the coloration of head, while black in *M. mentawiensis.* On average, *M. bruneiensis* new sp. is smaller (3.75–4.70 mm) than *M. mentawiensis* (4.90–6.25 mm). The second and third

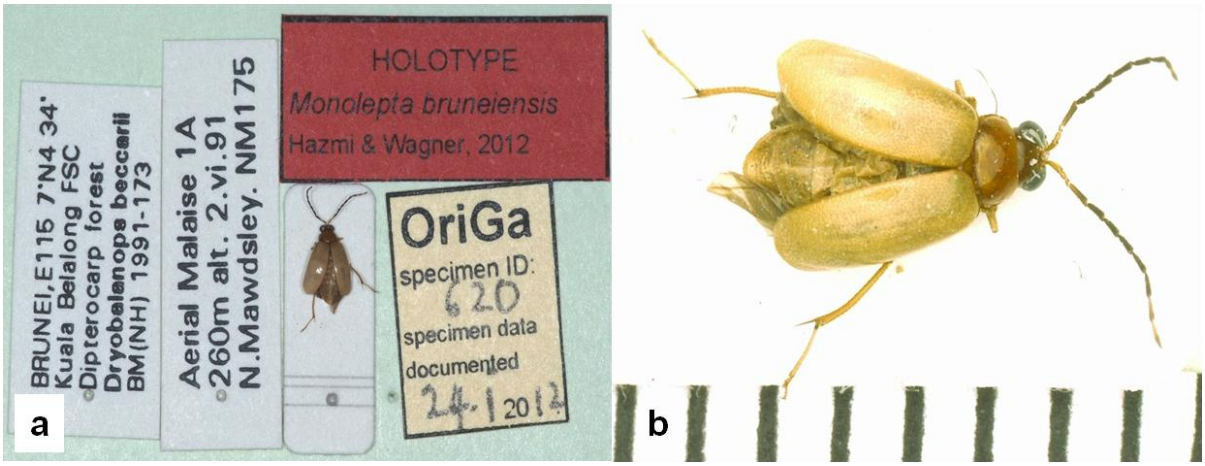


Fig. 97. Photographs of the holotype of *Monolepta bruneiensis* new sp., a. with labels, b. detail.

antennomere of *M. bruneiensis* new sp. is the same length, and in some specimens, third antennomere a bit shorter than second antennomere (ratio length of second to third antennomere 1.00–1.50) while in *M. mentawiensis*, second antennomere shorter, or almost of the same length to third antennomere (0.75–1.00). The genitalic characters particularly the median lobe are quite different between these two species (Figs 67, 94).

Distribution. This species only recorded in Brunei (Fig. 96).

Type material. Holotype: Brunei, E115 7'N4 34', Kuala Belalong FSC Dipterocarp forest Dryobalanops beccarii, BM(NH) 1991-173, Aerial Malaise 1A, 260m alt. 2.VI.91, N. Mawdsley. NM175 (BMNH) (Fig. 97). **Paratypes**: 6 ex., Brunei, Kuala Belalong FSC Dipterocarp Forest, 8.II.92, N. Mawdsley, BM(NH) 1991-173 (BMNH). Type locality: 4º34'N/115º07'E.

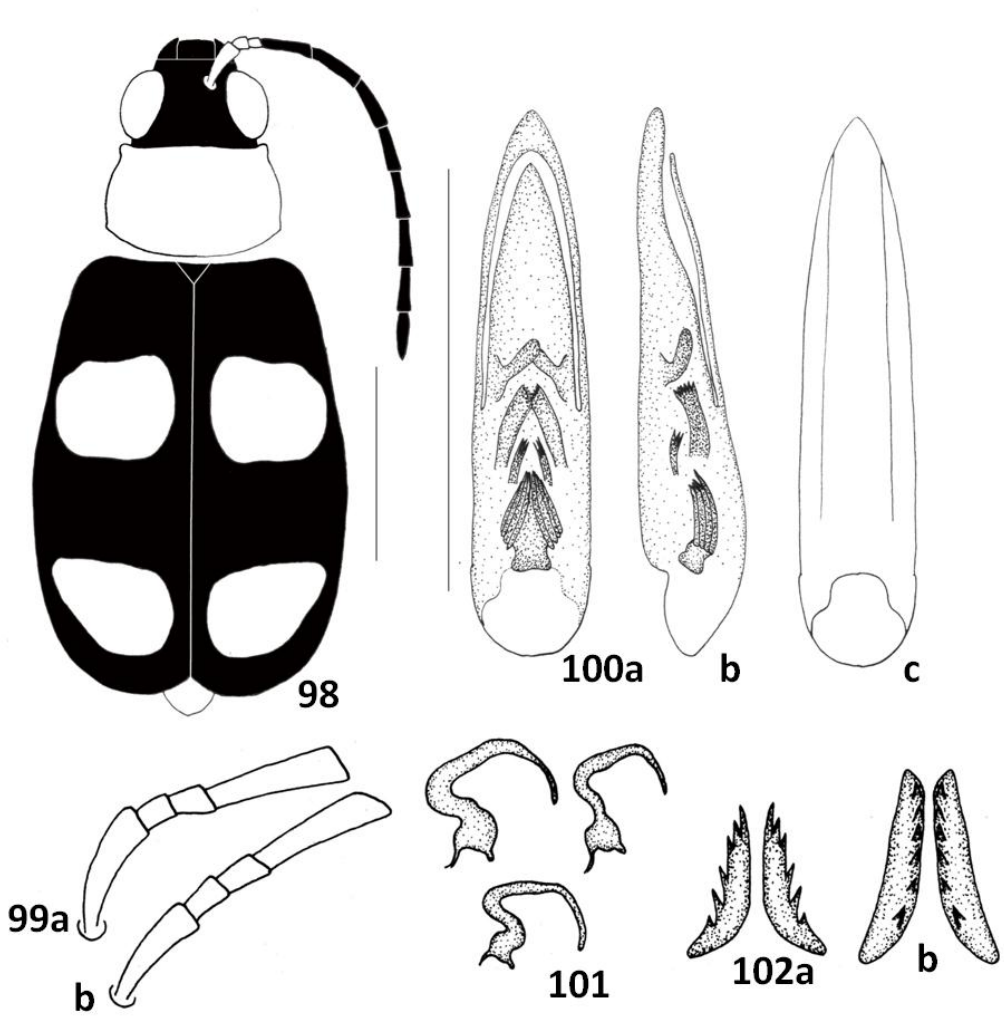
***Monolepta empatbulat* new sp.**

Figs 98–103

Etymology. The name of the new species refers on the elytra coloration with four circular spot. Empatbulat means four circular spot in Malay.

Total length. 3.25–3.80 mm (mean: 3.55 mm; n=10).

Head. Impunctate, entirely blackish and shiny. Labrum and mandible blackish. Antennae



Figs 98–102. *Monolepta empatbulat* new sp. – 98. dorsal colour pattern; 99. antennae, (a) male; (b) female; 100. median lobe: (a) dorsal; (b) lateral; (c) ventral; 101. three different spermathecae; 102. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

long and slender, blackish and only three basal antennomere yellow-brownish (Fig. 98). First antennomere club-shaped, second and third antennomere almost of the same length: 0.67–1.00 (mean: 0.93), ratio length of third to fourth antennomere: 0.29–0.43 (mean: 0.34) (Fig. 99).

Thorax. Pronotum finely punctuated, parallel-sided, entirely yellow-brownish, without depression. Pronotal width: 0.95–1.20 mm (mean: 1.06), ratio length to width: 0.63–0.66 (mean: 0.64). Scutellum, meso- and metathorax black. Elytron elongated, and broadened on

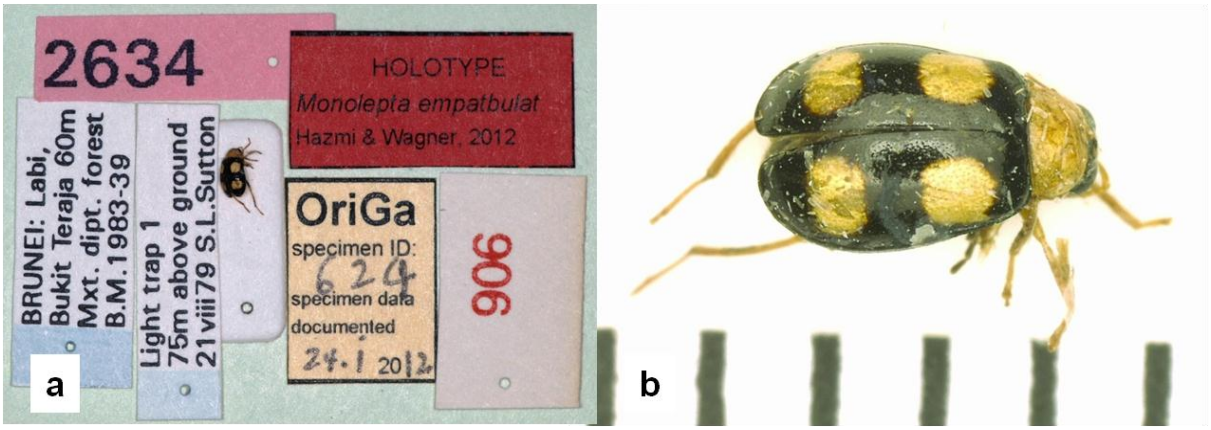


Fig. 103. Photographs of the holotype of *Monolepta empatbulat* new sp., a. with labels, b. detail.

apical. Elytron black, with two circular yellowish spot, each on basal half and apical of elytron. Elytra length 2.50–2.75 mm (mean: 2.67), maximal width of both elytra together 1.80–2.00 mm (mean: 1.92), ratio of maximal width of both elytra together to length of elytra 0.70–0.73 (mean: 0.72) (Fig. 98). Legs yellow-brownish and part of femur and tibiae particularly the apical are blackish.

Abdomen. Yellow-brownish and darker in the middle and apical part of the abdomen.

Male genitalia. Median lobe broad at basal, and becomes narrow and conical towards apex. Tectum broad at base and narrow towards apex, ventral groove parallel sided towards basal. Three differentiations of spiculae clearly visible. Lateral spiculae club-shaped, widened at basal, median spiculae of short and slender filamentous-like on basal one third, and two pairs of ventral spiculae, club-shaped and jagged at apex, two pairs. Sacculus occurs at basal (Fig. 100).

Female genitalia. Spermatheca with rounded nodulus, and short slender tube-like protruding from inner part of nodulus. The median part long, and cornu very curved, blunt hook-shaped at apex (Fig. 101). Bursa sclerites consist of two pairs. Dorsal part is smaller, both with spur at the outer margins (Fig. 102).

Diagnosis. *Monolepta empatbulat* new sp. looks very similar to *M. mohamedsaidi* new sp. These two species have two circular yellow spots on elytron, each one in the basal and apical half (Figs 98, 123a), and size is on average small in both species (*M. empatbulat* new sp. 3.25–3.80 mm; *M. mohamedsaidi* new sp. 3.25–4.00 mm). Pronotum is broader in *M.*

empatbulat new sp. (pronotal width to length 0.58-0.62) than *M. mohamedsaidi* new sp. (0.63–0.66), and head is black in *M. empatbulat* new sp. while in *M. mohamedsaidi* new sp. varies from yellow-brownish to blackish. Mouthparts are black in both species, and the antenna is blackish and only three basal antennomeres yellow-brownish. The legs of *M. empatbulat* new sp. generally yellow-brownish but, part of femur and tibiae particularly the apical are blackish, and legs of *M. mohamedsaidi* new sp. is yellow-brownish. The characteristic of median lobe is very different between these two species (Figs 100, 125).

Distribution. This species distributed only in Borneo. Specimens have been so far collected in Brunei, Kalimantan, Sabah and Sarawak (Fig. 96).

Type materials. Holotype: Brunei, Labi, Bukit Teraja 60m, Mxt. Dipt. Forest, B.M. 1983-39, Light trap 1, 75m above ground, 21.VIII.79, S.L. Sutton, 906, 2634 (BMNH) (Fig. 103). Type locality: 4º18'N/114º26'E. **Paratypes**: 12 ex. – **Brunei.** 5 ex., same data as holotype (BMNH). – **Indonesia**. 1 ex., Indonesia, Borneo, Kalimantan Tengah, Busang / Rekut confl., 0º03'S/113º59'E, VIII.2001, Brendell/Mendel, 2001–191, Barito Ulu 2001, BMNH(E). – **Malaysia**. 5 ex., W. Sarawak, Mt. Matang, 1º34'N/110º16'E, XII.1913–II.1914, G.E. Bryant (BMNH); 1 ex., Sarawak, Gunong Mulu Nat. Park, 3º55'N/114º46'E, R. G. S. Exped. 1977-8, 24.VI. J. D. Holloway et al., B. M. 1978-206 (BMNH).

***Monolepta hitam* new sp.**

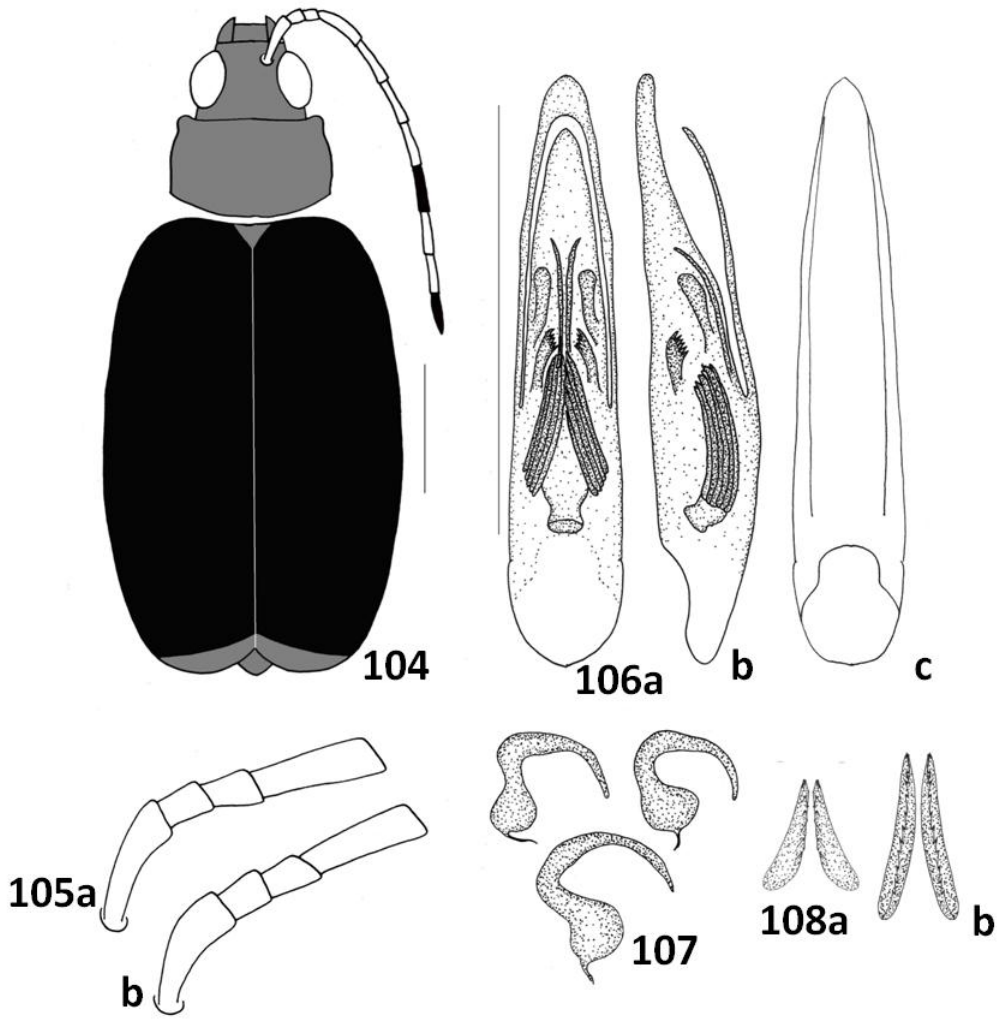
Figs 104–109

Etymology. The name of the new species refers to the coloration of its elytron. Hitam means black in Malay.

Total length. 4.60–6.00 mm (mean: 5.16 mm; n=10).

Head. Impunctate, reddish-brown to dark-brown. Labrum and mandible as the coloration of head. Antennae long and slender, extending to the middle of the elytra, yellow-brownish and seventh, eighth and terminal antennomere are partly dark-brown or blackish in coloration (Fig. 104). First antennomere club shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.75–1.00 (mean: 0.92); ratio length of third to fourth antennomere: 0.33–0.44 (mean: 0.38) (Fig. 105).

Thorax. Pronotum finely punctuated, reddish-brown, and in few specimens dark-brown. Pronotal width: 1.35–1.60 mm (mean: 1.48), ratio length to width: 0.63–0.66 (mean: 0.64).



Figs 104–108. ***Monolepta hitam*** **new sp.** – 104. dorsal colour pattern; 105. antennae, (a) male; (b) female; 106. median lobe: (a) dorsal; (b) lateral; (c) ventral; 107. three different spermathecae; 108. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

Scutellum similar with the coloration of pronotum. Meso- and metathorax black. Elytron entirely blackish, widened towards apical and in few specimens the tips reddish-brown. Elytra length 3.65–4.45 mm (mean: 3.98), maximal width of both elytra together 2.50–3.00 mm (mean: 2.65), ratio of maximal width of both elytra together to length of elytra 0.64–0.68 (mean: 0.67) (Fig. 104). Legs entirely reddish-brown.

Abdomen. Brown-reddish.

Male genitalia. Median lobe parallel-sided at basal half and becomes narrow towards apex.

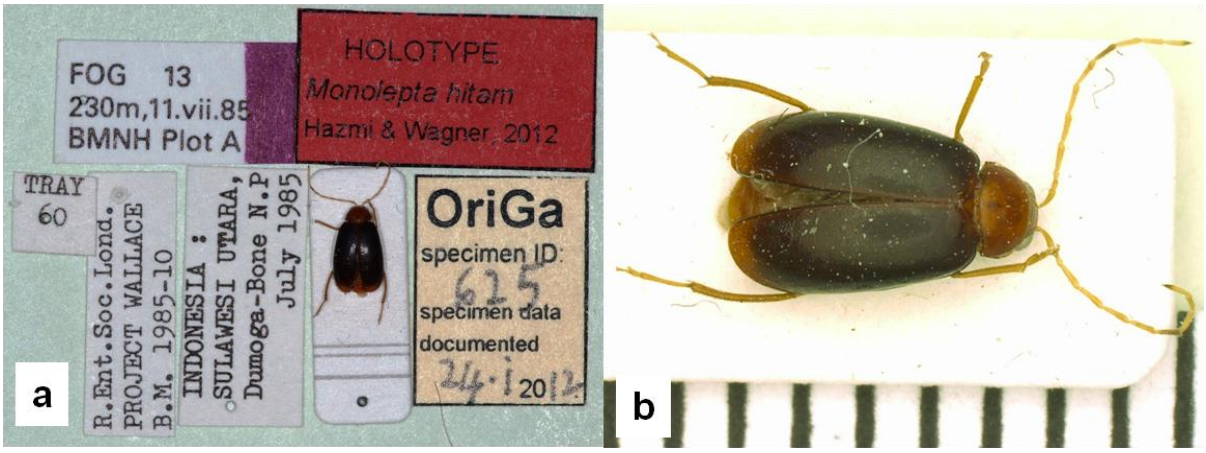


Fig. 109. Photographs of the holotype of *Monolepta hitam* new sp., a. with labels, b. detail.

Tectum long, also broad at basal and becomes narrow to apex, ventral groove parallel sided towards basal. Lateral spiculae club-shaped and elongated at basal, median spiculae long and slender filamentous-like, one longer at the apical half, ventral spiculae club-shaped and jagged at apex. Sacculus occurs at basal (Fig. 106).

Female genitalia. Spermatheca with rounded nodulus, comparatively big. Cornu long and curved (Fig. 107). Bursa sclerites consist of two pairs. Dorsal part is smaller, spiny (Fig. 108a), ventral part slender with fine serrate at the outer margin (Fig. 108b).

Diagnosis. *Monolepta hitam* new sp. can be easily distinguished from other *Monolepta* species of Sundaland area by the predominantly unicolorous blackish and reddish tips elytron. The similar species that has unicolorous elytron is *M. rufipennis*, but in this species dorsum coloration (elytron) is reddish-brown, head and pronotum black (Figs 52, 104). These two species have on average medium-size, (*M. hitam* new sp. 4.60–6.00 mm; *M. rufipennis* 4.75–6.35 mm). The genitalic characters are very different between these two species. The median lobe of *M. hitam* new sp. with three clear differentiations of spiculae (Fig. 106) while in *M. rufipennis* lack of ventral spiculae (Fig. 54). The spermatheca is also very different between these two species (Figs 55, 107).

Distribution. This species only recorded in Sulawesi Island (Fig. 78).

Type materials. Holotype: Indonesia, Sulawesi Utara, Dumoga-Bone N. P., July 1985, R. Ent. Soc. Lond. Project Wallace B.M. 1985-10, Fog 13, 230m, 11.VII.85, BMNH Plot A, Tray 60 (BMNH) (Fig. 109). Type locality: 0º32'N/123º58'E. **Paratypes**: 37 ex. – **Indonesia.** 26 ex., Indonesia, Sulawesi Utara, Dumoga-Bone N.P., 0º32'N/123º58'E, II.–XII.1985, Project

Wallace (BMNH); 6 ex., N. Sulawesi, Dumoga-Bone N. P. Toraut, alt. m 0233, 0º32'N/123º58'E, 21.V.1985, J. Huijbregts, multistr. evergreen forest, Rothamstead trap (NNML); 2 ex., Dumoga Bone NP, 0º32'N/123º58'E, Edwards subcamp at light, 664m, 29.IV.1985, J. van Tol (NNML); 3 ex., N. Sulawesi, Dumoga-Bone Hogs Back, alt. m 0664, 0º32'N/123º58'E, 2.–5.V.1985, J. Huijbregts, multistr. evergreen forest Rothamstead trap (NNML).

***Monolepta kuninghitam* new sp.**

Figs 110–115

Etymology. The name of the new species designated based on the coloration of the body, yellowish with black on apical of elytra. Kuninghitam means yellow-black in Malay.

Total length. 3.70–4.35 mm (mean: 3.96 mm; n=10).

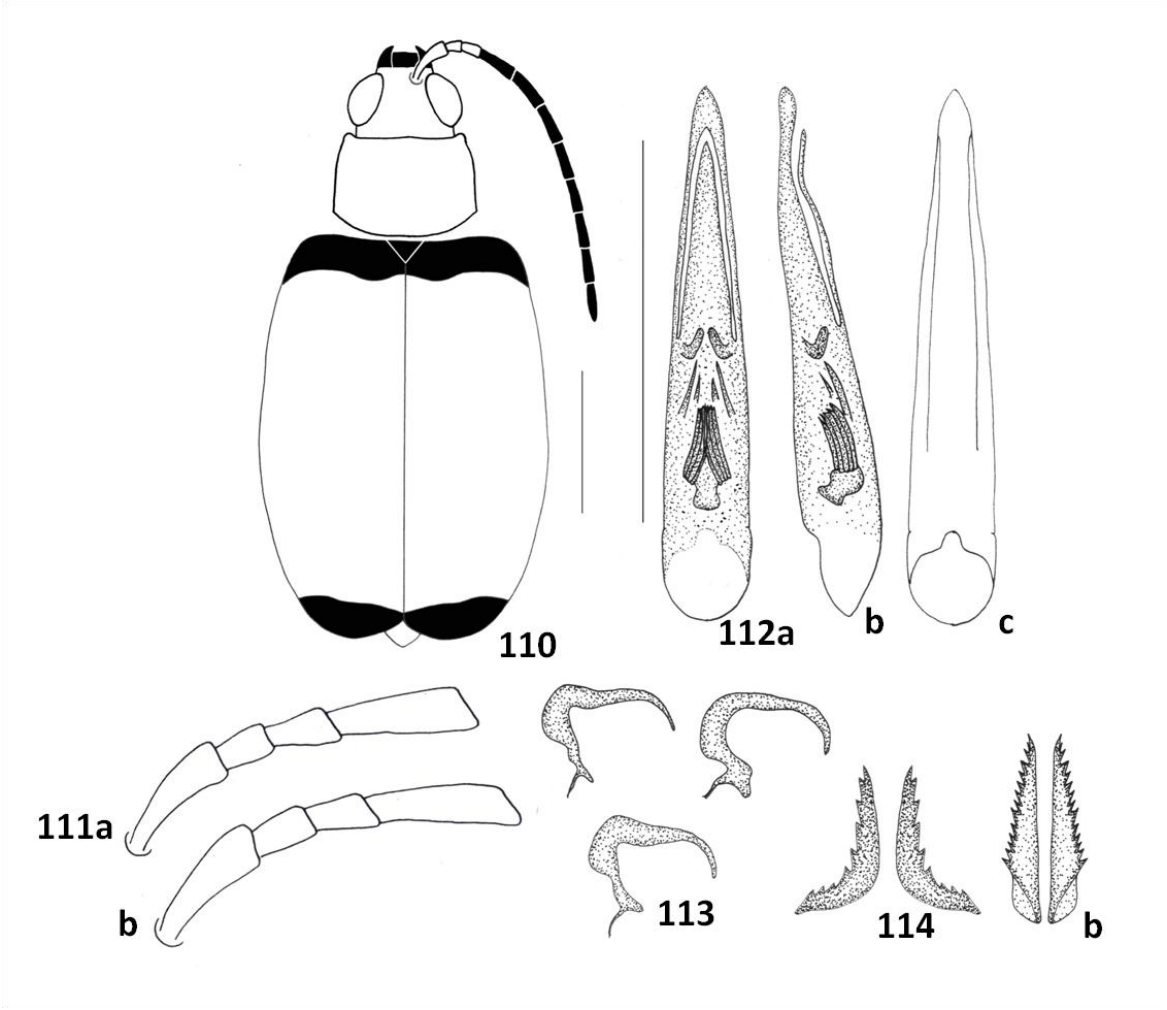
Head. Impunctate, yellow-brownish. Labrum and mandible blackish. Antennae slender, extending almost to the middle of the elytra, blackish and only three basal antennomere yellow-brownish (Fig. 110). First antennomere club-shaped, second antennomere shorter; ratio length of second to third antennomere: 0.67–0.75 (mean: 0.69), ratio length of third to fourth antennomere: 0.50–0.57 (mean: 0.52) (Fig. 111).

Thorax. Pronotum finely punctuated, yellow-brownish, narrow. Pronotal width: 1.00–1.25 mm (mean: 1.09 mm), ratio length to width: 0.70–0.73 (mean: 0.71). Scutellum, meso- and metathorax blackish. Elytra yellowish, basal margin and humerus black, and in some specimens apical margin blackish. Elytra length 2.65–3.30 mm (mean: 2.94), maximal width of both elytra together 1.90–2.40 mm (mean: 2.10), ratio of maximal width of both elytra together to length of elytra 0.70–0.73 (mean: 0.72) (Fig. 110). Legs yellow-brownish, femur and tibiae dark-brown.

Abdomen. Yellow-brownish.

Male genitalia. Median lobe slender, and becomes narrow towards apex, apex often conical. Tectum long, broad at basal and becomes very narrow and conical at apex, ventral groove parallel-sided towards basal. Lateral spiculae V-shaped on basal half of median lobe, median spiculae short and slender filamentous-like and ventral spiculae of elongated spur-like in the middle. Sacculus occurs at basal and clearly visible (Fig. 112).

Female genitalia. Spermatheca with very small nodulus, median part long and curved cornu



Figs 110–114. *Monolepta kuninghitam* new sp. – 110. dorsal colour pattern; 111. antennae, (a) male; (b) female; 112. median lobe: (a) dorsal; (b) lateral; (c) ventral; 113. three different spermathecae; 114. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

(Fig. 113). The shape of spermatheca in this species resemble the spermatheca of *M. bifasciata* and *M. rubra* (Figs 4, 14). Two spiky bursa sclerites present, dorsal are smaller with bigger spike at the outer margin and ventral part bigger in size, finely undulate at the outer margin (Fig. 114).

Diagnosis. The coloration of *M. kuninghitam* new sp. is most similar to *M. putri*. Elytron is unicolorous yellowish with basal margin stretch to humerus blackish, but in some specimens of *M. kuninghitam* new sp. the apical margin of elytra is blackish (Figs 87, 110). Underside of both species is blackish, and abdomen is yellow-brownish. The differences of these

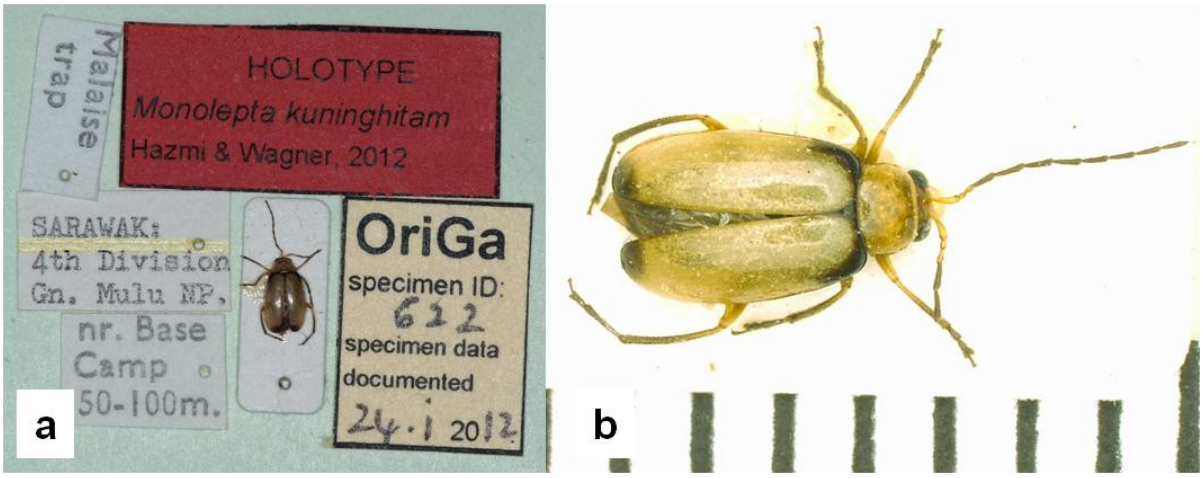


Fig. 115. Photographs of the holotype of *Monolepta kuninghitam* new sp., a. with labels, b. detail.

two species are antennae blackish and only three basal antennomere yellow-brownish in *M. kuninghitam* new sp. while entirely yellowish in *M. putri* and pronotum is narrowed in *M. kuninghitam* new sp. (0.70–0.72) than *M. putri* (0.64–0.66). The body is smaller in *M. kuninghitam* new sp. (3.70–4.35 mm), and bigger in *M. putri* (4.60–4.90 mm). The spermatheca is very different between these two species (Figs 89, 113).

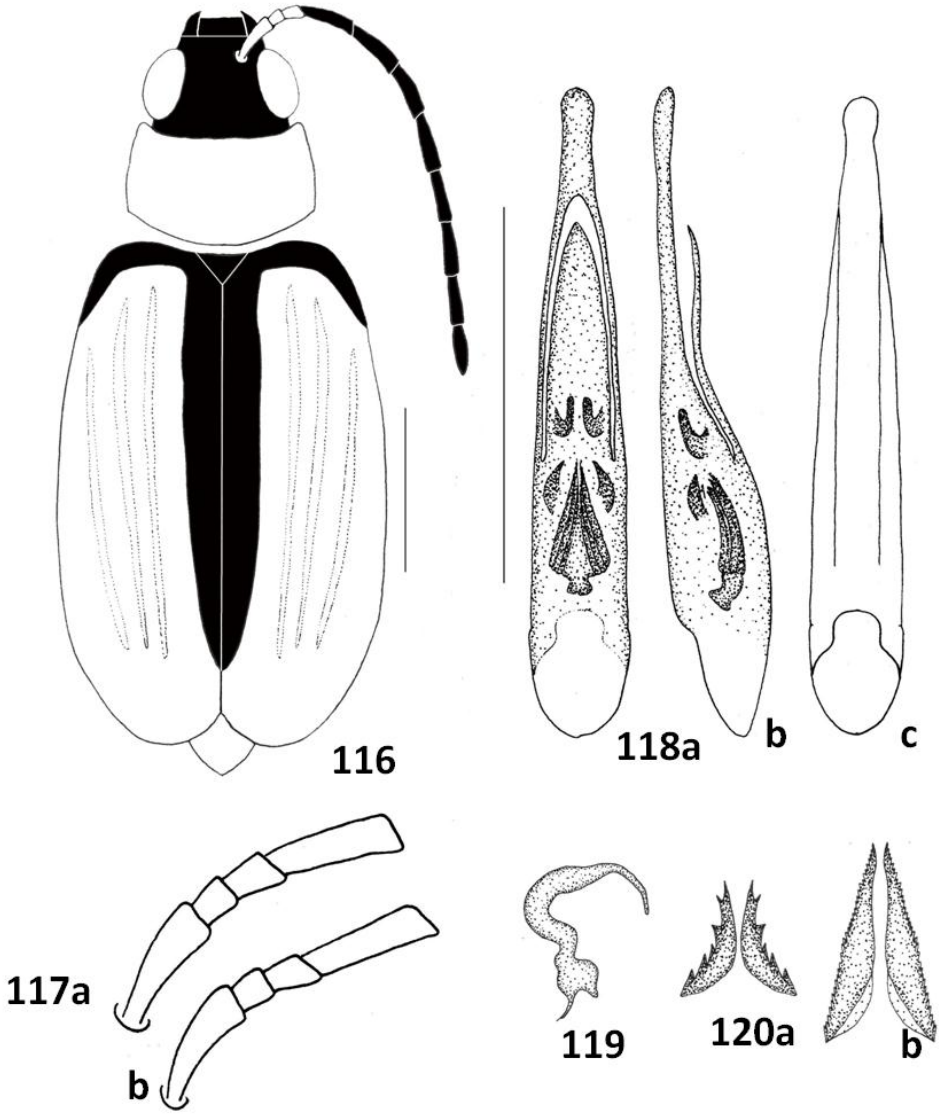
Distribution. This species distributed in Sabah and Sarawak (Borneo) (Fig. 85).

Type material. Holotype: Sarawak, 4th Division, Gn. Mulu NP, nr. Base Camp 50–100m, Malaise trap (BMNH) (Fig. 115). Type locality: 3º55'N/114º46'E. **Paratypes**: 50 ex., – **Malaysia.** 1 ex., N. Borneo, Bettotan, nr. Sandakan, 5º51'N/118º03'E, VII.1927 (BMNH); 18 ex., Sarawak, Mt. Dulit, 4000 ft., 3º20'N/114º9'E, VIII.–XI.1932, B. M. Hobby & A. W. Moore (BMNH); 31 ex., Sarawak, 4th Division, Gn. Mulu, 3º55'N/114º46'E, V.–VIII.1978, P. M. Hammond & J. E. Marshall (BMNH).

***Monolepta marginicolloides* new sp.**

Figs 116–122

Etymology. The name of the new species refers to the similarity of the new species with *M. marginicollis.*



Figs 116–120. ***Monolepta marginicolloides*** **new sp.** – 116. dorsal colour pattern; 117. antennae, (a) male; (b) female; 118. median lobe: (a) dorsal; (b) lateral; (c) ventral; 119. spermathecae; 120. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale: 1 mm.

Total length. 3.70–5.10 mm (mean: 4.38 mm; n=6).

Head. Impunctate, blackish and shiny. Labrum and mandible blackish. Antennae long and slender, extending to the middle of the elytra, blackish and only three basal antennomere yellowish (Fig. 116). First antennomere club-shaped, second and third antennomere of the same length; ratio length of second to third antennomere: 0.67–0.75 (mean: 0.69); ratio

length of third to fourth antennomere: 0.38–0.43 (mean: 0.41) (Fig. 117).

Thorax. Pronotum impunctate, entirely yellowish. Pronotal width: 1.20–1.55 mm (mean: 1.37 mm), ratio length to width: 0.58–0.63 (mean: 0.60). Scutellum, meso- and metathorax black. Elytron yellowish, basal and suture margin blackish, and fainted longitudinal darkish striped on the disc of elytra. In some specimens, the black margin broadened to the disc of elytra, and the apical margin of elytra yellowish. Elytra length 2.90–3.95 mm (mean: 3.48), maximal width of both elytra together 2.00–2.70 mm (mean: 2.38), ratio of maximal width of both elytra together to length of elytra 0.68–0.70 (mean: 0.69) (Fig. 116). Legs entirely yellow-brownish.

Abdomen. Yellow-brownish and darker in the middle of abdomen.

Male genitalia. Median lobe slender, parallel-sided at basal and becomes very narrow towards apex. Tectum broad at base and narrow towards apex, ventral groove parallel-sided towards basal. Lateral spiculae of V-shaped, median spiculae short and slender filamentous-like and ventral spiculae horn-like at the mid basal of median lobe. Sacculus occurs at basal (Fig. 118).

Female genitalia. Spermatheca with rounded nodulus, short slender tube-like protruding, long-curved median part and cornu (Fig. 119). Two pairs of bursa sclerites. Dorsal bursa with big spur and ventral bursa with fine undulate at the outer margins (Fig. 120).

Diagnosis. *Monolepta marginicolloides* new sp. looks very similar to *M. marginicollis*, but the size is average bigger in this species (3.70–5.10 mm) than *M. marginicollis* (3.25–4.00 mm). Both species have yellow elytron and black line on dorsal margin and suture, and fainted longitudinal stripy appearance on disc of elytron (Figs 40, 116). Head is usually blackish in *M. marginicolloides* new sp., and *M. marginicollis* has yellowish head and black stripe on vertex. The median lobe is slender and narrow towards apex in this species (Fig. 43) and very different from the median lobe of *M. marginicollis* (Fig. 118).

Distribution. This species distributed in Peninsular Malaysia and Borneo (Sarawak, Kalimantan, and Brunei) (Fig. 121).

Type materials. Holotype: Johor, Gunung Ledang, 19-23.VI.93, Yusof, Saiful, Meor, Galerucinae, Monolepta n.sp. det Mohamedsaid 1997 (UKM) (Fig. 122). Type locality: 2º22'N/102º36'E. **Paratypes**: 8 ex. – **Brunei.** 1 ex., Brunei, Labi, Bukit Teraja, 60m Mxt. Dipt. Forest, 4º18'N/114º26'E, 26.VIII.1979, S. L Shutton (BMNH). – **Indonesia.** 3 ex., N Sumatra, Bivouac one Mt Bandahara, 3º43'N/97º41'E, 25.VI.–5.VIII.1972, J. Krikken (NNML); 1 ex., Kalimantan, Timur Apokayan, Long Sungei Barang, 900 m, 1º15'S/116º49'E,

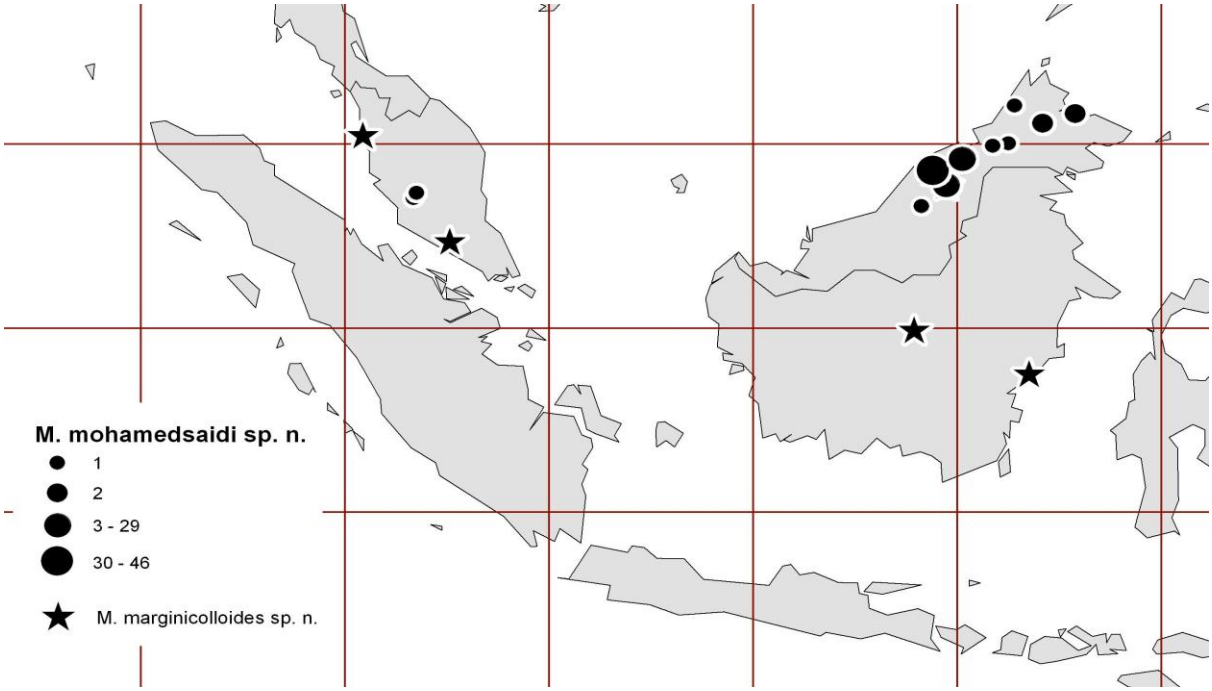


Fig. 121. Distribution of *M. marginicolloides* new sp. and *M. mohamedsaidi* new sp.

15.–23.II.1997, CuP Zorn (CJB); 1 ex., Indonesia, Borneo, Kalimantan Tengah Busang/Rekut conf., 0º03'S/113º59'E, VIII.2001, Brendell/Mendel, General collecting (BMNH). – **Malaysia.** 1 ex., Penang, 5º15'N/100º29'E, Lam. 93.60 (BMNH); 1 ex., Sarawak, 4th Division, Gn. Mulu NP., 3º55'N/114º46'E, P. M. Hammond et al. (BMNH).

Fig. 122. Photographs of the holotype of *Monolepta marginicolloides* new sp., a. with labels, b. detail.

***Monolepta mohamedsaidi* new sp.**

Figs 123–128

Etymology. The name of the new species dedicated in honour to MohammedSalleh MohamedSaid, a Malaysian taxonomist who is actively worked on Galerucinae of Sundaland.

Total length. 3.25–4.00 mm (mean: 3.60 mm; n=10).

Head. Impunctate, varied from brownish to blackish. Labrum and mandible black. Antennae slender, extending almost to the middle of elytra, blackish and only three basal antennomere yellow-brownish (Fig. 123). First antennomere club-shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.67–1.00 (mean: 0.72); ratio length of third to fourth antennomere: 0.50–0.60 (mean: 0.53) (Fig. 124).

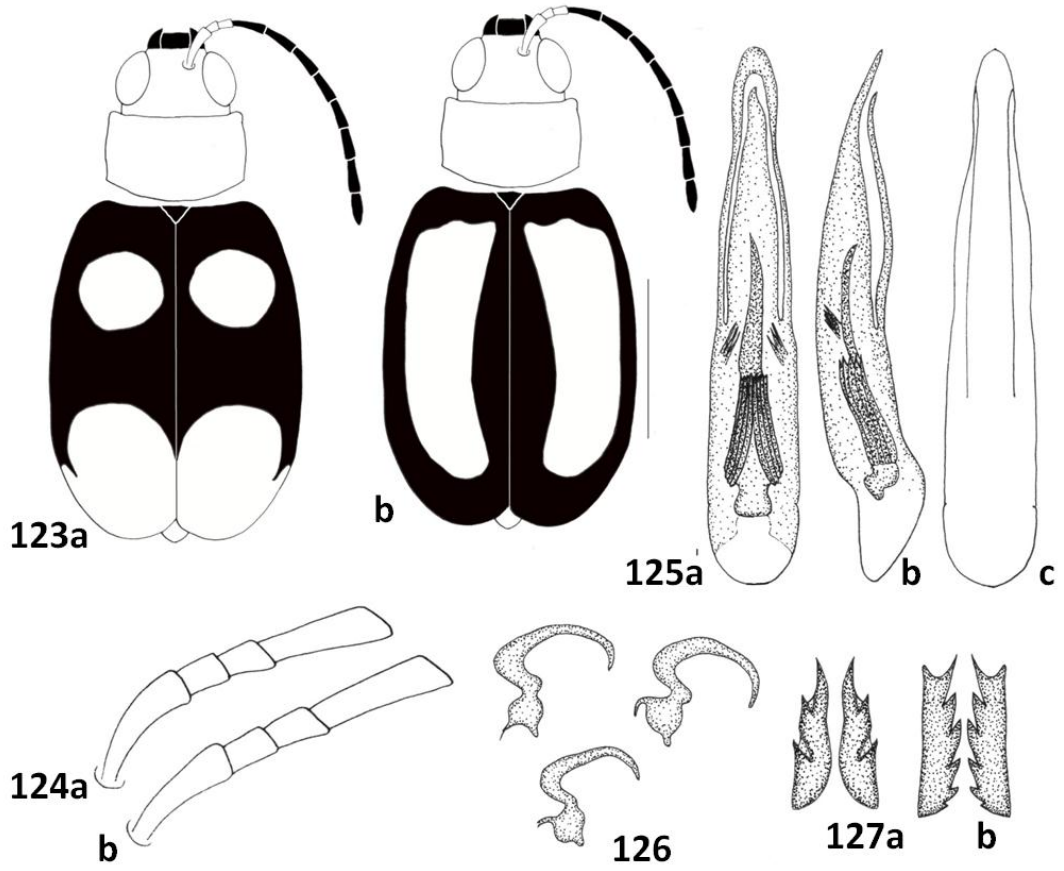
Thorax. Pronotum finely punctuated, entirely yellow-brownish and shiny. Pronotal width: 1.00–1.25 mm (mean: 1.12), ratio length to width: 0.58–0.62 (mean: 0.60). Scutellum, meso- and metathorax black. Elytron shows considerable variation. About 20 % has two yellow spot on the first basal of elytra, and another two spot on the apical part, stretch to margin of elytra and other specimens has black elytra with longitudinal yellow spot in the middle of the disc. Elytra length 2.50–2.90 mm (mean: 2.71), maximal width of both elytra together 1.90–2.20 mm (mean: 2.08), ratio of maximal width of both elytra together to length of elytra 0.75–0.79 (mean: 0.77) (Fig. 123). Legs entirely yellow-brownish.

Abdomen. Yellow-brownish.

Male genitalia. Median lobe slender, paralled sided at least on basal half and becomes narrow at the apical third. Tectum long, and lanceolate-shaped at the tip, ventral groove parallel sided towards basal. Lateral spiculae is weakly sclerotised in this species, median spiculae of long and slender, another short and slender filamentous-like at the basal half, and ventral spiculae comb-like. Sacculus occurs at basal (Fig. 125).

Female genitalia. Spermatheca with small and almost rounded nodulus, short slender tube-like protruding. Median part short, cornu long and curved (Fig. 126). Two pairs of bursa sclerites present. Dorsal and ventral bursa sclerites with strong spines at the outer margins and highly sclerotised (Fig. 127).

Diagnosis. *Monolepta mohamedsaidi* new sp. show considerable variation on coloration of the elytra. About 20 % of specimens have four yellowish spot, while other specimens have yellow longitudinal band on the disc of elytra. Particularly for specimens that have circular



Figs 123–127. *Monolepta mohamedsaidi* new sp. – 123. dorsal colour pattern; 124. antennae, (a) male; (b) female; 125. median lobe: (a) dorsal; (b) lateral; (c) ventral; 126. three different spermathecae; 127. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

yellowish spot on elytra (Fig. 123a), this species look very similar to *M. empatbulat* new sp. (Fig. 98). Both species has on average small size (from 3.25–4.00 mm), but the pronotum of *M. mohamedsaidi* new sp. is broader (0.58-0.62) than *M. empatbulat* new sp. (0.63–0.66). *Monolepta mohamedsaidi* new sp. that has yellow longitudinal band on elytron can easily distinguish from other species, but a bit similar to this coloration are *M. marginicollis* and *M. marginicolloides* new sp., but the later two species has stripy appearance on the disc of elytron (Figs 40, 116). Finally the genitalic characters particularly the median lobe of *M. mohamedsaidi* new sp. are very different from *M. empatbulat* new sp., *M. marginicollis* and *M. marginicolloides* new sp. (Figs 42, 100, 118, 125).

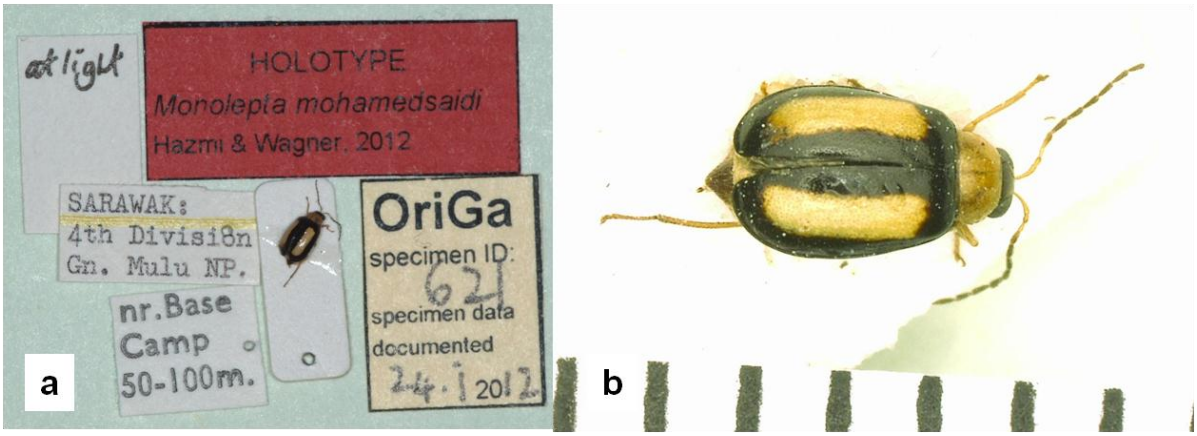


Fig. 128. Photographs of the holotype of *Monolepta mohamedsaidi* new sp., a. with labels, b. detail.

Distribution. This species distributed in Peninsular Malaysia and Borneo (Sabah, Sarawak and Brunei) (Fig. 121).

Type material. Holotype: Sarawak, 4th. Division Gn. Mulu NP, nr. Base Camp 50–100 m, V.–VIII.1978, P. M. Hammond & J. E. Marshall, B. M.1978-49, at light (BMNH) (Fig. 128). Type locality: 3º55'N/114º46'E. **Paratypes**: 109 ex., – **Brunei.** 46 ex., Brunei, Labi, Bukit Teraja 60 m, Mxt. Dipt. Forest, 4º18'N/114º26'E, 21.VIII.79, B.M. 1983-39, Light trap 1, 75 m above ground, S. L. Sutton (BMNH); 24 ex., Brunei, Temburung District Ridge, NE of Kuala Belalong, 300 m, 4º37'N/115º08'E, X.1992, 125W MV Light Trap, J. H. Martin coll. BMNH(E) 1992-172 (BMNH). – **Malaysia.** 24 ex., same data as holotype (BMNH); 4 ex., Sarawak, Gunong Mulu Nat. Park, R. G. S. Exped. 1977/78, 3º55'N/114º46'E, 24.VI., J. D. Holloway et al., B. M.1978-206 (BMNH); 1 ex., W. Sarawak, Quop, IV.1914, G. E. Bryant (BMNH); 1 ex., Sarawak, foot of Mt. Dulit, Junction of rivers Tinjar & Lejok, 3º20'N/114º09'E, 29.VIII.1932 (BMNH); 2 ex., Sabah, Tawau Plat. 1300 ft., 8 m S. Telupid, 5º35'N/117º07'E, 8.IX.1977, M. E. Bacchus, B.M. 1978-48 (BMNH); 1 ex., Malay Penin., Selangor, Bukit Kutu, 3500ft., 3º33'N/101º43'E, 11.IX.1929, H. M. Pendlebury (BMNH); 2 ex., Sabah, Sandakan, Sepilok FR (obs tower), 50 m, 5º52'N/117º56'E, 1.XI.1987, Krikken & Rombaut (NNML); 1 ex., Sabah, Interior zone, road Keningau-Sepulut, km 39 Sg. Sook, 350 m, 5.02'N/116.27'E, 17.XI.1987, J. Huisman & R. de Jong (NNML); 1 ex., Sabah, West coast zone, 12 km NNE of Ranau, Poring hot Springs, 6.04'N/116.42'E, 9.XI.1987, J. Huisman & R. de Jong (NNML);

1 ex., Sabah, Keningau Area, Tenom, 4º59'N/115º55'E, 23.XI.1987, Krikken & Rombaut (NNML); 1 ex., Malaysia, Fraser's Hill, 3º42'N/101º44'E, 22.II.1991, RM Exped. (NHRS).

***Monolepta ranuensis* new sp.**

Figs 129–134

Etymology. The name of the new species refers to its type locality. The Ranu River located in Sulawesi.

Total length. 3.25–3.70 mm (mean: 3.44 mm; n=10).

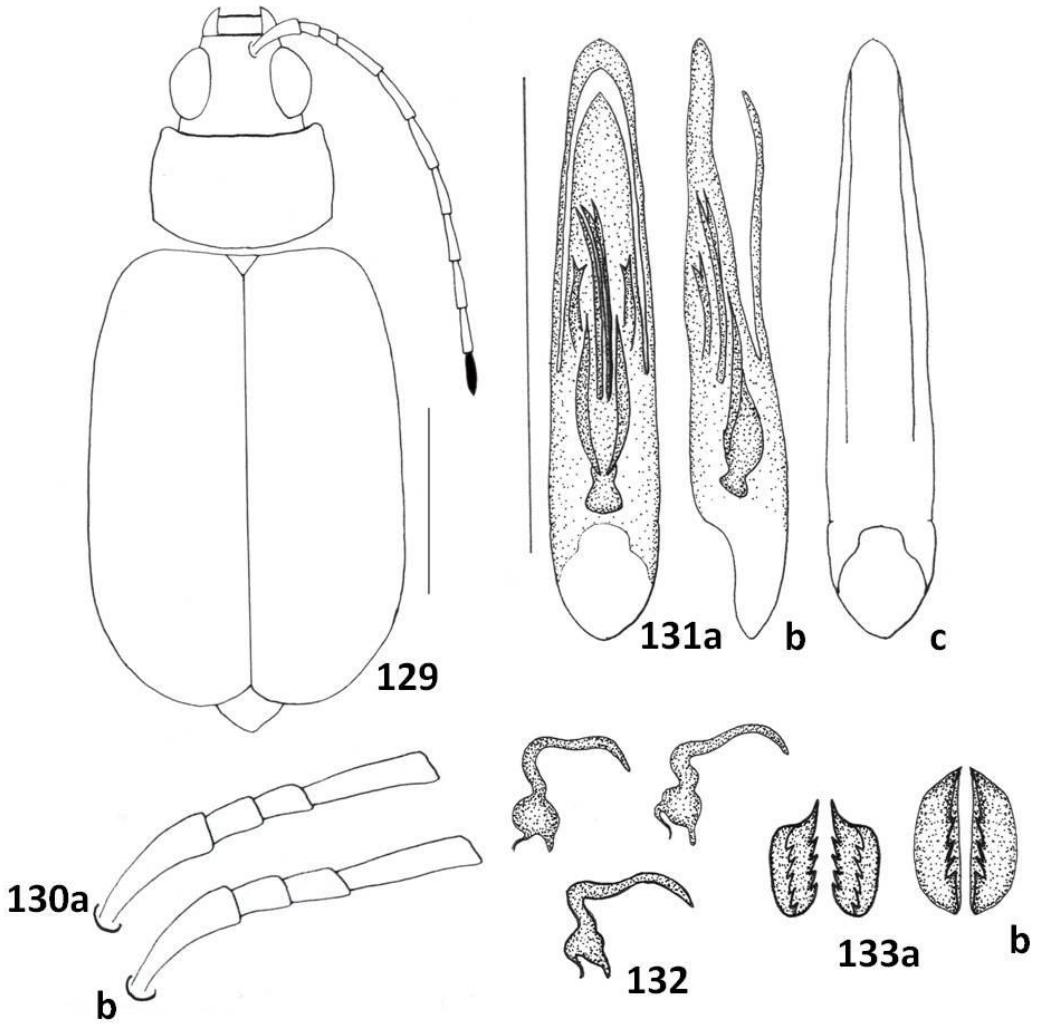
Head. Impunctate, yellow-brownish, with deep suture between antennae socket. Labrum and mandible yellow-brownish. Antennae slender, extending to the middle of the elytra, yellow-brownish, last antennomere a bit blackish (Fig. 129). First antennomere club-shaped, second and third antennomere approximately of the same length; ratio length of second to third antennomere: 0.67–1.00 (mean: 0.85); ratio length of third to fourth antennomere: 0.43–0.50 (mean: 0.42) (Fig. 130).

Thorax. Pronotum yellow-brownish and broad, shiny and with shallow depression in the middle. Pronotal width: 0.95–1.00 mm (mean: 0.97), ratio length to width: 0.63–0.65 (mean: 0.64). Scutellum, meso- and metathorax yellow-brownish. Elytron entirely yellow-brownish, coarsely punctuated. Elytra length 2.35–2.60 mm (mean: 2.43), maximal width of both elytra together 1.70–1.90 mm (mean: 1.74), ratio of maximal width of both elytra together to length of elytra 0.69–0.73 (mean: 0.71) (Fig. 129). Legs yellow-brownish.

Abdomen. Yellow-brownish.

Male genitalia. Median lobe slender and parallel-sided at basal and becomes rounded towards apex. Tectum quite long but not reaching the apex of median lobe, broad at basal and becomes narrow towards apex. Lateral spiculae elongated with two spur at apex, median spiculae long and slender filamentous-like at basal half and another close to sacculus, and ventral spiculae weakly sclerotised in this species. Sacculus occur at the basal of median lobe (Fig. 131).

Female genitalia. Spermatheca with rounded nodulus, comparatively small and short slender tube-like protruding from the inner part of nodulus. Median part long and cornu curved (Fig. 132). Bursa sclerites consist of two pair, both with strong serrate at the outer margins (Fig. 133).



Figs 129–133. *Monolepta ranuensis* new sp. – 129. dorsal colour pattern; 130. antennae, (a) male; (b) female; 131. median lobe: (a) dorsal; (b) lateral; (c) ventral; 132. three different spermathecae; 133. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

Diagnosis. *Monolepta ranuensis* new sp. is among the small *Monolepta* species from Sundaland area, next to *M. marginicollis* (3.25–4.00 mm). This unicolorous species looks similar to *M. sulawensis* new sp. in dorsum coloration, but *M. sulawensis* new sp. is more brown-reddish, while *M. ranuensis* new sp. is yellow-brownish (Figs 129, 135). These two species are restricted in Sulawesi Island. In term of size, *M. ranuensis* new sp. is on average smaller (3.25–3.70 mm), than *M. sulawensis* new sp. (3.70–4.25 mm). The elytron is coarser and pronotum with shallow depression in this species, and the genitalic characters are very

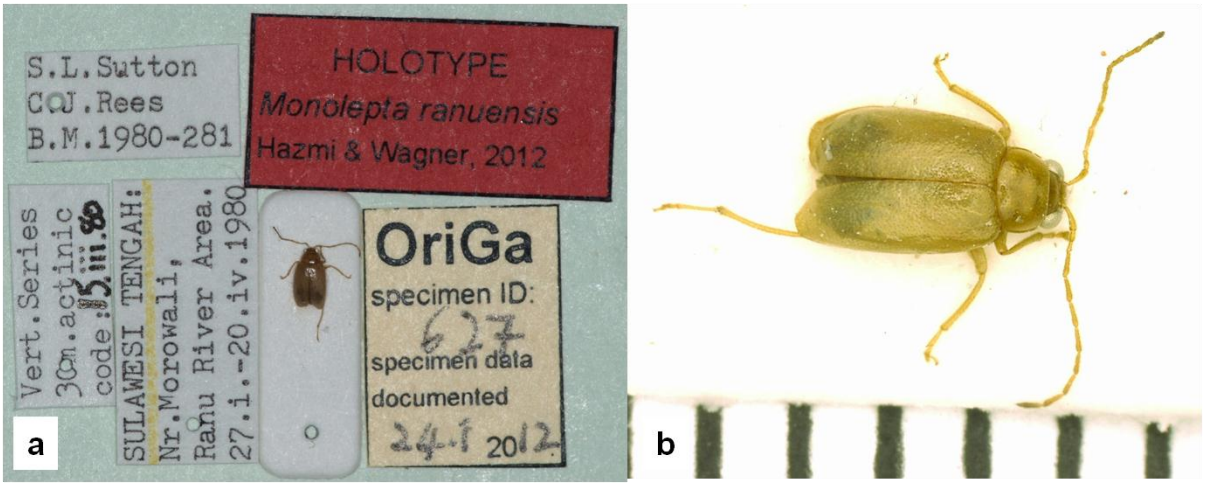


Fig. 134. Photographs of the holotype of *Monolepta ranuensis* new sp., a. with labels, b. detail.

different between these two species (Figs 131, 132, 137, 138).

Distribution. This species only recorded from Sulawesi Island (Fig. 78).

Type materials. Holotype: Sulawesi Tengah, Nr. Morowali, Ranu River Area, 27.I.–20.IV.1980, S. L. Sutton & C. J. Rees; M. J. D. Brendell, B. M. 1980-281, Vert. Series 30m actinic, code 15.III.80 (BMNH) (Fig. 134). **Paratypes**: 108 ex., same data as holotype (BMNH). Type locality: 6º14'S/106º49'E.

***Monolepta sulawensis* new sp.**

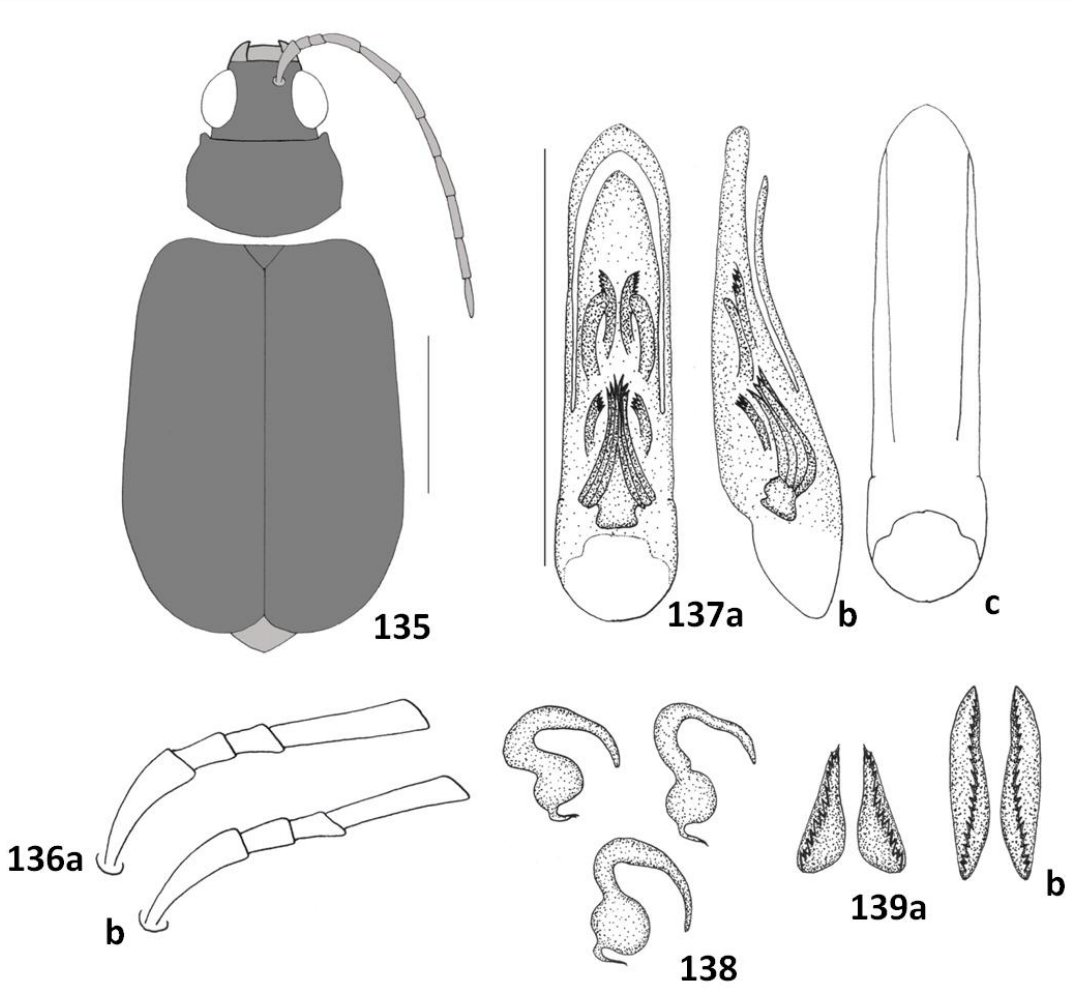
Figs 135–140

Etymology. The name of the new species refers to the island where it exclusively occurs.

Total length. 3.70–4.25 mm (mean: 3.90 mm; n=10).

Head. Impunctate, entirely brownish-red. Labrum and mandible brownish. Antennae slender, extending to the middle of elytra, brownish, and the last antennomere a bit darker (Fig. 135). First antennomere club-shaped, third antennomere shorter than second to almost of the same length; ratio length of second to third antennomere: 1.00–1.50 (mean: 1.25); ratio length of third to fourth antennomere: 0.37–0.42 (mean: 0.38) (Fig. 136).

Thorax. Pronotum impunctate, entirely brownish-red, shiny and without depression.



Figs 135–139. ***Monolepta sulawensis*** **new sp.** – 135. dorsal colour pattern; 136. antennae, (a) male; (b) female; 137. median lobe: (a) dorsal; (b) lateral; (c) ventral; 138. three different spermathecae; 139. two pairs of bursa sclerites: (a) dorsal; (b) ventral. Scale bar: 1 mm.

Pronotal width: 1.20–1.25 mm (mean: 1.22), ratio length to width: 0.60–0.64 (mean: 0.62). Scutellum, meso- and metathorax brownish-red. Elytron entirely brownish-red. Elytra length 2.80–3.40 mm (mean: 3.04), maximal width of both elytra together 2.10–2.40 mm (mean: 2.20), ratio of maximal width of both elytra together to length of elytra 0.70–0.74 (mean: 0.72) (Fig. 135). Legs brownish-red.

Abdomen. Brownish.

Male genitalia. Median lobe broad, short, parallel-sided at basal and becomes rounded at

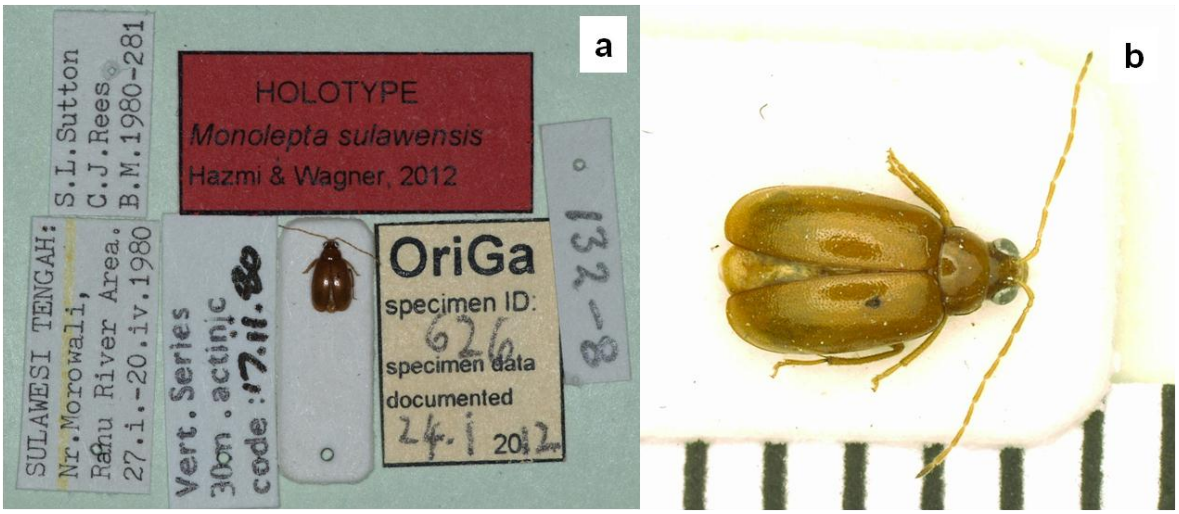


Fig. 140. Photographs of the holotype of *Monolepta sulawensis* new sp., a. with labels, b. detail.

apex. Tectum broad at basal, and narrow towards apex, ventral groove parallel-sided towards basal. Three clear differentiations of spiculae visible. Lateral spiculae club-shaped, jagged at apex and curved to margin side, median spiculae elongated tube-like, and long and slender filamentous-like on basal, and ventral spiculae club-shaped and jagged at apex. Sacculus occur on basal (Fig. 137).

Female genitalia. Spermatheca with rounded and big nodulus. Median part short, and cornu curved (Fig. 138). Two pairs of bursa sclerites present. Both highly sclerotised, and spiny at the outer margins (Fig. 139).

Diagnosis. *Monolepta sulawensis* new sp. looks very similar to *M. rubra*. These two species have unicolorous elytron, varies from brownish-red to brown, and always the pronotum, head, legs and underside colored as the dorsum coloration (Figs 11, 135). *Monolepta sulawensis* new sp. on average is smaller (3.70–4.25 mm) than *M. rubra* (4.50–6.00 mm), and pronotum is broader in *M. sulawensis* new sp. (0.60–0.64) than *M. rubra* (0.64–0.68). The third antennomere of *M. sulawensis* new sp. is sometimes shorter than second antennomere, while in *M. rubra* is almost the same length. The characteristic of median lobe is very different between these two species (Figs 13, 137) and spermatheca with rounded nodulus in *M. sulawensis* new sp. relatively to small nodulus of *M. rubra* (Figs 14, 138).

Distribution. This species is endemic in Sulawesi (Fig. 85).

Type materials. Holotype: Sulawesi Tengah, Nr. Morowali, Ranu River Area, 27.I.–

20.IV.1980, S. L. Sutton & C. J. Rees; M. J. D. Brendell, B. M. 1980–281, Vert. Series 30m actinic, code 17.II.80, 132–8 (Fig. 140). – **Paratypes**. 13 ex., same data as holotype (BMNH). Type locality: 7º16'S/112º44'E.

Identification key

1 Elytron bi- or tricolorous, often with transverse band or circular yellow spots ……..…….…. **2**

- Elytron predominantly unicolorous, yellow, reddish or black, rarely with stripy appearance (Figs 40, 116), narrow black suture and/or basal and lateral elytral margins (Figs 58, 87, 110), or red or brownish elytral tips (Figs 104) **10**

2 Elytron with transverse bands (Figs 1, 27, 34, 45, 65) ……**3**

- Elytron with usually two, rarely one circular yellow spot, or rarely one longitudinal yellow spots (Figs 18, 73, 98, 123) ……**7**

3 Elytron only with black transverse band at base, extension very narrow up to one third of the elytral length, remaining parts of elytron brown-reddish (Fig. 45), head and pronotum yellow to yellowish-brown, total length 3.70–5.40 mm, widely distributed from India to South East Asia (Fig. 50) ……... ***M. militaris***

- Elytron with at least three clearly differentiated transverse bands, head and pronotum yellow, brownish-yellow, brownish-red, brown or red ……..…… **4**

4 Elytron with broad medium transverse band (up to the half of the elytral length), elytral base and apical part brown-reddish, sometime elytral tips yellow (Figs 1, 65) ……..…….**5**

- Elytron with narrow medium transverse band (less than one quarter of the elytral length), elytral base black or brown-reddish, but then with small black transverse band to the yellow medium band (Figs 27, 34) ……..……**6**

5 Head and pronotum brown-reddish to red, larger, total length 4.90–6.25 mm, pronotum very broad, pronotal width to length 0.53–0.57 (Fig. 65), widely distributed

in Sumatra, Borneo, Malaysia, Thailand and Singapore (Fig. 70) ……. ***M. mentawiensis***

- Head and pronotum yellow, rarely head slightly darker brownish-yellow or blackish (Fig. 1), smaller, total length 3.70–5.10 mm, pronotum less broad, pronotal width to length 0.61–0.65, widely distributed from India through SE-Asia towards New Guinea (Fig. 6) ……..…… ***M. bifasciata***

6 Broad yellowish transverse band bounded above and below by a narrow black band, and another narrow black band on basal margin (Fig. 34), scutellum brown-reddish, total length 4.10–5.80 mm, median lobe broad, and differentiation of three types of spiculae clearly visible (Fig. 36), widely distributed from India towards Java (Fig. 32) ……..… ***M. orientalis***

- Narrow yellowish transverse-band in the middle, broad black at base and narrow black behind the yellow band, brown-reddish in the apical third (Fig. 27), scutellum black, total length 4.30–5.80 mm, median lobe comparatively small, and ventral spiculae weakly sclerotised (Fig. 29), distributed in Peninsular Malaysia and Thailand (Fig. 32) ……..… ***M. flavofasciata***

7 Head and pronotum of same coloration, usually pale brown to reddish-brown, middle of elytra, at least along the suture brown to red, yellow spots close to humerus (Fig. 18), total length 3.50–5.25 mm, widely distributed and abundant from India to southern China in the North and New Guinea and northern Australia in the South (Fig. 23) ……..……...…***M. signata***

- Usually black head contrasting to the always yellow pronotum, elytron yellow and black only, yellow spots not close to humerus (Figs 78, 98, 123) ……..……..**8**

8 Only one circular yellow spot in the basal half of elytron, apical quarter of elytron completely yellow, including suture (Fig. 73), on average larger, total length 3.50–4.90 mm, distributed in Peninsular Malaysia, Borneo, and Sumatra (Fig. 78) ……..……***M. zonula***

- Elytron with two circular yellow spots, each one in the basal and apical half (Figs 98, 123), tip of elytra black or yellow, on average smaller, total length 3.25–4.00 mm ……..…… **9**

9 Pronotum broad, pronotal width to length 0.58-0.62, elytron shows considerable variation, 80% of specimens examined have black elytron with longitudinal yellow spot in the middle (Fig. 123b), others have one pair of circular yellow spots (Fig. 123a), and sometimes with yellow apex, total length 3.25–4.00 mm, median lobe slender, tip of tectum lanceolate shaped (Fig. 125), restricted to the Peninsular Malaysia and Borneo (Fig. 121) ……..… ***M. mohamedsaidi*** **new sp.**

- Pronotum less broad, pronotal width to length 0.63–0.66, elytron with completely black margins, and two circular yellow spots (Fig. 98), total length 3.25–3.80 mm, median lobe broad, becoming conical towards apex (Fig. 100), restricted to Borneo (Fig. 96) ……..….. ***M. empatbulat*** **new sp.**

10 Elytron yellow with stripy appearance on the disc (Figs 40, 116) ……..……**11**

- Elytron yellow, reddish or black, without stripy appearance ……..……**12**

11 Head yellow-brownish and vertex with a short central black stripe, smaller, total length 3.25–4.00 mm, elytra less broad, width of both elytra to length of elytron 0.71–0.74 (Fig. 40), median lobe slender and parallel sided (Fig. 42), distributed in Borneo and Sumatra (Fig. 16) ……..……***M. marginicollis***

- Head black, larger, total length 3.70–5.10 mm, elytra broad, width of both elytra to length of elytron 0.68–0.70 (Fig. 116), median lobe slender, very narrow towards apex (Fig. 118), distributed in Malaysia (Peninsular) and Borneo (Fig. 121) ……..……***M. marginicolloides*** **new sp.**

12 Elytron predominantely yellow, humerus and/or basal margins of black (Figs 58, 87, 110) ……..……...**13**

- Elytron unicolorous yellowish, or predominantly reddish-brown or black, rarely with tips of other coloration (Figs 11, 52, 80, 92, 104, 129, 135) …… **15**

13 Large, total length 6.40–7.70 mm, mouthparts brown, scutellum yellowish, pronotum broad, pronotal width to length 0.59–0.61 (Fig. 58), distributed in South East Asia from Java to Sulawesi (Fig. 63) …….. ***M. jacobyi***

- Small, total length 3.70-4.90 mm, mouthparts and scutellum black, pronotum less

broad, pronotal width to length 0.64–0.72 (Figs 87, 110) …… **14**

14 Antenna yellowish, pronotum broad, pronotal width to length 0.64–0.65 (Fig. 87), total length 4.60–4.90 mm, endemic in Bali (Fig. 70) ……..…… ***M. putri***

- Antenna blackish, only three basal antennomere yellow-brownish, pronotum very narrow, pronotal width to length 0.70–0.72 (Fig. 110), total length 3.70–4.35 mm, restricted to Borneo (Fig. 85) …… ***M. kuninghitam*** **new sp.**

15 Elytron with exception of the reddish-brown tip, black (Fig. 104), total length 4.60–6.00 mm, endemic in Sulawesi (Fig. 78) ……...…***M. hitam*** **new sp.**

- Elytron reddish, brownish or yellow ……..……..**16**

16 Elytron reddish to brownish-red ……..**17**

- Elytron yellow ……**19**

17 Pronotum, head, femur, tibia, meso- and metathorax black, elytron reddish brown (Fig. 52), total length 4.75–6.35 mm, known from Peninsular of Malaysia only (Fig. 50) ……..……***M. rufipennis***

- Pronotum, head, femur, tibia, meso- and metathorax reddish brown as elytron, sometimes margin of elytron dark brown to black (Figs 11, 135) ……..…..**18**

18 Large, total length 4.50–6.00 mm, elytron with dark brown to black outer margins, in particular in the apical half (Fig. 11), known from Java and Borneo (Fig. 16) ……..***M. rubra***

- Small, total length 3.70–4.25 mm, dorsum unicolorous reddish to brownish-red (Fig. 135), restricted to Sulawesi (Fig. 85) ……..…..***M. sulawensis*** **new sp.**

19 Head black contrasting to the pale yellow (Fig. 80), total length 4.75–6.15 mm, distributed in Borneo (Malaysia, Brunei) Singapore and Indonesia (Sumatra and Java) (Fig. 85) ……..…… ***M. tiomanensis***

- Head and pronotum of same colour, yellow, yellowish-red or red ……..….... **20**

20 Head and pronotum reddish-brown, antennae blackish and only three basal

antennomeres yellow-brownish, pronotum broad, pronotal width to length 0.56–0.58 (Fig. 92), total length 3.75–4.70 mm, restricted to Brunei (Fig. 96) …… ***M. bruneiensis* new sp.**

- Head and pronotum yellow, usually same colour as elytron, antennae yellow-brownish and only last antennomere blackish, total length 3.25–3.70 mm, pronotum less broad, pronotal width to length 0.63–0.65 (Fig. 129), distributed only in Sulawesi (Fig. 78) …….. ***M. ranuensis* new sp.**

Checklist of *Monolepta* Chevrolat, 1837 from Sundaland

The following list comprises all known species of *Monolepta* after my revision including synonymies:

Monolepta bifasciata (Hornstedt, 1788)
= *Cryptocephalus multicolor* Gmelin, 1790
= *Crioceris quadrinotata* Fabricius, 1801
= *Luperodes latefasciata* Motschulsky, 1858
= *Monolepta rubrosignata* Boheman, 1859
= *Monolepta parvonotata* Jacoby, 1886; **new syn.**
= *Monolepta mustaphai* Mohamedsaid, 1997; **new syn.**
= *Monolepta entimauensis* Mohamedsaid, 1998; **new syn.**
Monolepta bruneiensis **new sp.**
Monolepta empatbulat **new sp.**
Monolepta flavofasciata Jacoby, 1889
Monolepta hageni Weise, 1916
= *Monolepta basalis* Jacoby, 1884
= *Monolepta mentawiensis* (Jacoby, 1896); **new syn.**
Monolepta hitam **new sp.**
Monolepta jacobyi Weise, 1908
Monolepta kuninghitam **new sp.**
Monolepta marginicollis Jacoby, 1896
Monolepta marginicolloides **new sp.**

Monolepta militaris Jacoby, 1896

Monolepta mohamedsaidi **new sp.**

Monolepta orientalis Jacoby, 1889

= *Monolepta konbiriensis* Duvivier, 1891

Monolepta putri Mohamedsaid, 2001

Monolepta ranuensis **new sp.**

Monolepta rubra (Gyllenhal, 1808)

= *Luperodes javanensis* Jacoby, 1887

Monolepta rufipennis Jacoby, 1899

Monolepta signata (Olivier, 1808)

= *Crioceris neglecta* Sahlberg, 1829

= *Luperodes quadripustulatus* Motschulsky, 1858

= *Luperodes hieroglyphicus* Motschulsky, 1858; **new syn.**

= *Monolepta elegantula* Boheman, 1859; **new syn.**

= *Luperodes quadriguttata* Fairmaire, 1887; **new syn.**

= *Monolepta picturata* Jacoby, 1896; **new syn.**

Monolepta sulawensis **new sp.**

Monolepta tiomanensis Mohamedsaid, 1999

Monolepta zonula Weise, 1916

Species transferred to other genera

The following list comprises species of *Monolepta* from Sundaland that has been synonymised or transferred to other genera and species of *Monolepta* that need to be transferred to other genera in future:

Monolepta aemula Weise, 1922

Synonym of *Paraneolepta imitans* (Jacoby, 1894) (See appendix 4)

Monolepta affinis Jacoby, 1886

Monolepta albofasciata Jacoby, 1884

Monolepta approximans Jacoby, 1896

Monolepta azlani Mohamedsaid, 1998

Monolepta bimaculata (Hornstedt, 1788)

Monolepta borneensis Mohamedsaid, 1994

Monolepta c-album (Jacoby, 1899)

Monolepta cantik Mohamedsaid, 2000

Monolepta castanea Allard, 1888

Monolepta castanoptera Weise, 1924

Monolepta danumica Mohamedsaid, 1993

Monolepta erythromelas Weise, 1922

Synonym of *Ochralea nigripes* (Olivier, 1808) (See appendix 1)

Monolepta discoidalis (Jacoby, 1895)

Monolepta flavicollis Gyllenhal ?

Monolepta foveicollis Baly, 1888

Monolepta haemorrhoidalis (Fabricius, 1801)

Monolepta impressicollis (Jacoby, 1896)

Monolepta inornata (Jacoby, 1894)

Monolepta irpa Mohamedsaid, 2000

Monolepta kedenburgi Weise, 1922

Transferred to *Nadrana*

Monolepta kenit Mohamedsaid, 2000

Monolepta kerangas Mohamedsaid, 1998

Monolepta kraepelini Weise, 1922

Monolepta latefasciata Jacoby, 1896

Monolepta laticornis (Jacoby, 1899)

Monolepta longitarsis Jacoby, 1896

Monolepta malaysiana Mohamedsaid, 1993

Monolepta melancholica Jacoby, 1886

Monolepta merah Mohamedsaid, 1993

Monolepta modigliani Jacoby, 1896

Monolepta murphyi Mohamedsaid, 2002

Monolepta nigriceps Weise, 1915

Monolepta nigrilabrum (Jacoby, 1899)

Monolepta nigromarginata Jacoby, 1896

Monolepta nigripes (Olivier, 1808)

Validated as *Ochralea nigripes* (Olivier, 1808) (See appendix 1)

Monolepta obtusa Jacoby, 1896

Monolepta pagi Mohamedsaid, 2001

Monolepta parva Mohamedsaid, 2001

Monolepta pectoralis Boheman, 1859

Monolepta piceola Weise, 1915

Monolepta rubricollis Jacoby, 1905

Monolepta rugosa Mohamedsaid, 1998

Monolepta sangirensis Jacoby, 1894

Monolepta semifovea Mohamedsaid, 1993

Monolepta sexmaculata Jacoby, 1886

Monolepta submarginata Weise, 1922

Monolepta thoracica (Jacoby, 1896)

Monolepta terminata (Guerin, 1830)

Monolepta tibowensis Mohamedsaid, 2000

Monolepta unicolor Jacoby, 1886

Monolepta wallacei Baly, 1888

Monolepta wangkliana Mohamedsaid, 2005

Transferred to *Ochralea* (See appendix 1)

Monolepta wilsoni Kimoto, 1989

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