

UNIVERSIDADE FEDERAL DO PARANÁ

TATIANA ALEJANDRA SEPÚLVEDA VILLA

**NERIIDAE (DIPTERA, SCHIZOPHORA) OF THE WORLD: PHYLOGENY,
CLASSIFICATION AND REVISION OF GENERA**

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Tese apresentada à Coordenação do programa de Pós-Graduação em Ciências Biológicas, Área de Concentração em Entomologia, Setor de Ciências Biológicas, Universidade Federal do Paraná, como requisito parcial para obtenção do título de Doutora em Ciências Biológicas.

Orientador: Prof. Dr. Claudio José Barros de Carvalho.

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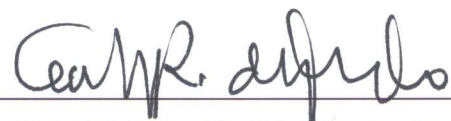
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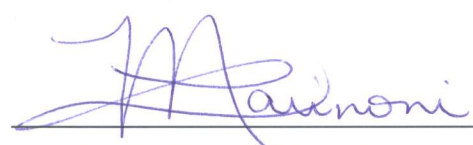
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RESUMO GERAL

Os Neriidae são moscas de pernas compridas amplamente conhecidas por estudos comportamentais, graças ao hábito de disputa territorial dos machos e sua correlação com a alta plasticidade fenotípica. Espécies de Neriidae são conhecidas para todas as regiões biogeográficas sem revisão dos seus representantes, tornando incerta a sua identidade, bem como os limites de seus grupos genéricos. Com o objetivo de aclarar essas questões taxonômicas, a maioria dos gêneros de Neriidae têm sido revisados e uma proposta filogenética é fornecida, produzida a partir de novas evidências morfológicas e moleculares. O capítulo 1, “Redescription of *Teloneria* Aczél, and its revalidation as genus of Neriidae (Diptera)”, apresenta evidências morfológicas para ressuscitar o gênero *Teloneria* Aczél a partir da sinonímia com *Chaetonerius* Hendel. Lectótipos e paralectótipos são designados para *Teloneria apicata* (Edwards) e *Telostylus apicalis* Enderlein, *Telostylinus ornatipennis* Enderlein, e *T. bimaculata* (Edwards). Três novas espécies de *Telostylus* Bigot (*T. eumaculata*, sp.n., *T. furva* sp.n. e *T. scaenica* sp.n.) são descritas. O capítulo 2, “*Chaetonerius* Hendel (Neriidae: Diptera) from the Indian Ocean islands”, registra pela primeira vez a *C. alluaudi* (Giglio-Tos) para a ilha La Reunión. Adicionalmente, sete espécies de Madagascar (*C. antankarana*, sp.n., *C. antanosy*, sp.n., *C. ebejeri*, sp.n., *C. madagasikara*, sp.n., *C. mandelai*, sp.n., *C. hololissa*, sp.n. e *C. kirkspriggsi*, sp.n.) e uma espécie nova da ilha de Comoros (*C. eualluaudi*, sp.n.) são descritas e ilustradas. O capítulo 3, “A revision of the genus *Chaetonerius* Hendel (Diptera: Neriidae)”, inclui as descrições das espécies *C. alienum*, sp.n., *C. anemona*, sp.n. e *C. lobayensis*, sp.n., assim como redescritões e ilustrações para as espécies previamente conhecidas. *C. apicalis* (Walker) é sinonimizada com *C. ghesquierei* Aczél. A revalidação de *C. fascipes* é proposta e, adicionalmente, a espécie *C. nyassicus* Enderlein é retirada da sinonímia com *C. fascipes* e reconhecida como espécie válida. No capítulo 4, “Taxonomic revision of *Telostylus* Bigot (Diptera, Neriidae)”, apresenta-se o estudo morfológico detalhado desse gênero Oriental. Uma nova combinação é proposta para *T. latibrachium* Enderlein como sinônimo junior de *T. remipes* (Walker). Adicionalmente, duas espécies são descritas, *T. facsimile*, sp.n. and *T. claroscuro*, sp.n.. Lectótipo e paralectótipo são designados para *Coenurgia remipes* Walker, *Telostylus trilineatus* de Meijere and *Telostylus babiensis* de Meijere. O capítulo 5, “A phylogenetic hypothesis based on a total evidence analysis of morphological and DNA sequences data, elucidate the inter-relationships for Neriidae (Diptera, Schizophora)”, trata dos limites entre os gêneros que compõem a família e as suas hipóteses de relacionamento, inferidas a partir de caracteres morfológicos e moleculares. Entre os resultados mais relevantes, as análises filogenéticas forneceram evidências para corroborar a revalidação de *Teloneria* Aczél e estabelecer uma estreita relação entre os Neriidae do Novo Mundo e o gênero paleártico *Stypocladius* Enderlein, que também é proposto como sinônimo-sênior de *Nipponerius* Cresson. Adicionalmente, dois novos gêneros Neotropicais são descritos: *Aczelia*, gen.n. para *A. opita*, sp.n., e *Freidbergmyia*, gen. n. para *F. cholita*, sp.n. Os limites taxonômicos dos grupos genéricos de Neriidae são redefinidos e uma nova classificação é proposta para a família.

Palavras chave. biodiversidade, filogenia, marcadores moleculares, morfologia, moscas del cactus, Neriioidea, taxonomia.

GENERAL ABSTRACT

Neriidae are long legged flies widely known from behavioral and developmental studies, thanks to male particular territorial fight behavior and high phenotypical plasticity. Species of Neriidae have been described from every biogeographical region with no revision of its representatives, making uncertain the identity of many of it, as well as the boundaries of its generic groups. With the aim of clarifying these new-old inaccuracies, most of the genera of Neriidae have been revised and included in a phylogenetic analysis based on new morphological and molecular datasets. Chapter 1, “Redescription of *Teloneria* Aczél, and its revalidation as genus of Neriidae (Diptera)”, provides morphological evidence for the resurrection of *Teloneria* Aczél from synonymy with *Chaetonerius* Hendel. Lectotypes and paralectotypes are designated for *Teloneria apicata* (Edwards), *Telostylus apicalis* Enderlein and *Telostylinus ornatipennis* Enderlein. Three new species, *T. eumaculata*, sp.n., *T. furva* sp.n. and *T. scaenica* sp.n. are described. Chapter 2, “*Chaetonerius* Hendel (Neriidae: Diptera) from the Indian Ocean islands”, records *C. alluaudi* (Giglio-Tos) for the first time in La Reunion island. Additionally, seven species from Madagascar (*C. antankarana*, sp.n., *C. antanosy*, sp.n., *C. ebejeri*, sp.n., *C. madagasikara*, sp.n., *C. mandelai*, sp.n., *C. hololissa*, sp.n. and *C. kirkspriggsi*, sp.n.) and one new species from Comoros islands (*C. eualluaudi*, sp.n.), are described and illustrated. Chapter 3, “A revision of the genus *Chaetonerius* Hendel (Diptera: Neriidae)”, includes descriptions of the species *C. alienum*, sp.n., *C. anemona*, sp.n. and *C. lobayensis*, sp.n., as well as redescriptions and illustrations of previously known species. *C. ghesquierei* Aczél is proposed as synonym of *C. apicalis* (Walker). The revalidation of *C. fascipes* is proposed and *C. nyassicus* Enderlein is resurrected from synonymy with *C. fascipes* and revalidated. Chapter 4, “Taxonomic revision of *Telostylus* Bigot (Diptera, Neriidae)”, contains a comprehensive study regarding the morphology of this mostly Oriental genus. A new combination is proposed for *T. latibrachium* Enderlein as junior synonym for *T. remipes* (Walker). In addition, two new species *T. facsimile*, sp.n. and *T. claroscuro*, sp.n. are described. Lectotype and paralectotype are designated for *Coenurgia remipes* Walker, *Telostylus trilineatus* de Meijere and *Telostylus babiensis* de Meijere. Chapter 5, “A phylogenetic hypothesis based on a total evidence analysis of morphological and DNA sequences data, elucidate the inter-relationships for Neriidae (Diptera, Schizophora)”, deals with the boundaries between genera and its conformation, as well as the hypotheses of relationships within the family, inferred from morphological and molecular characters. Among the most relevant results, phylogenetic analyzes provided evidence to corroborate the revalidation of *Teloneria* Aczél and result in a close relationship between New World Neriidae and the Palearctic *Stypocladus* Enderlein, which is also proposed as senior synonym for *Nipponerius* Cresson. In addition, two new Neotropical genera are described, *Aczelia*, gen.n. for *A. opita*, sp.n., and *Freidbergmyia*, gen. n. for *F. cholita*, sp.n.

Key words. biodiversity, cactus flies, molecular markers, morphology, Neriidae, phylogeny, taxonomy.

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INTRODUÇÃO GERAL

Neriidae são moscas de pernas compridas amplamente conhecidas por estudos ontogênicos e comportamentais, graças ao hábito de disputa territorial dos machos e sua correlação com a alta plasticidade fenotípica. Espécies de Neriidae têm sido descritas para todas as regiões biogeográficas sem revisão dos seus representantes, tornando incerta a sua identidade, bem como os limites de seus grupos genéricos. Uma proposta filogenética para a família foi recentemente publicada por Koch *et al.* (2014), baseada em caracteres contínuos e discretos extraídos principalmente de revisões antigas sobre Neriidae, muitas delas, publicadas por Martin Aczél antes de 1961. Novas evidências sobre a inexatidão de identificação de um número expressivo de táxons de Neriidae presentes na literatura antiga foram reveladas a partir de revisões taxonômicas recentes e fornecem novos *insights* sobre sua classificação. Essas revisões também apontaram diversos mal-entendidos que poderiam ter se propagado em estudos recentes de Neriidae, incluindo a primeira hipótese filogenética, por ter sido o estudo de M. Aczél, o único disponível há muitos anos. Por estas razões, e com o objetivo de elucidar essas questões taxonômicas, a maioria dos gêneros de Neriidae têm sido redescritos recentemente (*Cerantichir* Hennig, Sepúlveda *et al.*, 2013a; *Eoneria* Aczél, Sepúlveda *et al.* 2013b; *Nerius* Fabricius Sepúlveda 2013; *Glyphidops* Enderlein, Sepúlveda *et al.*, 2014), incluindo os gêneros revisados neste estudo (*Chaetonerius* Hendel, *Teloneria* Aczél, *Loxozus* Enderlein, *Styprocladius* Enderlein) e uma proposta filogenética é fornecida, produzida a partir de novas evidências morfológicas e moleculares. Os gêneros revisados neste estudo são apresentados na primeira parte da tese a fim de esclarecer a identidade das suas espécies e reconhecer os caracteres sinapomórficos que foram posteriormente utilizados na análise filogenética.

O capítulo 1, intitulado “Redescription of *Teloneria* Aczél, and its revalidation as genus of Neriidae (Diptera)” traz à tona uma antiga discrepância discutida pelos autores Aczél (1954a, 1955c) e Steyskal (1977) com relação às *Telostylus apicatus* Edwards e *Telostylus bimaculatus* Edwards. Estas espécies foram incluídas no gênero *Teloneria* por Aczél (1954a) e, posteriormente, foi sinonimizado com *Chaetonerius* Hendel no catálogo de Steyskal (1977) sem qualquer argumentação. Depois de estudar o material-tipo de todas as espécies de *Chaetonerius*, bem como de outros gêneros de Neriidae, neste capítulo são apresentadas evidências morfológicas para ressucitar o gênero *Teloneria*

Aczél a partir da sinonímia com *Chaetonerius* para alocar as espécies *Teloneria apicata* (Edwards) e *T. bimaculata* (Edwards). Lectótipos e paralectótipos são designados para *Teloneria apicata* (Edwards) e seu sinônimo-júnior, *Telostylus apicalis* Enderlein. Lectótipo e paralectótipos também são designados para *Telostylinus ornatipennis* Enderlein, sinônimo-júnior de *T. bimaculata* (Edwards). Três novas espécies de *Telostylus* Bigot (*T. eumaculata*, espécie nova, *T. furva* espécie nova e *T. scaenica* espécie nova) são descritas e outras duas são redescritas. Chave para identificação das espécies, incluindo ilustrações para todas as espécies e dados de distribuição são fornecidos.

O capítulo 2, intitulado “*Chaetonerius* Hendel (Neriidae: Diptera) from the Indian Ocean islands” foi elaborado após o recebimento de um grande número de espécimes recentemente coletados nas ilhas do Oceano Índico, como parte do esforço conjunto de diversos dipterólogos para descrever a fauna que habita essas ilhas, que é em grande parte desconhecida. Assim como as demais espécies afrotropicais de Neriidae (com exceção do artificialmente introduzido *Telostylinus lineolatus* Wiedemman), as espécies das ilhas do Oceano Índico pertencem a *Chaetonerius*, que é o único gênero que não apresenta a lunule protuberante como a maioria dos demais representantes da família. Atualmente, *Chaetonerius alluaudi* (Giglio-Tos, 1895) é a única espécie do gênero registrada para Madagascar, mas também está presente nas ilhas Seychelles e Mauritis (Steyskal, 1980). Neste capítulo, *C. alluaudi* é registrada pela primeira vez para a ilha de La Reunión. Outras sete espécies novas de *Chaetonerius* de Madagascar (*C. antankarana*, espécie nova, *C. antanosy*, espécie nova, *C. ebejeri*, espécie nova, *C. madagasikara*, espécie nova, *C. mandelai*, espécie nova, *C. hololissa*, espécie nova e *C. kirkspriggsi*, espécie nova) e uma espécie nova da ilha de Comoros (*C. eualluaudi*, espécie nova) são descritas e ilustradas.

O capítulo 3, intitulado “A revision of the genus *Chaetonerius* Hendel (Diptera: Neriidae)” é o primeiro nesse sentido, uma vez que nenhum trabalho anterior tratou dos limites deste gênero e, portanto, nenhuma hipótese prévia foi levantada com relação à sua validade. *Chaetonerius* está distribuído, principalmente, na Região Afrotropical, com apenas duas espécies distribuídas na Região Oriental, incluindo a espécie-tipo, *C. inermis* (Schiner), registrada para a Índia. Quase todos os tipos primários para os nomes propostos em *Chaetonerius* foram examinados, com exceção de *C. inermis* e dos tipos perdidos durante a Segunda Guerra Mundial. Com base numa quantidade abrangente de material dessas duas regiões, novas espécies de *Chaetonerius* Hendel (*C. alienum*, espécie nova,

C. anemona, espécie nova e *C. lobayensis*, espécie nova) são descritas, e redescrições e ilustrações são apresentadas para as espécies previamente conhecidas. Após estudar o material-tipo de *C. apicalis* (Walker), esta espécie é sinonimizada com *C. ghesquierei* Aczél contrariamente ao proposto por Aczél (1954a), que associou esse holótipo fêmea aos machos de *C. fascipes* (Brunetti). Consequentemente, a revalidação de *C. fascipes* é proposta e, adicionalmente, justificada por diferenças na genitália masculina, a espécie *C. nyassicus* Enderlein é retirada da sinonímia com *C. fascipes* e reconhecida como espécie válida. Novos registros são fornecidos para a maioria das espécies, assim como uma nova diagnose para o gênero e chave para identificação das espécies.

No capítulo 4, intitulado “Taxonomic revision of *Telostylus* Bigot (Diptera, Neriidae)”, apresenta-se o primeiro estudo morfológico detalhado de *Telostylus*, um gênero exclusivamente encontrado nas Regiões Oriental e Australiana. Desde a descrição do gênero *Telostylus* por Bigot (1859), apenas um estudo (Steyskal, 1966) abordou a questão da falta de definição dos limites genéricos na família e tentou organizar a informação disponível em uma chave para ajudar na identificação de suas espécies. Neste capítulo, o material-tipo de todas as espécies descritas em *Telostylus* foi examinado e suas espécies foram redescritas pela primeira vez. Uma nova combinação é proposta para *T. latibrachium* Enderlein como sinônimo junior de *T. remipes* (Walker). Adicionalmente, duas espécies novas são descritas, *T. facsimile*, espécie nova and *T. claroscuro*, espécie nova, e novas designações de lectótipo e paralectótipo são propostas para *Coenurgia remipes* Walker, *Telostylus trilineatus* De Meijere and *Telostylus babiensis* De Meijere.

O capítulo 5, “A phylogenetic hypothesis based on a total evidence analysis of morphological and DNA sequences data, elucidate the inter-relationships for Neriidae (Diptera, Schizophora)”, trata ds hipóteses de relacionamento das espécies de Neriidae e dos limites entre os gêneros que compoem a família. Neste capítulo, as hipóteses filogenéticas foram inferidas a partir de caracteres morfológicos e moleculares. Para as inferências baseadas em dados morfológicos, foi construída uma matriz de dados que inclui 81 táxons terminais (incluindo quatro espécies de Micropezidae, que foram utilizados como grupos-externos na análise) e 97 caracteres de espécimes adultos, posteriormente analisados sob o critério de parcimônia com pesagem igual e implícita de caracteres. Para as inferências com dados moleculares, análises de máxima verossimilhança e inferência bayesiana foram realizadas a partir de dois genes mitocondriais (cox1 e 12S rRNA) e 23 espécies de Neriidae. Embora tenhamos

encontrado algumas diferenças entre as árvores filogenéticas realizadas com as diferentes abordagens separadamente, a combinação das matrizes morfológica e molecular resultou nos mesmos agrupamentos com valores robustos para o suporte de ramos. As análises filogenéticas forneceram evidências para corroborar a revalidação de *Teloneria* Aczél como gênero independente de *Chaetonerius* Hendel, embora baixos valores de suporte tenham sido obtidos para inferir sua relação com os demais gêneros da família. Nossas análises não corroboram hipóteses prévias de relacionamento que propoem *Chaetonerius* Hendel como grupo-irmão dos Neriidae do Novo Mundo e resultam numa estreita relação entre estes últimos e o gênero paleártico *Stypocladius* Enderlein, que também é proposto como sinônimo-sênior de *Nipponerius* Cresson e uma designação de lectotipo é proposta para a espécie-tipo do gênero, *Nerius appendiculatus* Hendel. O macho de *Loxozus* Enderlein é descrito pela primeira vez e dois novos gêneros são descritos: *Aczelia*, gênero novo para *A. opita*, espécie nova, e *Freidbergmyia*, gênero novo para *F. cholita*, espécie nova. Diversos clados neotropicais, incluindo *Longina*-group, *Eoneria*-group and *Nerius*-group foram corroborados nas análises. Os limites taxonômicos desses grupos genéricos são redefinidos e uma nova classificação é proposta para a família.

GENERAL INTRODUCTION

Neriidae are long legged flies widely known from behavioral and developmental studies, thanks to male particular territorial fight behavior and high phenotypical plasticity. Species of Neriidae have been described from every biogeographical region with no revision of its representatives, making uncertain the identity of many of it, as well as the boundaries of its generic groups. One phylogeny has been recently proposed by Koch *et al.* (2014), based on discrete and continuous characters extracted mainly from old reviews on Neriidae, mainly from M. Aczél's work. New evidence on the inaccuracy of an important number of identifications and re-descriptions in old literature on the family have been revealed from recent taxonomical revisions and provide new insights over its morphology and classification. These revisions have also pointed on diverse misunderstandings that might have been passing forward through recent studies of Neriidae, including the first phylogenetic hypothesis recently published, for have being M. Aczél's studies the only available for many years. For these reasons and with the aim of clarifying these new-old inaccuracies, most of the genera of Neriidae have been revised by the authors recently (*Cerantichir* Hennig, Sepúlveda *et al.*, 2013a; *Eoneria* Aczél, Sepúlveda *et al.* 2013b; *Nerius* Fabricius Sepúlveda 2013; *Glyphidops* Enderlein, Sepúlveda *et al.*, 2014), including the genera revised in this study (*Chaetonerius* Hendel, *Teloneria* Aczél, *Loxozus* Enderlein, *Stypocladius* Enderlein) and are included in a phylogenetic analysis based on new morphological and molecular datasets. The revised genera are presented in the first part of this theses, in order to clarify the species identities and its shared general apomorphic character states, which were posteriorly tested in the phylogenetic analysis.

Chapter 1, entitled "Redescription of *Teloneria* Aczél, and its revalidation as genus of Neriidae (Diptera)" brings to light an old discrepancy between the authors Aczél (1954a, 1955c) and Steyskal (1977) regarding the species *Telostylus apicatus* Edwards and *Telostylus bimaculatus* Edwards. These species were included in the genus *Teloneria* by Aczél (1954a), which was finally synonymized with *Chaetonerius* Hendel by Steyskal (1977) in a catalogue, without any explicit argument. After study the type material of all the *Chaetonerius* species and other genera of Neriidae, here is provided morphological evidence for the resurrection of *Teloneria* Aczél from synonymy with *Chaetonerius* and the species *Teloneria apicata* (Edwards) and *T. bimaculata* (Edwards) are assigned to it.

Lectotypes and Paralectotypes are designated for *Teloneria apicata* (Edwards) and its junior synonym *Telostylus apicalis* Enderlein. Lectotype and Paralectotypes are also designated for *Telostylinus ornatipennis* Enderlein, junior synonym of *T. bimaculata* (Edwards). Three new species *T. eumaculata*, new species, *T. furva* new species and *T. scaenica* new species are described for the genus and the two previously known species re-described. For all the species, a key for identification, illustrations and distribution data are provided.

Chapter 2, entitled “*Chaetonerius* Hendel (Neriidae: Diptera) from the Indian Ocean islands” was created after receiving numerous specimens from collections of the last years in the islands of the Indian Ocean, as part of a joint effort of several dipterists to describe the fauna inhabiting these islands, largely unknown. Like every Afrotropical species of Neriidae (except the artificially introduced *Telostylinus lineolatus* Wiedemman), the species from the Indian Ocean Islands, belong to *Chaetonerius*, which is the only genus without the protruding lunule that characterizes most of the species of the family. Currently, *Chaetonerius alluaudi* (Giglio-Tos) is the only species of the *Chaetonerius* recorded from Madagascar, but, also present in the Seychelles and Mauritius Islands (Steyskal, 1980). In this chapter, *C. alluaudi*, which is the only species previously recorded from Seychelles, Madagascar and Mauritius, is here also recorded for the first time in La Reunión. Other seven new species of *Chaetonerius* from Madagascar *C. antankarana*, new species, *C. antanosy*, new species, *C. ebejeri*, new species, *C. madagasikara*, new species, *C. mandelai*, new species *C. hololissa*, new species and *C. kirkspriggsi*, new species and one new species from Comoros islands *C. eualluaudi*, new species, are described and illustrated.

Chapter 3, entitled “A revision of the genus *Chaetonerius* Hendel (Diptera: Neriidae)” is the first of its class, since no previous work has never questioned the limits of this genus and therefore no hypothesis has been raised regarding its validity. *Chaetonerius* is a mainly Afrotropical genus of Neriidae with two Oriental species, one of which is the type species, *C. inermis* (Schiner), recorded for India. Almost all primary types for the names known in the genus are examined, except for *C. inermis* and the primary types lost in World War II. Based on comprehensive material from these two regions, new species *C. alienum*, new species, *C. anemona*, new species and *C. lobayensis*, new species are described and re-descriptions and illustrations are given for the previously known species. After study of the type material of *C. apicalis* (Walker),

this species is synonymized with *C. ghesquierei* Aczél, contrary to that proposed by Aczél (1954a), who associated this female holotype with males of *C. fascipes* (Brunetti). Consequently, the revalidation of *C. fascipes* is proposed and in addition, based on male genitalia differences, *C. nyassicus* Enderlein is retired from synonymy with *C. fascipes* and recognized as a valid species and its revalidation is proposed. New localities are recorded for most of the species and a new diagnosis is provided for the genus along with a key for the identification of its species.

Chapter 4, entitled “Taxonomic revision of *Telostylus* Bigot (Diptera, Neriidae)”, contains the only comprehensive study regarding the morphology of this shiny genus, present exclusively in the Oriental and Australian Regions. Since the description of the genus *Telostylus* for Bigot (1859), only one work by Steyskal (1966), addressed the issue of lack of limits for the genus and tried to organize the information available in a key to assist in the identification of its species. In the present work, the type material of every species described in *Telostylus* are re-described for the first time, as well as additional material, resulting in a new identification key and new distribution areas. A new combination is proposed for *T. latibrachium* Enderlein as junior synonym for *T. remipes* (Walker). In addition, two new species *T. facsimile*, new species and *T. claroscuro*, new species are described and Lectotype and Paralectotype designations are proposed for *Coenurgia remipes* Walker, *Telostylus trilineatus* de Meijere and *Telostylus babiensis* de Meijere.

Chapter 5, entitled “A phylogenetic hypothesis based on a total evidence analysis of morphological and DNA sequences data, elucidate the inter-relationships for Neriidae (Diptera, Schizophora)”, deals with the hypotheses of relationship within the family, as well as the boundaries between genera and its conformation. With this propose, we use a phylogenetic approach that involves morphological and molecular characters. The matrix of morphological characters includes 81 terminal taxa –of which four are outgroup species of Micropezidae– and 97 adult morphological characters. Parsimony analyses were carried out under equal and implied weight. Maximum likelihood and Bayesian inference were performed for 23 in-group terminals for two genes, the mitochondrial *cox1* and 12S rRNA. While we found some differences among gene trees, a concatenated gene matrix and genes-morphology matrix recovered the same groupings with robustly supporting branch values. There is good evidence for the revalidation of *Teloneria* Aczél out of *Chaetonerius* Hendel, although with low support values to allow us to determine

their relationship with other genera of the family. Our analyses do not support previous hypothesis that propose *Chaetonerius* Hendel as sister group of the New World Neriidae and result in a close relationship between the latter and the Palearctic *Stypocladus* Enderlein, which is also proposed as senior synonym for *Nipponerius* Cresson and a Lectotype designation is proposed for its formerly only species, *Nerius appendiculatus* Hendel. The male of *Loxozus* Enderlein is described for the first time and two new genera related to it are described, *Aczelia*, new genus for *A. opita*, new species and *Freidbergmyia*, new genus for *F. cholita*, new species (the first from Colombia and the second from Peru). Several Neotropical clades within the family (*Longina*-group, *Eoneria*-group and *Nerius*-group) were clearly recovered. The limits of these genera and its insertion in the Neriidae are considered, and an updated intra-familial classification is provided.

CHAPTER 1

Redescription of *Teloneria* Aczél, and its revalidation as genus of Neriidae (Diptera)

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**Redescription of *Teloneria* Aczél, and its revalidation as genus of Neriidae
(Diptera)**

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Abstract

The *Teloneria* Aczél is resurrected from synonymy with *Chaetonerius* Hendel and the species *T. apicata* (Edwards) and *T. bimaculata* (Edwards) are assigned to it. Lectotypes and Paralectotypes are designated for *Telostylus apicatus* Edwards and its junior synonym *Telostylus apicalis* Enderlein. Lectotype and Paralectotypes are also designated for *Telostylinus ornatipennis* Enderlein, junior synonym of *T. bimaculata* (Edwards). Three new species *T. eumaculata*, new species, *T. furva* new species and *T. scaenica* new species are described for the genus and the two previously known species re-described. For all the species, a key for identification, illustrations and distribution data are provided.

Key words: Oriental Region, biodiversity, Nerioidea, new records, taxonomy.

INTRODUCTION

The genus *Teloneria*, was proposed by Aczél (1954) based on the differences of two species of *Telostylinus* Enderlein: *Tl. apicalis* Enderlein and *Tl. bimaculatus* Edwards. According to Aczél (1955), these two species had a less specialized head shape within the family, which was almost as long as high with the eye occupying an important part of the head. The author also distinguishes the species in his new genus from the *Chaetonerius* Hendel y *Telostylus* Bigot, for the number and position of fronto-orbital setae.

In the same paper, Aczél (1955) re-describe the type species of *Chaetonerius*, *C. inermis* (Schiner), known from the Oriental Region and describe the type species of *Teloneria*, *T. apicalis* (Enderlein). Both species described as lacking antennal base and presenting several dorsocentral setae, both, plesiomorphic character states shared for the species of *Chaetonerius*. Posteriorly, Steyskal (1977) proposed the synonymy of *Teloneria* with *Chaetonerius* in his catalogue of the Neriidae of the Oriental Region and since then, no author has addressed their relationships.

We recently had the opportunity to examine specimens from the Oriental and Afrotropical Regions and compare them with each other, founding that the species formerly in *Teloneria*, exhibit a primordial antennal base, evident in lateral view and only two postsutural dorsocentral setae, contrasting with the total lack of antennal base and four dorsocentral setae present in *Chaetonerius*. There is no doubt that the presence of presutural dorsocentral seta and reduced to absent antennal base, represent apomorphic characters for the lineage gathering this two genera. After a thorough re-examination of the type material of the Oriental species currently in *Chaetonerius* Hendel, there is enough evidence to propose the revalidation of *Teloneria* and the results regarding its taxonomy and geographical distribution are here reported.

MATERIAL AND METHODS

The revalidation of *Teloneria* Aczél, as a genus of Neriidae, included a study of all available type material of the species currently known in *Chaetonerius* Hendel, in order to confirm the non-correspondence of the extant species with the new names proposed. The most important distinguishing features of these two genera are included in the section of general morphology of *Teloneria*. Descriptions of female Lectotypes are provided with female variation and male variation separately. Label information is transcribed numbering the labels in parentheses. Distribution data are included at the end of every description and new records marked with asterisk.

This study is based on material lent from the following institutions: NHMUK – The Natural History Museum, London, United Kingdom (Daniel Whitmore); TAUI – Tel Aviv University, Tel Aviv, Israel (Amnon Freidberg); UCDC – University of California, R.M. Bohart Museum of Entomology, Davis, California, U. S. A. (Steven L. Heydon); ZMHB –Museum für Naturkunde der Humboldt, Berlin, Germany (Joachim Ziegler).

TAXONOMY

Teloneria Aczél

Teloneria Aczél, 1954: 510. Type-species: *Telostylus apicalis* Enderlein, 1922 (orig. des.).

The following principal features are most distinctive for *Teloneria* and can be used in separating it from *Chaetonerius* Hendel and other genera of Neriidae: Arista pubescent in all its extension; pubescence shorter at base and longer towards apex. Pedicel very short. Antennal base tiny, but visible laterally between the anterior part of frons and parafacial. The eye occupies almost all the lateral view of head, with parafacial, gena and occiput very short, following the eye margin closely. Wing with well-defined brown macula from the middle of vein R_{4+5} to apex; vein A_2 very short, ending abruptly before reach the second third of the anal lobe. Fore femur and tibia approximately same size and each one with almost twice the length of thorax, which in turn, is as long as the fore basitarsomere.

Morphology. Small-sized species with very long setae. Tegument shiny and when present, the pruinescence is sparse. One of the most evident particularities of *Teloneria* is the long and prominent legs, as well as the absence of paler or darker rings in femora, which are frequent in other genera of Neriidae. Unlike most *Chaetonerius*, the species of this genus have small antennal base, which can be considered similar to the primordial antennal base found in the Oriental *C. inermis* (Schiner).

Head (figs. 1A, 2A, 3A, 4A). Inner process of pedicel placed towards dorsal half, with triangular wide shape and apex wide rounded (fig. 3B). Pedicel with one only dorso-apical outstanding seta. Scape slightly longer than width. Antennal base dark and shiny distally, placed below the concavity of anterior margin of frons in front of parafacial. Anterior margin of frons wide in dorsal view, slightly concave to projected anteriorly beyond the antennal bases (fig. 2C); frontal-vitta with median longitudinal furrow; fronto-orbital plate wide; posterior fronto-orbital seta placed slightly anterior to the posterior third of the eye and closer to inner vertical seta than to middle fronto-orbital seta. Vertex and occiput joining in a curve that follows from close the posterior margin of the eye until postgena; two lines of postocellar setae: one line of long setae in dorsal half and a second line of thin and short setae in ventral half near genal seta. Parafacial and gena extremely narrow, run very close to the eye from the height of genal

seta to antennal base. Postgena convex and narrow with black setulae on direction to occipital foramen.

Thorax. Conspicuously long thoracic setae, measuring 1.5–2x the length of scutellum. Dorsocentral seta in anterior margin of thorax, which is present in every species of *Chaetonerius* Hendel is absent in *Teloneria* Aczél. Postpronotal lobe short and slightly protuberant; postpronotal carina small, placed at level of proepisternal ring and anterior margin of scutum. Three well-developed and long dorsocentral setae: one presutural and two postsutural setae, the anterior close to transversal suture and the posterior near scutoscutellar suture. Scutellum sub-shiny and triangular-shaped, with rounded margins and narrow posterior margin measuring less than half the distance between pre-scutellar dorsocentral setae; apical scutellar seta slightly shorter than dorsocentral pre-scutellar seta; discal scutellar seta, typically spine-like and long in *Chaetonerius* is hair-like and much shorter in *Teloneria* and located in posterior half of scutellum, not medially as in *Chaetonerius*. Anterior and posterior notopleural setae well-developed and almost same-sized in males. Anepisternum and katepisternum with no setula, as the ones in *Chaetonerius*. Katatergite brown and slightly protrude. Katepisternum with one ventral seta. Fore coxa yellow with one apical spine-like seta and one antero-apical smaller; one postero-apical seta and no anterolateral setae; mid coxa with two lateral setae; hind coxa with two lateral setae. Male hind trochanter ventrally with dense setulae.

Legs. Femora cylindrical and conspicuously elongate. Anterior margin of mid femur with proximal line of 10–14 long setulae. Tibiae with anterior line of outstanding setulae. Basicosta with two spine-like setae.

Abdomen. Dark brown with no yellow dorsal stripes, unlike the two dorsal yellow stripes in *Chaetonerius* species. Syntergite 1+2 with short and numerous setae in anterior half, followed by a nude medial area and posteriorly, longer setae in lower density. Sternite 6 long and narrow with line of relatively long black setulae posteriorly. Syntergite 7+8 with long 3–5 long setulae in proximal half dorsally. Epandrium cylindrical and elongate, measuring approximately 1.5–2x the length of syntergite 7+8.

Key for identification of *Teloneria* Aczél

1 Thorax dorsally brown shiny or sub-shiny, with no longitudinal differentiated stripes. Head in lateral view, yellow only in the narrow gena. Occiput completely brown. Pleura brown (fig. 1) ... 2

- 1' Thorax dorsally with longitudinal stripes paler or yellow. Head in lateral view partially or completely yellow. Occiput pale brown or yellow on dorsal half. Pleura partially yellow (fig. 2) ... 3
- 2 (1) Mid coxa yellow. Postpronotal lobe partially yellow. Male fore basitarsomere with spine-like setae posteriorly ... *T. furva*, new species
- 2' Mid coxa brown. Postpronotal lobe and pleura completely brown (fig. 1B). Male tarsomere IV, modified with four very strong spine-like setae ... *T. apicata* (Edwards)
- 3 (1') Frontal-vitta completely yellow and ocellar triangle black. Fronto-orbital seta thin and short (fig. 3A) ... 4
- 3' Frontal-vitta mainly black, except for the nearly yellow stripe of triangular shape on anterior third (fig. 2C). Two anterior fronto-orbital setae well-developed and relatively long (fig. 2A) ... *T. bimaculata* (Edwards)
- 4 Anterior margin of frons straight to slightly concave. First flagellomere ovate with supramedian constriction (pear format) and distal half slightly flipped up (fig. 3A). Presutural scutum with median brown to black wide stripe ... *T. eumaculata*, new species
- 4' Anterior margin of frons very concave (V-shaped) (fig. 8D). First flagellomere ovate (fig. 8B). Presutural intra-alar black spot and no median brown stripe (fig. 8C) ... *T. scaenica*, new species

***Teloneria apicata* (Edwards), new combination**

Figures 1, 6.

Telostylus apicatus Edwards, 1919: 53.

Telostylinus apicalis Enderlein, 1922: 143; Synonymy by Steyskal, 1977: 9.

Head. Arista white in proximal half and brown distally. First flagellomere ovate with acute apex and arista inserted apically. Anterior margin of frons slightly concave, projecting over the small antennal base without surpassing the anterior margin of parafacial; frontal-vitta mainly black, except for the yellow triangular-shaped stripe on anterior third. Fronto-orbital plate wide and shiny; anterior fronto-orbital seta well-developed, long and slightly shorter than the other setae in the head; anterior fronto-orbital seta positioned near the anterior margin of fronto-orbital plate and separated from the middle fronto-orbital seta by one third of the distance of the last from the posterior fronto-orbital seta. Parafacial pale brown. Vertex brown. Occiput yellow with slight white pruinescence dorsally; in lateral view, narrow and pale brown in ventral

half; outer vertical seta aligned with three postocular setae almost same-sized, in a transverse line that reaches dorsal half of occiput and in front of this; occipital line of four smaller postocular setae ventrally.

Thorax. Brown sub-shiny and slightly elongate longitudinally; dorsal longitudinal stripe of faint gray pruinescence; pleura completely brown; anterior notopleural seta well developed and subequal to posterior notopleural seta. Mid coxa brown, with two lateral setae; hind coxa brown with one laterodorsal strong seta and lateroventral thin seta.

Legs. Femora completely brown; fore femur with prominent antero-ventral setae not spine-like.

Abdomen. Dark brown with several long setulae laterally on posterior half of syntergite 1+2. Oviscape dark brown shiny.

Variation. Body length 4.6–5.6 mm. Wing length 4.7–4.9 mm and width 1.2–1.5 mm. Anterior margin of frons with pronounced concavity; projecting anteriorly beyond the anterior line of parafacial; frontal-vitta narrow. Dorsal thorax with no stripes of gray pruinescence.

Male. Body length 4.7–5.0 mm. Fore femur with several anteroventral long setae diminishing in size distally, to absent on distal third. Fore tarsomere III with two very strong ventro-apical setae; ventro-apical margin of anterior tarsomere IV, modified with four very strong specialized setae. Epandrium thin and elongate, almost 1.5X longer than syntergite 7+8; surstylus linear and narrow basally, distal half ovate and flattened dorsoventrally with strong ventral setae; cercus wide at base, narrowing distally with long yellow setulae dorsally, which are more densely grouped towards distal third (fig. 1D).

Type Material. **LECTOTYPE** (here designated), *Telostylus apicatus* f#; Type locality: Pattani Province, Thailand. **LABELS:** (1, blue perimeter) **SYNTYPE** (2) Siam: Bulsit Besar. H. C. Robinson & N. Annandale, 1916-21. (3) **SYNTYPE**, *Telostylus apicatus* Edwards, det. J. E. Chainey, 1995 (4) NHMUK01240951 [NHMUK] (fig. 6A). **PARALECTOTYPE 1**, 1f#: (1, blue perimeter) **SYNTYPE** (2, red perimeter) **TYPE**, *Telostylus apicatus* Edw. (3) 1916. Scolak Daras, 65. W. Sumatra, 1914. (Robinson & Kloss) (4) **SYNTYPE**, *Telostylus apicatus* Edwards, det. J. E. Chainey, 1995(5) NHMUK01240950 [NHMUK] (fig. 6B). **PARALECTOTYPE 2**, 1f#: (1, blue perimeter) **SYNTYPE** (2) Siam: Bulsit Besar. H. C. Robinson & N. Annandale, 1916-

21. (3) SYNTYPE, *Telostylus apicatus* Edwards, det. J. E. Chainey, 1995 (4) NHMUK01240952 [NHMUK] (fig. 6C).

LECTOTYPE, *Telostylus apicalis* m#, Type locality: Sumatra, Indonesia. LABELS: (1) Ober-Langkat, Deli, Sumatra, 1894, M. U. de S. (2, red label) Type (3) *Telostylus apicalis* m#, Type Enderlein, Dr. Enderlein det. 1921 (4) Zool. Mus. Berlin (5, red label) SYNTYPE, *Telostylus apicalis* Enderlein, 1922, det. Mello & Ziegler 2010 [ZMHB] (fig. 6D). **PARALECTOTYPE**, 1f#: (1) Ober-Langkat, Deli, Sumatra, 1894, M. U. de S. (2, red label) Type (3) *Telostylus apicalis* f#, Type Enderlein, Dr. Enderlein det. 1921 (4) Zool. Mus. Berlin (5, red label) SYNTYPE, *Telostylus apicalis* Enderlein, 1922, det. Mello & Ziegler 2010 [ZMHB] (fig. 6E).

Material Examined. Malaysia. 1m# 1f#, (1) Bukit Tinggi forest 1300ft, 26.xii.1972 (2) W. MALAYSIA, Pahang, A. E. Stubbs, BMNH 1974-87 [NHMUK].

Distribution. Thailand, Malaysia* (Pahang), Indonesia (Sumatra).

***Teloneria bimaculata* (Edwards), new combination**

Figures 2, 5A, 7.

Telostylus bimaculatus Edwards, 1919: 53.

Telostylus ornatipennis Enderlein, 1922: 143; Synonymy by Hennig, 1937: 279.

Head. Arista pale brown at basal third and dark distally. First flagellomere ovate, narrowing on distal half with wide apex. Anterior margin of frons slightly concave, projecting over the small antennal base, beyond anterior margin of parafacial; frontal-vitta narrow and mainly black, except for the yellow triangular-shaped stripe on anterior third; fronto-orbital plate wide and sub-shiny; fronto-orbital setae long and slightly shorter than the other setae of head; two anterior fronto-orbital setae positioned near anterior margin of fronto-orbital plate; middle fronto-orbital seta separated from posterior fronto-orbital seta by one third of the distance between the latter and the inner vertical seta. Vertex brown. Occiput yellow with dorsal faint white pruinescence; in lateral view, narrow and pale brown on ventral half; outer vertical seta aligned with two postocular setae almost same-sized in a transverse line that reaches the ventral half of occiput and in front of this, another line of three smaller postocular setae that reach the gena. Parafacial yellow.

Thorax. Brown sub-shiny and slightly elongate longitudinally; pleura with yellow stripe from humeral lobe, passing through notopleura ventrally, anepisternum

and katepisternum dorsally towards mid coxa. Mid coxa yellow with two lateral setae; hind coxa with one large laterodorsal seta and one thin and short lateroventral seta. Wing brown macula surrounding the basal third of vein R_{4+5} , almost reaching vein M passing through r-m and approaching vein R_1 anteriorly.

Legs. Femora yellow on proximal half, darkening distally to brown at apex; fore femur with long antero-ventral setae non-spine-like.

Abdomen. Dark brown with several conspicuously long thin setae laterally on syntergite 1+2. Oviscape dark brown shiny.

Variation. Body length approximately 5.1–5.5 mm. Wing length 5.2–5.9 mm and width 1.4–1.6 mm.

Male. Body length 6.3 mm. Dorso-apical seta of pedicel very long. Outer vertical seta aligned with three post-ocular setae, while in front of it, the ventral line present four postocular setae. Wing with no macula around vein R_{4+5} . Femora yellow on basal third and dark in the rest. Tibia and tarsomers with line of thick and short spine-like setae posteriorly. Epandrium dark yellow shiny, measures twice width of syntergite 7+8; surstylus short linear with round apex; cercus oblancelolate with apical group of long and dark setulae (fig. 5B).

Type Material. HOLOTYPE, *Telostylus bimaculatus* (? without abdomen); Type locality: Sumatra, Indonesia. LABELS: (1, red perimeter label) HOLOTYPE (2) 1916. Scolak Daras, 65. W. Sumatra, 1914. (Robinson & Kloss) (3) HOLOTYPE, *Telostylus apicatus* Edwards, det. J. E. Chainey, 1995 (4) NHMUK01241421 [NHMUK] (original designation) (fig. 7A).

LECTOTYPE, *Telostylinus ornatipennis* f#; Type locality: Sumatra, Indonesia. LABELS: (1) Ober-Langkat, Deli, Sumatra, 1894, M. U. de S. (2, red label) Type (3) *Telostylinus ornatipennis*, Type Enderlein f#, Dr. Enderlein det. 1921 (4) Zool. Mus. Berlin (5, red label) SYNTYPE, *Telostylinus ornatipennis* Enderlein, 1922, det. Mello & Ziegler 2010 [ZMHB] (fig. 7B). **PARALECTOTYPE**, 1f#, (1) Ober-Langkat, Deli, Sumatra, 1894, M. U. de S. (2, red label) Type (3) *Telostylinus ornatipennis*, Type Enderlein f#, Dr. Enderlein det. 1921 (4) Zool. Mus. Berlin (5, red label) SYNTYPE, *Telostylinus ornatipennis* Enderlein, 1922, det. Mello & Ziegler 2010 [ZMHB] (fig. 7C).

Material examined. Thailand. 1m#, (1) Neriidae, Gen. Spec. (hand writted) (2) Siam: Talum. 9.i.1902, H. O. Robinson & N. Annandale. 1916-21 [NHMUK].

Malaysia. 1m#1f#, (1) Gentig Tea Estate, Gentig Sembah, forest 2000 feet, 24-27.xii.1972 (2) W. MALASYA: Selangor, A. E. Stubbs, BMNH 1974-87 [NHMUK].

Comments. The lectotype's terminalia is lost, therefore it was impossible to determine with certainty if it is a male or female and based on the lack of spine-like setae on fore femur, is described as a female. However, variations with respect to the single male specimen found are described separately, as well as the differences of this specimen with other females observed.

Distribution. Thailand*, Taiwan, Malaysia* (Pahang), Indonesia (Sumatra).

***Teloneria eumaculata*, new species**

Figures 3, 5B.

Head. Arista dark brown and inserted apically. First flagellomere ovate, constrained medially with distal half upturned and wide apex. Inner process of pedicel wide triangular; wide at base and narrow at apex. Parafacial yellow. Anterior margin of frons straight to slightly concave; frontal-vitta completely yellow, surrounding the black ocellar triangle until the post-ocellar seta; fronto-orbital plate wide and shiny, same as occiput, except on medial occipital sclerite, which is black; anterior frontal-orbital seta hair-like and very short; middle fronto-orbital seta same size as inner vertical. Outer vertical seta aligned with three postocular setae; ventral half of occiput with line of small setae running very close to the eye.

Thorax. Sub-shiny and partially brown with several yellow areas; two longitudinal yellow stripes dorsally from the anterior margin of scutum to pre-scutellar margin; pre-scutellar dorsocentral seta slightly longer than apical scutellar seta. Scutellum brown dorsally and yellow laterally with posterior margin straight. Postpronotal lobe yellow as well as notopleura, anepisternum posteriorly and dorsal part of katatergite. Mid coxa with two long antero-apical setae; hind coxa with one laterodorsal thick and long seta and one weaker lateroventral seta.

Legs. Femora yellow with distal third black, slightly paler on fore femur; fore femur with three ventral lines of short spine-like setae approximately same-sized from base to apex. Fore tibia brown

Abdomen. Syntergite 1+2 with lateral margin yellow. Epandrium cylindrical and elongate, measures 1.5X the length of syntergite 7+8; distal margin densely setulose laterally; surstylus linear with round apex; cercus linear narrowing towards apex,

similar to *T. apicata* (fig. 1C) with tapering apex distally towards inner margin (fig. 5B).

Female. Body length 4.5–6.3 mm. Ventral katepisternal seta inconspicuous to absent in most females. Mid coxa yellow, partially brown or almost completely brown. Fore femur with no prominent ventral setae. Oviscape shiny with dorsal stripe brown and laterally yellow to completely brown.

Variation. Body length 5.6–6.6 mm. Wing length 5.2–6.5 mm and width 1.3–1.7 mm. Yellow parts of body slightly darker. Outer vertical seta thin to hair-like. Line of setae on dorsal half of occiput vary from three long setae to one short plus three long seta or one short seta plus two long setae. Dorsal longitudinal stripes of thorax vary in intensity, especially on anterior half, where this can be yellow to black.

Type material. HOLOTYPE, *Teloneria eumaculata* ♂, (1) INDIA: Meghalaya, Nongphoh Forest, 7.xi.2002, A. FREIDBERG (2) SMNH-TAUI 205837. [TAUI].

PARATYPES, India. 2♂1♀, same data as holotype – 205829, 205834, 205835– [TAUI]. **Thailand.** 1♂, 160340. Soppong, 6kmE, Rt. 1095, 19°30'N 98°17'E, 700m, 1-2.xi.2012, A. FREIDBERG [TAUI, 994]; 1♀, 160338. Soppong, 6kmE, Rt. 1095, 19°30'N, 98°17'E, 700m, 1-2.xi.2012, A. FREIDBERG [TAUI]; 1♂, 160759. Soppong, 10kmE, Rt.1095, near Ban Nam Rin, 19°28'N, 98°18'E, 810m, 5.xi.2012, A. FREIDBERG [TAUI]; 1♂, 160228. Soppong, 6kmE, Rt.1095, 19°30'N, 98°17'E, 700m, 20.xi.2012, A. FREIDBERG [TAUI]; 1♀, 160230. Soppong, 6kmE, Rt.1095, 19°30'N, 98°17'E, 700m, 20.xi.2012, A. FREIDBERG [TAUI]; 1♂, S. TakuaPa, Rt. 401, 21.x.93, F: KAPLAN & A. FREIDBERG (2) SMNH-TAUI 205886. [TAUI]; 2♂, 350m Mae Hong Son Prov. Tham Pla NP, Pha Sua waterfall, 14.v.2004, Ilan Yarom, N19°29.45'E, 97°57.44' (2) SMNH-TAUI –205885, 205885– [TAUI]; 1♂, S. TakuaPa, Rt. 401, 21.x.93, F: KAPLAN & A. FREIDBERG (2) SMNH-TAUI 205971. [TAUI]; 1♀, NW: Soppong, 8kmS Rt. 1095, near Ban Man Rim, 28-30.x.2002, A. FREIDBERG (2) SMNH-TAUI 205970 [TAUI].

Etymology. The species is named *T. eumaculata* due its coloration pattern similar to *T. bimaculata*.

Distribution. India, Thailand.

Teloneria furva, new species

Figures 4, 5C.

Head. Arista white in small proximal part and brown in the rest; inserted apically. First flagellomere ovate with narrow apex. Parafacial pale brown. Anterior margin of frons slightly concave, projecting itself over the small antennal bases and surpassing discreetly, the anterior margin of parafacial; frontal-vitta mainly black, except for one triangular-shaped yellow stripe on anterior third. Fronto-orbital plate wide, yellow and sub-shiny; anterior and middle fronto-orbital setae one third shorter than posterior fronto-orbital seta. Vertex dark brown. Occiput brown laterally; outer vertical seta aligned with three postocular setae, almost same-sized, organized in one transverse line that reaches ventral half of occiput; transverse line of seven small postocular setae ventrally.

Thorax. Brown sub-shiny with no evident dorsal gray pruinose stripe; pleura brown with faint gray pruinescence. Postpronotal lobe dorsally yellow; anterior notopleural seta subequal to posterior notopleural seta. Ventral katapisternal setae large and a second ventral katapisternal seta thin and short. Mid coxa yellow with two long lateral setae; hind coxa with one large laterodorsal seta and lateroventral seta weaker.

Legs. Fore femur brown with anteroventral spine-like setae very short and same-sized; mid and posterior femora with small part yellow distally. Tibiae yellow with line of long setae posteriorly. Basitarsomere with line of thick and short spine-like setae.

Abdomen. Brown. Tergite 2 with few but long setulae laterally. Epandrium cylindrical and elongate, measures 1.5–2X the length of syntergite 7+8; distal margin densely setulose laterally; surstylus spatulate and short; cercus linear, wide and elongated, narrows distally and has one dense patch of very long apical setulae (fig. 5C).

Female. Body length 4.9 mm. Mid coxa pale brown. Fore femur with no spine-like anteroventral setae. Fore tibia brown. Basitarsomere with no spine-like setae. Wing with brown macula between veins C and M, base of M and proximal half of vein R₄₊₅. Oviscape dark brown shiny, as long as twice its width.

Variation. Body length 5.3–5.6 mm. Wing length 4.5–5.6 mm and width 1.2–1.5 mm. Line of postocular setae on ventral half of occiput with only three short setae. Apical setulae on cercus not very densely grouped.

Type material. HOLOTYPE, *Teloneria furva* m#: BORNEO: SARAWAK, s. Gunung Buda, 64km s. Limbang, 4°12'N, 114°56'E, 19.xi.1996, S. L. Heydon & S. Fung [UCDC]. **PARATYPES, Malaysia.** 1f#, same data as the holotype [UCDC];

1m#, SARAWAK, s. Gunung Buda, 64km s. Limbang, 4°12'N, 114°56'E, 20.xi.1996, S. L. Heydon & S. Fung [UCDC].

Etymology. The name of the species comes is related to the latin adjective “*furvus*“, which means dark or black.

Distribution. Malaysia (Sarawak).

***Teloneria scaenica*, new species**

Figures 5D, 8.

Head. Arista brown; inserted dorso-apically. First flagellomere ovate with wide apex. Parafacial yellow. Anterior margin of frons very concave, projecting over the small antennal bases and between the antennae, surpassing the anterior margin of parafacial; frontal-vitta yellow and ocellar triangle black; fronto-orbital plate wide, yellow and sub-shiny; anterior and middle fronto-orbital setae shorter and thinner than posterior fronto-orbital seta. Vertex and occiput yellow; brown laterally; outer vertical seta aligned with three postocular setae, almost same-sized, organized in one transverse line that reaches half of occiput; transverse line of five small postocular setae ventrally.

Thorax. Partially yellow sub-shiny with no evident dorsal pruinose stripe; presutural intra-alar black spot; anepisternum and katepisternum anteriorly black; meron and katatergite black. Scutellum black. Anterior notopleural seta subequal to posterior notopleural seta. Ventral katepisternal setae thin and short and second ventral katepisternal seta thin and shorter. Mid coxa yellow with two long lateral setae; hind coxa yellowish-brown with one large laterodorsal seta and lateroventral seta thin and short. Hind trochanter densely setulose ventrally.

Legs. Femora yellow with brown distal third; fore and mid femora with anteroventral and posteroventral spine-like setae very short. Tibiae brown with line of long setae anteriorly; fore tibia cylindrical and thin; mid tibia swollen distally. Mid tarsomere III with thick and short spine-like setae distally.

Abdomen. Brown. Syntergite 1+2 with several long setulae laterally; lateral margin yellow. Epandrium cylindrical and elongate, measures 1.5X the length of syntergite 7+8; distal margin densely setulose laterally; surstylus linear slightly narrow at base and rounded apex; cercus wide linear narrowing towards apex, as long as half the length of epandrium.

Female. Thorax and legs darker. Macula in the wing paler than male to absent. Anteroventral and posteroventral spine-like seta in femora absent. Mid tibia only slightly wider than fore tibia. Oviscape completely brown.

Variation. Body length 6.0–6.44 mm. Wing length 5.8–5.9 mm and width 1.5–1.62 mm. Head dark yellow. Thorax with brownish-yellow longitudinal stripes dorsally. One male from Selangor, Malaysia (#1823) with anterior fronto-orbital seta longer than average and two ventral lines of short spine-like setae in fore femur.

Type material. HOLOTYPE, *Teloneria furva* m#: (1) Gentig Tea Estate Gentig Sembah, forest 2000 feet, 24-27.xii.1972 (2) W. MALASYA: Selangor, A. E. Stubbs, BMNH 1974-87 [NHMUK]. **PARATYPES, Malaysia.** 1m#1f#, (1) Gentig Tea Estate Gentig Sembah, forest 2000 feet, 24-27.xii.1972 (2) W. MALASYA: Selangor, A. E. Stubbs, BMNH 1974-87 [NHMUK]. **Thailand.** 2m#, (1) S. Khao Lak 100, Km. N. Phuket, 19X93, F. KAPLAN & A. FREIDBERG (2) SMNH-TAUI –205846, 205845–.[TAUI]; 1f#, (1) South Ton Nga Chase N.P. 20kmSW Hat Yai, 20-24.x.2002, A. FREIDBERG (2) SMNH-TAUI 205965 [TAUI].

Etymology. The name of the species is related to the latin adjective “*scaenica*“, which means theatrical, in reference to its conspicuous likeness with species in *Telostylus* Bigot.

Distribution. Thailand, Malaysia (Sarawak).

Comments. This species is very similar to *T. eumaculata* in general color and genitalia and differentiated by the pattern of dark stripes in thorax and head. Other characters particular to *T. scaenica*, new species, include the unique dense setulae in hind trochanter in and anterior margin of frons very concave. The new species may be confused in a quick examination with *Telostylus* species due its yellow tegument, but the generic synapomorphic character states of *Teloneria* such as three dorsocentral setae, transverse sutura incomplete and anterior and middle fronto-orbital seta present, allows to place it rapidly in *Teloneria*. In addition, *T. scaenica*, new species presents a slightly swollen mid tibia, which is expected to be the fore tibia as in other species of Neriidae.

Acknowledgments

We are grateful to curators and staff of collections that sent us material. We are thankful to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the research grants (TAS proc. 142356/2013-1, CJBC proc. 309873/2016–9).

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Figures

Figure 1. *Teloneria apicata* (Edwards), male. A, B. Head lateral; C. Thorax lateral; D. Terminalia lateral.

Figure 2. *Teloneria bimaculata* (Edwards), male. A. Head lateral; B. Head latero-dorsal; C. Head dorsal.

Figure 3. *Teloneria eumaculata*, new species, male. A. Head lateral; B. Thorax lateral.

Figure 4. *Teloneria furva*, new species, male. A. Head lateral; B. Inner process of pedicel.

Figure 5. Genitalia of *Teloneria* species, lateral. A. *T. bimaculata*; B. *T. eumaculata*; C. *T. furva*; D. *T. scaenica*, new species.

Figure 6. *Teloneria apicata* (Edwards), type material and labels. (A-C) *Telostylus apicatus* Edwards. A. Lectotype, here designated; B. Paralectotype 1, here designated; C. Paralectotype 2, here designated. (D-E) *Telostylinus apicalis* Enderlein. D. Lectotype, here designated; E. Paralectotype, here designated.

Figure 7. *Teloneria bimaculata* (Edwards), type material and labels. A. *Telostylus bimaculatus* Edwards. A. Holotype, habitus dorsal. (B-C) *Telostylinus ornatipennis* Enderlein. B. Lectotype, here designated; C. Paralectotype, here designated.

Figure 8. *Teloneria scaenica*, new species, holotype. A. Habitus lateral; B. Head lateral; C. Thorax dorsal; D. Head dorsal.

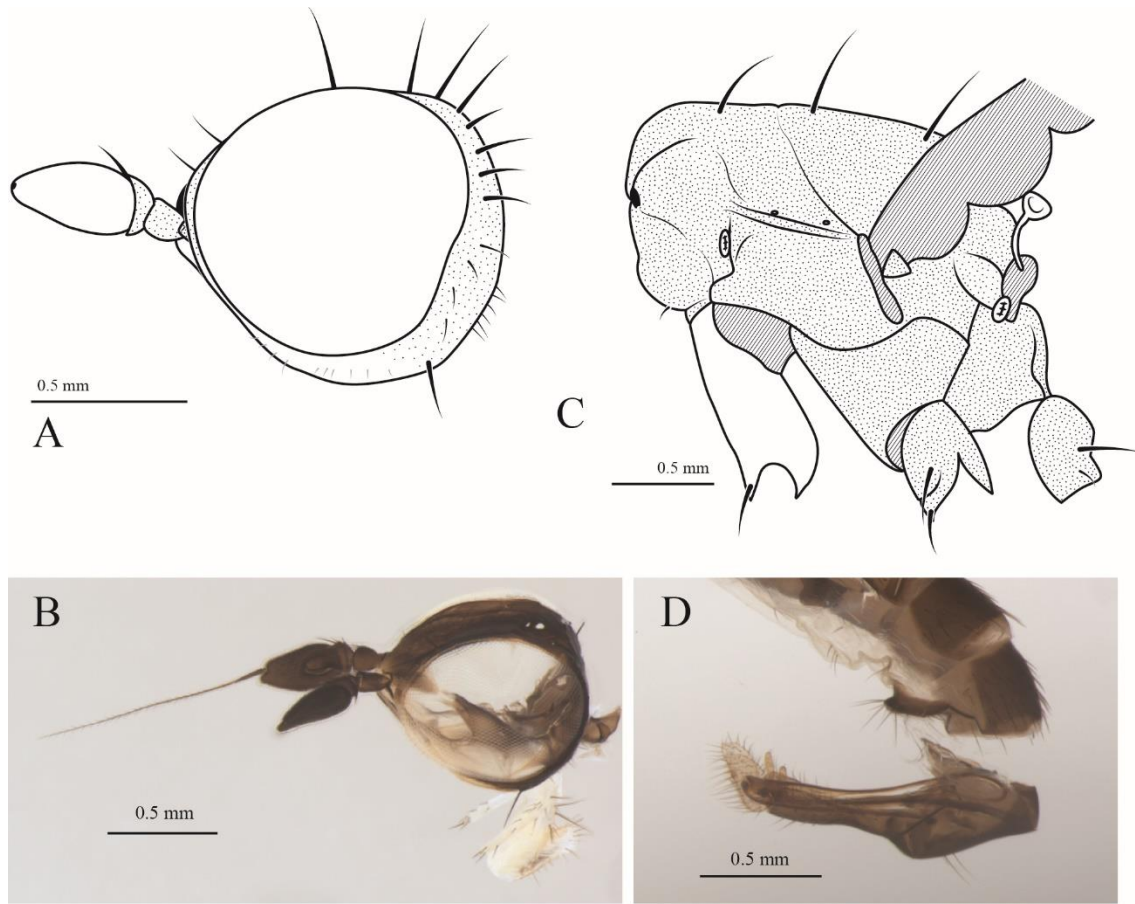


Figure 1. *Teloneria apicata* (Edwards), male. A, B. Head lateral; C. Thorax lateral; D. Terminalia lateral

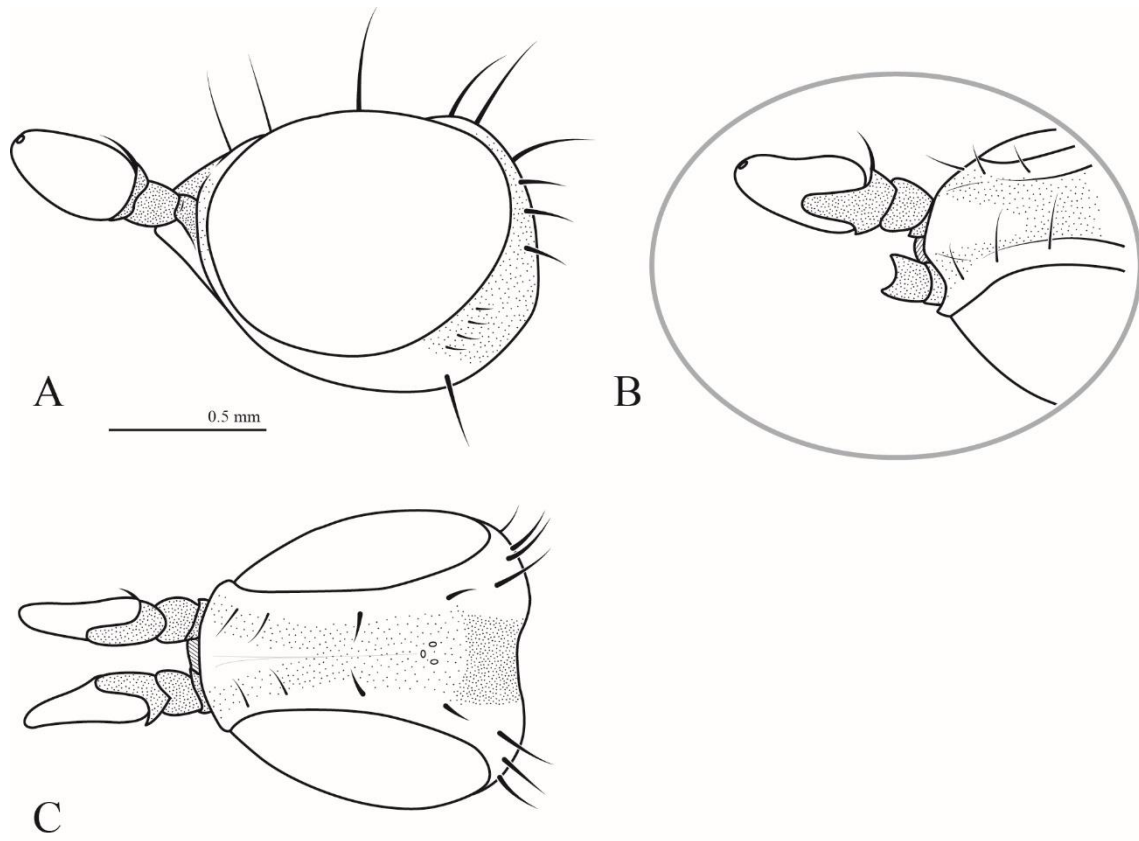


Figure 2. *Teloneria bimaculata* (Edwards), male. **A.** Head lateral; **B.** Head latero-dorsal; **C.** Head dorsal.

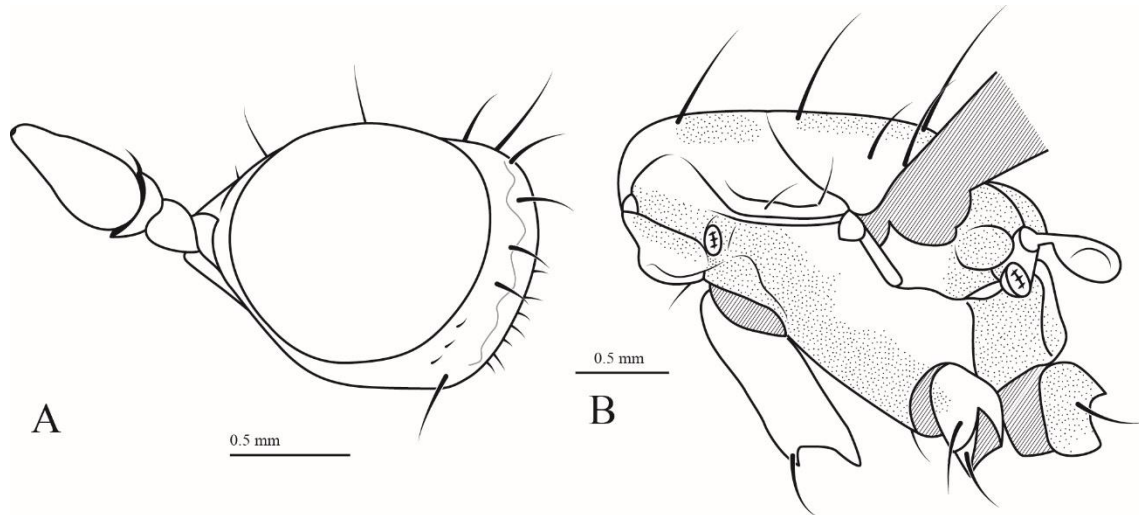


Figure 3. *Teloneria eumaculata*, new species, male. **A.** Head lateral; **B.** Thorax lateral.

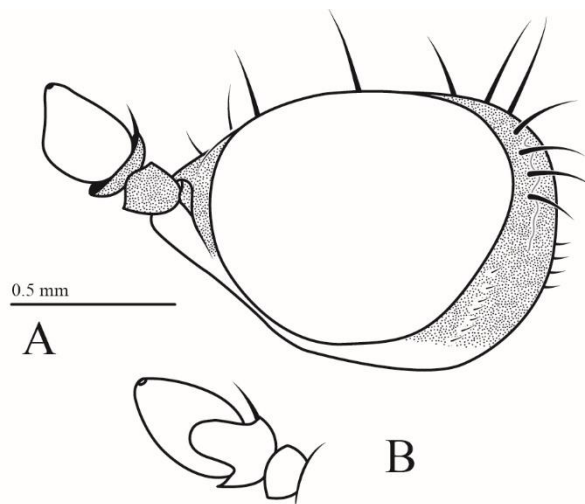


Figure 4. *Teloneria furva*, new species, male. **A.** Head lateral; **B.** Inner process of pedicel.

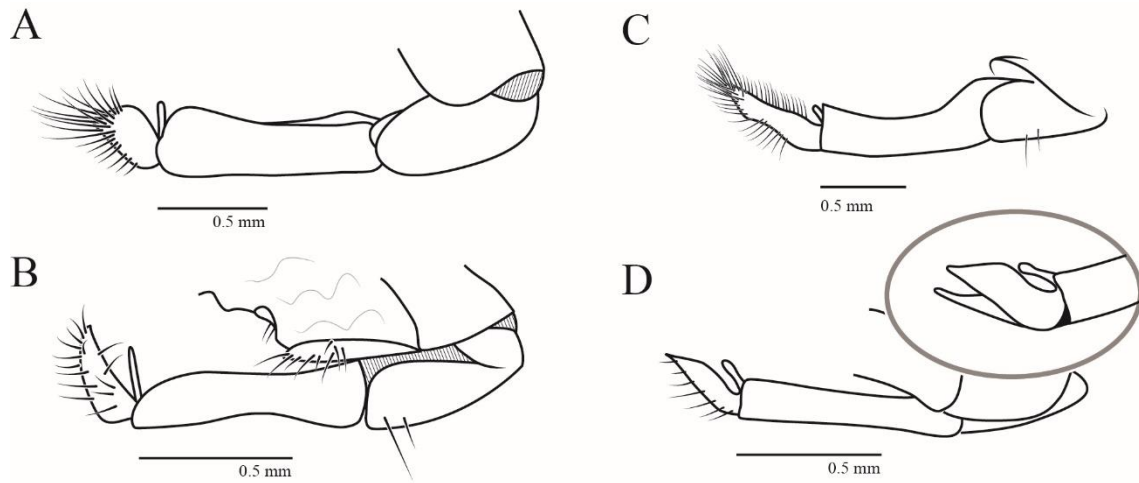


Figure 5. Genitalia of *Teloneria* species, lateral. **A.** *T. bimaculata*; **B.** *T. eumaculata*; **C.** *T. furva*, new species; **D.** *T. scaenica*, new species.

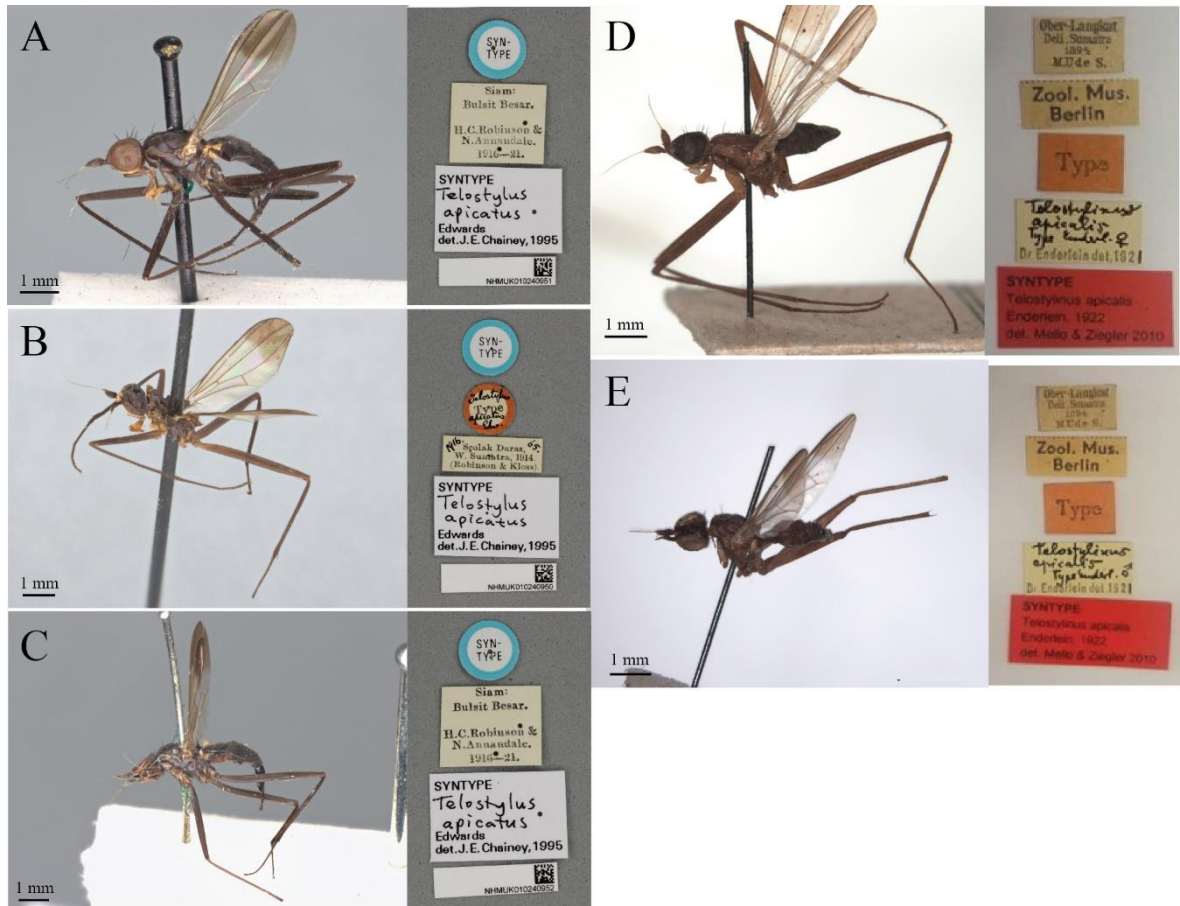


Figure 6. *Teloneria apicata* (Edwards), type material and labels. (A-C) *Telostylus apicatus* Edwards. A. Lectotype, new designation; B. Paralectotype 1, new designation; C. Paralectotype 2, new designation. (D-E) *Telostylimus apicalis* Enderlein. D. Lectotype, new designation; E. Paralectotype, new designation.

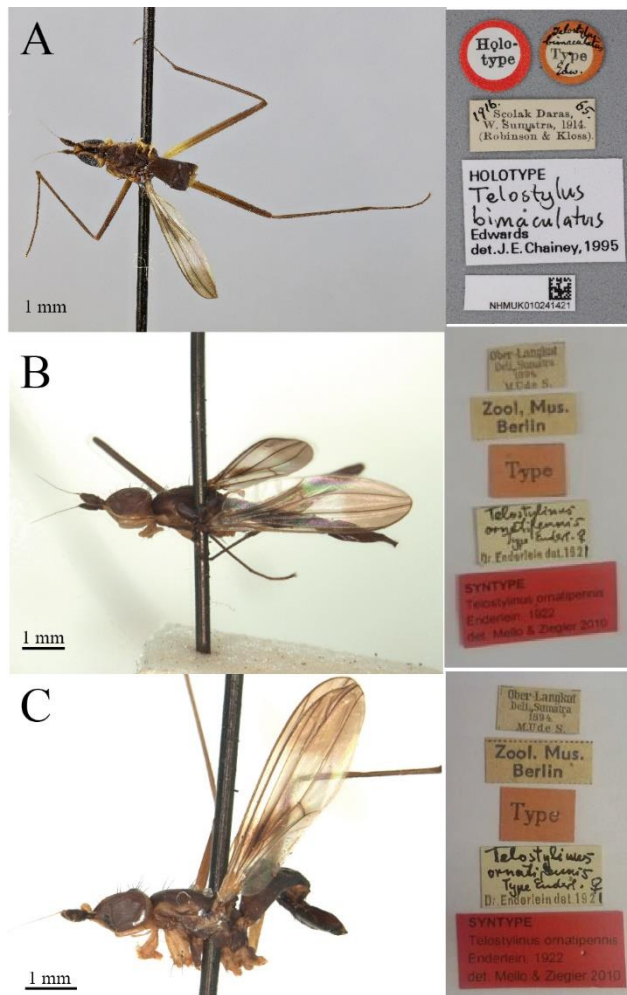


Figure 7. *Teloneria bimaculata* (Edwards), type material and labels. A. *Telostylus bimaculatus* Edwards. A. Holotype, habitus dorsal; (B-C) *Telostylinus ornatipennis* Enderlein. B. Lectotype, new designation; C. Paralectotype, new designation.

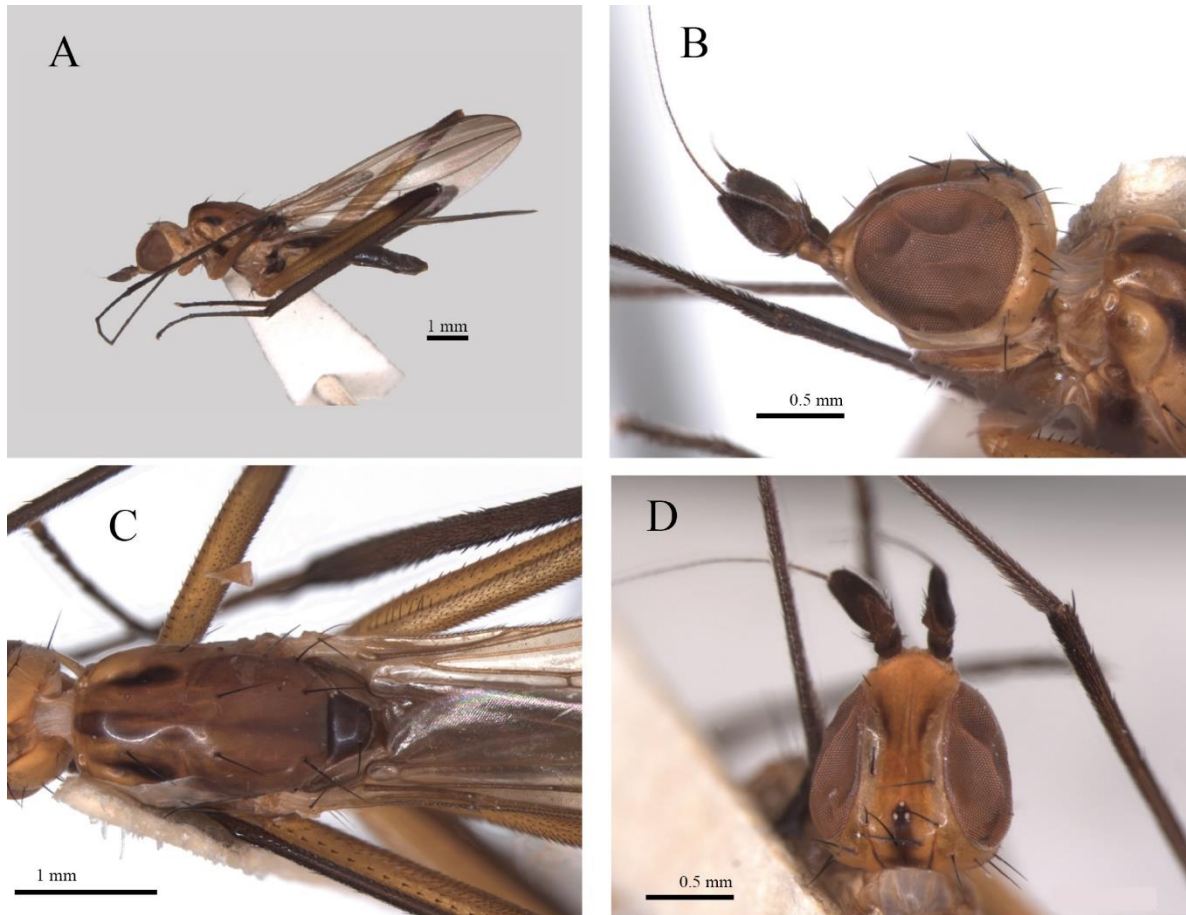


Figure 8. *Teloneria scaenica*, new species. Holotype. **A.** Habitus lateral; **B.** Head lateral; **C.** Thorax dorsal; **D.** Head dorsal.

CHAPTER 2

Chaetonerius Hendel (Neridae: Diptera) from the Indian Ocean islands

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***Chaetonerius* Hendel (Neriidae: Diptera) from the Indian Ocean islands**

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Abstract

A revision of the type material of Afrotropical Neriidae was published fifteen years ago and is until now the only recent information on the species of this region. After studying material from major entomological collections housing Afrotropical specimens, we found seven new species from the Indian Ocean islands and *C. alluaudi* (Giglio-Tos) which is the only species previously recorded from Seychelles, Madagascar and Mauritius, is here also recorded from La Reunión. The new species *C. eualluaudi*, new species is the first neriid described from the Comoros and other seven new species *C. antankarana*, new species, *C. antanosy*, new species, *C. ebejeri*, new species, *C. madagasikara*, new species, *C. mandelai*, new species *C. hololissa*, new species and *C. kirkspriggsi*, new species are described from material collected in Madagascar,.

Key words. Afrotropical Region, Malagasy Subregion, Neriioidea, new species, new records, taxonomy.

INTRODUCTION

The Afrotropical Neriidae are gathered in *Chaetonerius* Hendel, which is the only genus without the protruding lunule that characterizes this family of long legged flies. *Chaetonerius alluaudi* (Giglio-Tos, 1895) is the only species of the *Chaetonerius* recorded from Madagascar, but, also present in the Seychelles and Mauritius Islands (Steyskal, 1980). This species was not included in the revision of the Afrotropical type-material of Neriidae by Barraclough (1993) and no additional species or material of the

family has been known from the Indian Ocean islands since then. Madagascar and its surrounding islands are areas defined as “hotspot” by their tremendous biodiversity, including the independent nations of Seychelles, the Comoros, La Reunion and Mauritius (Myers *et al.*, 2000).

In the present paper, we describe seven new species of *Chaetonerius* from Madagascar and one new species from Comoros islands. *Chaetonerius alluaudi* is the only species of the genus until now recorded for the Indian Ocean islands Seychelles, Madagascar and Mauritius and is here recorded for the first time in La Reunion.

MATERIAL AND METHODS

This study is based on material collected by Martin Ebejer on La Reunion and other pinned material kindly sent in loan by curators and staff from the following institutions: BMSA – National Museum Bloemfontein, Bloemfontein, South Africa (Ashley H. Kirk-Spriggs); CSCA – California State Collection of Arthropods, Sacramento, California, U.S.A. (Stephen Gaimari); MNHN – Muséum National d'Histoire Naturelle, Paris, France (Christophe Daugeron); NMSA – Natal Museum, Pietermaritzburg, Kwa-Zulu Natal, South Africa (Burgert Muller and Thembeca Nxele); ME. – Martin Ebejer, private collection; RMCA – Musee Royal de l'Afrique Centrale, Tervuren, Belgium (Eliane De Coninck and Didier Van den Spiegel); RMNH – Naturalis Biodiversity Centre, Leiden, Netherlands (Ben Brugge); SANC – South African National Collection of Insects, Pretoria, South Africa (Cornel du Troit); TAUI – Tel Aviv University, Tel Aviv, Israel (Amnon Freidberg); UCDC – University of California, R.M. Bohart Museum of Entomology, Davis, California, U. S. A. (Steven L. Heydon); USNM – National Museum of Natural History, Washington D.C., U.S.A. (Allen Norrbom); ZSM – Zoologische Staatssammlung, Munich, Germany (Marion Kotrba).

The type material of all the species of the Afrotropical *Chaetonerius* Hendel was examined but not included here, in order to confirm the non-correspondence of the extant species with the new names proposed. Label information is provided for every specimen examined, with more than one label indicated with the number in parenthesis. When labels share the same information, except for small differences like collecting date or museum catalogue number, all data are included together into an m-dash, separated by comma. The depository institution is indicated in brackets.

TAXONOMY

The only non-*Chaetonerius* species recorded from the Afrotropical Region is the widespread *Telostylinus lineolatus* (Wiedemann 1830), which is also occurring in the Australasian and Oriental Regions (Barraclough 1992). Other species recorded from the African continent and its Indian Oceanic islands, belong to *Chaetonerius* Hendel.

Barraclough (1993) had already mentioned that from his observations of material coming from Comoro Island, he would have found what he thought could be a new species of Neriidae. This finding led him to also think that other new species could remain unknown in the Indian Ocean islands. This suspicion is confirmed in this work, based on the study of material coming from some of the mentioned islands, including the Comoros, from which a new species is described. Seven more species are described and keyed and the distribution areas of *C. alluaudi* are expanded.

One structure of the head infrequently used in studies of Diptera and never mentioned for Neriidae is the frontogenal suture, which has been found to have different length between the genera of the family. Those differences will be described and discussed in detail in a future article on a revision of *Chaetonerius*. In neriids from the Indian Ocean and Malagasy islands, the fronto-genal suture reaches the level of the parafacial anteriorly before fade up, leaving a small portion of the face visible in lateral view seeming like a different plate (figs. 1B, 1C).

The character is also shared with continental species out of the *apicalis*-group (*sensu* Aczél 1954). Furthermore, two species from Madagascar have an inconspicuous antennal base, similar to that observed in *C. inermis*, although evidently smaller and primordially developed. Additionally, the anterior fronto-orbital seta placed away from the anterior margin of the fronto-orbital plate and the three fronto-orbital setae equidistant also differentiate the Indian Oceanic species from the continental species of *Chaetonerius*.

Key for the identification of *Chaetonerius* Hendel from the Indian Ocean islands

1. Head almost rounded, with the posterior margin concave, making the point of joint between occiput and gena also rounded (fig. 1). Between the anterior margin of fronto-orbital plate and the position of anterior seta, there are several short setulae ... 2
- Posterior margin of head almost straight; occiput very narrow, reaching the gena ventrally in a right angle (fig. 2E). Setulae near the anterior margin of the fronto-orbital plate absent (fig. 3F) ... *C. kirkspriggsi*, new species

2. Primordial antennal base absent (figs. 1A). Katatergite yellow ... 4
 - Primordial antennal base present (fig. 1D). Katatergite brown ... 3
3. Two long black seta on dorsal half of the occiput, aligned with the outer vertical seta and other three short setae; postgena with just a few yellow long setulae (fig. 1D). Katepisternum brown on dorsal half and yellow on ventral half. Abdomen brown with no yellow lines dorsally ... *C. ebejeri*, new species.
 - Dorsal half of the occiput with two lines of very short black setulae laterally and no long black setulae present; postgena with a dense group of long yellow setulae (fig. 1B, 3B). Katepisternum with dorsal half yellow and ventral half brown (fig. 3A). Abdomen brown with one wide yellow line dorsally ... *C. antankarana*, new species.
4. Femora brown with one well-defined yellow ring on the distal third. Frontogenal suture fades out anteriorly without leaving a curve mark on his way towards the parafacial (figs. 1A, 2B). Cercus and surstylus elongate (almost half of epandrium length) ... 5
 - Femora completely brown or at least with a very faint yellow ring on distal third (fig. 3E). Frontogenal suture curved anteriorly, almost reaching the parafacial under the scape. Cercus not conspicuously elongate (figs. 1C, 2A, 2C, 2D) ... 6
5. Mid and hind coxae brown. Thorax dorsally with one median brown V shaped stripe. Cercus linear with rounded apex, which has very large and strong setae with appearance of claws ... *C. madagasikara*, new species.
 - Mid and hind coxae yellow. Thorax dorsally with V-shaped brown stripe medially, divided by narrow gray pruinose stripe; sometimes the brown stripes fades out posteriorly before being reached (fig. 1A). Cercus linear and narrow with a very sharp apex ... *C. alluaudi* (Giglio-Tos).
6. Mid and hind coxae brown (fig. 3). Abdomen dorsally with one median yellow stripe very narrow to almost absent. Scape wide at base (figs. 1C, 2D, 3B). Occipital ventral brown half without incomplete yellow median stripe (fig. 1C, 2D). Postgenal yellow setulae densely grouped (1C, 2D, 3B) ... 7
 - Mid and hind coxae yellow or brown (fig. 2C). Abdomen dorsally with one wide median yellow stripe. Scape slightly constricted at base, giving the appearance of a higher parafacial (figs. 2A, 2C). Occipital ventral brown half with one medial yellow stripe incomplete behind the eye (figs. 2A, 2C). Postgenal yellow setulae not densely grouped (7–8 setulae present) ... 8

7. First flagellomere elongate, with distal half slightly tighten. Occiput with two transversal lines of long black setae: two seta at dorsal half aligned with outer vertical seta and a second line on ventral half posterior to the first, with five setae (fig. 2D) ... *C. hololissa*, new species

- First flagellomere slightly elongate with dorsal and ventral margins parallel. Occiput with three transverse lines of medium-sized black setae: one complete line behind the eye, aligned with the outer vertical, followed posteriorly by a second line with three median slightly longer setae (fig. 1C) ... *C. antanosy*, new species

8. Mid coxa brown and hind coxa yellow. The part of the face visible in lateral view is always yellow under the scape. Occiput with three transverse lines of large black setae: one line of four setae aligned with the outer vertical seta; posterior to the first, one line of four setae and near the occipital foramen, there are two black seta aligned with the postgenal yellow setulae (fig. 2A). Katepisternum completely brown ... *C. eualluaudi*, new species

- Mid coxa dorsally yellow with one third ventral portion brown; hind coxa brown. Brown under the scape. Occiput with one unique median large black seta on ventral brown half (fig. 2C). Katepisternum yellow on dorsal half ... *C. mandelai*, new species.

***Chaetonerius alluaudi* (Giglio-Tos)**

Figures 1A, 4.

Nerius alluaudi Giglio-Tos 1895: 366.

Chaetonerius alluaudi; Enderlein 1922: 146.

Male. Body length 4.0–6.0 mm. Wing length 3.8–5.4 mm and width 1.2–1.6 mm.

Head. Arista brown with slightly paler base and sparse pubescence. First flagellomere oblong with sub-apical arista. Inner process of pedicel finger-like. Anterior fronto-orbital seta well-developed, measuring approximately half the posterior fronto-orbital seta length and positioned at one third of the distance between the anterior margin of the fronto-orbital plate and the middle fronto-orbital seta; fronto-orbital setae equidistant. Frontogenal suture fades out anteriorly without leaving a curve mark on his way towards the parafacial. Face completely yellow below the scape. Occiput brown with a median yellow stripe well-defined and one incomplete yellow stripe in the ventral brown half, which starts horizontally in the posterior margin of the eye and fades out in the lateromedial part of the occiput; a long black seta in the upper limit of the medial yellow stripe aligned with another two setae: one in the middle of the same

yellow stripe and a third larger seta on the ventral brown half; four long and black transverse setae on ventral brown part laterally and directed backwards dorsally. Postgena with a few ventral yellow setulae.

Thorax. Covered by gray pruinescence. Wide dorsal pruinose stripe of the thorax divided medially by two brown stripes that fade post-suturally; four well-developed dorsocentral setae: one presutural same-sized as the outer vertical seta and three postsutural setae of similar size, except the pre-scutellar that reaches the size of the apical scutellar seta (fig. 1A). Scutellum with trapezoidal appearance, curved margins and posterior margin measuring almost half the distance between the pre-scutellar dorsocentral setae. Pleura mainly brown, except for a small portion in the dorsal katapisternum and the anterior half of the anepisternum. Humeral lobe anterolaterally projected. Katatergite yellow dorsally. Wing with one brown macula at level of the union of veins R_{2+3} and C. All coxae yellow; fore coxa with two anterolateral spine-like setae.

Legs. Femora brown with one yellow ring on distal third; fore femur with short spine-like anteroventral setae increasing discretely in size as they approach the apex. Fore tibia with two lines of very narrow spine-like setae posteriorly.

Abdomen. Dark brown. Epandrium cylindrical and narrow; surstylus linear, flattened dorsoventrally and short with about half the length of cercus with 5–6 apical setae; cercus lanceolate and long, measuring approximately half the length of epandrium.

Variation. The number of occipital lateral setae vary and the yellow stripe on ventral half of occiput is sometimes so short horizontally that it only looks like a "spot" near the posterior margin of the eye. The specimens from La Reunion have darker brown macula in the wing when compared to the intensity of it with in specimens of Seychelles and Mauritius. Anepisternum with anterior half brown and posterior half yellow with dense gray pruinescence. Anepimeron with anterior two thirds yellow with gray pruinescence and posterior third brown. Katapisternum yellow and densely pruinose in dorsal half. Fore coxa with two lateral setae on one side and one on the other or up to three spine-like setae in several males. Abdomen with two long and wide yellow lines dorsally.

Female. Body length 5.6–6.4 mm. Anterior fronto-orbital seta very short and hair-like. Fore coxa with one and sometimes two anterolateral setae or even only one seta on

one side. Fore femur with several prominent anteroventral setae, although only two in the apical third are spine-like; femora dark with rings on distal third only slightly differentiated. Abdomen with two long and wide yellow stripes dorsally. Oviscape yellow with black apex.

Type Material. (not examined). Type locality: Seychelles Island.

Material examined. Seychelles: 2m# 7f# 1?, (1) Illes Séchelles Solhou-ette: Mare Cochons, forêt endémique 500m, 2-8.vii.1972 (2) Coll Mus Tervuren Miss. Zool belge aux Sécgelles-PLG Benoit et J. J. van Mol [RMCA]; 2f#, (1) Illes Séchelles Solhou-ette: Mt. Dauban, for. endémique vers. Est 600m, 5-6.vii.1972 (2) Coll Mus Tervuren, Miss. Zool belge aux Sécgelles-PLG Benoit et J. J. van Mol [RMCA].

Madagascar: 2m# 7f#, (1) N. Ambohitra 800m Joffreville, 9-12.iv.1991, A. FREIDBERG & FINI KAPLAN (2) SMNH-TAUI 205774, 205773, 205768, 205767, 205766, 205765, 205764, 205763 [TAUI]; 1f#, (1) E. Perinet (2) Institut Scientifique (2) NMSA-DIP 71550 [NMSA]; 1f#, (1) Ivoloina, viii.62, tomate (2) Madagascar [USNM]; 2f#, (1) RÈP. MALGACHE, TAMATAVE, Ivoloina, 1.viii.1972, L. & R. Blommers (2) RMNH Leiden ex collection ZMAN [RMNH]; 3f#, Brickaville, vii.58, Sigwalt [MNHN]; 1m# 1f#, Ranomafana N. P., 21°16'S, 47°27'E, 18.iv.1994, M. Wasbauer [NMSA; UCDC]. **La Reunion:** 2f#, (1) General sweeping: secondary vegetation (2) Mare Longe, research station, 27m, 21°21'43"S, 55°45'51"E, 6.xi.2015, M. J. Ebejer [ME]; 1m#, (1) General sweeping: riverbed (2) Rivière St. Suzanne, 20°56'53"S, 55°35'02"E, 4.xi.2015, 360m, M. J. Ebejer [ME]; 2m# 1f#, (1) Malaise trap: lowland tropical rainforest (2) Mare Longue, réserve naturelle at: 21°21'08"S, 55°44'20"E, 7-10.xi.2015, 270m, A. H. Kirk-Spriggs (3, blue label) Entomology Dept. National Museum, P.O. Box 266, Bloemfontein 9300, South Africa (4) BMSA (D) 75365, 75364, 75363 [BMSA]; 2m# 9f#, (1) Hanging trap baited rotten fish; lowland, tropical rainforest (2) Mare Longue, réserve naturelle at: 21°21'08"S, 55°44'20"E, 23-28.x.2015, 270m, A. H. Kirk-Spriggs (3, blue label) Entomology Dept. National Museum, P.O. Box 266, Bloemfontein 9300, South Africa (4) BMSA (D) 78105, 78101, 78106, 78107, 78109, 78110, 78111, 78104, 78102, 78100, 78099 [BMSA]. **Mauritius:** 2f#, (1) Vacoas, 5.10.63, 27.3.1961, C. M. Courtois (2) NATIONAL COLL. OF INSECTS, Pretoria, South Africa [SANC]; 1m# 1f#, (1) Beau Bassin, 12.9.1939, M. Courtois (2) NATIONAL COLL. OF INSECTS, Pretoria, South Africa [SANC]; 1f#,

(1) Ile d'Ambre, 7.ii.65, C. M. COURTOIS (2) NATIONAL COLL. OF INSECTS, Pretoria, South Africa [SANC].

Distribution. Seychelles, Madagascar (Diana Region, Alaotra-Mangoro Region, Atsinanana Region, Vatovavy-Fitovinany Region), La Reunion, Mauritius.

Comments. Barraclough (1993a) mentions that it was not possible to access the type material of *C. alluaudi* despite having unsuccessfully sought out all the institutions in which it could have been deposited. For this reason the species was not discussed in his revisionary work. In fact, the species has never been re-described by any other author after Giglio-Tos and the only mention since then has been for Lamb (1914), who narrates how he identified as *C. alluaudi* those neriids with three thoracic lines dorsally, being the medial the narrowest. The same character used by Giglio-Tos (1895): “*Chez l'un des exemplaires, l'he thorax a trois lignes grises longitudinales, dont la mediane beaucoup plus étroite; chez l'autre, ces lignes manquent et on voit deux petites lignes latérales fauves très peu distinctes qui ne rejoignent pas la suture transversale du thorax*”. This character, together with its exclusive record on the Island of Seychelles, allows us to believe that the species described by Giglio-Tos (1895) corresponds to the material we record here as *C. alluaudi*, and state that it can be easily differentiated from other species in the Indian Ocean islands by having the three dorsal longitudinal lines of the thorax mentioned above and the mid and hind coxae yellow.

***Chaetonerius antankarana*, new species**

Figures 1B, 3A, 3B, 4.

Male. Body length 7.3 mm. Wing length 6.7 mm and width 1.8 mm.

Head (fig. 1B). Arista brown with short and sparse pubescence. First flagellomere oblong and slightly elongate with sub-apical arista. Inner process of pedicel finger-like. Anterior fronto-orbital seta well-developed, only slightly shorter than the middle fronto-orbital seta and separated from the anterior margin of the fronto-orbital plate by almost half the distance separating it from the middle fronto-orbital seta; middle fronto-orbital seta thin and short, measuring $\frac{2}{3}$ the posterior fronto-orbital seta length; fronto-orbital setae equidistant. Face yellow below the scape. Occiput pale brown and pruinose, with one median yellow stripe and one incomplete yellow stripe behind the eye in the ventral brown half; dorsal half of the occiput laterally with one transverse line of very short black setae; one medial longitudinal line of three longer black setae; long yellow setulae densely grouped from behind the genal seta and running posteriorly until the occipital

foramen. Gena wide with white pruinescence and a very short spine-like seta, only longer than the anterior and middle fronto-orbital setae.

Thorax. Blackish brown, partially covered with white pruinescence. Dorsal stripe of the thorax wide, divided medially by two brown lines V-shaped, reaching the pre-scutellar line; four well-developed dorsocentral setae: presutural and postsutural setae very thin and short, while remaining two postsutrals almost as long as the scutellar apical seta. Scutellum trapezoidal, with posterior margin relatively wide, measuring slightly less than half the distance between the dorsocentral pre-scutellar setae. Postpronotal lobe yellow on its distal two thirds, fused in color with the yellow stripe that extends through the wing base. Anepisternum completely blackish brown and setulose posteriorly. Katepisternum yellow and pruinose dorsally, with a few long yellow setulae. Katatergite brown. Wing with one pale brown macula at level of the union of veins R_{2+3} and C. Fore coxa with three anterolateral spine-like setae; mid and hind coxae brown.

Legs. Femora brown, with one diffuse yellow ring on distal third; fore femur with short spine-like anteroventral setae same-sized, except for three longer setae on distal third; fore femur with very short spine-like posteroventral setae same-sized. Fore tibia yellow, with two posterior lines of relatively long spine-like setae.

Abdomen. Dark brown sub-shiny, with two dorsal longitudinal yellow stripes separated by a relatively wide medial brown stripe. Epandrium cylindrical, narrow and elongate, with a slight median constriction; surstylus narrow, linear and flattened dorsoventrally, measuring less than half of the cercus length; cercus ensiform and long, measuring one third the length of epandrium.

Female. Unknown.

Type Material. **HOLOTYPE**, *Chaetonerius antankaran* m# (1) Madagascar Nord, Montagne d' Ambre, 1700m, det Diego-Suarez, 11-15.xii.58, B. Suckenberg (2) NMSA-DIP 71524 [NMSA, 1665].

Etymology. This species is described from one only known male specimen from north Madagascar. The ethnic group Antankarana inhabits the same territory and this species is named in their honor.

Distribution. Madagascar (Diana Region).

Comments. This species share wide morphological affinities with the southern *C. antanosy*, regarding the number and position of the occipital setae, which, however, are

larger in the *C. antanosy*. Also, both species have other morphological features typical of species adapted to arid and semi-arid environments, despite that *C. antankarana* is labeled for Montagne d'Ambre, a National Parc at north Madagascar, known for its humid tropical forest composition.

***Chaetonerius antanosy*, new species**

Figures 1C, 3C, 3D, 4.

Male. Body length 6.2 mm. Wing length 4.6–5.6 mm and width 1.3–1.8 mm.

Head (fig. 1C). Arista brown with short and sparse pubescence. First flagellomere oblong with sub-apical arista. Inner process of pedicel finger-like. Anterior fronto-orbital seta well-developed and relatively long, separated from the anterior margin of the fronto-orbital plate by one third of the distance separating it from the middle fronto-orbital seta; fronto-orbital setae equidistant and increasing in size posteriorly. Vertex yellow and densely pruinose. Occiput with one wide supramedial yellow stripe and one slightly narrower yellow stripe ventrally; one transverse line of medium-sized setae running behind the posterior margin of the eye; posterior to this, there is one median transverse line of four long black setae and; long yellow setulae densely grouped from behind the genal seta, running posteriorly until the occipital foramen where there are five long black setae. Gena wide and densely pruinose, with one seta as long as the anterior fronto-orbital seta.

Thorax. Dorsal pruinose stripe of thorax wide and dense. Four very long dorsocentral setae: one presutural as long as the middle fronto-orbital seta and three postsutural setae similar-sized, being the dorsocentral pre-scutellar as long as the apical scutellar seta. Scutellum trapezoidal in appearance, with posterior margin measuring approximately half of distance between the pre-scutellar dorsocentral setae. Pleura densely pruinose. Proepisternum with thin yellow setulae. Anepisternum with long setulae in posterior half. Katatergite yellow. Katepisternum yellow dorsally. Fore coxa yellow with one anterolateral line of spine-like setae; mid and hind coxae brown. Wing with a very pale brown macula at level of the union of veins R_{2+3} and C.

Legs. Femora completely brown; fore femur with short anteroventral spine-like setae same-sized, except for one prominent seta on distal third; fore femur with very short spine-like posteroventral setae. Tibiae brown; fore tibia with one line of relatively long spine-like setae posteriorly.

Abdomen. Laterally brown with one wide yellow stripe occupying approximately three-fourths of the dorsal area of abdomen and one medial brown stripe very narrow. Epandrium thin and elongate, almost twice longer than syntergite 7+8; surstylus linear, narrow and dorsoventrally flattened, with short setae distally; cercus ensiform, narrowing on apical third.

Female. Body length 5.2–6.3 mm. The body may be only slightly covered with pruinescence. First flagellomere narrow at apex. Yellow submedial stripe of the occiput is from incomplete to very short behind the eye. The line of postocular setulas of the occiput are present only dorsally and the line posterior to this, is composed by six setulae that reach the limit with the postgena. Fore coxa with two anterolateral setae; mid and hind coxae partially yellow. Fore femur with none up to two anteroventral spine-like setae on distal third. Dorsal yellow stripe on abdomen with a very narrow brown stripe that does not extend longitudinally along the tergites or even this can be absent. Oviscape yellow with lateral margins and apex black.

Type Material. **HOLOTYPE**, *Chaetonerius antanosy* m#, Berenty Reserve, 80km west of Forth-Dauphin, 25°00'S, 46°18'E, 9.iv.1994, M. Wasbauer [UCDC]. **PARATYPES**, 1f#, same data as the Holotype [UCDC]; 1f#, (1) N. Namakia 9.iv.1991, A. FREIDBERG & FINI KAPLAN (2) SMNH-TAUI 205771 [TAUI].

Distribution. Madagascar (Ihorombe Region, Anosy Region).

Etymology. The species is named in honor of the human populations of the south of the Malagasy island, the Antanosy.

Comments. This species has the densely pruinose integument that characterizes species from arid areas, like in Africa, like *C. nolae* and *C. londti* and in the New World, like *Eolozoxus* Aczél and *Eoneria* Aczél species.

***Chaetonerius ebejeri*, new species**

Figures 1D, 4.

Male. Body length 6.4–6.7 mm. Wing length 5.2–6.0 mm and width 1.3–1.7 mm.

Head (fig. 1D) Arista mainly brown, covered by short and sparse pubescence brown and with a small part of the base white. First flagellomere oblong with sub-apical arista. Inner process of the pedicel narrow triangular and conspicuously elongated, reaching the distal third of the first flagellomere. One primordially protruding antennal base, blackish-yellow and visible only laterally (fig. 1D). Anterior fronto-orbital seta well-developed, subequal to the posterior fronto-orbital seta and separated from the

anterior margin of the fronto-orbital plate by half the distance from the middle fronto-orbital seta; middle fronto-orbital seta slightly closer to anterior fronto-orbital seta than to posterior fronto-orbital seta; one tiny additional fronto-orbital seta present between anterior and middle fronto-orbital setae. Face slightly brown below scape. Occiput brown with one median well-defined yellow stripe; slightly expanded posteroventrally; two long lateral setae dorsally, aligned with the outer vertical seta; posterior to this, there is one shorter seta ventrally. Postgena with several yellow setulae on posterior margin.

Thorax. Dorsal stripe of thorax wide and medially divided by one brown stripe that narrows postsuturally, reaching the scutellum in the form of a "V"; four well-developed dorsocentral setae, the two anterior evidently shorter than the two posterior, of which the pre-scutellar is as long as the apical scutellar seta. Scutellum narrow trapezoidal, with posterior margin slightly concave, measuring approximately half the distance between the dorsocentral pre-scutellar setae. Anepisternum brown with several black setulae posteriorly. Anepimeron completely brown. Katepisternum mainly brown, with one yellow spot above mid coxa and several black setulae. Katatergite brown with a small yellow spot anteriorly. Fore coxa yellow, with one line with two spine-like anterolateral setae; mid and hind coxae brown.

Legs. Femora brown with yellow rings on distal third; fore femur with anteroventral spine-like setae of intermittent size, with two thicker and longer on distal third. Tibiae yellow; fore tibia with one line of short spine-like setae posteriorly.

Abdomen. Completely sub-shiny brown. Sternite 6 relatively small. Syntergite 7+8 and epandrium brown and similar-sized, the latter being only slightly longer. Epandrium cylindrical and narrow on basal half and extending distally; surstylus linear and flattened dorsoventrally and one third shorter than the cercus; cercus ensiform, measuring about half of epandrium length.

Female. Body length 6.0 mm. Arista darker at base. First flagellomere elongate and slightly constricted distally. Antennal base inconspicuous. No additional fronto-orbital seta appears between anterior and mid fronto-orbital setae. Occiput with two and three long lateral setae dorsally, aligned with the outer vertical seta and posterior to these, one transverse line with three shorter setae ventrally. Anepisternum yellow in dorsal third. Anepimeron yellow anteriorly. Katatergite mainly yellow with dorsal brown spot. Fore coxa with one anterolateral long spine-like seta. Femora without rings.

Abdomen with one single longitudinal yellow stripe occupying one third of dorsal margin. Oviscape shiny yellowish with only a very short part of the apex black.

Etymology. This species is named after Matin Ebejer from the National Museum Wales, Cardiff, for his contributions to the knowledge of the Afrotropical Diptera.

Type Material. HOLOTYPE, *Chaetonerius ebejeri* m#, Madagascar, Fianarantsoa Prov. Ramonafana National Park, Valbio Research Station, radio towel, S21°15'15", E47°25'18", 900m, (14-01) M. Hauser, S. D. Gaimari & R. Harin'Hala, 13-22.i.2014, ex. Malaise trap [CSCA]. **PARATYPES**, 1m# 1f#, same data as holotype [CSCA]; 1f#, Madagascar, Prov. Fianarantsoa, 7kmW Ranomafana, 1100m, 7-14 September 1988, C. Kremen, collr, Malaise trap in small clearing, montane rain forest [USNM]; 1f#, Madagascar, Prov. Fianarantsoa, 7kmW. Ranomafana, 1100m, 22-31 October 1988, W.E. Steiner, Malaise trap in small clearing, montane rain forest [USNM].

Distribution. Madagascar (Vatovavy-Fitovinany Region).

***Chaetonerius eualluaudi*, new species**

Figures 2A, 4.

Macho. Body length 4.4–6.1 mm. Wing length 3.8–5.4 mm and width 1.2–1.6 mm.

Head (fig. 2A). Arista brown with slightly paler base and brown pubescence. First flagellomere oblong with sub-apical arista. Inner process of pedicel linear, wide and short. Anterior fronto-orbital seta well-developed and short, measuring approximately half the length of the middle fronto-orbital seta and separated from the anterior margin of the fronto-orbital plate by one third of the distance that separates it from the middle fronto-orbital seta; middle fronto-orbital seta slightly closer to posterior fronto-orbital seta with respect to the anterior fronto-orbital seta. Face slightly brown below the scape. Occiput brown with one median yellow stripe; two short black setae: one at upper limit of the yellow stripe and one at lower limit; one long seta in the middle of the same yellow stripe and posterior to it and ventrally, four long black transverse setae. Postgena with a few ventral yellow setulae.

Thorax. Three dorsal stripes of gray pruinescence separated by two narrow brown stripes; the central yellow stripe widens behind the suture and fades out medially in the postsutural scutum; postsutural scutum with one acrostical stripe of gray pruinescence from the pre-scutellar margin that fades out before reaching the transversal suture; four

well-developed dorsocentral setae: one presutural same-sized as the outer vertical seta and three postsutural setae similar-sized, except the pre-scutellar, that reaches the length of the apical scutellar seta. Scutellum rectangular in appearance, with posterior margin measuring almost half the distance between the pre-scutellar dorsocentral setae. Pleura mainly brown, except for the small dorsal yellow part of anepisternum, anterior half of anepimeron and katatergite; anepisternum with several black setulae posteriorly. Fore coxa yellow with two anterolateral spine-like setae; hind coxa yellow and mid coxa pale brown.

Legs. Femora brown with diffuse yellow ring on distal third; fore femur with anteroventral spine-like setae that vary in size, with some longer setae standing out every 3–4 short ones. Fore tibia with two lines of very narrow spine-like setae posteriorly.

Abdomen. Pale brown, with one dorsal wide yellow longitudinal stripe, divided by a wide median brown stripe. Sternite 6 almost short and narrow, occupying only one third of ventral diameter of abdomen. Epandrium cylindrical and narrow; surstylus linear, dorsoventrally flattened and elongated, with approximately same size of cercus and 5–6 apical setulae; cercus ensiform and narrow with apex rounded and narrow, measuring approximately one third the length of epandrium.

Female. Body length 4.8–5.4 mm. Fore coxa with one single anterolateral seta. Femora darker with diffuse rings, especially on anterior femur and in several cases, those rings are inconspicuous; fore femur without anteroventral spine-like setae, with two or more anteroventral setae prominent on distal third, only for being longer. Abdomen almost completely brown, with one dorsomedial narrow yellow stripe. Oviscape completely yellow, slightly darkened at apex.

Type Material. HOLOTYPE, *Chaetonerius eualluaudi* m# Comoren, Moheli, Bach bei Nioumachoua, leg. M. Kotrba, 20.ix.2002 [ZSM]. **PARATYPES**, 4m# 1f#, same data as holotype [ZSM]; 1m# 3f#, Comore, Moheli, Wald Bach bei Ouallah, leg. M. Kotrba, 20.iv.2002 [ZSM]; 1m#, Moheli, Nach Zackht-aus, Ouallah, leg. M. Kotrba, apr.2002 [ZSM (dissected)]; 3f#, Moheli, April.2002, M. Kotrba [ZSM (dissected)]; 3f#, Comoren, Moheli, Hoani, Weg zum Chalest St. Antoine urngefall, Baumstamm, 400m, leg. M. Kotrba, 21.iv.2002 [ZSM]; 1m#, Comoren, Grand Comore, south of Moroni, 5-20m, leg. M. Kotrba, 11.iv.2002 [ZSM]; 1f#, Comoren, Grand Comore,

Bahani, Weg zur Grotte des Cpt. Dubois, 600-800m, leg. M. Kotrba, 12.iv.2002 [ZSM]; 1m#, M'vouni, ix.69 Grande Comore, Brunhes réc. [USNM].

Distribution. Comoros (Grande Comore, Mohéli).

***Chaetonerius madagasikara*, new species**

Figures 2B, 4.

Male. Body length 4.8–6.7 mm. Wing length 4.2–6.8 mm and width 1.2–1.9 mm.

Head (fig. 2B). Arista brown and pubescent. First flagellomere oblong with subapical arista. Inner process of pedicel finger-like. Anterior fronto-orbital seta well-developed, measuring approximately half the length of posterior fronto-orbital seta and positioned at one third of the distance between the anterior margin of fronto-orbital plate and middle fronto-orbital seta; fronto-orbital setae equidistant. Frontogenal suture fades out anteriorly without leaving a curve mark on his way towards the parafacial. Face pale brown below the scape. Occiput brown slightly expanded posteroventrally; median yellow stripe well-defined; two long lateral setae dorsally aligned with the outer vertical seta; posterior to this, one transverse line of 1–2 short setae ventrally. Postgena with yellow setulae posteriorly.

Thorax. Dorsal stripe of thorax wide, medially divided by one brown stripe that narrows postsuturally until the pre-scutellar margin; four well-developed dorsocentral setae increasing in size posteriorly; dorsocentral pre-scutellar seta twice longer than dorsocentral pre-sutural and as long as apical scutellar seta. Scutellum rectangular, with posterior margin measuring approximately half of distance between the pre-scutellar dorsocentral setae. Anepisternum brown with one yellow posterodorsal stripe and three setulae parallel to posterior margin. Anepimeron brown with small yellow area dorsally. Katepisternum brown sub-shiny. Katatergite yellow. Wing with one brown macula at level of the union of veins R_{2+3} with C. Fore coxa yellow with one anterolateral spine-like seta; mid and hind coxae brown.

Legs. Femora dark brown with one yellow ring on distal third; fore femur with only two small anteroventral spine-like setae on distal third. Tibiae yellow; fore tibia without spine-like setae posteriorly.

Abdomen. Brown and sub-shiny with two longitudinal yellow stripes divided medially by one brown stripe. Sternite 6 conspicuously elongate, shaped like a cap and projected on the ventral margin of the epandrium. Syntergite 7+8 and epandrium yellowish-brown shiny and almost same-sized, being the epandrium slightly longer.

Epandrium constricted medially with distal margin dorsally convex; surstylus linear narrow with long black setae on ventro-apical third, measuring half the length of synterite 7+8; cercus linear long with long and strong setae gathered distally.

Variation. Body generally dark brown to brownish-black. Occiput with two long setae between the median yellow stripe and the dorsal brown half; posterior to this, there may be one transverse line of three long setae. Scutellum slightly shorter than the distance between apical scutellar setae. Katepisternum with several yellow setulae on posterior third. Fore coxa in most cases with two anterolateral setae on one side and two, three or one on the other. Fore femur with small anteroventral spine-like setae: one strong medial spine-like seta and three prominent setae not spine-like on distal third. Tibiae with small spine-like setae posteriorly. Epandrium and syntergite 7+8 brown, being the base of the syntergite 7+8 yellow. One specimen from Montagne d'Amore (# 1697), with a small hair-like fronto-orbital seta accompanying the anterior fronto-orbital seta and the fully brown abdomen.

Female. Body length 4.9–6.5 mm. Fore coxa with one or two large, but not spine-like anterolateral setae. Fore femur with one or three anteroventral setae, also noted for being longer, but not spine-like. Oviscape yellow to brown with black apex.

Etymology. The new species is named *madagasikara*, which is the name of the island on its native language, the Malagasy.

Type Material. HOLOTYPE, *Chaetonerius madagasikara* m# (1) Madagascar: Prov. Fianarantsoa, 7 km W. Ranomafana, 900m, 10-16 February 1990, W. E. Steiner (2) Malaise trap in small clearing. montane rain forest [USNM]. **PARATYPES**, 1m# 1f#, same data as the holotype, except the dates: 1-7 March, 17-22 February [USNM]; 1m#, same data as the holotype, except 23-28 February and (2) Flight Intercept-yellow pan trap in Malaise trap in small clearing, montane rainforest [USNM]; 3m#, (1) Madagascar-Nord Montagne d'Ambre 1000m, det Diégo Suarez, 23.xi-4.xii.57 B. Stuckenberg (2) NMSA-DIP 71525, 29801, 29806 [NMSA]; 1m# 1f#, (1) E. Perinet (Andasibe), 16-17.iv.1991, A. FREIDBERG & FINI KAPLAN (2) SMNH-TAUI 255769, 255770.[TAUI]; 1m#, (1) Ambrosita (2) Institut Scientifique (3) NMSA-DIP 71551 [NMSA]; 1f#, (1) Mandraka 75kmE, Antananarivo, 16.iv.1991Rt2, A. FREIDBERG & FINI KAPLAN (2) SMNH-TAUI 205772.[TAUI, 736]; 1m#, (1) Ranomafana Forest, 21°15'S, 47°27'E, 26-29.x.2007, 932m, L. GAHANAMA (2) SMNH-TAUI 205631.[TAUI, 873]; 1f#, (1) Fianarantsoa, 7km W. Ranomafana,

1100m, 1-7 November 1988, W.E. Steiner (2) Flight intercept-yellow pan trap in Malaise trap in small clearing, montane rainforest [USNM]; 6m# 9f#, (1) Hanging trap baited with fermenting fruit (2) Fianarantsoa, Ranomafana National Park, Talatakely, 800m SW entrance, 21°15.48'S, 47°25.27'E, 16-19.x.2014, 610m, A. H. Kirk-Spriggs & R. Harin'Hala (3, blue label) Entomology Dept. National Museum, P. O. Box 266, Bioemfontein 9300, South Africa (4) BMSA (D) [BMSA, 61230, 61224, 61223, 61217, 61227, 61228, 61225, 61229, 61226, 61222, 61219, 61218, 61220, 61221, 61231 [BMSA]; 2f#, (1) Malaise traps, secondary rainforest (2) Fianarantsoa, Ranomafana National Park, Talatakely, 800m SW entrance, 21°15.48'S, 47°25.27'E, 16-19.x.2014, 610m, A. H. Kirk-Spriggs & R. Harin'Hala (3, blue label) Entomology Dept. National Museum, P. O. Box 266, Bioemfontein 9300, South Africa (4) BMSA (D) 61217, 60699 [BMSA]; 1f#, (1) Sweeping paths, secondary rainforest (2) Fianarantsoa, Ranomafana National Park, Talatakely, 800m SW entrance, 21°15.48'S, 47°25.27'E, 18.x.2014, 610m, A. H. Kirk-Spriggs & R. Harin'Hala (3, blue label) Entomology Dept. National Museum P. O. Box 266, Bioemfontein 9300, South Africa (4) BMSA (D) 61387 [BMSA].

Distribution. Madagascar (Diana Region, Alaotra-Mangoro Region, Analamanga Region, Amoron'ı Mania Region, Vatovavy-Fitovinany Region).

***Chaetonerius mandelai*, new species**

Figures 2C, 4.

Male. Body length 8.7 mm. Wing length 7.5 mm and width 2.1 mm.

Head (fig. 2C). Arista brown pubescent. First flagellomere deltoid with apical arista. Inner process of pedicel triangular and narrow. Scape narrow at base. Anterior fronto-orbital seta well-developed, sub-equal to posterior fronto-orbital seta and separated from the anterior margin of the fronto-orbital plate by one third of the distance from the middle fronto-orbital seta; fronto-orbital setae equidistant. Face dark brown below the scape. Occiput brown with one well-defined median yellow stripe and one incomplete yellow stripe from the posteroventral margin of the eye; one single long occipital seta on lower margin on median yellow stripe, same length as anterior fronto-orbital seta. Postgena with yellow setulae posteriorly.

Thorax. Dorsal pruinose stripe of the thorax wide and medially divided by one brown stripe that narrows postsuturally until the pre-scutellar margin. Four well-developed dorsocentral setae growing slightly towards the scutellum; dorsocentral pre-

scutellar seta only one third longer than dorsocentral pre-sutural and as long as apical scutellar seta. Scutellum of rectangular appearance, with posterior margin measuring approximately half the distance between the pre-escutelar dorsocentral setae; lateromedial seta of scutellum almost same size as apical scutellar seta. Anepisternum brown with four short black posterodorsal setulae and two long setulae parallel to posterior margin. Anepimeron brown with a small portion yellow anteriorly. Katepisternum yellow dorsally and brown ventrally. Katatergite yellow (fig. 2C). Wing with one brown macula at level of union of the veins R_{2+3} and C. Fore coxa partially yellow, slightly brown near anterior and posterior margin, with one anterolateral line of five short and thick spine-like setae inserted in tubercles; mid coxa brown and partially yellow laterally and hind coxa brown.

Legs. Femora brown; fore femur with short spine-like anteroventral setae inserted in tubercles, one of which is conspicuously wide on distal third and posteroventral line of spine-like setae very short. Tibiae pale brown; fore tibia with short spine-like setae posteriorly.

Abdomen. Brown sub-shiny with two yellow longitudinal stripes, divided medially by one brown stripe. Sternite 6 very small and short laterally, with long black setae. Syntergite 7 + 8 light brown and epandrium dark brown, the latter being 3x longer. Epandrium cylindrical and narrow proximally and extending distally; surstylus linear flattened dorsoventrally and slightly shorter than cercus; cercus short, measuring a little less than $\frac{1}{4}$ the length of epandrium.

Etymology. This species is named after the South African leader Nelson Mandela.

Type Material. HOLOTYPE, *Chaetonerius mandelai* m# Madagascar, Fianarantsoa Prov. Ramonafana National Park, Valbio Research Station, radio towel, S 21°15'15"E, 47°25'18", 900m, (14-01) M. Hauser, S. D. Gaimari & R. Harin'Hala, 13-22.i.2014, ex. Malaise trap [CSCA].

Distribution. Madagascar (Vatovavy-Fitovinany Region).

Comments. A single male specimen available for this description has resemblance with the continental species *C. spinibrachium* and *C. spinosissimus* regarding the morphology of the head. The new species can be rapidly differentiated from those two by the position of the fronto-orbital setae (which in this case are equidistant), the pleural coloring pattern and the type and number of spine-like seta on

fore coxa and femur. Also, *C. mandelai* displays one characteristic unique between Afrotropical fauna of Neriidae that is the syntergite 6 unusually narrow.

***Chaetonerius hololissa*, new species**

Figures 2D, 3E, 4.

Male. Body length 6.5–7.8 mm. Wing length 5.9–6.5 mm and width 1.5–1.8 mm.

Head (fig. 2D). Arista brown and bare. First flagellomere oblong elongate with apical arista. Inner process of pedicel finger-like. Two well-developed anterior fronto-orbital setae, being the first short, half the size of the second one; first fronto-orbital anterior positioned very close to the anterior margin of the fronto-orbital plate and separated from the second by slightly less than the distance separating the other fronto-orbital setae, which are equidistant. Face dark brown under the scape. Occiput brown with one median wide yellow stripe well-defined; one long seta aligned ventrally with one shorter black seta and dorsally with the outer vertical seta; posterior to the latter, there is one transverse line with five long black setae. Postgena with a relatively dense group of long yellow setulae running from behind the genal seta towards occipital foramen.

Thorax. Dorsal pruinose stripe of thorax wide and divided medially by one brown line that narrows postsuturally until the pre-scutellar margin. Four well-developed dorsocentral setae increasing in size posteriorly, being the dorsocentral pre-scutellar almost twice longer than dorsocentral pre-sutural and as long as apical scutellar seta. Scutellum of triangular appearance, with posterior margin measuring approximately half the distance between dorsocentral pre-scutellar setae. Anepisternum brown with one posterodorsal stripe yellow and several setulae on posterior margin. Anepimeron brown with a small area yellow anterodorsally. Katepisternum brown. Katatergite yellow. Wing with one brown macula at level of union of the veins R_{2+3} with C. Fore coxa yellow with one line with four anterolateral spine-like setae; mid and hind coxae brown.

Legs. Femora brown; fore femur with one complete anteroventral line of spine-like setae, alternating between long and short setae. Tibiae brown; fore tibia with two dense lines of short setae posteriorly.

Abdomen. Brown with two yellow longitudinal stripes separated medially by one brown stripe. Sternite 6 conspicuously elongate shaped like a cap and projected on the ventral margin of the epandrium. Syntergite 7+8 and epandrium yellowish-brown shiny and almost same-sized, being the epandrium slightly longer. Epandrium cylindrical and

elongate, slightly constricted medially; measuring almost twice the length of syntergite 7+8; surstylus linear and dorsoventrally flattened, with short setae distally; cercus narrowing on apical third.

Female. Unknown.

Etymology. The restricted distribution that both species share, as well as the small number of known specimens, lead us to honor the majestic subspecies of Seychelles endemic turtles, *Aldabrachelys gigantea hololissa* Günther (1877). This fly of Neriidae is named *C. hololissa* in honor to the giant tortoise of Seychelles, of which only some specimens remain in captivity.

Type Material. HOLOTYPE, *Chaetonerius hololissa* m# COLL. MUS. TERVUREN, N. E. Madagascar: Ambodivoangy, x.1959, J. Vadon [RMCA].

PARATYPE, 1 m#, same data as the holotype [RMCA].

Distribution. Madagascar (Vatovavy-Fitovinany Region).

***Chaetonerius kirkspriggsi*, new species**

Figures 2E, 3F, 4.

Male. Body length 7.5–11.8 mm. Wing length 6.6–11.7 mm and width 1.9–2.9 mm.

Head (fig. 2E). Arista pale brown with short and sparse pubescence. First flagellomere ovate and short, with apical arista. Inner process of pedicel triangular and narrow with acute apex. Anterior fronto-orbital seta very short and hair-like, separated from the anterior margin of the fronto-orbital plate by almost half the distance separating it from the middle fronto-orbital seta; middle fronto-orbital seta thin and short, less than half the size of posterior fronto-orbital seta and separated from the latter by slightly less than the distance separating it from the anterior fronto-orbital seta. Face yellow and frosted, with facial carina shiny. Palpus dark brown and very wide, with ovate elongate shape. Occiput dark brown and frosted, with one yellow dorsal stripe and one narrow median yellow stripe; two parallel transverse lines of tiny post-ocular black setae dorsally and posteriorly, three long black setae prominent near the upper margin of the brown ventral stripe of the occiput; near the occipital foramen, one line with five long black setae. Postgena with several yellow setulae towards the occipital foramen. Gena wide with white pruinescence; one spine-like seta slightly longer than the middle fronto-orbital seta and posterior to this, several long yellow setulae; gena posteriorly

truncated, forming a right angle between its ventral margin and the transverse line of the occiput laterally.

Thorax. Blackish brown, partially covered by white pruinescence. Dorsal stripe of thorax wide and divided medially by two brown stripes that fade out postsuturally; four well-developed dorsocentral setae: one presutural almost same length as the fronto-orbital setae and three postsutural setae increasing in size towards posterior margin, being the pre-scutellar same-sized as the apical scutellar seta. Scutellum trapezoidal, with posterior margin broadly rounded, measuring half the distance between the dorsocentral pre-scutellar setae. Postpronotal lobe mainly yellow, joined in color with the stripe extending to the wing base. Anepisternum completely blackish-brown and setulose distally. Katepisternum yellow dorsally with a few black setae and one short medial hair-like seta. Meron yellow dorsally. Katatergite brown. Fore coxa brown with one lateral line of 6–7 spine-like setae inserted in tubercles; mid and hind coxae brown. Wing with one very pale brown macula at level of union of the veins R_{2+3} with C; vein dm-cu oblique.

Legs. Femora blackish brown with one yellow ring on distal third; fore femur with short anteroventral spine-like setae same-sized, except for two longer setae on distal third inserted in tubercles. Fore tibia with two anterior and posterior lines of very short spine-like setae. Fore basitarsomere with short spine-like setae anteriorly.

Abdomen. Dark brown and sub-shiny. Epandrium cylindrical narrow basally and extending distally; surstylus linear flattened dorsoventrally and slightly shorter than cercus; cercus ensiform elongate, measuring approximately half the length of epandrium.

Female. Body length 8.3 mm. Arista darker at base. Fore coxa with one spine-like anterolateral seta aligned with three non-spiny long setae. Fore femur with long non-spine-like setae and two prominent setae on distal third. Fore tibia without setae posteriorly. Abdomen almost completely dark brown, with inconspicuous dorsomedial yellow stripe. Oviscape black at base, yellow in medially and black on posterior third.

Type Material. **HOLOTYPE**, *Chaetonerius kirksprigsi* m# (1) Prov. Fianarantsoa, 7km. W. Ranomafana, 900m. 17-22 February 1990, W. E. Steiner (2) Malaise trap in small clearing. montane rain forest [USNM]. **PARATYPES**, 1m#, Prov. Fianarantsoa, 7km. W. Ranomafana, 900m. 17-22 February 1990, W. E. Steiner [USNM]; 1m# 1f#, Fianarantsoa Prov. Ramonafana National Park, Valbio Research

Station, radio towel, S 21°15'15"E, 47°25'18", 900m, (14-01) M. Hauser, S. D. Gaimari & R. Harin'Hala, 13-22.i.2014, ex. Malaise trap [CSCA].

Etymology. The name of several new species on this paper, honors the contributions of great entomologists, studios of the African Diptero-fauna and we could not miss Dr. Ashley Kirkspriggs, that and is after whom we name this conspicuous Malagasy neriid. He, as well as the other names honored in this article, contributed in a decisive way so that our study could be concluded.

Distribution. Madagascar (Vatovavy-Fitovinany Region).

Comments. It is likely that females of this species are difficult to differentiate from other species of the island, especially females of *C. madagasikara*, since the males described feature conspicuous secondary sexual characters. The main difference, besides the highly sophisticated and differentiated male genitalia of both species, is the number and type of occipital setae, as well as the shape of the postgena, which allows a reliable identification of both species.

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Figures

Figure 1. **A.** *C. alluaudi* (Giglio-Tos), habitus and thorax lateral; **B.** *C. antankaran*, new species, head lateral; **C.** *C. antanosy*, new species, head lateral; **D.** *C. ebejeri*, new species, head lateral and detailed area below the scape, showing the primordial antennal base by the arrow (Scales: 1 mm).

Figure 2. **A.** *C. eualluaudi*, new species, head lateral; **B.** *C. madagasicara*, new species, head lateral; **C.** *C. mandelai*, new species, head and thorax lateral; **D.** *C. hololissa*, new species, head lateral; **E.** *C. kirkspriggsi*, new species, head lateral (Scales: 1 mm).

Figure 3. **A, B.** *C. antankarana*, new species, habitus and head lateral; **C, D.** *C. antanosy*, new species, habitus and head lateral; **E, F.** *C. kirkspriggsi*, new species, habitus and lateral.

Figure 4. Map of distribution of the species of *Chaetonerius* in the Indian Ocean. (●) *C. alluaudi* (Giglio-Tos); (★) *C. antankarana*, new species; (☆) *C. antanosy*, new species; (■) *C. ebejeri*, new species; (▲) *C. eualluaudi*, new species; (□) *C. mandelai*, new species; (△) *C. madagasikara*, new species; (X) *C. hololissa*, new species; (*) *C. kirksprissi*, new species.

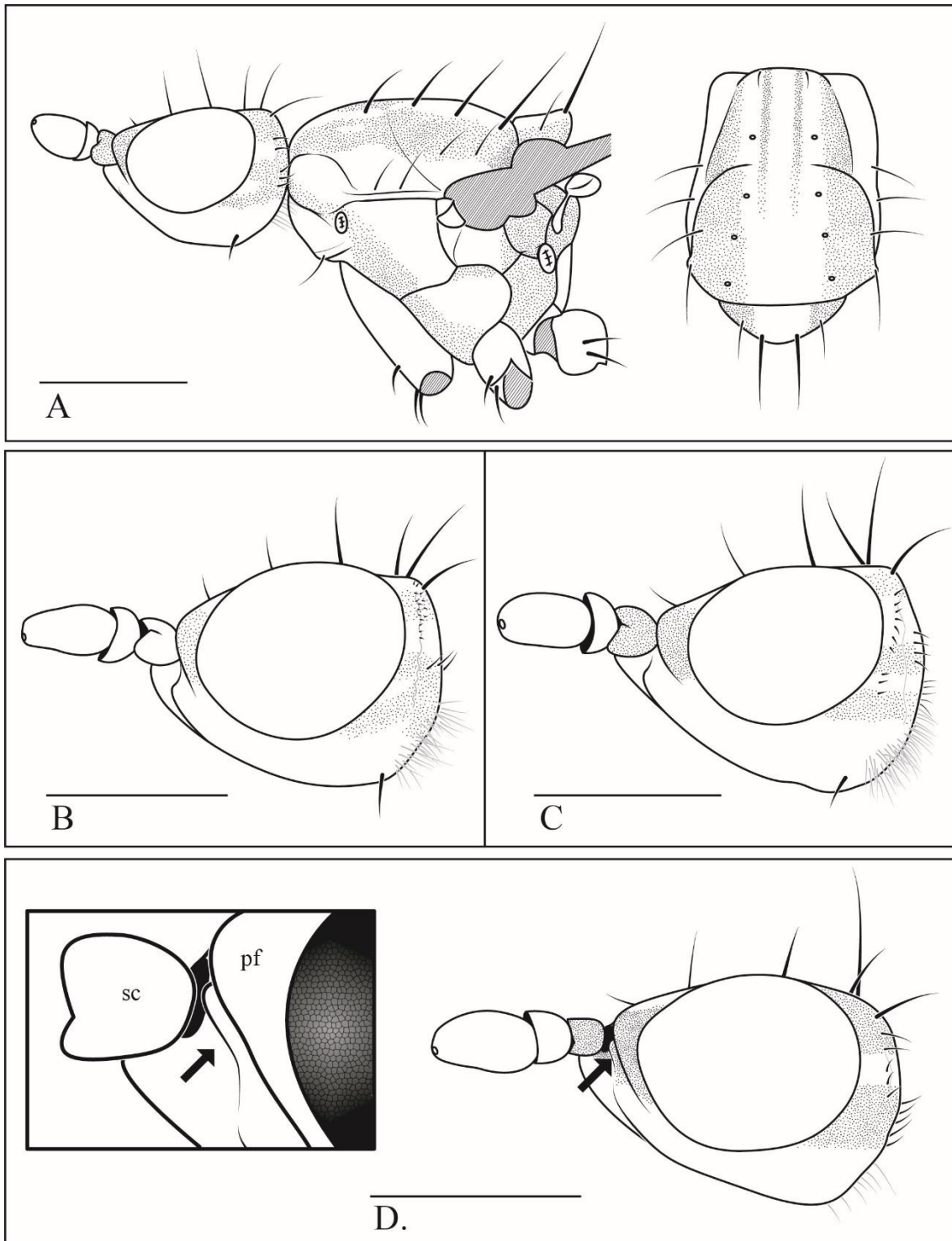


Figure 1. A. *C. alluaudi* (Giglio-Tos), habitus and thorax lateral; B. *C. antankarana*, new species, head lateral; C. *C. antanosy*, new species, head lateral; D. *C. ebejeri*, new species, head lateral and detailed area below the scape, showing the primordial antennal base by the arrow (Scales: 1 mm). pf, parafacial; sc scape.

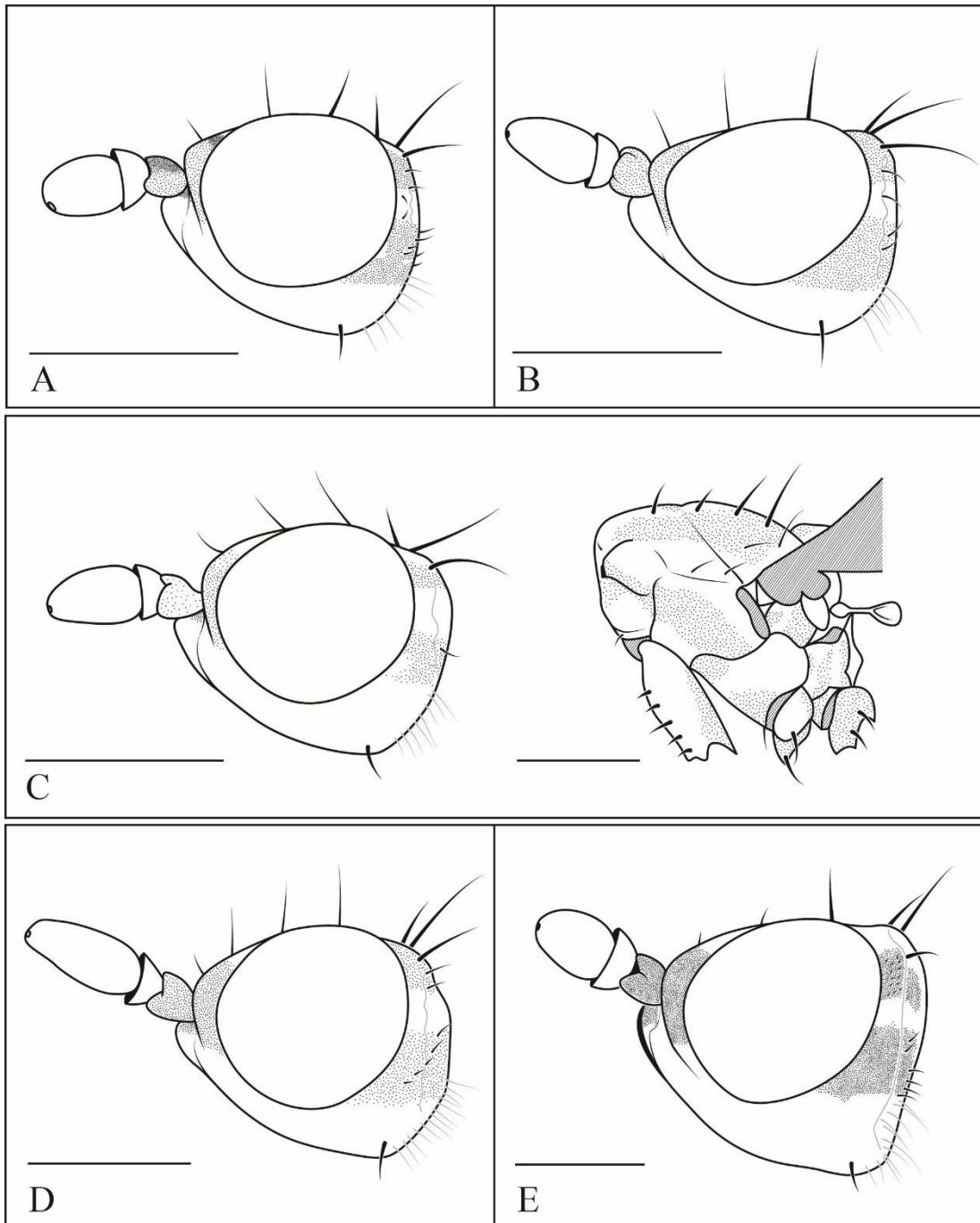


Figure 2. A. *C. eualluaudi*, new species, head lateral; B. *C. madagasikara*, new species, head lateral; C. *C. mandelai*, new species, head and thorax lateral; D. *C. hololissa*, new species, head lateral; E. *C. kirkspriggsi*, new species, head lateral (Scales: 1 mm).

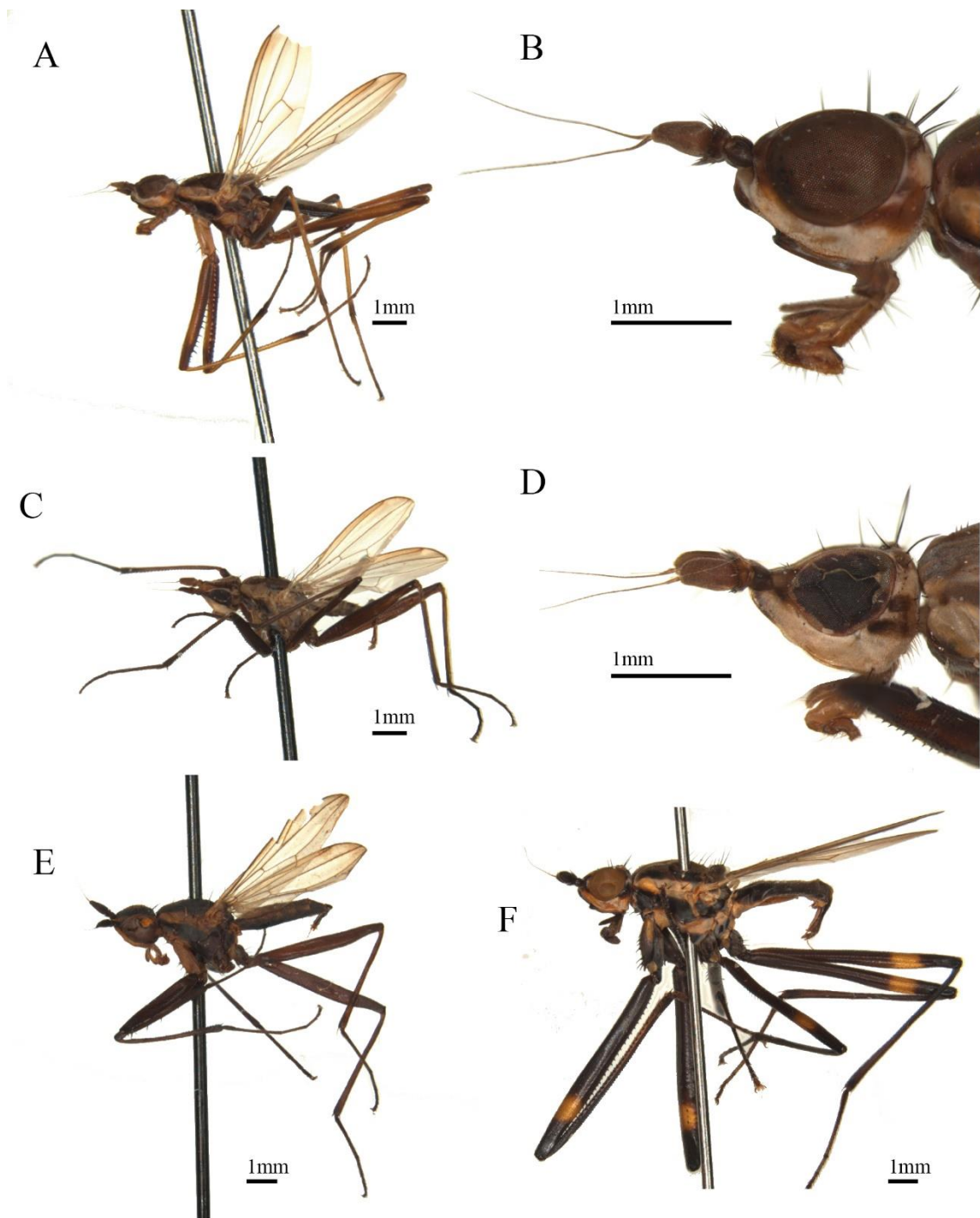


Figure 3. A–B. *C. antankarana*, new species, A. Habitus lateral; B. Head lateral. C–D. *C. antanosy*, new species, A. Habitus lateral; B. Head lateral. E. *C. hololissa*, new species. F. *C. kirksprigsi*, new species, habitus lateral.

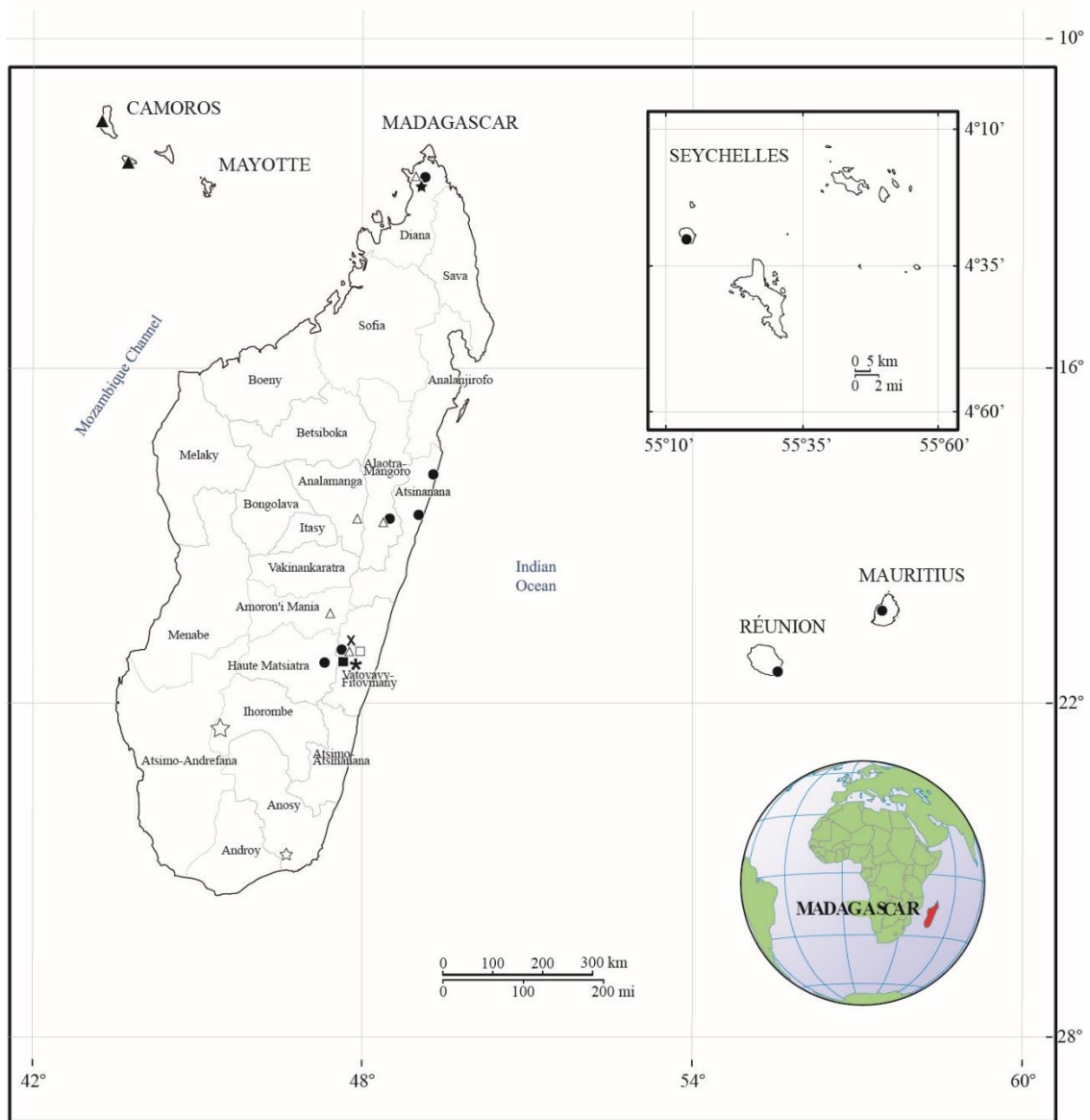


Figure 4. Map of distribution of the species of *Chaetonerius* in the Indian Ocean. (●) *C. alluaudi* (Giglio-Tos); (★) *C. antankarana*, new species; (☆) *C. antanosy*, new species; (■) *C. ebejeri*, new species; (▲) *C. eualluaudi*, new species; (□) *C. mandelai*, new species; (△) *C. madagasikara*, new species; (×) *C. hololissa*, new species; (*) *C. kirksprissi*, new species.

CHAPTER 3

A revision of the genus *Chaetonerius* Hendel (Diptera: Neriidae)

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A revision of the genus *Chaetonerius* Hendel (Diptera: Neriidae)

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Abstract

Chaetonerius Hendel is a mainly Afrotropical genus of Neriidae with two Oriental species, one of which is the type species, *C. inermis* (Schiner), recorded for India. Almost all primary types for the names known in the genus are examined, except for *C. inermis* and the primary types lost in World War II. Based on comprehensive material from these two regions, new species *C. alienum*, new species, *C. anemona*, new species and *C. lobayensis*, new species are described and re-descriptions and illustrations are given for the previously known species. After study of the type material of *C. apicalis*, this species is synonymized with *C. ghesquierei*, contrary to that proposed by Aczél (1954a), who associated this female holotype with males of *C. fascipes*. Consequently, the revalidation of *C. fascipes* is proposed and in addition, based on male genitalia differences, *C. nyassicus* is retired from synonymy with *C. fascipes* and recognized as a valid species and its revalidation is proposed. New localities are recorded for most of the species and a new diagnosis is provided for the genus along with a key for the identification of its species.

Key words: Afrotropical Region, biodiversity, cactus flies, Neriioidea, new records, taxonomy.

INTRODUCTION

The most important author in Neriidae, Aczél (1961), considered *Chaetonerius* Hendel as basal within the family, by comparing it with the so-called

"Tanipezidiformes" (which are currently classified among the families of Neriioidea (Aczél, 1951)). The characters mentioned by the author include the elongation of structures such as the head (including antennal segments), the anterior half of thorax and legs, which among the Neriioidea are relatively longer in Neriidae species. Among the unique structures present in the family is the formation of the so-called antennal base, formed by a protruding mesofacial, in which the antenna is inserted. This structure is one of the most relevant synapomorphies of the family and is lost in *Chaetonerius*, which antenna is inserted directly into the mesofacial.

The type material of the African species of Neriidae was reviewed by Barraclough (1993a), who also described two new species for southeastern Africa in a subsequent publication (Barraclough, 1993b). The *Chaetonerius* species are the only Neriidae distributed in the Afrotropical Region, along with the widespread species *Telostylus lineolaatus* Wiedemann, which is introduced to the Indian Ocean islands at east coast of Africa (Barraclough, 1992) and the French Guyana. In the study by Barraclough (1993a), the number of valid species decreased from 17 to 13, with six established synonyms. The summary of the main taxonomic changes proposed by the author is presented in Table 1.

Table 1. Systematic summary of the revision of type material of African species of Neriidae by Barraclough (1993a). *LT: Lectotype designation

Type material	Synonymy
<i>Calobata apicalis</i> Walker (f#) *LT	<i>Chaetonerius nyassicus</i> Enderlein (m#) <i>Telostylus fascipes</i> Brunetti (m#, não f#)
<i>C. brachialis</i> Enderlein (f#) *LT	
<i>C. claricoxa</i> Enderlein (m#)	<i>C. echinus</i> Hennig (m#)
<i>C. perstriatus</i> (Speiser) (m#)	<i>C. fulleborni</i> Enderlein (m#) *LT <i>Telostylus uniannulatus</i> Brunetti (f#) <i>C. wittei</i> Aczél (m#)
<i>C. simillimus</i> (Karsch) (m#) *LT	
<i>C. spinibrachium</i> Enderlein (m#) *LT	

Among the most revealing points of Barraclough's work (1993a) is the warning of the lack of systematic zeal by the authors Walker (1849), Karsch (1887) and Speiser

(1910) in relation to the way some species have been described. In addition, the postulation of a species concept based exclusively on the morphology of males was presented by Barraclough (1993a), stating that females of different species have extremely similar external morphology, which hinders the accuracy for identification. Finally, Barraclough (1993b) criticized the indiscriminate use of coloring patterns as the only argument for the description of new species, citing as an example the work by Aczél (1954b), which makes use almost exclusively of femur coloration patterns in its key for identification of African species.

As mentioned before, Aczél (1954b) considered *Chaetonerius* like the most plesiomorphic group among the genera of Neriidae. However, in the topology by Koch *et al.* (2014), the most basal position is for the species from the islands of the Australian Region, although this hypothesis did not get high support. Also with low support, Koch *et al.* (2014) relate *Chaetonerius* to the New World species, and proposed synapomorphies for this clade based on the coloration of the femurs and the presence of ventral spinous arrows in anterior femur. Both of these synapomorphies were previously mentioned by Barraclough (1993b), Bonduriansky (2007) and Bonduriansky & Head (2007) as unreliable and with a high degree of phenotypic plasticity.

Steyskal (1977) proposed a new combination for the Oriental *Telostylus apicatus* Edwards and *Telostylus bimaculatus* Edwards in *Chaetonerius*, but after examining the type material, these species were transferred to the genus *Teloneria* Aczél, originally described by Aczél (1954a) to house these two species. The other Oriental species of *Chaetonerius* is its type species, *C. inermis* (Schiner) and we had no access to the type material, and therefore the identification is based on the re-description by Aczél (1955c). In this study, we revise the mainly Afrotropical *Chaetonerius*, and its species are re-described and illustrated.

MATERIAL AND METHODS

The holotypes of almost every species of *Chaetonerius* Hendel were described and re-described (except the Indian Ocean species, described in a previous paper) and the variations found in other material examined are included in an additional paragraph after the description and before the variation of the females. In cases where the holotypes or lectotypes correspond to females, these are re-described and the variation

in males is included after variation in females. The measures of the specimens studied are included in the paragraph of variation and include males and females separately and subsequently, the measurement of the wings for both sexes in a single measurement.

Re-descriptions and key for identification is provided for the continental species, since species from the India Ocean islands are re-described and keyed by Sepúlveda & de Charvalho (*in prep.*). New records are followed by asterisk (*) and the case in which the localities could not be confirmed, the reference containing the record is cited.

The type material and other material examined, are housed in the following institutions:

BMSA: National Museum Bloemfontein, Bloemfontein, South Africa.

NMSA: Natal Museum, Pietermaritzburg, South Africa.

MNHN: Muséum National d'Histoire Naturelle, Paris, France.

NHMUK: The Natural History Museum, London, United Kingdom.

NMSA: Natal Museum, Pietermaritzburg, South Africa.

NMW: Naturhistorisches Museum Wien, Wien, Austria.

NZSI: Zoological Survey of India, National Zoological Collection, Calcutta, India.

RMCA: Musee Royal de l'Afrique Centrale, Tervuren, Belgium.

SANC: National Insect Collection, Plant Protection Research Institute, Pretoria, South Africa.

TAUI: Tel Aviv University, Tel Aviv, Israel.

UCDC: University of California, R.M. Bohart Museum of Entomology, California, USA.

USNM: National Museum of Natural History, Washington D.C., USA.

ZMHB: Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.

ZMUC: Zoologisk Museum Statens Naturhistoriske Museum, Kopenhagen, Denmark.

ZMUH: Universität von Hamburg, Zoologisches Institut und Zoologisches Museum, Hamburg, Germany.

TAXONOMY

Chaetonerius Hendel

Chaetonerius Hendel, 1903: 205. Type-species: *Nerius inermis* Schiner, 1868 (original designation).

Diagnosis. First flagellomere ovate with apex narrow rounded. Antennal base absent. Scape and pedicel short, together can be as long or less than first flagellomere. Vibrissa absent. Scutum with one small dorsocentral seta on anterior margin (referred as scapular by Aczél). Katatergite mainly yellow, except in *C. claricoxa* Enderlein and *C. spinibrachium* Enderlein. Fore coxa with two antero-apical setae and one postero-apical seta; mid and posterior coxae with two lateral setae. Scutellum with apical seta longer than dorsocentral and minor latero-dorsal seta. Abdomen with two dorsal longitudinal yellow stripes divided for medial brown stripe.

Morphology. All species of this genus are brown colored, varying slightly in intensity, while some parts are always yellow: ventral half of the head, a V-shaped variable portion of frontal-vitta, at least the ventral half of postpronotum, the notopleura and the alar base.

Head. Rounded, slightly narrow anteriorly in lateral view. Arista subapical. First flagellomere ovate with rounded apex. Scape and pedicel wide and short, together measuring approximately the length of first flagellomere; pedicel with two prominent spine-like setae on distal margin: one ventral and one dorsal. Antennal base absent. Face exposed anteriorly between antennae in dorsal view. Frons concave and relatively wide, with anterior margin straight. Yellow-whitish and wide fronto-orbital plate; three fronto-orbital setae increasing in size posteriorly; anterior fronto-orbital seta small to inconspicuous in several species; posterior frontal-orbital seta large, similar-sized as post-ocellar and outer vertical seta. Parafacial brown; narrow and slightly projected anterodorsally, narrowing ventrally towards the margin of the eye. Face yellow-whitish and pruinulent; wide with rounded ventral margin. Vibrissa absent. Postgena narrowing towards the occiput, with one line of 4-6 black setae or thin yellow setulae ventrally. Occiput and postgena separated by their contrasting coloration and, in addition, the occiput is elevated relative to the postgene. Occiput with several strong and short black setae, distributed in two transverse lines: one line in dorsal half with 2-5 setae and one mid line with 3-4 smaller to hair-like setae.

Thorax. Prosternum linear, separated from the proepisternum by a wide membranous area. Proepisternum with one well-developed seta, which in most cases is at least as long as the genal seta. Dorsally, the scutum presents variable patterns of intensity in stripes, being basically two yellow stripes separated by one brown stripe that narrows towards the scutellum and can be covered by white pruinescence in more or less intensity. Scutum, anteprenotal ring and postpronotal carina aligned on anterior margin. Scutum with one small dorsocentral seta in the anterior margin. Postpronotal carina small, positioned on a ventral position with respect to postpronotal lobe and differentiated by its shiny texture. One pair of well-developed notopleural setae, the posterior being always larger. Two scutellar setae present: one apical long seta and one lateromedial smaller. Katepisternum and meron, each with one thin seta ventrally. Katatergite yellow. Fore coxa yellow with two antero-apical setae and one postero-apical seta, which may or may not be accompanied by one minor seta. Mid and hind coxae with two lateral strong setae and at least two well-developed antero-apical setae. Fore and mid trochanter with one dorsal seta and mid and hind trochanter ventrally setulose.

Wing. Tegula with 2–6 black setulae. Basicosta setulose with two strong distal setae: one dorsally conspicuously elongated and one of smaller size ventrally.

Legs. Mid femur with one antero-medial line of setae differentiated by being longer than the same setae on fore and hind femora.

Abdomen. Brown of varying tones, with two yellow dorsal stripes that can vary in width and in a few specimens, may be diffuse to inconspicuous. Syntergite 1+2 with yellow lateral margin. Sternites linear and pale brown, with margins setulose, except sternite 6, which is wide and protruding.

Key for identification of male *Chaetonerius* Hendel

1 Lateral margin of epandrium elongated distally, with exponential shape, leaving the distal margin conspicuously wider; surstylus positioned in the latero-apical end of epandrium, not near cercus [*apicalis*-group] ... 3

1' Lateral margin of epandrium, not expanded. Surstylus positioned adjacent to cercus ... 2

2 Epandrium thin and elongated, almost twice longer than syntergite 7+8. Cercus linear and short, narrowing on apical third. Distal margin of epandrium straight and short ... 6

- 2' Epandrium relatively wide and about 1.5X longer than syntergite 7+8. Cercus large and modified, with conspicuous spine-like setae and surstylus prominent ... 11
- 3 Epandrium cylindrical and robust, measuring less than 1.5X the width of syntergite 7+8; antero-apical end rounded and setulose. Gonopods protuberant on inner margin of epandrium, with setae inserted in small tubercles ... 4
- 3' Epandrium slightly wide, not robust; antero-apical end highly modified like pseudosurstylus. Gonopods unmodified and slightly raised, its setae are not inserted in tubercles ... *C. fascipes* (Brunetti)
- 4 Surstylus at latero-apical end of epandrium with two long and strong apical setae; so long that it overlaps its homologous giving the distal margin of the epandrium a cylindrical shape ... *C. lobayensis*, new species
- 4' Surstylus short and with no prominent setae, positioned on distal margin of epandrium, not on antero-apical end ... 5
- 5 Anterior lobe of surstylus at antero-apical end of epandrium and posterior lobe of surstylus adjacent to it on distal margin, with the same length and similar appearance, both flattened dorso-ventrally and with round apex ... *C. nyassicus* Enderlein
- 5' Anterior lobe of surstylus and posterior lobe of surstylus separated by approximately one third the length of distal margin of epandrium; of different appearances, the surstylus is cylindrical and thin while the pseudosurstylus is flattened dorsoventrally, setulose and wide with round apex ... *C. apicalis* (Walker)
- 6 Femora brown with yellow rings on distal third; in some cases, this ring may be absent in the anterior femur, but it is clear in mid and posterior femora. Occiput brown with no yellow medial stripe and sometimes with dorsal half slightly paler ... *C. spinosissimus* (Karsch)
- 6' Femora brown with no rings; sometimes, the femora may have one paler area, but in no case one ring is present. Occiput with one yellow median stripe ... 7
- 7 Line of anteroventral setae on fore femur are homogeneous. Fore coxa brown ... 8
- 7' Line of anteroventral setae on fore femur is heterogeneous with no pattern of size. Fore coxa yellow ... 9
- 8 Anterior fronto-orbital seta well-developed, measuring half the width of middle fronto-orbital seta and positioned medially between the last and the anterior margin of fronto-orbital plate. Epandrium with distal margin elongated; surstylus positioned far

from the latero-apical margin; cercus wide, narrowing toward medial margin. Four dorsocentral setae ... *C. londti* Barraclough

8' Frontal-orbital seta inconspicuous to absent, positioned near the anterior margin of frontal-orbital plate. Epandrium with distal margin short and the surstylus positioned in the middle, between cercus and the latero-apical margin. Two dorsocentral setae ... *C. latifemur* Enderlein

9 Scutellum triangular and brown, with no whitish pruinose or median yellow stripe. Fore coxa with no anterolateral setae ... *C. claricoxa* Enderlein

9' Scutellum triangular or not, with one dorsal yellow or white pruinose median stripe. Fore coxa with one line of 2-6 anterolateral spine-like setae ... 10

10 Arista bare. Fronto-orbital seta positioned at the height of anterior margin of the eye and separated from the middle fronto-orbital seta by twice the distance between the latter and the posterior fronto-orbital seta ... *C. alienum*, new species

10' Arista with sparse pubescence. Anterior fronto-orbital seta positioned near the anterior margin of fronto-orbital plate and separated from the middle fronto-orbital seta by half the distance between the latter and the posterior fronto-orbital seta ... *C. spinibrachium* Enderlein

11 Surstylus linear, widening slightly toward the apex, forming a racket and longer than cercus. Epandrium with distal margin, convex in dorsal view ... 12

11' Surstylus linear and narrow, shorter than cercus. Epandrium with distal margin narrow and straight ... [Indian Ocean Islands species]

12 Cercus narrow at base and very wide at apex, which is truncated; numerous ventral setae modified in small thick and rounded spines ... *C. anemona*, new species

12' Cercus linear, wide and long with rounded apex and unmodified setae in all its extension ... *C. perstriatus* (Speiser)

1. *Chaetonerius alboniger* Hennig

Chaetonerius alboniger Hennig, 1937: 273.

Type Material. HOLOTYPE, *Chaetonerius alboniger* m#. Type locality: Misselele, Cameroon. LABEL: Kamerun, Umgebung des Kamerunberges, Misselele, 6-21.iix.35, Dr. F. Zumpt leg. Mus. Hamburg [ZMUH, destroyed] (Barraclough, 1993a).

Distribución. Cameroon.

Comments. In his review of the Neriidae type material, Barraclough (1993a) said about this species, that although the holotype had been destroyed, two specimens collected within 20km of the type locality could also be *C. alboniger*. However, the lack of confidence in the few data provided by the original description and the variations present in the material to which this author referred did not give him the confidence to make a neotype designation.

Hennig uses several variable or generalized characters among the African species to describe this species, such as the pubescent white arista, present in almost every species, scutellum with wide yellow median stripe, four dorsocentral setae and/or yellow dorsal longitudinal stripe in abdomen. In the present work, this problem will not be solved, because of the same difficulties, since the frequent use of coloring patterns and some references like "dark", "clear" or "tenuous", do not allow us to create an objective determination of the identity of the individuals of *C. alboniger*.

References. Hennig (1937, description); Aczél (1954b, key); Rohlfien & Ewald (1970, catalogue type material); Steyskal (1980, catalogue); Barraclough (1993a, type material).

2. *Chaetonerius alienum*, new species

Head. Rounded. Arista brown and pubescent, inserted apically. First flagellomere ovate and short. Inner process of pedicel linear and wide. Fronto-genal suture not divided to join the facial carina anteriorly. Frontal-vitta wide and mostly black with medial yellow stripe V-shaped. Anterior fronto-orbital seta short, placed in the middle between anterior margin of fronto-orbital plate and middle fronto-orbital seta; middle fronto-orbital seta closer to anterior fronto-orbital seta than to posterior fronto-orbital seta; middle fronto-orbital seta equal to inner vertical seta; posterior fronto-orbital slightly shorter than the very long postocellar seta. Ocellar triangle protruding. Occiput very short and rounded; brown with diffuse median yellow stripe; outer vertical seta aligned with three subequal transversal setae in occiput dorsally; two seta ventrally very close to posterior margin of eye. Parafacial very narrow, runs closely to anterior margin of the eye. Postgena with line of black setulae towards posterior tentorial pit.

Thorax. Very pruinose. Four dorsocentral setae anterior postsutural setae shorter than the others; pre-scutellar dorsocentral seta equal to apical scutellar seta; two dorsal longitudinal stripes pruinose, divided medially for brown stripe V-shaped that reaches margin pre-scutellar. Scutellum triangular with rounded margins; discal scutellar

setahalf as long as apical scutellar. Proepisternum setulose and with one ventral seta. Fore coxa with one anterolateral seta. Mid coxa yellow and hind coxa brown. Posterior half of anepisternum and posterodorsal katepisternum yellow pruinose.

Legs. Femora brown with wide supramedial yellow ring; fore femur with three anteroventral spine-like seta on distal third. Tibiae yellow.

Abdomen. Dark brown. Syntergite 7+8 shiny brownish-yellow; slightly longer than tergite 6 and shorter than epandrium, with dorsal yellow setulae. Epandrium cylindrical and elongate with dense setulae laterodistally; surstylus linear and thin shorter than cercus; cercus wide linear with apex narrowing towards inner margin.

Variation. Body length 5.9–8.4 mm. Wing length 4.6–7.0 mm and width 1.3–1.7 mm.

Female. Ocellar triangle only slightly protruding. Occipital ventral setae very thin and yellow. Postgenal setulae yellow. Fore femur with one anteroventral spine-like seta. Oviscape yellow with lateral margin brown.

Type Material. **HOLOTYPE**, *Chaetonerius alienum* m#; Type locality: Mbeya Region, Tanzania. LABELS: (1) TANZANIA: Ngozi crater, nrRt.A345, 2000-2200m, 1.ix.1996, A. Freidberg (2) SMNH-TAUI 205701 [TAUI]. **PARATYPES**, Tanzania. 2m# 1f#, Uzungwa Mts. Chita Forest Reserve, 1500m, 10.xi.1984, M.Stoltze & G.Petersen, Zool.Museum, Copenhagen [ZMUC].

Distribution. Tanzania.

Comments. This species exhibits many characters of *Teloneria* Aczél, such as rounded shape of head, very narrow parafacial, occipital setae dorsally aligned with outer vertical seta, as well as ventral setae near the eye and the elongated epandrium. However, the synapomorphies of the group *Chaetonerius* Hendel, such as lack of antennal base, dorsocentral seta on anterior margin of scutum, four postsutural dorsocentral setae, two antero-apical setae of fore coxa and thick ventral katepisternal seta, place this species undoubtedly in *Chaetonerius*.

3. *Chaetonerius alluaudi* (Giglio-Tos)

Nerius alluaudi Giglio-Tos 1895: 366.

Chaetonerius alluaudi; Enderlein 1922: 146.

Type Material. Type locality: Seychelles [unknown].

Distribución. Seychelles, Mauritius, Madagascar.

References. Giglio-Tos (1895a, description); Enderlein (1922, new combination); Hennig (1937, key); Aczél (1954b, key); Steyskal (1980, catalogue); Sepúlveda & de Carvalho (*in press*, re-description).

4. *Chaetonerius anemona*, new species

Male. Body length 6.1 mm. Wing length 5.0 mm and width 1.6 mm.

Head. Arista brown and pubescent, inserted apically. First flagellomere ovate and short, with narrow apex. Inner process of pedicel linear and wide, with rounded apex. Fronto-genal suture divided anteriorly to join the primordial antennal base ventrally. Frontal-vitta mostly black, with yellow stripe V-shaped anteriorly. Anterior fronto-orbital seta very small in relation to other setae of head and positioned in the middle between anterior margin of fronto-orbital plate and middle fronto-orbital seta; middle fronto-orbital seta placed closer to anterior fronto-orbital seta than to posterior fronto-orbital seta; posterior fronto-orbital seta conspicuously long and curved, reaching the size of postocellar seta. Occiput brown with median dark yellow stripe; dorsally with four postocellar setae aligned with outer vertical seta, very close to posterior margin of eye, being the third from the outer vertical setae, twice as long as the other; posterior to the later line of setae, there is another line of five long setae on ventral half. Postgena densely white pruinose, with a few ventral yellow setulae and four black setulae posteriorly.

Thorax. Four well-developed dorsocentral setae: one presutural, as long as posterior fronto-orbital and three postsuturals same-sized or longer, being the pre-scutellar straight and same-sized as apical scutellar seta. Scutellum triangular with rounded margins; apical scutellar seta curved; discal seta long, measures two thirds the size of apical scutellar seta. Fore coxa with one spine-like anterolateral seta; mid and hind coxa brown.

Legs. Fore femur brown with anteroventral setae short; mid femur with one diffuse yellow ring on apical third and this same ring is well-defined on hind femur. Fore tibia with spine-like seta posteriorly.

Abdomen. Epandrium almost twice longer than syntergite 7+8; wide with medial and membranous contraction on distal half dorsally, giving a concave appearance to distal margin in dorsal view; surstylus linear and flattened dorsoventrally, widened towards apex and slightly longer than cercus; cercus narrow at base and wide distally

with truncated apex; cercus with thin setae dorsally and dense thick black spine-like setae with rounded apex ventrally.

Female. Fronto-genal suture anterior division barely apparent in a female from East Usambara (#1228). Occiput pale brown dorsally and median stripe pale yellow. Two of the four setae of the occiput dorsally placed are long; the line posterior to the latter, placed in ventral half of the occiput, with two to five long setae. Postgena not densely pruinulent. Fore femur with one anteroventral spine-like seta on distal third. Fore tibia with no spine-like setae posteriorly. Oviscape yellow with brown tip.

Material examinado. HOLOTYPE, *Chaetonerius anemona* m#; Type locality: Tanga Region, Tanzania. LABELS: (1) TANZANIA, East Usambara, Amaní, 1000m, 30.i.1977 (2) Zool. Mus., Copenhagen, H. Enghoff., O. Lomholdt, O. Martin leg. [ZMUC]. **PARATYPES**, 1f#, same data as holotype [ZMUC]; 2f#, same data as holotype, except –27.i.1977– [ZMUC].

Etymology. The cercus in this species, possess a peculiar structure in Neriidae. These are ventral cylindrical setae which due to their dense occupation (especially on distal half), refers to *Stichodactyla mertensii* Brandt, 1835, commonly known as “anemone carpet of Mertens”. For this reason, we name this new species *C. anemona*.

Distribution. Tanzania.

Comments. The general shape of epandrium and surstylus of *C. anemona* are similar to those of *C. perstriatus*, however the new species has such particular cercus, that have never been described in another neriid. In addition, cercus in this species is particularly shorter than surstylus, due its truncate distalmargin, while in *C. perstriatus* surstylus is only slightly longer than cercus.

5. *Chaetonerius antankarana* Sepúlveda & de Carvalho (in press)

Chaetonerius antankaran Sepúlveda & de Carvalho (in press).

Type Material. Type locality: Madagascar [NMSA]

Distribución. Madagascar.

References. Sepúlveda & e Carvalho (in press, description).

6. *Chaetonerius antanosy* Sepúlveda & de Carvalho (in press)

Chaetonerius antanosy Sepúlveda & de Carvalho (in press).

Type Material. Type locality: Madagascar [UCDC].

Distribución. Madagascar.

References. Sepúlveda & e Carvalho (*in press*, description).

7. *Chaetonerius apicalis* (Walker)

Calobata apicalis Walker 1849: 1055.

Chaetonerius ghesquierei Aczél, 1954b. **New synonymy.**

Head. (f#) Arista white with small basal portion pale brown; inserted apically. Inner process of pedicel linear with narrow base and rounded apex. Frontal-vitta mostly black, with yellow stripe V-shaped anteriorly. Anterior fronto-orbital seta as long as middlefronto-orbital seta and placed next to anterior margin of fronto-orbital plate; fronto-orbital setae equidistant. Occiput pale brown dorsally and brown ventrally; dorsally with two long setae aligned with outer vertical seta; posterior to the latter on ventral brown half, there is another line of six relatively short setae. Postgenal black setulae reaching the posterior margin near posterior tentorial pit.

Thorax. Four dorsocentral setae well-developed and long; one presutural longer than inner vertical seta and three postsutural setae increasing in size posteriorly. Scutellum trapezoidal; wide and straight distal margin measures two thirds of the distance between the pre-scutellar dorsocentral setae. Fore coxa with one anterolateral spine-like seta; mid and hind coxae brown.

Legs. Femora brown; fore femur with one spine-like anteroventral seta on apical third, other anteroventral setae weak and differentiated by being longer, never spine-like. Tibiae yellow with darkened apex; fore tibia with no spine-like setae posteriorly.

Abdomen. Oviscape yellow with brown tip.

Male. Epandrium sturdy and 1.5X longer than syntergite 7+8; expanded latero-apically on distal third where there are strong setae; latero-apical margin protuberant, forming a thick setulose linear posterior lobe of surstylus that rolls inwards overlapping the anterior surstylus; anterior surstylus cylindrical and very thin, with only a few setulae on distal third; posterior surstylus positioned on midway between anterior lobe of surstylus and cercus; cercus rectangular, wide and truncated.

Variation. Body length length 4.3–6.7 mm. Wing length 4.1–6.3 mm and width 1.2–1.8 mm. Arista with dense white pubescence and distal part brown, also pubescent. Occipital medial line of setae vary, from six to one, being frequently asymmetrical by one or two setae. Pre-scutellar dorsocentral seta slightly longer than apical scutellar seta, which is three times longer than dorsolateral scutellar seta. Fore coxa with no differentiated anterolateral setae. Fore femur without differentiated anteroventral setae

in one specimen from Côte d'Ivoire and another from D. R. Congo with dm-cu slightly oblique.

Type Material. HOLOTYPE, *Calobata apicalis* f#; Type locality: "West Africa". LABELS: (1, green perimeter label) Type (2) W. Raddon, 42, 29 (3) One of Walkers series named *Calobata apicalis* Walker (4, red perimeter label) LECTOTYPE f# *Calobata apicalis* Walker, 1849, Design. by D. Barraclough (5, red perimeter label) HOLOTYPE - HOLOTYPE f#, *Calobata apicalis* Walker, 1849, det. D. Whitmore 2015 [NHMUK] (original designation) (examined by photographs).

HOLOTYPE, *Chaetonerius ghesquierei* m#; Type locality: Kisangani, Democratic Republic of the Congo. LABELS: (1, red label) HOLOTYPUS m# (2) MUSÉE DU CONGO, Stanleyville, ii.1926, J. Ghesquière (3, red label) HOLOTIPO (4) R. Det. E. 6446 (5) *Chaetonerius* m# *ghesquierei* n. sp., Dr. M. Aczél det. 19 [RMCA] (original designation).

Material examined. Guinea: 1m#, (1) Mus. Western. (2) Guinea [ZMUC]; 1f#, Guinea Mus. Western. [ZMUC]. **Cote d'Ivoire:** 1m#, (1) Mar. Salery-ny-13h, 20.3.71 (2) MUSEUM PARIS, LAMTO (Côte d'Ivoire), Leg. D. LACHAISE [MNHN]. **Togo:** 1m#, 99198. Kloto, waterfall, 6°57'N, 0°36'E, 336m, 22.i.2011, A. FREIDBERG [TAUI]; 1f#, 99122. Kloto, waterfall, 6°57'N, 0°36'E, 336m, 22.i.2011, A. FREIDBERG [TAUI]; 1m#, 97718. Kloto, Kouma Tokpli, 6°58'N, 0°35'E 530m, 20.i.2011, A. FREIDBERG [TAUI]. **Camerun:** 1m#, (1) CAMEROON, Rt. N4, 120km, NW Yaounde, 5.xi.1987, A. FREIDBERG (2) SMNH-TAUI/ 205818.[TAUI]; 1f#, (1) CAMEROON, Rt. N11, Bafut, 20km N. Bamenda, 17-24.xi.1987, A. FREIDBERG (2) SMNH-TAUI, 205810.[TAUI]; 1f#, (1) CAMEROON, 50km E. Bamenda, off Rt.N11, Bambalang Area, 21.xi.1987, FINI KAPLAN (2) SMNH-TAUI, 205797.[TAUI]; 1m#, (1) CAMEROON, Rt. N11, Befang, 60kmN Bamenda, 500m, 24.xi.87, FINI KAPLAN (2) SMNH-TAUI, 205794.[TAUI]; 1f#, (1) Sud Cameroun, Yaoundé-Nkolbisson, 17-21 Octobre 1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]. **República Centroafricana:** 1m#, (1) La Makobé, Rèp. Centrafric., 11-14.Nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS (3) *Chaetonerius ghesquierei* Aczél d. G. Steyskal '71 [MNHN]; 1f#, (1) La Maboké, Rép. Centrafric., 11-14.nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]. **Gabón:** 3f#, (1) IPASSA PISTE PANTHÉRE, (MALAISE) 11-16.v.1974 (2) Museum Paris, GABON, Mission M. DONSKOFF et J. LE BRETON [MNHN]; 1f#, (1) IPASSA-RESERVE, 16-29.v.1974

(2) SUR BANANES (3) Museum Paris, GABON, Mission M. DONSKOFF et J. LE BRETON [MNHN]. **Congo**: 1f#, (1) ODZALA, CONGO, x.1963 (2) MUSEUM PARIS, MISSION A. DESCARPENTRIES ET A. VILLIERS, 1963-1964 (3) *Chaetonerius* sp., d. G. Steyskal'67 [USNM]; 1m#, (1) MUSEUM PARIS, Rep. Pop. Congo, L Matile (2) MAYOMBE, ENV. DE MAKABA (PAR DIMONIKA), 14.XI.1975 [RMCA]. **República Democrática de Congo**: 1m#, MUS. ROY. AFR. CENTR., Eala, 4.vii.1933 (A. Corbisier) [RMCA]; 1m#, (1) COLL. MUS. CONGO, Tshuapa: Eala, 1933, A. Corbisier (2) *Chaetonerius apicalis* Walker [RMCA]; 1f#, COLL. MUS. CONGO, Tshuapa: Eala, 1933 A. Corbisier [RMCA]; 1f#, COLL. MUS. CONGO, Tshuapa: Bokuma, iv.1952, R. P. Lootens [RMCA]; 1f#, (1) Malaise trap, low land evergreen primary forest (disturbed) (2) D. R. CONGO: Oriental Prov. Likombo forest. 2km SW Bomane, 1.28349, 23.723558, 20-22.v.2010, A. H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (4) BECE, 00274 [BMSA]; 2m#, (1) Hanging trap, balted fermenting fruit (2) D. R. CONGO: Oriental Prov. Likombo forest. 2km SW Bomane, 1.28349, 23.723558, 20-22.v.2010, A. H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition 2010 (4) BECE, 00978 [BMSA]; 1f#, (1) Malaise traps, lowland evergreen swamp forest (2) D. R. CONGO: Oriental Prov. Yafira forest transect, 00.69594, 24.20107, 29-31.v.2010, A. H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition 2010 (4) BECE, 03384 [BMSA]; 1m#, (1) Hanging trap balted fruit village environs (2) D. R. CONGO: Oriental Prov. Lieki village arena at: 00°41.117'N, 24°14.362'E, 31.v-2.vi.2010, A. H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (4) BECE, 03762 [BMSA]; 1f#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II.f.d.18, 6.x.1951, Réc. H. De Saeger. 2523 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, I o 2, 2.xi.1950, Réc. H. De Saeger. 923 [RMCA]; 8m#, Congo belge: P. N. A. (Parc National Albert) Rwindi, 1000m. 20 au 24.xi.1934, G. F. de Witte: 773 [RMCA]; 1m#, Congo belge: P. N. A. (Parc National Albert) Rwindi 1000m, 20 au 24.xi.1934, G. F. de Witte: 790 [RMCA]; 1m#, Congo belge: P. N. A. (Parc National Albert) Rwindi, 1000m, 20 au 24.xi.1934, G. F. de Witte: 792 [RMCA]; 1f#, S. L. Edouard: Katakunda, 5.iii.36, L. Lippens, PARC NAT. ALBERT [RMCA]; 1f#, Congo belge: P. N. A. (Parc National Albert), 7-15.vii.1955, P. Vanschuytbroeck, 13274-309 (2) Mont Hoyo, 1.280m, sur plantes basses [RMCA]; 1m#, Congo belge: Kivu, Rutshuru. 1285m, 22.v au 4.vi.1934, G. F. de Witte: 427 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1285m. 4.vii.1935, G.

F. de Witte: 1686 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1285m, 1 au 6.vi.1935, G. F. de Witte 1411 [RMCA]; 1m#, R. Ondo, aff. Rutshuru, 30.vii.35, Dr. H. Damas, PARC NAT. ALBERT [RMCA]; 1m#, (1) BANDUNDU: WAMBA, Ntsheshe Forest ne. of Kikongo, Mission (2) 8-14.vii.2008, 4°16'S, 17°12'E, T. Chapman MT, primary forest [UCDC]; 3m#, (1) BANDUNDU: WAMBA, Kikongo Mission, 4°16'S, 17°11'E (2) 24.iv.2006, S. L. Heydon, Malaise trap in riparian forest [UCDC]; 1m#, (1) BANDUNDU: WAMBA, Kikongo Mission, 4°15'S, 17°10'E (2) 19-20.iv.2006, S. L. Heydon & S. E. Stevenson forest pantrap [UCDC]; 1m#, (1) BANDUNDU: WAMBA, Kikongo Mission, 4°15'S, 17°10'E, 13.iv.2006 (2) S. L. Heydon & S. E. Stevenson, forest pantrap [UCDC]; 1f#, BANDUNDU: WAMBA, Kikongo Mission, 23.iv.06, 4°16'S, 17°11'E, 15-17.iv.2006, S. L. Heydon YPT, riparian forest [UCDC]; 1f#, BANDUNDU: WAMBA, Kikongo Mission, 23.iv.06, 4°15'S, 17°10'E, 2.iv.2006, S. L. Heydon & S. E. Stevenson, pantrap, forest [UCDC]; 2f#, (1) BANDUNDU: WAMBA, Kikongo Mission, 4°15'S, 17°10'E, 8.iv.2006 (2) S. L. Heydon & SE Stevenson forest pantrap [UCDC]; 1f#, (1) BANDUNDU: WAMBA, Kikongo Mission, 4°15'S, 17°10'E (2) 6-17.iv.2006, S. L. Heydon & S. E. Stevenson, malaise trap [UCDC]; 1f#, (1) BANDUNDU: WAMBA, Nsheshe Forest ne. Kikongo Mission, 19.iv.2006 (2) S. L. Heydon & SE Stevenson, Malaise trap, primary forest [UCDC]; 1f#, (1) BANDUNDU: WAMBA, Kikongo Mission, 4°15'S, 17°10'E, 14-16.iv.2006 (2) S. L. Heydon & S. E. Stevenson, forest pantrap inside forest [UCDC]; 1f#, (1) BANDUNDU: WAMBA, Kikongo Mission, 4°15'S, 17°10'E (2) 19-20.iv.2006, S. L. Heydon & S. E. Stevenson, forest pantrap [UCDC]. **Uganda:** 1m#, Budongo Forest, 1000m, 31°31.33 E, 1°39.45 S, 23-30 Sept.1973, Hans Gønget leg. [ZMUC]; 2f#, Uganda, Budongo Forest, 1000m, 31°31-33 E, 1°39-45 S, 23-30 Sept.1973, Hans Gønget leg. [ZMUC]; 3f#, (1) S.W. Maramegambo Forest, 1900m, 5.i.1996, I. Yarom & A. FREIDBERG (2) SMNH-TAUI, 205693; SMNH-TAUI, 205689; SMNH-TAUI, 205675 [TAUI]; 1f#, SW Kibale Forest NP, 1400m, 10.i.1996, I. YAROM & A. FREIDBERG (2) SMH-TAUI, 205670 [TAUI].

Distribution. Guinea*, Zaire, Côte d'Ivoire, Togo, Central African Republic, Cameroon*, Congo*, Democratic Republic of the Congo, Uganda*.

Comments. Walker's publication (1849) describes a female of West Africa with dark brown legs, along with other characters of coloration and venation, which, although peculiar to that specimen at that time, are now known in almost all species of

Chaetonerius Hendel. In her review of Neriidae, Enderlein (1922) associated the female holotype of *Calobata apicalis* Walker with males of yellow femora with dark apex. This association of male and female was also followed by Hennig (1937) and later by Steyskal (1980), who determined the synonymy of *Ca. apicalis* with *Telostylus uniannulatus* var. *fascipes* Brunetti (1926), based on the correspondence of these males with the description of males associated with *Ca. apicalis*.

As noted by Barraclough (1993b) for South African neriids, species concepts are predominantly based on characters of male genitalia, since females of *Chaetonerius* in general have little interspecific variability, which makes its identification difficult. However, after studying the female holotype of *Ca. apicalis*, we find that it has completely brown legs as described by Walker (1849) and one spine-like anterolateral seta in fore coxa. Contrary to what was thought to date, these characteristics are highly informative, since they are constant in specimens of *C. ghesquierei* Aczél (1954a) and are absent in all males examined that had been erroneously determined as *C. apicalis*, based on the known descriptions.

Therefore, the female *Ca. apicalis* Walker was mistakenly associated with females with yellow femora with dark apex, and is in fact a senior synonym of *C. ghesquierei* Aczél (1954b), which has completely brown femurs and one spine-like seta in fore coxa. Based on this new information, *Telostylus uniannulatus* var. *fascipes* Brunetti is removed from synonymy with *Ca. apicalis* and we affirm that male re-descriptions of Enderlein (1922), Hennig (1937) and Aczél (1954b) do not correspond to the male of *Ca. apicalis*. As a consequence, the species *C. fascipes* (Brunetti) is revalidated and we assign to this name the material examined by Aczél (1954b), for which re-description of male genitalia shows complete correspondence.

On the females of *C. fascipes*, it is difficult to determine diagnostic characters for this species, which presents high morphological variability in legs coloring, from yellow femora with dark apex, which are the most common, to femora with yellow rings on one pair or three pairs of legs. In addition, as mentioned by Aczél (1954b), we also observed that most males of this species have four dorsocentral postsutural setae and a few, but in approximately equal proportions, they may present two or three dorsocentral setae.

The species *C. ghesquierei* was described by Aczél (1954a) with an external morphology very similar to that of *C. fascipes*, although differentiated by the conspicuous shape of its genitalia. Due to the bulky shape of its epandrium, Aczél

(1954b) included *C. ghesquierei* in what he called the *apicalis-collarti*-group (fig. 1D). However, although the epandrium of *C. ghesquierei* is quite robust due mostly to the latero-apical elongation, the voluminous shape observed in it, has a different origin from that observed in *C. fascipes*. The epandrium of the latter is literally cylindrical and is associated with the elevated position of the gonopode in the inner margin, whereas in *C. ghesquierei* the gonopode is less developed and the inner margin of epandrium is not elevated.

Despite subtle differences in shape of genitalia within the *apicalis-collarti*-group, we believe that this group has certain significance, since there are general differences which can be traced to groups of species in *Chaetonerius*. Undoubtedly, these individuals with epandrium, surstylus and cercus bulky and modified (fig. 1D), belong to the *apicalis-collarti*-group defined by Aczel (1954a) and here re-defined *apicalis*-group, including *C. apicalis*, *C. fascipes*, *C. nyassiscus* and *C. lobayensis*, new species (fig. 5). On the other hand, species with a more homogeneous genitalia, epandrium narrow, surstylus and cercus short and thin (fig. 1C), belong to a morphologically more homogeneous group here named *latifemur*-group, which includes *C. latifemur*, *C. spinibrachium*, *C. spinosissimus* and *C. claricoxa*, which is the most differentiated species morphologically within this group.

In the original description of *C. ghesquierei* Aczél (1954a), only a male Holotype of Stanleyville (currently called Kisangani in the Democratic Republic of the Congo) was cited, and there is no reference to other type material, hence the paratype from Eala, Zaire, mentioned in subsequent publications by the same author, is not considered here as type material. Barraclough (1993a) cited this same "paratype" and warns that it is not co-specific with the holotype. Consequently, after analyzing in detail the genitalia of the specimen of Zaire, we consider that it corresponds to *C. nyassiscus* Enderlein (see re-description *Chaetonerius nyassiscus*) and differs from Barraclough's opinion (1993a), which suggests that this could belong to *C. apicalis*.

Similarly, in the illustrations by Barraclough (1993b) we find that the genitalia of males designated to *C. apicalis* have bilobed surstylus that do not correspond to the description by Aczél (1954b; figures 10, 11, 12, pp. 15) and it actually corresponds to the genitalia of the male Holotype of *C. nyassiscus*. Therefore, the species illustrated as *C. apicalis* in Barraclough (1993b) is in fact *C. nyassiscus* (see comments *C.*

nyassiscus). In general, *C. fascipes* males present elongate surstylus, although in some cases they may be short (looking almost triangular).

Barraclough (1993a) also determined a Lectotype for *C. apicalis*, but Walker indicates a "Type" in its original description, so his designation is not considered valid.

8. *Chaetonerius claricoxa* Enderlein

Chaetonerius claricoxa Enderlein, 1922: 147.

Chaetonerius echinus Hennig, 1937: 276; Synonymy by Barraclough, 1993a: 272.

Head. Lost in the holotype, described in the variation.

Thorax. Sub-shiny and slightly elongated longitudinally; the classic longitudinal dorsal gray pruinescent stripe in *Chaetonerius* species is absent in *C. claricoxa*; four well-developed and long dorsocentral setae: one presutural and three postsutural setae, being the presutural curved and as long as the apical scutellar. Scutellum small, completely sub-shiny brown; triangular with rounded margins and narrow and slightly rounded posterior margin, measuring half the distance between the prescutellar dorsocentral setae. Fore coxa yellow, with no anterolateral setae; mid and hind coxae brown.

Legs. Femora completely brown; fore femur antero-ventral spine-like setae variable in size, usually alternating between one long and one short. Fore tibia with line of spine-like setae posteriorly.

Abdomen. Epandrium thin and elongate, almost twice longer than syntergite 7+8; surstylus linear and narrow, flattened dorsoventrally; cercus linear and elongate, narrowing at apical third.

Variation. Body length 3.6–6.0 mm. Wing length 3.9–6.0 mm and width 1.1–1.9 mm. Arista completely brown, as well as its sparse pubescence; inserted apically. Inner process of pedicel linear. Frontal-vitta almost completely black, except for one narrow medial yellow portion near anterior margin. Anterior fronto-orbital seta well-developed, positioned near the anterior margin of fronto-orbital plate and separated from the middle fronto-orbital seta by half the distance between the latter and posterior fronto-orbital seta; one male from Haut-Uele, Democratic Republic of the Congo with one additional anterior fronto-orbital seta. Occiput brown with a diffuse yellow stripe. Postgena with a few ventral yellow setulae. Dorsal line of sparse gray pruinescence. Fore coxa usually with no anterolateral spine-like setae, although occasionally one or two setae may be present on one or both sides.

Female. Fore coxa with one prominent seta that is spine-like in several females. Fore tibia with no spine-like seta posteriorly.

Type Material. LECTOTYPE, *Chaetonerius claricoxa* m#; Type locality: Litoral Province, Equatorial Guinea. LABELS: (1) Spanish Guinea, Alou Benitogbt. 1-15.viii.1906 (2) 102 (3, red label) Type (4) *Chaetonerius claricoxa*, Type Enderlein m#, Dr. Enderlein det. 1921 (5) Zool. Mus. Berlin (6) LECTOTYPE ♂m# *Chaetonerius claricoxa* Enderlein, 1922, Design. by D. Barraclough [ZMHB] (without head) (designate by D. Barraclough, 1993a).

HOLOTYPE, *Chaetonerius echinus* m#; Type locality: Obuasi, Ghana. LABELS: (1, red perimeter label) Type (2) *Chaetonerius echinus* Hennig, Examined & det. W. Hennig, 1936 (3) *Chaetonerius echinus* n. sp. (4) Caught in bush (5) Obuasi, Ashanti, W. Africa. 20.xi.1907. Dr. W. M. Grajam. 1908-245. (6, red label) Typus! (7) Holotype (red perimeter label), HOLOTYPE m# *Chaetonerius echinus* Hennig, 1937, det. D. Whitmore 2015 [NHMUK] (original designation) (examined by photographs).

Material Examined. Guinea. 1m#, IFAN, NIMBA (Guinée), Lamotte et Roy, vii.xii.51 [MNHN]. **Togo.** 1m#, (1) 98294. Kloto, Kouma, Konda, 620m, 6°57'N, 0°35' E, 20-22.i.2011, A. FREIDBERG [TAUI]; 5m# 2f#, (1) 97720; 97121; 97124; 97122; 97123; 97125; 97062. Kloto, Mt. Agou, 6°51' N, 0°45' E, 900m, 19.i.2011, A. FREIDBERG [TAUI]. **Nigeria.** 1m#, Kagoro Forest, 15-17.x.1971, J.C.Deeming [USNM]. **Cameroon.** 1f#, 147400. Bafut, 5°51' N, 10°10' E, 1060m, 18.viii.2013, E. MORGULIS [TAUI]; 1m#, N'KOLBISSON, 4.xi.1970, L. MATILE REC. [PARIS]; 1m#, COLL. MUS. TERVUREN, Cameroun: Nkolblsson, Dept.Nyong-Sanaga, ix.63, L. G. Segers leg. [RMCA]; 3m# 7f#, (1) Rt. N4, 120km NW Yaounde, 5.xi.1987, A. FREIDBERG (2) SMNH-TAUI 205824; 205823; 205822; 205820; 205788; 205786; 205781; 205780; 205778; 205775. [TAUI]; 1m# 1f#, Mt. Cameroon, 1000-1800m, 11-13.xi.1987, FINI KAPLAN (2) SMNH-TAUI 205809; 205808 [TAUI]; 1m# 3f#, (1) Rt. N4, 120km NW Yaounde, 5.xi.1987, FINI KAPLAN (2) SMNH-TAUI 205805; 205804; 205803; 205801; 205798 [TAUI]; 1f#, (1) Rt. N6, Bali-Batibo West of Bamenda, 20.xi.1987, FINI KAPLAN (2) SMNH-TAUI 205799.[TAUI]; 1m#, (1) Rt. N11, Bafut, 20km N. Bamenda, 17-24.xi.1987, A. FREIDBERG (2) SMNH-TAUI 205811.[TAUI]. **Gabon.** 1f#, MUSEUM PARIS, OGOQUÉ, LAMBARÉNÉ, R. ELLENBERGER, 1913 [MNHN]. **Democratic Republic of the Congo.** 1f#, (1) COLL. MUS. CONGO, Uelé: Bayenga. Terr. Wamba 810m, 12.xi.1956, R. Castelain [RMCA];

1m#, (1) MUSÉE DU CONGO, Haut-Uele: Moto, x.xi.1923, L. Burgeon (2)
Chaetonerius m# niger Czernyi, Dr. M. Aczél det.[RMCA]; 10m#, (1) Congo Belge: P. N. A. (Parc National Albert), 7-15.vii.1955, P. Vanschuytbroeck, 13274-309 (2) Mont Hoyo, 1.280m, sur plantes basses [RMCA]; 5f#, (1) Congo Belge, P. N. A. (Parc National Albert), 7-15.x.1952, P. Vanschuytbroeck & J. Kekenbosch 1275-84 (2) Massif Ruwenzori, Kyandolire 1.700m, Camp des Gardes [RMCA]; 4f#, (1) Congo Belge, P. N. A. (Parc National Albert), 7-15.vii.1955, P. Vanschuytbroeck 13274-309 (2) Mont Hoyo, 1.280m sur plantes bases [RMCA]; 2f#, (1) Congo Belge, P. N. A. (Parc National Albert), 12.x.1952, P. Vanschuytbroeck & J. Kekenbosch 1288-89 (2) Massif Ruwenzori, Kyandolire 1.700m, Camp des Gardes [MRAC]; 1f#, (1) Congo Belge, P. N. A. (Parc National Albert), 22.x.1952, P. Vanschuytbroeck & J. Kekenbosch 1377 (2) Massif Ruwenzori, Kyandolire 1.700m Camp des Gardes [RMCA]; 1f#, (1) Congo Belge, P. N. A. (Parc National Albert), 10.iv.1953, P. Vanschuytbroeck & J. Kekenbosch 2862-63 (2) Massif Ruwenzori, Moyenne Lume, 1.760m, Kiribata (Migeri) ex P.N.A.[RMCA]; 1f#, (1) Congo Belge: P. N. A. (Parc National Albert), 8.i.1954, H. Synave 7026-31 (2) Massif Ruwenzori, Kalonge, 1.900m, Riv. Kamusonge, aff. Butahu [RMCA]; 2f#, Lukuiu (Kivu), 15.viii.35, Dr. H. Damas, PARC NAT. ALBERT [RMCA]; 2f#, (1) Congo Belge, P. N. A. (Parc National Albert), 26.vii.1955, P. Vanschuytbroeck, 14104 (2) Massif Ruwenzori, Riv. Lusilube, 1.700m Mt Kyanyamu [RMCA]; 1m#, (1) Congo belge: P. N. A. (Parc National Albert), 26-28.viii.1953, P. Vanschuytbroeck & V. Hendrickx 4999-5005 (2) Secteur Tshiaberimu, Riv. Mbulikerere, affl. Dr. Talia N, 2.720m [RMCA]; 2m#, (1) Congo Belge: P. N. A. (Parc National Albert), 3-18.ii.1953, P. Vanschuytbroeck & J. Kekenbosch 2149-51 (2) Secteur Nord Mutsora, 1100-1150m, Riv. N. Gokoi affl. Talya [RMCA]; 1f#, (1) Congo Belge, P. N. A. (Parc National Albert), 13-18.ii.1953, P. Vanschuytbroeck & J. Kekenbosch 2149-51 (2) Recteur Nord Mutora, 1100-1150m Riv. N`Gokoi affl. Talya [RMCA]; 4m# 2♀, Kalondo (Kivu), 6-9.viii.35, Dr. H. Damas, PARC NAT. ALBERT [RMCA]; 1f#, (1) MUSÉE DU CONGO, Kivu: Mauita, xii.1935, Boutakoff (2)
Chaetonerius f# niger Czerny, Dr. M. Aczél det [RMCA]; 1f#, (1) COLL. MUS. CONGO, N. Lac Kivu: Rwankwi, 1-15.iv.1948, J. V. Leroy (2) *Chaetonerius f# niger* Czerny, Dr. M. Aczél det [RMCA]; 1m#, (1) Congo Belge: P. N. A. (Parc National Albert), 26.ix.1955, P. Vanschuytbroeck, 14104 (2) Massif Ruwenzori, Riv. Lusilube, 1.700m, Mt Kyanyamu [RMCA]; 1m#, SL Edouard: r. Rwindi, (1000m) 5.iii.1936, L.

Lippens, PARC NAT. ALBERT [RMCA]; 1m# 1f#, Congo belge: Kivu, Rutshuru (riv. Rodahira), 1200m, 1.vii.1935, G. F. de Witte: 1680 [RMCA]; 1m#, Congo belge: Kivu, Rutshuburu (Lubirizi), 1285m, 13.vii.1935, G. F. de Witte: 1644 [RMCA]; 2f#, Congo belge: Kivu, Rutshuru (Lubirizi), 1285m, 13.vii.1935, G. F. de Witte: 1647 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1285m, 4.vii.1935, G. F. de Witte: 1626 [RMCA]; 1m#, (1) COLL. MUS. CONGO, Rutshuru, 12.v.36, L. Lippens (2) *Chaetonerius* m# *niger* Czerny, Dr. M. Aczél det.[RMCA]; 1f#, (1) COLL. MUS. CONGO, Rutshuru, 19.v.36, L. Lippens (2) *Chaetonerius* f# *niger* Czerny, Dr. M. Aczél det [RMCA]; 1f#, (1) COLL. MUS. CONGO, Rutshuru, 26.iv.36, L. Lippens (2) *Chaetonerius* f# *niger* Czerny, Dr. M. Aczél det [RMCA]; 1♀, (1) COLL. MUS. CONGO, Rutshuru Fuku, 30.iv.36, L. Lippens (2) *Chaetonerius* ♀ *niger* Czerny, Dr. M. Aczél det [RMCA]; 1f#, (1) COLL. MUS. CONGO, Terr. Rutshuru, 15.vi.1937, Miss. Prophylactique (2) *Chaetonerius* f# *niger* Czerny, Dr. M. Aczél det [RMCA]; 1f#, (1) COLL. MUS. CONGO, Rutshuru, 19.v.36, L. Lippens (2) *Chaetonerius* f# *niger* Czerny, Dr. M. Aczél det [RMCA]; 2m#, BANDUNDU: WAMBA, Kikongo Mission, 4°16'S, 17°11'E, 15-17.iv.2006, SL Heydon YPT, riparian forest [UCDC]; 1m#, BANDUNDU: WAMBA, 2 km E. Kikongo, Mission 320m, 4°16'S, 17°12'E (2) 3.iv.2006, S. L. Heydon & S. E. Stevenson, sweep in forest/ along river [UCDC]. **Uganda.** 5m# 1f#, (1) S.W Maramagambo Forest, 1900m, 5.i.1996, I. Yarom & A. FREIDBERG (2) SMNH-TAUI 205694; 205692; 205691; 205688; 205687; 205686 [TAUI]; 1m# 1f#, (1) S.W Maramagambo Forest, 1900m, 5.i.1996, I. Yarom & A. FREIDBERG (2) SMNH-TAUI 205666; 205665 [TAUI]; 1m# 1f#, (1) S.W Maramagambo Forest, 1900m, 5.i.1996, I. Yarom & A. FREIDBERG (2) SMNH-TAUI 205666; 205665.[TAUI]; 3m# 6f#, (1) S.W Buhoma, Burundi NP, 1500m, 31.xii.1995, I. YAROM & A. FREIDBERG (2) SMNH-TAUI 205685; 205684; 205683; 205682; 205681; 205680; 205674; 205672; 205671. [TAUI]. **Rwanda.** 1f#, (1) COLL. MUS. CONGO, Ruanda: Gite de Nkuii, 17.iii.36, L. Lippens (2) *Chaetonerius* f# *niger* Czerny, Dr. M. Aczél det [RMCA]. **Kenya.** 1f#, (1) Kokamega Forest, 20-21.xi.1988, A. FREIDBERG (2) SMNH-TAUI 205753.[TAUI]; 13m# 16f#, (1) Kakamenga Forest, 8-9.xi.83, A. FREIDBERG (2) SMNH-TAUI 205751; 205750; 205749; 205748; 205747; 205745; 205744; 205743; 205742; 205741; 205740; 205739; 205738; 205737; 205735; 205734; 205733; 205731; 205729; 205725; 205728; 205723; 205722; 205721; 205720; 205719; 205714; 205713; 205712 [TAUI]; 2m# 1?, (1) Kakamenga Forest, 8-9.xi.83, I. YARON (2) SMNH-

TAUI 205711; 205710; 205709 [TAUI]; 2m# 2f#, (1) 1300m Kakamega Forest, 01°14'S, 34°52'E, 26-27.viii.2003, A. FREIDBERG (2) SMNH-TAUI 205662; 205661; 205660; 205658.[TAUI]; 2m# 2f#, (1) 1525m Kakamegal Forest, 0°13'N, 34°52'E, 23.ix.2005, A. FREIDBERG (2) SMNH-TAUI 205648; 205647; 205644; 205641.[TAUI]; 2f#, (1) 1525m Kakamegal Forest, 0°13'N, 34°52'E, 23.ix.2005, L. Gahanama (2) SMNH-TAUI 205639; 205634 [TAUI]; 2m#, (1) Kakamega Forest, 14.i.1996, I. YAROM & A. FREIDBERG (2) SMNH-TAUI 205679; 205678.[TAUI]; 1m# 1f#, (1) 1300m Kakamega Forest, 0°14'S, 34°52'E, 26-27.viii.2003, L. FREIDMAN (2) SMNH-TAUI 205698; 205697.[TAUI]; 1f#, (1) 2000m, 8kmNE Kericho, 0°34'S, 36°21'E, 26.viii.2003, S. KLEYNBERG (2) SMNH-TAUI 205663.[TAUI]; 1f#, (1) 101075. Kakamega Forest, 0°14'N, 34°53'E, 1600m, 7.ii.2011, A. FREIDBERG [TAUI].

Distribution. Guinea*, Togo, Cameroon, Ghana, Equatorial Guinea, Gabon*, Democratic Republic of the Congo, Uganda*, Rwanda*, Kenya*.

Comments. Although the Lectotype has lost the head, this species with cylindrical and elongate epandrium, as most of the species not in the *apicalis*-group, shows particular traits that make it easily distinguishable from other species in the genus. The most conspicuous trait is the color of abdomen, which is completely brown and unique within *Chaetonerius*, as is the sub-shiny and short thorax, with no gray pruinescence, that allow recognizing males and females of *C. claricoxa* easily, with no need to explore the male genitalia.

Aczél (1954b) cites characters of coloring for this species, very similar to those described for *C. niger*, which is, in our opinion, very likely to be a junior synonym of *C. claricoxa*. According to Barraclough (1993a), the main difference between *C. claricoxa* and *C. niger* is that the latter apparently has a ventral part of pleura paler, but we did not found any specimen with this condition.

9. *Chaetonerius compeditus* Hennig

Chaetonerius compeditus Hennig, 1937: 270.

Type Material. HOLOTYPE, *Chaetonerius compeditus* m#; Type locality: Misselele, Cameroon. LABELS: Kamerun, Umgebung des Kamerunberges, Misselele, 6-21.ix.35, Dr. F. Zumpt leg. Mus. Hamburg [ZMUH, destroyed] (Barraclough, 1993a).

References. Hennig (1937, description); Aczél (1954b, key); Steyskal (1980, catalogue); Barraclough (1993a, type material).

Comments. Puedo decir sobre la descripción original de Hennig y ver qué caracteres lo definieron y ver los caracteres que uso Aczel en su clave.

10. *Chaetonerius comperei* Hennig

Chaetonerius comperei Cresson, 1926: 259.

Head. Atypically elongate, compared to other species of the genus. Arista lost in the holotype. Pedicel very short; inner process linear. Anterior margin of frons straight; frontal-vitta yellow with brown spot anterolateral; fronto-orbital plate wide posteriorly, narrowing anteriorly to turn upside at level of anterior eye margin and separated from frontal-vitta in a carena; anterior fronto-orbital seta absent, middle and posterior fronto-orbital setae same length and slightly longer than inner vertical seta. Parafacial brown opaque, strongly projected anteriorly. Frontogenal suture reaching the facial carina anteriorly. Vertex brown and pruinose as the occiput. Occiput with two long transversal setae dorsally, aligned with outer vertical seta; medially, occiput with transverse line of six short setae, reaching the postgena. Postgena with densely placed yellow setulae.

Thorax. Dorsally with wide gray pruinose stripe; one pre-scutellar dorsocentral seta as long as inner vertical seta; three postsutural dorsocentral setae: anterior postsutural being as long as presutural and the other two dorsocentral ones slightly longer, the pre-scutellar being as long as apical scutellar seta. Scutellum trapezoidal with posterior margin slightly curved, only slightly shorter than the distance between the pre-scutellar dorsocentral setae. Postpronotal lobe dorsally protuberant. Pleura densely pruinose with transversal subshiny brown stripe from postpronotal lobe to ventral katatergite. Fore coxa yellow with one anterolateral spine-like; mid and hind coxae brown.

Legs. Femora brown with no defined rings; fore femur with anteroventral line of short spine-like setae. Fore tibia with no spine-like setae posteriorly.

Abdomen. Syntergite 7+8 almost as long as epandrium. Epandrium cylindrical; surstylus linear and flattened, almost as long as cercus; cercus linear with slightly narrow apex.

Type Material. HOLOTYPE, *Chaetonerius comperei* m#; Type locality: Colombo, Sri Lanka. LABELS: (1) Colombo, Ceylon (2) G. Compere, Collector (3) *Chaetonerius comperei*, Cr. (4, red label) HOLOTYPE, *Chaetonerius comperei*, E. T. Cresson. Jr. [USNM].

Distribution. Sri Lanka.

Comments. This species could be confused with a species of *Micropeza* Meigen in a quick glance, due to the high convergence of its morphology, especially regarding the head. The main differences are the synapomorphies of the two families, such as the apical arista, sternite baciliform, genitalia extended ventrally under the abdomen and the presence of four well-developed and long dorsocentral setae in *C. comperei*. This species could be part of a larger complex of species in *Chaetonerius* that inhabit the Oriental Region and present primordial antennal base, such as the type species of the genus, *C. inermis* (Schiner). Some specimens likely belonging to this complex were examined, but not described here, due to lack of sufficient material to corroborate our assumptions. These specimens present a complete range of variations from the rounded head of *Chaetonerius* lacking an antennal base, to an anteriorly elongated and narrow head with primordial antennal base, such as that of the species of *Micropeza* (*Neriocephalus*) Enderlein.

11. *Chaetonerius ebejeri* Sepúlveda & de Carvalho (*in press*)

Chaetonerius ebejeri Sepúlveda & de Carvalho (*in press*).

Type Material. Type locality: Madagascar [CSCA].

Distribución. Madagascar.

References. Sepúlveda & e Carvalho (*in press*, description).

12. *Chaetonerius eualluaudi* Sepúlveda & de Carvalho (*in press*)

Chaetonerius eualluaudi Sepúlveda & de Carvalho (*in press*).

Type Material. Type locality: Madagascar [ZSM].

Distribución. Madagascar.

References. Sepúlveda & e Carvalho (*in press*, description).

13. *Chaetonerius fascipes* (Brunetti).

Telostylus uniannulatus var. *fascipes* Brunetti, 1929. **Revalidation.**

Chaetonerius collarti Aczél, 1954a: 18. **New synonymy.**

Head. Arista white on basal half and brown on distal half; inserted apically in a slightly more ventral position. Inner process of pedicel narrow at base and linear, with rounded apex. Anterior fronto-orbital seta short; fronto-orbital setae equidistant. Occiput with almost yellow dorsal half, darkening towards vertex, with one line of three long setae; pale brown ventral half with incomplete median yellow longitudinal stripe and a transverse line of four setae in posterior brown part. Postgena with six long black

setulae ventrally, extending in a transverse line from behind the genal seta to occiput posteriorly.

Thorax. One pre-scutellar dorsocentral seta as long as posterior fronto-orbital seta; three postsutural dorsocentral setae: anterior postsutural being as long as presutural and the other two dorsocentral ones slightly longer, the pre-scutellar being as long as apical scutellar seta. Scutellum with posterior margin slightly curved, only slightly less wide than the distance between the pre-scutellar dorsocentral setae. Fore coxa with no spine-like anterolateral setae; mid and hind coxae brown.

Legs. Femora partially brown with no defined rings; fore femur with anteroventral line of setae, outstanding by being longer and only one spine-like seta on distal third. Fore tibia with no spine-like setae posteriorly.

Abdomen. Epandrium robust, cylindrical in appearance and discretely flattened dorso-ventrally, expands latero-apically, becoming also densely setulose; contiguous to this latero-apical expansion, is positioned the cylindrical surstylus, which is also setulose in smaller proportion; cercus square-shaped wide, narrowing at base and positioned medially on distal margin of epandrium, far from surstylus. Gonopods differentiated by being elevated and present 4–5 setae.

Variation. Body length 4.8–6.7 mm. Wing length 4.3–6.2 mm and width 1.3–1.8 mm. Anterior fronto-orbital seta sometimes hair-like. Number of dorsocentral setae vary from one to four. Syntergite 7+8 and epandrium almost same-sized, being the epandrium slightly longer. Fore coxa with one prominent thin seta that does not become spine-like in some specimens. Femora commonly yellow with apex brown, varying until completely brown in a few specimens; fore femur with the same non-spine-like anteroventral setae of females and one or two spine-like anteroventral setae on distal third and in one single specimen with no spine-like anteroventral setae. Abdomen can be completely dark brown to blackish and present or not two yellow longitudinal dorsal stripes.

Type Material. **HOLOTYPE**, *Telostylus uniannulatus* var. *fascipes* m#; Type locality: Kampala, Uganda. **LABELS:** (1, red parameter) Type (2) *Telostylinus uniannulatus* Brunetti, var. *fascipes* Brunetti. Type m#, Det. E. Brunetti 1926 (3) Pres. by Imp. Bur. Ent. Brit. Mus. 1929-48. (4) Kampala, Uganda, 17.xi.1915, No. 5378, C. C. Gowdey (5) **HOLOTYPE** (red perimeter) **HOLOTYPE** m#, *Telostylus uniannulatus* var. *fascipes* Brunetti, 1929, det. D. Whitmore 2015 [NHMUK] (original designation)

(examined by photographs). **PARATYPE**, 1f#, (1, yellow perimeter) Co-type (2) *Telos. uniannulatus* Brun. var. *fascipes*, cotype. Brun m#, Det. E. Brunetti 1926. (3) Pres. by Imp. Bur. Ent. Brit. Mus. 1929–48. (4) No. 4441, 20.ix.12 (5) PARATYPE (yellow perimeter) PARATYPE f#, *Telostylus uniannulatus* var. *fascipes* Brunetti, 1929, det. D. Withmore 2015 [NHMUK].

HOLOTYPE, *Chaetonerius collarti* m#; Type locality: Eala, Democratic Republic of the Congo. LABELS: (1) Congo-belge, Eala – IV – 1936, J. Ghesquiére (2) *Chaetonerius* m# *collarti* n. sp., Dr. M. Aczél det. (3, red label) HOLOTIPO (4) R. Mus. Hist. Nat. Belg. I. G. 482 [SANC] (original designation) (not examined).

PARATYPES, Democratic Republic of the Congo. 1m#, (1) Congo-belge, Eala XI – 1934, J. Ghesquiére (2) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (3) *Chaetonerius* m# *collarti* n. sp., Dr. M. Aczél det. (4) PARATIPO [SANC]; 1m#, (1) Congo-belge, Eala 16.IV.1936, J. Ghesquiére (2) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (3) *Chaetonerius* m# *collarti* n. sp., Dr. M. Aczél det. (4) PARATIPO [SANC]; 1m#, (1) Congo-belge, Eala IV.1935, J. Ghesquiére (2) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (3) *Chaetonerius* m# *collarti* n. sp., Dr. M. Aczél det. (4) PARATIPO [SANC]; 1♀f#, (1) Congo-belge, Eala III.1935, J. Ghesquiére (2) *Chaetonerius* f# *collarti* n. sp., Dr. M. Aczél det. (3, red label) ALOTIPO (4) Reg. Mus. Hist. Nat. Belg. I. G. 10482 [SANC]; 1m#, (1) Congo-belge, Eala III.1936, J. Ghesquiére (2) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (3) *Chaetonerius* m# *collarti* n. sp., Dr. M. Aczél det. (4) PARATIPO [SANC]; 1f#, (1) Congo-belge, Eala III – 1935, J. Ghesquiére (2) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (3) *Chaetonerius* f# *collarti* n. sp., Dr. M. Aczél det. (4) PARATIPO [SANC]; 1m#, (1) Congo-belge, Eala IV – 1936, J. Ghesquiére (2) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (3) *Chaetonerius* m# *collarti* n. sp., Dr. M. Aczél det. (4) PARATIPO (genitalia tube attached) [SANC]; 1f#, (1) Congo-belge, Eala 31-V – 1935, J. Ghesquiére (2) Trone d'Elaiies on déscomposition (3) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (4) *Chaetonerius* f# *collarti* n. sp., Dr. M. Aczél det. (5) PARATIPO [SANC]; 1m#, (1) Congo-belge, Eala III – 1936, J. Ghesquiére (2) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (3) *Chaetonerius* m# *collarti* n. sp., Dr. M. Aczél det. (4) PARATIPO [SANC]; 1m#, (1) Congo-belge, Eala III – 1935, J. Ghesquiére (2) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (3) *Chaetonerius* m# *collarti* n. sp., Dr. M. Aczél det. (4) PARATIPO [SANC].

Material examined. Côte d'Ivoire. 1m#, (1) Piège 10m, Gal. For. Band. 19 Nov.70 (2) (COTE D'IVOIRE) LAMTO, D. LACHAISE LEG. (3) MUSEUM PARIS (4) CHAETONERIUS APICALIS (WALK), d. GSteyskal' 71 [MNHN]; 1m#, (1) *Ficus capensis*, fruits a terre, 4 janu.71, 12h (2) MUSEUM PARIS, LAMTO (COTE D'IVOIRE), LEG. D.LACHAISE [RMCA]. **Equatorial Guinea.** 1m#, (FERNANDO-POO) RTE DE SAN-CARLOS A CONCEPCION, PRÉS RIO TIBURONES, 11.xi.1970, L. MATILE REC [RMCA]. **Cameroun.** 1m, (1) CAMEROON, Rt. N11, Bafut, 20km N. Bamenda, 17-24.xi.1987, A. FREIDBERG (2) SMNH-TAUI 205795. [TAUI]; 1m#, (1) CAMEROON, Bambalang, off Rt.N11, 35km, E. Bamenda 1200m, 18.xi.1987, FINI KAPLAN (2) SMNH-TAUI 205789. [TAUI]; 1m#, (1) Ouest Cameroun, Foubot-Alt. 1100m, 28 octobre 1967, Leg. L. Tsacas (2) MUSEUM PARIS, Plantation SAFA [MNHN]; 1m#, (1) CAMEROUN, N. KOLBISSON, 24.x.1970, L. MATILE REC (2) FORÉT [MNHN]; 1m#, (1) CAMEROUN, N. KOLBISSON, 22.x.1970, L. MATILE REC (2) Piège lumineux [MNHN]; 2m#, (1) Cameroun Ahala, 19.x.1961, Leg. L. Tsacas (2) MUSEUM PARIS, test cacau [MNHN]; 1m#, (1) CAMEROON, Rt. N4, 120km, NW Yaounde, 5.xi.1987, A. FREIDBERG (2) SMNH-TAUI/ 205785. [TAUI]; 1m#, (1) Sud Cameroun, Yaoundé-Nkolbisson, 31 Octobre 1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]; 1m#, Sud Cameroun, Yaoundé-Nkolbisson, 17-21 Octobre 1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]. **Central African Republic.** 1m#, (1) La Maboké, 6-10 Nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]; 3m#, (1) La Maboké, 11-14 Nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]. **Kenya.** 3m#, (1) Bungoma, 6-7.xi.83, A. FREIDBERG (2) SMNH-TAUI 205718. [TAUI]; 1m#, (1) Kakamega Forest, 14.i.1996, I. YAROM & A. FREIDBERG (2) SMNH-TAUI 205677. [TAUI]; 1m#, (1) 1525m, Kakamegal Forest, 0°13'N, 34°52'E, 23.ix.2005, L. Gahanama (2) SMNH-TAUI 205640. [TAUI]; 1m#, 172343; 172342. Ungoye, ICIPE station, forest, 0°36.846'S, 34°05.508'E, 1137m, 24.vii.2013, A. FREIDBERG [TAUI]. **Democratic Republic of the Congo.** 2m#, (1) Malaise traps, lowland evergreen, primary forest (disturbed) (2) D. R. Congo: Oriental Prov. Likombo forest. 2km SW Bomane, 1.28349, 23.72358, 20-22.v.2010, A.H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (4) BECE 00275; 00273 [BMSA]; 8m#, COLL. MUS. CONGO, Tshuapa: Eala, 1933, A. Corbisier [RMCA]; 1m#, MUS. ROY. AFR. CENTR. Tshuapa: Eala, 12.ix.1932, A. Corbisier [RMCA]; 1m#, (1) COLL. MUS. CONGO, Tshuapa: Bokuma,

v. 1952, R. P. Lootens (2) *Chaetonerius* m# *apicalis* (Walk.), Dr. M. Aczél det [RMCA]; 1m#, COLL. MUS. CONGO, Tshuapa: Bokuma, ix.1952, R. P. Lootens [RMCA]; 1m#, (1) Congo belge, Eala i.1935, J.Ghesquière (2) R. Mus. Hist. Nat. Belg. L.G. 10.482 (3) *Chaetonerius* m# *apicalis* (Walk), Dr. M. Aczél det. 19 [RMCA]; 1m#, (1) Congo Belge, Eala 14-16.iii.1935, J.Ghesquière (2) Fruits de Rollinia Siébéri (3) R. Mus. Hist. Nat., Belg. L.G. 10.482 (4) *Chaetonerius* m# *apicalis* (Walk), Dr. M. Aczél det. 19 [RMCA]; 2m#, (1) Congo Belge Eala 5-9.iii.1935, J.Ghesquière (2) Fruits de Rollinia Steberi A.D.C (3) R. Mus. Hist. Nat., Belg. L.G. 10.482 (4) *Chaetonerius* m# *apicalis* (Walk), Dr. M. Aczél det. 19 [RMCA]; 1m#, (1) Congo Belge, Eala 10.iii.1935, J.Ghesquière (2) Fruits de Rollinia Siébéri (3) R. Mus. Hist. Nat., Belg. L.G. 10.482 (4) *Chaetonerius* m# *apicalis* (Walk), Dr. M. Aczél det. 19 [RMCA]; 2m#, (1) Congo belge, Eala 10.iii.1935, J.Ghesquière (2) Eclos de fruits de Rollonia Siéber (3) R. Mus. Hist. Nat., Belg. L.G. 10.482 (4) *Chaetonerius* m# *apicalis* (Walk), Dr. M. Aczél det. 19 [RMCA]; 1m#, (1) Congo-belge, Eala, 21.iii.1935, J.Ghesquière (2) Sur Rollinia, Seèberi (3) R. Mus Hist. Nat., Belg. L. G. 10.482 (4) *Chaetonerius* m# *apicalis* (Walk), Dr. M. Aczél det. [RMCA]; 1m#, (1) COLL. MUS. CONGO, Eala 22.ix.1939, (Réc. Obutobe), Coll. Ghesquière (2) *Chaetonerius* m# *apicalis* (Walk.), Dr. M. Aczél det. 19 [RMCA]; 1m#, (1) Sweeping bush paths & village environs (2) D. R. Congo: Oriental Prov. Bomane village area at: 01°16.283'N, 23°43.994'E, 20-24.v.2010, A.H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (4) BECE 01087 [BMSA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, Ndelele 4, 22.xi.1952, H. De Saeger. 4068 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, PpK.9-8, 15.vii.52, H. De Saeger, 3792 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, Iol, 13.ix.1950, Réc. G. Demoulin, 817 [RMCA]; 1m#, (1) Congo Belge, P. N. G. (Parc National De La Garamba) (2) Miss. H. De Saeger (3) II hd 8, 3.viii.1951 (4) Réc. H. De Saeger. 2195 [RMCA]; 1m#, (1) Congo Belge, P. N. G. (Parc National De La Garamba) (2) Miss. H. De Saeger (3) PpK 60,d,8, 18.xii.1951 (4) Réc. H. De Saeger. 2925 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II fg 17, 31.vii.1952, H. De Saeger. 3865 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, Mabanga, 23.ix.1952, H. De Saeger. 4069 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II gc 4, 1.vi.1951, Rec. H. De Saeger. 1853 [RMCA]; 1m#, Congo

Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, Dedegwa, 21.v.1952, H. De Saeger. 3499 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II le 8, 9.xi.1952, H. De Saeger. 4040 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II fd 17, 27.viii.52, H. De Saeger. 3983 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, ii cd 8, 30.iv.1951, Réc. J. Verschuren. 1639 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II fd 17, 6.v.1952, H. De Saeger. 3428 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II fd 17, 25.vi.1951, Réc. J. Verschuren. 1970 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba) (Parc National De La Garamba), Miss H. De Saeger, II fd 17, 13.viii.1951, Réc. H. De Saeger. 2242 [RMCA]; 1m#, Congo Belge, P. N. G. (Parc National De La Garamba) (Parc National De La Garamba), Miss H. De Saeger, II eb 9, 13.iii.1952, H. De Saeger. 3234 [RMCA]; 1m#, Congo Belge, P. N. G., Miss. H. De Saeger, II.le.8, 9.xi.1952, H. De Saeger. 4040 [RMCA]; 1m#, Congo Belge. P. N. G., Miss. H. De Saeger, Garamba.2 (source), 6.vi.1952, H. De Saeger. 3583 [RMCA]; 2m#, Congo belge: Uelé, Monga (riv. Bili), 450m, 18.iv au 8.v.1935, G. F. de Witte: 1337 [RMCA]; 2m#, Congo belge: Uele, Monga, 450m. 18.iv au 8.v.1935, G. F. de Witte: 1331; 1333 [RMCA]; 1m#, COLL. MUS. CONGO, Uele: Bayenga, terr.Warmba, 810m, x.1955, R. Castelain [RMCA]; 1m#, Congo belge: P. N. A. (Parc National Albert), Rwindi, 1000m 20 au 24.xi.1934, G. F. de Witte: 773 [RMCA]; 1m#, Congo belge: P. N. A, N' Zulu (Lac Kivu), 1500m, 6 au 7.ii.1934, G. F. de Witte: 221 [RMCA]; 1?, S. L. Edouard: Kltembo (925m) 2.iv.36, L. Lippens, PARC NAT. ALBERT [RMCA]; 1m#, Congo belge: P. N. A, Rwindi, 1000m, 20 au 24.xi.1934, G. F. de Witte: 773 [RMCA]; 1m#, Congo belge: P. N. A. (Parc National Albert), Rutshuru, 1285m 18 au 23.vi.1934, G. F. de Witte: 448 [RMCA]; 1m#, (1) Congo Belge: P. N. A. (Parc National Albert), 7-15.vii.1955, P. Vanschuytbroeck, 13274-309 (2) Mont Hoyo, 1.280m, sur plantes basses [RMCA]; 1m#, (1) Avril (2) CONGO BELGE, Kivou, Kadjudju (3) MUSEUM PARIS, 1932, G. BABAULT [MNHN]; 2m#, Congo Belge: Kivu, Rutshuru, 1285m. 1 au 6.vi.1935, G. F. de Witte: 1404; 1431; 1407; 1400 [RMCA]; 4m#, Congo Belge: Kivu, Nyongera (près Rutshuru), 1218m (Butumba), 18.vii.1935, G. F. de Witte: 1664; 1665 [RMCA]; 3m#, Congo Belge: Kivu, Nyongera (près Rutshuru), 1218m (Butumba) 17.vii.1935, G. F. de Witte: 1667; 1669; 1670 [RMCA]; 4m#, Congo Belge: Kivu,

Nyongera (près Rutshuru), 1218m (Butumba) 22.vii.1935, G. F. de Witte: 1670 [RMCA]; 1m#, Congo Belge: Kivu, Rutshuru, 1285m, 3.vii.1935, G. F. de Witte: 1614 [RMCA]; 1m#, Congo Belge: Kivu, Rutshuru (riv.Musugereza), 1100m. 9.vii.1935, G. F. de Witte: 1632 [RMCA]; 1m#, Congo belge: Kivu, Rutshuru (Lubirizi), 1285m, 13.vii.1935, G. F. de Witte: 1646 [RMCA]; 1m#, Congo Belge: Kivu, Rutshuru, 1285m, 6.vii.1935, G. F. de Witte: 1615 [RMCA]; 1m#, COLL. MUS. CONGO, Kibati-Ituri: Kilomines, xii.1955, R. P. C. Smoor [RMCA]; 2m#, Congo Belge: Kivu, Rutshuru (riv.Musugereza), 1100m. 4.vii.1935, G. F. de Witte: 1606, 1608 [MRAC]; 1m#, Congo Belge: Kivu, Rutshuru (riv.Musugereza), 1100m. 9.vii.1935, G. F. de Witte: [RMCA]; 1m#, Congo Belge: Kivu, Rutshuru 1285m., 22.v-4.i.1934, G. F. de Witte: 427 [RMCA]; 1m#, Congo Belge: Kivu, Rutshuru, 1285m, 2.vii.1935, G. F. de Witte: 1685 [RMCA]; 2m#, Congo Belge: Kivu, Rutshuru, 1285m, 18 au 32.vi.1934, G. F. de Witte: 448 [RMCA]; 1m#, Congo belge: Kivu, Rutshuru, 1285m. 28 au 31.v.1935, G. F. de Witte: 1397 [RMCA]; 1m#, Congo belge: Kivu, Rutshuru, 1285m. vii.1935, G. F. de Witte: 1671 [RMCA]; 1m#, Congo Belge: Kivu, Rutshuru, 1285m 6 au 8.vi.1934, G. F. de Witte: 431 [MRAC]; 1m#, Congo Belge: Kivu, Rutshuru, 185m. 29-31.v.1935, G. F. de Witte: 1398 [RMCA]; 1m#, Congo belge: Kivu, Rutshuru (riv. Fuku), 1250m, 5.vii.1935, G. F. de Witte: 1621 [RMCA]; 1m#, Congo belge: Kivu, Rutshuru (Lubirizi), 1285m, 13.vii.1935, G. F. de Witte: 1647 [RMCA]; 1m#, Congo belge: Kivu, Rutshuru (riv. Kanzarue), 1200m. 15.vii.1935, G. F. de Witte [RMCA]; 1m#, Congo belge: Kivu, Rutshuru (riv. Kanzarue), 1200m. 16.vii.1935, G. F. de Witte: 1660 [RMCA]. **Uganda.** 1m#, Uganda, Budongo Forest, Nov. 14. 1972, H. Gønget leg. [ZMUC]; 1m#, Uganda, Budongo Forest, 1000m, 31°31-33'E, 1°39-45'S, 23-30 Sept. 1973, Hans Gønget leg [ZMUC].

Distribution. Côte d'Ivoire*, Equatorial Guinea*, Cameroon*, Central African Republic*, Democratic Republic of the Congo, Uganda, Kenya*.

Comments. As noted by Barraclough (1993b), South African neriid species concepts are predominantly based on genitalia characters of males, since females of *Chaetonerius* in general have little interspecific variability, which makes their identification difficult. We completely agree with Baraclough in this statement and want to make clear that only molecular studies or tools complementary to morphological examination can bring clarity and certainly in the association of males and females in the African species of Neriidae.

Intraspecific morphological variation is surprising, to the extent that females *C. fascipes* are the most difficult to determine in the whole family. Not only are the colors variable (although with some predominance, as in the color of femora, which is mainly yellow with dark apex), but also the characters of genitalia of male, such as the length of surstylus and cercus, which are the main identification tool for this species, are variable. Characteristics such as the distance between fronto-orbital setae, positioning of vein dm-cu, coloration of legs and scutellum shape, determinants when differentiating *Chaetonerius* species are highly plastic in this particular species. Female specimens are only included maintaining the paratypes designated by Aczél for *C. collarti*, but no inference is made regarding its identification, except that these are certainly *apicalis*-group species.

C. fascipes was described as a subspecies of *C. unniannulatus* by Brunetti (1929), based in two female specimens from Uganda. Both varieties of *C. unniannulatus* Brunetti, would be considered as synonymous by Steyskal (1980). Later, Barraclough (1993a) would propose a new combination for *C. fascipes*, as synonymous with *C. apicalis* (Walker). Barraclough (1993b) associated males he examined with females of *C. apicalis*, according to him, based on descriptions by Aczél (1954b). In the original description of *Calobata apicalis* Walker, one female also was used, so it was difficult to affirm with total certainty that the males associated by Aczél to this species were co-specific with the Holotype.

In this revision, we have found that the identification of males *Chaetonerius apicalis* (Walker) by Aczél (1954a) was wrong, and that female holotype of this species with completely brown femora and one lateral seta on fore coxa is co-specific with males of *C. ghesquierei* Aczél. For this reason, *C. fascipes* is removed of synonymy with *C. apicalis* and revalidated, being also the species corresponding to the redescriptions made by Aczél (1954a) for *C. apicalis* and *C. collarti*.

Some of the characteristics and patterns described by Aczél (1954a) with which we agree for this species are: (1) occiput coloration apparently constant, with basal half pale brown, but always darker than dorsal half, which is mainly yellow or whitish; (2) the coloration of the coxae shows slight variation in their tonalities, but always, fore coxa is yellow and mid and posterior coxae are brown; (3) tendency of the femurs to be yellow with some proportion on distal half brown; (4) femora with one line of short

non-spine-like anteroventral setae, accompanied by one spine-like seta prominent on distal third.

On the latter character, it should be noted that in the illustrations of Barraclough (1993b), the femur of specimens determined as *C. apicalis* (figure 7, pp. 9) do not possess any differentiated anteroventral seta, which is yes, indicated for the individuals of *C. londti* (figure 8, pp. 9), leading us to state that this character can not be considered as a diagnosis for any of these species.

The species *C. collarti* was described by Aczél (1954a), under the argument of being the only species in which the phallus “knee” extends beyond the base of cercus (fig. 5D). However, after examining the genitalia of several males with this same condition, we do not recognize this species as different, since the position of the phallus with respect to the fences is associated with the treatment of the individual during its collection and storage. Unable to determine a pattern to differentiate the genitalia from *C. apicalis* (Walker) and *C. collarti* Aczél, we consider the latter as a junior synonym.

14. *Chaetonerius hololissa* Sepúlveda & de Carvalho (*in press*)

Chaetonerius hololissa Sepúlveda & de Carvalho (*in press*).

Type Material. Type locality: Madagascar [RMCA].

Distribution. Madagascar.

References. Sepúlveda & de Carvalho (*in press*, description).

15. *Chaetonerius inermis* (Schiner)

Nerius inermis Schiner 1868: 248.

Chaetonerius inermis; Hendel 1903: 205.

Head. Arista white pubescent and inserted apically. Pedicel with spine-like dorso-apical seta and no prominent ventro-apical seta; inner process of pedicel triangular, slightly displaced towards dorsal half. Presence of insipient antennal base brown and opaque. Anterior margin of frons straight, ending anteriorly at level of anterior margin of parafacial and projecting laterally on it. Anterior fronto-orbital seta well developed and slightly shorter than middle fronto-orbital seta; fronto-orbital setae almost equidistant, being anterior and middle fronto-orbital setae slightly closer. Occiput with yellow dorsal half darkening slightly dorsally, with transverse line of three long setae aligned with outer vertical seta; ventral half dark brown with two long black transverse lines of setae: one of two setae near the yellow part and a second transverse

line of five long black setae, from lateral part, extends towards foramen occipital. Postgena with dense long yellow setulae. Palp conspicuously wide ovate with acuminate apex.

Thorax. One dorsocentral pre-scutellar seta with same length as postocellar seta and three postsutural dorsocentral setae increasing in size posteriorly being the pre-scutellar almost twice the size of postocellar seta. Scutellum with posterior margin straight and only slightly narrower than the distance between the pre-scutellar dorsocentral setae. Pleura brown pruinose. Anepisternum with several yellow setulara and two small black setulae. Katepisternum with yellow setulae on posterior third. Katatergite and anatergite brown. Fore coxa with one anterolateral spine-like seta; mid and hind coxae brown.

Legs. Femora brown; tibiae slightly paler.

Abdomen. Syntergite 7+8 and epandrium brownish-yellow sub-shiny; epandrium cylindrical and thin, slightly longer than syntergite 7+8; distal margin of epandrium short, making visible the total extension of sulstylus; surstylus cylindrical and elongate, almost as long as cercus, with setae apical and ventrally; cercus triangular and elongate, measures approximately half the size of syntergite 7+8.

Type material. SYNTYPE, *Nerius inermis* m#; Type locality: Nicobra Island, India. [NMW] (not examined).

Material examined. Indonesia. 1m#, SARAWAK, sw. Gunung Buda, 64km s. Limbang, 4°13'N, 114°56'E, 16-21.xi.1996 MT, S.L.Heydon & S.Fung [UCDC].

Distribution. China (Guangdong), India (Nicobar Isl.), Taiwan, Indonesia (Sulawesi, Java, Moluccas Isl.).

Comments. Despite not having access to material type of *C. inermis*, here we describe the species identified by Aczél (1954a) as such. This species presents a very small antennal base, similar to that found in the species of *Teloneria*, however, the presence of four postsutural dorsocentral setae, inner process of pedicel medially placed, lack of ventral postocular seta and other apomorphies shared with Afrotropical species, places it without a shadow of doubt within *Chaetonerius* Hendel. In addition, *C. inermis* presents traits of genitalia and sternites, exclusive in this genus.

As mentioned in *C. comperei* Hennig, there might exist a species complex of Oriental *Chaetonerius*, very similar to *C. inermis*, with the same primordial antennal base and a range of length of head from rounded to elongate and narrow anteriorly.

Despite of having examined some specimens that could fit in this description, its widely variable morphology from that of *Chaetonerius* although conserving many of its synapomorphies together with the limited material available to describe these species, did not allow us to take any decision regarding Oriental *Chaetonerius*. Further studies including material from oriental collections will help resolve this mystery.

References. Schiner (1868, description); Osten Sacken (1881, listed, notes); Hendel (1903; new combination); Hennig (1937, key); Aczél (1955c, redescription); Steyskal (1980, catalogue); Pitkin (1989, catalogue).

16. *Chaetonerius kirkspriggsi* Sepúlveda & de Carvalho (in press)

Chaetonerius kirkspriggsi Sepúlveda & de Carvalho (in press).

Type Material. Type locality: Madagascar [USNM].

Distribución. Madagascar.

References. Sepúlveda & e Carvalho (in press, description).

17. *Chaetonerius latifemur* Enderlein

Chaetonerius latifemur Enderlein, 1922: 147.

Telostylus nigripes Brunetti, 1929: 32; Synonymy by Hennig, 1937: 271.

Head. Arista with sparse pubescence, almost completely brown, except for a small basal portion slightly paler and inserted apically. Inner process of pedicel linear, with acute apex. Anterior fronto-orbital seta spine-like and short, separated from medial fronto-orbital seta by half the distance between the latter and posterior fronto-orbital seta. Face yellow under scape and black in ventral carina until genal seta. Occiput yellowish-brown sub-shiny in dorsal half, which attaches to dorsal margin at an acute right angle posteriorly, right in the insertion of outer vertical seta; three lines of transverse setae: the first, of three short setae laterally in dorsal half; the second of four setae slightly longer, behind the first, between the dorsal half and the ventral brown half and the third and longer, placed behind the second line, beginning with two spine-like setae behind the genal seta towards postgena and decrease in size towards occipital foramen.

Thorax. Dorsal wide longitudinal stripe occupying approximately half of the dorsum; two dorsocentral setae, both postsutural: one anterior half the size of pre-scutellar seta and this in turn, almost as same length as apical scutellar. Scutellum rectangular in appearance with wide posterior margin truncated, measuring only slightly

less than the distance between the pre-escutellar dorsocentral seta. Postpronotal lobe with dorsal acute protuberance. Pleura brown and pruinose. Anepisternum and katepisternum with yellow setulae in posterior third. Fore coxa yellowish-brown with anterolateral line of five short spine-like setae inserted on small tubercles. Mid and hind coxae brown. Vein dm-cu slightly oblique.

Legs. Femora completely brown; fore femur with anteroventral and posteroventral spine-like setae; hind femur with anteroventral and posteroventral thin spine-like setae on distal third. Tibiae brown; fore tibia with short spine-like setae posteriorly.

Abdomen. Dark brown sub-shiny, dorsally with two longitudinal yellow stripes separated by narrow median brown stripe. Epanthrium thin and elongated, almost twice longer than syntergite 7+8; surstylus narrow linear and dorsoventrally flattened, has short setulae in distal half and is positioned contiguous to the cercus; cercus linear elongated, narrowing in apical third.

Variation. Body length 5.5–7.2 mm. Wing length 5.5–7.5 mm and width 1.3–1.9 mm. In a few specimens, there is a third dorsocentral seta very weak and in one only specimen from Kenya is thin and prominent. Katepisternum slightly paler in dorsal half. Fore coxa of variable coloration, from yellow to completely brown; 3-7 spine-like anterolateral setae in larger specimens. Fore femur with anteroventral setae not very large, although it is common for the more distally placed setae to be slightly longer. Vein dm-cu more or less oblique, depending on the size of the specimen.

Female. Body length 5.3–6.5 mm. Face yellow under the scape. Number of occipital setae reduced and the dorsal line of short black setae sometimes absent. Fore coxa with no anterolateral setae up to two. Fore femur with just several spine-like anteroventral setae of variable size on distal third, similar to those in hind femur, which could also be absent in females. Vein dm-cu straight or slightly oblique, depending on the size of the specimen. Oviscape yellow with black apex.

Type material. HOLOTYPE, *Chaetonerius latifemur* m#; Type locality: Sotouboua, Togo. LABELS: (1) Togo, Bismarckburg, 5.vii.1893, J. Co S. (2) Type *Chaetonerius latifemur* Type Enderlein m#, Dr. Enderlein det. (3) Zool. Mus. Berlin (4) LECTOTYPE m# *Chaetonerius latifemur* Enderlein, 1922, Designed by D. Barraclough [ZMHB] (Designate by D. Barraclough, 1993a) (examined by photographs).

HOLOTYPE, *Telostylus nigripes* m#; Type locality: Ibadan, Nigeria. LABELS: (1, red perimeter label) Type (2) *Telostylus nigripes* Brun. Type f#, Det. E Brunetti

1926 (3) Press. by Imp. Bur. Ent. Brit. Mus. 1929–48. (4) Ibadan, 10:7.23. Nigeria (5) 1589 (6) HOLOTYPE m#, *Telostylus nigripes* Brunetti, 1929, Det. D. Barraclough (red perimeter label) [NHMUK] (original designation) (examined by photographs).

PARATYPES, 1m#, (1, yellow perimeter label) Co-type (2) *Telostylus nigripes* Brun. cotype f#, Det. E Brunetti 1926 (3) Press. by Imp. Bur. Ent. Brit. Mus. 1929–48. (4) Gold Coast Aburi, 1921, W. H. Patterson (4) = *Chaetonerius latifemur* End. D. D. Auberkin, 1928, Frey. (5, yellow perimeter label) PARATYPE m#, *Telostylus nigripes* Brunetti, 1929, Det. D. Barraclough (1922) [NHMUK]; 1m#, (1, yellow perimeter label) Co-type (2) *Telostylus nigripes* Brun. cotype f#, Det. E Brunetti 1926 (3) Press. by Imp. Bur. Ent. Brit. Mus. 1929–48. (4) Agege (5) S. Nigeria, 14.viii.1913. Dr. W. A. Lamborn. (6) = *Chaetonerius latifemur* End. D. D. Auberkin, 1928, Frey. (5, yellow perimeter label) PARATYPE m#, *Telostylus nigripes* Brunetti, 1929, Det. D. Barraclough (1992) [NHMUK].

Material examined. Senegal. 1f#, Senegal, in forest 1,5 km NE, Djibélor, ca 6,5 km SW Ziguin-chor, 8.iii.1977. At light, 19.00-21.30. Loc.No. 23A, UTM 28PCJ575885 (2) LUND UNIV. SYST.DEPT, SWEDEN.GAMBIA, SENEGAL, FEBR-MARCH 1977, CEDERHOLM-DANIELSSON-LARSSON- NORLING-SAMUELSSON (3) MZLU 2015, 331 [MZLU]. **Guinea.** 1m#, (1) 4C (2) I. F. A. N. NIMBA (Guinée), Lamote et Roy, vii.xii.51 [MNHN]. **Liberia.** 4m# 2f#, Moala, Liberia, Oct 31. 1938 [AMNH]; 4f#, Du River, Camp No.3, Liberia [AMNH]; 1m#, Palata, Liberia, Oct.1926 [AMNH]. **Côte d'Ivoire.** 1m#, MUSEUM PARIS, COTE D'AVOIRE, DELAFOSSE 1897 [MNHN]; 1m#, (1) (COTE D'IVOIRE) LAMTO, D. LACHAISE (2) MUSEUM PARIS [MNHN]; 1m#, MUS. ROY. AFR. CENTR. Côte D'Avoire: Zepreghé, Daloa, J. Decelle v.1962 [RMCA]; 1m#, (1) Piège 10m, ?? for band, 19.nov.10 (2) (COTÈ D'IVOIRE) LAMTO, D. LACHAISE LEG. (3) MUSEUM PARIS [MNHN]; 1f#, (1) Fruits de Malacanta, hendelatiana sapatacet (2) lamto, 5-4-71 (3) MUSEUM PARIS, LAMTO (Cote d'Ivoire), Leg. D. LACHAISE (4) CHAETONERIUS, LATIFEMUR, Enderl., d. G. [RMCA]; 1?, (1) Piège 10m, Gal. For Band., 19.nov.70 (2) (COTE D'IVOIRE) LAMTO, D. LACHAISE LEG. (3) MUSEUM PARIS (4) *Chaetonerius latifemur* (End), d. G. Steyskal'71 [MNHN]; 2f#, (1) Mélange fruits, Lisière Gal. For., lamto., 11.nov.70 (2) (COTE D'IVOIRE) LAMTO, D. LACHAISE LEG. (3) MUSEUM PARIS [MNHN]; 1f#, (1) Mélange de fruits, lamto. 10.nov.70 (2) (COTE D'IVOIRE) LAMTO, D. LACHAISE LEG.(3) MUSEUM PARIS

[MNHN]; 1f#, (1) Fruit de *Kigelia*, 26.iii.71, 15h (2) MUSEUM PARIS, LAMTO (Côte d'Ivoire), Leg. D.LACHAISE [MNHN]; 2f#, COLL. MUS. TERVUREN, Côte d'Ivoire: Zeprehé, Daloa, J. Decelle v.1962 [MNHN]; 1f#, (1) Marigot, salc. 3.iii.71 (2) MUSEUM PARIS, LAMTO (Cote d'ivoire), Leg. D. LACHAISE [MNHN]. **Ghana.** 1m#, (1) Ghana, Kumasi Apeadu, 1, 1/2 mls from Agyase, 24.vi.1965/ IKB Acheampong (2) MZLU, 2015, 330 [MZLU]. **Togo.** 2m#, -99198, 97422- Kloto, Kouma, Konda, 620m, 6°57'N 0°35'E, 20-22.i.2011, A. FREIDBERG [TAUI]. **Benin.** 1m#, 96717. BENIN: Amanhoue, Gohome, Djakotomey, 6°50'N 1°46'E, 53m, 15.i.2011, A. FREIDBERG [TAUI]. **Nigeria.** 1m#, Nigeria: Ile-Ife, W. state 16.Mar.1975, J. T. Wedler Coll. [RMCA]; 1m#, Muséum Paris, NIGERIA, Suleija, 25.ix.1981, Lafferrere rec. [MNHN]; 1f#, Nigeria: Ile-Ife, W. State, 26.jan.1975, J. T. Medler Coll. [USNM]. **Cameroon.** 2m#, W. CAMEROUN, BAFUT-NGUEMBA ALT. 2000M., ENV. MAISON FOREST., 10.x.1970 L. MATILE REC. [MNHN]; 1m#, (1) Sud Cameroun, Yaoundé-Nkolbisson, 17-21 Octobre 1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]; 1m#, (1) Sud Cameroun, Yaoundé-Nkolbisson, 14 Octobre 1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]; 1m#, (1) Cameroun, Ahala, 19.x.1961, Leg. L. Tsacas (2) MUSEUM PARIS, test cacau [MNHN]; 1m#, (1) CAMEROON, Rt. N9, 80km, SE Yaounde, 6.xi.1987, A. FREIDBERG (2) SMNH TAUI, 205826. [TAUI]; 1m#, (1) CAMEROON, Bambalang Area, 50km E. Bamenda, off Rt. N11, 21.xi.1987, A. FREIDBERG (2) SMNH TAUI, 205825 [TAUI]; 3m#, (1) CAMEROON, Bambalang, 1200m, Off Rt. N11, 35km E. Bamenda, 18-21.xi.1987, AMNON FREIDBERG (2) SMNH-TAUI -205815, 205814, 205813- [TAUI]; 1f#, (1) CAMEROON, Rt. N9, 40km E, Sangmelima, 8.xi.1987, A. FREIDBERG (2) SMNH-TAUI/ 205812. [TAUI]; 2m# 2f#, (1) CAMEROON, Rt. N4, 120km, NW Yaounde, 5.xi.1987, FINI KAPLAN (2) SMNH-TAUI -205802, 205799, 205787, 205779- [TAUI]; 2m# 1f#, (1) CAMEROON, Rt. N11, Befang, 60kmN Bamenda, 500m, 24.xi.87, FINI KAPLAN (2) SMNH-TAUI -205793, 205790, 205791- [TAUI]; 1m#, (1) CAMEROON, Rt. N11, Bafut, 20km N. Bamenda, 17-24.xi.1987, A. FREIDBERG (2) SMNH-TAUI, 205792.[TAUI]; 1m#, (1) CAMEROON, Yaunde, 4.xi.1987, YORAM ZVIK (2) SMNH-TAUI, 205633.[TAUI]; 1f#, 147399. CAMEROON: Bafut, 5°51'N 10°10'E, 1060m, 18.viii.2013, E. MORGULIS [TAUI]; 2f#, (1) Sud Cameroun, Yaoundé-Nkolbisson, 31 Octobre 1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]; 1f#, (1) Sud Cameroun, Yaoundé-Nkolbisson, 17-21 Octobre 1967, Leg. L.

Tsacas (2) MUSEUM PARIS [MNHN]. **Central African Republic.** 2m#, (1) La Maboké, Rép. Centrafric., 11-14.Nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]; 1m#, MUS. ROY. AFR. CENTR., Tshuapa: Eala, 1932, J. Corbisier [RMCA]; 1m#, REP. CENTRAFRIC., LA MABOKE, 21.ix.1970, L. MATILE rec. [MNHN]; 1f#, (1) La Maboké, Rép. Centrafric., 11-14.nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]; 2f#, (1) La Maboké, Rép. Centrafric., 11-14.nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]. **Gabon.** 1m#, (1) IPASSA-RESERVE, 16-29.v.1974 (2) SUR BANANES, Museum Paris, GABON, Mission M. DONSKOFF, et J. LE BRETON [MNHN]; 1m#, MUSEUM PARIS, OGOQUÉ, LAMBARÉNÉ, R. ELLENBERGER 1913 [MNHN]; 1f#, (1) IPASSA SORIE DE RÉSERVE, RTE. MAKOKOU, 6.v.1974 (2) Museum Paris, GABON, Mission M. DONSKOFF et. J. LE BRETON [MNHN]. **Democratic Republic of the Congo.** 7m# 2f#, Congo belge: Uele, Monga, 450m, 18.iv.1935, G. F. de Witte: -1335, 1331, 1330, 1333- [RMCA]; 5m# 1#, Congo belge: Uelé, Monga (riv. Bili), 450m, 18.iv au 8.v.1935, G. F. de Witte: 1343 [RMCA]; 1m# 10f#, Congo belge: Uelé, Monga, 450m, 18.iv au 8.v.1935, G. F. de Witte: 1335 [RMCA]; 1m#, COLL. MUS. CONGO, Uele: Bayenga, terr. Warm-ba 810m 8.vii.1956, R. Castelain [RMCA]; 2m#, COLL. MUS. CONGO, Tshuapa: Eala, 1933, A. Corbisier [RMCA]; 1m#, COLL. MUS. CONGO, Tshuapa: Bokuma, ix.1952, R. P. Lootens [RMCA]; 1m#, (1) COLL. MUS. CONGO, Basoko, v. 1948, P. L. G. Benoit (2) *Chaetonerius ♂ latifemur* End, Dr. M. Aczél det. 19 [RMCA]; 5m# 1f# 1?, (1) Congo belge: P. N. A. (Parc National Albert), 7-15.vii.1955, P. Vanschuytbroeck, 13274-309 (2) Mont Hoyo, 1.280m, sur plantes bases [RMCA]; 1m#, Congo belge: P. N. A. (Parc National Albert), Rwindi, 1000m 22 au 24.xi.1934, G. F. de Witte: 792 [RMCA]; 1m#, St. Edouard: Bitshumbi (925m) 15.iv.36, L. Lippens, PARC NAT. ALBERT [RMCA]; 1m#, Kalondo (Kivu), 6-9.viii.35, Dr. H. Damas, PARC NAT. ALBERT [RMCA]; 1m#, Congo belge: P. N. A. (Parc National Albert), Kibati, 1900m. 10 au 12.i.1934, G. F. de Witte: 161 [RMCA]; 1f#, Kalondo (Kivu), 6-9.viii.35, Dr. H. Damas, PARC NAT. ALBERT [RMCA]; 1f#, (1) Congo Belge: P.N.A., 7-15.vii.1955, P. Vanschtbroeck, 13274-309 (2) Mont Hoyo, 1.280m, sur plantes basses [RMCA]; 1f#, MUS. ROY. AFR. CENTR., Kasongo, viii.1959, P.L.G. Benoit [RMCA]; 1f#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II.f.d.18, 6.x.1951, Réc. H. De Saeger. 2522 [RMCA]; 1f#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II.f.d.10, 20.xii.1951, Réc. H. De Saeger. 2935

[RMCA]; 1f#, (1) Congo Belge: P. N. A. (Parc National Albert), 26.ix.1955, P. Vanschuytbroeck, 14.104 (2) Massif Ruwenzori, Riv. Lusilube, 1.700m, Mt. Kyanyamu [RMCA]; 1f#, Congo belge: P. N. A, Kibati, 1900m 10 au 12.i.1934, G. F. de Witte: 161 [RMCA]; 1f#, Rutshuru, 26-28.xii.1933, G. F. de Witte, PARC NAT. ALBERT [RMCA]; 1f#, (1) Congo Belge: P. N. A. (Parc National Albert), 16.vii.1954, P. Vanschuytbroeck & H. Synave 9191 (2) Secteur Nord Mulingo, 1.350m, Secteur Kikura, Region Baniangala [RMCA]; 1f#, Congo belge: Uelé, Buta, 450m, iv.1935, G. F. de Witte: 1329 [RMCA]; 2f#, Congo belge: Uelé, Monga, 450m, 18.iv au 8.v.1935, G. F. de Witte: 1333 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1285m, 1 au 6.vi.1935, G. F. de Witte: 1399 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru (Riv. Musugereza), 1100m, 8.vii.1935, G. F. de Witte: 1630 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru (Riv. Fuku), 1280m, 5.vii.1935, G. F. de Witte: 1622 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1285m, 1 au 6.vi.1935, G. F. de Witte: 1409 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1285m, 1.vii.1935, G. F. de Witte: 1624 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru (Lubirizi), 1285m, 13.vii.1935, G. F. de Witte: 1647 [RMCA]; 1f#, COLL. MUS. CONGO, Uele: Bayenga. Terr. Wam-ba 810m, 8.vii.1956, A. Castelai [RMCA]; 1f#, (1) Congo-belge/ Rutshuru, 6.xii.1937/ J.Ghesquière [R. Mus Hist. Nat. Belg. L. G. 10.482 (2) *Chaetonerius* ♀ *latifemur* End. Dr. M. Aczél det. [RMCA]; 1m#, Congo belge: Kivu, Rutshuru. 1285m, 22.v au 4.vi.1934, G. F. de Witte: 427 [RMCA]; 2m#, Congo Belge: Kivu, Rutshuru, 1285m, 1 au 6.vi.1935, G. F. de Witte [RMCA]; 1m#, Congo belge: Kivu, Rutshuru, 1285m. 15.vii.1935, G. F. de Witte: 1661 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1285m. 5.viii.1935, G. F. de Witte: 1661 [RMCA]; 1m#, Congo belge: Kivu, Rutshuru (riv. Fuku), 1250m, 2.vii.1935, G. F. de Witte [RMCA]; 1m#, Congo belge: Kivu, Rutshuru (Lubrizi), 1286m. 13.vii.1935, G. F. de Witte: 1644 [RMCA]; 1m#, Congo belge: Kivu, Rutshuru, 1285m. 5.viii.1935, G. F. de Witte: 1661 [RMCA]; 1m#, COLL. MUS. CONGO, Urundi: Bururi, 1949, F. François (2) *Chaetonerius* ♂ *latifemur* End, Dr. M. Aczél det. [RMCA]; 1m#, Congo Belge: Uelé, Buia, 450m, iv.1935, G. F. de Witte: 1329 [RMCA]; 1m#, MUSÉE DU CONGO, Mayumbé: Kiniati, 7.vi.1911, R. Mayné [RMCA]; 4m#, (1) DEM. REP. CONGO, BANDUNDU: WAMBA, 2km e. Kikongo, Mission 23.iv.06, 4°16'S 17°12'E (2) S. L. Heydon & S. E. Stevenson Malaise along forest edge [UCDC]; 2m#, (1) DEM. REP. CONGO, BANDUNDU: WAMBA, 2km e. Kikongo, 4°16'S 17°12'E (2) 4-17.iv.2006, S. L. Heydon & S. E. Stevenson, field edge

MT [UCDC]; 1m#, (1) Hanging traps, balted fruit, village environs (2) D. R. Congo: Oriental Prov. Iield village area at: 00°41.117'N, 24°14.362'E, 31.v-2.vi.2010, A.H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (4) BECE, 03764 [BMSA]; 1m#, (1) Sweeping bush paths & village environs (2) D. R. Congo: Oriental Prov. Bomane village area at: 01°16.283'N, 23°43.994'E, 20-24.v.2010, A.H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (4) BECE, 01090 [BMS]; 2m#, (1) Congo belge, Eala- ii.1935, J. Ghesquière (2) R. Mus. Hist. Nat. Belg. L. G. 10.482 (3) *Chaetonerius* ♂ *latifemur* End., Dr. M. Aczél det [RMCA]; 1f#, COLL. MUS. CONGO, Tshuapa: Eala, 1933, A. Corbisier [RMCA]; 11m# 6f#, MUS. ROY. AFR. CENTR. Tshuapa: Eala, 12.ix.1932, A. Corbisier [RMCA]; 2m#, MUS. ROY. AFR. CENTR. Eala, 4.vii.1933 (A. Corbisier) [RMCA]; 1m#, MUS. ROY. AFR. CENTR. Terr. De Kasongo, riv. Kabondo, P. L. G. Benoit [RMCA]; 1f#, Congo Belge, P.N.G. Miss. H. De Saeger, II.fc.18, 24.xi.1951, Réc. H. De Saeger. 2806 [RMCA]; 1f#, (1) Congo belge, Eala 13.xii.1934, J. Ghesquiere (2) sur chenilles pourries (3) Reg. Mus. Hist. Nat. Belg. I. G. 10482 (4) *Chaetonerius* ♀ *latifemur* End., Dr. M. Aczél det. [RMCA]; 2f#, COLL. MUS. TERVUREN, Kasongo: Mwana-Kusu, viii.1959, P. L. G. Benoit [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1250m, 4.vii.1935, G. F. de Witte: 1696 [RMCA]; 1f#, Congo belge: Kivu, Nyongara (près Rutshuru), 1282m. 18.vii.1935, G. F. de Witte: 1670 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru 1285m., 4.vii.1935, G. F. de Witte: 1624 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru 1285m., 12.vii.1935, G. F. de Witte: 1642 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1285m. 2.vii.1935, G. F. de Witte: 1685 [RMCA]; 2f#, Congo belge: Kivu, Rutshuru (Lubirizi), 1285m. 13.vii.1935, G. F. de Witte: 1647 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru, 1285m. 11.vii.1935, G. F. de Witte: 1635 [RMCA]; 1f#, Congo belge: Kivu, Rutshuru (riv. Fuku), 1250m, 2.vii.1935, G. F. de Witte: 1679 [RMCA]; 1f#, Congo belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II.fd.18, 6.x.1951, Rec. H. De Saeger. 2522 [RMCA], 1f#, Congo belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II.fc.4, 30.viii.1952, H. De Saeger. 3997 [RMCA]; 1f#, Congo belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, PpK.73.d.9, 8.iv.1952, H. De Saeger. 3311 [RMCA]; 1f#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II.fd.17, 31.vii.1951, Réc. J. Verschuren. 2182 [RMCA]; 1f#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II.gc.8, 10.vii.1952, H. De Saeger. 3765 [RMCA]; 1f#, Congo Belge, P. N. G.

(Parc National De La Garamba), Miss. H. De Saeger, II.hc.9, 28.ix.1951, Réc. H. De Saeger. 2491 [RMCA]; 1f#, Congo Belge, P. N. G. (Parc National De La Garamba), Miss. H. De Saeger, II.fc.17, 25.ix.1951, Réc. H. De Saeger. 2471 [RMCA]; 1f#, (1) Congo-belge, Eala, 21.iii.1935, J.Ghesquière (2) Fruits en decomposition (3) R. Mus Hist. Nat. Belg. L. G. 10.482 (4) *Chaetonerius* ♀ *latifemur* End., Dr. M. Aczél det. [RMCA]; 1f#, COLL. MUS. CONGO, Uele: Bayenga. Terr. Wam-ba 810m, iii.1956, R. Castelain [RMCA]; 1f#, (1) Hanging trap, balted fermenting, fruit (2) D. R. CONGO: Oriental Prov. Yafira area at: 00.70269, 24.20080, 30-31.iv.2010, A. H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (4) BECE, 03080 [BMSA]; 1f#, (1) Sweeping leaves, primary lowland, evergreen forest (2) D. R. CONGO: Oriental Prov. Bosega nr. Village, 00.51814, 24.16574, 3.vi.2010, A. H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (4) BECE, 03741 [BMSA]; 1f#, (1) Hanging trap balted fruit village environs (2) D. R. CONGO: Oriental Prov. Lield village area at: 00° 41.117'N, 24°14.362'E, 31.v-2.vi.2010, A. H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (4) BECE/ 03763 [BMSA]; 1f#, (1) Malaise trap, bush paths & village environs (2) D. R. CONGO: Oriental Prov. Lield village area at: 00° 41.117'N, 24°14.362'E, 25.v-4.vi.2010, A. H. Kirk-Spriggs (3) Boyekoli Ebale, Congo Expedition, 2010 (5) BECE, 03578 [BMSA]. **Uganda.** 1m#, Budongo Forest, Nov. 14. 1972, H. Gønget leg. [ZMUC]; 1f#, (1) Impenetrable, Forest, S.W. Uganda, 27.i.72, A. Freidberg (2) SMNH-TAUI, 205776 [TAUI]; 1m# 1f#, (1) SW, Fort Portal, 5kmNW, 2000m, 10.i.1996, I. YAROM & A. FREIDBERG (2) SMNH-TAUI –205667, 205669– [TAUI]; 2f#, Uganda, Budongo Forest, Nov. 14. 1972, H. Gønget leg. [ZMUC]. **Kenya.** 2f#, (1) Kakamega Forest, 11.v.1991, A. FRIEDBERG & FINI KAPLAN (2) SMNH-TAUI 205758. [TAUI]; 3m#, (1) Kakamega Forest, 8-9.xi.83, A. FREIDBERG (2) SMNH-TAUI –205732, 205727, 205726 [TAUI]; 1f#,(1) KENYA (West) Kakamega Forest 22.xi.1989, A. FREIDBERG & FINI KAPLAN (2) SMNH-TAUI 205754. [TAUI]; 2m# 1f#, (1) KENYA: 1300m, Kakamega Forest, 0°14'S 34°52'E, 26-27.viii.2003, L. FREIDMAN (2) SMNH-TAUI –205700, 205699, 205659– [TAUI]; 1f#, (1) KENYA: 1450m, kakamegal Forest, Yala River, 0°13'N, 34°53'E, 23.ix.2005, A. FREIDBERG (2) SMNH-TAUI 205650. [TAUI]; 1f#, (1) KENYA: 1525m, kakamegal Forest, 0°13'N, 34°52'E, 23.ix.2005, A. FREIDBERG (2) SMNH-TAUI 205649. [TAUI]; 1f#, (2) KENYA: 1525m, Kakamegal Forest, 0°13'N, 34°52'E, 23.ix.2005, A. FREIDBERG (2) SMNH-TAUI 205646. [TAUI]; 1m#, (1) KENYA:

1525m, Kakamegal Forest, 0°13'N, 34°52'E, 23.ix.2005, L. Gahanama (2) SMNH-TAUI 205638. [TAUI].

Distribution. Senegal*, Guinea*, Sierra Leone, Liberia*, Côte d'Ivoire*, Ghana, Togo, Benin*, Nigeria, Cameroon, Central African Republic*, Equatoria Guinea, Gabon*, Democratic Republic of the Congo, Uganda*, Rwanda, Burundi, Kenya*.

Comments. The holotype has no abdomen; however, the size and number of spine-like setae on fore coxa and fore femur allow us to confirm Barraclough's (1993a) assumption, that it is a male, although Brunetti (1929) indicates that it is a female.

18. *Chaetonerius lobayensis*, new species

Head. Arista with small basal brown part, followed by white basal third with pubescence of the same color and brown in the rest, also with brown pubescence; inserted apically. Inner process of pedicel wide triangular. Anterior fronto-orbital seta well-developed and short, positioned at anterior margin of fronto-orbital plate; fronto-orbital setae equidistant. Parafacial not projected anteriorly, follows the curvature of the eye. Gena very wide below the eye, about one third as high as the eye. Occiput brown, with diffuse yellow median stripe and two setae in dorsal half longer than the two setae in ventral half. Postgena with several ventral black setulae in line towards occiput posteriorly.

Thorax. Four well-developed dorsocentral setae: one presutural, same-sized as the outer vertical seta and three postsuturals slightly longer, except the dorsocentral pre-scutellar that is same-sized as the apical scutellar. Scutellum with posterior margin straight, measuring two thirds of the distance between the pre-scutellar dorsocentral seta; apical scutellar setae straight and 3x longer than laterodorsal seta. Fore coxa with no spine-like anterolateral setae. Mid and hind coxae pale brown.

Legs. Femora yellow with pale brown apex. Fore femur with several differentiated but very small anteroventral setae. Fore tibia with no spine-like setae posteriorly.

Abdomen. Epandrium thick from base, expanding distally to give an exponential format to the lateral margin; at latero-apical margin is positioned the linear and curved surstylus, so elongated that it overlaps its homologous, giving the distal margin of epandrium a cylindrical shape; apex of surstylus with two strong and curved spine-like setae, measuring about half the length of surstylus; cercus truncated and short with rectangular appearance, attached to its homolog by a thin membrane on distal third.

Gonopod highly modified if compared to any other neriid: elongated, approximately two thirds the size of surstylus and with strong spine-like setae longer than the setae of surstylus, which are inserted in small tubercles.

Variación. Body length 4.5–5.0 mm. Wing length 4.0–5.2 mm and width 1.1–1.3 mm. Coxa anterior con una seta destacada que no llega a ser espinosa. Fémur anterior con una seta anteroventral espinosa pequeña en el tercio distal. Abdomen con dos líneas amarillas amplias en el individuo de Bokuma (Democratic Republic of the Congo, #474).

Etymology. The species is named “*lobayensis*” in reference to Maboké in Loyabe, near Bangui in the Central African Republic, where the holotype was collected.

Material examined. HOLOTYPE, *Chaetonerius lobayensis* m#; Type locality: Loyabe, Central African Republic. LABELS: (1) La Maboké, Loyabe, Rép. Centrafric., 14.nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]. **PARATYPES, Central African Republic.** 2m#, (1) La Maboké (Station expérimentale de La Maboké en Lobaye), Rép. Centrafric., 14.nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]; 3m#, (1) La Maboké (Station expérimentale de La Maboké en Lobaye), Rép. Centrafric., 6-10.nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN]; 4m#, (1) La Maboké (Station expérimentale de La Maboké en Lobaye), Rép. Centrafric., 11-14.nov.1967, Leg. L. Tsacas (2) MUSEUM PARIS [MNHN].

Distribution. Central African Republic.

Comments. Males of this species are known only from La Maboké Reserve in the Democratic Republic of Congo, where specimens of the *apicalis*-group *C. apicalis* and *C. fascipes* are also recorded, which are almost exclusively differentiated by male genitalia. As consequence, it was not possible to differentiate the females of this species from the others of the *apicalis*-group of this locality.

19. *Chaetonerius londti* Barraclough

Chaetonerius londti Barraclough 1993b: 8.

Head. Arista brown with a very short white basal portion and sparse pubescence inserted apically but slightly inclined towards ventral margin. Inner process of pedicel narrow triangular with rounded apex. Anterior fronto-orbital seta well-developed, measuring half of middle fronto-orbital seta length and positioned in the middle between the latter and anterior margin of fronto-orbital plate. Frontal-vitta yellow, with no black pattern Y-shaped, as quoted for other species of *Chaetonerius*. Occiput brown

with one medium stripe of white pruinescence with small black setae. Postgena with ventral yellow setulae.

Thorax. Brown and completely covered by whitish pruinescence that gives it a paler appearance; four well-developed dorsocentral setae: one pre-sutural and three postsutural. Scutellum with straight posterior margin that measures approximately two thirds of the distance between pre-scutellar dorsocentral setae. Fore coxa brown with one anterolateral line of 4-5 spine-like setae; mid and hind coxae brown.

Legs. Femora pale brown; fore femur with spine-like and short anteroventral setae and one larger setae prominent on distal third; spine-like posteroventral setae uniform and shorter than anteroventral setae. Fore tibia with two lines of short spine-like setae posteriorly.

Abdomen. Epandrium cylindrical and narrow, measuring a little less than 1.5X the length of syntergite 7+8; one dorsomedial membranous stripe on distal third, where relatively long and thin setae are concentrated; surstylus cylindrical with rounded apex, presents ventral thin setae and is positioned contiguous to cercus, away from the latero-apical margin; cercus narrow and slightly triangular, with wide base and narrowing on apical third towards medial margin. Gonopod positioned very close to the latero-apical end of the epandrium and differentiated mainly by presenting a dense line of long, very thin setae half the size of surstylus.

Variation. Body length 6.9 mm. Wing length 5.0–5.3 mm and width 1.2–1.5mm.

Female. Body length 5.6–6.3 mm. Frontal-vitta slightly darker than male. Occiput with one long seta and two shorter on dorsal brown portion and one long black seta on ventral brown portion, near the yellow pruinescent median stripe. Fore coxa yellow with one single anterolateral seta. Femora dark brown; fore femur with no spine-like setae ventrally, just two prominent anteroventral setae on distal third. Oviscape pale brown

Type Material. HOLOTYPE, *Chaetonerius londti* m#; Type locality: Easter Cape, South Africa. LABELS: (1) East London, C. P. 25.ii.1922 (2) Ac. E. L. 122 (original designation) [SANC] (not examined). **PARATYPES: South Africa.** 1m#, Resolution, Albany Distr., 8.xi.1921, A. Walton [SANC] (not examined); 1m# 1f#, (1) East London, C. P. 15.viii.1922 (2) Ac. E. L. 122 (3, yellow parameter) *Chaetonerius londti* f#, Barraclough [SANC].

Material examined. South Africa. 1f#, (1) Malaise trap baited, fermenting fruits, b.leafed deciduous woodland (2) RSA: KZN, Ndumo Game R. main camp area at:

26°54.652'S, 32°19.719'E, 28.xi-1.xii.2009, A. H. Kirk-Spriggs (3) Entomology Dept. National Museum, P. O. Box 266, Bioemfontein 9300, South Africa (4) BMSA(D) 15344 [BMSA].

Distribution. South Africa.

Comments. As its author describes it, this species is really particular when compared to other African species, because of its highly differentiated male genitalia and its easily recognizable general morphology. The pruinecent body resembles that of the Neotropical species *Eoneria aczeli* Sepúlveda & de Carvalho (2014).

20. *Chaetonerius madagasikara* Sepúlveda & de Carvalho (in press)

Chaetonerius madagasikara Sepúlveda & de Carvalho (in press).

Type Material. Type locality: Madagascar [USNM].

Distribución. Madagascar.

References. Sepúlveda & e Carvalho (in press, description).

21. *Chaetonerius mandelai* Sepúlveda & de Carvalho (in press)

Chaetonerius mandelai Sepúlveda & de Carvalho (in press).

Type Material. Type locality: Madagascar [CSCA].

Distribución. Madagascar.

References. Sepúlveda & e Carvalho (in press, description).

22. *Chaetonerius niger* Czerny

Chaetonerius niger Czerny, 1932: 297.

Type-Material. HOLOTYPE, *Chaetonerius niger* ♀; Type locality: Boua, Cameroun. LABELS: von Kameroun, Buoa, C. Bigge leg. [ZMUH, destroyed].

Comments. In his review of Neriidae of the Belgian Congo, Aczél (1954a) re-described this species from a specimen of Sinda (env. Rutshuru) and later (Aczél, 1955a), when his knowledge of the distribution areas of the species increased, the author insisted on the consistence of the characters that used to determine these individuals as *C. niger*: “A very well defined species and it is easily recognized in both sexes by the uniformly dark brown abdominal tergites”. Similarly, although the original description provides poor information on the appearance of the holotype, it draws attention to its dark and sub-shiny coloration.

Among the material examined in this study, we studied the material in the RMCA labeled by M. Aczél as *C. niger*, corresponding to *C. claricoxa* and unlike the

previous descriptions, it presents a not so dark brown coloration. Since the original description for *C. niger* is succinct and it is impossible to access the type material, we cannot assure that the specimen described by Czerny (1932) is a junior synonym of *C. claricoxa*, but that *C. niger* described and determined by Aczél (1954b) correspond to material of *C. claricoxa*.

Distribución. Cameroun.

23. *Chaetonerius nolae* Barraclough

Chaetonerius nolae Barraclough, 1993b: 8.

Head. Arista brown with sparse brown pubescence and a very small portion white at base; inserted sub-apically. First flagellomere elongated and slightly narrower on distal half. Inner process of pedicel triangular narrow at base. Anterior fronto-orbital seta inconspicuous, positioned near the anterior margin of fronto-orbital plate, from which it is separated by one third of the distance separating it from the middle fronto-orbital seta; fronto-orbital setae equidistant. Occiput brown with one thin median longitudinal pruinose stripe; one long well-developed seta and another short seta on dorsal half; one long seta on ventral half with two shorter setae and five more setae posteriorly. Postgena with yellow setulae ventrally.

Thorax. Pleura dark and pruinose. Four well-developed dorsocentral setae: one presutural as long as inner vertical seta and three postsutural setae similar-sized, the dorsocentral pre-scutellar almost as long as the apical scutellar seta. Scutellum rectangular with rounded lateral margins and wide posterior margin that measures two thirds of the distance between the pre-scutellar dorsocentral setae. Fore coxa, with three and four long spine-like anterolateral setae; mid and hind coxae brown.

Legs. Femora brown; fore femur with strong antero-ventral spine-like setae of variable size, with one outstanding seta near the middle and another on distal third. Fore tibia with two lines of spine-like setae posteriorly.

Abdomen. Brown. Epandrium thin and elongated, surpassing the syntergite 7+8 by one third of its length: surstylus narrow linear and flattened dorsoventrally; surstylus with short ventral setae on distal half and positioned contiguous to the cercus; cercus linear elongated with rounded apex.

Variation. Body length 5.6–5.9 mm. Wing length 4.0–5.3 mm and width 1.1–1.5 mm. Fore tibia with no setae posteriorly.

Female. Body length 4.5–4.8 mm. Fore coxa yellow, with 1-3 anterolateral setae long and non-spine-like. Fore femur with no spine-like or prominent anteroventral setae. Fore tibia with no spine-like setae posteriorly. Katepisternum yellow dorsally. Abdomen brown with two dorsal yellow longitudinal stripes. Oviscape dark yellow with black apex; length is slightly more than twice its width.

Type Material. HOLOTYPE, *Chaetonerius nolae* m#; Type locality: Natal, South Africa. LABELS: SOUTH AFRICA: Pietermaritzburg, Natal, S. Africa, B & P Stuckenberg, Blackridge 28-7-71 (2, red perimeter label) HOLOTYPE m#, *Chaetonerius nolae* Barraclough [NMSA] (not examined). **PARATYPES, South Africa.** 2m# (1) Natal*** St. Lucia Estuary area, 28°23'S: 32°25'E, 10m, Date: 05-10.x.1992, Coll: J. G. H. Londt, Coastal Bush, Forest (2, yellow perimeter label) PARATYPEm# *Chaetonerius nolae* BARRACLOUGH (3) NATAL MUSEUM, Pietermaritzburg, South Africa [NMSA]; 1f#, (1) Natal, Pietermaritzburg, Montrose, J. G. H. Londt, 29°34'35"S, 30°20'40"E, Date: 22.iii.1992, BANANA BAIT (3, yellow perimeter) PARATYPE m#, *Chaetonerius nolae* BARRACLOUGH (4) NATAL MUSEUM, Pietermaritzburg, South Africa [NMSA]; 1f#, (1) Natal, Pietermaritzburg, Montrose, J. G. H. Londt, 29°34'35"S, 30°20'40"E, Date: 26.iii.1992, BANANA BAIT (2, yellow label) PARATYPE m#, *Chaetonerius nolae* BARRACLOUGH (3) NATAL MUSEUM, Pietermaritzburg, South Africa [NMSA]; 1f#, (1) Natal*** Mission Rocks area, 28°17'S, 32°29'E, 10m, Date: 9.x.1992, Coll: J. G. H. Londt, Tree trunks nr. beach (2, yellow label) PARATYPE m#, *Chaetonerius nolae* BARRACLOUGH (3) NATAL MUSEUM, Pietermaritzburg, South Africa [NMSA].

Material Examined. Burundi. 1f#, 99525. Kayanza Providence, Kibiral National Park, Rwegura, 2100m, 2°55'S, 29°30'E, 28-30.i.2011, A. FREIDBERG [TAUI, 885]. **Tanzania.** 1m#, (1) Soni Usambara Mts., Rt. B1124, 1100m, 11.ix.1992, A. FREIDBERG (2) SMNH-TAUI 205706 [TAUI]; 1f#, (1) E. Usambara, Amani, Sigi, 445m, 05°06'S, 38°39'E, 16.viii.2003, A. FREIDBERG (2) SMNH-TAUI 205653 [TAUI]. **South Africa.** 1f#, (1) Malaise trap baited fermenting fruits, b.leafed deciduous woodland (2) RSA: KZN, Ndumo Game R. main camp area at: 26°54.652'S, 32°19.719'E, 28.xi-1.xii.2009, A. H. Kirk-Spriggs (3) Entomology Dept., National Museum, P. O. Box 266, Bioemfontein 9300, South Africa (4) BMSA(D) 15345 [BMSA]; 1f#, (1) Natal #6, Kube Yini Game Res., 27°48'S, 32°14'E, 360m, Date: 10-14.i.1994, Natal Musm Expedition (2) NMSA-DIP 71547 [NMSA].

Distribution. Burundi*, Tanzania*, South Africa.

Comments. Barraclough (1993b) considered *C. nolae* as a new species, based mainly on the presence of a constant yellow midline in the occiput and a prominent spine-like seta anteroventrally on fore femur of males. In its discussion, the new species is compared with other two species that the author considered could be morphologically related: *C. alboniger* and *C. simillimus*.

The type material of *C. alboniger* was destroyed during the bombing of Hamburg in World War II, so the comparisons of Barraclough (1993b) with this species are based on the description by Hennig (1937), in which numerous coloring characters are used. The mentioned characters include coloration of pleura dorsally and occiput, which are the same as those present in *C. spinosissimus* and *C. simillimus*.

The author mentions in his discussion of *C. nolae* that this is part of a possible group of new species of neriids of Southeast Africa that must be described. However, we consider that this species is closely associated with *C. spinosissimus*, with which it shares a relevant similarity, especially the wide dorsal pruinescent stripe on thorax, which is a character only shared by this two species, also with the pleura and mainly densely pruinescent body. The three species can be differentiated by the format of male cercus.

In addition, the distribution of *C. nolae* described in this revision, shows that the species is not a southern species and have a wider distribution out of South Africa.

24. *Chaetonerius nyassicus* Enderlein

Chaetonerius nyassicus Enderlein 1922: 148. **Revalidation.**

Head. Arista brown with white pubescence, inserted apically. Iner process of pedicel lineal and wide. Fronto-orbital seta gross and short, placed in the anterior margin of fronto-orbital plate; fronto-orbital setae equidistant. Occiput brown in ventral half with incomplete longitudinal yellow stripe and posterior transverse line of five gross and short setae; dorsal half of the occiput yellow darkening towards vertex, with two setae longer than those of the ventral brown half and smaller than genal seta. Postgena line of black setae same length as dorsal occipital setae.

Thorax. Dorsal longitudinal wide yellow stripe divided medially by narrow brown V-shaped stripe; four dorsocentral setae very long, one presutural as long as postocellar seta and three postsutural setae increasing in size posteriorly, being the pre-scutellar as long as apical scutellar seta. Scutellar apical same length as the distance

between the dorsocentral pre-scutellar setae and discal seta measuring one third of this length. Fore coxa with one anterolateral seta; mid and hind coxae yellow.

Legs. Femora yellow with no brown rings, with anteroventral setae differentiated for being elongate but not spine-like. Fore tibia with two lines of small spine-like setae posteriorly.

Abdomen. Syntergite 7+8 and epandrium shiny yellow and half as long as epandrium. Epandrium with lateral margin expanding latero-apically, forming a setulose and elongate protuberance of rounded apex sustaining the cylindrical surstylus; surstylus bilobed, both lobes wide linear and contiguous; cercus wide, elongate, rectangular-shaped.

Variación. Body length 4.2–5.6 mm Wing length 4.4–5.0 mm and width 0.9–1.6 mm. Femora with dark apex to almost completely brown in two individuals from Uganda and Congo. Tibiae with no posterior spine-like setae in three individuals from Kenya, Fernando-Poo and Tanzania. Epandrium short (1.5X syntergite length) in one specimen from Congo.

Material Tipo. HOLOTYPE, *Chaetonerius nyassicus* m#; Type locality: Iringa Region, Tanzania. LABELS: (1) Nyassa-See, Langenburg, 25.iii.98-26.iv.98, Fülleborn S. (2, red label) Holotypus (3) *Chaetonerius nyassicus*, Type Enderlein m#, Dr. Enderlein det. 1921 (original designation) [ZMHB].

Material examined. Equatorial Guinea. 1m#, (FERNANDO-POO) RTE DE, SAN-CARLOS A CONCEPCION, PRÉS RIO TIBURONES, 11.xi.1970 L. MATILE REC [RMCA]. **Kenya.** 1m#, (1) Kokamega Forest, 20-21.xi.1988, A. FREIDBERG (2) SMNH-TAUI 205752 [TAUI]. **Cameroun.** 1m#, 147398. Bafut, 5°51'N 10°10'E, 1060m, 18.viii.2013, E. MORGULIS [TAUI]. **Democratic Republic of the Congo.** 1♂m#, (1) Congo belge, Eala, 23.iii.1936, J. Ghesquiere (2) R, Mus. Hist.Nat. Belg. L. G. 10.482 (3) *Chaetonerius* m# *ghesquierei* n. sp., Dr. M. Aczél det. 19' (4) PARATIPO (5, red label) Paratype [RMCA]; 1m#, (1) BANDUNDU: WAMBA, Ntsheshe Forest ne. of Kikongo Mission (2) 8-14.vii.2008, 4°16'S, 17°12'E, T. Chapman MT, primary forest [UCDC]. **Tanzania.** 1m#, (1) E. Usambara, Amani, Sigi, 445m, 05°06'S, 38°39'E, 16.viii.2003, A. FREIDBERG (2) SMNH-TAUI 205652 [TAUI]. **South Africa.** 2m#, (1) Ndumu Reserve, Ingwavuma District, Tongaland, S. Africa, B. & P. Stuckenberg, 1-10 December 1963 (2) NATAL MUSEUM, Pietermaritzburg, South Africa (3) *Chaetonerius apicalis* (Walker) m# [DMSA]; 1m#, (1) Natal, Enseleni,

28°44'S, 32°03'E, Date: 26.vii.1980, COLL: R. M. Miller (2) NATAL MUSEUM, Pietermaritzburg, South Africa (3) *Chaetonerius apicalis* (Walker) m# [DMSA].

Distribution. Equatorial Guinea*, Kenya*, Cameroon*, Democratic Republic of the Congo*, Tanzania, Mozambique (Barracough, 1993b), South Africa.

Comments. After analyzing the type material and studying in detail the genitalia of the species in the *apicalis*-group, we have found that the bulking genitalia is not homogeneous and have been poorly interpreted for these species. First, the female of *C. apicalis* (Walker) is synonym of *C. ghesquierei* Aczél and not *C. fascipes* (Brunetti), as proposed by Barracough (1993a). Then, we found that *C. collarti* Aczél, described as a new species by Aczél (1954a) mainly based on genitalia traits, is a junior synonym of *C. fascipes*. Both of these results, as consequence of the misunderstanding of male genital morphology and the lack of other morphological traits to assist in the differentiation of the *apicalis*-group.

Finally, as consequence of this previous confusion regarding male genitalia interpretations, *C. nyassicus* Enderlein was synonymized with *C. apicalis* (Walker) by Barracough (1993a). Prove of this is the figure included in Barracough (1993b), where terminalia of *C. nyassicus* (fig. 3A; figs. 11–12 pp.11 in the original work) is determined as belonging to *C. apicalis* and the author further states that –“*I am not redescribing the species, having only examined southern African specimens; Aczél (1954a) has in any event comprehensively described and figured apicalis based on more than 200 central African specimens*”–. But, as we have already discussed in *C. apicalis* section, the re-descriptions by Aczél (1951, 1954a, 1954b, 1954c, 1955a, 1955b, 1955c, 1959, 1961) and distribution data present several inaccuracies and must be used with caution.

Supported by this morphological evidence, we propose *C. nyassicus* to be revalidated, based mainly on differences in male genitalia mentioned in the descriptions and addressed here. Localities cited by Barracough (1993b) for *C. apicalis* based on male material are included for *C. nyassicus*.

25. *Chaetonerius perstriatus* (Speiser)

Nerius (*Paranerius*) *perstriatus* Speiser 1910: 192.

Chaetonerius perstriatus; Enderlein, 1923: 543.

Chaetonerius fuelleborni Enderlein, 1922: 145; Synonymy by Barracough, 1993a.

Chaetonerius wittei Aczél, 1955b: 89; Synonymy by Barracough, 1993a.

Telostylus uniannulatus Brunetti, 1929: 33; Synonymy by Barraclough, 1993a.

Head. Arista brown micropubescent; inserted apically. Inner process of pedicel wide lineal. Anterior fronto-orbital seta inconspicuous, positioned on midway between anterior margin of fronto-orbital plate and middle fronto-orbital seta, which in turn is separated from the posterior fronto-orbital by twice that distance. Occiput brown laterally and paler posteriorly; laterally with one yellow diffuse median stripe and slightly paler on dorsal half; two long setae on dorsal half and one seta on ventral half near the yellow median stripe. Postgena with several white setulae posteriorly.

Thorax. Four dorsocentral setae, presutural and two anterior postsutural setae approximately same-sized and smaller than outer vertical seta, whereas dorsocentral pre-scutellar is notoriously longer, reaching the size of apical scutellar seta. Scutellum triangular with posterior margin slightly convex and narrow, measuring less than half the distance between the pre-scutellar dorsocentral setae. Fore coxa with one spine-like anterolateral seta; mid and hind coxae brown.

Legs. Femora brown with yellow ring on distal third; fore femur with anteroventral spine-like setae, increasing in size distally and very small spine-like posteroventral setae. Tibiae brown; fore tibia with two lines of small spine-like setae posteriorly.

Abdomen. Dark brown sub-shiny, with two longitudinal yellow stripes dorsally. Syntergite 7+8 and epandrium brown shiny and almost same-sized, being epandrium slightly longer. Epandrium with medial constriction and convex distal margin; surstylus linear flattened dorsoventrally and elongated; slightly narrower at base; located at ventro-apical margin, contiguous to cercus; cercus rectangular wide and elongated.

Variation. Body length 4.5–6.9 mm Wing length 5.0–7.2 mm and width 1.9–2.1 mm. Arista brown with sparse pubescence; insertion of arista apical appearing in a slightly ventral position, depending on the shape of distal margin. Occiput coloring vary between brown, partially brown and yellow. Pleura with dense gray pruinescence. Number of dorsocentral setae variable, being that the presutural and anterior postsutural may be inconspicuous in many individuals. Katepisternum paler brown to yellow on dorsal half. Vein dm-cu slightly oblique. Fore coxa in most cases with one or two lateral setae, although 3–4 setae can also be observed, varying in number for each side; mid and hind coxae yellow. In several specimens, the yellow ring on apical third of fore femur may be absent; femora may be yellow with dark apex. Males of smaller size and

paler color, present anteroventral spine-like setae of smaller size, evident only on distal third. Tibiae yellow with darkened apex.

Material Tipo. LECTOTYPE, *Nerius (Paranerius) perstriatus* m#; Type locality: Klimanjaro, Tanzania. LABELS: (1) Klimandjaro, Sjöstedt. 1905-6 (2) Kibonoto, kulturz. (3) 17.april (4) *Nerius perstriatus* (5, red label) Type (6) *Chaetonerius perstriatus* Type (Speiser), Dr. Enderlein det. 1922 (7) Zool. Mus. Berlin (8, red perimeter label) LECTOTYPE m#, *Chaetonerius perstriatus* Speiser, 1910, Design. by D. Barraclough [ZMHB] (designed by Barraclough, 1993a).

LECTOTYPE, *Chaetonerius fulleborni* m#; Type locality: Iringa Region, Tanzania. LABELS: (1) Nyassa-See, Langenburg, 1-26.vii.98, Fülleborn S. (2, red label) Type (3) *Chaetonerius Fülleborni* m#, Type Enderlein, Dr. Enderlein det. 1921 (4) Zool. Mus. Berlin (5) LECTOTYPE m#, *Chaetonerius fulleborni* Enderlein, 1922, Design. by D. Barraclough [ZMHB] (designed by Barraclough, 1993a).

LECTOTYPE (here designated), *Telostylus uniannulatus* m#; Type locality: Zanzibar, Tanzania. LABELS: (1, yellow perimeter label) Co-type (2) *Telostylinus uniannulatus* Brunetti. Co-type ♀, det. E. Brunetti, 1926 (3) Pres. Imp. Bur. Ent. Brit. Mus. 1929-48/ D157 (4) Zanzibar, Dr. W. M. Aders (5) SYNTYPE m#, *Telostylus uniannulatus* Brunetti, 1929, det. D. Whitmore 2015 [NHMUK] (examined by photographs). **PARALECTOTYPE 1**, f# (1, red perimeter label) Type (2) *Telostylinus uniannulatus* Brunetti. Type f#, det. E. Brunetti, 1926 (2) Pres. Imp. Bur. Ent. Brit. Mus. 1929-48 (3) D157 (4) Zanzibar, Dr. W. M. Aders (5) SYNTYPE m#, *Telostylus uniannulatus* Brunetti, 1929, det. D. Whitmore 2015 [NHMUK] (examined by photographs). **PARALECTOTYPE 2**, f# (1, yellow perimeter label) Co-type (2) *Telostylinus uniannulatus* Brunetti. Co-type f#, det. E. Brunetti, 1926 (3) Pres. Imp. Bur. Ent. Brit. Mus. 1929-48 (4) D157 (5) Zanzibar, Dr. W. M. Aders (7) SYNTYPE m#, *Telostylus uniannulatus* Brunetti, 1929, det. D. Whitmore 2015 [NHMUK] (examined by photographs).

HOLOTYPE, *Chaetonerius wittei* m#; Type locality: Kiamalwa, Democratic Republic of the Congo. LABELS: (1) Zaire: HOLOTYPUS (2, red label) HOLOTIPO (3) Congo belge: PNU R. Bowa af. dr. Kalule-N. pès Kiamalwa. 3-4.iii.1949. Miss. G.F. de Witte, 2401a (4) COLL. MUS. CONGO (5) *Chaetonerius* m# *wittei* n. sp., Dr. Martin Aczél det. [RMCA] (not examined). **PARATYPE**, (just thorax remains) [RMCA].

Material examined. Ethiopia. 1m#, (1) Ethiopia, SHEWA, Wendo Genet, 2100m, 29.i.2000, A. FREIDBERG & I. YAROM (2) SMNH-TAUI 205642 [TAUI].

Cameroun. 1m#, (1) Ouest Cameroun, Fombot-Alt. 1100m, 25 octobre 1967, Leg. L. Tsacas (2) MUSEUM PARIS, Porcherie [MNHN]; 3m#, (1) MUSEUM PARIS, CAMEROUN, RÉG. DE DCHANG, (1400M D'ALT.), PLATEAUX VOLCANIQUES, Dr. GROMIER 1923 (2) Jaison (3) très humide [MNHN]; 1m#, MUSEUM PARIS, CAMEROUN N.-O., PLATEAU DE DCHANG, 1500M SAISON SÉCHE, Dr CROMIER 1924 [MNHN]; 1m#, (1) MUSEUM PARIS, CAMEROUN, RÉG. DE DCHANG, (1400M D'ALT.), PLATEAUX VOLCANIQUES, Dr. GROMIER 1924 (2) Juin á Sept. [MNHN]; 2m#, 147283. CAMEROON: University of Dschang, 5°27'N, 10°04' E, 1402m, 16.viii.2013, E. MORGULIS [TAUI].

Democratic Republic of the Congo. 3m#, (1) Congo belge: P. N. A, 7-15.vii.1955, P. Vanschuytbroeck, 13274-309 (2) Mont Hoyo, 1.280m, sur plantes basses [RMCA]; 1m#, (1) Congo belge: P. N. A., 20.vii.1954, P. Vanschuytbroeck, 9283 (2) Massif Rwenzori, Litongo, 1575m [RMCA]; 1m#, Uganda, Kampala, Tank Hill, 1300 m.o.h., 30.viii.1976, Hans Gonget leg. [ZMUC]; 1m#, Congo belge: P. N. A, Rwindi, 1000m 20 au 24.xi.1934, G. F. de Witte: 773 [RMCA]; 1m#, SL Edouard: r. Rwindi (1000m) 4.ii.1936, L. Lippens, PARC NAT. ALBERT [RMCA]; 1m#, (1) COLL. MUS. CONGO, Rutshuru, 20.ii.36, L. Lippens (2) *Chaetonerius m# wittei* Aczél, Dr. M. Aczél det. [RMCA]; 1m#, COLL. MUS. CONGO, Kivu: Nyabikoro (Rutshuru xi.1956, K. Baeten) [RMCA]; 1m#, (1) COLL. MUS. CONGO, Terr. Rutshuru, 15.vi.1937, Miss. Prophylactique (2) *Chaetonerius m# wittei* Aczél Dr. M. Aczél det [RMCA]; 1m#, (1) COLL. MUS. CONGO, Terr. Rutshuru, 7.iv.1937, Miss. Prophylactique (3) *Chaetonerius m# wittei* Aczél, Dr. M. Aczél det [RMCA]; 1m#, Congo belge: Kivu, Rutshuru, 1285m, 22.v au 4.vi.1934, G. F. de Witte: 427 [RMCA]; 1m#, Congo Belge: Kivu, Rutshuru, 1285m, 2.vii.1935, G. F. de Witte: 1685 [RMCA].

Tanzania. 1m#, (1) Marangu, 9-11.i.72, A. Freidberg (2) SMNH-TAUI 205777 [TAUI]; 1m#, (1) East Usambara, Amaní, 1000m, 1.ii.1977 (2) Zool. Mus., Copenhagen, H. Enghoff., O. Lomholdt, O. Martin leg [ZMUC].

South Africa. 1m#, (1) NATAL, Eshowe Dlinza Forest, Reserve 450m 2831Cd, JGH Londt 20-23.xi.1978 (2) *Chaetonerius perstriatus* m# (Speiser) (3) NATAL MUSEUM, Pietermaritzburg, South Africa [NMSA]; 1m#, (1) SO Africa: Natal, Pietermaritzburg, Prestbury. 7-5-83, RM Miller (2) NATAL MUSEUM, Pietermaritzburg, South Africa [NMSA].

Distribution. Ethiopia*, Cameroon*, Democratic Republic of the Congo, Kenya, Uganda, Tanzania, Zambia, Malawi, Mozambique, Zaire, Zimbabwe, South Africa.

Comments. Four specimens of *C. perstriatus* from Kilimanjaro were cited by Speiser (1919) in the original description of this species, and only one male was found by Barraclough (1993a) in the ZMHB and designated as Lectotype. Although *C. perstriatus* males have a rather particular genitalia and are easily distinguishable. On the other hand, Aczél (1955b) explains in regard to females of *C. perstriatus*, that he encounters the same problem of lack of interspecific variation mentioned for *C. apicalis*. For this same reason, and unable to describe a reliable pattern that can help identify females, we only describe the male.

In the original description of *Telostylus uniannulatus* Brunetti (1929) used three specimens from Zanzibar, which according to him, correspond to females. However, one of the specimens is a co-specific male with *C. perstriatus* and since none of it was designated as Holotype in the original description, the three specimens of the series used by Brunetti (1929) are here considered as Syntypes, disagreeing with Barraclough (1993a) when he declares as Holotype one of the females labeled "Type". Given the difficulties to identify females, already mentioned in this and other works, we consider it important to designate the male specimen within the Syntypes as a Lectotype and thus, confirm the synonymy proposed by Barraclough (1993a) between *C. uniannulatus* and *C. perstriatus*.

26. *Chaetonerius spinibrachium* Enderlein

Chaetonerius spinibrachium Enderlein, 1922: 145.

Head. Arista completely brown, as well as its sparse pubescence; inserted apically. inner process of pedicel triangular and wide at base. Anterior fronto-orbital seta long and thin, separated by the same distance from the anterior margin of fronto-orbital plate and middle fronto-orbital seta, which separates from the posterior fronto-orbital seta by twice this distance. Occiput brown with very wide yellow median stripe, the dorsal part brown very narrow; four relatively long setae in dorsal half; line of five seta in ventral part, near the limit with postgena. Postgena with two long black ventral setulae.

Thorax. Four very long dorsocentral setae: one presutural seta as long as postsutural and three postsutural setae of similar size, being the pre-scutellar the longer and same-sized as apical scutellar seta. Scutellum triangular with narrow and convex

posterior margin, measuring less than half the distance between pre-scutellar dorsocentral setae. Fore coxa yellow with two anterolateral spine-like setae; mid and hind brown.

Legs. Completely brown femora; fore femur with strong antero-ventral spine-like setae varying in size, generally alternating between a long and a short one. Tibiae yellow, fore tibia with line of spine-like setae posteriorly.

Abdomen. Epandrio thin and elongate, almost twice longer than syntergite 7+8; surstylus narrow linear and flattened dorsoventrally; with short setae on distal half and positioned contiguous to the cercus; cercus linear elongate, narrowing in apical third.

Variation. Body length 5.9–8.4 mm. Wing length 4.6–7.0 mm and width 1.3–1.7 mm. Fore cox with one only anterolateral spine-like seta.

Female. Fronto-orbital seta thin and short. Occiput brown with narrow yellow median stripe with two long setae; two setae larger than the latter in the brown dorsal part. Oviscape brown with posterior third paler and black apex.

Type Material. **LECTOTYPE**, *Chaetonerius spinibrachium* m#; Type locality: Nord-Kivu, Democratic Republic of the Congo. **LABELS:** (1) Nördl. V. Alb.Edw.-Se, Ruwensori FuB, Westseite 2.08 (2) Exped. Herzog, Adolf Friederich z. Mecklenburg (3, red label) Type (4) *Chaetonerius spinibrachium*, Type Enderlein m#, Dr. Enderlein det. 1921 (5) Zool. Mus. Berlin (6, red perimeter label) **LECTOTYPE** m# *Chaetonerius spinibrachium* Enderlein, 1922, Design. by D. Barraclough [ZMHB] (Designated by D. Barraclough, 1993a).

Material examined. **Cameroon.** 1m#, N'KOLBISSON, 24.X.1970, L. MATILE REC. [MNHN, 491]. **Democratic Republic of the Congo.** 1m#, (1) Congo Bele: P. N. A. (Parc National Albert), 30.vii.1952, P. Vanschuytbroeck & J. Kekenbosch 600-02 (2) Massif Ruwenzori, Kalonge, 2.130m, Riv. Klondo. *aff.* Butahu [RMCA]; 1m#, Congo belge: P. N. A. (Parc National Albert), Près Mt. Kamatembe (Forêt), 2200m, 12.iv.1934, G. F. de Witte: 348 [RMCA]; 1m#, Congo Belge P. N. A. (Parc National Albert), Rumangabo (Nyakibanda), 11-13.iv.1945, G. F. de Witte: 20 [RMCA]; 1♂, Coll. Mus. Tervuren, Kenya: Taita Hills, Macha forest (col. 4), 20.vi.1999 De Meyer (genitalia attached) [RMCA].

Distribution. Cameroon*, Democratic Republic of the Congo.

27. *Chaetonerius spinosissimus* (Karsch)

Nerius spinosissimus Karsch, 1887: 9.

Chaetonerius spinosissimus; Enderlein, 1922.

Chaetonerius simillimus Karsch, 1887: 9. **New synonymy**

Chaetonerius brachialis Enderlein, 1922: 146. **New synonymy**

Head. Arista brown inserted apically, with sparse brown pubescence and very small part of base white. First flagellomero elongate and slightly narrower in distal half. Inner process of pedicel triangular narrow at base. Anterior fronto-orbital seta very small, positioned in the midway between anterior margin of fronto-orbital plate and middle fronto-orbital seta, which in turn is separated from the posterior fronto-orbital seta by almost twice that distance. Occiput brown with narrow longitudinal pruinous stripe; two well-developed setae in dorsal half and three minors in ventral half. Postgena with yellow ventral setulae.

Thorax. Four well-developed dorsocentral setae: one presutural seta as long as inner vertical seta and three postsutural setae of similar size, being the dorsocentral pre-scutellar as long as apical scutellar seta. Scutellum rectangular shaped, with rounded lateral margins and slightly concave posterior margin that measures half the distance between the dorsocentral pre-scutellar setae. Katepisternum paler in dorsal half. Fore coxa yellow with three anterolateral long and spine-like setae; mid and hind coxae brown.

Legs. Brown femora with yellow ring in apical third, which is paler in fore femur; fore femur with antero-ventral strong spine-like setae increasing discretely in size towards apex, while posteroventral setae are uniform and very short. Fore tibia with two lines of spine-like setae posteriorly.

Abdomen. Epandrium slender and elongate, surpassing synterite 7+8 by one third of its length; surstylus narrow linear and flattened dorsoventrally, with short ventral setae in distal half and positioned contiguous to the cercus; cercus linear elongate with apex narrow.

Variation. Body length 7.8–10.0 mm. Wing length 6.1–9.4 mm and width 1.6–2.5 mm.

Female. Body length 5.3–8.1 mm. First flagellomere ovate, slightly shorter than male. Anterior fronto-orbital seta inconspicuous. Occipital setae vary in number, from 0–3 well-developed and short setae in the longitudinal pruinose line and four longer setae in ventral half. Postgena with 2–3 thin black ventral setae. Posterior margin of scutellum slightly narrower, with no rectangular appearance. Fore coxa with one

anterolateral spine-like seta. Fore femur completely brown, with prominent anteroventral setae although notoriously weaker than in male and posteroventral setae hair-like. Kataterguito brown or yellow. Oviscape shiny dark yellow with black apex.

Type Material. HOLOTYPE, *Chaetonerius spinosissimus* m#; Type locality: Malanje, Angola. LABELS: (1, blue label) ANGOLA: Pungo Andongo, A.v. Homeyer (2) 11029 (3, red label) Holotypus (4) *Nerius spinosissimus*, n. sp. Karsch (5) Zool. Mus. Berlin (6) LECTOTYPE m#, *Nerius spinosissimus* Karsch, 1887, Design. by D. Barraclough [ZMHB].

LECTOTYPE, *Chaetonerius brachialis* f#; Type locality: Buea, Cameroun. LABELS: (1) CAMEROUN: Kamerun, Gebirge Bluea, Preuss S. (green label) (2) Type (red label) (3) *Chaetonerius brachialis* Type Enderlein m#, Dr. Enderlein det. 1921 (4) Zool. Mus. Berlin (5) LECTOTYPE f#, *Chaetonerius brachialis* Enderlein, 1922, Design. by D. Barraclough [ZMHB] (designate by Barraclough, 1993a).

LECTOTYPE, *Chaetonerius simillimus* m#; Type locality: Malanje, Angola. LABELS: (1, blue label) ANGOLA: West Africa, Pungo Andongo, A v. Homeyer S. (2, red label) Type (3) *Nerius simillimus*, n. sp. Karsch (4) Zool. Mus. Berlin (5) HOLOTYPE m#, *Nerius simillimus* Karsch, 1887, Design. by D. Barraclough [ZMHB] (designate by Barraclough, 1993a).

Material examined. Ghana. 1m# 1f#, (1) GOLD COAST, Kumasi, 30.xii.1947, J. Bowden, iii.41 (20 NMSA-DIP 29150 [NMSA]. **Cameroun.** 1f#, (1) Rt. N9, 20km E, Sangmelima, 7.xi.1987, FINI KAPLAN (2) SMNH-TAUI 205807 [TAUI]; 1f#, (1) Sud Cameroun, Yaoundé-Nkolbisson, 14 Octobre 1967, Leg. L. Tsacas (2) MUSEUM PARIS (3) *Chaetonerius* sp. d. G. Steyskal'71 [MNHM]; 1f#, (1) Ouest Cameroon, Kounden-Alt. 1200m, 25.Octobre.1967, Leg. L.Tsacas (2) MUSEUM PARIS, Porcherie [MNHN]. **Central African Republic.** 1f#, LA MABOKE, 21.ix.1970, L. MATILE rec. [MNHN]. **Democratic Republic of the Congo.** 1f#, (1) BANDUNDU: WAMBA, 2 km e.Kikongo, Mission 23.iv.06, 4°16'S 17°12'E (2) S. L. Heydon & S. E. Stevenson, malaise along, forest edge [UCDC]; 1f#, (1) COLL. MUS. CONGO, Mongbwalu, 11.ii.1939, Mme Lepersonne (2) *Chaetonerius* f# *brachialis* End, Dr. M. Aczél det. 19 [RMCA]; 1m#, (1) CONGO BELGE, REG. LAC KIVU, BULIRA (2) MUSÉUM PARIS, 1932, G. Babault [MNHN]; 1f#, COLL. MUS. CONGO, Uelé: Bayenga. Terr. Wamba, 810m, 12.xi.1956, R. Castelain [RMCA]; 1f#, (1) Congo Belge: P. N. A. (Parc National Albert), 28.iii.1954, P. Vanschuytbroeck & H. Synave, 7743-47 (2) Secteur

Tshiaberimu, riv. Talia Nord, 2.340m [RMCA]; 1f#, S. L. Edouard: r. Rwindi (1000m) 4.ii.1936, L. Lippens, PARC NAT. ALBERT [RMCA]; 1?, (1) Congo Belge: P. N. A. (Parc National Albert), 7.i.1958, P. Vanschuytbroeck, VS-273 (2) Massif Ruwenzori, Plate Ruwenzori, 1.900m [RMCA]; 1f#, (1) MUSÉE DU CONGO, Lulua: Kapanga, ix.1932, F. G. Overlaet (2) *Chaetonerius* f# *brachialis* End., Dr. M. Aczél det.19 [RMCA]; 1f#, (1) COLL. MUS. CONGO, Rutshuru, 17.iv.36, L. Lippens (2) *Chaetonerius* f# *wittei* Aczél, Dr. M. Aczél det.1 [RMCA]; 1f#, (1) MUSÉE DU CONGO, Lomami: Katombe, 20.xii.1923, Dr. M. Bequaert (2) *Chaetonerius* f# *brachialis* End, Dr. M. Aczél det. 19 [RMCA]. **Uganda.** 1f#, Kampaia, Tank Hill, 1300m.o.h., 14.ii.1970, Hans Gonget leg. [ZMUC]. **Kenya.** 1m#, (1) 1525m Kakamegal Forest, 0°13'N, 34°52'E, 23.ix.2005, L. Gahanama (2) SMNH-TAUI 205636 [TAUI]; 1f#, (1) Bungoma, 6-7.xi.83, A. FREIDBERG (2) SMNH-TAUI 205717 [TAUI]; 3m#, (1) Kabolet, Cherangani Hills, Kenia, 26.Jen.1973, I. BAMPTON (2) NMSA-DIP -71520, 71521, 29822- [NMSA]. **Tanzania.** 1f#, (1) Usambara Mts. Rt. B124, 1300m, near Lushoto, 10-15.ix.1992, A. FREIDBERG (2) SMNH-TAUI 205707 [TAUI]; 2f#, (1) E. Usambara (2) Amani, Sigi, 445m, 05°06'S, 38°39'E, 16.viii.2003, A. FREIDBERG (2) SMNH-TAUI -205655, 205653- [TAUI]; 1f#, Uzungwa Mts. Chita Forest Reserve, 750m, 28.x.1984, M. Stoltze & G. Petersen, Zool. Museum, Copenhagen [ZMUC]; 1f#, Tanzania Uzungwa Mts., Chita Forest Reserve, 1500m, 10.xi.1984, M. Stoltze & G. Petersen, Zool. Museum, Copenhagen [ZMUC]. **Malawi.** 1f#, (1) Center, Ntchisi Forest, 1500-1700m, 17-18.ix.1998, F. KAPLAN & A. FREIDBERG (2) SMNH-TAUI 205657 [TAUI]. **South Africa.** 1f#, (1) Natal, Makaheli For. 2632DD ca. 5km NE Mangusi, 30.xii.1982, Barraclough, Londt & Stuckenberg Forest (2) *Chaetonerius* *perstriatus* m# (Speiser) (3) NATAL MUSEUM, Pietermaritzburg, South Africa [RMCA]; 1f#, Natal, Pietermaritzburg, Montrose J. G. H. Londt, 29°34'35"S, 30°20'40"E, Date: 26.iii.1992, BANANA BAIT (2) *Chaetonerius* *perstriatus* f# (Speiser) (3) NATAL MUSEUM, Pietermaritzburg, South Africa [NMSA].

Distribution. Cameroun, Togo (REF), Central African Republic*, Democratic Republic of the Congo, Uganda*, Kenya*, Angola, Tanzania*, Malawi*, South Africa*.

Comments. The synonymy of *C. spinosissimus* with *C. simillimus* had already been suggested by Barraclough (1992a), however, differences in size and number of spine-like setae in fore femur and fore coxa, did not allow the author to assert his

suspicious due to lack of material. In this work we have re-described it to highlight the combination of characters that lead us to consider it a valid name. Females are generally not easy to identify in *Chaetonerius*, due to the overlapping of many variable characters, but the rings on mid and hind femora of *C. brachialis*, and the position of anterior fronto-orbital seta, have served us to conclude that this species is junior synonym of *C. spinosissimus*.

NEW COMBINATIONS

Steyskal (1980), states that the Afrotropical *Chaetonerius* Hendel is represented in the Oriental Region by five more species, one of which is its type species, *C. inermis* (Schiner), known from China, India Taiwan and Indonesia. The Oriental *C. inermis* (Schiner) is here re-described, based on information by Aczél (1955c) and we confirm that this and *C. comperei* (Cresson) are the only non-Afrotropical species of *Chaetonerius* Hendel so far known. Other Oriental species formerly in *Chaetonerius*, are transferred to its correct generic placement in *Teloneria* Aczél: *T. apicata* (Edwards) (synonymy with *Telostylinus apicalis* Enderlein) and *T. bimaculata* (Edwards) (synonymy with *T. ornatipennis* Enderlein).

Brunetti (1913) described *Nerius obscurus* (fig. 9) from material collected in the Oriental Region. After studying the male holotype of *N. obscurus* and verify that it corresponds with *Gymnonerius fuscus* (Wiedemann), here we propose *N. obscurus* as a junior synonymy of *G. fuscus*. Other specimen of *Teloneria* sp. was labeled posteriorly by Brunetti as type material of *N. obscurus*, but was not published.

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Figures

Figure 1. Male postabdomen dorsal and lateral. A. *Chaetonerius perstriatus* (Speiser); B. *Chaetonerius anemona*, new species; C. *Chaetoneirus latifemur* Enderlein; D. *Chaetonerius apicalis* (Walker).

Figure 2. Male postabdomen dorsal and lateral. A. *Chaetonerius nyassicus* Enderlein; B. *Chaetonerius londti* Barraclough; C. *Chaetoneirus nolae* Barraclough. Taken from Barraclough (1993b).

Figure 3. Species with white pubescent arista, head lateral. A. *Chaetonerius nyassicus* Enderlein; B. *Chaetonerius apicalis* (Walker); C. *Chaetoneirus lobayensis*, new species.

Figure 4. *Chaetonerius claricoxa* Enderlein. A. Thorax lateral; B. Fore femur, male; C. Head lateral; D. Head lateral (specimens determined by Aczél (1954a) as *C. niger* (Czerny).

Figure 5. *Chaetonerius lobayensis*, new species A. Genitalia ventral; B. Genitalia lateral. *Chaetonerius fascipes* (Brunetti); C. Genitalia ventral. D. *Chaetonerius collarti* Aczél Paratype.

Figure 6. Genitalia lateral. A. *Chaetonerius inermis* (Schiner); B. *Chaetonerius madagasikara* Sepúlveda & de Carvalho.

Figure 7. Species with brown arista, head lateral. A. *Chaetonerius anemona*, new species; B. *Chaetonerius perstriatus* (Speiser); C. *Chaetoneirus spinibrachium* Enderlein; D. *Chaetonerius spinosissimus* (Karsch).

Figure 8. A. *Chaetonerius apicalis* (Walker), head lateral; B. *Chaetonerius perstriatus* (Speiser), Holotype C. *fuelleborni* Enderlein, head lateral; *Chaetonerius alluaudi* C. Head lateral; D. Habitus, male; *Chaetonerius latifemur* Enderlein, Holotype E. Head lateral; F. Habitus.

Figure 9. Holotype *Nerius obscurus* Brunetti, 1913.

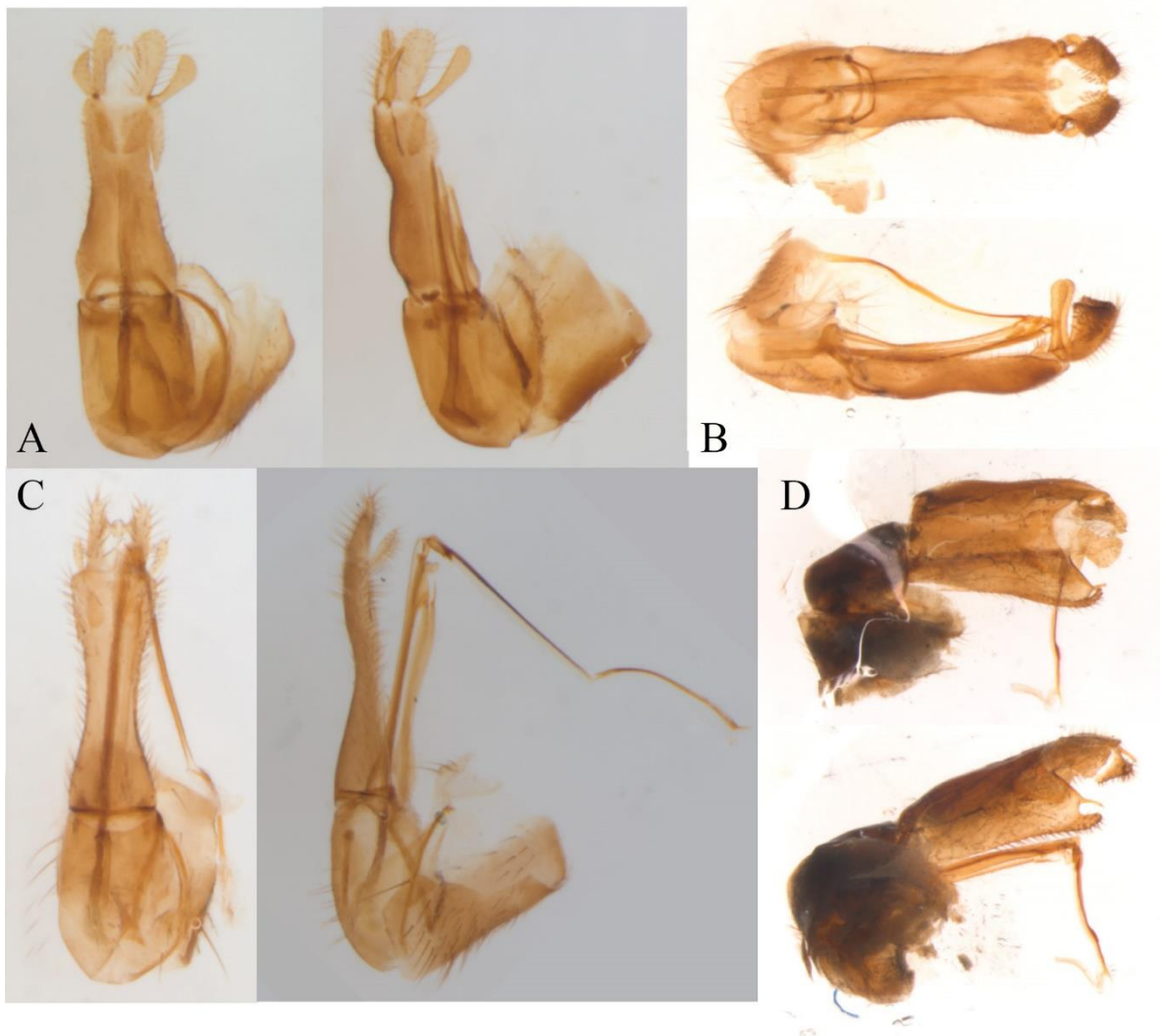


Figure 1. Male postabdomen dorsal and lateral. A. *Chaetoneirus perstriatus* (Speiser); B. *Chaetoneirus anemona*, new species; C. *Chaetoneirus latifemur* Enderlein; D. *Chaetoneirus apicalis* (Walker).

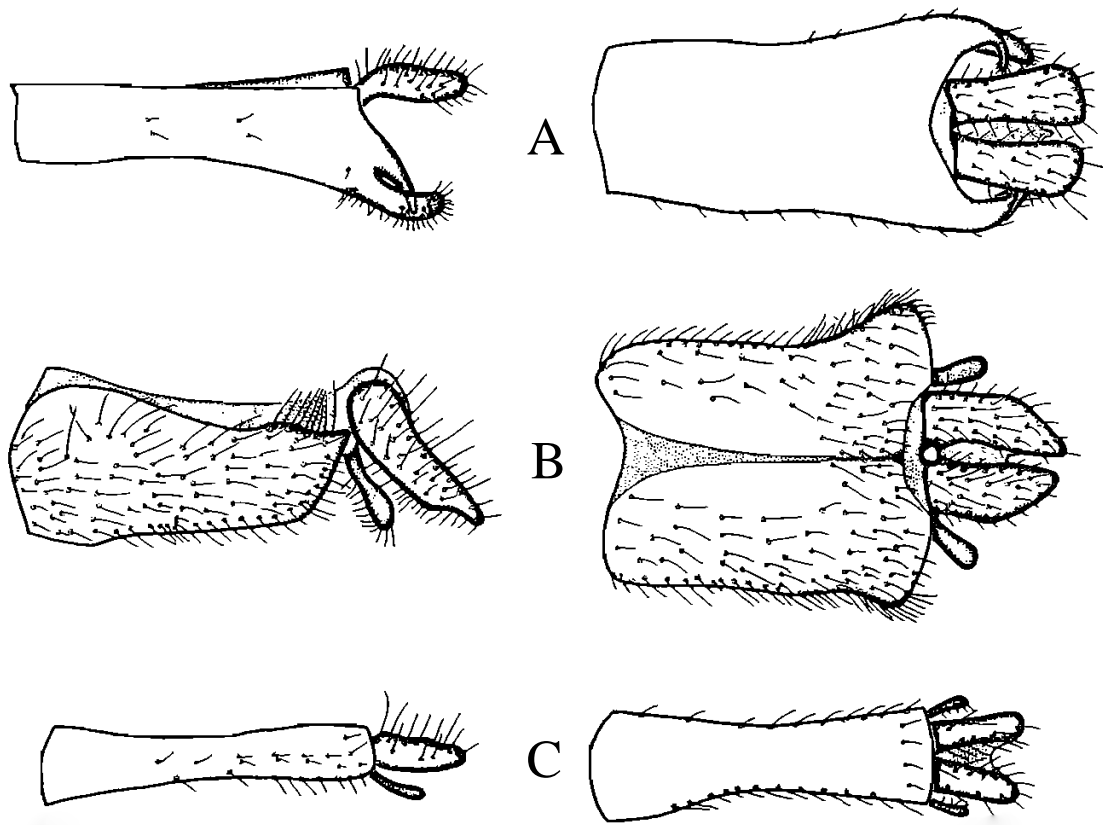


Figure 2. Male postabdomen dorsal and lateral. A. *Chaetoneirus nyassicus* Enderlein; B. *Chaetoneirus londti* Barraclough; C. *Chaetoneirus nolae* Barraclough. Taken from Barraclough (1993b).

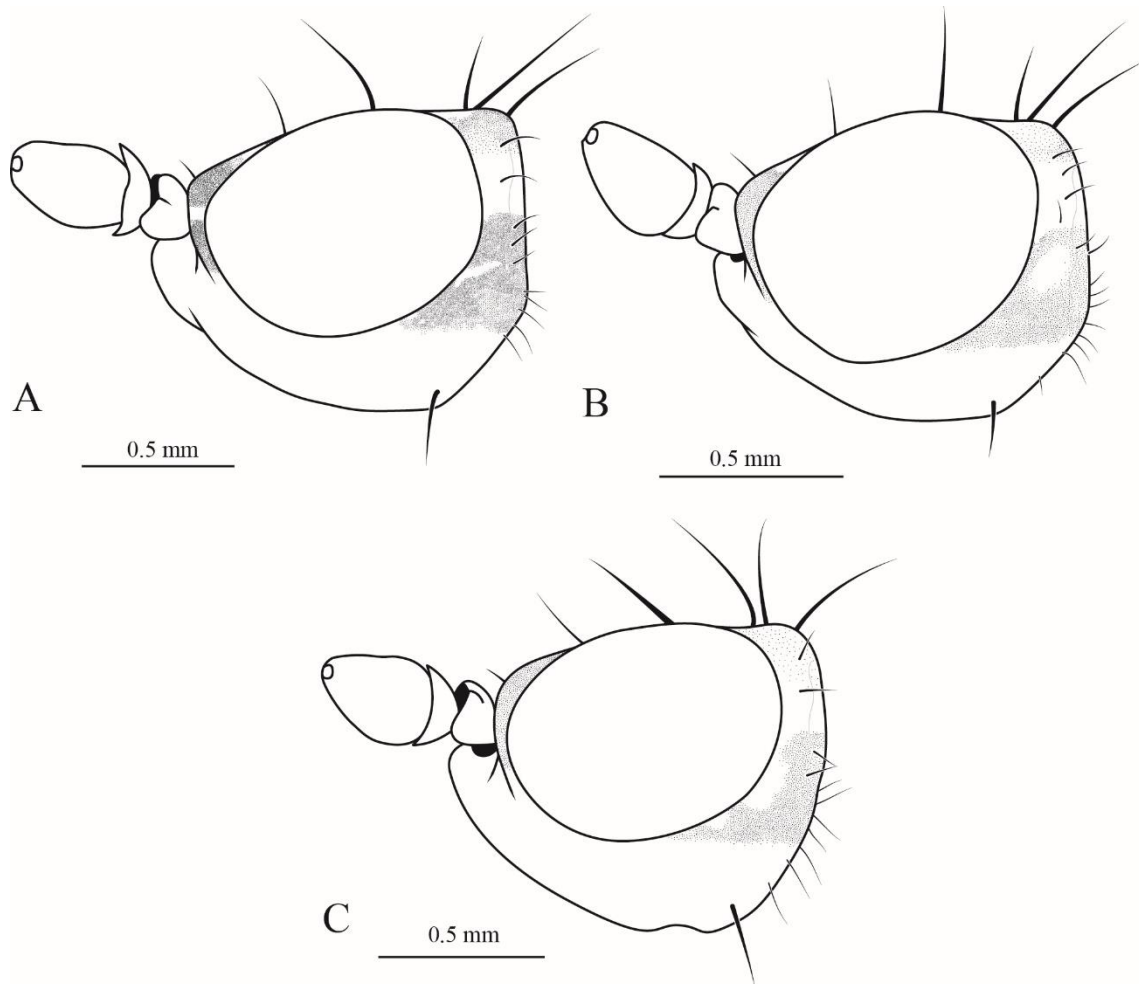


Figure 3. Species with white pubescent arista, head lateral. A. *Chaetoneirus nyassicus* Enderlein; B. *Chaetoneirus apicalis* (Walker); C. *Chaetoneirus lobayensis*, new species.

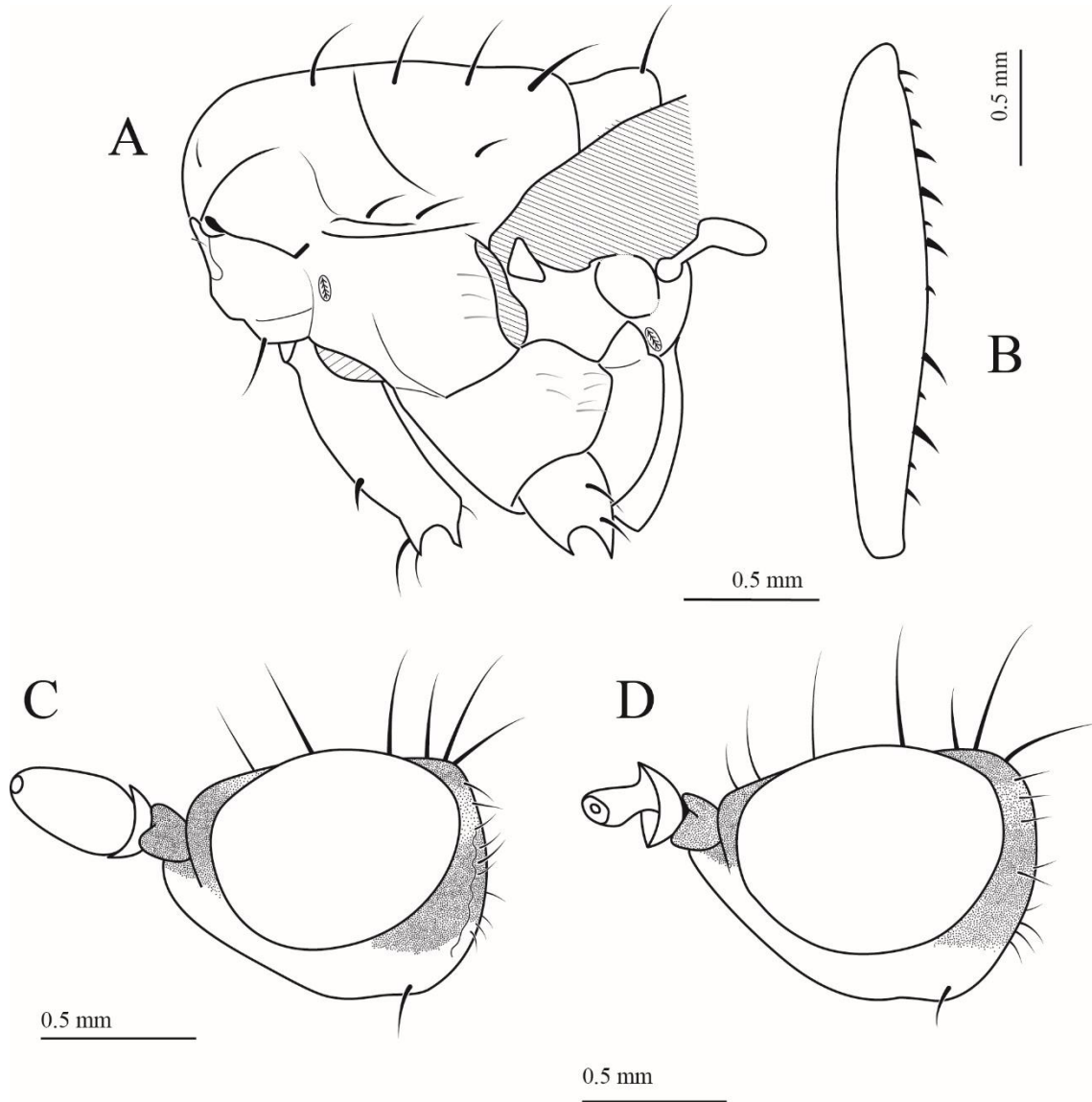


Figure 4. *Chaetonerius claricoxa* Enderlein. A. Thorax lateral; B. Fore femur, male; C. Head lateral; D. Head lateral (specimens determined by Aczél (1954a) as *C. niger* (Czerny)).

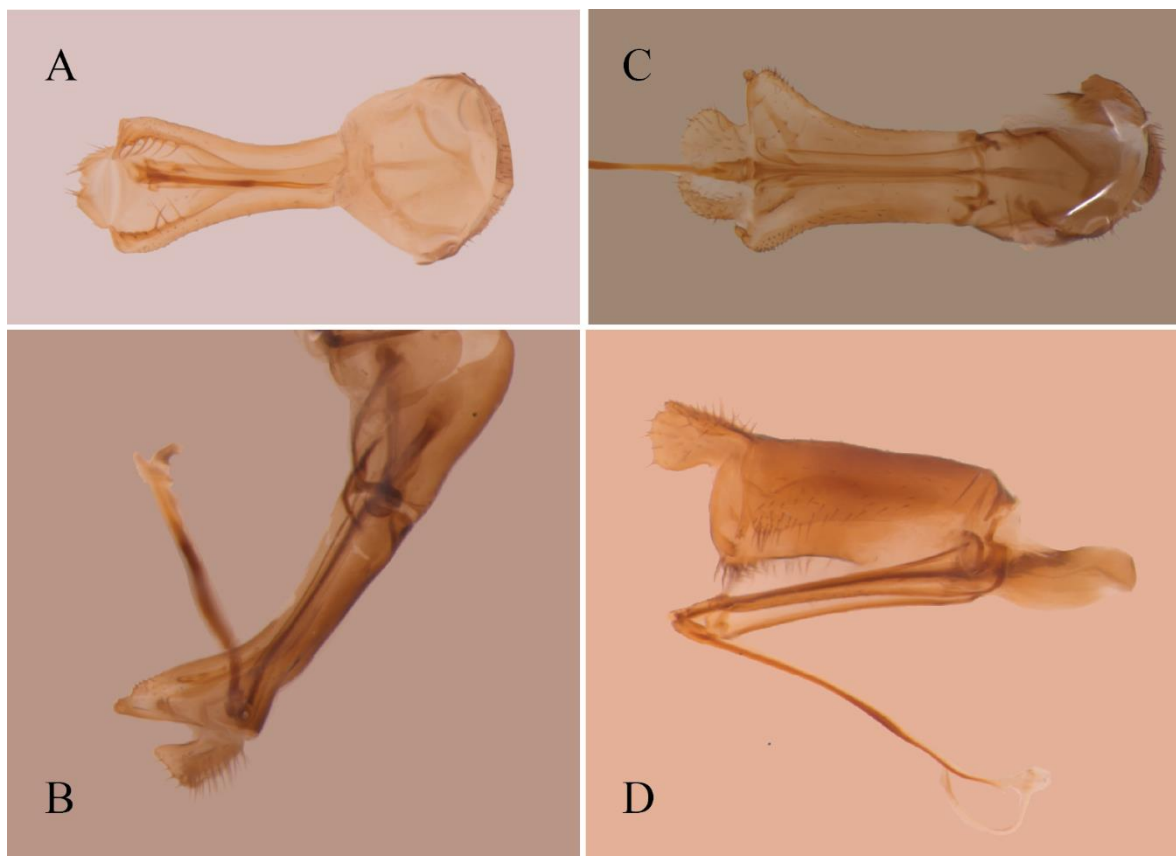


Figure 5. A–B. *Chaetonerius lobayensis*, new species **A.** Genitalia ventral; **B.** Genitalia lateral. **C.** *Chaetonerius fascipes* (Brunetti), genitalia ventral. **D.** *Chaetonerius collarti*, Aczél (Paratype), genitalia lateral.

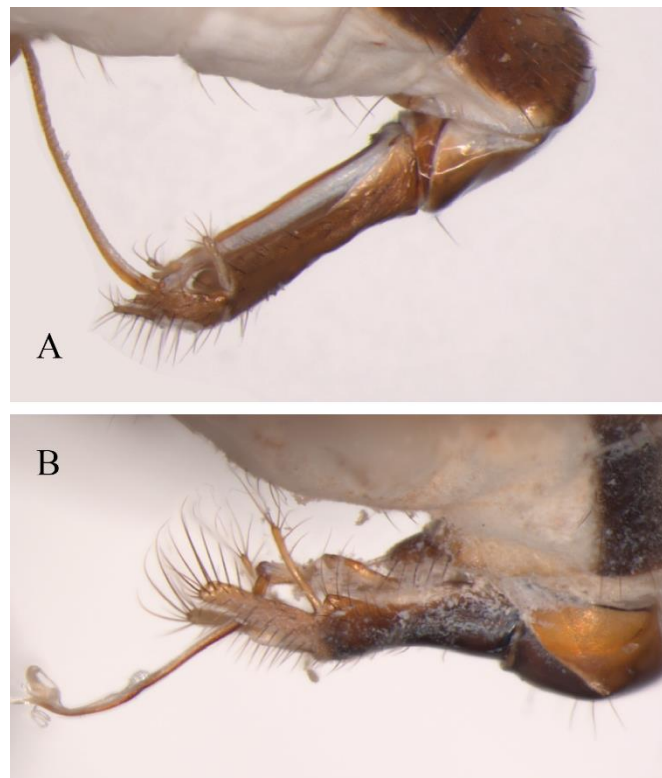


Figure 6. Genitalia lateral. A. *Chaetonerius inermis* (Schiner); B. *Chaetonerius madagasikara* Sepúlveda & de Carvalho.

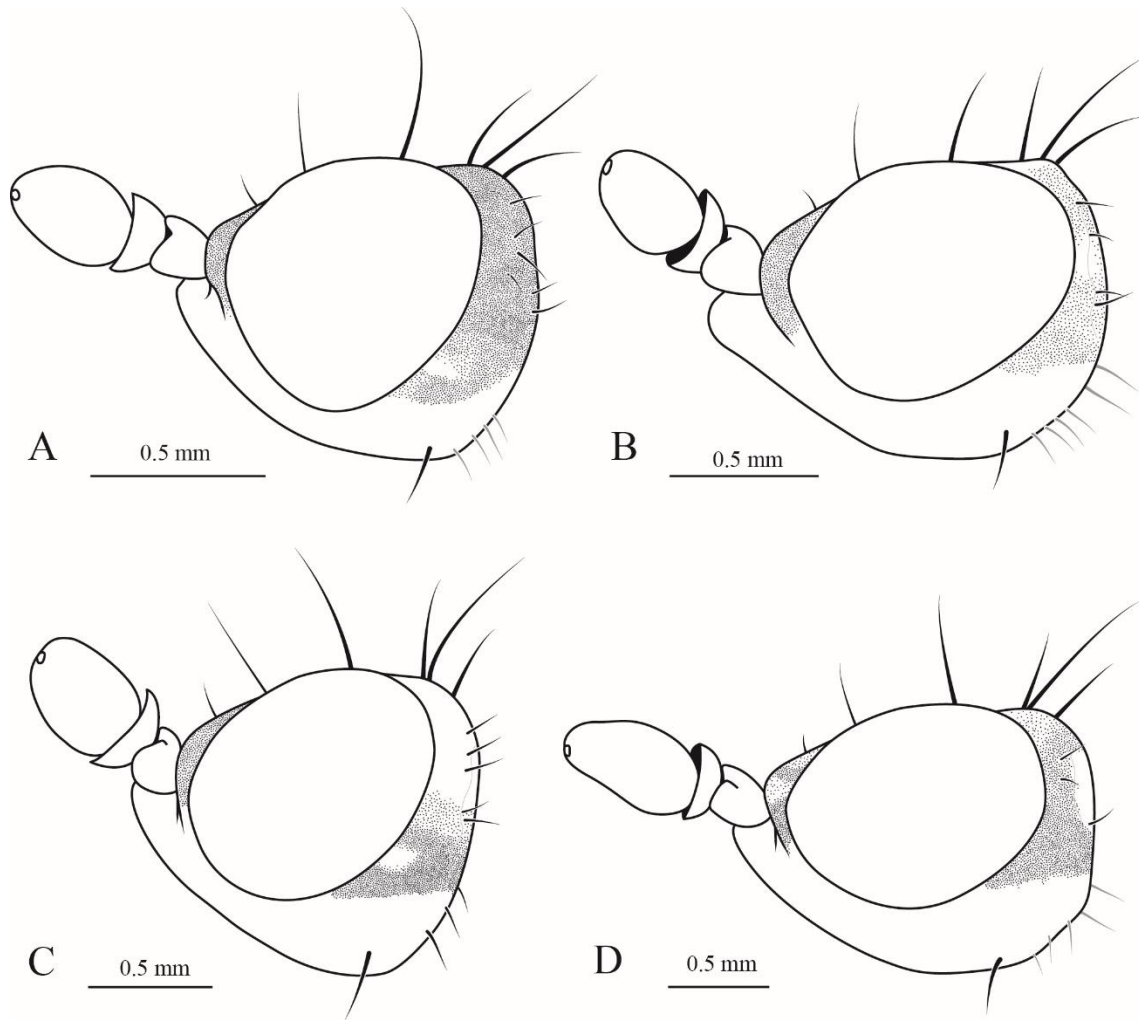


Figure 7. Species with brown arista, head lateral. A. *Chaetoneirus anemona*, new species; B. *Chaetoneirus perstriatus* (Speiser); C. *Chaetoneirus spinibrachium* Enderlein; D. *Chaetoneirus spinosissimus* (Karsch).

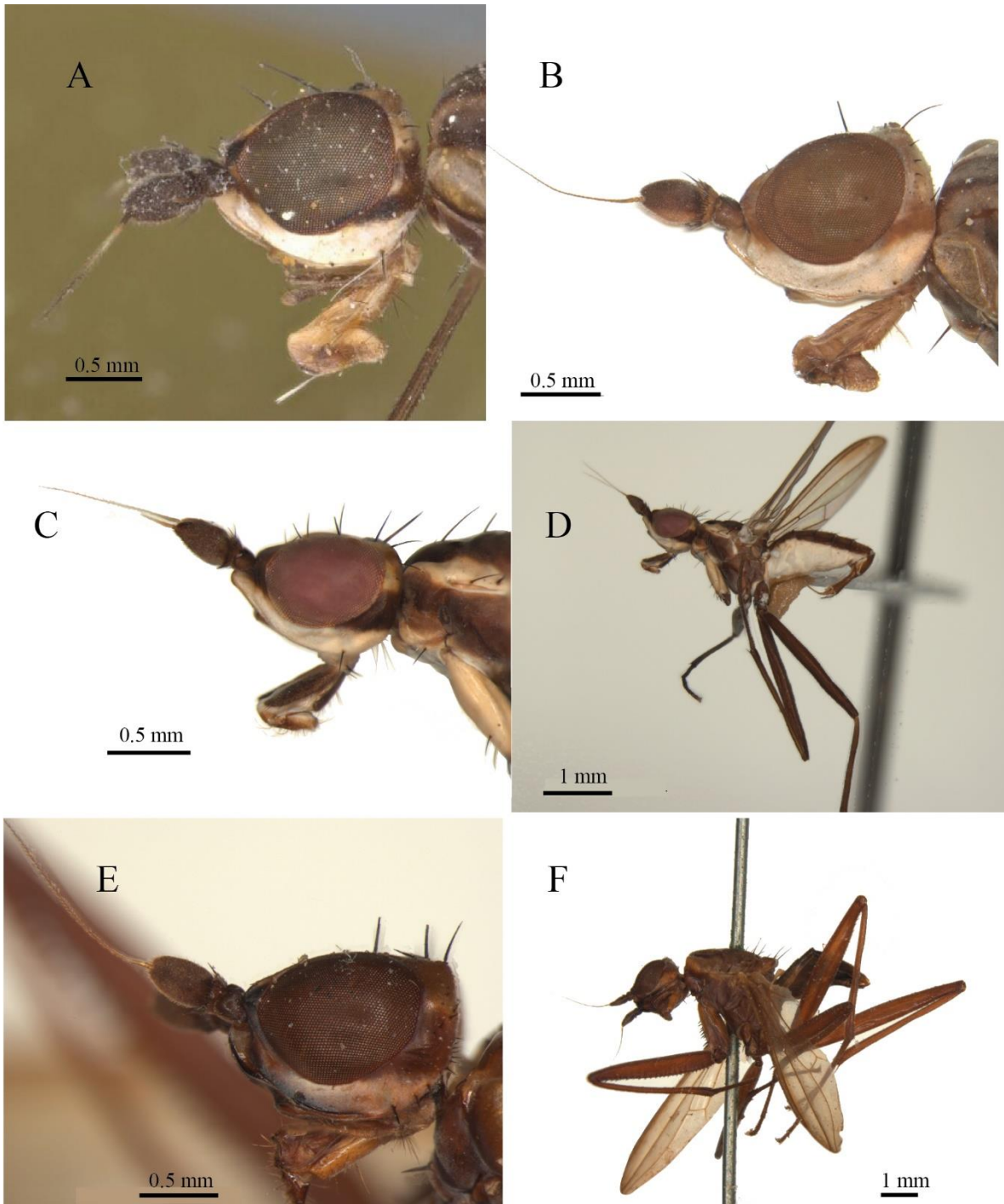


Figure 8. A. *Chaetonerius apicalis* (Walker), head lateral; B. *Chaetonerius perstriatus* (Speiser), Holotype *C. fuelleborni* Enderlein, head lateral; *Chaetonerius alluaudi* C. Head lateral; D. Habitus, male; *Chaetonerius latifemur* Enderlein, Holotype E. Head lateral; F. Habitus.

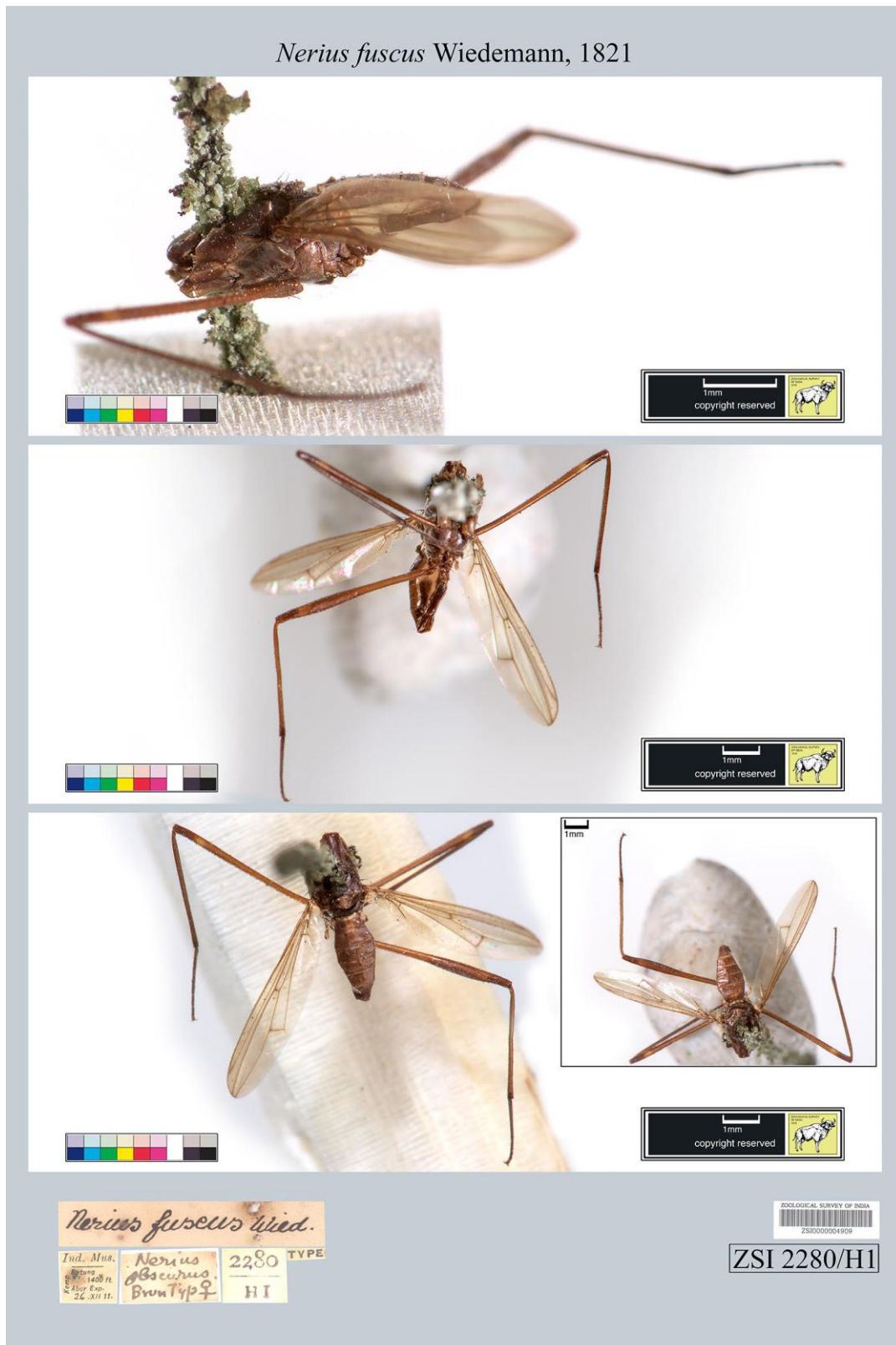


Figure 9. Holotype *Nerius obscurus* Brunetti, 1913.

CHAPTER 4

Taxonomic revision of *Telostylus* Aczél (Diptera, Neriidae)

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Taxonomic revision of *Telostylus* Bigot (Diptera, Neriidae)

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Abstract

Since the description of the genus *Telostylus* for Bigot (1859), only one work by Steyskal (1966), addressed the issue of lack of limits for the genus and tried to organize the information available in an identification key. In the present work, the type material of every species described in *Telostylus* are re-described for the first time, as well as additional material, resulting in a new identification key and new distribution areas. A new combination is proposed for *T. latibrachium* Enderlein as junior synonym for *T. remipes* (Walker). In addition, two new species *T. facsimile*, new species and *T. claroscuro*, new species are described and Lectotype and Paralectotype designations are proposed for *Coenurgia remipes* Walker, *Telostylus trilineatus* de Meijere and *Telostylus babiensis* de Meijere.

Key Words. Asia, Oceania, Neriioidea, taxonomy, new records.

INTRODUCTION

For almost a century, most species of Neriidae were described within the genus *Nerius* Fabricius (1805), with very few exceptions. The first one corresponds to the species *Longina abdominalis* Wiedemann, who decided that this new species of neriid with aberrant antennae could not be in *Nerius* and created the genus *Longina*, which name alludes to its conspicuously elongate antenna. The second case, in which the author was certain to have found a new type of neriid, occurred when Bigot (1859) found a rare specimen from Celebes (Sulawesi, Indonesia), of which he mentions its

close morphological relationship with species of *Nerius* and decides that it is necessary to describe a new genus to include it.

The new genus of Bigot (1859), named *Telostylus*, would include all species with (1) elongated conical first flagellomere (2) arista apical tomentous and (3) pedicel elongated. The new species, named *T. binotatus* by the same author, also possesses yellow frontal-vitta, femora black and tibiae brown, with yellowish wings slightly darkened apically. This unique species of the genus *Telostylus* was not known by Walker (1860), who proposed a new genus for one specimen collected in Makassar (Sulawesi, Indonesia), which he described as new and named *Coenurgia remipes*. The new genus *Coenurgia* was described by Walker based on the same characters mentioned by Bigot (1859), and this last author also made clear the close resemblance of the new species with *Nerius*.

In a later short publication, seeking to correct some inaccuracies from previous works, Bigot (1881) synonymized the two genera by declaring: —“*Mon Telostylus bimaculatus, Leptopodidae? = Coenurgia remipes (Walker), à qui appartient la priorité.*”—. When referring to *Telostylus bimaculatus* as a species of his authorship, we assume that this is a writing error and the species to which Bigot make reference is *T. binotatus*, as this is the only species of *Telostylus* described by the author. Additionally, *T. bimaculatus* was not described until 1919 by F.W. Edwards.

Only until Hennig's review of Neriidae (1937), information on *Telostylus* species was organized and cataloged. This review included a new diagnosis for the genus that increased characters such as the number and size of head and thorax setae and the description of the new species *T. inversus*. Since the declaration of synonymy of *C. remipes* with *T. binotatus*, the former species was listed by all authors as such and was in this last review that Hennig (1937) proposed its revalidation. The list of 11 species proposed by Hennig for this genus has not changed until today, except for the exclusion of *Telostylus apicatus*, Edwards (1919), which has been classified within *Teloneria*.

The type species of the genus, *Telostylus binotatus*, was re-described by Aczél (1955) from one male collected in Borneo. Later, Steyskal (1966), in an attempt to collect and organize the available information on the genus, presents a key for identification of the species of *Telostylus*, based mainly on previous descriptions and also the observation of some types and material housed in the USNM. In this work, Steyskal also warns about the description of *T. binotatus* by Aczél, in which the

distribution records are wrong and probably, as a consequence, the species is poorly identified.

The present work of taxonomic revision, seeks to revert this situation and present re-descriptions of all the valid species for this charismatic genus, as well as illustrations and distribution data, together with an identification key that allows to increase in an effective way, the time and precision in the determination of species of Neriidae from Oriental and Australian Regions.

MATERIAL AND METHODS

This study is based on material kindly sent in loan or photographed by curators and staff from the following institutions: – CSCA. California State Collection of Arthropods, Sacramento, California, U.S.A. (Stephen Gaimari); – MZH. Finnish Museum of Natural History, Helsinki, Finland (MSc. Jere Kahanpää); – MZLU. Sweden, Lund, Lund University (Rune Bygebjerg); – NHMUK. The Natural History Museum, London, United Kingdom (Daniel Withmore); – SDEI. Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (Frank Menzel) – TAUJ. Tel Aviv University, Tel Aviv, Israel (Amnon Freidberg); – UCDC. University of California, R.M. Bohart Museum of Entomology, Davis, California, U.S.A. (Steven L. Heydon); – USNM. National Museum of Natural History, Washington D.C., U.S.A. (Allen Norrbom); – ZMAN. Universiteit van Amsterdam, Instituut voor Taxonomische Zoologie, Zoologisch Museum, Amsterdam, Netherlands (Pasquale Ciliberti); – ZMHB. Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (Joachim Ziegler); – ZMUC. University of Copenhagen, Zoological Museum, Denmark, Copenhagen (Thomas Pape); – ZSM. Zoologische Staatssammlung, Munich, Germany (Marion Kotrba).

The type material of all the species of *Telostylus* Bigot was examined. Label information is provided for every specimen examined, with more than one label indicated by the number in parenthesis. When labels share the same information, except for small differences like collecting date or museum catalogue number, all data are included together into an m-dash, separated by comma. The depository institution is presented in brackets. Localities followed by asterisk (*), represent new records.

TAXONOMY

Telostylus Bigot

Telostylus Bigot, 1859: 307. Type-species: *Telostylus binotatus* Bigot, 1859 (monotypy).

Coenurgia Walker, 1860: 164. Type-species: *Coenurgia remipes* Walker, 1860 (monotypy). Synonymy with *Telostylus* by Bigot 1881: 374.

Diagnosis. Very long and thin legs; glossy tegument and startling coloring patterns. Head elongated anteriorly, with first flagellomere lanceolate and arista apical, densely white pubescent; small antennal base; fronto-orbital plate with one posterior seta; occiput widely rounded laterally; fronto-genal suture attached anteriorly to ventral line of the parafacial, leaving a shiny portion of the subgena exposed below the insertion of scape; a small portion of face exposed in lateral view, in front of subgena; no vibrissa; transverse suture complete; one dorsocentral seta, one notopleural seta and no katapisternal seta; one pair of antero-apical setae on fore coxa and two lateral seta on mid and hind coxae

Morphology. Medium-sized species with long setae. Tegument shiny with startling colors. The general morphology of *Telostylus* is differentiated from species in other genera by its pale colors with patterns of contrasting spots. These spots are the main sources of rapid characters to assist in the determination of species in the genus. The shape of antennal base of *Telostylus* corresponds to the same pattern present in the *Telostylinus* with smaller size. Like most genera of Neriidae, the *Telostylus* present uniform genitalia, with epandrium short cylindrical and surstylus linear, positioned adjacent to cercus. The sexual dimorphism in species of this genus is manifested by the fore basitarsomere swollen in males and cylindrical on females. Some species of the genus exhibit strong similarity with darker species of *Teloneria*, however, the main generic states of characters remain the evident.

Head. Tegument shiny. Head strongly acuminate anteriorly and rounded posteriorly. Scape relatively short, almost as long as wide; pedicel almost same length as scape, with one dorso-apical and one ventro-apical prominent setae, inner process of pedicel wide linear with apex widely rounded and positioned dorsally; first flagellomere lanceolate; arista white and densely pubescent, inserted apically. Antennal base small, measures approximately two thirds of the length of scape. Anterior and middle fronto-orbital setae absent; posterior fronto-orbital seta almost as long as inner vertical seta;

frontal-vitta yellow with black spot on anterior margin, adjacent to antennal base; longitudinal median cleft and anterior margin concave. Face projects anteriorly between the antennal bases and expands into anterior margin of parafacial. Parafacial black opaque, forming a black spot anteriorly between antennal base and anterior margin of fronto-orbital plate; parafacial and frontal-vitta are the most opaque parts of the head and join dorsally without any differentiating mark or carina, unlike other genera in the family. Fronto-genal suture joins anteriorly to the ventral line of antennal base, leaving a wide shiny portion of subgena exposed below the insertion of scape; small portion of face exposed in lateral view surpassing subgena anteriorly. No vibrissa. Occiput shiny, very short with respect to the eye; without any postocular seta or setulae; dorsal margin below level of vertex. Gena wide posteriorly and very narrow anteriorly, reaching its narrowest level near anteroventral margin of the eye. Postgena widely rounded, with no evident separation from lateral occiput and one prominent line of black setulae posteriorly.

Thorax. One dorsocentral pre-scutellar seta. Postpronotal ring elongate; one thin postpronotal seta. Anterior notopleural seta absent. Transverse suture complete dorsally; presutural and postsutural scutum with same length. Katepisternal seta absent. Katatergite slightly swollen. Scutellum with triangular appearance and rounded margins; one scutellar apical spine-like seta longer than dorsocentral seta; one short and hair-like laterodorsal seta. Fore coxa swollen at base, with two antero-apical spine-like setae and no prominent anterolateral setae; mid and hind coxae with two lateral spine-like setae.

Legs Male fore basitarsomere oblong, measures approximately two thirds of the length of thorax; varies from very thin cylindrical, slightly swollen or very swollen, without any pattern; always cylindrical in females.

Abdomen. Yellowish-brown to dark brown, with no yellow lines dorsally. Sternite 6 protruding, shaped like a cap and a posterior line of relatively long black setae. Syntergite 1+2 setulose, with short and dense setae on anterior half, followed by a medial bare area and long setae in lower density posteriorly. Epandrium cylindrical, measures approximately 1.5-2x the width of syntergite 7+8; positioned adjacent to cercus; cercus lanceolate.

Key for the identification of *Telostylus* Bigot

- 1 Pleura brown (fig. 6A). Occiput brown or with median yellow stripe (fig. 4A). Frontal-vitta mainly black, with at least one yellow round spot anteriorly (4B) ... 2
- 1' Pleura yellow or with brown to black spots (figs. 5C, 5G). Occiput yellow with ventral or dorsal dark to black spot laterally (fig. 2B). Fronta-vitta mainly yellow with diverse shapes of black spots ... 4
- 2 (1) Fronto-orbital plate yellow (fig. 6B). Occiput with one median yellow stripe. Pleura dorsally with diffuse yellow stripe, from postpronotal lobe to mediotergite. Scutum dorsally with two longitudinal stripes of gray pruinescence (fig. 6B). Femora mostly brown ... *T. inversus* Hennig
- 2' Fronto-orbital plate brown to dark brown (fig. 4B). Occiput completely brown. Pleura with no yellow stripe. Thorax dorsally shiny, without any pruinose stripe. Femora partially to mostly yellow (fig. 6D) ... 3
- 3 (2') Femora with basal third yellow (fig. 5E). Anterior margin of frons widely rounded, almost straight (fig. 5F) ... *T. claroscuro*, new species
- 3' Femora yellow with black tip and one brown ring on distal third (fig. 6C). Anterior margin of frons narrow medially, slightly projected between antennal bases (fig. 6D) ... *T. niger* Bezzi
- 4 (1') Vertex mostly yellow, except for ocellar triangle black and behind it, also black, a narrow black stripe that ends between postocellar setae (fig. 3B). Occiput with laterodorsal and lateroventral brown stripes (fig. 3A) ... *T. maccus* Osten Sacken
- 4' Vertex and ocellar triangle black (fig. 2B). Occiput mostly yellow, with only one narrow lateroventral round black spot (fig. 2C) ... 5
- 5 (4') Pleura yellow with one katepisternal anteroventral dark brown to black spot (fig. 5A). Femora with distal third brown or with wide brown ring. Scutellum dorsally with well-defined and wide yellow stripe (fig. 5B) ... 6
- 5' Pleura yellow (fig. 5G). Femora with one incomplete brown ring on distal third. Scutellum dorsally, if with median yellow stripe, it is diffuse (fig. 5H) ... 7
- 6 (5) Supra-alar black spot diffuse to absent (fig. 5B). Fore femur with black tip and wide brown ring on distal third (fig. 5A) ... *T. binotatus* Bigot
- 6' Postsutural scutum with supra-alar square black spot (fig. 6H). Fore femur with black tip and diffuse to absent rings (fig. 6G) ... *T. trilineatus* de Meijere

7 (5') Black spot on vertex and ocellar triangle, trespass the postocellar setae and narrows posteriorly towards occipital foramen (fig. 5D). Black spot above proepisternal lobe absent (fig. 5C) ... *T. babiensis* de Meijere

7' Black spot on vertex and ocellar triangle pentagonal, ends in a straight line between postocellar setae (fig. 2C). Presutural scutum dorsally with black spot above postpronotal lobe (fig. 5H) ... *T. facsimile*, new species

***Telostylus binotatus* Bigot**

Figures 5A, 5B.

Telostylus binotatus Bigot, 1859: 307.

Head. Mostly yellow, with some dark and pruinose areas. Scape and pedicel yellow. Frontal-vitta with black small area medially, joining the dark anterior half of fronto-orbital plate and a second black area with pentagonal shape surrounding ocellar triangle; posterior fronto-orbital seta slightly shorter than inner vertical seta. Occiput yellow and shiny, with narrow lateromedial round black spot.

Thorax. Completely shiny; dorsally yellow with black presutural spot medially above humeral lobe and blackish yellow postsuturally, being paler yellow over dorsocentral line; pleura yellow with katepisternal anteroventral black spot and proepistenum brown ventrally. Coxae same color as pleura. Wing with one dark macula on apical third.

Legs. Femora yellow with brown tip and one diffuse brown ring on distal third; fore femur with short spine-like anteroventral setae on distal half; mid and hind femora with black tip and one incomplete and inconspicuous ring on distal third. Tibiae brown; fore tibia with no spine-like setae posteriorly.

Abdomen. Shiny dark brown. Sintergite 7+8 yellow, measures two thirds of the length of epandrium; epandrium cylindrical, same color as syntergite 7+8; surstylus linear and short, measures half the length of cercus; cercus measures approximately one third of the length of epandrium.

Variation. Body length approximately 5.1–6.2 mm. Wing length 4.6–5.3 mm and width 1.1–1.5 mm. Femora with wide and well-defined rings on distal third, being wider on hind femur; fore femur with no spine-like setae.

Female. Body length approximately 4.5–5.7 mm. Fore femur with no anteroventral spine-like setae. Oviscape yellow, darkening dorsally and dark brown tip.

Type material. SYNTYPE (not examined, lost) *Telostylus binotatus* f#; Type locality: Indonesia, Sulawesi. [MNHN].

Material examined. Thailand. 4m# 1f#, NW: Soppong, 5kmSE, 26.x.2002, A. FREIDBERG (2) SMNH-TAUI –205925, 205924, 205923, 205921, 205922– [TAUI].

Distribution. Thailand, Malaysia (Pen), Indonesia (Borneo, Sulawesi, Sumatra)

Comments. We had no access to type material of this species, which is lost, and instead, re-description by Aczél (1955c) is used to identify this species.

Telostylus babiensis de Meijere

Figures 5C, 5D.

Telostylus babiensis de Meijere, 1915: 37.

Head. Mainly yellow, with some dark and pruinulent areas. Scape and pedicel yellow. Frontal-vitta yellow with triangular black spot surrounding ocellar tubercle; posterior fronto-orbital seta slightly shorter than inner vertical seta. Occiput shiny and yellow, with narrow lateromedial round black spot.

Thorax. Completely shiny; dorsally yellow with one wide black postsutural spot anteriorly; pleura yellowish. Coxae same color as pleura.

Legs. Femora yellow with brown tip and diffuse brown ring on distal third; fore femur with short outstanding anteroventral setae. Tibiae darker than femora; fore tibia with strong and short setae posteriorly.

Abdomen. Shiny dark brown. Sintergite 7+8 brown, measures two thirds of the length of epandrium; epandrium cylindrical, same color as syntergite 7+8; surstylus linear and short, measures half the length of cercus; cercus measures approximately one third of the length of epandrium.

Variation. Body length 6.1–6.8 mm. Wing length 5.1 mm and width 1.5 mm. Dark macula of wing, varies from dark to pale and inconspicuous. Abdomen black or with yellow lateral margin.

Female. Body length 4.7 mm. Fore femur with no outstanding anteroventral setae. Tibia with no outstanding setae posteriorly. Oviscape brown.

Femur anterior sin setas anteroventrales destacadas. Tibia sin setas destacadas posteriormente. Oviscapo café.

Type material. LECTOTYPE (here designated), *Telostylus babiensis* m#; Type-locality: Malaysia (Babi Besar Is.) LABELS: Edw. Jacobson, Pulu Babi.Slm,

3um.4.1913. **PARALECTOTYPE**, 1?; Type locality: Indonesia (Simeulue Is.) [RMNH] (not examined).

Material examined. Philippines. 4m#, (1) Palawan, Mantalingajan, Pinigisan, 600 meter, 28.sept.1961, Noona Dan Exp. 61-62 (2) Caught in Malaise-traps outside forest [ZMUC]. **Papua New Guinea.** 1f#, NEW BRITAIN, Keravat, 22-30.vii.1965, R. W. Crosskey [NHMUK].

Distribution. Taiwan, Malaysia, Indonesia (Simeulue Is., Java), Philippines*, Papua New Guinea*.

***Telostylus claroscuro*, new species**

Figures 4A, 4B, 5E, 5F.

Body length 4.7 mm. Wing length 3.7–4.0 mm and width 1.0–1.2 mm.

Head. Round, not elongate anteriorly; mostly brown, with yellow scape and pedicel, gena and a part of vitta-frontal. Anterior margin of the frons wide and only slightly concave. Frontal-vitta yellow on anterior half and around ocellar triangle. Fronto-orbital plate brown and shiny. Occiput completely brown and gena posteriorly. Subgena black below the insertion of scape.

Thorax. Brown sub-shiny, slightly pruinose dorsally. Fore coxa yellow; mid and hind coxae brown. Wing dark macula with diffuse borders on apical third.

Legs. Femora brown with base and apex yellow; fore femur with only several weak and short anteroventral spine-like setae on distal half. Tibiae brown; fore tibia with no spine-like setae posteriorly.

Abdomen. Blackish-brown shiny. Epandrium cylindrical, between 1.5–2X longer than synterguito 7+8; syrstylus linear and short, measures less than half the length of cercus; cercus measures approximately two thirds of the length of epandrium.

Female. Body length 4.1 mm. Macula on apical third of wing hardly evident. Fore femur with no outstanding anteroventral setae. Tibia with no outstanding setae posteriorly. Oviscape brown.

Type material. HOLOTYPE, *Telostylus claroscuro*, new species m#: (1) SARAWAK: 4th Div. Niah, 9-17.x. 1976, 3.49°N, 113.46°E, P. S. Cranston, B. M. 1977-19 (2) ex. rotting fruit [NHMUK]. **PARATYPES**: 1f#, SUMATRA: Sibolangit forest, 3.vi.1985, J.W. Ismay, BM 1986-283 [NHMUK, 1868]; 1m#, Philippines, Palawan, Mantalingajan, Pinigisan, 600 meter, 7.sept.1961, Noona Dan Exp. 61-62 [ZMUC].

Etymology. The species is named with the composed word *claroscuro* in allusion to its contrasting color on frontal-vitta and femora.

Distribution. Malaysia, Philippines, Indonesia.

***Telostylus facsimile*, new species**

Figures 2A, 2B, 2C, 5G, 5H.

Head. Mainly yellow, with some dark and pruinose areas. Scape and pedicel yellow. Frontal-vitta yellow, with medial black areas accompanying the dark anterior half of fronto-orbital plate and pentagonal shaped black spot that surrounds the ocellar triangle. Occiput shiny and yellow, with narrow round black spot ventrally.

Thorax. Completely shiny; dorsally yellow with black presutural spot medially above postpronotal lobe; pleura yellow and paler than the rest of thorax. Proepistenum brown ventrally. Coxae same color as pleura. Wing with dark macula on apical third.

Legs. Femora yellow; fore femur brown on distal third, darkening towards apex and with short spine-like anteroventral setae; mid and hind femora with black tip and one incomplete ring on distal third. Tibiae darker than femora; fore tibia without spine-like setae posteriorly.

Abdomen. Shiny dark brown. Sintergite 7+8 yellow, measures two thirds of the length of epandrium; epandrium cylindrical, same color as syntergite 7+8; surstylus linear and short, measures half the length of cercus; cercus measures approximately one third of the length of epandrium.

Variation. Body length approximately 3.9–6.3 mm. Wing length 3.4–5.9 mm and width 0.9–1.5 mm. Presutural black spot on thorax may be longer or shorter. Fore femur may be brown the entire distal third and in some individuals this brown area is reduced to an incomplete ring equal to that of the other femora.

Female. Body length approximately 4.9–6.2 mm. Fore femur without anteroventral spine-like setae. Oviscape yellow with two dorsomedial brown stripes and dark brown tip.

Type material. **HOLOTYPE**, *Telostylus facsimile*, new species m#: BORNEO: SARAWAK, sw. Gunung Buda, 64km s. Limbang, 4°13'N, 114°56'E, 22-28.xi.1996 MT, S. L. Heydon & S. Fung [NHMUK]. **PARATYPES**, **Malaysia**. 3m# 5f#, same data as Holotype, except —8-15.xi; 16-21.xi; 23.xi; november.— [UCDC]; 1m# 2f#, MALAYSIA: Selangor, Ulu Gombak, 800ft, 10.xi.1983, J.W. Ismay, BM 1986-283 [NHMUK]; 2m# 1f#, (1) Georgetown, Botanic Gdns. 3.1.1973 (2) W. MALAYSIA:

Penang, A. E. Stubbs, BMNH 1974-87 [NHMUK]; 1m# 1f#, SUMATRA: Sibolangit, forest, 3.vi.1985, J.W. Ismay, BM 1986-283 [NHMUK]; 2m#, (1) SARAWAK: 4th Div. Niah, 9-17.x. 1976, 3.49'N, 113.46'E, P. S. Cranston, B. M. 1977-19 (2) malaise in primary forest [NHMUK]; 1f#, (1) SARAWAK: 1st. Div. Semongoh For. Res., 1.25'N, 110.17'E, 15-19.xi.1976, P. S. Cranston, B. M. 1977-19 (2) malayse over stream [NHMUK]. **Singapore.** 1m# 1f#, (1) Bukit Timah Nature Res. 20.xii.1972 (2) MALAYSIA, Singapore Is., A. E. Stubbs, BMNH 1974-87 [NHMUK].

Etylology. Named form the Latin phrase “*fac simile*”, that means “*do something similar*”, by the outstanding resemblance of this species with *T. binotatus* Bigot.

Distribution. Malaysia, Singapore.

***Telostylus inversus* Hennig**

Figures 6A, 6B.

Telostylus inversus Hennig, 1937: 269.

Head. Round, not elongate anteriorly; mostly dark brown with fronto-orbital plate yellow, anterior part of frontal-vitta, gena and median occiput; antenna brownish-black. Occiput very narrow.

Thorax. Mostly brown, with two longitudinal stripes of gray pruinose dorsally and pleura dorsally slightly pruinose, with yellow stripe diffuse between proepisternal lobe and mediotergite. Lateral scutellar seta long, measuring half the size of apical scutellar seta. Fore coxa brown, with one anterolateral spine-like seta; mid and hind coxae brown.

Legs. Femora completely brown; fore femur with long anteroventral spine-like setae on distal two thirds. Tibiae yellow; fore tibia widens distally; fore tibia posteriorly, with strong and short setae densely distributed and a line of six spine-like latero-apical setae.

Abdomen. Blackish brown sub-shiny. Epandrium cylindrical, between 1.5–2X longer than synterguito 7+8; surstylus linear and short, measures slightly more than half the length of cercus; cercus lanceolate, measures approximately half of the length of epandrium.

Variation. Body length 4.8–5.6 mm. Wing length 4.4–5.0 mm and width 1.2–1.3 mm. Dorsal lines of gray pruinescence on thorax, fuse in one very wide stripe that occupies almost the entire postsutural scutum. Fore coxa without antero-lateral setae.

Female. Body length 4.5–5.0 mm. Fore femur with no prominent anteroventral setae. Occiput posteriorly, covered by gray pruinescence. Tibia with no prominent setae posteriorly. Fore coxa pale brown, almost yellow. Oviscape brown.

Type material. HOLOTYPE, *Telostylus inversus* m#; Type-locality: Thailand, Talum. LABELS: Siam, Talum, 21.i.02, H. C. Robonson u. N. Annandale leg. [NHMUK].

Material examined. Philippines. 3m# 1f#, (1) Masbate, Mobo-Mapuyo. 2-5.ix.1980, T. Boromeo & R. I. Vane-Wright, B. M. 1980-458 (2) Mt. Oac., 400-500m [NHMUK].

Distribution. Thailand, Philippines*.

Telostylus niger Bezzi

Figures 6C, 6D.

Telostylus niger Bezzi, 1913: 329.

Body length 5.3 mm. Wing length 4.5–4.7 mm and width 1.2–1.3 mm

Head. Round, not elongate anteriorly; mostly brown, yellow on scape and pedicel, gena and a part of frontal-vitta. Anterior margin of frons wide and slightly concave. Vitta-frontal with yellow spot on anterior third. Fronto-orbital plate brown and shiny. Protruding Ocellar triangle protruding, while vertex remains at level of occiput dorsally. Occiput completely brown and gena posteriorly. Subgena black below the insertion of scape.

Thorax. Brown sub-shiny, slightly pruinose dorsally. Fore coxa yellow, mid and hind coxae brown. Wing dark macula with diffuse borders on apical third.

Legs. Femora yellow with brown tip and diffuse brown ring on distal third; fore femur with no anteroventral spine-like setae. Tibiae yellow; fore tibia widens distally; fore tibia with strong and short setae densely distributed posteriorly and line of six latero-apical spine-like setae.

Abdomen. Blackish-brown shiny. Epandrium cylindrical, between 1.5–2X longer than synterguito 7+8; surstylus linear and short, measures less than half the length of cercus; cercus measures approximately two thirds of the length of epandrium.

Female. Body length 4.9–5.5 mm. Fore tibia and basitarsomere not swollen. Fore tibia with no spine-like setae posteriorly. Oviscape blackish-brown shiny.

Type material. LECTOTYPE, *Telostylus niger* f#; Type-locality: Philippines, Luzon. LABELS: (1) Mt. Makiling, PI/Baker (2) 5264, *Tylostylus niger* n. [MSNM] (Designated by Delfinado 1969: 168).

Material examined. Philippines. 1m# 3f#, Tawi-Tawi, Tarawakan, north of Batu Batu, -5, 22-.oct.1961, Noona Dan Exp. 61-62 [ZMUC].

Distribution. Philippines (Luzon, Tawi-Tawi).

***Telostylus maccus* Osten Sacken**

Figures 3A, 3B, 6E, 6F.

Telostylus maccus Osten Sacken, 1882b: 207.

Telostylus philippinensis Cresson, 1926: 258. **New synonymy.**

Telostylus decemnotatus Hendel, 1913: 84. **New synonymy.**

Head. Mainly yellow, with some dark and pruinose areas. Scape and pedicel yellow, darkened dorsally. Frontal-vitta almost completely yellow, except small anterolateral black spot; anterior third of fronto-orbital plate shiny and darkened; posterior fronto-orbital seta shorter inner vertical seta. Vertex yellow pruinose; ocellar tubercle black and behind it, a black linear spot reaching the postocellar seta; occiput laterally brown with wide median yellow stripe.

Thorax. Completely shiny; dorsally yellow with black spot medially on presutural scutum above the humeral lobe, continuing narrow dorsocentrally almost to reach the transverse suture; square postsutural black spot occupies almost all lateral half; pleura almost completely yellow, except for black proepisternum. Coxae same color as pleura.

Legs. Femora yellow with no rings, only dark brown tip; fore femur with short spine-like anteroventral setae. Tibiae darker than femora.

Abdomen. Brownish-yellow with irregular darker areas. Syntergite 7+8 and epandrium sub-shiny yellow; sintergite 7+8 measures slightly more than half the length of epandrium; epandrium cylindrical and narrow; surstylus linear and short, measures half the length of cercus; cercus measures approximately one third of the length of epandrium.

Variation. Body length approximately 4.4–5.6 mm. Wing length 3.6–4.4 mm and width 1.0–1.4 mm. Thorax and abdomen exhibit different tones of yellow.

Female. Body length approximately 4.8–5.5 mm. Fore femur with no anteroventral setae. Oviscape completely yellow.

Type material. HOLOTYPE, *Telostylus maccus* f#; Type locality: Luzon, Philippines. LABELS: (1) Bataan, Limay P9 (2) RCMcGregor, Collector (3, red label) TYPE, *Telostylus maccus*, Osten Sacken (4, red label) Type No. 29456 U.S.N.M. (5) *Telostylus philippinensis* Cr. (6) USNMENT 01384607 [USNM] (original designation).

Material examined. Philippines. 4m# 1f# 1?, (1) Luzon, Laguna Province, Pagsanjan, 14° 15.8'N, 120°27.9'E, 15-16.x.2006, A. FREIDBERG (2) SMNH-TAUI—205883, 205882, 205881, 205880, 205874, 205875— [TAUI]; 1m# 3f# 1?, (1) Luzon, Cavite Providence, Tagaytan, 8.x.2006, 14°6.11'N, 120°55.58'E, A. FREIDBERG (2) SMNH-TAUI—205879, 205873, 205878, 205877, 205876— [TAUI]; 3m# 4f#, (1) Masbate, Mobo- Mapuyo. 2-5.x.1980, T. Borromeo & R. I. Vane-Wright. B.M 1980-458 (2) Mt Oas. 400-500m [NHMUK]; 2m# 3f#, (1) Negros Oriental, Amlan Falls. 25-28.viii.1980, R. I. Vane-Wright. B. M. 1980-458 [NHMUK]; 1m# 5f#, Leyte, Baybay, "Visca" grounds. 15-22.viii.1980, R. I. Vane-Wright. B. M. 1980-458 [NHMUK]; 1m#, (1) Atimonan, 16.8.1915 (2) <http://id.luomus.fi>, GV.32951, PHILLIPINES Luzon, Balbalan, 17.5N, 121.1E, 6.vii.1915, Boettcher, G. leg [MZH]; 1f#, (1) Balbalan, 30.11.1917 (2) *Telostylus maccus*, O. G. (3) <http://id.luomus.fi>, GV.32950, PHILLIPINES Luzon, Balbalan, 17.5N, 121.1E, 30.xi.1917, Boettcher, G. leg [MZH]. **Indonesia.** 1?, (1) Sulawesi, Dumoga-Bone National Park Maze, 29.x.1985 (2) PROJECT WALLACE, BM 1985-10 [NHMUK]; 1m#, (1) Sulawesi, Dumoga-Bone National Park Maze, 29.x.1985 (2) PROJECT WALLACE, BM 1985-10 [NHMUK]; 2m#, (1) Edwards Camp, 5,xii.1985, B. R. Pitkin (2) INDONESIA, Sulawesi Utara, Dumoga Bone N. P, Project Wallace [NHMUK].

Distribution. Taiwan, Philippines, Indonesia (Java, Sulawesi).

Telostylus remipes (Walker)

Figures 1A, 1B.

Coenurgia remipes Walker, 1860: 164.

Telostylus remipes; Hennig 1937: 269

Telostylus latibrachium Enderlein, 1922: 142. **New synonymy.**

Head. Mostly yellow, with only a few small dark and pruinose areas. Scape and pedicel yellow. Eye longer than high. Frontal-vitta yellow; fronto-orbital plate yellowish-brown anteriorly and shiny yellow on posterior half; vertex pruinose and

yellow; ocellar triangle black and behind it, also black, a narrow black stripe that ends between postocellar setae. Occiput mostly yellow, with lateroventral brown spot and dorsal brown half very pale.

Thorax. Completely yellow, black presutural spot above postpronotal lobe. Coxae yellow. Yellow tones of thorax slightly variable, but coloring pattern remains constant.

Legs. Femora yellow with black tip; no spine-like anteroventral setae, only a few thick and short setae on distal half. Tibiae brown; fore tibia with strong and short cylindrical setae anteriorly.

Abdomen. Brown. Sintergite 7+8 yellowish-brown with several darker areas; length is almost half the length of epandrium. Epandrium wide cylindrical, slightly paler than syntergite 7+8; surstylus linear and short, measures half the length of cercus; cercus measures almost one third of the length of epandrium.

Variation. Body 4.3–6.1 mm. Wing length 3.4–5.0 mm and width 1.0–1.5 mm. Black spot on presutural scutum only slightly dark. Mid and hind femora with incomplete brown ring on distal third.

Female. Body length 4.7–5.0 mm. Body setae in general weaker than in males. Femora with no prominent anteroventral seta. Oviscape yellow with small black area distally, length is twice more than width.

Type material. LECTOTYPE (here designated), *Coenurgia remipes* m# Type-locality: Sri-Lanka. LABELS: (1, red perimeter label) SYNTYPE (2) Mak. (3) 68-4 (4) SYNTYPE, *Coenurgia remipes* Walker, det. J.E. Chainey, 1995 (4) NHMUK010579866 [NHMUK]. **PARALECTOTYPE**, 1m#, (1, red perimeter) SYNTYPE (2) Celebes (3) remipes (4) SYNTYPE *Coenurgia remipes* Walker, det. J.E. Chainey, 1995 (5) NHMUK010579867 [NHMUK] (examined in photographs).

HOLOTYPE, *Telostylus latibrachium* m#; Type-locality: Sri-Lanka. LABELS: (1) Ceylon, Nietner S. (2) *Telostylus latibrachium*, Typus Enderl. m#, Dr. Enderlein det. 1921 (3, red label) HOLOTYPE, *Telostylus latibrachium*, Enderlein, 1922, det. Mello & Ziegler 2010 [ZHMB] (examined in photographs) (original designation).

Material examined. Thailand. 1f#, (1) South Ton Nga Chase, N.P. 20kmSW Hat Yai, 20-24.x.2002, A. FREIDBERG (2) SMNH-TAUI —205968, 205967— [TAUI]. **SriLanka.** 2m#1f#, (1) Ceylon, NW. Prov. Andapolakanda, 3 mls. NE Melsiripura, 7.ii.62, Loc.53 (2) Ravine with small stream (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 1m#, (1) Ceylon, NW. Prov.

Andapolakanda,, 3 mls. NE Melsiripura, 7.ii.62, Loc.53 (2) Ravine with small stream (2) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 2m#, (1) Peradeniya, Ceylon, x.07 (2) Pres. by E. Brunneti, B. M. 1927-184 [NHMUK]; 1m#, (1) 500m Central Prov. Kandy, Distr., Talwatte, 21.x.1995, M. Shaffer (2) BMNH(E) 1996-213 [NHMUK]; 1m#1f#, (1) Kandy, Ceylon, 5.09 (2) Pres. by e. Brunetti, B. M. 1927-184 [NHMUK]; 1m#, (1) Kandy Distr. Udawattekele Sanctuary, 23.ii.1974 (2) SRY LANKA (CEYLON): BMNH 1974-624, A. E. Stubbs & P. J. Chandler [NHMUK]; 1m#, (1) Kandy distr. Udawattekele sanctuary, 23.ii.1974 (2) SRI LANKA (CEYLON): BMNH 1974-624, A. E. Stubbs & P. J. Chandler [NHMUK]; 2f#, (1) Kandy distr. Perideniya, Mahaweli River, 22 & 24.ii.1974 (2) SRI LANKA (CEYLON): BMNH 1974-624, A. E. Stubbs & P. J. Chandler [NHMUK]; 1f#, (1) Peradeniya, Ceylon, x.07 (2) Pres. by E. Brunneti, B. M. 1927-184 [NHMUK]; 2f#, (1) Kandy Distr. Peradeniya, 24.11.1974 (2) SRY LANKA (CEYLON): BMNH 1974-624, A. E. Stubbs & P. J. Chandler [NHMUK]; 1m#1f#, (1) Kandy Distr. Peradeniya, Mahaweli river, 22 & 24.ii.1974 (2) SRY LANKA (CEYLON): BMNH 1974-624, A. E. Stubbs & P. J. Chandler [NHMUK, 1869, 1888]; 1f#, (1) Ceylon, Centr. Prov. Kandy, 12.i.62. Loc. 9 (2) Swep on shrubs in jungle (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 1m#, 81) Ceylon, Centr. Prov. Stream, 20 mls E Kandy, 12.iii.62. Loc. 135 (2) Swep on grass in forest (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 1?, (1) Ravine with small stream (2) Ceylon, Centr. Prov. Rambukparth Oya, 10 mls NW Hatton, 18.iii.62.Loc. 153 (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 1f#, (1) Kandy distr. Karugastota, 24.ii.1974 (2) SRI LANKA (CEYLON): BMNH 1974-624, A. E. Stubbs & P. J. Chandler [NHMUK]; 1f#, (1) Kan. Distr. Udawattakele Section, Elevation 1800ft. 23-25.ix.1980 (2) K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, L. Jayawickema, V. Gunawardane [USNM]; 3m# 3f#, (1) Kan. Distr. Udawattakele Section, 1800ft. 1-3.ix.1980 (2) K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, L. Jayawickema, V. Gunawardane (3) RESTRICTIONS APPLY NMNH - Sri Lanka Agreement #6 [USNM]; 1m# 1f#, (1) Colombo Distr. Labugama, 18.ii.1974 (2) SRI LANKA (CEYLON): BMNH 1974-624, A. E. Stubbs & P. J. Chandler [NHMUK]; 1f#, (1) Ceylon, Prov. Of Uva, Ettampitiya, 6 mls SW Badulla 14.iii.62.Loc.144 (2) Swept above surface of small stream (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 1m#, Ceylon, Prov.

Of Uva, Westminster Abbey, 25 mls ESSE Bibile, 7.iii.62.Loc.119:II (2) Swept above surface of small stream (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 2m# (1) Ceylon, Sabaragamuwa, Prov. Bopathella Falls, 9mls NNW Ratnapura, 19.ii.62, Loc.91:I (2) Swep on vet.at small stream (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 2m# 1f#, Ceylon, Sabaragamuwa, Prov. Gilimale. Alt. 300ft., 6 mls NE Ratnapura, 20.ii.62, Loc.93 (2) Ravine with small stream (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 1f#, (1) Ceylon, Sabaragamuwa, Prov. Deerwood Kuruwita, 6 mls NNW Ratnapura, 18.ii.62, Loc.90:ii:1 (2) Swept on veg. in jungle ravine (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 1m# 2f# , (1) Ceylon, Sabaragamuwa, Prov. Deerwood.Kuruwita, 6 mls NNW Ratnapura, 18-21.ii.62, Loc.90:III (2) Ravine with small stream (3) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 2m# 3f#, (1) Ceylon, Sabaragamuwa, Prov. Stream at 2500ft., 5 mls NNW Balangoda, 22.ii.62, Loc.96 (2) Swept above surface of small stream (3) Ravine (4) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 1f#, (1) Ceylon, Sabaragamuwa, Prov. Stream at 3000ft., 5 mls NNW Balangoda, 22.ii.62, Loc.97 (2) Swept along roads in tea plantation of small stream (3) Ravine (4) Lund University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm [MZLU]; 1f#, (1) Flying round *Solanum brishes* (2) Ludunganga, 11.xi.1918 (2) CEYLON. R. Senior White, B. M. 1924-100 [NHMUK]; 1m#, (1, hand written) Bred from decaying stem (2) Luduganga, may 1922 (3) MP3 [NHMUK]; 3m# 1f#, (1) In Garden, Luduganga, —4, 5—.i.1919 (2) CEYLON. R. Senior White B. M. 1924-100 [NHMUK]; 1m#, (1) In Hibiscus hedge (2) Luduganga, 8.12.1918 (3) CEYLON. R. Senior White, B. M. 1924-100 [NHMUK]; 1m#, (1, hand written) Bred from decaying stem (2) Luduganga, June 1922 (3) MP3 [NHMUK]; 1m#, (1) Gal. Distr. Kanneliya Section, Sinharaja Jungle, 2-5.x.1980 (2) Collected in Malaise trap (3) K. V. Krombein, P. B. Karunaratne, T. Wijesinhe, L. Jayawickema, V. Gunawardane (4) RESTRICTIONS APPLY NMNH - Sri Lanka Agreement #6 [USNM]; 1m#, (1) Ceylon, S. Prov. Galandala, 16 mls. NNE Galle, 27.i.62.Loc.28 (2) Lung University, Ceylon Expedition 1962, Brinck-Andersson-Cederholm (3) Swept on shrubs in jungle [MZLU]; 1?, (1) Ceylon, S. Prov. Hemmeliya, 2 mls. E Baddegama 10 mls. N. Galle, 27.i.62, Loc.26 (2) Lund University Ceylon

Expedition 1962, Brinck-Andersson-Cederholm (3) Swept on veg. at small stream [MZLU].

Distribution. Thailand, SriLanka, Indonesia (Java).

***Telostylus trilineatus* de Meijere**

Figures 6G, 6H.

Telostylus trilineatus de Meijere, 1910: 113.

Body length 4.5–5.7 mm. Wing length 4.1–5.5 mm and width 1.1–1.4 mm.

Head. Mainly yellow, with several dark and pruinose areas. Scape and pedicel yellow. Frontal-vitta yellow dusted; black spots medially, accompanying the darkening on anterior half of fronto-orbital plate and vertex black over ocellar triangle, extending slightly further from the insertion of post-ocellar setae. Occiput sub-shiny and yellow pruinose; narrow and round submedial black spot laterally.

Thorax. Mainly yellow with black spots and different tones of yellow; yellowish-brown spot above humeral lobe; presutural scutum with longitudinal wide yellowish-brown stripe medially; postsutural scutum with longitudinal wide yellowish-brown stripe medially, that never joins the presutural medial black stripe; postsutural scutum lateral black spot square between transverse suture and supra-alar seta. Scutellum yellow-brownish to blackish with median pale yellow stripe. Pleura yellow, except anteroventral katapisternal black spot; ventral line of proepisternum brown. Mid and hind coxae brownish-yellow anteriorly.

Legs. Femora yellow with black tip and wide ring same-colored on distal third, which is incomplete on fore femur; fore femur with long and thin anteroventral setae. Tibiae yellowish-brown, darker than femora; fore tibia with strong and short cylindrical setae anteriorly.

Abdomen. Blackish-brown sub-shiny with intermittent yellow spots laterally. Syntergite 1+2 brown with two lateral yellow spots; other tergites with small yellow spots anteriorly. Epandrium cylindrical and wide, 1.5-2X longer than syntergite 7+8; surstylus linear and short, measures slightly more than half the length of cercus; cercus measures approximately half of the length of epandrium.

Female. Body length 4.7–5.1 mm. Fore femur with no prominent anteroventral setae; rings on apical third of femora frequently incomplete. Tibia with no prominent setae anteriorly. Oviscape yellow with dark brown apex.

Type material. LECTOTYPE (here designated), *Telostylus trilineatus* m#; Type locality: Indonesia, Krakatau [ZMAN]. LABELS: (1) Depok (Java) x.07, Jacobson (2) *Telostylus trilineatus* de Meijere, Type (3, red label) *Telostylus trilineatus* de Meijere, 1910 ZMAN type DIPT.0747.1. **PARALECTOTYPE**, 1f#, same data as holotype [ZMAN].

Material examined. India. 1f#, (1) Muthikolam 3,000', Coimbatore Dt, S. India, 23-26.ix.38 (from behind) B. M. -C. M. Expdm. to S. India, Sept-Oct., 1938 [NHMUK]; 1m#, Tenmalai 500-800', Travancore, S. India, 11-17.x.38 (same label behind:) B. M. C. M. Expdn. to S. India, Sept-Oct. 1938. [NHMUK]; 6m# 3f#, (1) Meghalaya, Nongpoh Forest, 7.ix.2002, A. FREIDBERG (2) SMNH TAU I —205838, 205833, 205831, 205830, 205828, 205827— [TAUI]; 3m#, (1) Mizoram, Phaibawkkawn, 40kmE Aizawl, 10.xi.2002, A. FREIDBERG (2) SMNH TAU I —205841, 205840, 205839 [TAUI]. **Thailand.** 4m# 3f#, (1) S. KhaoSokNat. Rt. 401, 22.x.1993, F. KAPLAN & A. FREIDBERG (2) SMNH-TAU I — 205853, 205851, 205849, 205848, 205854, 205851, 205847— [TAUI]; 3m# 1f#, (1) South Khlong Ngae, 40kmS Hat Yai, 23.x.2002, A. FREIDBERG (2) SMNH-TAU I —205964, 205963, 205962, 205961— [TAUI]; 1m#, NW: Tam Pha Mon Cave, 4kmSE Soppong, 26.x.2002, A. FREIDBERG (2) SMNH-TAU I 205959 [TAUI]. **Philippines.** 4m# 1f#, Palawan, Mantalingajan, Pinigisant, 600meter, —31.August., 1.Sept, 20 sept., 23 sept.—1961, Noona Dan Exp. 61-62 [CSCA]; 1m#, (1) Palawan, Brookes Point, Uring Uring, 17.August.1961, Noona Dan Exp. 61-62 (2, yellow label, hand written) *delicatus* [ZMUC]; 1m#, Palawan, Brookes Point, Uring Uring, 21.August.1961, Noona Dan Exp. 61-62 [ZMUC]; 1f#, Balabac, Dalawan Bay, 12 oct.1961, Noona Dan Exp. 61-62 (2) Caught in Malaise-traps [ZMUC]. **Malaysia.** 1m#, (1) Gentig Tea Estate, GentigSembah, forest 2000 feet, 24-27.xii.1972 (2) W. MALASYA: Selangor, A. E. Stubbs, BMNH 1974-87 [NHMUK]; 2f#, (1) Btwn Pokok Sena and Kuala Nerang, 1.i.1973 (2) W. MALAYSIA: Selangor, BMNH 1974-87 [NHMUK]; 1f#, (1) Bukit Tinggi forest 1300ft, 26.xii.1972 (2) W. MALAYSIA, Pahang, A. E. Stubbs, BMNH 1974-87 [NHMUK]; 1f#, (1) Gentig Tea Estate, GentigSembah, forest 2000 feet, 24-27.xii.1972 (2) W. MALASYA: Selangor, A. E. Stubbs, BMNH 1974-87 [NHMUK]; 1f#, (1) Yan, S of Yan Kechil, 2.i.1973 (2) W. MALAYSIA: Kedah, A. E. Stubbs, BMNH 1974-87 [NHMUK].

Distribution. India*, Thailand, Philippines*, Malaysia*.

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Figures

Figure 1. *Telostylus remipes* (Walker), head. A. lateral; B. dorsal.

Figure 2. *Telostylus facsimile*, new species, head. A. Lateral; B. Antenna; C. Dorsal

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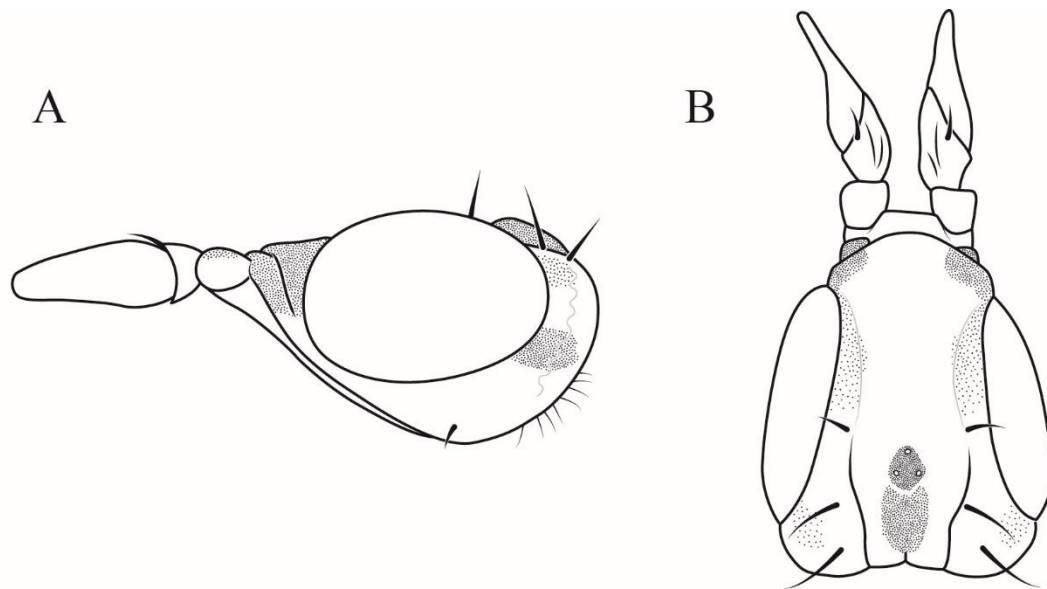


Figure 1. *Telostylus remipes* (Walker), head. A. Lateral; B. Dorsal.

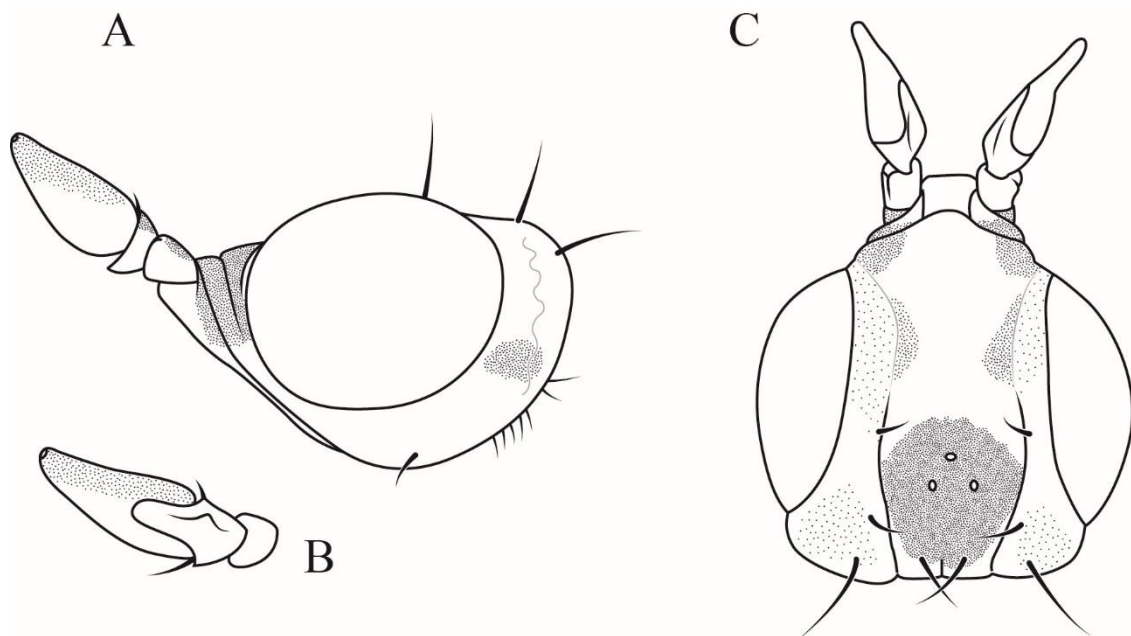


Figure 2. *Telostylus facsimile*, new species, head. A. lateral; B. Antenna; C. Dorsal.

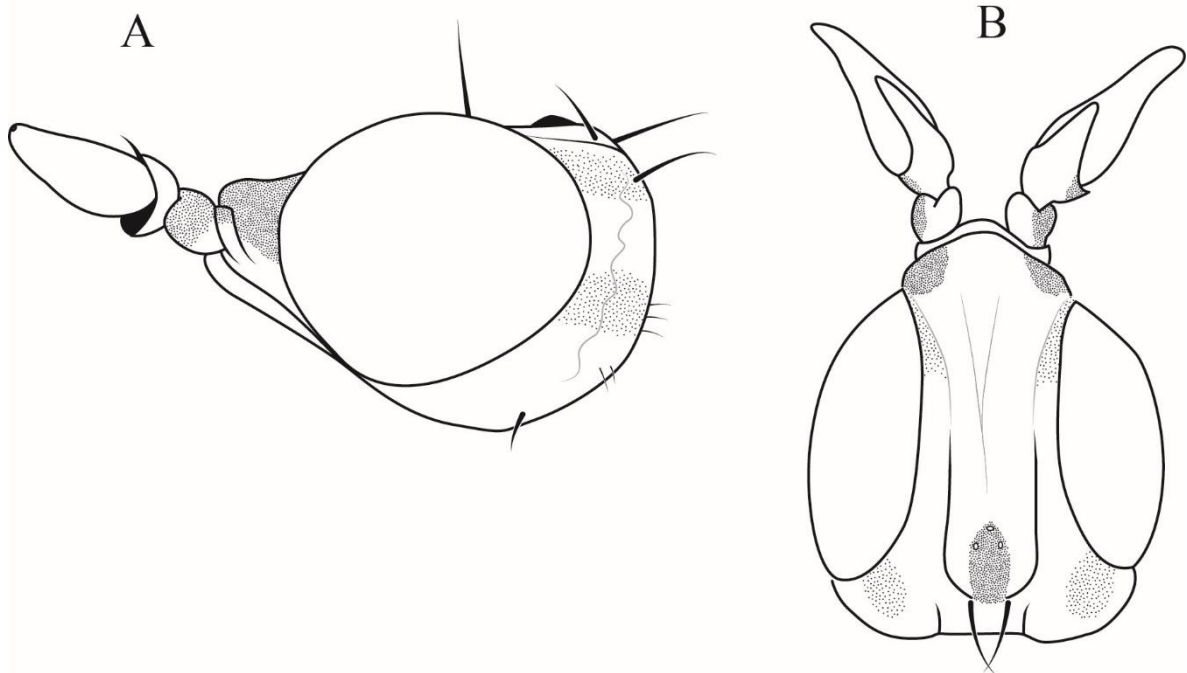


Figure 3. *Telostylus maccus* Osten Sacken, head. A. lateral; B. Dorsal.

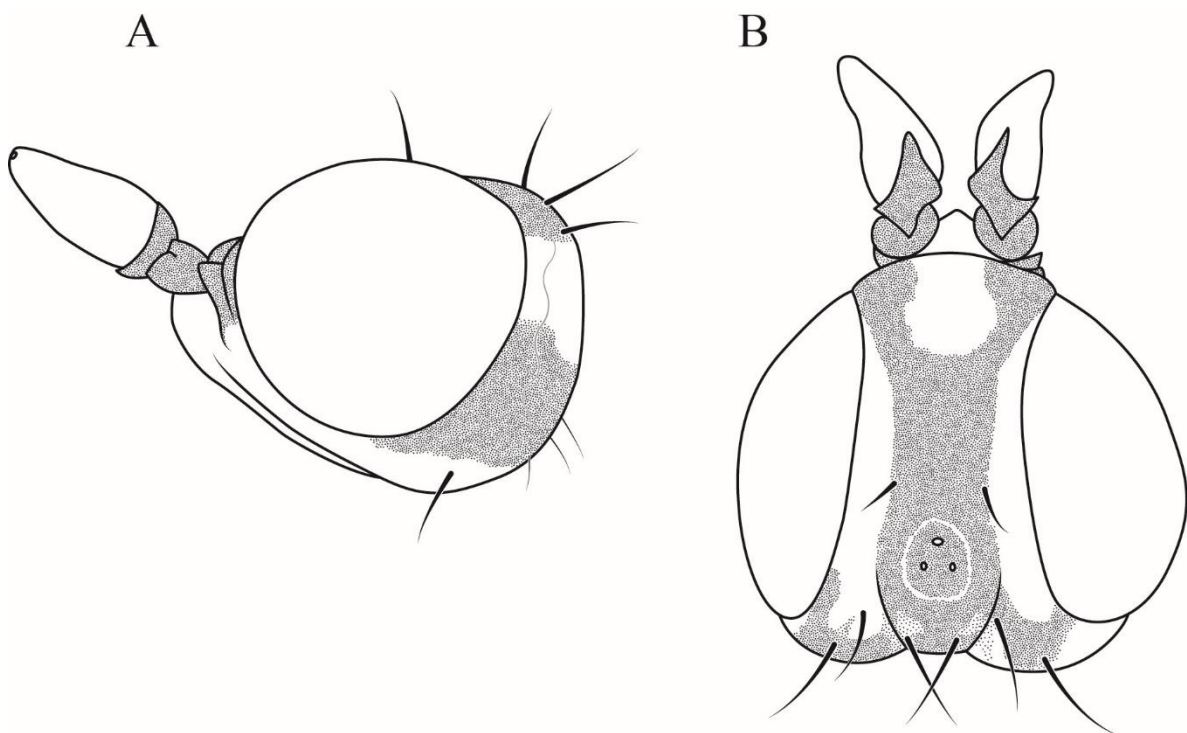


Figure 4. *Telostylus claroscuro*, new species, head. A. lateral; B. Antenna; C. Dorsal.

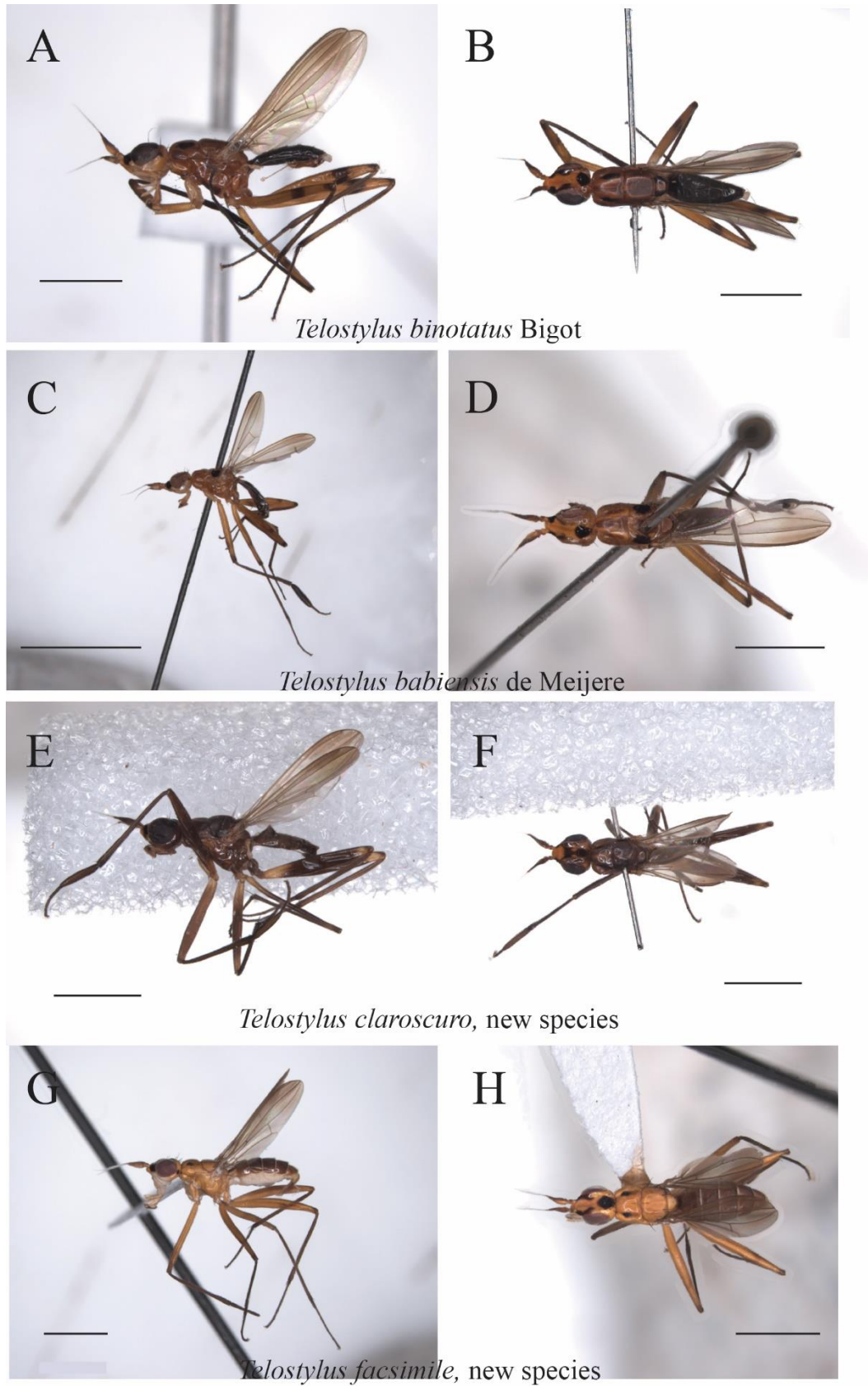


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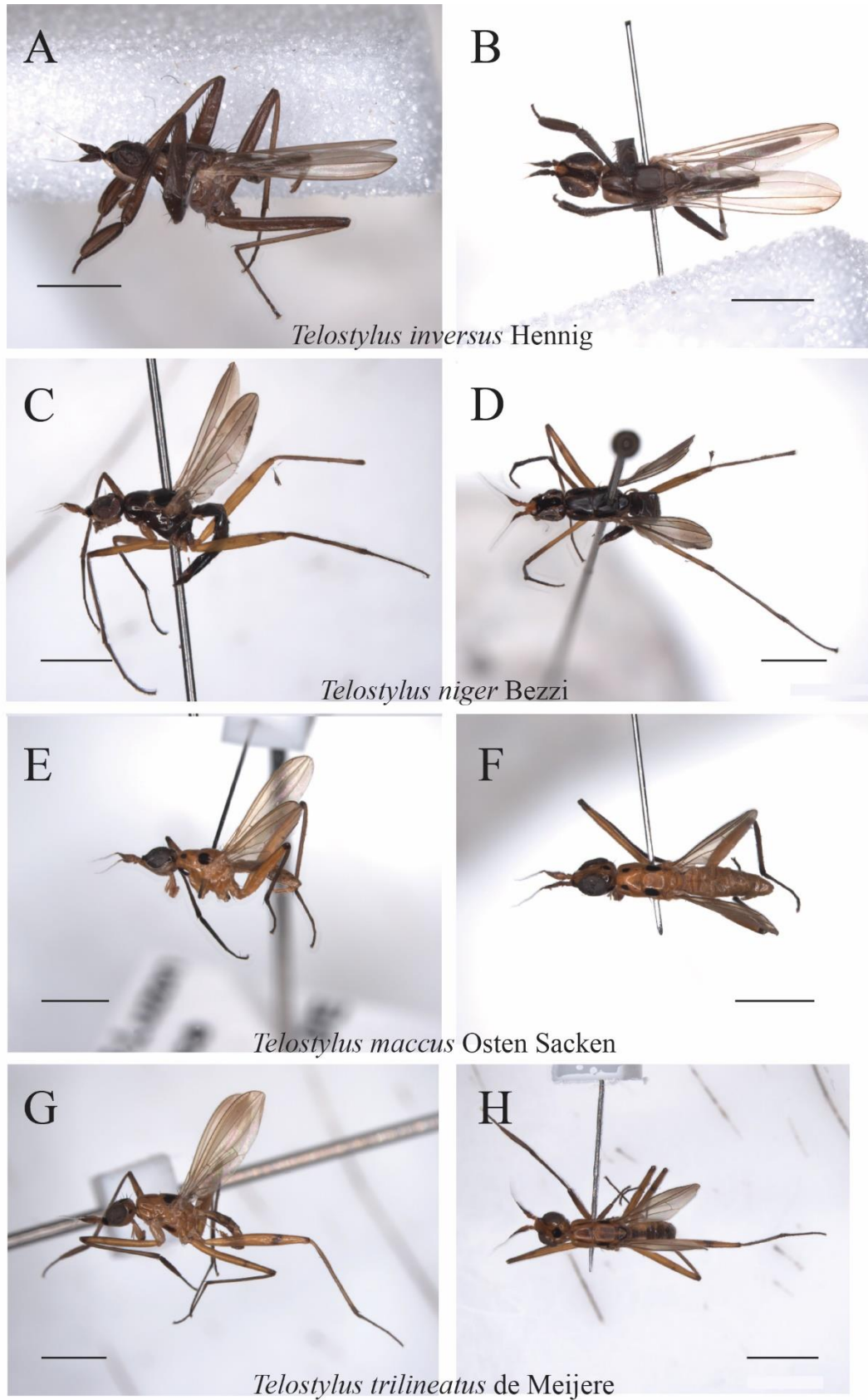


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CHAPTER 5

A phylogenetic hypothesis based on a total evidence analysis of morphological and DNA sequences data, elucidate the inter-relationships for Neriidae (Diptera, Schizophora)

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A phylogenetic hypothesis based on a total evidence analysis of morphological and DNA sequences data, elucidate the inter-relationships for Neriidae (Diptera, Schizophora)

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Running Head: New phylogeny of Neriidae

Abstract

The phylogeny of the Neriidae is reconstructed using morphology and DNA sequence data by employing three phylogenetic methods (parsimony, maximum likelihood and Bayesian inference). Based in or results, the number of extant genera of Neriidae raises from 19 to 20 and a new suprageneric classification is proposed. To better understand the new classification and morphological evolution in the lineages of Neriidae, the hypothesis of relationships are reconstructed on the morphology-based tree. Because the Palearctic *Nipponerius* Enderlein and *Stypocladus* Cresson form a monophyletic group, we propose its synonymy along with new synapomorphies and diagnosis for *Stypocladus*, long with a Lectotype designation for its formerly only species *Nerius appendiculatus* Hendel. In addition, high branch support corroborates the revalidation of *Teloneria* Aczél and confirms the structure of other genera currently known in the family. For the Neotropical lineage, the male of *Loxozus cornutus* (Walker) is described and illustrated for the first time and two new genera related to it are described, *Aczelia*, gen.n and *Freidbergmyia* gen.n. Three main Neotropical clades, *Longina*-group, *Eoneria*-group and *Nerius*-group were clearly recovered within the family. The limits of these genera and its insertion in the Neriidae are considered, and an updated intra-familiar classification is provided.

Introduction

Neriidae are acaliptrate flies recognized as one of the families within Neriioidea. Recent phylogenetic studies of Diptera based on both morphological (Yeates and Wiegmann, 2005; Yeates *et al.*, 2007) and molecular data (Wiegmann *et al.*, 2011), have confirmed the monophyly of Neriioidea, supported by the following synapomorphies: male and female genitalia conspicuously elongated females and lower region of face not sclerotized (McAlpine, 1989; Sinclair *et al.*, 2013).

Neriioidea is composed by four families: Cypselosomatidae, Micropezidae, Neriidae and Pseudopomyzidae. Micropezidae is the richest in number of species (583), followed by Neriidae (110), being both medium-sized flies (between 5.0-15.0 mm), characterized mainly by the elongated body appearance of their representatives, while Cypselosomatidae and Pseudopomyzidae (35 species between 1.7-5.5 mm) are relatively small and compact size flies (Papp *et al.*, 2011; Buck and McAlpine, 2010).

Historically, Neriidae and Micropezidae have been treated as closely related groups, with some authors treating Neriidae as sister-group of Micropezidae (Hendel, 1922; Cresson, 1930), and others considering it as subfamily of Micropezidae (Enderlein 1922; Hennig, 1937). The family status for Neriidae was initially proposed by Hendel (1922), but was only completely accepted after multiple studies and discussions presented by Aczél (1951, 1954a, 1954b, 1955a, 1955b, 1955c, 1959, 1961). The most recent hypothesis of relationship between families in Neriioidea proposed by Wiegmann *et al.* (2011), based on molecular and morphological data, recovered a clade composed by Neriidae + Cypselosomatidae as the sister group of Micropezidae.

The neriids have long and thin legs, elongated heads and antennae porrects and can be easily differentiated from other nerioids by the arista inserted in the apex of first flagellomere, the lunula modified to be exposed as a base for the antennae and the inner process of pedicel. The family comprises a small number of acaliptrate flies distributed in all biogeographic regions, with greater diversity concentrated in tropical regions (Steyskal, 1968, 1987). Currently, 110 valid species of Neriidae are known in 18 valid genera (Pape *et al.*, 2011; Sepúlveda *et al.*, 2014). Only four species are recorded in the tropics: *Odontoloxozus longicornis* (Coquillett) and *Odontoloxozus pachycericola* Mangan & Baldwin, which occur in the Nearctic Region (Steyskal, 1965a; Pfeiler *et al.*,

2013), *Styprocladius appendiculatus* (Hendel) and *Nipponius femoratus* (Coquillet), in the Palaearctic Region (Soós, 1984; Ozerov, 2005).

Neriidae adults are found in a wide variety of habitats in tropical regions, ranging from deserts to arid lowlands and sea-level forests, including humid forests and uplands with high rainfall rates (+2000 msnm) (Barracough 1993b). For all neriids with biological information record, they are known to feed on decomposing material (Berg, 1947; Dufek, *et al.*, 2015), like *O. longicornis* (Coquillet) in deserted areas in northern Mexico and southern United States, which develop in necrotic tissues of a wide variety of cactus species (hence they are known as cactus fly) and for *Telostylinus lineolatus* (Wiedemann) in Australia, larvae and pupae were found inside and under bark of rotten trees fallen in the soil (Berg, 1947).

Other immature specimens of Neriidae have been found in trees and fallen branches (Eberhard, 1998), in galleries of wood boring beetles (Preston-Mafham, 2001) and cultivated plants such like papaya, pumpkin and banana (Cresson, 1938; Berg, 1947; Barracough, 1993b). Adults of many species feed on plant extracts (Berg, 1947) and decomposing fruits (Bezzi, 1916), but also, to a lesser extent, have also been observed feeding on necrotic tissues from animals, manure and human feces (Aczél, 1954a, 1959; Chin *et al.*, 2011). In Africa, some species are quite common in rural areas, apparently attracted by the scent of human foods (Barracough, 1993b).

Neriidae individuals are commonly used in studies of sexual selection, ethology and phenotypic plasticity (Bonduriansky, 2007; Bonduriansky & Head, 2007). Males of *Gymnonerius fuscus* (Wiedemann) and *Derocephalus angusticollis* Enderlein, compete for control over the best sites for oviposition, which allows them greater access to females (de Meijere, 1911; Preston-Mafham, 2001; Bonduriansky, 2006). This peculiar type of competition is also common in other species of the family and is associated with the development of conspicuous secondary sexual characters, which are expressed primarily in body length, such as stretching of the antennal segments, thorax, and anterior legs. Some examples are the conspicuously elongated scape in *Longina* Wiedemann; the anteroventral spine-like setae on femora in *Glyphidops* Enderlein; the tibiae dilated apically in *Indonesicesa* Koçak & Kemal and the fore basitarsomere elongated and dilated in *Telostylus* Bigot (Aczél, 1959, 1961).

Taxonomically, most of the available knowledge about Neriidae is based on works of three authors (Gunter Enderlein, Willi Hennig and Martin Aczél), who

described many species and proposed most of the genera that are still valid today. The first major revision of Neriidae was by Enderlein (1922), who described 23 new species and proposed seven genera from the material deposited in the Museum für Naturkunde (ZMHB). Hennig (1937), who reviewed the species known at the time, carried the second study, including comments and proposing synonyms and new combinations at generic level. However, the most prolific author in Neriidae was Martin Aczél, who not only identified and described new species, but also presented the first discussions and hypotheses on the evolution of groups of species within the family. Martin Aczél also identified neriids from the world's mayor collections, generating an important distribution database and was one of the few authors to present detailed illustrations and descriptions on the morphology of the species cited in his works.

The suprageneric classification proposed by Aczél (1961) is based mainly on characters of antennal base, dividing Neriidae species in two subfamilies: Telostylinae and Neriinae. In Telostylinae, considered the basal group, were included the species that present reduced or absent antennal base and in Neriinae, the species with protruding antennal base. In this last subfamily, the antennal vestiture was also used by Aczél (1961) to propose two generic groupings in Neriinae: *Eoneria*-Group, which contains species with antennal base coated with dense pruinescence that gives it an opaque appearance; and *Nerius*-Group, composed by species that have glabrous and bright antennal bases. Based on this classification, the Neotropical species of *Antillonerius* Hennig, *Eoloxozus* Aczél and *Eoneria* Aczél, together with the species of *Indonesicesa* Koçak & Kemal and *Telostylinus* Enderlein, of the Oriental and Australian Regions, respectively, comprised the small *Eoneria*-Group, considered by Aczél (1961) as the most basal group of the subfamily (fig. 1). Other species of the American continent were classified in the *Nerius*-Group, together with *Paranerius* Bigot, *Gymnonerius* Hendel and *Stypocladius* Enderlein.

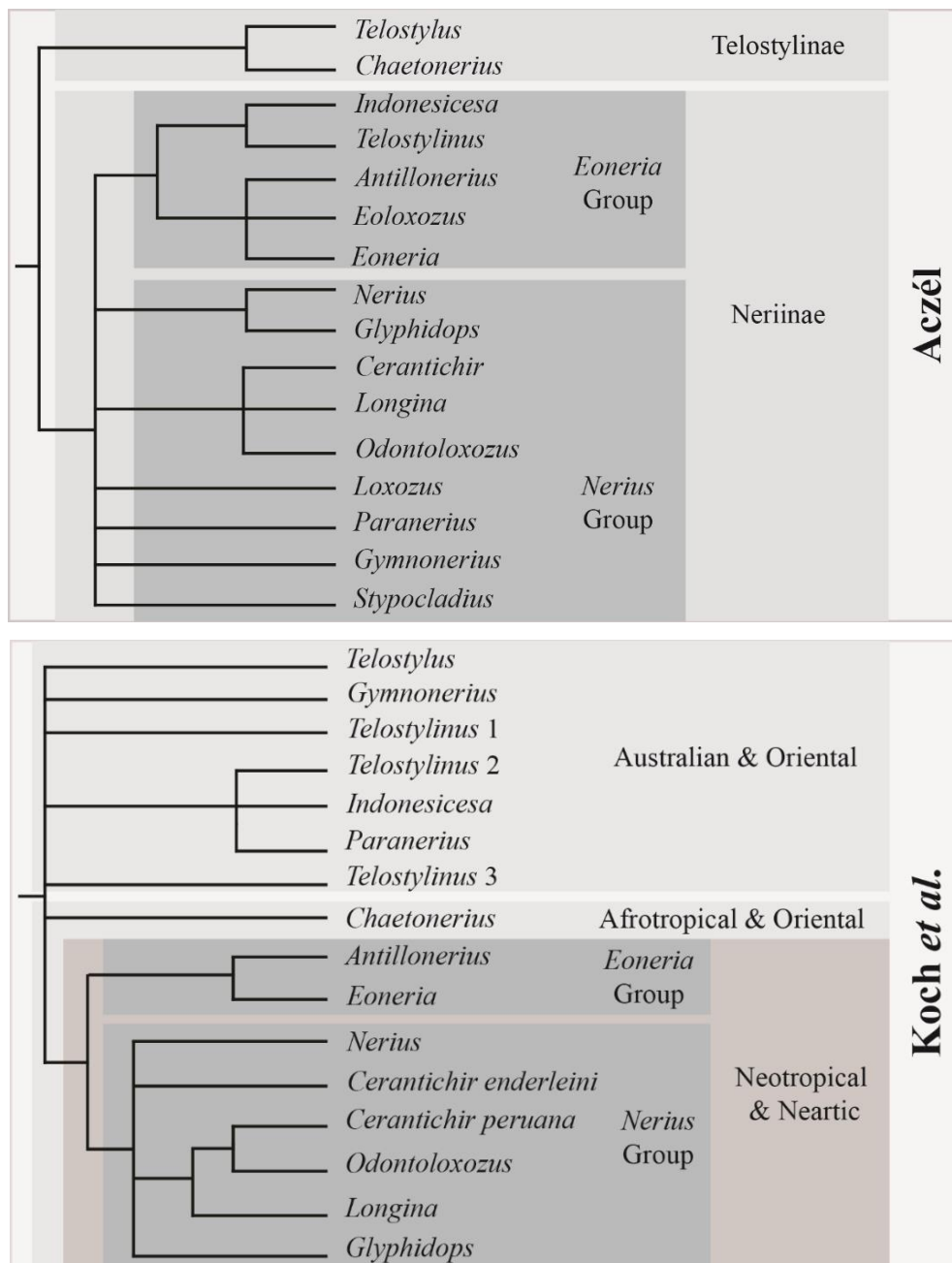


Figure 1. Past suprageneric classifications of Neriidae by Aczél (1961) and Koch *et al.* (2014) (adapted from Koch *et al.*, 2014).

Although it has been accepted over the last 50 years, the proposal of classification by Aczél (1961) has been recently reviewed by several authors, who question the monophyly of its groups (Barraclough, 1993a; Buck, 2010; Koch *et al.*, 2014). Among the most common difficulties in studying the taxonomy of Neriidae, is the lack of consensus in the works published before M. Aczél on the characters that define species and genera. Hennig (1937), for example, found the classification proposed by Enderlein

(1922) to be less careful, stating that the gender delimitation was based on morphologically unrelated affinities and should be carefully reviewed. Although less than half of the species with valid names at that time were examined by the author.

Aczél (1951) mentioned this same difficulty when referring to *Nipponerius* Cresson, stating that this had been interpreted as three different basic planes by Coquillett (1898), Cresson (1926) and Czerny (1930). In addition, Aczél (1951) mentioned that his new genus *Eoneria* was, according to Hennig (1937), very similar to *Paranerius* Bigot, who in turn, was considered by Steyskal (1966) as synonymous with *Nipponerius* Cresson. In this example, the lack of enough taxonomic information to delimit these three genera did not allow Aczél (1951) to determine exactly how close or real the relationship between them could be, by limiting the use of distribution data to define the boundaries between the three genera: *Eoneria* in the Neotropical Region, *Nipponerius* in Japan and *Paranerius* in the Oriental and Australian Regions.

Cases like the mentioned, are found on recent revisions of Neriidae (Barraclough, 1993a; Buck & Marshall, 2004; Sepúlveda *et al.*, 2014), making evident the the importance of exploring the physical material studied by previous authors. In the specific case of M. Aczél's work, it is important to emphasize that, despite the extraordinary work done by this author, with well-illustrated specimens, described and redescribed, in most cases there was no revision or reference to the type material, as pointed out by author himself (Aczél, 1954b). In the same way, Enderlein (1922), Brunetti (1913; 1929) and Hennig (1937) also make no reference to type material or any other material studied by authors prior to their works, leading to problems as old as the original descriptions of the species and should be clarified (Barraclough, 1993a).

In the years after M. Aczél's publications, few papers have been published on taxonomy of Neriidae, including two review chapters in the Manual of Nearctic Diptera (Steyskal, 1987) and Manual of Central American Diptera (Buck, 2010). Three revisions were also published: one on the genus *Longina* Wiedemann, for which two new species were described; and two other reviews of the genera with the highest number of species in the family, the Afrotropical *Chaetonerius* Hendel (Barraclough, 1993a) and the Neotropical *Glyphidops* Enderlein (Sepúlveda *et al.*, 2014), both lead to descriptions of new species. The growing interest of several authors in the species of Neriidae over the last decade, has brought with it new morphological information that

has made evident the need for a relationship hypothesis based on a phylogenetic method (Buck, 2010).

Despite the facts exposed above, Koch *et al.* (2014) consider the work of M. Aczél as the key to a new and revised phylogeny of neriids and published the first phylogenetic hypothesis for the family, based on continuous and discrete morphological characters, extracted mainly from the publications of Aczél (1951, 1954a, 1954b, 1954c, 1955a, 1955b, 1955c, 1959, 1961). It was from the results published by Koch *et al.*, (2014), that the proposed classification of Aczél (1961) began to be questioned.

The results of the phylogenetic analysis by Koch *et al.* (2014) propose an apical clade with low support values that includes two great clades: *Chaetonerius* Hendel + New World Neriidae (only big and well-supported clade) and that constitute the sister-group of the other neriids (fig. 1). Only two other clades were recovered with high support values, specifically involving American species: the *Eoneria*-Group, containing the Neotropical species with antennal base pruinosa; and a clade formed by large body species *Cerantichir* Hennig, *Odontoloxozus* Enderlein and *Longina* Wiedemann. All other clades were not proposed as valid by the authors due to low support values.

Finally, Koch *et al.* (2014) proposed an unnatural classification based on what they called "biogeographic congruence", which is nothing more than a grouping pattern based on distribution information of the taxa (fig. 1). This hypothesis is based on a "primary distribution center" for the family, located in the Oriental Region *sensu* Aczél (1961). Considering the occurrence of Telostylinae species in this region and their basal radiation in the topology, the authors suggest that from this ancestral region, the *Telostylinus* Enderlein species would have hypothetically colonized the oceanic islands.

Based on recent statements for caution in the use of information in old identifications and re-descriptions, we believe that the family inner relationships must be re-analyzed from a revised and updated morphological database. This new information is now available, after the number of recent taxonomic revisions increased considerably (Barraclough, 1993a; Buck & Marshall, 2004; Buck, 2010; Sepúlveda, *et al.*, 2013a; Sepúlveda *et al.*, 2013b; Sepúlveda *et al.*, 2014), bringing new lights to the knowledge of Neriidae, preventing these old errors and inaccuracies to pass forward.

In an attempt to clarify the identity and relationships of the genera of Neriidae, the primary types of all its species were studied at least from photos, to guaranty the identity of the species poorly known. Posteriorly, phylogenetic analyses were conducted

using morphological and molecular data in order to determinate the accuracy of proposals published by previous authors. Additionally, we will explore the results of Koch *et al.* (2014) and discuss it in the light of recent taxonomic reviews, as well as original descriptions, redescriptions and illustrations available in the literature.

Material and Method

Taxon sampling

The most recent taxonomic proposal for Neriidae is that of Wiegmann *et al.* (2011), that studies the relationships between almost every Diptera family based in morphological and molecular data. In this work, only were included one species of Neriidae, one of Cypselosomatidae and two of Micropezidae, corroborating the suggestion of McAlpine (1986) of two main sister groups in Neriioidea, the Neriidae + Cypselosomatidae on the one hand and Micropezidae on the other.

However, in the present study, we follow the proposals by Aczél (1961) and Hennig (1937), including Micropezidae as sister group of the Neriidae, mainly due to lack of material of Cypselosomatidae, both dry and suitable to DNA extraction. Since it is not our objective to corroborate the monophyly of Neriidae or to clarify its relations within Neriioidea, we consider our external groups sufficient for the polarization of the inner group.

Institutions providing specimens are listed below, together with the acronyms for collections, institutes and museums (according to Evenhuis, 2017) and the people who kindly assisted in lending the specimens: BMSA– National Museum Bloemfontein, Bloemfontein, South Africa (Ashley Kirkspriggs); CEUA– Colección Entomológica Universidad de Antioquia, Medellín, Colombia (Martha Wolff); CSCA– California State Collection of Arthropods, Sacramento, California, U.S.A (Stephen Gaimari); DZUP– Coleção Entomológica 'Padre Jesus Santiago Moure', Universidade Federal do Paraná, Curitiba, Brazil; IAVH– Instituto Alexander von Humboldt, Bogotá, Colombia (Claudia Alejandra Medina Uribe); IFML– Instituto Fundación Miguel Lillo, Tucumán, Argentina (Guillermo Claps); INBIO– Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica; LACM– Los Angeles County Museum of Natural History, Los Angeles, California, U.S.A (Brian Brown); MNHN– Muséum National d'Histoire Naturelle, Paris, France (Christophe Daugeron); MZUSP– Museu de

Zoologia da Universidade de São Paulo, São Paulo, Brazil (Carlos Lamas); NHMUK– The Natural History Museum, London, United Kingdom (Daniel Withmore); NMSA– Natal Museum, Pietermaritzburg, South Africa (Thembeke Nxele and Burgert Muller); RMCA– Musée Royal de l'Afrique Centrale, Tervuren, Belgium (Marc De Meyer); SANC– National Insect Collection, Plant Protection Research Institute, Pretoria, South Africa (Ros Urban); TAUI– Tel Aviv University, Tel Aviv, Israel (Amnon Freidberg); UCDC– University of California, R.M. Bohart Museum of Entomology, Davis, California, USA (Steven L. Heydon); USNM– National Museum of Natural History, Washington D.C., USA (Allen Norrbom and Torsten Dikow); ZMHB– Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (Joachim Ziegler and Sven Marotzke); ZMUC– Zoologisk Museum Statens Naturhistoriske Museum, Copenhagen, Denmark (Thomas Pape); ZSM– Zoologische Staatssammlung, Munich, Germany (Marion Kotrba).

For morphological inferences, were studied 76 species of Neriidae representing almost every genera and coded for 97 characters. Species not included correspond to genera lacking of revision (*Nerius* Fabricius, *Protonerius* de Meijere and *Telostylinus* Enderlein) in which cases, only the type species and well-known species are included (except for the monotypic *Protonerius* de Meijere). Also not included from revised genera, are the species with dubious identification where type material was not available to confirm the species name, like *C. alboniger* Hennig, *C. compeditus* Hennig and *C. niger* Czerny. Also included are four species of Micropezidae to serve as outgroup taxa to polarize the in-group data (table 1). The specimens examined and their origins are detailed in table 1 for all material preserved in alcohol and at least one pinned specimen and institutions are cited by abbreviations according to Evenhuis (2017).

From the 77 species represented in the morphological dataset, 23 are included in the molecular based and total evidence analyses. In this sampling, 10 of the 20 genera of the family are represented with at least one species, including the monotypic *Gymnonerius* Hendel and *Aczelia*, new genus. Other genera represented are *Cerantichir* Hennig, *Chaetonerius* Hendel, *Glyphidops* Enderlein, *Longina* Wiedemann, *Nerius* Fabricius, *Teloneria* Aczél, and *Telostylus* Bigot. The outgroup taxa are also represented for a fraction of the species in the morphological analysis. Specimens collected and preserved in 98% ethanol used for DNA inferences, were sent in loan or donated from the following researchers: Allen Norrbom – USNM; Ashley Kirkspriggs –

BMSA; Brian Brown – LACM; Marion Kotrba – ZSM; Stephen Gaimari – CSCA.

Most DNA vouchers are deposited in their associated institutions or the DZUP, as indicated in table 1.

Table 1. List of species and specimens of Neriidae and outgroup taxa included in our analysis with its depositories and known distribution (Abbreviations for Biogeographical Regions: AFR, Afrotropical; AOC, Australasian-Oceanian; NEA, Nearctica; NEO, Neotropical; ORI, Oriental; PAL, Palearctic. Species with asterisk (*) where studied by high-resolution photographs and original description. Depositories in brackets [] house the vouchers of DNA extractions.

In-group species	Depository	Region	DNA
<i>Aczelia opita</i> , new species	[IAvH]	NEO	X
<i>Antillonerius cinereus</i> (Röder)	USNM	NEO	-
<i>Antillonerius solitarius</i> (Johnson)	USNM	NEO	-
<i>Cerantichir enderleini</i> Hennig	INBio	NEO	-
<i>Cerantichir peruana</i> (Hennig)	[DZUP], USNM	NEO	X
<i>Chaetonerius alienum</i> Sepúlveda & de Carvalho	TAUI, ZMUC	AFR	-
<i>Chaetonerius alluaudi</i> (Giglio-Tos)	[CSCA]	AFR	X
<i>Chaetonerius anemona</i> Sepúlveda & de Carvalho	ZMUC	AFR	-
<i>Chaetonerius antankarana</i> Sepúlveda & de Carvalho	NMSA	AFR	-
<i>Chaetonerius antanosy</i> Sepúlveda & de Carvalho	UCDC, TAUI	AFR	-
<i>Chaetonerius apicalis</i> (Walker)	[CSCA]	AFR	X
<i>Chaetonerius claricoxa</i> Enderlein	ZMHB, RMCA	AFR	-
<i>Chaetonerius ebejeri</i> Sepúlveda & de Carvalho	[CSCA]	AFR	X
<i>Chaetonerius eualluaudi</i> Sepúlveda & de Carvalho	ZSM	AFR	-
<i>Chaetonerius fascipes</i> Brunetti	RMCA, SANC	AFR	-
<i>Chaetonerius hololissa</i> Sepúlveda & de Carvalho	RMCA	AFR	-
<i>Chaetonerius inermis</i> (Schiner)	[UCDC]	ORI, AOC	X
<i>Chaetonerius kirksriggsi</i> Sepúlveda & de Carvalho	[CSCA], USNM	AFR	X
<i>Chaetonerius madagasikara</i> Sepúlveda & de Carvalho	[CSCA]	AFR	X
<i>Chaetonerius mandelai</i> Sepúlveda & de Carvalho	CSCA	AFR	-
<i>Chaetonerius latifemur</i> Enderlein	ZMHB, NHMUK	AFR	-
<i>Chaetonerius lobayensis</i> Sepúlveda & de Carvalho	MNHN	AFR	-
<i>Chaetonerius londti</i> Barraclough	SANC	AFR	-
<i>Chaetonerius nolae</i> Barraclough	SANC	AFR	-
<i>Chaetonerius nyassicus</i> Enderlein	NMSA	AFR	-
<i>Chaetonerius perstriatus</i> (Speiser)	ZMHB, NHMUK	AFR	-
<i>Chaetonerius spinibrachium</i> Enderlein	ZMHB, RMCA	AFR	-
<i>Chaetonerius spinosissimus</i> (Karsch)	ZMHB, UCDC	AFR	-
<i>Derocephallus angusticollis</i> Enderlein	ZMUC, NHMUK	AOC	-
<i>Eoneria aczeli</i> Sepúlveda, Wolff & de Carvalho	IAvH, CEUA	NEO	-
<i>Eoneria blanchardi</i> Aczél	MZUSP	NEO	-
<i>Eoneria maldonadoi</i> Aczél	MZUSP	NEO	-

<i>Eoneria sabroskyi</i> (Aczél)	MZUSP	NEO	-
<i>Glyphidops bistratus</i> (Williston)	USNM	NEO	-
<i>Glyphidops bullatus</i> (Enderlein)	ZMHB, IAvH	NEO	-
<i>Glyphidops carrerai</i> Aczél	MZUSP, CEUA	NEO	-
<i>Glyphidops coracinus</i> Sepúlveda & de Carvalho	IAvH	NEO	-
<i>Glyphidops durus</i> Cresson	USNM, IAvH	NEO	-
<i>Glyphidops etele</i> Aczél	MZUSP, USNM	NEO	
<i>Glyphidops filus</i> Fabricius	[DZUP], CEUA	NEO	X
<i>Glyphidops flavifrons</i> Bigot	[DZUP], CEUA	NEO	X
<i>Glyphidops limbatus</i> Enderlein	ZMHB, MZUSP	NEO	-
<i>Glyphidops pluricellatus</i> (Schiner)	[USNM], CEUA	NEO	X
<i>Glyphidops ruselatus</i> Sepúlveda, Wolff & de Carvalho	[DZUP], CEUA	NEO	X
<i>Glyphidops steyskali</i> Sepúlveda, Wolff & de Carvalho	IAvH, MZUSP	NEO	-
<i>Glyphidops vittatus</i> (Cresson)	[DZUP], ZMHB	NEO	X
<i>Gymnonerius fuscus</i> (Wiedemann)	[CSCA], TAU	ORI	X
<i>Indonesicesa lieftincki</i> Aczél	NHMUK, IFML	AOC	-
<i>Indonesicesa annulipes</i> (Doleschall)	NHMUK	AOC	-
<i>Longina abdominalis</i> Wiedemann	[DZUP]	NEO	X
<i>Longina anguliceps</i> Buck & Marshall	DZUP	NEO	-
<i>Longina semialba</i> Buck & Marshall	[DZUP]	NEO	X
<i>Loxozus cornutus</i> (Walker)	NHMUK, USNM	NEO	-
<i>Freidbermyia cholita</i> , new species	USNM	NEO	-
<i>Nerius czernyi</i> Aczél	[DZUP]	NEO	X
<i>Nerius pilifer</i> Fabricius	[DZUP]	NEO	X
<i>Nerius plurivittatus</i> Bigot	[DZUP]	NEO	X
<i>Nipponerius femoratus</i> (Coquillet)	USNM	PAL	-
<i>Odontoloxozus longicornis</i> (Coquillet)	[DZUP], LACM	NEO	X
<i>Paranerius fibulatus</i> Enderlein	USNM	AOC	-
<i>Styocladium appendiculatus</i> Hendel	USNM	PAL, ORI	-
<i>Teloneria apicata</i> (Edwards)	[CSCA]	ORI	X
<i>Teloneria bimaculata</i> (Edwards)	NHMUK	ORI	-
<i>Teloneria eumaculata</i> Sepúlveda & de Carvalho	TAUI	ORI	-
<i>Teloneria furva</i> Sepúlveda & de Carvalho	[CSCA], UCDC	ORI	X
<i>Teloneria scaenica</i> Sepúlveda & de Carvalho	TAUI	ORI	-
<i>Telostylinus lineolatus</i> (Wiedemann)	USNM	AFR, AOC, ORI, NEO	-
<i>Telostylinus</i> sp.	ZSM	AOC	-
<i>Telostylus babiensis</i> de Meijere	ZMUC, NHMUK	ORI	-
<i>Telostylus binotatus</i> Bigot	TAUI	ORI	-
<i>Telostylus claroscuro</i> Sepúlveda & de Carvalho	NHMUK	ORI	-
<i>Telostylus facsimile</i> Sepúlveda & de Carvalho	NHMUK, [CSCA]	ORI	X
<i>Telostylus inversus</i> (Hennig)	NHMUK	ORI	-
<i>Telostylus latibrachium</i> Enderlein	NHMUK	ORI	-
<i>Telostylus niger</i> Bezzi	ZMUC	ORI	-
<i>Telostylus philippinensis</i> Cresson	TAUI	ORI	-
<i>Telostylus trilineatus</i> de Meijere	TAUI	ORI	-
Out-group species	Despository	Region	DNA

<i>Cryogonus</i> sp.	[DZUP]	NEO	X
<i>Micropeza</i> sp.	[DZUP]	NEO	X
<i>Cothornobata shuimanensis</i> *	Li <i>et al.</i> (2015)	ORI	-
<i>Taeniptera albitarsis</i>	MZUSP	NEO	-

Inferences from morphological characters

Construction of morphological characters

Some of the characters were previously mentioned in previous studies on Neriidae, e.g., Aczél (1951; 1954a; 1954b; 1954c; 1955a; 1955b; 1955c; 1959; 1961). The data matrix includes 97 characters, containing 57 binary characters and 40 multistate characters. The characters list includes 51 characters from head (characters 1–51; 53%), 37 from thorax (52–88; 38%) and nine from abdomen (89–97; 9%). No presented character is constant and all are parsimony informative. The list of characters with its character states included in the cladistic analysis is presented in Appendix 1.

Cladistic analysis and taxonomic procedures

The morphology data matrix was produced in Winclada version 1.00.08 (Nixon 1999–2002) (Appendix 2) and the heuristic search for the most parsimonious trees was carried out in TNT version 1.1 [August, 2011] (Goloboff *et al.*, 2008) through a traditional search with 1,000 replications, saving 10 trees per replication, and under tree-bisection reconnection branch swapping (TBR). All characters were treated as unordered and non-additive. In order to explore the effects of different treatments of the characters on the results, we carried out the parsimony analysis under equal and implied weights for the characters (Goloboff, 1993). Resulting trees were rooted in *Micropeza* sp.

Branch support values for the equally weighted trees were calculated in TNT. Bootstrap (Bo) resampling support was calculated based on a traditional search with 1,000 pseudoreplicates. Total Bremer (Br) values (Bremer, 1998, 1994) were determined by performing a search for trees suboptimal by up to 1. Bremer support is indicated from two, considered relevant from three and considered strong Bremer support from five. Bootstrap are also indicated in the topology when higher than 50 and considered strong Bootstrap support over 80.

For the analysis under implied weights, character weights were not given a priori; instead, they were assigned during tree search. This procedure resolves conflict in favor

of less homoplastic characters. The implied weighting analysis was conducted applying the script *K_automatiko.run*. Relative Bremer support was performed in T.N.T as branch support values for implied weighted trees (Bw).

For the descriptions and redescrptions of species, measurements of total length of the specimens are given without antenna and terminalia length. The scales of all figures are 1 mm. General morphological terminology follows that recommended in Manual of Central American Diptera (Cumming and Wood, 2009). For antennal characters, we use the terminology proposed by Aczél (1961) and for male genitalia, we follow Sinclair *et al.* (2013).

Inferences from molecular characters

Laboratorial methods

Genomic DNA was obtained by a non-destructive method using DNeasy Blood and Tissue Kit (QIAGEN Biotecnologia Brasil Ltda), following the manufacturer's protocol. After extractions, each specimen was mounted on an entomological pin, identified and labeled with its respective registration number (voucher) and deposited in the institutions indicated in Table 1.

PCRs were carried out using genomic DNA to obtain sequences of two mitochondrial markers, selected according to their relevance in phylogenetic inferences in Diptera, including a fragment of the protein coding cytochrome oxidase subunit 1 (cox1) and the ribosomal gene 12S rRNA. The primer sequences used in this study follow Simon *et al.* (1994) and are listed in Table 2. Amplifications were in 25 μ L of total volume containing 2,5 μ L Buffer 10x, 1,5 μ L MgCl₂ 50mM, 0,5 μ L dNTPs 10mM, 0,5 μ L of each primer 10mM, 0,1 μ L Taq DNA Polymerase, and the volume of water ddH₂O varied according to the amount of DNA used for each reaction. To amplify both markers, we used an initial denaturation at 96° C for 3 minutes and a final extension at 72° C for 10 minutes. The following cycle conditions to amplify cox1 were 40 cycles of denaturation at 94° C for 30 seconds, annealing at 50° C for 30 seconds and extension at 72° C for 1 minute; and, for 12S, we used 35 cycles of denaturation at 94° C for 30 seconds, annealing at 48° C for 1 minute and extension at 72° C for 1 minute.

PCR products were purified by isopropanol precipitation and sequenced using BigDye Terminator v3.1 (Applied Biosystems, Foster City CA, USA) by the company WEMSeq Biotecnologia, at the Departamento de Bioquímica e Biologia Molecular,

Setor de Ciências Biológicas, Centro Politécnico, UFPR. In total, 38 new sequences (22 for 12S and 16 for *cox1*) were generated for this study, which will be uploaded to GenBank.

Table 2. Oligonucleotide primers used for PCR amplification

Marker	Primer	Sequence (5'→3')
cox1	Pat	TCC AAT GCA CTA ATC TGC CAT ATT A
	Jerry	CAA CAT TTA TTT TGA TTT TTT GG
12S	12Sh	GAC CAA ATT GGT GCC AGC AGT
	12Sbi	AAG AGC GAC GGG CGA TGT GT

Edition and sequence alignments

Sequences were edited in the program Geneious® 9.1.3 (Biomatters Ltd.). Sequence edition included only coding heterozygous positions according to the IUPAC ambiguity code. Alignment for the phylogenetic analyses were produced with our novel sequences and, additionally, sequences for two species were obtained from GenBank (*Micropeza (Micropeza) sp2.*, *cox1*: KM287304; 12S: KM287346. *Cryogonus formicarius* (Rondani), *cox1*: KM287293; 12S: KM287333). Sequences obtained from GenBank were only to fit them to our alignments, i.e., completing with Ns their finals and/or removing final extra positions when they are longer than the target fragments produced in this study. The coding protein marker, *cox1*, was firstly aligned as nucleotides in MAFFT version 7.222 (Kato *et al.*, 2002), through Geneious® 9.1.3, using the algorithm G-INS-I (default values: gap open penalty = 1,53; offset value = 0,123) and, then, the alignment was translated to aminoacids in order to check for presence of stop codons or any other translation problem in the sequences. The RNA ribosomal gene, 12S, was aligned using the Q-INS-I algorithm in MAFFT, which considers secondary structure information to refine the alignment (Kato and Toh, 2008).

Phylogenetic analyses

Hypothesis on phylogenetic relationship between the genera of Neriidae based on molecular data were constructed under Bayesian inference, for which posterior probability was interpreted as support for the clades; and for maximum likelihood, Bootstrap values were considered as statistical support. Prior to phylogenetic analyses, data were analyzed to identify character partitions and their optimal substitution model in the program PartitionFinder v.1.0.1 (Lanfear *et al.*, 2012) (Table 3).

Table 3. Character partitions and their optimal substitution model in the program PartitionFinder v.1.0.1

Subset	Partitions	Model	Positions
1	12SrRNA	GTR+I+G	1-534
2	cox1, 1 ^a posição do códon	TrN+G	535-1329\3
3	cox1, 2 ^a posição do códon	F81+I	536-1329\3
4	cox1, 3 ^a posição do códon	HKY+G	537-1329\3

Each data set and combined molecular data were analyzed using Bayesian inferences carried out in MrBayes 3.2.2 (Ronquist *et al.*, 2012), through CIPRES server (Miller *et al.*, 2010), using the algorithm MCMC (Metropolis-coupled Markov Chain Monte Carlo). Analyzes were performed in two simultaneous runs with eight chains each, with 20 million generations, saving a tree every 1,000 generations. Congruence between Bayesian inference results was inferred based on split frequencies values and the stabilization of the log-likelihood of the cold chain after removing 25% of the initial trees obtained in the analyzes.

Maximum likelihood analyses were carried out in RAxML 7.2.6 (Stamatakis, 2006), using the same partition scheme used for the Bayesian inferences, considering unlinked GTR+I+G model for each data partition of the resulting optimal partition scheme, with their respective parameters estimated from the data. A tree resulting from the maximum-likelihood analysis was obtained from a bootstrapping analysis, based on 50 maximum likelihood trees under different starting trees, rooting the species *Micropeza* sp. as outgroup. Bootstrap values were calculated for the best tree based on 1,000 replications.

Total evidence systematics of Neriidae

A total evidence hypothesis combining both sources of data (morphological and molecular characters) was obtained from Bayesian analysis, for which posterior probability was interpreted as support for the clades (By). For the combined analysis, we included only the 23 in-group specimens from which we obtained DNA amplifications (Table 1). Bayesian inference was performed in Mr. Bayes using the same scheme of character partitions and under parameters previously mentioned for each sequence segment in the 'Phylogenetic analyses' session.

Results

Morphological inferences

The parsimony analysis equally weighted resulted in four most parsimonious cladograms of 613 steps (CI=23; RI=79) and the strict consensus topology, in which two nodes concerning the relationships within *Teloneria* Azcél and *Telostylus* Bigot are collapsed, has a length of 615 steps (CI=23; RI=79; fig. 14).

Was obtained one most parsimonious tree under implied weight analysis (L=640; CI=23; RI=79; k=8.906250) congruent with the equally weighted cladogram. The only differences are reflected basally to *Nerius*-group, where the monotypic genera *Aczelia* new genus and *Loxozus* Enderlein, are its sister-group under equally weighted analysis, based on the type and number of anterior outstanding setae on mid femur [84:1]. While under implied weight, this position is occupied by the lineage *Freidbergmyia* new genus and *Loxozus*. Under this scheme of weighting, several groups with low support values under Br and Bo, have gain some Bw support. Such are the cases of (*Aczelia* + *Freidbergmyia* + *Loxozus* + *Nerius*-group); *Eoneria*-group; *Glyphidops* Enderlein and; the close relation of *Cerantichir* and *Odontoloxozus* within *Longina*-group (fig. 15).

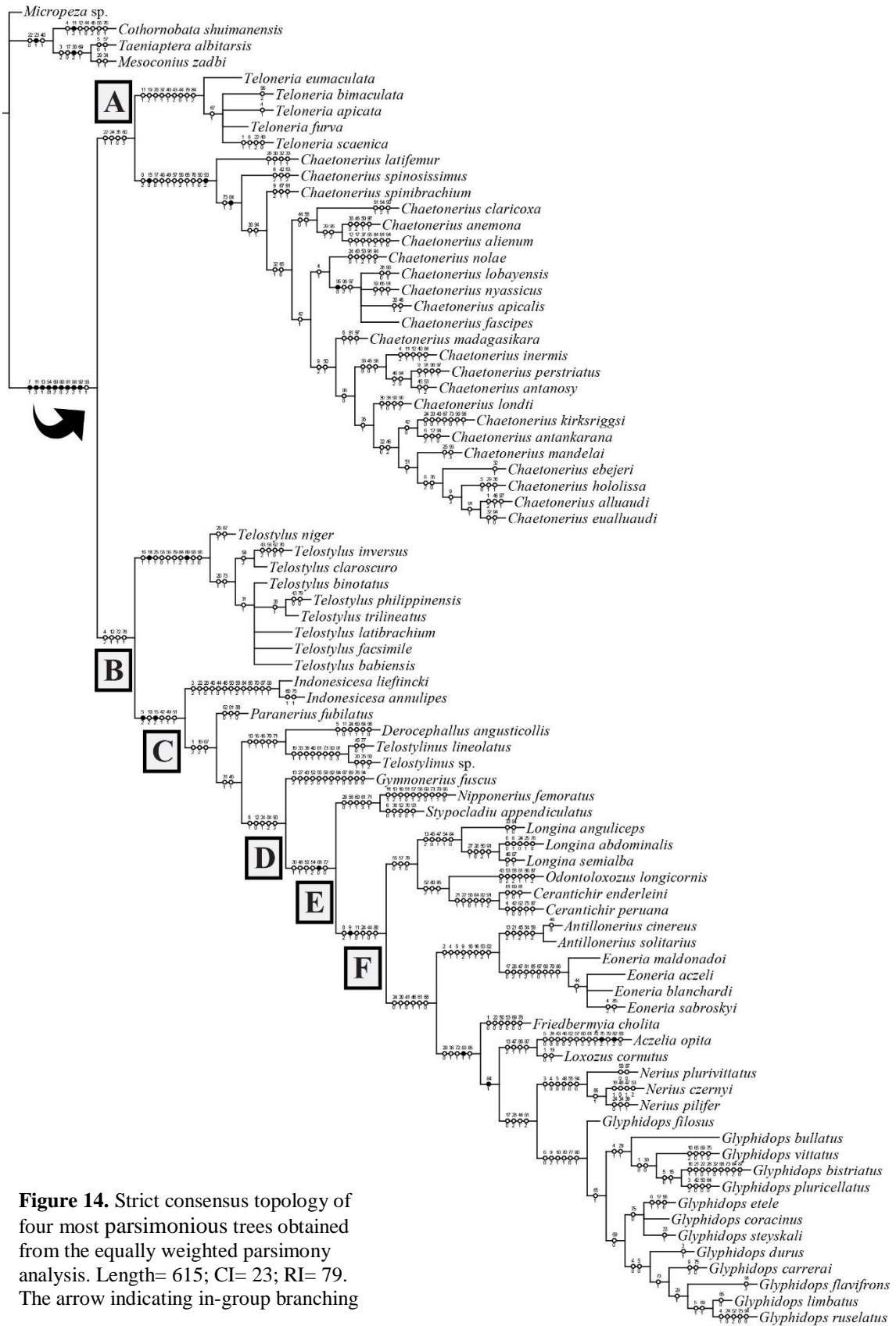
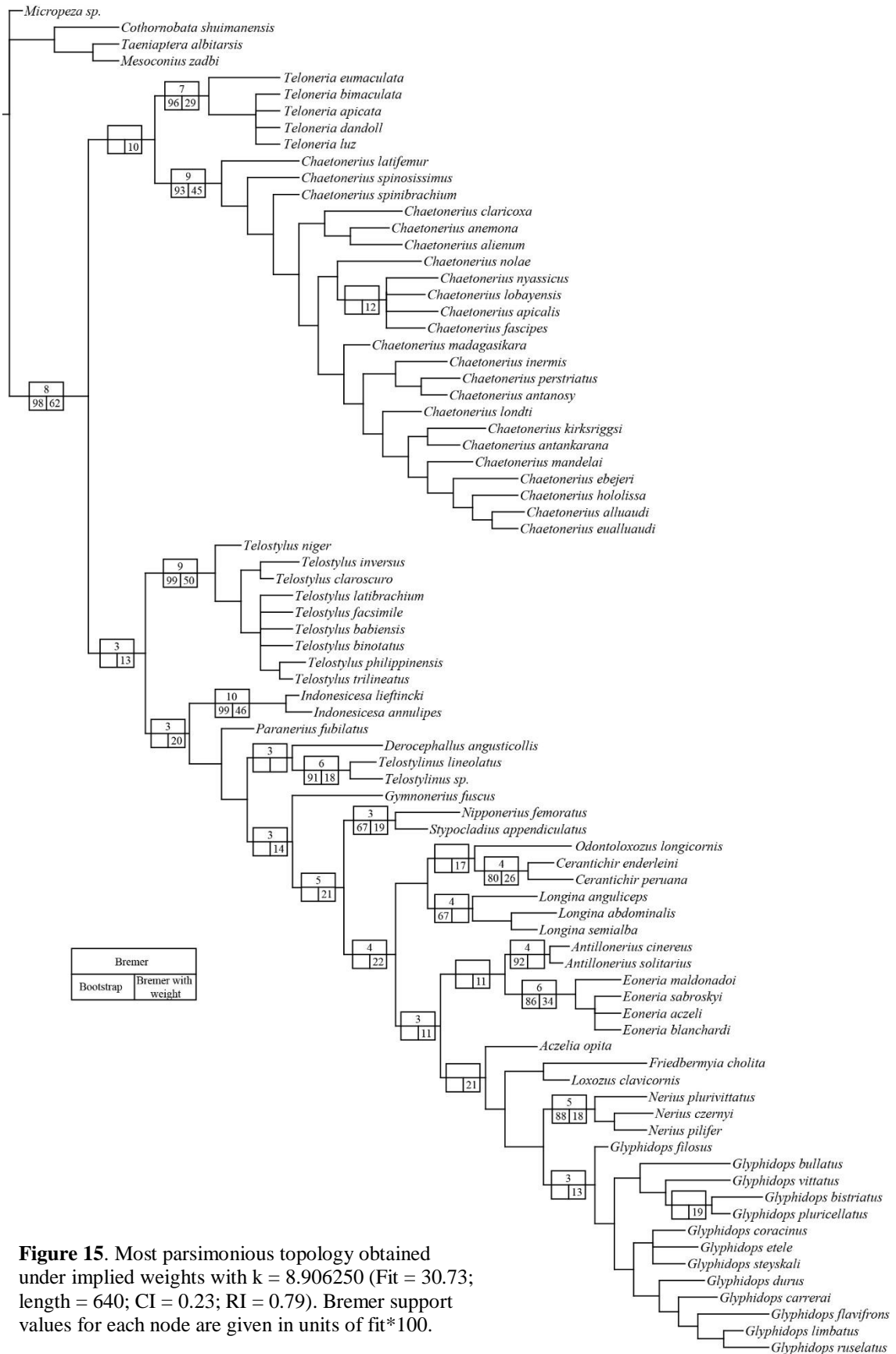


Figure 14. Strict consensus topology of four most parsimonious trees obtained from the equally weighted parsimony analysis. Length= 615; CI= 23; RI= 79. The arrow indicating in-group branching



Phylogenetic hypothesis based on molecular data and total evidence

Despite the small number of sampled terminals, the result of our analysis of total evidence includes clades is congruent with the relationships recovered in our analyzes based on morphological data and molecular data. The family is clearly divided into two main groups, one of which includes the Afro-tropical species of *Chaetonerius* Hendel and the Oriental *Teloneria* Aczél, while the other main clade contains the Nearctic and Neotropical species. Another important result supporting our inferences based on morphological data is the relationship between neriids of the New World and *Gymnonerius* Hendel in the total evidence and molecular-only topologies. This genus form a monophyletic clade including the species of *Nipponerius* Cresson and *Stypocladius* Enderlein in the morphology-only analysis.

The main result regarding support branch versus sampling, is the lack of posterior probability support in our total evidence topology for the same node where about half of taxa represented in morphological dataset are not sampled (fig. 16, red rectangle). This include many small genera rarely collected, that have not been properly preserved for DNA extraction and sequencing. Nevertheless, our results from combined morphological and molecular data, allows us to confirm convergent lineages and relationships obtained with morphological evidence only. The inclusion of other taxa will allow to increase the resolution and conclusive reach in this node, which although preliminary (representing near 20% of all valid species in Neriidae), can be considered adequate to infer the relationships of the resulting groups, due to the high support values obtained as well as the diversity of the species included.

The convergent results between different types of data and approaches, give us the confidence to believe that the characters constructed for the cladistic analysis based on morphological data, reflect the evolution of the main groups of Neriidae. For this reason, the combined data constitute an additional support for the resulting cladograms, which will be used to explain the generic and suprageneric relationships, as for the proposal of a new classification within the family.

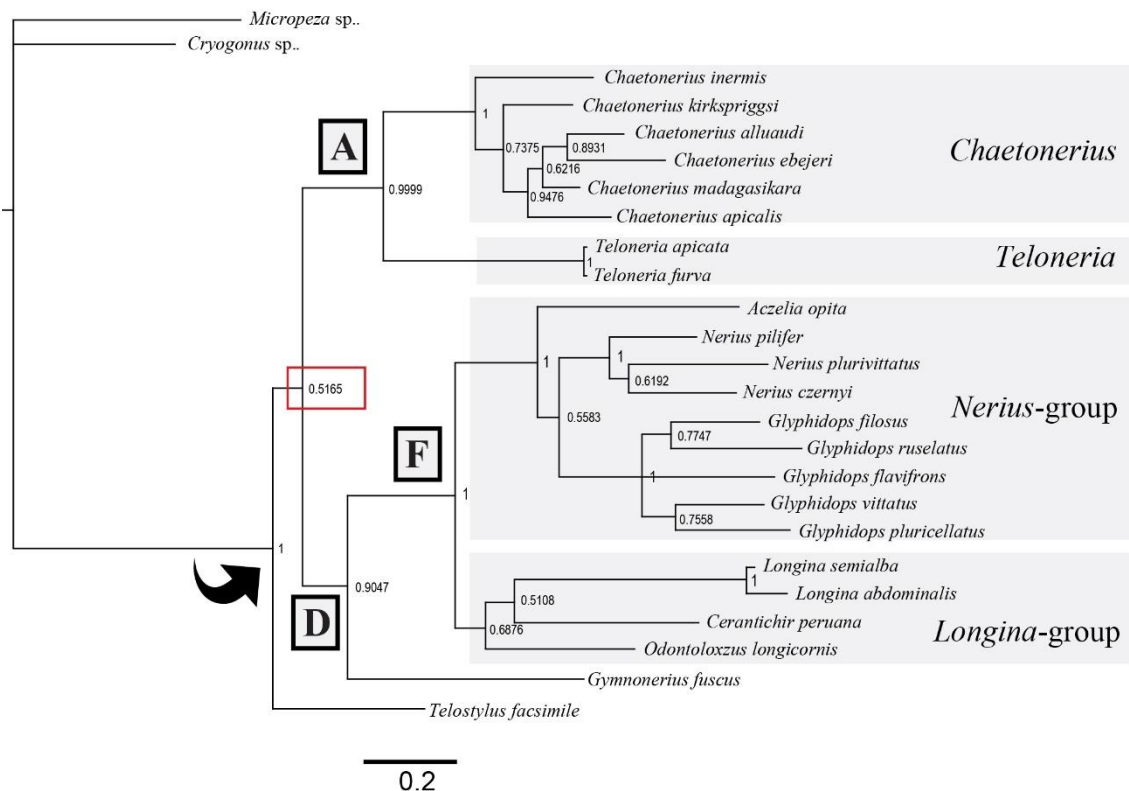


Figure 16. Bayesian analysis of the combined dataset (morphology + 12S + cox1). Posterior probabilities are shown at each branch. Neriidae branching indicated by the arrow.

Discussion

The use of several tree search strategies allowed identifying which groups were more stable and which groups were not. As all trees obtained under different nature of data (molecular, morphological and molecular/morphologic) and treatment (equal and implied weight, maximum likelihood and posterior probability) were fully resolved and congruent with total evidence topology, the highest resolution and group support value were the criteria to choose between cladograms. Therefore, using these parameters as argument, we will discuss the phylogenetic relationships in the tree obtained under equally weighted results and compared with implied weights and/or molecular and total evidence results when necessary.

Although is not the aim of this work to corroborate the monophyly of Neriidae, as it has been proved monophyletic and strongly supported by previous studies (Wiegmann *et al.*, 2011; Sinclair), important synapomorphies support the conformation of the family: (1) presence of a modified pedicellar structure for the support of first flagellomere [7:1]; (2) one pair of spine-like setae apically on pedicel [11:3],

secondarily lost in Neotropical species; (3) scape slightly elongate to conspicuously elongate [13:1]; (4) fore femur long [54: 1]; (5) proepisternum with one spine-like seta ventrally [69:2], which may be secondarily lost in a few species; (6) two apical setae in fore coxa [80:0], which are reduced to one in *Glyphidops* and the clade formed by *Odontoloxozus* and *Cerantichir*; (7) hind coxa with two lateral setae [81:2], reduced to one in several Neotropical species; (8) long spine-like setae apically in tibiae [88:2] of most Palearctic and Oriental species and small-sized in Neotropical species; and (9) sternite 5 baciliform [92:1], differently from micropezids which are characterized by a sternite 6 modified in a genital fork.

Phylogenetic relationships of the Neriidae

No branch support is obtained to propose a relationship hypothesis based on morphological evidence between groups of genera in clades A and C, the latter composed mostly for Australian species, as indicated in figure 17, but when possible, apomorphies are proposed to derive these relationships, based on character states distribution in the resulted topology (fig. 14). Almost every genus previously proposed for the family are resolved as monophyletic and new character states are proposed and presented in figure 14 as synapomorphies supporting its composition.

Clade A

Notable exception in the confirmation of previously known groups is *Chaetonerius* Hendel, which does not include the *Teloneria* Aczél species *T. apicata* Edwards and *T. bimaculata* Bigot, as proposed by Steyskal (1977). The two genera share character states like the presence of presutural dorsocentral setae [59:1], absent only in *C. latifemur* Enderlein and more than one postsutural dorsocentral seta [60:3], which are reduced in number and thickened in other genera, as noted by Aczél (1961).

In addition, an important character never pointed before for any author, that is only present in these two genera, is the presence of transversal occipital line of setae in dorsal half, aligned with outer vertical seta [35:0]; these setae are plenty developed and conspicuous in *Teloneria* (figs. 7, 12) and of variable size in *Chaetonerius* (figs. 2, 11).

Despite these two genera being the ones with the largest number of dorsocentral setae, the *Teloneria* have two long postsutural setae, unlike *Chaetonerius*, which has four long setae and two in the particular case of *C. latifemur*. Hence, the genus

Teloneria is revalidated and differentiated from *Chaetonerius* by the following easily observed characters: (1) the position of inner process of pedicel, which is dorsally placed in *Teloneria* [8:0], and medially placed in *Chaetonerius* [8:1]; (2) the presence of a very small antennal base in *Teloneria*, which is completely absent in *Chaetonerius*; (3) the absence of a projected part of face [19:1], which is evident between the antennae of *Chaetonerius* (fig. 12) [19:0]; and at least ten more character states cited in the topology.

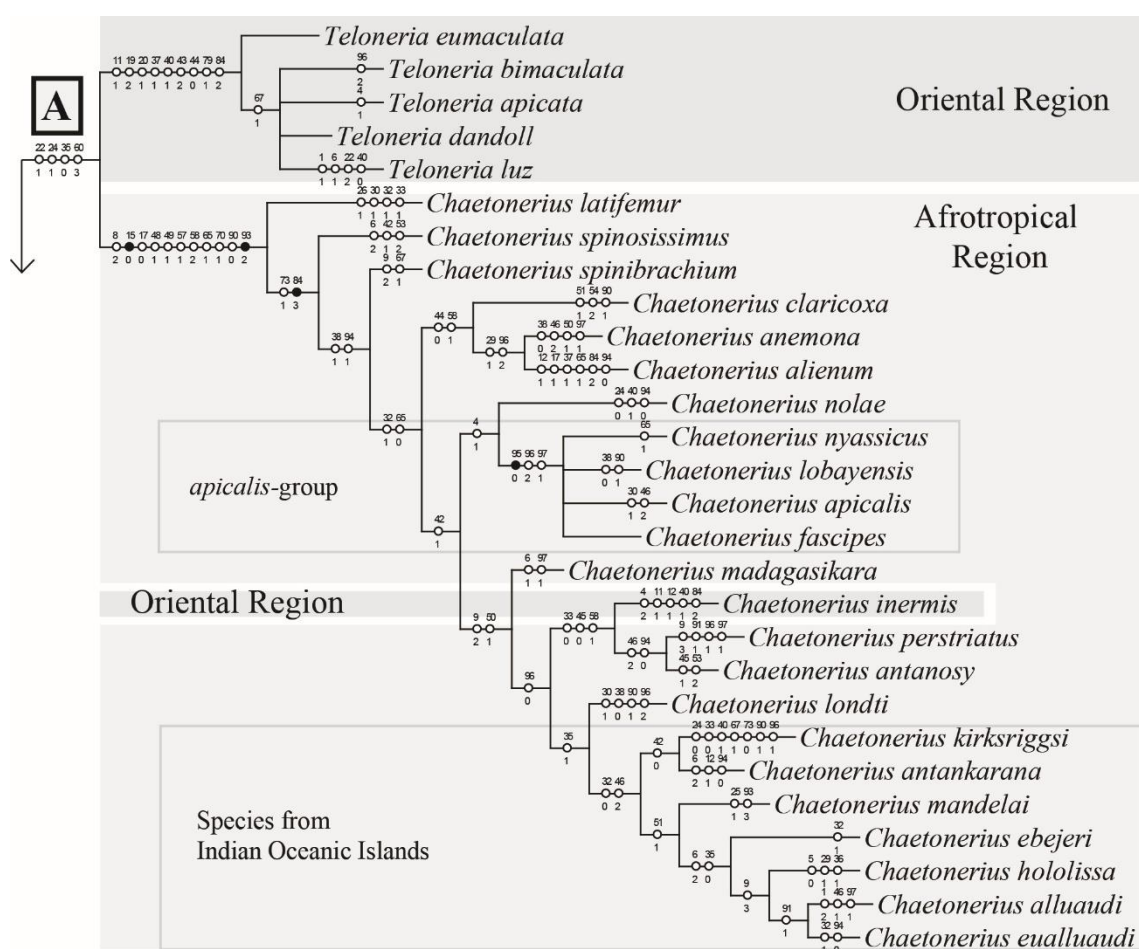


Figure 17. Fragment of topology in figure 14, detailing clade A.

Several characters resulted in homoplastic synapomorphies supporting *Teloneria*, because they evolved independently in one or two species and albeit homoplastic, are here considered supporting synapomorphies. Such character states are (1) the presence of one dorso-apical seta in pedicel [11:1], present also in *C. inermis* (Schiner) and *Nipponerius femoratus* Coquillet; (2) the presence of four to five ventral postocular

setae, following the eye margin [37:1] is not recovered as autapomorphy, only because one species of *Chaetonerius* (*C. alienum* Sepúlveda & de Carvalho, *in press.*) has one remaining seta; (3) the apical wing macula [79:1], present simultaneously in *Telostylus* Bigot and several big-sized Neotropical species, in which the macula is remanescent and evidently different in shape.

The new delimitation of *Chaetonerius* comprises every Afrotropical species and the Oriental *C. inermis*, which would be the same arrangement proposed by Aczél (1955c), including the new species described from material collected in Madagascar and other Indian Ocean islands (Sepúlveda & de Carvalho, *in press.*) Unfortunately, as result of this analysis, it is impossible to infer the internal relationships within the genus, but its monophyly is well-supported. This result is expected, if considered the statements by Barraclough (1993b), where the author address the attention to the fact that –“*the species concept in Chaetonerius (at least for the southern African fauna) are based predominantly on male characters and females may be difficult to identify*”–. This impression of the author reflects the lack of diversity in the external morphology of Afrotropical Neriidae, also reflected in the low support obtained in our results, concerning the intraspecific relationships in *Chaetonerius*.

Two autapomorphies are cited for the mainly Afrotropical genus *Chaetonerius* (Br 9/ Bo 93/Bw 0.45/By 1), being the only one with antennal base absent [15:0] and sternite 6 protuberant [93:2]. Other apomorphic character states supporting the clade include (1) anterior margin of frons straight [17:0], also present in *Glyphidops* Enderlein and *Eoneria* Aczél; (2) anterior margin of scutum with one seta [57:1]; (3) pleura with yellow stripe between prostpronotal lobe and katatergite [70:1]; (5) two longitudinal yellow stripes in abdomen dorsally [90:0], character state shared exclusively with species of *Telostylinus* Enderlein; and (6) large discal seta [58:2].

Despite the strong support obtained to erect *Teloneria* as an independent genus out of *Chaetonerius* (Br 7/ Bo 96/Bw 0.29/By 1) in all our treatments, the clade *Teloneria* + *Chaetonerius* obtained conflicting results. With the morphological dataset, the relation of these two genera is uncertain (Br 1/Bo 6/Bw 0.10) and with the combined dataset, the two genera are closely related, regarding the rest of genera included in this analysis. Nevertheless, in this last case, the lack of representatives of other genera does not allows us to determine how certain this relation might be. Therefore, is not possible

to define the relationship between these two genera or with the rest of Neriidae (clade A, fig. 17).

Clade B and C

The result of the topology presented by Koch *et al.* (2014), is comparable with the quality and quantity of information available on the species included in their analysis, since no synapomorphies were found for almost any of the clades containing Oriental or Australian species (except the *Indonesicesa* Koçak and Kemal; fig. 1). The species of these regions are the ones that have never been revised and for which little information is available, except for its original descriptions, which are usually very old and with limited taxonomic information (Buck, 2010).

After performing the required minute taxonomic revision of these species, in order to build our dataset, our results regarding the Oriental and Australian Neriidae are in discordance with those of Koch *et al.* (2014), mostly in reference to clades B and C. Other relevant differences are the statement of *Chaetonerius* as sister-group of New World Neriidae and the new combination suggested for *C. peruana* (Hennig) in *Odontoloxozus* Enderlein (fig. 1), that will be discussed ahead.

In our findings, species of *Chaetonerius* with no antennal base and *Teloneria* with very small antennal base are placed basally in clade A, corroborating the assumptions of Aczél (1961) regarding the development of antennal base within the family, being this a synapomorphy for the groups of the Americas, although not exclusive. In our results, the presence of antennal base [15:1], brings together the species that have protruding and mostly shiny antennal base (clade C) with *Telostylus* (clade B).

Despite having small antennal base similar to that in *Teloneria*, and the relatively low support values obtained for clade B (Br 3/Bo 6/Bw 0.13), *Telostylus* shares important apomorphic character states with the rest of Neriidae: (1) arista completely white [4:2], which is a constantly brown arista in basal clade A and constantly white in *Telostylus*, but very variable among species with protruding antennal base; (2) the absence of anterior notopleural seta [72:1] present in species of Neriidae placed basally in the topology and other families of Neriioidea is lost in this clade and secondarily developed in the *Nerius*-group (fig. 20); absence of ventral katepisternal seta [76:1], present in clade A and in other plastic and big-sized species (*Gymnonerius fuscus*, *Styptocladus appendiculatus* and *Longina abdominalis*), in which males present conspicuous body elongation and strong setae, important in the fights for territories.

Since the description of *Telostylus* by Bigot, many authors have based their descriptions of new species in this genus, based in the colors of its shiny tegument, which is usually yellow with variable black spots. Despite the genus being one of the first genera described for the family, the major contribution to knowledge of its species is a key published by Steyskal (1966) on his notes about flies captured in the Selangor Gombak Forest Reserve, Malaysia. In this study, *Telostylus* resulted in strong branch support (Br 9/Bo 99/Bw 0.46) and two autapomorphies: face laterally exposed, projected anteriorly beyond margin of fronto-genal suture [18:1] and males fore basitarsomere swollen [89:1].

Additional apomorphic character states supporting the genus are: (1) antennal base opaque [16:1], which is one of Aczél's characters (1961) used to classify suprageneric groups of species, stating that *Telostylus* lack antennal base to place it in Telostylinae along with *Chaetonerius*, but *Telostylus* indeed, has a well-developed antennal base, very similar to the one in *Telostilynus* but smaller (not as small as the antennal base in *Teloneria*); (2) besides lack of anterior fronto-orbital seta, *Telostylus* also particularly lacks middle fronto-orbital seta [25:1], character state developed independently in only three more known species in the family, *C. mandelai* Sepúlveda and de Carvalho, *Telostylinus* sp. and *Longina abdominalis* Wiedemann; and (3) tegument shiny, except dorsal slightly pubescent area in *Tl. inversus* [53:0], character state only shared with the monotypic *Freidbergmyia*, gen. n.; (4) the transversal suture is complete in this genus [56:1] and *Stypocladius* Enderlein, striking that this character had never been mentioned by any author.

Despite have resulted in high support values (Br 3/Bo 26/Bw 0.20) and two autapomorphies: (1) appearing of dense pubescence in the arista [5:2], secondarily lost in clade H and reduced in *Eoneria*-group and (2) protrudent antennal base [15:2], the base of clade C are of the less resolved in our topology. The species in this clade are small genera not included in our study with total evidence, due lack of suitable material for DNA extraction. The clade includes at its base, the Australian genera *Indonesicesia* Koçak and Kemal and *Paraneri* Bigot, each with three valid species and the widespread *Telostylinus* Enderlein, with at least 20 valid species. The Australian endemic *Derocephalus angusticollis* is also basally placed in this clade, closely related to *Telostylinus*.

In addition, four apomorphies support the lineage formed by clade C: (1) pedicel moderately to very elongate [10:1, 2], which, as already mentioned, is a character associated with the behavioral nature of Neriidae males on of fighting for territories and to this extent, an elongated pedicel, confers a greater appearance to the head; (2) occiput elevated over nivel of postgena [42:1]; (3) postgena widens posteriorly, drawing away from the eye margin [49:1]; (4) postgenal setulae positioned laterally [51:1], this character is associated with the numerous modifications that suffers the postgena in these groups.

Accordingly with results of Koch *et al.* (2014), we also corroborate the monophyly of the *Indonesicesa* (Br 10/Bo 99/Bw 46), and face difficulties to determine the relationship between this and *Paranerius* Bigot and the lineage formed by *Telostylinus* Enderlein + *Derocephalus* Enderlein, due low support values in our topologies based on morphological characters.

Only one of the three species of *Paranerius* is included in our analysis, and is not the type species, *P. continentalis* Hennig, as the holotype was destroyed [formerly deposited in MLUH], so there is no inference regarding its monophyly, but the species included in this study *P. fibulatus*, certainly shares very similar morphology traits with *Indonesicesa*, more than any other of the genera in the topology.

Currently, near 20 species are described for *Telostylinus*, although only two are included in our study, its monophyly is corroborated with high support values (Br 6/Bo 91/Bw 0.18) and several apomorhic character states (1) face projected anteriorly between antennal bases [19:0], this character evolved independently at least three times in Neriidae and in the particular cases of *Telostylinus* and *Telostylus*, the face is projected between and over inner margin of antennal bases; (2) occipital median yellow stripe [38:1], this character state is constantly present in most of the species without sexual dimorphism (part of Neotropical and *Chaetonerius* species) and might play an important role in social interaction; (3) katatergite yellow [73:1], this is a constant character within genera, and have evolved independently at least five times in the family; (4) dorsal longitudinal yellow stripe on abdomen [90:0], shared only with *Chaetonerius*, is a constant character state within *Telostylinus* and may also play an important part in intraspecific interaction.

The lineage *Derocephalus* + *Telostylinus* is also corroborated as monophyletic and supported for the following apomorphies: (1) pedicel not elongate and also not

reduced in size [10:1], an elongate appearance (specially the head) is a trait very important for males, because will help them in fights for control over the best territories for oviposition, and give them wide access to females (Eberhard, 1998; Preston-Mafham, 2001; Adler and Bonduriansky, 2011), hereby, the size of pedicel has evolved from its very short plesiomorphic state, to elongate or very elongate in Neotropical species, presenting an intermediate state in *Telostylinus* and *Derocephalus*; (2) antennal base opaque [16:1], a rare character, used by Aczél to group the named *Eoneria*-group (fig. 1), which are species from arid areas in the neotropics, and also shared with *Telostylus*, not included by Aczél in the *Eoneria*-group, since the author considered it lacking of antennal base; (3) pleural longitudinal yellow stripe dorsally [70:1] and transversally from notopleura to mid coxa [71:1], being the latter shared only with species in *Stypocladus* (figs. 36, 42).

The lineage formed by *Derocephalus* and *Telostylinus* resulted in a relatively low supported clade (Br 3/Bw 0.9), and this values does not give us confidence to determine a synonymy of the genera, as suggested by Colles and McAlpine (1991). Nevertheless, *D. angusticollis* is frequently used for experimental research on developmental plasticity, nongenetic inheritance, ageing and sexual selection under the name *T. angusticollis* (Bonduriansky, 2007, 2009; Bonduriansky and Head, 2007). However, this species, endemic from Australia, has been related with *Gymnonerius* (Hennig, 1937) by the similarities of bigger males with its species and with *Telostylinus* (Colles and McAlpine, 1991) by the similarity of its females and smaller males with its species. After studying specimens of the three genera from diverse localities and dimensions, we are convinced that this similarity constitutes convergences and *D. angusticollis* corresponds to a differentiated generic unit outside *Telostylinus* and should be treated within *Derocephalus*.

The first mention of *D. angusticollis* in *Telostylinus* was by Colles and McAlpine (1991) but no argument was exposed about the new combination and since then, several authors have used this combination, which has been fixed in diverse studies of behavior of this species in Australia. A taxonomic revision of *Telostylinus*, followed by the performance of a cladistic analysis including *D. angusticollis*, will help to resolve the remaining shadows of doubt in authors who continue to use the combination proposed by Colles and McAlpine (1991).

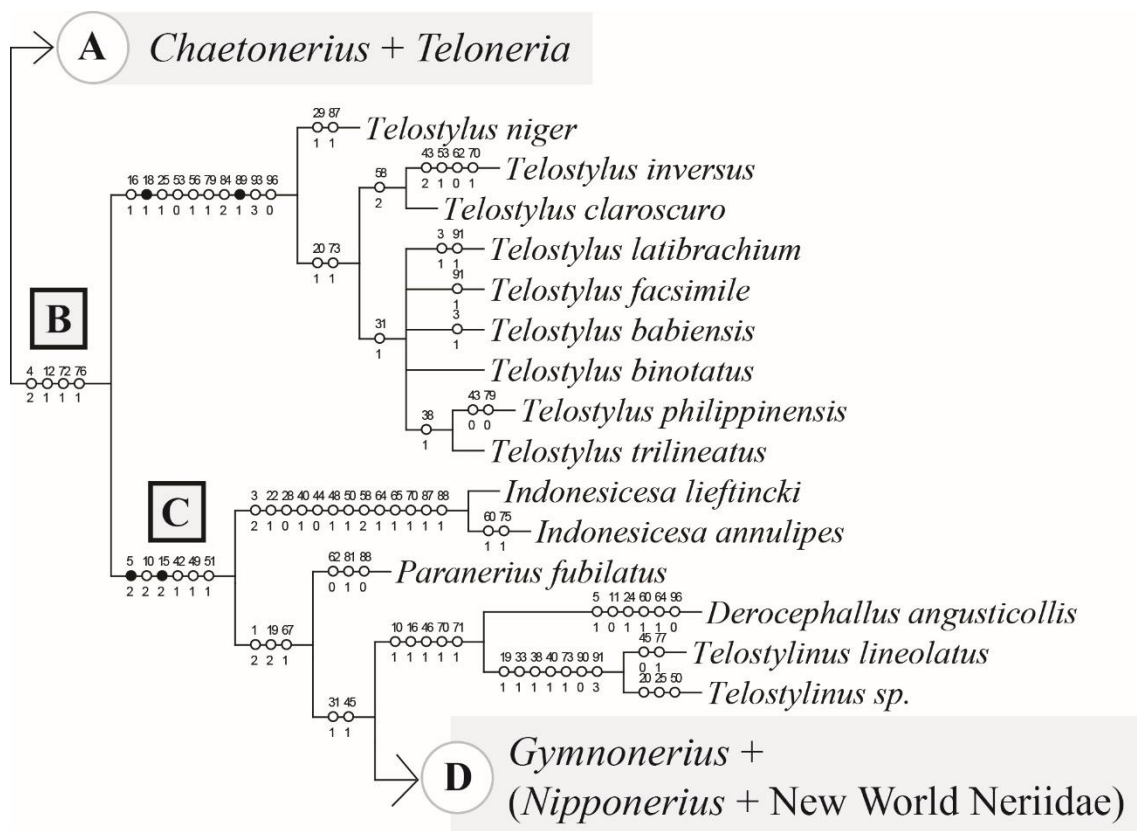


Figure 18. Fragment of topology in figure 14, detailing clades B and C.

Clade D

Wiedemann described the aberrant *Nerius fuscus* in 1821 and near a century later, Hendel (1913) described a new genus named *Gymnonerius* for the species, based mainly in traits of wing. Currently, *Gymnonerius fuscus* is the only species known for this genus. Hennig (1937) was the first to discuss the variability in body proportions and coloration of *G. fuscus* Wiedemann, proposing numerous subspecies (Steyskal, 1977). Aczél (1955a), on the other hand, criticized the lack of material examined to support the determinations of Hennig (1937). Here, only the *Gy. fuscus* var. *fuscus* is included in the analysis, emphasizing the fact that the sub-species status of this names need to be revised, as seems likely that the genus has more than one species.

The genus present striking traits, as the body in general is highly modified in order to seem longer, that will allow him to fight with other males for control in the best territories for oviposition, that will give him access to females and custody of females during oviposition (Preston-Mafham, 2001). *Gymnonerius* is considered by Aczél

(1955a) as a derived genus among Oriental groups, more closely related to neriids of the New World due to its particular morphology, which has made it difficult to delimit its species.

Although Koch *et al.* (2014) describe in his conclusions that *Chaetonerius* is the most likely sister group of Neotropical Neriidae, they mention an important fact regarding this hypothesis, saying that the possibility of *Gymnonerius* as sister-group of New World species should be considered and studied in detail. The assumptions of Aczél (1955c) and Koch *et al.* (2014) are confirmed in our studies and *Gymnonerius* is in fact, closely related to the lineage comprising the *Nipponerius* Cresson + New World species (Br 3/Bw 0.14/By 0.9047).

Apomorphic character states supporting this relationship are: (1) arista dorsoapical [6:1]; (2) absence of protuberance on distal third of inner margin of pedicel [12:0], associated with movement of first flagellomere; (3) outer vertical seta absent [34:1], as stated by Aczél (1961), the presence of long and numerous setae is a plesiomorphic character state, lost in species from the Americas, as it turns to be also for the species related to them, *Gymnonerius* and *Nipponerius*; and (4) mid femur with anterior line of prominent setulae medially [84:2], the tendency of this line of setulae is to reduction until one or two setae in *Aczelia*, new genus, *Loxozus* Enderlein, *Nerius* Fabricius and *Glyphidops* Enderlein.

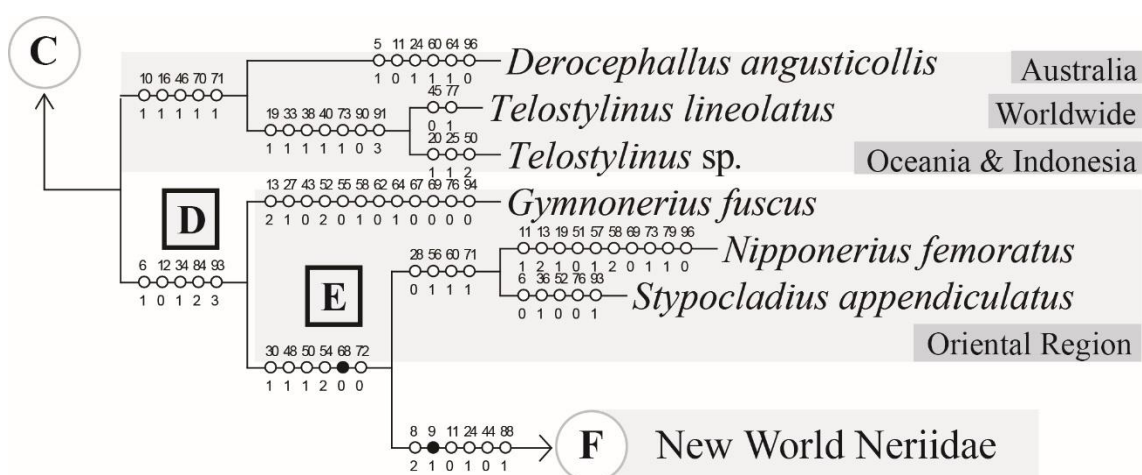


Figure 19. Fragment of topology in figure 14, detailing clades D and E.

Clade E. *Stypocladius* Cresson + New World Neriidae

Our results confirm that the monotypic genera of the Palearctic Region, *Nipponerius* Cresson, 1926 and *Stypocladius* Enderlein, 1922 are synonyms. High branch support values corroborate our statement (Br 3/Bo 67/Bw 0.19) and *Nipponerius* is here declared junior synonym of *Stypocladius*, based on the following apomorphic character states: (1) union of fronto-orbital plate and occiput in a striate horizontal line [28:0], this character state has evolved at least four times independently in clade H (protruding antennal base); (2) transversal suture complete [56:1], character state also present in *Teloneria* species; (3) two postsutural dorsocentral setae [60:1]; (4) pleural transversal yellow line [71:1], this coloration mark is present also in clade *Derocephalus* + *Telostylinus*, but in the particular case of *Nipponerius*, there is absence of the dorsal yellow line of those species and only the transversal stripe is present and does not reach the mid coxa.

Several hypotheses have been proposed regarding the relation of the neriids of the New World with the rest of the family (fig. 1), with the clade *Chaetonerius* + New World Neriidae, being the most accepted and discussed (Hennig, 1937; Koch *et al.*, 2014). Aczél (1954b) considered *Chaetonerius* as the most plesiomorphic group among the genera of Neriidae. However, in the hypothesis by Koch *et al.* (2014), this position is attributed to species of the islands of the Australian Region, although that hypothesis has not been significantly supported. Also unsupported, Koch *et al.* (2014) relate *Chaetonerius* with the American species, and propose synapomorphies for this clade based on coloration of femora and presence of ventral spine-like setae on fore femur, both characters of which was previously stated by Barraclough (1993b), Bonduriansky (2007) and Bonduriansky and Head (2007) as unreliable due to the high degree of phenotypic plasticity.

In this study, strong support values are attributed to clade E, formed by *Stypocladius* + New World Neriidae (Br 5/Bw 0.21). This lineage also shares the autapomorphic constriction of postpronotal lobe anteriorly (fig. 19), giving the postpronotal carina an elongated appearance at the point of attachment to it (fig. 13). Our results contradict all previous hypotheses, placing *Chaetonerius* in a separated clade, related to species of the Oriental Region at southeastern Asia (India, Thailand, Malaysia and Indonesia), whereas the species of the Americas, seem to have derived from the same lineage that gave origin to Palearctic species of *Stypocladius*.

Clade F. New World Neriidae

Aczél (1961) defended a paraphyletic origin for the New World neriids, nevertheless, the monophyly of the species in this part of the world was demonstrated by Koch *et al.* (2014), proposing as synapomorphies, characters mainly related to coloration and setae size, (constituting 86% of the characters proposed as sinapomorphies: 57%, continuous characters of size, 12% coloring, and 12%, setae size).

In our analysis, these kind of characters were avoided, due its dependence on the environment for the development of its states, as proven in studies by Bonduriansky (2007; 2009) and Bonduriansky and Head (2007). These studies show experimentally and indirectly, how these characters (mainly those related with size and presence of setae) constitute a dubious source of phylogenetic information. More specifically, these authors describe differences in size and development of secondary sexual characters in males and discuss how these characters are strongly dependent on immature developmental conditions. This explains why an expressive number of neriids described from a single male or female specimen are later synonymized after examining additional material, *eg.*, *C. apicalis* (♀) with *C. guesquierei* (♂) (Barraclough, 1993a) and *G. bullatus* (♂) with *Chaetomeristes peruanus* (♀) (Sepúlveda *et al.*, 2014).

The characters used in this analysis are different from those used in Koch *et al.* (2014), nevertheless our topology confirms the proposal of these authors regarding the monophyly of the neriids of the American continent (Br 4/Bw 0.22/By 1). Apomorphic characters supporting this result are: (1) inner process of pedicel placed medially [8:2]; (2) inner process of pedicel triangular [9:1], varying in wide and narrow triangular shape; (3) pedicel with no outstanding setae [11:0], character state also present in *Derocephalus angusticollis* Enderlein; (4) tibiae apical setae reduced in size [88:1].

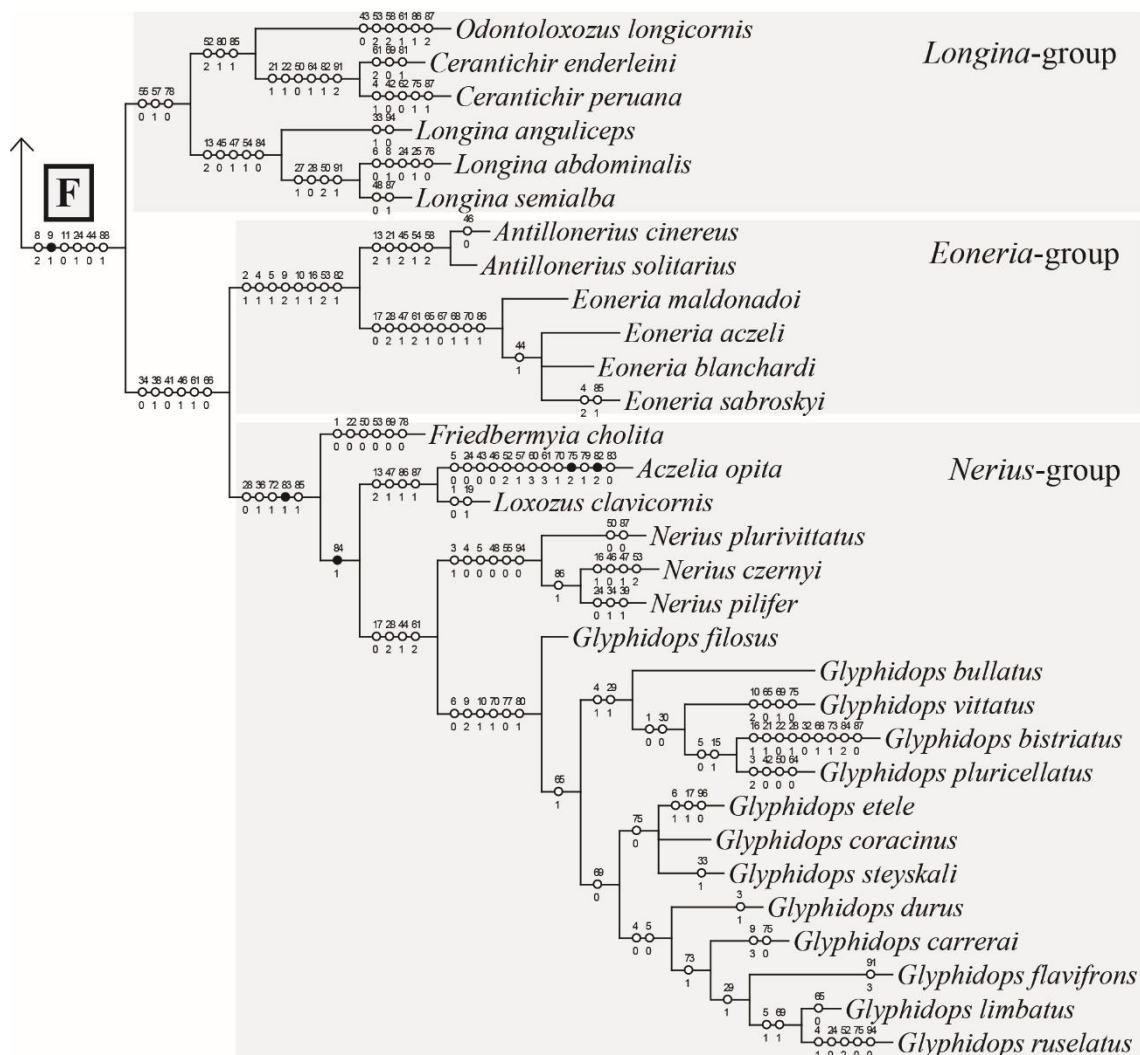


Figure 20. Fragment of topology in figure 14, detailing clade F: New World Neriidae.

Longina-group

According to Aczél's (1961) classification, there were 11 genera in the New World, of which nine remain valid names. The most significant taxonomic changes recently proposed in Neriinae, occurred in the genus *Odontoloxozus* Enderlein (Buck, 2010), *Longina* Wiedemann (Buck and Marshal, 2004), *Cerantichir* Enderlein (Buck, 2010), *Eoneria* Aczél (Sepúlveda *et al.*, 2013) and *Glyphidops* Enderlein (Sepúlveda *et al.*, 2014). In Koch *et al.* (2014), the former three genera resulted in a well-supported monophyletic clade with high support values, corroborating the evolutionary inferences of Aczél (1961), albeit the only genera recovered as monophyletic was *Longina*. Here,

the three genera are discussed and a *Longina*-group proposed, containing the high supported *Odontoloxozus* + *Cerantichir* + *Longina*.

The phylogenetic analysis by Koch *et al.* (2014) includes very few characters coded for *Cerantichir enderleini* Hennig, probably because no specimen was examined and about 30% of the continuous characters for this species were coded as missing. This may have caused that, although the *Longina*-group was supported, there is still no internal resolution in the grouping. Here, the *Cerantichir* resulted monophyletic (Br 4/Bo 80/Bw 0.26), contrary to Koch *et al.* (2014) suggestion of a new combination for *Cer. peruana* and we also corroborate the combination of *Cer. peruana* (Hennig) out of *Odontoloxozus* proposed by Buck (2010). Additionally, the *Longina* resulted monophyletic (Br 3/Bo 67/By 1) and despite the relation of *Odontoloxosus* as sister group of *Cerantichir* was not well resolved in the total evidence analysis (fig. 16), it received high Bremer support in the tree resulting from implied weighting (Bw 0.17).

Accordingly, the relation between these three genera is not completely clear, and yet, the grouping here denominated *Longina*-group is supported for three homoplastic synapomorphies: (1) presutural scutum longer than postsutural scutum [55:0], this character may be associated with the larger size of this species, which represent advantages in the struggles for territory; (2) anterior margin of scutum with one dorsocentral seta [57:1], character also present in *Chaetonerius*, evolved secondarily in the Neotropical species of larger size, also probably associated with their behavioral nature of struggle, which gives them a more threatening appearance, as the spine-like setae and large size reached by their representatives; (3) wing with bare areas on basal cells [78:0], this character is almost exclusive of this genus, but is present very weakly in *Freidbermyia*, new genus, for which relations are not completely resolved.

Eoneria-group

The *Eoneria*-group was revised recently (Sepúlveda, *in prep.*) and a cladistics analysis including several Neotropical species, confirming it as monophyletic. Additionally, a new combination was proposed for *E. sabroskyi*, which is transferred to *Eoneria*, the *Antillonerius* Hennig was also revised and the known Caribbean species described. Furthermore, a new combination, *Glyphidops bistratus* was proposed for *Nerius bistratus*, and the endemic species from Jamaica *Nerius solitarius* was revalidated in *Antillonerius*.

Eoneria-group species are distributed mainly in arid to semi-arid environments and present an extremely similar morphology related to these environments, such as very pruinose tegument and numerous and spine-like setae. In the topology by Koch *et al.*, (2014), *Eol. sabroskyi* and *E. maldonadoi* resulted closely related in an apical clade, with *E. blanchardi* at base. This clade resulted in low support values and the authors abstained from making decisions about a possible synonymy, since the data supporting the associations obtained in the topology come from the size of the known specimens, which, as has already been said, are a few.

Koch *et al.* (2014) proposed a new conformation of the *Eoneria*-group, containing the species with elongate head, the increase in number of fronto-orbital setae, the presence of katepisternal setae and a continuation of mesonotal pruinosity into the scutellum. The latter character was not tested in our analysis and the other character states were not recovered supporting this grouping, but we agree with the statement of Koch *et al.* (2014) of maintain the *Eoneria*-group defined by Aczél, restricted to the Neotropical neriids.

Apomorphic character states supporting the *Eoneria*-group in our topology are (1) the dorsal line of head [2:1]; (2) inner process of pedicel narrow triangular [9:2]; (3) antennal base opaque [16:1], this character was used by Aczél to erect the *Eoneria*-group and Koch *et al.* (2014) restricted it to Neotropical species with this character state, however, this trait has independently evolved in Neotropical species *Nerius czernyi* Aczél and *Glyphidops bistriatus* Williston; (4) body covered by dense pruinescence [53:2], characteristic of species inhabiting arid areas, like the *Eoneria* and *Odontoloxozus*, but also present partially in *Nerius czernyi*; (5) femora with dorsal setae [82:1], present also in *Cerantichir* Hennig and *Aczelia*, new genus.

Nerius-group

The *Nerius*-group as proposed by Koch *et al.* (2014) is not recovered as monophyletic in our topology, since the *Longina*-group branches basally within the American clade. Therefore, we propose to keep the *Nerius*-group restricted to species in clade G, which does not include the species allocated in *Longina*-group. Thus, the new *Nerius*-group constitutes the species of *Aczelia*, gen. n., *Freidberimyia*, new genus, *Loxozus* Enderlein, *Nerius* Fabricius and *Glyphidops* Enderlein (fig. 20).

This lineage contains at its base, several monotypic genera, including the *Aczelia*, gen. n. and *Freidbergmyia*, new genus, related to the also monotypic *Loxozus* Enderlein. The fact of being monotypic and the highly homoplastic apomorphic character states shared for these genera, led to unresolved relations within these groups based on morphological characters and the lack of material suitable for DNA extractions, abstained us from the possibility of solving this problem.

This clade resulted in relatively high support values (Br 3/Bw 0.21/By 1) and one autapomorphic character state: development of anteroventral and posteroventral spine-like setae on fore femur, inserted in short tubercles [83:1]. The *Nerius*-group is in fact, the less resolved in our topology and contains not only the Neotropical monotypic genera, but also, the more diverse Neotropical genera *Nerius* and *Glyphidops*. These two genera were emphatically recovered in all types of analyzes, with high support values, however their relationships were not so well resolved. In our result of total evidences, nevertheless, the close relation between these two genera with *Aczelia* gen. n. is confirmed and we extend this relation to the other monotypic genera *Loxozus* and *Freidbergmyia* gen. n.

No conclusion can be taken, based on support values regarding its relationships, but the three new genera are included in a polytomic branch (lack of resolution in a phylogenetic tree is usually represented as a polytomy) and often adding more data (loci and taxa) helps to resolve the species tree. The three genera, related to *Nerius* and *Glyphidops*, are described (or re-described in the case of *Loxozus* Enderlein) and discussed below. The low support values obtained in our topology at this point reveals a need for detailed phylogenetic analysis focusing on the *Nerius*-group, including new data.

Nerius Fabricius

For a long time, all species of Neriidae were described in the genus *Nerius*. This genus is in terms of number of species one of the most numerous (Steyskal, 1968) and Aczél (1961) refers to it as –“the most chaotic of Neotropical genera”–, with a considerable number of species poorly described. Hence, in our analysis, we only include three species of *Nerius* that correspond to the species we recognize as valid.

In the phylogeny by Koch *et al.* (2014), the *Nerius* resulted related to the *Longina*-group, but almost every synapomorphy proposed, refers to continuous characters,

except for the wide triangular inner process of pedicel. It is not surprising that in these groups resulted related as consequence of the use of continuous character, due its elongate nature and larger sizes. Enderlein (1922) also implied a close relation between *Nerius* and *Cerantichir*, but in our topology, *Nerius* resulted as sister-group of *Glyphidops* following the statement by Aczél (1961) that proposes a close relationship of these two genera.

These two Neotropical genera are the most collected and diverse in that part of the world, but the relations within each group have never been addressed for any author. In the revision of *Glyphidops* by Sepúlveda *et al.* (2014) only defined the limits of its species, but no relation between them was proposed and regarding *Nerius*, it has never been revised.

The three species of *Nerius* included in our study, resulted in a well-resolved clade with the plastic *N. plurivittatus* Bigot placed basally (Br 5/Bo 88/Bw 0.18/By 1). Apomorphic character states supporting the monophyly of *Nerius*, are: (1, 2) is the only genus in which all of its species present a brown and bare arista [4:0; 5:0]; (3) presutural scutum longer than postsutural scutum [55:0], also the only Neotropical genus with gena narrow, as this character is plesiomorphic and common in smaller Oriental species; (4) as mentioned before for the *Longina*-group, this character may be associated with the reproductive behavior of its species (Eberhard, 1998); (5) epandrium very thin and long [94:0], this character, also present in the Oriental *Teloneria*, makes this genus, the only Neotropical with this apomorphic character state.

Glyphidops Enderlein

In spite of having resulted as a monophyletic group with high support values, its relation with *Glyphidops* is not well-resolved (Br 2/Bo 3/Bw 0.07/By 1). Nevertheless, like in *Nerius*, the species in *Glyphidops* share several plesiomorphic character states exclusive in this part of the world. Some of those apomorphic character states supporting the clade are: (1) anterior margin of frons straight [17:0], also straight in *Eoneria* Aczél and the basal *Chaetonerius* Hendel; (2) union of fronto-orbital plate and occiput in a carina [28:2], species in both genera share this rare character state, only present in *Eoneria*; (3) margins of scutellum truncate [61:2], this character is also present in *Eoneria* and no other species or genus of Neriidae, in which this character is very variable.

After the compilations of Aczél (1959, 1961) on species of Micronesia and the American continent, the largest revision study of material in Neriidae published recently, corresponds to the neotropical *Glyphidops* Enderlein. The genus contains 16 species distributed from southern United States (*G. flavifrons* (Bigot) in southern Florida) to southern Brazil and northern Argentina (*G. limbatus* Enderlein and *G. durus* (Cresson), respectively). No species of *Glyphidops* has been recorded so far to the Caribbean Islands or to any other oceanic island except *G. durus*, recorded on Gorgona Island in the Colombian Pacific Ocean (Sepúlveda *et al.*, 2014).

Among the material of *Glyphidops* examined by Koch *et al.* (2014), only one species, *G. neuter* (Hennig) (reported as junior synonym of *G. durus* by Sepúlveda *et al.*, 2014) is cited. Once Koch *et al.* (2014) had no access to other material of *Glyphidops* nor to the information contained in the revision by Sepúlveda *et al.* (2014), the data about this genus included in the matrix used for the phylogenetic analysis, were extracted from works by Aczél (1961). Therefore, the taxonomic errors were propagated in the result, generating relationships that were not coherent. Some of those errors addressed in Table 4.

The most notable example among the taxonomically problematic species included in the analysis corresponds to *G. flavipes* Wiedemann. Since the study of Steyskal (1968), inconsistencies regarding the identity of this species were noted. However, *G. flavipes* was re-described in the review of Aczél (1961) from a specimen subsequently identified as *G. obscurus* Hennig in Sepúlveda *et al.* (2014). Then, although *G. flavipes* was included with different names, Koch *et al.* (2014) did not recover those terminals as close in the topology.

Table 4. Main considerations of Sepúlveda *et al.* (2014) on the species of *Glyphidops* Enderlein, compared with the proposals of Aczél (1961) and the results obtained for this genus in Koch *et al.* (2014).

Species	Sepúlveda <i>et al.</i> (2014)	Koch <i>et al.</i> (2014)
<i>G. carrerai</i> Aczél (♂)	Several characters used in the original description were rectified: rings in femora and length of the epandrium.	The authors had no access to any <i>G. carrerai</i> material and such characters were used in the analysis, including those errors from the original description

<i>G. flavipes</i> (Wiedemann) (?)	The specimens described by Aczél (1961) as <i>G. flavipes</i> correspond to the species <i>G. obscurus</i> .	In spite of being of the same species, the terminals treated as <i>G. flavipes</i> and <i>G. obscurus</i> were not obtained as related
<i>G. durus</i> (Cresson) (♀)	Three species were synonymized with this species: <i>Nerius dispar</i> , <i>Oncopsia dubia</i> and <i>Oncopsia neutra</i>	<i>G. durus</i> and <i>G. neuter</i> were included as different terminals in the analysis and obtained as unrelated, although they were the same species <i>G. durus</i> e <i>G. neuter</i>
<i>G. vittatus</i> (Cresson) (♀)	It was synonymized with <i>G. ochreus</i> . It was also, erroneously identified as <i>G. filusus</i> by Aczél (1961), who examined specimens of <i>G. vittatus</i> in the redescription of <i>G. filusus</i>	Both <i>G. filusus</i> and <i>G. vittatus</i> were included in the analysis and, although the matrix data were extracted from Aczél (1961), <i>G. vittatus</i> was obtained as a sibling group of <i>G. obscurus</i> , not <i>G. filusus</i>
<i>G. obscurus</i> Hennig (♂)	Four of the eight paratypes of this species were described as <i>G. coracinus</i>	

Systematics of Neriidae

The following synonymy and new genera are proposed for Neriidae, based in phylogenetic analysis and the hypothesized cladogram (fig. 14). The proposed two new genera reflects morphological character states as recorded as part of this research. In addition, diagnosis and list of species is provided for every general of Neriidae.

Description of two new genera and re-description of the monotypic genus *Loxozus* Enderlein from the *Nerius*-group

The two new genera proposed for the Neotropical Region are nested between the *Eoneria* and *Nerius*-groups, supported in this position by the presence of the following apomorphic characters: (1) outer vertical seta present [34:0]; (2) yellow median stripe in the occiput [38:1]; (3) occiput not protrude or narrow posteriorly [41:0]; (4) fronto-genal suture reaching the facial carina anteriorly [46:1]; and (5) non-retracted postpronotal carina, typical in species of the *Longina*-group [66:0].

In addition, species of the new genera, share with other species in the *Nerius*-group the tendency to develop strong spine-like setae in the legs. Some of the homoplastic synapomorphies, are the presence of anteroventral and posteroventral spine-like setae inserted in tubercles in fore femur [83: 1] and the spine-like setae on mid femur [85: 1]. In this group, the reduction on the number of setae, including the absent median occipital setae [36: 1] and anterior notopleural seta [72: 1], along with the presence of one lateral setae on hind coxa [81:1], are also synapomorphies

In our most parsimonious tree, the genus *Loxozus* Enderlein branches next to *Aczélia*, new genus in a clade without support, related to other species in the *Nerius*-group, while *Freidbergmyia*, new genus, resulted as the sister-group of the clade including ((*Loxozus* + *Aczelia*) + (*Nerius* + *Glyphidops*)), also without support. However, all three genera have sufficient morphological evidence justifying its establishment as independent generic groups.

Additionally, in our analysis of the combined dataset, *Aczelia* gen. n. resulted closely related to the clade formed by *Nerius* + *Glyphidops*. And this same relationship is supported in our morphological topology by the following synapomorphies [20:0]; [36:1]; [71:1]; [83:1]; [85:1]. For this reason, we believe appropriate to designate these well-supported group (fig. 20) as the *Nerius*-group and extend the group-limits to include the *Freidbergmyia* gen. nov. and *Loxozus* Enderlein, not included in the total

evidence analysis. A confident determination of its relationships within the *Nerius*-group will require further studies. Information on the homoplastic synapomorphies that support these lineages is provided in the diagnosis for each genus.

The monospecific genus *Loxozus* Enderlein (1922) was described from one female collected in Colombian highlands (fig. 21), specially differentiated from other Neotropical species for having separated antennal bases, scape and pedicel particularly thin and elongate and vein dm-cu very oblique. Steyskal (1965) synonymized the type species of the genus *Loxozus clavicornis* Enderlein with another species described also for Colombia one hundred years before by Walker (1853) in the genus *Tetanocera* Duméril of the family Sciomyzidae. Thus, *Lx clavicornis* (fig. 22) turns to be junior synonym of *Lx. cornuta* (Walker). For a long time, the species was known exclusively by the female holotype and here the male is described and new distribution data are presented.

***Loxozus* Enderlein**

Loxozus Enderlein, 1922: 156. Type species: *Tetanocera cornuta* Walker, 1853 (designated by Steyskal, 1965).

Diagnosis. Arista micropilose. Head rounded [1:0]. Anterior margin of frons concave, projected anteriorly between antennal bases and beyond level of anterior margin of parafacial; frontal-vitta with U-shaped yellow stripe separating frontal-vitta and fronto-orbital plate. Face evident in dorsal view between the antennal bases [19:1]. Antennal base blackish brown and shiny; inner margin projected anteriorly over dorsal part of face. Vibrissa spine-like, inserted on small ventral tubercle. Prosternum wide, joining proepisternal plate laterally. Postpronotal carina large, higher than postpronotal lobe. Mid coxa with three lateral setae.

***Loxozus cornutus* (Walker)**

Figures 21–25

Tetanocera cornuta Walker, 1853: 401. (original designation)

Loxozus cornutus; Steyskal, 1965: 446.

Loxozus clavicornis Enderlein, 1922: 156; Steyskal, 1965.

Female. Body length 11.7 mm. Wing length 11.5 mm and width 3.0 mm.

Head. Antenna elongate, same length of head; separated by more than twice the width of scape at base. Arista white inserted dorso-apically on first flagellomere. First flagellomere brown whitish pubescent; dorsal and ventral margins parallel and apex widely rounded. Scape slightly constricted at basal half, length is twice the maximum width. Pedicel very narrow and length more than three times its maximum width and slightly less than twice scape length; inner process of pedicel wide triangular. First flagellomere rectangular, shorter than pedicel (fig. 23). Fronto-orbital plate brown with white pruinescence; three short equidistant fronto-orbital setae, two anterior hair-like. Inner vertical seta almost hair-like. Ocellar triangle shiny and very small Parafacial very narrow; brown with dorsal yellow stripe. Gena sub-shiny yellow and wide; genal seta spine-like. Postgena densely white pruinose with several black and white long setulae. Occiput shiny brown, with wide yellow median stripe.

Thorax. Yellowish-brown pruinose with two dorsal white stripes, separated for a wide median brown stripe; pleura pruinose. Presutural scutum longer than postsutural scutum. Posterior notopleural seta spine-like inserted on small tubercle. Two dorsocentral setae. Scutellum yellowish brown pruinose with wide median yellow stripe. Postpronotal lobes yellow dorsally. Anterior notopleural seta absent, posterior notopleural seta spine-like inserted in tubercle. Katepisternum with one short dorsal seta. Coxae yellowish brown; fore coxa with two antero-apical setae; two anterolateral setae; mid coxa with three lateral setae; hind coxa with one lateral seta. Vein dm-cu very oblique (fig. 24).

Legs. Femora brownish-yellow; fore femur with several anteroventral and posteroventral spine-like setae on distal third; mid femur with two median setae on anterior margin and anteroventral and posteroventral setae on distal third; hind femur with two dorsal distomedial setae and anteroventral and posteroventral setae on distal third. Tibiae yellow with dark apex. Basicosta with one seta. Halter yellow, with black and orbicular knob.

Abdomen. Dark yellowish brown with short black setulae and lateral margins yellow. Oviscape dark yellowish-brown, darker medially and at apex.

Male. Body length 9.1–10.4 mm. Wing length 6.7–8.0 mm and width 1.8–2.3 mm. Three fronto-orbital setae spine-like. Inner vertical seta spine-like. Parafacial with yellow medial stripe. Gena brown and shiny; genal seta not inserted in tubercle. Femora brown; fore femur with anteroventral spine-like setae inserted on digitiform tubercles

and posteroventral setae spine-like very short. Fore tibia brown with two lines of spine-like short setae posteriorly; distal third swollen.

Type Material. HOLOTYPE, *Tetanocera cornuta* ♀; Type locality: Colombia. LABELS: (1) S. America, Colombia (2, green parameter) Type (3) *Tetanocera cornuta* Walk. [NHMUK] (fig. 22).

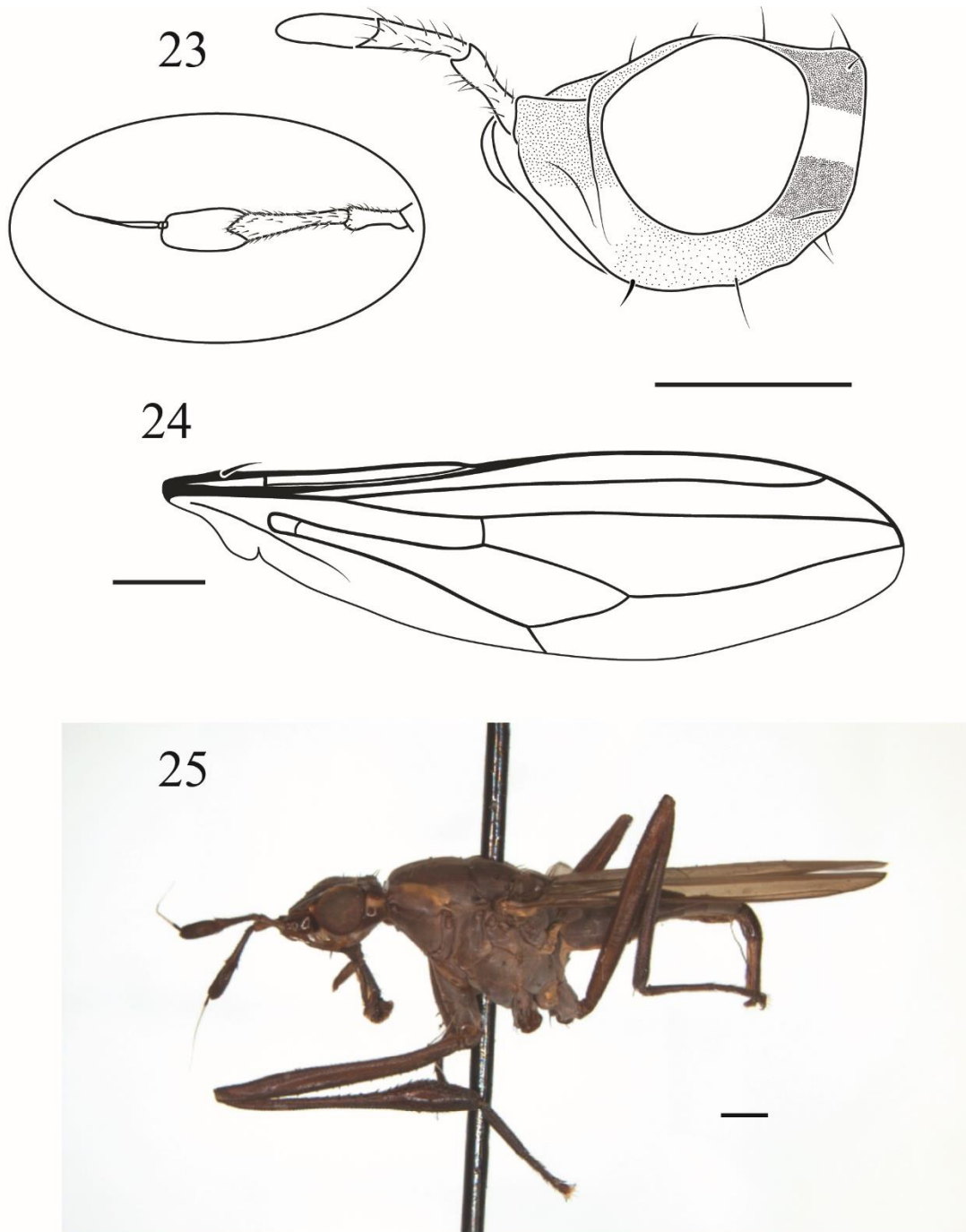
HOLOTYPE, *Loxozus clavicornis* ♀; Type locality: Colombia. LABELS: Columbien, Cordillieren (terra templada) Gesammelt von Professor Dr. Thieme [ZMHB] (fig. 21).

Material examined. Venezuela. 1♀, 30.i.1967- E. Miranda, Qda. Quintero-Caracas, col. J. M. A. Ayala L.[USNM, 2014]. **Brazil.** 1♀, RO. Monte Negro, Fazenda Amorin -248m, S 10°40'6" W 63°29'0", Sweeping, 03-15.xii.2011, Amorin, Ament & Riccardi col. SISBOTA, CNPq-FAPESP [MZUSP, 2013]. **Peru.** 1♂, Previsto, 800m, 17.vi.1965, J. Shunke. B. M. 1965-529 [NHMUK, 2012]; 1♀, (1) Madre de Dios: Manu, Erika (near Salvación), 550, 5-6, sept.1988, A.Freidberg (2) *Loxozus clavicornis* Det. M. Buck, 2002 [USNM, 2018]. **Bolivia.** 2♀, (1) Rurrenabaque, BeniBolivia, WMMann (2) oct (3) Mulford, BioExpl, 1921-22 [USNM, 2015, 2016]; 1♀, (1) Rurrenabaque, BeniBolivia, WMMann (2) oct (3) Mulford, BioExpl, 1921-22 (4) *Loxozus clavicornis* End. Det. G. Steyskal, 1953 [USNM, 2017].

Distribution. Colombia, Venezuela*, Brazil*, Peru*, Bolivia.



Figures 21–22. 21. *Loxozus clavicornis* Enderlein, Holotype. 22. *Loxozus cornutus* (Walker), Holotype.



Figures 23–25. *Loxozus clavicornis* Enderlein. **23.** Head in lateral view and detail of inner margin of pedicel. **24.** Wing. **25.** Male, habitus (Scales: 1 mm).

***Freidbergmyia*, new genus**

Type species: *Freidbergmyia cholita*, new species. Type-locality: Colombia, Huila.

Diagnosis. Arista dorso-apical white densely pubescent. Inner process of pedicel wide triangular (fig. 26). Antennal base protuberant (fig. 28); inner margin separating the scape by distance equal to scape width. Head rounded [1:0], black and shiny with occipital yellow median stripe and antenna yellow, except distal half of scape. Anterior margin of frons ending slightly prior to anterior margin of parafacial [22:0]. Vibrissa absent. Postgena with black setulae [50:0]. Tegument completely shiny [53:0]. Proepisternal seta absent [69:0]. Wing bare areas near base [78:0].

Etymology. The genus name *Freidbergmyia* is in honor to Dr. Amnon Freidberg, who made this work and many others in Diptera possible by collecting and making available the most amazing flies from diverse places in the world.

***Freidbergmyia cholita*, new species**

Figures 26–29

Male. Body length 11.7 mm. Wing length 11.5 mm and width 3.0 mm.

Head. First flagellomere ovate elongate. Pedicel elongate with no prominent setae. Scape short with basal constriction. Frontal-vitta brown with anterior margin straight. Fronto-orbital plate brown and shiny; anterior fronto-orbital seta very short; anterior and middle fronto-orbital setae slightly closer than the latter from posterior fronto-orbital seta. Parafacial very narrow; brown with ventral yellow stripe. Gena yellowish-brown; gena thin and short. Occiput protuberant, reaching the postgena in higher level.

Thorax. Mostly shiny, except dorsally, with faint pruinescence (fig. 29). Presutural scutum longer than postsutural scutum and narrows anteriorly. Anterior notopleural seta inconspicuous; posterior notopleural seta spine-like inserted on tubercle (fig. 27). One dorsocentral seta same length as apical scutellar seta. Scutellum with rounded margins and rectangular shape in dorsal view; median longitudinal constriction dorsally; discal seta inconspicuous and placed very close to apical scutellar seta; apical scutellar seta inserted on small tubercle. Prosternum wide, reaches the prosternum laterally. Postpronotal carina large, higher than postpronotal lobe, which is only slightly protuberant; dorsal yellow stripe anteriorly continuous with occipital yellow median stripe. Katapisternal seta absent. Katatergite very protrude. Coxae brown; fore coxa with

two anterolateral spine-like setae inserted on small tubercles; mid coxa with two lateral spine-like setae; hind coxa with one lateral spine-like seta. Basicosta with one seta.

Legs. Femora brown; fore femur with anteroventral and posteroventral spine-like setae inserted on digitiform tubercles; mid and hind femora with ventral spine-like setae on distal margin; inner margin of mid femur with four setae medially.

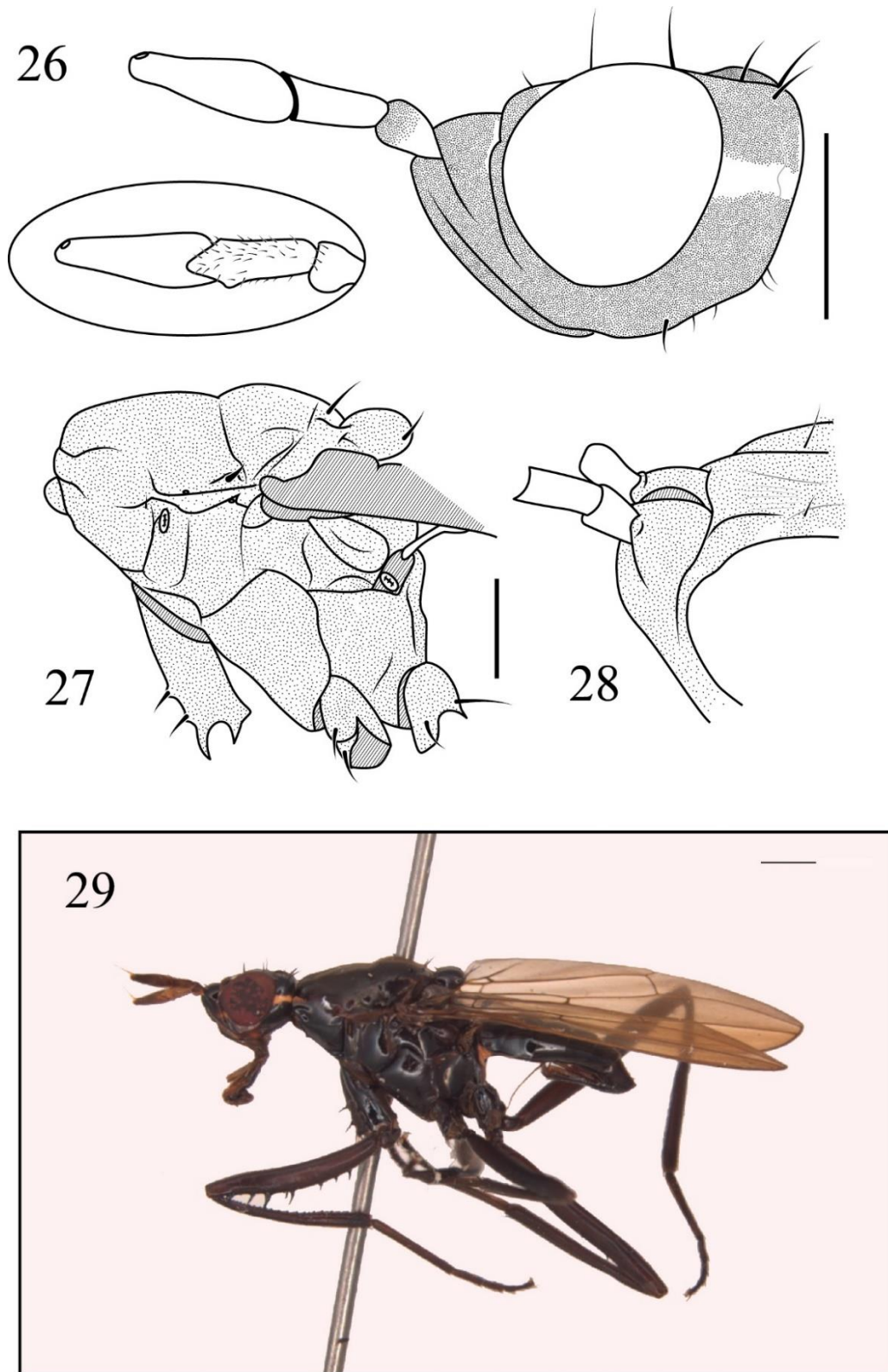
Abdomen. Brown and shiny. Syntergite 1+2 measuring 1.5X the length of epandrium; epandrium cylindrical and short; surstylus thin linear, almost as long as cercus; cercus wide linear and short.

Type Material. HOLOTYPE, *Freidbergmyia cholita*, new species ♂, PERU, Madre de Dios: Manu, Rio Manu, 250m, Pakitza, 12°7'S, 70°58'W, 9-23.sep.1980, Amnon Freidberg [USNM, 2011].

Female. Unknown.

Etymology. The species name “*cholita*” refers to the hispanoamerican word “*cholos*”, as used by Peruvians to refer mixed race people, as is the own nature of this new species, that shares mixed character states with several species in other genera of Neriidae, and at the same time, displays outstanding characteristics that make it unique.

Distribution. Peru.



Figures 26–29. *Freidbergmyia cholita*, new species. **26.** Head in lateral view and detail of inner margin of pedicel. **27.** Thorax in lateral view. **28.** Antennal base. **29.** Holotype, male, habitus. (Scales: 1 mm).

***Aczelia*, new genus**

Type species: *Aczelia opita*, new species. Type-locality: Colombia, Huila.

Diagnosis. Arista bare [5:0] inserted dorso-apically. Inner process of pedicel wide triangular. Setae of head very short and spine-like. Anterior fronto-orbital seta absent [24:0]. Parafacial wide [43:0]. Fronto-genal suture joining antennal base ventrally [46:0]. Body setae very short and spine-like [52:2]. Presutural scutum anteriorly ending at level of postpronotal carina. Prostermun obovate, separated from proepisternum by membranous area. Anterior notopleural seta absent. One dorsocentral pre-scutellar seta well-developed and at least six very short dorsocentral setae [60:3]. Scutellum triangular with rounded margins and posterior margin very narrow [61:3]. Katepisternum with four long katepisternal spine-like setae medially, inserted on conical tubercles [75:2]. Fore coxa with two antero-apical setae. Fore femur with two submedian, anterodorsal setae, inserted on small conical tubercles with black apex.

Etymology. The genus name *Aczelia* honors Dr. Martin Aczél for his outstanding contribution to knowledge of Neriidae and other acaliptrate flies.

***Aczelia opita*, new species**

Figures 30–35

Male. Body length 11.7 mm. Wing length 11.5 mm and width 3.0 mm (fig. 30).

Head. Scape blackish brown; slightly elongate and constricted at base. Pedicel same color as scape; elongate and directed to sides with inner margin exposed in frontal view. First flagellomere paler than pedicel and yellowish at base; sloping upwards towards apex. Anterior margin of frons straight, extends anteriorly beyond anterior margin of parafacial; frontal-vitta narrow and very concave; anterior margin straight and projected anteriorly beyond anterior margin of parafacial; frontal vitta black; fronto-orbital plate blackish brown with anterior half densely white pruinose; middle fronto-orbital setae very small. Ocellar triangle black with white pruinescence and protuberant; anterior ocellus very small. Inner vertical seta inserted on a very small and shiny tubercle; outer vertical seta slender than inner vertical seta. Parafacial blackish brown, rounded and wide, with yellow median stripe. Vibrissa present. Gena subshiny yellow; very wide and whitish pruinose near ventral eye margin. Postgena with two or three long and thin yellow setulae. Occiput brown with median yellow stripe.

Thorax. Brown; two dorsal narrow stripes of gray pruinescence. Postpronotal lobe yellow. Posterior notopleural seta inserted on sub-shiny tubercle. Scutellum brown without yellow median stripe. Proepisternum with anteroventral spine-like seta. Coxae brown; fore coxa with three anterolateral spine-like setae inserted on very small tubercles; mid coxa with two lateral setae on conical tubercles; hind coxa with one lateral spine-like seta inserted on a very small conical tubercle.

Legs. Femora cylindrical and orange with brown distal third; anteroventral strong spine-like setae inserted on tubercles interspersed with two small spine-like setae; two conspicuous spine-like seta on distal third inserted on digitiform tubercles (fig. 34); posteroventral spine-like setae only on distal third; mid femur with very weak anteroventral and posteroventral setae near apex; with three median setae on proximal half of anterior margin and one median and stronger dorsal seta; hind femur with very thin anteroventral and posteroventral setae on distal half and four dorsal setae on proximal half. Tibiae same color as femora; wider towards apex. Tarsi black.

Wing (fig. 35). Brownish, darker towards apex and completely microtrichose. Vein dm-cu straight. Halter whitish stem and black orbicular knob.

Abdomen. Orange with reddish spots and lateral margin almost black. Syntergite 7+8 sub-shiny reddish-yellow; slightly shorter than epandrium; epandrium sub-shiny reddish-yellow basally and blackish brown distally; extends forward to anterior margin of tergite 4; surstylus blackish-yellow, linear, narrow and large, with yellow setulae on distal half; cercus black, linear and relatively narrow.

Variation. Body length 11.1 mm. Wing length 10.7 mm and width 2.8 mm. Inner vertical seta not inserted on tubercle.

Female. Conspicuous sexual dimorphism is present in legs, abdomen and general setae the size and number of setae; differs from male as follows: Body length 11.2–11.9 mm (fig. 31); body setae slender. Wing length 10.0–11.7 mm and width 3.0–3.2 mm. Prosternum narrower. Katerpisternal setae very short and slender. Femora with anteroventral and posteroventral setae very short and not spine-like, except distal third, with three to four spine-like setae, not inserted on tubercles; fore femur mostly brown with distomedian yellow ring; mid and hind femur brownish-yellow, except the black distal third; without dorsal setae; mid femur with two small setae on basal third of anterior margin. Tibiae black with wide distomedial white ring. Abdomen blackish brown with violet-bluish reflections; dorsally covered with dense white pruinescence

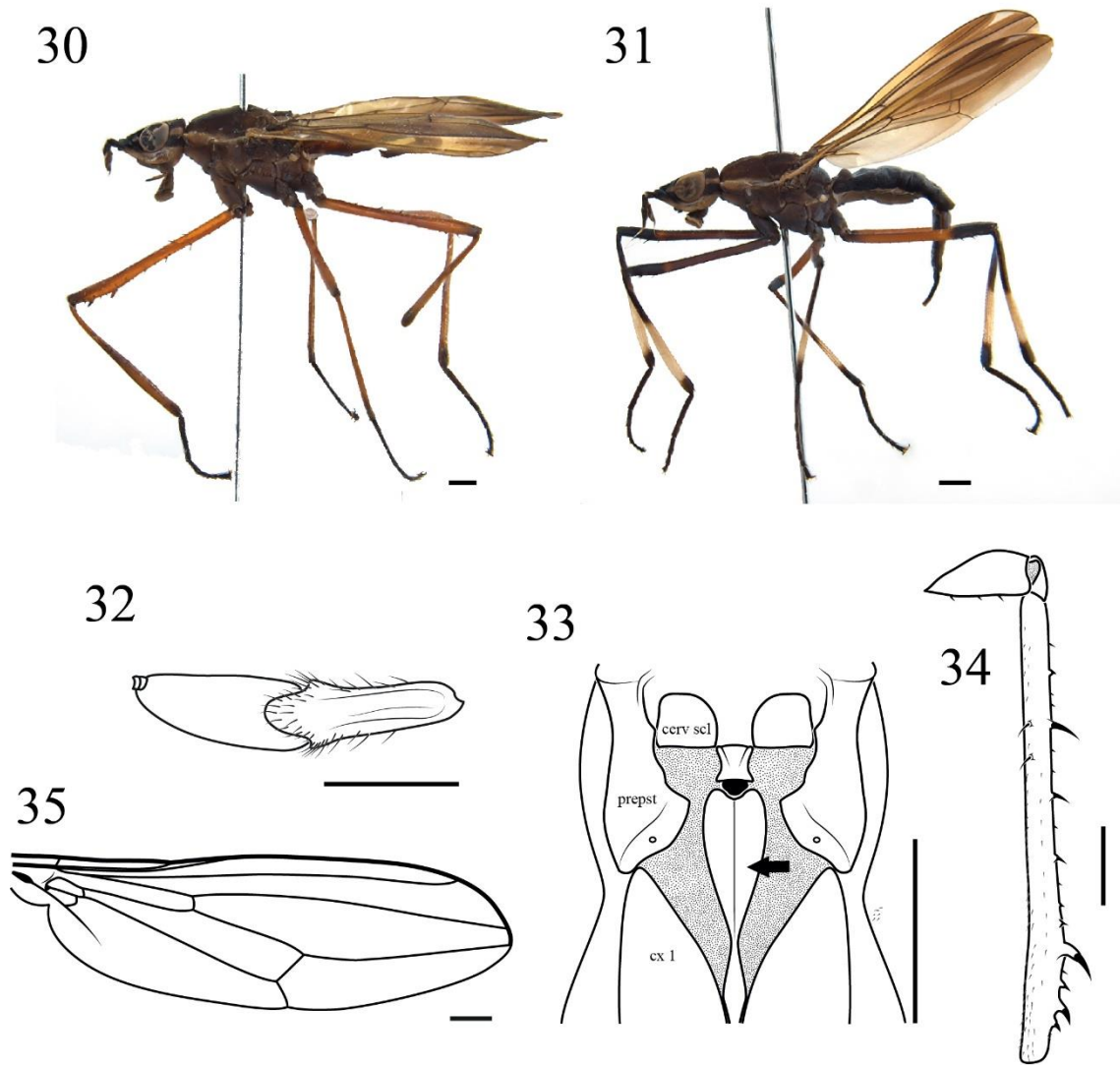
and vanishing towards lateral margin. Oviscape sub-shiny dark brown, with sparse white setulae.

Type Material. HOLOTYPE, *Aczelia opita*, new species ♂; Type locality: Colombia. LABELS: COLOMBIA, Huila, PNN Cueva de Los Guácharos, 1°37'N, 76°6'W, 2100m, Malaise, 10-21.xii.2001, C. Cortés Leg. M.2803 [IAvH].

PARATYPES, Colombia. 1♂2♀, Huila, PNN Cueva de Los Guácharos, Cabaña Cedros, 1°37'N, 76°6'W, -1950m; 2100m-, Malaise, -20.x.2002-03.xi.2002; 10-21.xii.2001; 18.ii-7.iii.2002-, C. Cortés Leg. M. -3370; 2803; 3037- [IAvH].

Etymology. The species name *opita*, refers the term used for people native or inhabitants of the department of Huila, Colombia, where the new species was collected.

Distribution. Colombia.



Figures 30–35. *Aczelia opita*, new species. **30.** Holotype, male, habitus lateral. **31.** Paratype, female, habitus lateral. **32.** Inner margin of pedicel. **33.** Thorax in anterior view, detailing prosternum. **34.** Fore femur. **35.** Wing. Abbreviations: cerv scl, cervical sclerite; cx 1, fore coxa; prepst, proepisternum (Scales: 1 mm).

Revision of the *Stypocladius* Enderlein and new synonymy with *Nipponerius*

Cresson

Six of the 19 genera known in Neriidae are monotypic and other six, have less than four valid species, leading to a difficult appreciation of the limits at generic level. In addition, many authors in the family have described and re-described species with no regard of type-material, leading to misidentifications (Barraclough 1993b; Sepúlveda *et al.*, 2014). *Stypocladius* is a monotypic genus, described by Enderlein to receive the species *Nerius appendiculatus* Hendel from Japan. The author based this new combination, based on the presence of cross-veins and five dorsocentral setae, combination of characters not known for any other genus.

Latter, Cresson (1926) created the genus *Nipponerius*, to house the species *Nerius femoratus* Coquillett, claiming that he knew no gender that was related to the morphology of this species, since in Enderlein's work (1922), there was no allusion to anything like that. However, Enderlein had actually described the species *Stypocladus appendiculatus* (Hendel). The misunderstanding was probably generated by the short description by Enderlein, in which special care is given in the description of cross-veins, not mentioning other relevant characters that were in fact mentioned by Cresson in the description of *Nipponerius*. Such characters are: conspicuously elongate head, slightly horizontal eyes, elongate pedicel with inner process finger-like and as long as half of the first flagellomere, arista white pubescent and inserted dorso-apically.

At this point, the only character that shared the species of both genera, if based on the description of Enderlein, is the presence of one pair of fronto-orbital setae. Cresson also noted other characters relevant to the genus: apical scutellar setae separated by a short distance and hair-like discal seta hair-like and placed very close to apical scutellar seta, fore femur with ventral spine-like setae, coxa with three to four spine-like setae and vein dm-cu perpendicular.

With respect to this new genus, described from a female paratype, Cresson (1926) describes the presence of a single dorsocentral seta, different from the line of five dorsocentral setae described by Enderlein for *Stypocladus*. However, this character, as color, size, antenna lengthening and others associated with sexual dimorphism, also presents a reduction in number in females and males of small size. This difference in the characters mentioned by the authors of these genera did not allow Hennig (1937) to determine their synonymy or even some relation between them, to which he states:

–"The genera *Nipponerius* and *Protonerius* are unknown to me, therefore , I can not give any indication about their relations ".

Both species, *Nipponerius femotaus* and *Stypocladius appendiculatus*, were included in our cladistics analysis, resulting in the synonymy of both genera.

Accordingly, we propose a new combination to *N. femoratus* in *Stypocladius*.

Synapomorphies supporting this grouping include the U-shaped striate horizontal line that divides the fronto-orbital plate and occiput; transversal suture of thorax complete, not vanishing medially like the rest of Neriidae, except the Oriental *Telostylus* Bigot; two well developed dorsocentral seta (even when reduced in small males and females) and pleural transversal yellow line.

The genus also share dark brown to black femora with yellow ring in distal third, postgena with dense yellow setulae, postsutural acrostical yellow stripe, occiput brown and shiny with yellow dorsal stripe dividing it from vertex. Both species can be easily differentiated by the presence of cross-veins in *S. femoratus* (Coquillet), character only present in the Neotropical *Glyphidops pluricellatus* (Schiner).

***Stypocladius* Enderlein**

Stypocladius Enderlein, 1922: 158.

Type species: *Nerius appendiculatus* Hendel, 1913b (original designation).

Nipponerius Cresson, 1926: 260. **New synonymy.**

Type species: *Nerius femoratus* Coquillet, 1898 (original designation).

Diagnosis. Arista white densely pubescent, inserted dorso-apically. Pedicel elongate with liner inner process dorsally placed. Protrude shiny antennal base. Anterior fronto-orbital seta absent, middle and posterior fronto-orbital setae well-developed and long. Outer vertical seta absent. Occiput shiny brown, laterally rounded and ventrally protrude over level of postgena. Anterior margin of scutum with one dorsocentral seta. Proepisternum yellow and protuberant, with dense white pruinescence and yellow setulae, no spine-like setae. Postpronotal lobe short and narrow anteriorly; postpronotal carinal of medium size and slightly retracted with respect to anterior margin of scutum and proepisternal ring. Two notopleural setae present and almost same-sized. Transversal suture complete. Scutellum triangular with apical setae very closely placed; discal seta placed on distal half of scutellum, measures one-third the length of apical scutellar seta. Fore coxa yellow with two antero-apical setae. Pleura mostly brown with

yellow transversal stripe in notopleura, posterior anepisternum and katepisternum. Katepisternal posterodorsal seta long. Basicosta with two long setae. Femora brown with yellow ring on distal third and slightly closer to half in fore femur; hind femur with outstanding short setae dorsally on distal half.

***Stypocladius appendiculatus* (Hendel)**

Figure 36–39.

Nerius appendiculatus Hendel 1913b: 84.

Head. Arista white and densely pubescent; inserted dorso-apically. First flagellomere oblong elongate. Pedicel elongate, with outstanding dorso-apical apical spine-like setae. Scape in lateral view, slightly longer than wide. Antennal base brown shiny and protuberant; inner margin extending to cover the portion of face anteriorly projected between antennae. Parafacial brown with yellow median stripe. Frontal-vitta wide, almost completely brown with wide median yellow stripe anteriorly. Fronto-orbital plate yellow anteriorly, brown between posterior fronto-orbital and inner vertical seta. Vertex yellow posteriorly to inner vertical seta towards occipital foramen, dividing the medially brown vertex and occiput. Occiput with six black setulae posteriorly. Postgena wide with yellow setulae ventrally.

Thorax. Brown and densely pruinose, partially shiny brown; median brown stripe narrow, dividing two wide gray pruinose dorsocentral stripes; acrostical yellow pruinose stripe postsutural; one presutural dorsocentral hair-like seta and three postsutural setae same-sized; one dorsocentral pre-scutellar seta well-developed. Prosternum linear and narrow. Anterior and posterior notopleural setae same length as supra-alar and postalar setae. Katatergite brown densely pruinose. Fore coxa with one anterolateral thin seta. Mid and hind coxae brown with two lateral setae.

Legs. Fore femur with short anteroventral spine-like setae of variable size and not inserted on tubercles, all setae shorter on distal third; mid and hind femora cylindrical, evidently longer than fore femur and with no ventral spine-like setae. Fore tibia with no spine-like setae posteriorly.

Wing. Cross-veins on apical half of R_{2+3} posteriorly and R_{4+5} anteriorly; vein $dm-cu$ slightly oblique and concave medially.

Abdomen. Brown with narrow yellow median stripe dorsally in syntergite 1+2. Epandrium cylindrical narrow and short, only slightly longer than syntergite 7+8;

surstylus narrow linear, slightly shorter than cercus; cercus linear and short, measuring about one-third of epandrium length.

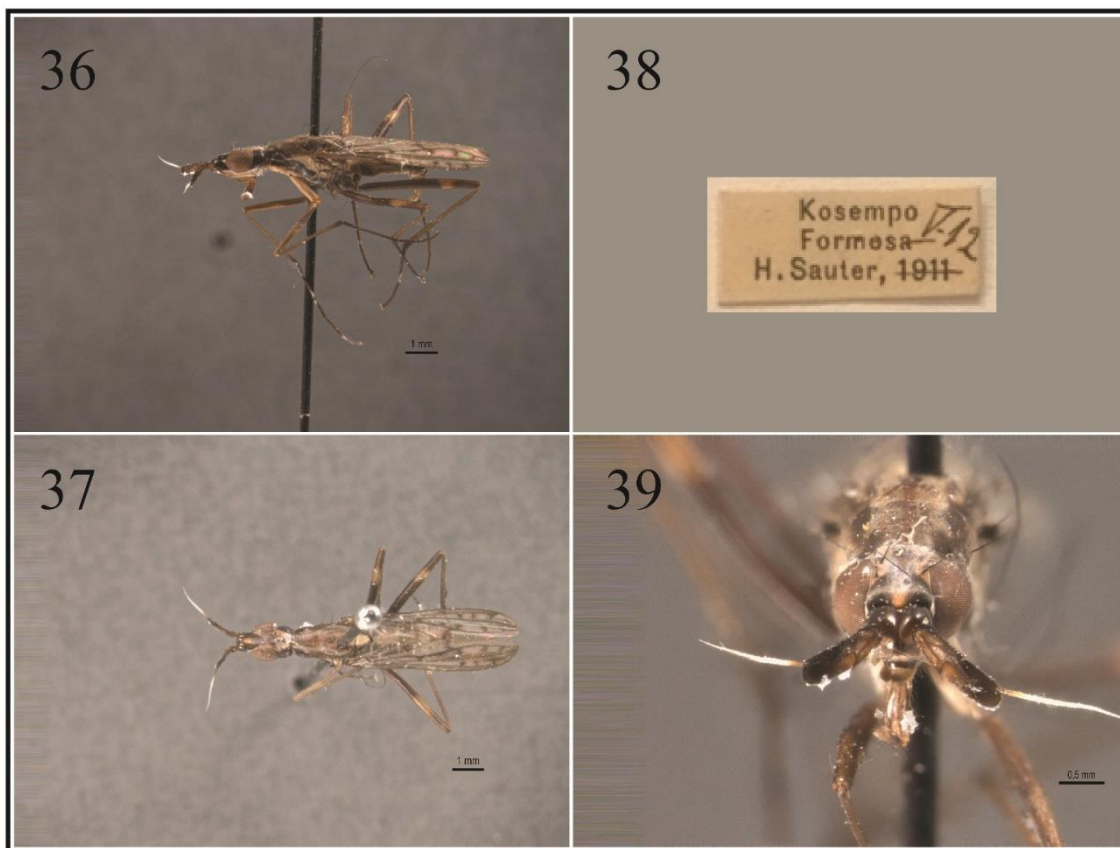
Female. Mid and hind femora brown with no yellow rings nor spine-like or outstanding setae. Adbomen completely brown with no yellow stripe. Oviscape subshiny brown.

Variation. The cross-veins are not constant, varying in females and males. One male with only two cross-veins posteriorly in R2+3 and one anteriorly in R4+5. Pleural transverse with pruinose stripe reduced to dorsal half of katepisternum. Fore coxa with no anterolateral setae.

Type material. LECTOTYPE (here designated), *Stypocladus appendiculatus* ♀; Type locality: Kosempo, Taiwan. LABELS: Kosempo, Formosa, v.12, H. Sauter, 1944. [NWM] (fig. 36).

Material examined. China. 1 ♀, (1) Formosa (Taiwan), Sauter (2) Taihorin, 1911.vii. (3) I66 (4) A.H.Sturtevant, Collection, 1970 (4) *Hippocladus appendiculatus*, Kert, Hendel [USNM]; 1 ♂, (1) Chengtu, 193 (2) Szechwan China DCGraham, xi.1-32 to iii.20-33, Lit. 1700ft [USNM]; 1 ♂, (1) HANGCHOW. China, vii.22.1928 (2) No. 110 [USNM]. **Japan.** 1 ♂, (1) Wakayama, Kii, Japan, 1928, S.Sakaduchi (2) *Stypocladus appendiculatus*, Hend [USNM]; 1 ♂ 1 ♀, (1) Kiungchow, Hainan Id, v.27.1935 (2) ALMelander, Collection, 1961 [USNM].

Distribution. China, Japan, South Korea, Thailand.



Figures 36–39. *Stypocladius appendiculatus*, Lectotype, female. **36.** Habitus lateral. **37.** Habitus dorsal. **38.** Label. **39.** Anterior view of head.

***Stypocladius femoratus* (Coquillet)**

Figures 40–42.

Nerius femoratus Coquillet, 1898: 336.

Nipponerius femoratus; Cresson, 1926: 260.

Stypocladius femoratus; **New combination.**

Head. Arista white and densely pubescent; inserted dorso-apically. First flagellomere obovate elongate. Pedicel elongate, with outstanding dorso-apical and ventro-apical spine-like setae. Scape in lateral view, slightly longer than wide. Antennal base brown shiny and protuberant. Parafacial black with yellow median stripe. Frontal-vitta wide, almost completely black with very narrow median yellow stripe anteriorly. Fronto-orbital plate yellow and sub-shiny; the same yellow stripe, reaches the occipital foramen posteriorly, dividing the brown vertex and occiput; anterior fronto-orbital seta absent; middle fronto-orbital seta slightly shorter than posterior front-orbital and postocellar setae. Vertex wide and flat; outer vertical seta absent. Occiput brown and

shiny, with median yellow line; six black setulae posteriorly; protuberant and rounded laterally, elevated over postgena. Postgena wide with yellow setulae ventrally.

Thorax. Brown and sub-shiny with areas of slight pruinescence; dorsocentral narrow densely gray pruinose stripe, divided by very wide median brown stripe; acrostical yellow pruinose stripe postsutural; two well-developed dorsocentral setae and several short dorsocentral hair-like setae. Scutellum triangular with narrow apex; wide yellow median stripe, same width as the distance between apical scutellar setae; discal seta supramedial, measures slightly less than half the length of apical scutellar seta. Prosternum linear and narrow. Pleura mostly brown with yellow transversal stripe in notopleura, posterior anepisternum and katapisternum. Anterior and posterior notopleural setae same length as supra-alar and postalar setae. Katatergite yellow and densely pruinose. Fore coxa with four anterolateral spine-like seta; mid coxa brown dorsally and yellow ventrally with two lateral setae; hind coxae brown with two lateral setae.

Legs. Femora brown with yellow ring on distal third and slightly closer to half in fore femur; fore femur with strong anteroventral spine-like setae of variable size inserted on tubercles, all setae short on distal third; mid and hind femora cylindrical, evidently longer than fore femur and with no ventral spine-like setae. Fore tibia with two lines of very short spine-like setae posteriorly.

Abdomen. Brown with narrow yellow median stripe dorsally in syntergite 1+2; tergite 6 yellow laterally. Epandrium cylindrical narrow and short, only slightly longer than syntergite 7+8; surstylus wide linear, slightly shorter than cercus; cercus lanceolate and long, measuring about half the length of epandrium.

Variation. Body length 9.1–10.4 mm. Wing length 6.7–8.0 mm and width 1.8–2.3 mm. Fore coxa one anterolateral seta in one side and two in the other. Syntergite 1+2 completely brown; tergites 4, 5 and 6 yellow medially near posterior margin.

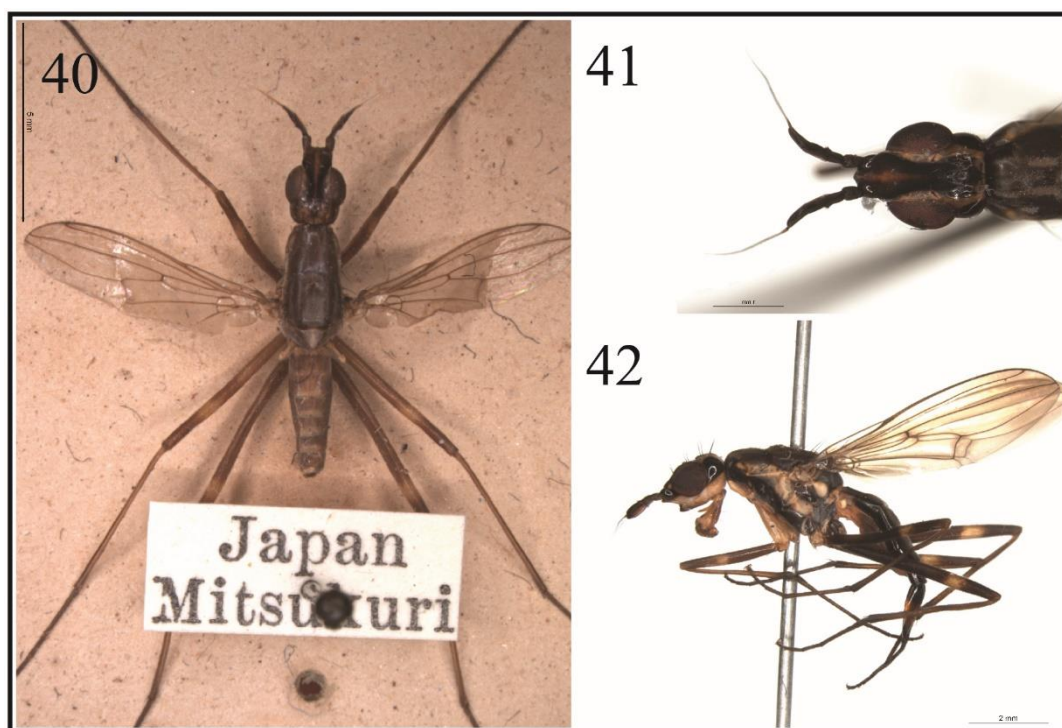
Female. Body length 8.5–9.4 mm. Line of five setae posteriorly in occiput. Oviscape brown and sub-shiny.

Type Material. **HOLOTYPE**, *Nerius femoratus* ♂; Type locality: Japan. **LABELS:** Japan, Mitsukuri, Holotype (red label), U. S. N. M., *N. femorata* HT [USNM]. **PARATYPES, Japan.** 1♂, (1) Mitsukuri (2, red label) Paratype No.4011, U. S. N. M. (3) *N. femorata* PT col. [USNM]; 2♂, (1) Mitsukuri (2, red label) Paratype

No.4011, U. S. N. M. [USNM]; 1♀, (1) Mitsukuri (2, red label) Paratype No.4011, U. S. N. M. [USNM].

Material examined. **China.** 1♂, (1) Foochow, China, Gardner (2) 23.8 (3) *Nipponerius femoratus* Coq, det. G. Steyskal 1953 [USNM]. **Vietnam.** 1♀, 1159606. Tam Dao (town), 26.x.2012, A. FREIDBERG [TAUI, 974].

Distribution. Vietnam*, China*, Japan, Russia (Vladivostok).



Figures 40–42. *Stipocladus femoratus* (Coquillet). **40.** Male paratype, habitus dorsal. **41.** Head dorsal. **42.** Female, habitus lateral.

Final considerations

Final consideration on the main problems not resolved in this work are addressed below:

1. Two major points of branching are considered unsolved in our topology: the first, related to radiation of species in the islands of southern Oriental Region (fig. 43, gray scale); and the second, the radiation of species in the Neotropics, in the base of *Nerius*-group (fig. 43, blue scale).
2. Lack of care in description of Afrotropical and Oriental species have led to numerous synonymies and erroneous identifications. Any study on Neriidae or any other group of

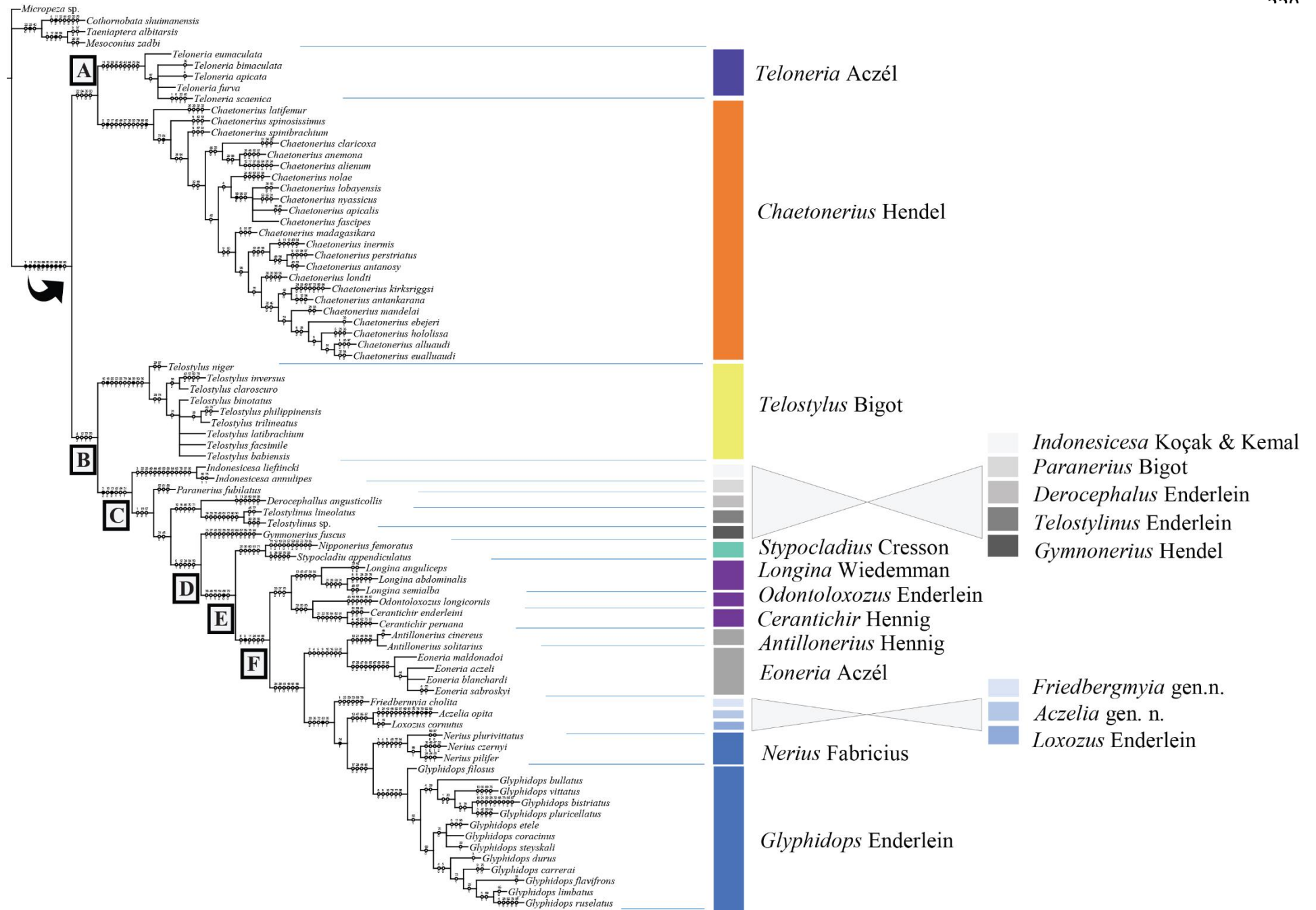
species, related to taxonomy and phylogeny, needs to confirm its species identity. Here, we cite the work by Donato and Siri (2010) on Chironomidae: –“*Given the facts that the coding is extensively based on literature, that numerous species are in need of re-description and that this analysis is based on adult male characters, the result can only be regarded as tentative*”– to present our reservations about the results of Koch *et al.* (2014). Some considerations are addressed throughout the text, for which we recommend to use with caution the data concerning the systematics and phylogenetic of Neriidae obtained from old descriptions.

3. The taxonomic revision of *Telostylinus* Enderlein, will probably be a task as difficult as necessary to determine the evolutionary history of the unsolved branches in our topology involving Oriental and Australian genera. *Telostylinus* Enderlein contains at least 19 species and no revision has been made in order to clarify the species limits and its distribution.

4. The genus *Nerius* Fabricius, containing at least 20 described species have never been revised and only three species recognized by the author are included in the matrix. A revision of the genus is mandatory, in order to solve the questions remaining to the relationships within this group and its related genera.

Next page,

Figure 43. Summary of relationships of genera in Neriidae



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Supporting Information

Additional Supporting Information may be found forward:

Appendix 1. Morphological characters coded in the phylogenetic analysis.

Appendix 2. Coded matrix of characters used in the morphological analyses.

APPENDIX 1

Morphological characters coded in the phylogenetic analysis.

Following the description of each character, in the list of characters we provide the length (L), consistency index (CI) and retention index (RI) based on the consensus strict of the most parsimonious topologies.

Head

1. Shape of head. (0) circular (1) conical (2) wider than high (length= 9; CI= 22; RI= 82) (state 0; fig. 2) (state 1; fig. 3) (state 2; fig. 4).
2. Dorsal line of head. (0) curved (1) straight (length= 2; CI= 50; RI= 83). (state 0; fig. 2, 3) (state 1; fig. 4)
3. Eye shape. (0) circular (1) wider than high (2) higher than wide (length= 11; CI= 18; RI= 59) (state 0; fig. 2, 3) (state 2; fig. 4).
4. Color of arista (0) brown (1) basal half brown, distal half white (2) white (length= 16; CI= 12; RI= 70).
5. Arista (0) bare (1) slightly pubescent (2) densely pubescent white (length= 11; CI= 18; RI= 71).
6. Position of arista (0) basal (1) dorso-apical (2) apical (3) ventro-apical (length= 10; CI= 20; RI= 69) (state 1; fig. 4, 9) (state 2; fig. 6) (state 3; fig. 7).
7. Inner process of pedicel (0) absent (1) present (length= 1; CI= 100; RI= 100).
8. Position of inner process of pedicel (0) dorsal (1) median (length= 3; CI= 33; RI= 91) (state 0; fig. 6) (state 1; fig. 9).
9. Shape of inner process of pedicel (0) wide rounded (1) wide triangular (2) narrow triangular (3) finger-like (length= 13; CI= 23; RI= 77) (state 0; fig. 11) (state 2; fig. 12).
10. Size of pedicel (0) very short (1) as long as wide (2) elongate (length= 5; CI= 40; RI= 92) (state 0; fig. 7) (state 1; fig. 2, 3, 4) (state 2; fig. 5).
11. Spine-like setae on pedicel (0) none (1) one dorsal (2) one ventral (3) two setae, one dorsal and one ventral (length= 7; CI= 42; RI= 90) (state 0; fig. 9) (state 1; fig. 2, 3) (state 3; fig. 4, 6).
12. Protuberance on distal third of inner margin of pedicel (0) absent (1) present (length= 6; CI= 16; RI= 72) (state 1; fig. 6, 12).
13. Size of scape (0) very short (1) as long as wide (2) elongate (length= 6; CI= 33; RI= 63) (state 1; fig. 11) (state 2; fig. 13).
14. Frontal-vitta anteriorly (0) not protuberant (1) protuberant (length= 2; CI= 50; RI= 50) (state 0; fig. 9) (state 1; fig. 5).

15. Size of antennal base (0) absent (1) small (2) protuberant (length= 3; CI= 66; RI= 79) (state 0; fig. 7) (state 1; fig. 2, 3) (state 2; fig. 4, 9).
16. Vestiture of antennal base (0) shiny (1) opaque (length= 5; CI= 20; RI= 78).
17. Anterior margin of frons (0) straight (1) concave (length= 6; CI= 16; RI= 86) (state 1; fig. 12).
18. Shape of face anteriorly (0) not exposed or visible laterally (1) evident in lateral view (length= 1; CI= 100; RI= 100) (state 0; fig. 5) (state 1; fig. 3).
19. Shape of face in dorsal view (0) exposed between the antennal base (1) not exposed or evident (length= 6; CI= 33; RI= 90) (state 0; fig. 8, 9) (state 1; fig. 13).
20. Median longitudinal slit on frontal-vitta (0) absent (1) present (length= 3; CI= 33; RI= 84) (state 0; fig. 12) (state 1; fig. 11).
21. Shape of frontal-vitta (0) lateral margin parallel (1) lateral margins narrowing posteriorly (length= 5; CI= 20; RI= 50) (state 0; fig. 11) (state 1; fig. 8).
22. Extension of anterior margin of frons (0) anterior to parafacial (1) same level as parafacial (2) extended beyond parafacial (length= 9; CI= 22; RI= 74) (state 1; fig. 9) (state 2; fig. 5).
23. Shape of fronto-orbital plate (0) narrowing anteriorly (1) parallel sided (length= 1; CI= 100; RI= 100).
24. Anterior fronto-orbital seta (0) absent (1) present (length= 11; CI= 9; RI= 64) (state 0; fig. 3) (state 1; fig. 4, 11).
25. Middle front-orbital seta (0) present (1) absent (length= 5; CI= 20; RI= 66) (state 0; fig. 11) (state 1; fig. 3).
26. Posterior margin of occiput between postocellar and vertical setae (0) straight (1) protuberant (length= 3; CI= 33; RI= 91).
27. Groove around ocellar triangle (0) absent (1) present (length= 7; CI= 14; RI= 33) (state 0; fig. 11).
28. Union of fronto-orbital plate and occiput (0) in a striate horizontal line (1) smoothly (2) in a carina (length= 7; CI= 28; RI= 80) (state 1; fig. 11).
29. Ocellar triangle (0) at level of vertex (1) protuberant (length= 10; CI= 10; RI= 57) (state 0; fig. 5). (state 1; fig. 7).
30. Position of ocellar triangle with respect to the eye (0) before posterior margin (1) beyond posterior margin (2) middle of the eye length dorsally (length= 7; CI= 28; RI= 85).

31. Vertex in lateral view (0) not evident over dorsal margin of occiput (1) higher than dorsal margin of occiput (length= 6; CI= 16; RI= 76) (state 0; fig. 2, 4). (state 1; fig. 3).
32. Dorsal margin of occiput (0) straight (1) downwards posteriorly (length= 10; CI= 10; RI= 76) (state 0; fig. 5) (state 1; fig. 10).
33. Size of inner vertical seta with respect to other setae of head (0) shorter (1) same size to longer (length= 9; CI= 11; RI= 57) (state 1; fig. 10).
34. Outer vertical seta (0) present (1) absent (length= 4; CI= 25; RI= 70) (state 0; fig. 10).
35. Postocular seta aligned with outer vertical seta on dorsal occiput (0) present (1) absent (length= 3; CI= 33; RI= 91) (state 0; fig. 2) (state 1; fig. 3, 4).
36. Occiput with medial line of transverse setae (0) present (1) absent (length= 7; CI= 14; RI= 84) (state 0; fig. 9) (state 1; fig. 3).
37. Postocular seta near posteroventral margin of eye (0) absent (1) present (length= 2; CI= 50; RI= 80) (state 0; fig. 3) (state 1; fig. 2).
38. Occiput with median yellow stripe (0) absent (1) present (length= 7; CI= 14; RI= 81) (state 0; fig. 2, 3) (state 1; fig. 4).
39. Vestiture of occiput (0) opaque (1) shiny (length= 13; CI= 7; RI= 50).
40. Shape of occiput posteriorly (0) rounded (1) angular (length= 11; CI= 9; RI= 72) (state 0; fig. 7) (state 1; fig. 10).
41. Occiput lateral (0) not protrude and wide posteriorly (1) protrude and narrows posteriorly (length= 3; CI= 33; RI= 77).
42. Division of occiput and postgena (0) at same level (1) occiput raised over postgena (length= 6; CI= 16; RI= 80).
43. Size of parafacial with respect to the eye (0) wide (1) short (2) evidently reduced (length= 8; CI= 25; RI= 57) (state 0; fig. 4) (state 1; fig. 3) (state 2; fig. 2, 9).
44. Shape of parafacial (0) rounded (1) projected anterodorsally (length= 7; CI= 14; RI= 72) (state 0; fig. 10) (state 1; fig. 7).
45. Yellow line on parafacial (0) absent (1) medial (2) dorsal (length= 9; CI= 22; RI= 85) (state 0; fig. 3) (state 1; fig. 4) (state 2; fig. 7).
46. Fronto-genal suture (0) joins the antennal base ventrally (1) joins the facial carina anteriorly (2) branches under the antennal base without reaching it (length= 13; CI= 15; RI= 71) (state 0; fig. 3, 5) (state 1; fig. 4) (state 2; fig. 7).

47. Vibrissa (0) absent (1) present (length= 4; CI= 25; RI= 66) (state 0; fig. 3) (state 1; fig. 4).
48. Size of gena (0) narrow (1) wide (length= 5; CI= 20; RI= 84) (state 0; fig. 3) (state 1; fig. 4).
49. Ventral shape of postgena (0) following the eye margin (1) drawing away from the eye margin (length= 2; CI= 50; RI= 94) (state 0; fig. 3) (state 1; fig. 4).
50. Postgenal setulae (0) black setulae (1) yellow setulae (2) no setulae (length= 10; CI= 20; RI= 78) (state 0; fig. 3) (state 1; fig. 4).
51. Distribution of postgenal setulae (0) posteriorly (1) laterally (length= 6; CI= 16; RI= 86) (state 0; fig. 2, 3) (state 1; fig. 11).

Thorax

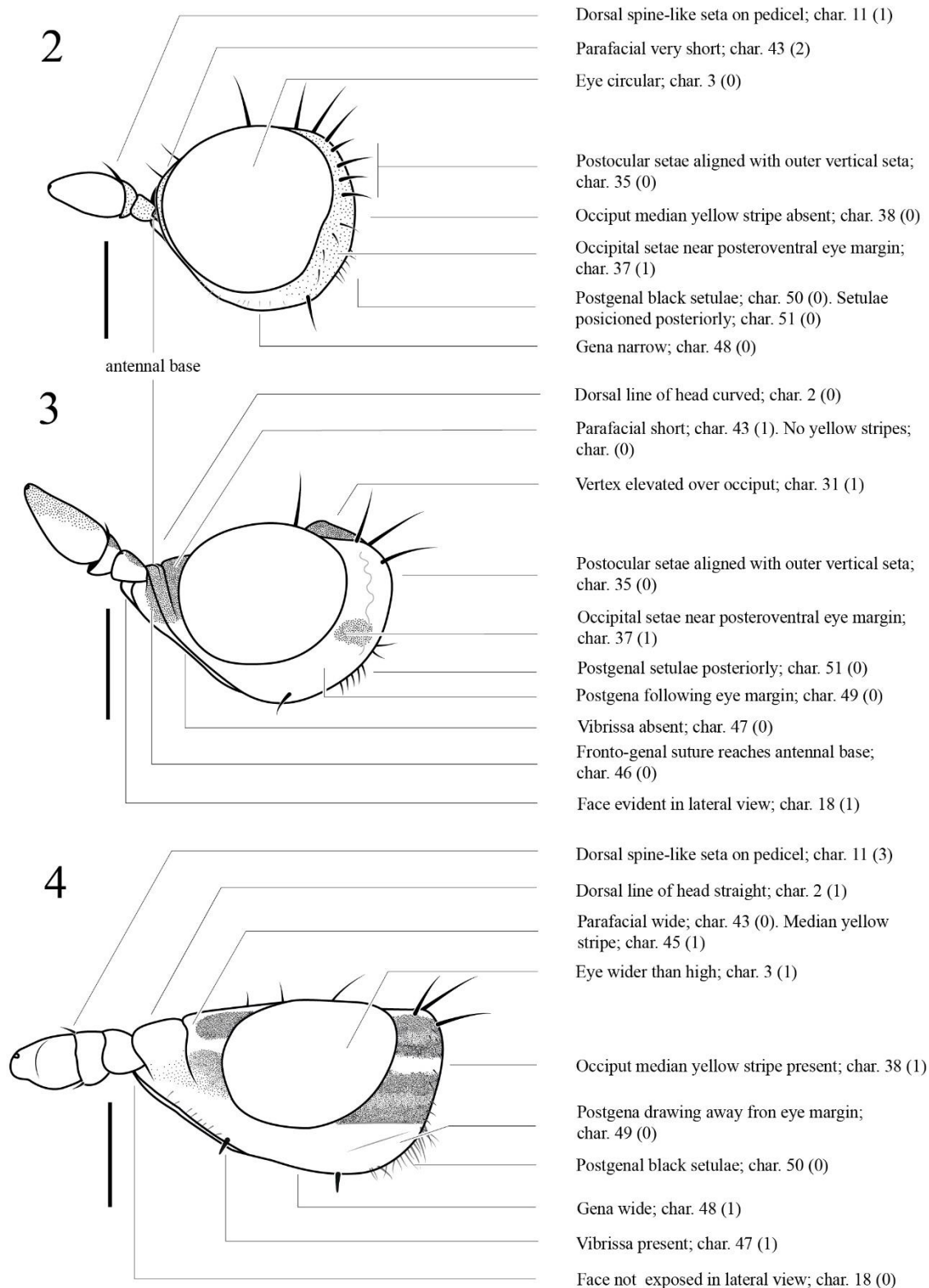
52. Size of body setae (0) long (1) short (2) very short (length= 7; CI= 28; RI= 85).
53. Thoracic pruinescence (0) absent (1) present (2) very dense (length= 12; CI= 16; RI= 52).
54. Size of thorax with respect to fore femur (0) thorax is half or less the size of fore femur (1) thorax is more than half and less than size of fore femur (2) thorax same size to longer than fore femur (length= 9; CI= 22; RI= 81).
55. Size of presutural scutum in relation to postsutural scutum (0) presutural scutum longer (2) both parts of scutum almost same sized (2) postsutural scutum shorter (length= 7; CI= 28; RI= 85).
56. Transversal suture (0) uncomplete (1) complete (length= 2; CI= 50; RI= 88).
57. Anterior margin of sutum with one seta (0) absent (1) present (length= 5; CI= 20; RI= 87).
58. Size of discal scutellar seta (0) hair-like and short (1) strong and half the size of scutellar seta (2) strong and almost as long as apical scutellar seta (length= 11; CI= 18; RI= 70).
59. Dorsocentral presutural seta (0) absent (1) present (length= 2; CI= 50; RI= 96).
60. Dorsocentral postsutural setae (0) one (1) two (2) three (3) four (length= 7; CI= 28; RI= 86).
61. Shape of scutellum (0) rounded (1) trapezoidal (2) rectangular (3) triangular (length= 11; CI= 27; RI= 77).
62. Position of discal scutellar seta (0) on lateral half of scutellum (1) near distal margin of scutellum (length= 6; CI= 16; RI= 82).

63. Shape of prosternum (0) narrow, separated from proepisternum by membranous area (1) wide, reaching proepisternum (length= 3; CI= 33; RI= 50).
64. Size of postpronotal lobe (0) short (1) long (length= 7; CI= 14; RI= 71).
65. Postpronotal lobe with dorsal protuberance (0) absent (1) present (length= 9; CI= 11; RI= 60).
66. Position of postpronotal carina (0) aligned with anterior margin of scutum and antepronotal ring (1) anterior margin of scutum and antepronotal ring distinctly projected anteriorly beyond postpronotal carina (length= 4; CI= 25; RI= 70).
67. Size of postpronotal carina (0) small (1) protuberant (length= 6; CI= 16; RI= 86).
68. Anterior margin of postpronotal lobe (0) narrowing towards carina (1) wide, not narrowing anteriorly (length= 3; CI= 33; RI= 92).
69. Proepisternal seta (0) absent (1) present (2) setulose (length= 9; CI= 22; RI= 53).
70. Dorsal yellow stripe on pleura (0) absent (1) present (length= 7; CI= 14; RI= 81).
71. Transversal yellow line of pleura (0) absent (1) present (length= 4; CI= 25; RI= 50).
72. Anterior notopleural seta (0) present (1) absent (length= 3; CI= 33; RI= 94).
73. Color of katatergite (0) brown (1) yellow (length= 7; CI= 14; RI= 83).
74. Shape of katatergite (0) short and flat (1) short and slightly protuberant (2) long and very protuberant (length= 8; CI= 25; RI= 83).
75. Katepisternal lateral seta (0) absent (1) one (2) four (length= 10; CI= 20; RI= 60).
76. Katepisternal ventral seta (0) present (1) absent (length= 5; CI= 20; RI= 87).
77. Setae on basicosta (0) absent (1) one (2) two (length= 5; CI= 40; RI= 88).
78. Bare areas on wing (0) present (1) absent (length= 2; CI= 50; RI= 83).
79. Wing macula (0) absent (1) present (length= 7; CI= 14; RI= 62).
80. Apical fore coxa (0) two spine-like setae (1) one spine-like seta (2) many setulae (length= 3; CI= 66; RI= 94).
81. Lateral setae on hind coxa (0) absent (1) one (2) two (length= 5; CI= 40; RI= 88).
82. Dorsal setae on fore femur (0) absent (1) on distal half (2) on basal half (length= 3; CI= 66; RI= 85).
83. Ventral setae on fore femur (0) anterior and posterior setae on tubercles (1) anterior and posterior not in tubercles (length= 2; CI= 50; RI= 94).
84. Inner margin of pedicel with line of long setae (0) absent (1) one to three (2) line on basal half (3) line from base to apex (length= 9; CI= 33; RI= 87).

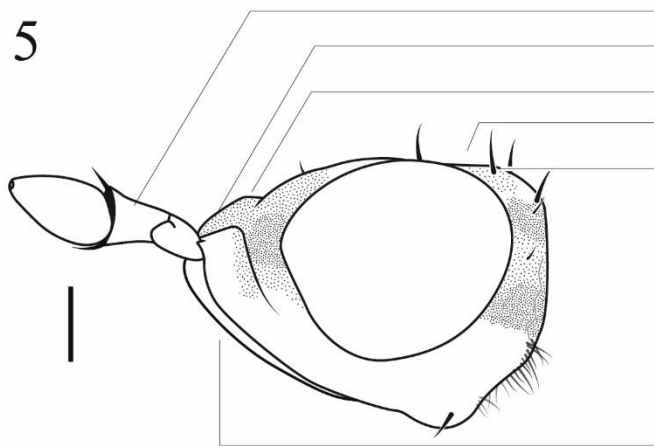
85. Anteroventral spine-like setae on mid femur (0) absent (1) present (length= 3; CI= 33; RI= 90).
86. Dorsal setae on hind femur (0) absent (1) present (length= 4; CI= 25; RI= 62).
87. Shape of fore tibia (0) cylindrical (1) swollen distally (1) slightly wider distally (length= 10; CI= 20; RI= 68).
88. Apical spine-like setae on mid and hind tibiae (0) absent (1) short (2) very long (length= 4; CI= 50; RI= 94).

Abdomen

89. Shape of fore basitarsomere (0) cylindrical (1) swollen (length= 1; CI= 100; RI= 100).
90. Dorsal yellow line on abdomen (0) present (1) absent (length= 6; CI= 16; RI= 75).
91. Setae on tergite 2 posteriorly (0) not differentiated (1) strong and scattered (2) strong and gathered (3) strong and gathered over a protuberance (length= 15; CI= 20; RI= 68).
92. Shape of fifth sternite (0) modified in a genital fork (1) baciliform (length= 1; CI= 100; RI= 100).
93. Shape of sixth sternite (0) wide and long (1) wide and short (2) wide and protuberant (3) narrow and short (length= 6; CI= 50; RI= 91).
94. Length of epandrium with respect to abdomen (0) epandrium more than half the length of abdomen (1) epandrium less than half the length of abdomen (2) epandrium as long as one tergite (length= 12; CI= 16; RI= 52).
95. Distal margin of epandrium (0) very wide (1) same length as base (length= 1; CI= 100; RI= 100).
96. Shape of cercus (0) triangular (1) linear (2) squared (3) wide rounded (length= 13; CI= 23; RI= 64).
97. Surstylus and cercus (0) small and short (1) long and strongly modified (length= 7; CI= 14; RI= 40).

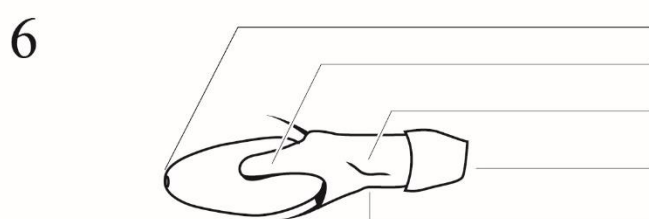


Figures 2-4. Heads in lateral view. **2.** *Teloneria apicata* Edwards; **3.** *Telostylus facsimile*; **4.** *Eoneria maldonadoi* Aczél (Scales: 0.5 mm).



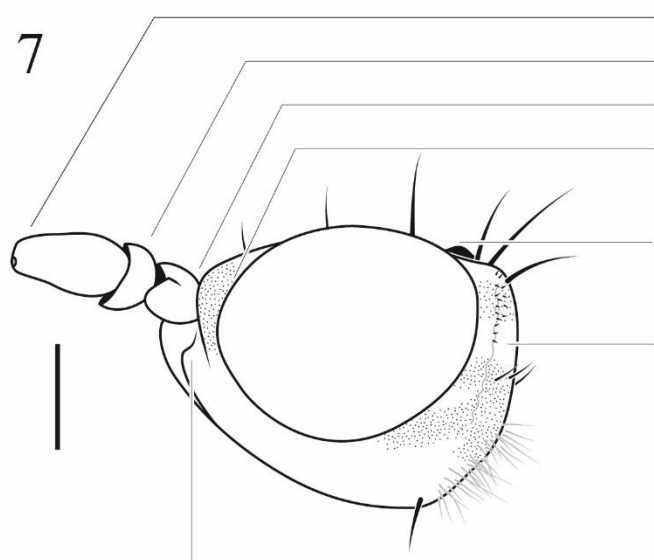
Pedicel elongate; char. 10 (2)
 Anterior margin of frons extended beyond
 parafacial anteriorly; char. 22 (2)
 Frontal-vitta protuberan anteriorly; char. 14 (1)
 Ocellar triangle protubernat; char. 29 (0)
 Dorsal margin of occiput straight; char. 32 (0)

Face not exposed in lateral view; char. 18 (0)



Arista apical; char. 6 (2)
 Dorsally placed inner process; char. 8 (0)
 Protuberance in inner margin of pedicel;
 char. 12 (1)
 Scape as long as wide; char. 13 (1)

Pedicel elongate; char. 10 (2)



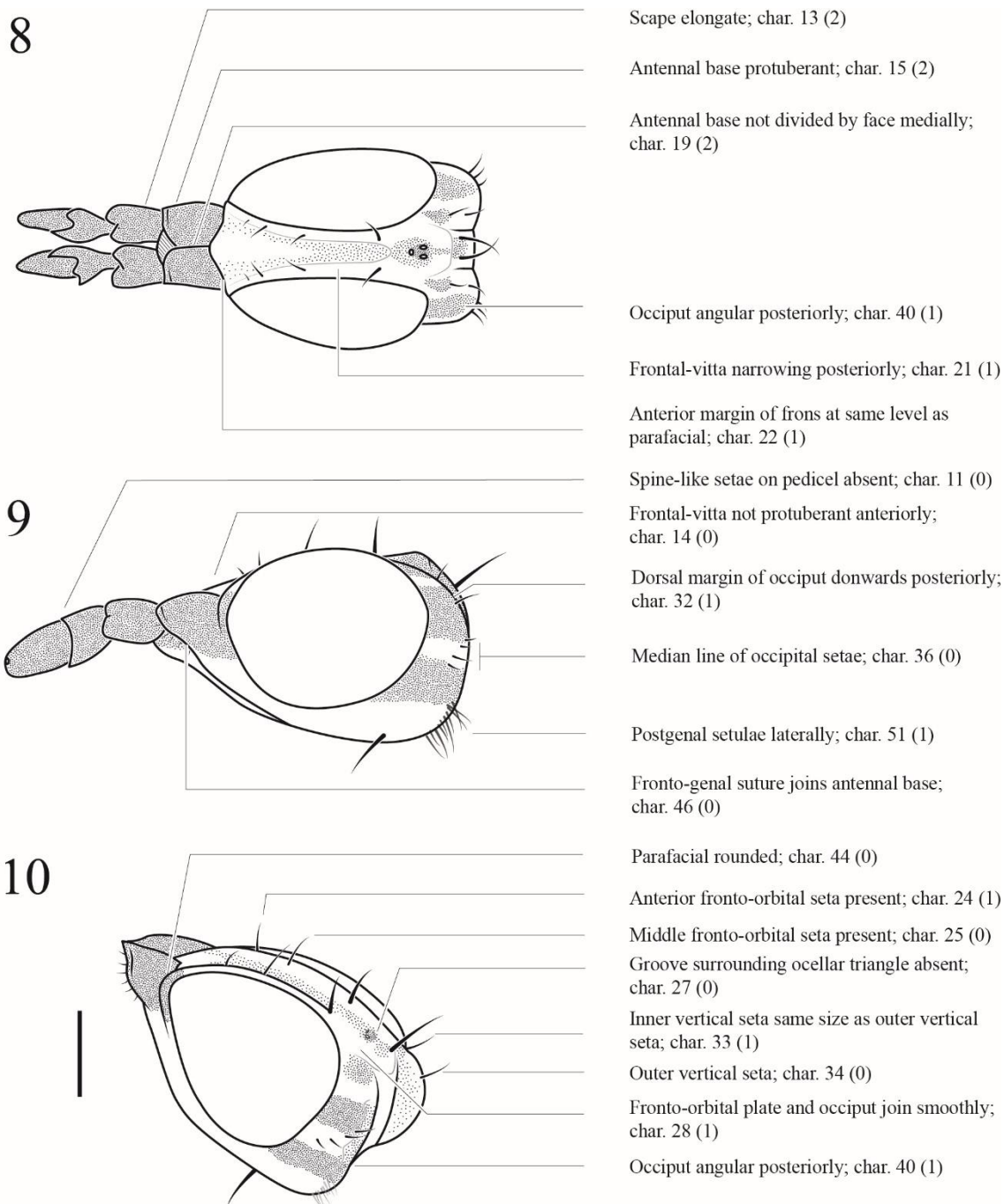
Arista ventro-apical; char. 6 (3)
 Pedicel very short; char. 10 (0)
 Antenal base absent; char. 15 (0)
 Parafacial projected anterodorsally; char. 44 (1)

Ocellar triangle protubernat; char. 29 (0)

Occiput rounded posteriorly; char. 40 (0)

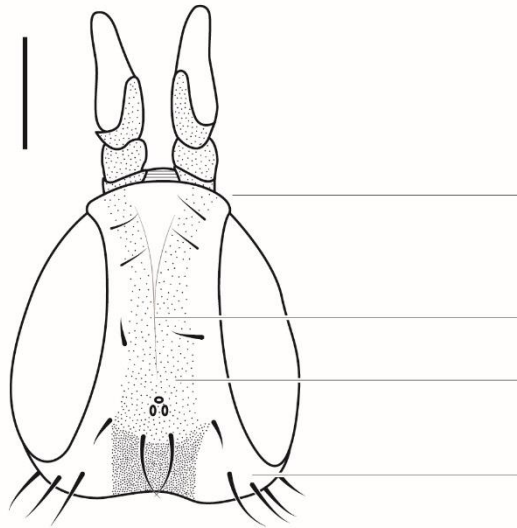
Fronto-genal suture not reaching the antenal
 insertion; char. 47 (2)

Figures 5-7. 5. *Indonesicesa lieftincki* Aczél, head lateral; 6. *I. lieftincki*, inner process of pedicel; 7. *Chaetonerius ebejeri* Sepúlveda and de Carvalho, head lateral (Scales: 0.5 mm).



Figures 8-10. *Antillonerius cinereus* Hennig. **8.** Head in dorsal view; **9.** Head in lateral view; **10.** Head in laterodorsal view (Scales: 0.5 mm).

11



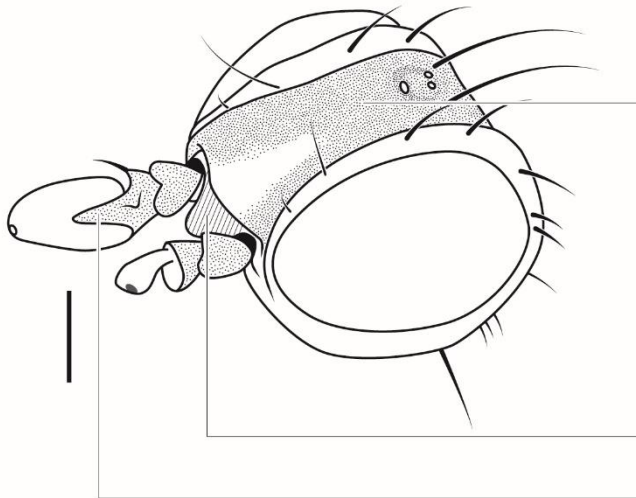
Anterior margin of frons concave; char. 17 (1)

Median longitudinal slit in frontal-vitta;
char. 20 (1)

Frontal-vitta not narrowing posteriorly;
char. 21 (0)

Occiput rounded posteriorly; char. 40 (0)

12



Median longitudinal slit in frontal-vitta absent;
char. 20 (0)

Face exposed dorsally between antennal bases;
char. 19 (0)

Median inner process of pedicel; char. 17 (1)

Figures 11-12. 11. *Teloneria bimaculata* Edwards, head in dorsal view; 12. *Ch. alienum*, new species, head in lateral view (Scales: 0.5 mm).

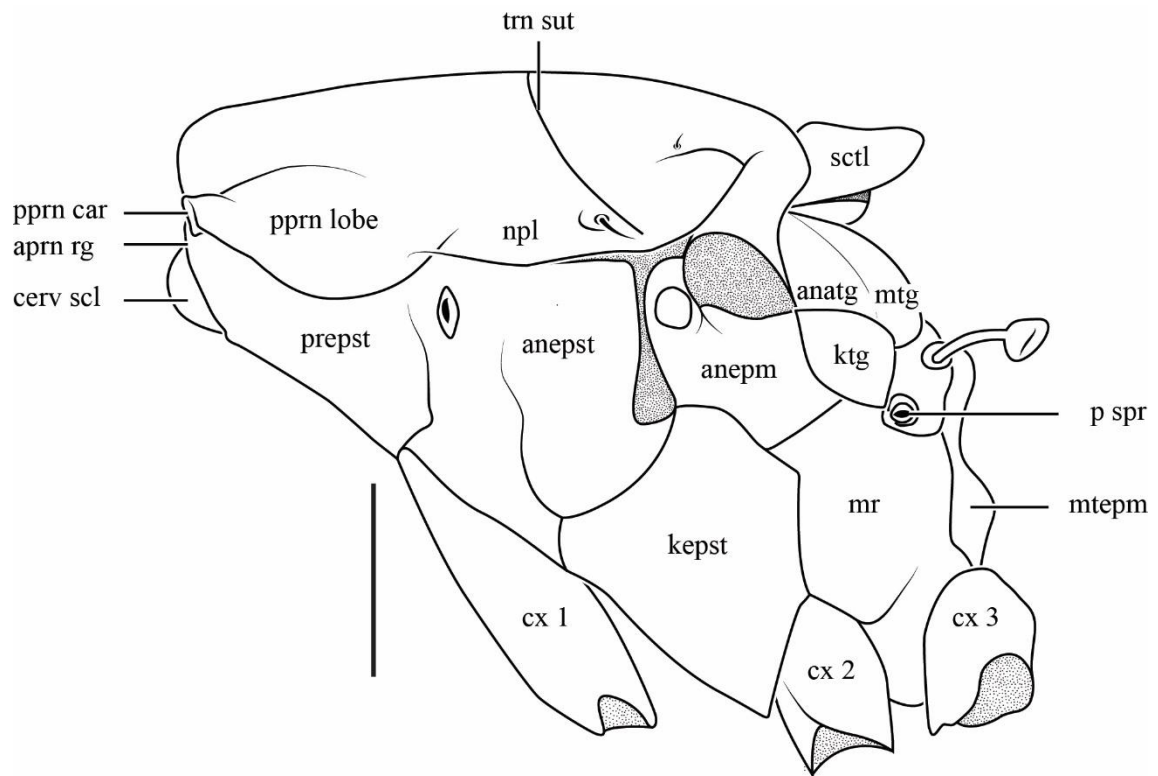


Figure 13. *Neriis czernyi* Aczél, thorax in lateral view (Scale 1 mm).

APPENDIX 2

Coded matrix of characters used in the morphological analyses

Appendix 2. Morphological character state matrix used in the reconstruction of phylogenetic relationships among Neriidae species plus 4 outgroup taxa

	1									2									3									4													
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	
1. <i>Azelia opita</i> new species	2	0	0	2	0	1	1	2	1	2	0	0	2	0	2	0	1	0	2	0	0	2	0	0	0	1	1	0	1	1	0	1	0	0	1	1	0	1	0	1	
2. <i>Antillonarius cinereus</i>	2	1	1	1	1	1	1	2	2	1	0	0	2	0	2	1	1	0	2	0	1	1	0	1	0	0	0	1	1	1	1	0	0	0	1	0	0	1	0	1	
3. <i>Antillonarius solitarius</i>	2	1	1	1	1	1	1	2	2	1	0	0	2	0	2	1	1	0	2	0	1	1	0	1	0	0	0	1	1	1	1	0	0	0	1	0	0	1	0	1	
4. <i>Cerantichir enderleini</i>	2	0	0	2	2	1	1	2	2	2	0	0	1	0	2	0	1	0	2	0	1	1	0	1	0	0	0	1	1	1	1	0	0	1	1	0	0	0	1	1	
5. <i>Cerantichir peruana</i>	2	0	0	1	2	1	1	2	0	2	0	0	1	0	2	0	1	0	2	0	1	1	0	1	0	0	0	1	1	1	1	0	0	1	1	0	0	0	1	1	
6. <i>Chaetonerius alienum</i>	0	0	0	0	1	0	1	2	3	0	3	1	1	0	0	-	1	0	1	0	0	1	0	1	0	0	0	1	1	0	0	1	0	0	0	0	1	1	0	0	
7. <i>Chaetonerius alluaudi</i>	2	0	0	0	1	2	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	
8. <i>Chaetonerius anemona</i>	0	0	0	0	1	0	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	
9. <i>Chaetonerius antankarana</i>	0	0	0	0	1	2	1	2	2	0	3	1	1	0	0	-	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	
10. <i>Chaetonerius antanosy</i>	0	0	0	0	1	0	1	2	2	0	3	0	1	0	0	-	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0
11. <i>Chaetonerius apicalis</i>	0	0	0	1	1	0	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0	1	0	0	
12. <i>Chaetonerius claricoxa</i>	0	0	0	0	1	0	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	
13. <i>Chaetonerius ebejeri</i>	0	0	0	0	1	2	1	2	2	0	3	0	1	0	0	-	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	
14. <i>Chaetonerius eualluaudi</i>	0	0	0	0	1	2	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	
15. <i>Chaetonerius fascipes</i>	0	0	0	1	1	0	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	

Appendix 2. Continued

	1									2									3									4																					
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
16. <i>Chaetonerius hololissa</i>	0	0	0	0	0	2	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	1	0	0	0	1	0	0	1	0	1	0
17. <i>Chaetonerius inermis</i>	0	0	0	2	1	0	1	2	2	0	1	1	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0
18. <i>Chaetonerius kirkspriggsi</i>	0	0	0	0	1	0	1	2	2	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1
19. <i>Chaetonerius latifemur</i>	0	0	0	0	1	0	1	2	2	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20. <i>Chaetonerius lobayensis</i>	0	0	0	1	1	0	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21. <i>Chaetonerius londti</i>	0	0	0	0	1	0	1	2	2	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
22. <i>Chaetonerius madagasikara</i>	0	0	0	0	1	1	1	2	2	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0
23. <i>Chaetonerius mandelai</i>	0	0	0	0	1	0	1	2	2	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	1
24. <i>Chaetonerius nolae</i>	0	0	0	1	1	0	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1
25. <i>Chaetonerius nyassicus</i>	0	0	0	1	1	0	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1
26. <i>Chaetonerius perstriatus</i>	0	0	0	0	1	0	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1
27. <i>Chaetonerius spinibrachium</i>	0	0	0	0	1	0	1	2	2	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
28. <i>Chaetonerius spinosissimus</i>	0	0	0	0	1	2	1	2	3	0	3	0	1	0	0	-	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29. <i>Derocephalus angusticollis</i>	2	0	1	1	1	0	1	1	3	1	0	1	1	0	2	1	1	0	2	0	1	2	0	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	
30. <i>Eoneria aczeli</i>	2	1	1	1	1	1	1	2	2	1	0	0	1	0	2	1	0	0	2	0	0	1	0	1	0	1	0	2	0	1	0	1	0	2	0	1	0	1	0	0	1	0	0	1	0	0	1		

Appendix 2. Continued

	1									2									3									4																						
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0										
31. <i>Eoneria blanchardi</i>	2	1	1	1	1	1	1	2	2	1	0	0	1	0	2	1	0	0	2	0	0	1	0	1	0	1	0	1	0	2	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	1	0	1	0	1
32. <i>Eoneria maldonadoi</i>	2	1	1	1	1	1	1	2	2	1	0	0	1	0	2	1	0	0	2	0	0	1	0	1	0	1	0	1	0	2	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	1	0	1	0	1
33. <i>Eoneria sabroskyi</i>	2	1	1	2	1	1	1	2	2	1	0	0	1	0	2	1	0	0	2	0	0	1	0	1	0	1	0	1	0	2	0	1	0	1	0	0	1	0	0	1	0	1	0	1	0	1	0	1	0	1
34. <i>Glyphidops bistratus</i>	0	0	0	1	0	0	1	2	2	1	0	0	1	0	1	1	0	0	2	0	1	0	0	1	0	1	0	1	0	1	1	0	0	0	0	0	1	1	0	1	0	1								
35. <i>Glyphidops bullatus</i>	2	0	0	1	2	0	1	2	2	1	0	0	1	0	2	0	0	0	2	0	0	1	0	1	0	1	0	1	0	2	1	1	0	1	0	0	1	1	0	1	0	1								
36. <i>Glyphidops carrerai</i>	2	0	0	0	0	0	1	2	3	1	0	0	1	0	2	0	0	0	2	0	0	1	0	1	0	1	0	1	0	2	0	1	0	1	0	0	1	1	0	1	0	1								
37. <i>Glyphidops coracinus</i>	2	0	0	2	2	0	1	2	2	1	0	0	1	0	2	0	0	0	2	0	0	1	0	1	0	1	0	1	0	2	0	1	0	1	0	0	1	1	0	1	0	1								
38. <i>Glyphidops durus</i>	2	0	1	0	0	0	1	2	2	1	0	0	1	0	2	0	0	0	2	0	0	1	0	1	0	1	0	1	0	2	0	1	0	1	0	0	1	1	0	1	0	1								
39. <i>Glyphidops etele</i>	2	0	0	2	2	1	1	2	2	1	0	0	1	0	2	0	1	0	2	0	0	1	0	1	0	1	0	1	0	2	0	1	0	1	0	0	1	1	0	1	0	1								
40. <i>Glyphidops filusus</i>	2	0	0	2	2	0	1	2	2	1	0	0	1	0	2	0	0	0	2	0	0	1	0	1	0	1	0	1	0	2	0	1	0	1	0	0	1	1	0	1	0	1								
41. <i>Glyphidops flavifrons</i>	2	0	0	0	0	0	1	2	2	1	0	0	1	0	2	0	0	0	2	0	0	1	0	1	0	1	0	1	0	2	1	1	0	1	0	0	1	1	0	1	0	1								
42. <i>Glyphidops limbatus</i>	2	0	0	0	1	0	1	2	2	1	0	0	1	0	2	0	0	0	2	0	0	1	0	1	0	1	0	1	0	2	1	1	0	1	0	0	1	1	0	1	0	1								
43. <i>Glyphidops pluricellatus</i>	0	0	2	1	0	0	1	2	2	1	0	0	1	0	1	0	0	0	2	0	0	1	0	0	0	1	0	0	1	0	2	1	0	0	1	0	0	1	1	0	1	0	1							
44. <i>Glyphidops ruselatus</i>	2	0	0	1	1	0	1	2	2	1	0	0	1	0	2	0	0	0	2	0	0	1	0	0	0	1	0	0	1	0	2	1	1	0	1	0	0	1	1	0	1	0	1							
45. <i>Glyphidops steyskali</i>	2	0	0	2	2	0	1	2	2	1	0	0	1	0	2	0	0	0	2	0	0	1	0	1	0	1	0	1	0	2	0	1	0	1	1	0	1	1	0	1	0	1								

Appendix 2. Continued

	1									2									3									4																					
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
61. <i>Stypocladus appendiculatus</i>	2	0	0	2	2	0	1	1	3	2	3	0	1	0	2	0	1	0	2	0	0	2	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	0	1	0	0	1	0	0	1	0	0	1	0
62. <i>Teloneria apicata</i>	0	0	0	1	1	0	1	1	0	0	1	0	1	0	1	0	1	0	2	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	1	0	0
63. <i>Teloneria bimaculata</i>	0	0	0	0	1	0	1	1	0	0	1	0	1	0	1	0	1	0	2	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	1	0	0
64. <i>Teloneria eumaculata</i>	0	0	0	0	1	0	1	1	0	0	1	0	1	0	1	0	1	0	2	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	0	1	0	1
65. <i>Teloneria furva</i>	0	0	0	0	1	0	1	1	0	0	1	0	1	0	1	0	1	0	2	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	1	0	1
66. <i>Teloneria scaenica</i>	1	0	0	0	1	1	1	1	0	0	1	0	1	0	1	0	1	0	2	1	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	1	0
67. <i>Telostylinus lineolatus</i>	2	0	1	1	2	0	1	1	3	1	3	1	1	0	2	1	1	0	1	0	1	2	0	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	1	1	1	0	0	1	1	1	0	1
68. <i>Telostylinus</i> sp.	2	0	1	2	2	0	1	1	3	1	3	1	1	0	2	1	1	0	1	1	1	2	0	0	1	0	0	1	0	0	1	0	1	0	1	0	1	0	1	0	0	1	0	1	0	0	1	0	1
69. <i>Telostylus babiensis</i>	1	0	1	2	1	0	1	1	0	0	3	1	1	0	1	1	1	1	1	0	2	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1	0	0	1	0
70. <i>Telostylus binotatus</i>	1	0	0	2	1	0	1	1	0	0	3	1	1	0	1	1	1	1	1	0	2	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1	0	0	1	0
71. <i>Telostylus claroscuro</i>	0	0	0	2	1	0	1	1	0	0	3	1	1	0	1	1	1	1	1	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0
72. <i>Telostylus facsimile</i>	1	0	0	2	1	0	1	1	0	0	3	1	1	0	1	1	1	1	1	0	2	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1	0	0	1	0
73. <i>Telostylus inversus</i>	0	0	0	2	1	0	1	1	0	0	3	1	1	0	1	1	1	1	1	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0
74. <i>Telostylus philippinensis</i>	1	0	0	2	1	0	1	1	0	0	3	1	1	0	1	1	1	1	1	0	2	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1	0	0	1	0
75. <i>Telostylus niger</i>	1	0	0	2	1	0	1	1	0	0	3	1	1	0	1	1	1	1	1	0	0	2	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0

Appendix 2. Continued

	1									2									3									4																					
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
<i>76. Telostylus remipes</i>	1	0	1	2	1	0	1	1	0	0	3	1	1	0	1	1	1	1	1	1	0	2	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	0	1	1	0	0	1
<i>77. Telostylus trilineatus</i>	1	0	0	2	1	0	1	1	0	0	3	1	1	0	1	1	1	1	1	1	0	2	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	0	1	1	0	1	1
Out-group																																																	
<i>78. Cothornobata shuimanensis</i>	0	0	0	1	1	0	0	-	-	0	2	1	0	0	1	0	1	0	1	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1
<i>79. Cryogonus sp.</i>	0	0	2	0	1	0	0	-	-	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1	1	2	0	0	0	1	1	1	0	0	1	1	1	0	0	0	1	1	0	0	1
<i>80. Micropeza sp.</i>	2	1	0	0	0	0	0	-	-	0	0	0	0	0	1	0	1	0	1	0	0	2	0	0	1	0	0	1	0	1	1	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1	0	0	0
<i>81. Taeniaptera albitarsis</i>	0	0	2	0	0	0	0	-	-	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	2	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1	0	0	1

Appendix 2. Morphological character state matrix used in the reconstruction of phylogenetic relationships among Neriidae species plus 4 outgroup taxa

	4				5					6					7					8																					
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0											
1. <i>Aczelia opita</i> , new species	0	1	0	0	1	0	1	1	1	1	1	2	1	1	1	0	1	0	0	3	3	1	0	0	0	0	1	0	2	1	0	1	0	1	2	1	1	1	1	0	
2. <i>Antillonerius cinereus</i>	0	1	2	0	2	0	0	1	1	1	1	1	2	1	1	0	0	2	0	0	1	1	0	0	0	0	1	0	2	0	0	0	0	0	0	1	1	2	1	0	0
3. <i>Antillonerius solitarius</i>	0	1	2	0	2	1	0	1	1	1	1	1	2	1	1	0	0	2	0	1	1	1	0	0	0	0	1	0	2	0	0	0	0	0	0	1	1	2	1	0	0
4. <i>Cerantichir enderleini</i>	1	1	1	0	1	0	0	1	1	0	1	2	1	2	0	0	1	0	0	0	2	1	0	1	0	1	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1
5. <i>Cerantichir peruana</i>	1	0	1	0	1	0	0	1	1	0	1	2	1	2	0	0	1	0	0	0	0	0	0	1	0	1	1	0	2	0	0	0	0	0	1	1	1	1	0	0	1
6. <i>Chaetonerius alienum</i>	0	0	1	0	2	1	0	1	1	0	0	0	1	1	2	0	1	1	1	3	1	0	0	0	1	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	
7. <i>Chaetonerius alluaudi</i>	0	1	1	1	2	1	0	1	1	1	1	0	1	1	2	0	1	1	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	
8. <i>Chaetonerius anemona</i>	0	0	1	0	2	2	0	1	1	1	0	0	1	1	2	0	1	1	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	
9. <i>Chaetonerius antankarana</i>	0	0	1	1	2	2	0	1	1	1	0	0	1	1	2	0	1	2	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	
10. <i>Chaetonerius antanosy</i>	0	1	1	1	1	2	0	1	1	1	0	0	2	1	2	0	1	1	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	
11. <i>Chaetonerius apicalis</i>	0	1	1	1	2	2	0	1	1	0	0	0	1	1	2	0	1	2	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	
12. <i>Chaetonerius claricoxa</i>	0	0	1	0	2	1	0	1	1	0	1	0	1	2	2	0	1	1	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	
13. <i>Chaetonerius ebejeri</i>	0	1	1	1	2	2	0	1	1	1	1	0	1	1	2	0	1	2	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	
14. <i>Chaetonerius eualluaudi</i>	0	1	1	1	2	2	0	1	1	1	1	0	1	1	2	0	1	1	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	
15. <i>Chaetonerius fascipes</i>	0	1	1	1	2	1	0	1	1	0	0	0	1	1	2	0	1	2	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0	

Appendix 2. Continued

	4				5					6					7					8																				
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0										
16. <i>Chaetonerius hololissa</i>	0	1	1	1	2	2	0	1	1	1	1	0	1	1	2	0	1	1	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
17. <i>Chaetonerius inermis</i>	0	1	1	1	0	1	0	1	1	1	0	0	1	1	2	0	1	1	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
18. <i>Chaetonerius kirkspriggsi</i>	0	0	1	1	2	2	0	1	1	1	0	0	1	1	2	0	1	2	1	3	1	0	0	0	0	0	1	1	2	1	0	0	0	0	0	0	2	1	0	0
19. <i>Chaetonerius latifemur</i>	0	0	1	1	2	2	0	1	1	0	0	0	1	1	1	0	1	2	0	3	1	0	0	0	1	0	0	1	2	1	0	0	0	0	0	0	2	1	0	0
20. <i>Chaetonerius lobayensis</i>	0	1	1	1	2	1	0	1	1	0	0	0	1	1	2	0	1	2	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
21. <i>Chaetonerius londti</i>	0	1	1	1	2	1	0	1	1	1	0	0	1	1	2	0	1	2	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
22. <i>Chaetonerius madagasikara</i>	0	1	1	1	2	1	0	1	1	1	0	0	1	1	2	0	1	2	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
23. <i>Chaetonerius mandelai</i>	0	1	1	1	2	2	0	1	1	1	1	0	1	1	2	0	1	1	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
24. <i>Chaetonerius nolae</i>	0	1	1	1	2	1	0	1	1	0	0	0	2	1	2	0	1	2	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
25. <i>Chaetonerius nyassicus</i>	0	1	1	1	2	1	0	1	1	0	0	0	2	1	2	0	1	2	1	3	1	0	0	0	1	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
26. <i>Chaetonerius perstriatus</i>	0	1	1	1	0	2	0	1	1	1	0	0	1	1	2	0	1	1	1	3	1	0	0	0	0	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
27. <i>Chaetonerius spinibrachium</i>	0	0	1	1	2	1	0	1	1	0	0	0	1	1	2	0	1	2	1	3	1	0	0	0	1	0	1	1	2	1	0	0	1	0	0	0	2	1	0	0
28. <i>Chaetonerius spinosissimus</i>	0	1	1	1	0	1	0	1	1	0	0	0	2	1	2	0	1	2	1	3	1	0	0	0	1	0	0	1	2	1	0	0	1	0	0	0	2	1	0	0
29. <i>Derocephalus angusticollis</i>	1	1	1	1	1	1	0	0	1	0	1	1	1	0	1	0	0	0	0	1	0	1	0	1	0	1	1	1	2	1	1	1	0	0	0	1	2	1	0	0
30. <i>Eoneria aczeli</i>	0	1	0	1	1	1	1	1	1	1	1	1	2	2	1	0	0	0	0	1	2	1	0	0	1	0	0	1	2	1	0	0	0	0	1	1	2	1	0	0

Appendix 2. Continued

	4				5					6					7					8																				
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0										
61. <i>Stypocladus appendiculatus</i>	1	1	1	1	1	0	0	1	1	1	1	0	1	2	1	1	0	0	0	1	3	1	0	0	0	1	1	0	2	0	1	0	0	1	1	0	2	1	0	0
62. <i>Teloneria apicata</i>	0	0	2	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	3	0	1	0	0	0	0	1	1	2	0	0	0	0	1	0	0	2	1	1	0
63. <i>Teloneria bimaculata</i>	0	0	2	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	3	0	1	0	0	0	0	1	1	2	0	0	0	0	1	0	0	2	1	1	0
64. <i>Teloneria eumaculata</i>	0	0	2	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	3	0	1	0	0	0	0	0	1	2	0	0	0	0	1	0	0	2	1	1	0
65. <i>Teloneria furva</i>	0	0	2	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	3	0	1	0	0	0	0	1	1	2	0	0	0	0	1	0	0	2	1	1	0
66. <i>Teloneria scaenica</i>	0	0	2	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	1	3	0	1	0	0	0	0	1	1	2	0	0	0	0	1	0	0	2	1	1	0
67. <i>Telostylinus lineolatus</i>	0	1	1	1	0	1	0	0	1	0	1	1	1	0	1	0	0	0	0	0	1	1	0	0	0	0	1	1	2	1	1	1	1	1	0	1	1	1	0	0
68. <i>Telostylinus</i> sp.	0	1	1	1	1	1	0	0	1	2	1	1	1	0	1	0	0	0	0	0	1	1	0	0	0	0	1	1	2	1	1	1	1	1	0	1	2	1	0	0
69. <i>Telostylus babiensis</i>	0	0	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	1	2	0	0	1	1	1	0	1	2	1	1	0
70. <i>Telostylus binotatus</i>	0	0	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0	0	1	2	0	0	1	1	1	0	1	2	1	1	0	
71. <i>Telostylus claroscuro</i>	0	0	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	2	0	0	1	1	0	0	0	0	0	1	2	0	0	1	1	1	0	1	2	1	1	0
72. <i>Telostylus facsimile</i>	0	0	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	1	2	0	0	1	1	1	0	1	2	1	1	0
73. <i>Telostylus inversus</i>	0	0	2	1	0	0	0	0	0	0	0	1	1	1	1	1	0	2	0	0	1	0	0	0	0	0	0	1	2	1	0	1	1	1	0	1	2	1	1	0
74. <i>Telostylus philippinensis</i>	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	1	2	0	0	1	1	1	0	1	2	1	0	0
75. <i>Telostylus niger</i>	0	0	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	1	2	0	0	1	0	1	0	1	2	1	1	0

Appendix 2. Continued

	4				5					6					7					8																					
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0											
<i>76. Telostylus remipes</i>	0	0	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	1	2	0	0	1	1	1	0	1	2	1	1	0	
<i>77. Telostylus trilineatus</i>	0	0	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	1	2	0	0	1	1	1	0	1	2	1	1	0	
Out-group																																									
<i>78. Cothornobata shuimanensis</i>	0	0	1	0	2	1	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	1	2	1	0	2
<i>79. Cryogonus sp.</i>	0	0	1	1	0	1	0	0	0	0	0	0	1	2	1	0	0	-	0	0	0	-	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2
<i>80. Micropeza zadbi</i>	0	0	1	1	0	1	0	0	0	0	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	2	1	0	2	
<i>81. Taeniaptera albitarsis</i>	0	0	1	1	0	1	0	0	0	0	0	1	1	2	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	2	1	0	2	

Appendix 2. Morphological character state matrix used in the reconstruction of phylogenetic relationships among Neriidae species plus 4 outgroup taxa

	8							9									
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
1. <i>Aczelia opita</i> , new species	1	2	0	1	1	1	1	1	0	1	2	1	3	1	1	1	0
2. <i>Antillonerius cinereus</i>	1	1	0	2	0	0	0	1	0	1	1	1	3	1	1	1	0
3. <i>Antillonerius solitarius</i>	1	1	0	2	0	0	0	1	0	1	1	1	3	1	1	1	0
4. <i>Cerantichir enderleini</i>	1	1	0	2	1	0	0	1	0	1	2	1	3	1	1	1	0
5. <i>Cerantichir peruana</i>	2	1	0	2	1	0	1	1	0	1	2	1	3	1	1	1	0
6. <i>Chaetonerius alienum</i>	2	0	0	2	0	0	0	2	0	0	1	1	2	0	1	2	0
7. <i>Chaetonerius alluaudi</i>	2	0	0	3	0	0	0	2	0	0	1	1	2	1	1	0	1
8. <i>Chaetonerius anemona</i>	2	0	0	3	0	0	0	2	0	0	0	1	2	1	1	2	1
9. <i>Chaetonerius antankarana</i>	2	0	0	3	0	0	0	2	0	0	0	1	2	0	1	0	0
10. <i>Chaetonerius antanosy</i>	2	0	0	3	0	0	0	2	0	0	0	1	2	0	1	0	0
11. <i>Chaetonerius apicalis</i>	2	0	0	3	0	0	0	2	0	0	0	1	2	1	0	2	1
12. <i>Chaetonerius claricoxa</i>	2	0	0	3	0	0	0	2	0	1	0	1	2	1	1	1	0
13. <i>Chaetonerius ebejeri</i>	2	0	0	3	0	0	0	2	0	0	0	1	2	1	1	0	0
14. <i>Chaetonerius eualluaudi</i>	2	0	0	3	0	0	0	2	0	0	1	1	2	0	1	0	0
15. <i>Chaetonerius fascipes</i>	2	0	0	3	0	0	0	2	0	0	0	1	2	1	0	2	1

Appendix 2. Continued

	8							9									
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
16. <i>Chaetonerius hololissa</i>	2	0	0	3	0	0	0	2	0	0	0	1	2	1	1	0	0
17. <i>Chaetonerius inermis</i>	2	0	0	2	0	0	0	2	0	0	0	1	2	1	1	0	0
18. <i>Chaetonerius kirkspriggsi</i>	2	0	0	3	0	0	0	2	0	1	0	1	2	1	1	1	0
19. <i>Chaetonerius latifemur</i>	2	0	0	0	0	0	0	2	0	0	0	1	2	0	1	1	0
20. <i>Chaetonerius lobayensis</i>	2	0	0	3	0	0	0	2	0	1	0	1	2	1	0	2	1
21. <i>Chaetonerius londti</i>	2	0	0	3	0	0	0	2	0	1	0	1	2	1	1	2	0
22. <i>Chaetonerius madagasikara</i>	2	0	0	3	0	0	0	2	0	0	1	1	2	1	1	1	1
23. <i>Chaetonerius mandelai</i>	2	0	0	3	0	0	0	2	0	0	0	1	3	1	1	0	0
24. <i>Chaetonerius nolae</i>	2	0	0	3	0	0	0	2	0	0	1	1	2	0	1	1	0
25. <i>Chaetonerius nyassicus</i>	2	0	0	3	0	0	0	2	0	0	1	1	2	1	0	2	1
26. <i>Chaetonerius perstriatus</i>	2	0	0	3	0	0	0	2	0	0	1	1	2	0	1	1	1
27. <i>Chaetonerius spinibrachium</i>	2	0	0	3	0	0	0	2	0	0	1	1	2	1	1	1	0
28. <i>Chaetonerius spinosissimus</i>	2	0	0	3	0	0	0	2	0	0	0	1	2	0	1	1	0
29. <i>Derocephalus angusticollis</i>	2	0	0	0	0	0	0	2	0	1	0	1	1	1	1	0	0
30. <i>Eoneria aczeli</i>	2	1	0	2	0	1	2	1	0	1	1	1	3	1	1	1	0

Appendix 2. Continued

	8							9									
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
31. <i>Eoneria blanchardi</i>	2	1	0	2	0	1	2	1	0	1	1	1	3	1	1	1	0
32. <i>Eoneria maldonadoi</i>	2	1	0	2	0	1	2	1	0	1	1	1	3	1	1	1	0
33. <i>Eoneria sabroskyi</i>	2	1	0	2	1	1	2	1	0	1	1	1	3	1	1	1	0
34. <i>Gluphidops bistratus</i>	1	0	1	2	1	0	0	1	0	1	2	1	3	1	1	1	0
35. <i>Glyphidops bullatus</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	1	0
36. <i>Glyphidops carrerai</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	1	0
37. <i>Glyphidops coracinus</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	1	0
38. <i>Glyphidops durus</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	1	0
39. <i>Glyphidops etele</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	0	0
40. <i>Glyphidops filusus</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	1	0
41. <i>Glyphidops flavifrons</i>	1	0	1	1	1	0	2	1	0	1	3	1	3	1	1	1	0
42. <i>Glyphidops limbatus</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	1	0
43. <i>Glyphidops pluricellatus</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	1	0
44. <i>Glyphidops ruselatus</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	0	1	1	0
45. <i>Glyphidops steyskali</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	1	0

Appendix 2. Continued

	8							9									
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
46. <i>Glyphidops vittatus</i>	1	0	1	1	1	0	2	1	0	1	2	1	3	1	1	1	0
47. <i>Gymnonerius fuscus</i>	2	0	0	2	0	0	0	2	0	1	0	1	3	0	1	1	0
48. <i>Indonesicesa lieftincki</i>	2	0	0	0	0	0	1	1	0	1	0	1	1	1	1	1	0
49. <i>Indonesicesa annulipes</i>	2	0	0	0	0	0	1	1	0	1	0	1	1	1	1	1	0
50. <i>Longina abdominalis</i>	2	0	0	0	0	0	0	1	0	1	1	1	3	1	1	1	0
51. <i>Longina anguliceps</i>	2	0	0	0	0	0	0	1	0	1	0	1	3	0	1	1	0
52. <i>Longina semialba</i>	2	0	0	0	0	0	1	1	0	1	1	1	3	1	1	1	0
53. <i>Loxozus cornutus</i>	1	0	1	1	1	1	1	1	0	1	2	1	3	1	1	1	0
54. <i>Freidbergmyia cholita</i>	1	0	1	2	1	0	2	1	0	1	2	1	3	1	1	1	0
55. <i>Nerius czernyi</i>	1	0	1	1	1	1	2	1	0	1	2	1	3	0	1	1	0
56. <i>Nerius pilifer</i>	1	0	1	1	1	1	2	1	0	1	2	1	3	0	1	1	0
57. <i>Nerius plurivittatus</i>	1	0	1	1	1	0	0	1	0	1	2	1	3	0	1	1	0
58. <i>Nipponerius femoratus</i>	2	0	0	2	0	0	0	2	0	1	0	1	3	1	1	0	0
59. <i>Odontoloxozus longicornis</i>	2	0	0	2	1	1	2	1	0	1	0	1	3	1	1	1	0
60. <i>Paranerius fibulatus</i>	1	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0

Appendix 2. Continued

	8							9									
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
61. <i>Stypocladus appendiculatus</i>	2	0	0	2	0	0	0	2	0	1	0	1	1	1	1	1	0
62. <i>Teloneria apicata</i>	2	0	0	2	0	0	0	2	0	1	0	1	1	0	1	1	0
63. <i>Teloneria bimaculata</i>	2	0	0	2	0	0	0	2	0	1	0	1	1	0	1	2	1
64. <i>Teloneria eumaculata</i>	2	0	0	2	0	0	0	2	0	1	0	1	1	0	1	1	0
65. <i>Teloneria furva</i>	2	0	0	2	0	0	0	2	0	1	0	1	1	0	1	1	1
66. <i>Teloneria scaenica</i>	2	0	0	2	0	0	0	2	0	1	0	1	1	0	1	1	1
67. <i>Telostylinus lineolatus</i>	2	0	0	0	0	0	0	2	0	0	3	1	1	1	1	1	0
68. <i>Telostylinus</i> sp.	2	0	0	0	0	0	0	2	0	0	3	1	1	1	1	1	0
69. <i>Telostylus babiensis</i>	2	0	0	2	0	0	0	2	1	1	0	1	3	1	1	0	0
70. <i>Telostylus binotatus</i>	2	0	0	2	0	0	0	2	1	1	0	1	3	1	1	0	0
71. <i>Telostylus claroscuro</i>	2	0	0	2	0	0	0	2	1	1	0	1	3	1	1	0	0
72. <i>Telostylus facsimile</i>	2	0	0	2	0	0	0	2	1	1	1	1	3	1	1	0	0
73. <i>Telostylus inversus</i>	2	0	0	2	0	0	0	2	1	1	0	1	3	1	1	0	0
74. <i>Telostylus philippinensis</i>	2	0	0	2	0	0	0	2	1	1	0	1	3	1	1	0	0
75. <i>Telostylus niger</i>	2	0	0	2	0	0	1	2	1	1	0	1	3	1	1	0	0

Appendix 2. Continued

	4							5									
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
76. <i>Telostylus remipes</i>	2	0	0	2	0	0	0	2	1	1	1	1	3	1	1	0	0
77. <i>Telostylus trilineatus</i>	2	0	0	2	0	0	0	2	1	1	0	1	3	1	1	0	0
Out-group																	
78. <i>Cothornobata shuimanensis</i>	0	0	-	0	0	0	0	0	0	1	0	0	0	2	1	1	0
79. <i>Cryogonus</i> sp.	0	0	-	0	0	0	0	0	0	1	0	0	0	2	1	3	0
80. <i>Micropeza zadbi</i>	0	0	-	0	0	0	0	0	0	1	0	0	0	2	1	3	0
81. <i>Taeniaaptera albitarsis</i>	0	0	-	0	0	0	0	0	0	1	0	0	0	2	1	3	0

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