

UNIVERSIDADE FEDERAL DO PARANÁ

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TAXONOMIA DE NERIIDAE (DIPTERA) DA COLÔMBIA

CURITIBA

2013

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Dissertação apresentada ao Programa de Pós-Graduação em Ciências Biológicas (Entomologia) da Universidade Federal do Paraná como requisito parcial à obtenção do grau de Mestre.

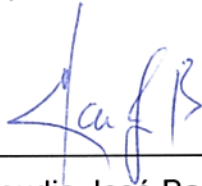
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Curitiba, 21 fevereiro de 2013

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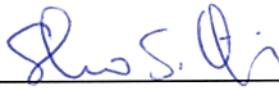
Dissertação aprovada como requisito parcial para obtenção do grau de “Mestre em Ciências Biológicas”, no Programa de Pós-graduação em Ciências Biológicas, Área de Concentração em Entomologia, da Universidade Federal do Paraná, pela Comissão formada pelos professores:



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Curitiba, 21 de fevereiro de 2013.

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GENERAL ABSTRACT

The family Neriidae comprises a small group of acalyptrate flies, with 110 species in 19 genera, that are easily identified due to their characteristic appearance; they have rather long legs, porrect antennae with dorsoapical or apical arista and ventral femora spine-like setae. For years, the classification of Neriidae was confusing and species have been described based in unstable characters, that lead to an elevated number of synonyms and question the validity of several genera. There are no recent studies (~50 years) of this family in the neotropics, except for the revision of *Longina* Wiedemann by Buck & Marshall (2004), and the type material has not been reviewed by any of the authors in most of the published material. Here we describe the information gathered from visits to the most important entomological collections in Colombia, as well as two important entomological collections in Brazil, one in Argentina and one in the United States. The results are presented in English, with the intention of increase the access to information contained therein and facilitate the process of disclosure in indexed journals specialized in taxonomy. This manuscript contains five chapters, embracing six genera found in Colombia: *Cerantichir* Enderlein, *Eoneria* Aczél, *Glyphidops* Enderlein, *Longina* Wiedemann, *Loxozus* Enderlein and *Nerius* Fabricius. The general organization of the chapters in this manuscript, aims to start from the more general and concrete knowledge, to finally treat the genera of which less information and/or number of species were available. With this aim, is presented a first chapter, which contains the general information about the treated genera. A dichotomous key to identification of the genera with a diagnosis and a list of species currently known to occur in Colombia is provided. Chapter 2 is a revision of *Eoneria*. The genus belongs to a small and basal group of Neriidae, the *Eoneria*-group, and before this work was known only from Argentina. In this chapter, we delimit the genus and review new characters and distributional information. We described previously unknown males of these species along with a new species from Colombia, a revised diagnosis for the genus and an identification key. Chapter 3 is a revision of *Glyphidops*, the most widespread neotropical genus. The revision includes redescriptions of the known species, descriptions of three new species, photographs and figures, comments on the type-material, synonyms and new records for Costa Rica, Colombia, Venezuela, Guiana, Ecuador and Brazil. Chapter 4 is an approach to *Cerantichir*, that comprises two species: *C. enderleini* Hennig and *C. peruana* (Hennig) and occurs in the neotropics from Guatemala to the midwestern Brazil. This genus is morphologically close to *Longina* (recently reviewed) for which is suggested a possible clade *Longina*+*Cerantichir*. Thus, to promote a critical

evaluation, the *Cerantichir* species were examined in detail. We propose a new diagnosis for the genus, redescribe the two known species, include new records, photographs and figures, along with an identification key. The monospecific genus *Loxozus* and chaotic *Nerius* are included in one last chapter. *Loxozus* was described from one known female from highlands in Colombia and no new material of the genus was found in the collections examined for this work, being the lack of material and the insufficient descriptions, the main obstacle for the improvement of its knowledge. We provide a redescription of *L.clavicornis* Enderlein, new diagnosis and figures. Aczél refers to *Nerius* as the most chaotic Neotropical genus, including a considerable number of insufficiently described species. The same author suggested several synonym names, appointing that certainly, many other *Nerius* species are rather problematic. Not all species of *Nerius* were considered in this work, because we found no material in the collections examined.

RESUMO GERAL

A família Neriidae compreende um pequeno grupo de moscas acaliptradas com 110 espécies descritas, que são facilmente reconhecidas devido a sua aparência característica: possuem as pernas bastante alongadas, antenas projetadas para frente com arista dorso-apical ou apical e fêmures, na face ventral, com cerdas em forma de espinho. Por anos, a classificação de Neriidae foi confusa e espécies foram descritas com base em caracteres instáveis, que levaram a um número elevado de sinonímias e questionar a validade de vários gêneros. Não existem estudos recentes (~50 anos) dessa família na Região Neotropical e o material tipo não tem sido revisado por nenhum dos autores na maioria das publicações conhecidas. Neste trabalho são descritas as informações obtidas a partir de visitas às mais importantes coleções entomológicas da Colômbia, bem como duas importantes coleções entomológicas do Brasil, uma da Argentina e uma dos Estados Unidos. Os resultados são apresentados em inglês, com o intuito de aumentar o acesso à informação nele contida e facilitar o processo de divulgação em revistas indexadas especializadas em taxonomia. Esta dissertação contém cinco capítulos, abrangendo os seis gêneros encontrados na Colômbia: *Cerantichir* Enderlein, *Eoneria* Aczél, *Glyphidops* Enderlein, *Longina* Wiedemann, *Loxozus* Enderlein e *Nerius* Fabricius. A organização geral dos capítulos deste manuscrito pretende partir do conhecimento mais geral e concreto, para finalmente tratar os gêneros com menos informação e/ou número de espécies disponíveis. Com este objetivo, é apresentado um primeiro capítulo, o qual contém a informação geral sobre os gêneros tratados. É fornecida uma chave dicotômica para identificação dos gêneros com uma diagnose e uma lista de espécies atualmente ocorrentes na Colômbia. O capítulo 2 é uma revisão de *Eoneria*. Este gênero faz parte de um pequeno grupo basal de Neriidae, o grupo-*Eoneria*, e antes deste trabalho, havia registro apenas para a Argentina. Nesse capítulo, o gênero é delimitado, novas características são acrescentadas à descrição e informações de distribuição geográfica são fornecidas. São descritos os machos previamente não conhecidos das espécies já descritas e uma nova espécie é descrita para a Colômbia, é apresentada uma revisão da diagnose para o gênero e uma chave de identificação. O capítulo 3 é uma revisão de *Glyphidops*, o gênero com as maiores áreas de distribuição das espécies na Região Neotropical. Esta revisão inclui redescrições das espécies conhecidas, fotografias e figuras, comentários sobre o material tipo, sinonímias e descrições de três novas espécies, e também novos registros para Costa Rica, Colômbia, Venezuela, Guiana, Equador e Brasil. O capítulo 4 aborda o gênero *Cerantichir*, que compreende duas espécies: *C. enderleini* Hennig e *C. peruana* (Hennig) e ocorre no

Neotrópico, da Guatemala ao Centro-Oeste do Brasil. Este gênero é morfologicamente semelhante a *Longina* (revisado recentemente), para os que é sugerido um possível clado *Longina*+*Cerantichir*. Deste modo, para promover uma avaliação crítica, as espécies de *Cerantichir* foram examinadas detalhadamente. Uma nova diagnose do gênero é proposta, duas espécies são redescritas e são adicionados novos registros de distribuição geográfica juntamente com uma chave de identificação para essas espécies. O gênero monoespecífico *Loxozus* e *Nerius*, são incluídos num único capítulo final. *Loxozus* foi descrito através de uma única fêmea dos planaltos da Colômbia e nenhum novo material do gênero foi encontrado nas coleções examinadas para este trabalho, sendo a falta de material e as insuficientes descrições os principais obstáculos para seu melhor conhecimento. Nesse capítulo são apresentadas a redescrição de *L.clavicornis* Enderlein, nova diagnose e figuras. Aczél refere-se a *Nerius* como o mais caótico gênero neotropical, com um alto número de espécies insuficientemente descritas. O mesmo autor sugeriu várias sinonímias, apontando que, possivelmente, muitas outras espécies de *Nerius* são problemáticas. Nem todas as espécies de *Nerius* foram consideradas neste trabalho, pois não foi encontrado material nas coleções examinadas.

INTRODUÇÃO GERAL

A América Latina contém 25% da cobertura florestal do planeta, no entanto, a aceleração da taxa de perda de floresta não tem precedentes. Da perda de mais de 400 milhões de hectares de floresta natural global nos últimos 30 anos, 40% ocorreu na América Latina. Com base no número de espécies de flora e fauna de vertebrados, Brasil e Colômbia apresentam a maior riqueza de espécies, com mais de 52.000 espécies. Em seguida, México, Venezuela, Equador, Peru, Bolívia e Costa Rica, com cerca de 12.000 a 28.000 espécies. Todos estes países são considerados como megadiversos de acordo com UNEP (2000). Colômbia é o segundo país com maior biodiversidade (genes espécies e ecossistemas), com uma extensão terrestre de 0,7% da superfície do planeta, abriga cerca de 10% da fauna e flora mundial e a metade dos páramos do planeta, que representam 1,7% do território nacional e fornecem água a 70% da população (Baptiste & Franco, 2009). Os inventários de espécies representam um passo fundamental para a caracterização das regiões naturais do país, ação que constitui a peça fundamental para elaborar as especializações cartográficas que permitirão no futuro, tomar melhores decisões com respeito ao uso dos recursos bióticos (Rangel, 2010).

A família Neriidae compreende um pequeno grupo de moscas acaliptradas com 110 espécies descritas em 19 gêneros, que são facilmente reconhecidos devido a sua aparência característica. Possuem as pernas bastante alongadas, antenas projetadas para frente com arista dorso-apical ou apical e fêmures, na face ventral, com cerdas em forma de espinho. As espécies nesta família são bastante diversas com relação ao tamanho, forma e cor do tegumento, especialmente algumas espécies orientais que podem ser bastante diferentes das espécies neotropicais (Aczél 1961).

São conhecidos poucos dados sobre biologia das espécies, mas a maioria delas desenvolvem-se em tecido vegetal em decomposição, alimentando-se de seiva, frutas podres e outras substâncias em decomposição (Mangan & Baldwin 1986; Buck 2011). Embora essas moscas sejam encontradas em todas as regiões biogeográficas, sua ocorrência é predominante nos trópicos e na Região Neotropical são conhecidos nove gêneros (Aczel 1961; Steyskal 1968, 1987). Buck & Marshall (2004), publicaram a revisão de *Longina* Wiedemann e a exceção deste trabalho, não são conhecidos estudos recentes (~50 anos) da família na Região Neotropical, exceto uma revisão de *Longina* Wiedemann por Buck & Marshall (2004), em que os autores sugerem, que alguns gêneros precisam ser revisados e um grande número de espécies ainda precisam ser descritas. Desta forma, este trabalho configura o primeiro estudo de taxonomia de Neriidae da Colômbia.

As informações obtidas a partir de visitas às mais importantes coleções entomológicas da Colômbia, bem como duas importantes coleções entomológicas do Brasil, uma da Argentina e uma dos Estados Unidos são descritas. Os resultados são apresentados em quatro capítulos, abrangendo os seis gêneros encontrados na Colômbia: *Cerantichir* Enderlein, *Eoneria* Aczél, *Glyphidops* Enderlein, *Longina* Wiedemann, *Loxozus* Enderlein e *Nerius* Fabricius.

O capítulo 1 contém as informações gerais sobre os gêneros tratados. Foram encontradas 19 espécies para 51 localidades abrangendo todo o país e é fornecida uma chave dicotômica para identificação das espécies do gênero com diagnose e uma lista das espécies atualmente registradas para a Colômbia.

No capítulo 2 é realizada uma revisão de *Eoneria*. Este gênero faz parte de um pequeno grupo basal de Neriidae, *Eoneria*-group (Aczél 1961), que possui a base das antenas fosca, não brilhante ou com brilho discreto, conhecidos para a Região Neotropical e que, até este trabalho, havia registro apenas para a Argentina. Embora a biologia desse gênero seja pouco conhecida, dados de coleta sugerem que suas espécies ocorrem em baixas latitudes e em ambiente áridos (Aczél 1949, 1951, 1961; Steyskal 1965, 1968). Neste capítulo, *Eoneria* Enderlein é delimitado, novas características são acrescentadas à descrição do gênero e informações de distribuição geográfica são fornecidas. São descritos os machos previamente não conhecidos das espécies já descritas e uma nova espécie é descrita para a Colômbia. É apresentada uma diagnose revisada para o gênero e uma chave de identificação para suas espécies.

No capítulo 3 é realizada uma revisão de *Glyphidops*, o gênero com as maiores áreas de distribuição de espécies na Região Neotropical. Este gênero foi descrito por Enderlein (1922) e revisado por Hennig (1937) e Aczél (1961), que incluiu o gênero *Oncopsia* Enderlein como subgênero de *Glyphidops*, diferindo-os pela coloração da arista e pela presença ou não de pubescência. Este é o estudo mais completo dos Neriidae da Região Neotropical, publicado há mais de 50 anos. Neste capítulo, 16 das 18 espécies apontadas por Aczél (ainda consideradas como pertencentes ao gênero) foram revisadas.

São descritas as espécies *Glyphidops* sp. 1, **espécie nova**, *Glyphidops* sp. 2, **espécie nova** e *Glyphidops* sp. 3 **espécie nova**, redescritas as espécies válidas e propostas as seguintes sinonímias: *G. peruanus* Enderlein com *G. bullatus* Enderlein; *G. dubia* Hennig, com *G. dispar* Cresson e *G. seductrix* Hennig, com *G. flavifrons* Bigot. São fornecidos uma nova diagnose para o gênero, chave de identificação para suas espécies e informação de novos registros para Costa Rica, Colômbia, Venezuela, Guiana, Equador e Brasil.

O capítulo 4 é uma redescrição de *Cerantichir*, que compreende duas espécies: *C. enderleini* Hennig e *C. peruana* (Hennig) e ocorre na região Neotropical, da Guatemala ao Centro-Oeste do Brasil. Recentemente, Buck (2011) transferiu *Odontoloxozus peruanus* Hennig para *Cerantichir*, mas a diagnose do gênero não inclui (ou descreve) as espécies recém-transferidas, que apresentam características que podem ser facilmente confundidas com espécies de *Longina*. Além disso, Buck & Marshall (2004) enfatizaram que as similaridades compartilhadas por esses gêneros podem sugerir um possível clado único *Longina+Cerantichir*, e Buck (2011) questionou a validade de alguns gêneros neotropicais de Neriidae e sugeriu que os gêneros precisam ser criteriosamente avaliados.

Buck & Marshall (2004) revisaram o gênero *Longina*, descreveram duas novas espécies do Equador e da Colômbia e forneceram uma lista sinonímica para *L. abdominalis* Wiedemann, novas diagnoses e figuras. Neste capítulo, o gênero não é discutido porque a revisão já mencionada é considerada suficientemente clara e completa. Deste modo, para promover esta avaliação, as espécies de *Cerantichir* foram examinadas detalhadamente. Uma nova diagnose do gênero é proposta, duas espécies são redescritas e são adicionados novos registros de distribuição geográfica juntamente com uma chave de identificação para essas espécies.

O capítulo 5 inclui os gêneros *Loxozus* e *Nerius*. Estes foram abordados com base no material disponível nas coleções com o objetivo de incrementar o conhecimento da família, que leve a uma proposta de posicionamento taxonômico para as espécies.

O gênero monoespecífico *Loxozus* foi descrito através de uma única fêmea de *L. clavicornis* Enderlein dos planaltos da Colômbia, que difere-se das outras espécies da família principalmente pela base antenal ligeiramente inchada. Nenhum novo material do gênero foi encontrado nas coleções examinadas para este trabalho. Neste capítulo a redescrição de *L. clavicornis* Enderlein e uma nova diagnose do gênero são apresentadas.

Aczél (1961) refere-se a *Nerius* como o mais caótico gênero neotropical, considerando o alto número de espécies insuficientemente descritas. Este autor sugeriu várias sinonímias, apontando que, possivelmente, muitas outras espécies de *Nerius* são taxonomicamente problemáticas. Nem todas as espécies de *Nerius* foram consideradas, já que não foi encontrado material nas coleções examinadas. No final deste trabalho, como apêndice, são apresentadas as instruções para os autores de cada uma das revistas em que os artigos foram ou serão submetidos, que são os padrões em que os capítulos são apresentados neste manuscrito, com a especificação da revista escolhida na primeira página.

Este trabalho busca esclarecer a taxonomia desse pequeno grupo de moscas, com descrições de novas espécies, redescritões das espécies pobremente conhecidas, novas diagnoses e chaves de identificação para gêneros e espécies, com ênfase nas espécies ocorrentes na Colômbia, baseando-se em informações extraídas de algumas grandes coleções entomológicas da América, com o objetivo de ajudar a esclarecer o posicionamento taxonômico das espécies.

MORFOLOGIA

Neriidae neotropicais, com exceção de *Eoneria aczeli* Sepúlveda & Carvalho e *Glyphidops pluricellatus* (Schiner), são moscas de médio a grande porte, de coloração geralmente castanha a castanho-escura e preto, fosco e, algumas vezes, o tegumento apresenta áreas com coloração amarelada a alaranjada. Algumas espécies são mais claras, tais como *E. aczeli*, *G. flavifrons* (Bigot) e *G. limbatus* (Enderlein). As cerdas são geralmente reduzidas em número e tamanho, mas podem ser longas (como em *Eoneria* Aczél) ou curtas e fortes inseridas em tubérculos cônicos (*G. bullatus* (Enderlein) e *Longina anguliceps* Buck & Marshall). A asa tem coloração castanha, exceto *G. pluricellatus*, que apresenta numerosas veias transversais e pontos mais escuros, geralmente associados a essas veias transversais e *Longina anguliceps*, que apresenta coloração castanha escura no ápice da asa.

Cabeça (Figs. 1, 2). Geralmente mais longa que alta, com área occipital variável em tamanho e forma, mas sempre bem desenvolvida. Fronte côncava entre os olhos. Base antenal polida e brilhante na maioria dos gêneros, exceto em *Eoneria*, *Eoloxozus*, *Antillonerius* e *Nerius czerny* Aczél, nos quais a base é tomentosa. As cerdas são geralmente curtas; cerdas pós-ocelares ligeiramente convergentes a cruzadas, se são suficientemente longas; cerda genal geralmente curta; vibrissa presente (*Eoneria*, *Eoloxozus*, *Longina* e *Nerius*) ou ausente (*Glyphidops*, *Antillonerius*, *Loxozus*, *Odontoloxozus* e *Cerantichir*). Antena projetada para a frente, com comprimento médio a alongado; pedicelo no mínimo ligeiramente achatado lateralmente, com uma projeção alongada ou triangular na margem interior; flagelômero de forma variável, mas sempre tão ou mais longo que o pedicelo (exceto em *Cerantichir* e *Loxozus*); arista apical a dorso-apical, nua ou pubescente.

Tórax (Figs. 3, 4). Relativamente alongado e parcialmente pruinoso; com cerdas curtas e delgadas, exceto em *Eoneria*; com um par de cerdas dorso-centrais em quase todas as espécies neotropicais, exceto em *Eoneria* e *Eoloxozus*, que apresentam seis pares. Escutelo brilhante a pruinoso e geralmente com uma vita mediana longitudinal amarelada. A maioria das espécies neotropicais possui uma cerda catepisternal, exceto *Longina*, *Cerantichir* e alguns *Glyphidops*, que podem apresentá-la reduzida, delgada, inconspícua ou completamente ausente (principalmente nas fêmeas). Asa (Fig. 5) alongada e estreita, mas sempre mais curta que o corpo; geralmente escurecida na margem anterior e apical; calíptra superior maior que a inferior. Pernas alongadas, delgadas e pelo menos o fêmur anterior apresenta fortes cerdas antero-ventrais em forma de espinhos; coxa anterior sempre alongada.

Abdômen (Figs. 6, 7) alongado; tergitos revestidos por pequenas cerdas e com margem lateral gradualmente mais clara a quase amarela; tergito 6 do macho estreito e mais longo que os demais; esternitos reduzidos, em forma de estreitas barras longitudinais. Genitália do macho consistentemente uniforme, inclusive entre os gêneros. Uma completa caracterização da genitália do macho de Neriidae pode ser encontrada em Steyskal (1987). Fêmea com tergito e esternito 7 fusionados lateralmente, formando um ovipositor conspícuo.

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FIGURAS

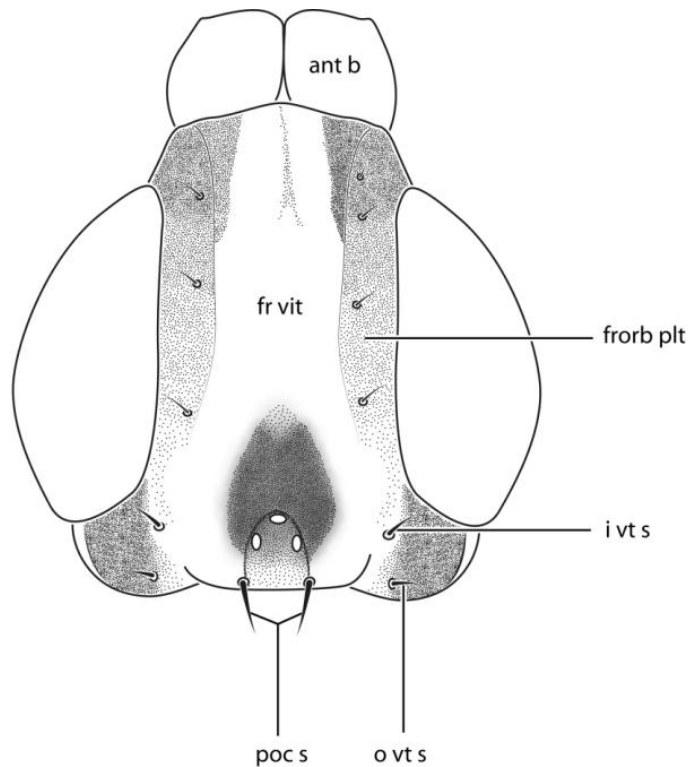


Figura 1. *Glyphidops filusus* Fabricius. Cabeça, vista dorsal. Legenda: **ant b**, base antenal (pba, base projetada da antena); **frorb plt**, placa fronto-orbital (gv, placa genovertical); **fr vit**, vita frontal (**fs**, linha frontal); **i vt s**, cerda vertical interior (vti, cerda vertical interior); **o vt s**, cerda vertical exterior (vte, cerda vertical exterior); **poc s**, cerda pós-ocelar (pvt, cerda paraverticial).

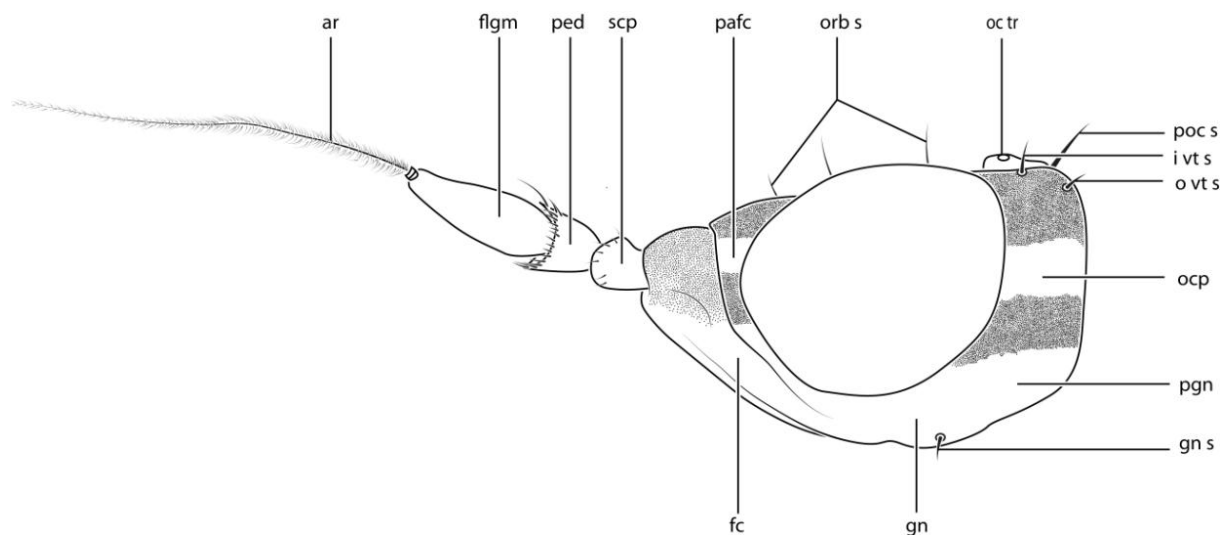


Figura 2. *Glyphidops filusus* Fabricius. Cabeça, vista lateral. Legenda: **ar**, arista; **fc**, face; **flgm**, flagelômero (pp, postpedicel); **gn**, gena; **gn s**, cerda genal; **ivt s**, cerda vertical interior; **oc tbr**, tubérculo ocelar; **ocp**, occipício (cer, placacerebral); **orb s**, cerda orbital (orsa, cerda orbital anterior; orss, cerda orbital superior); **o vt s**, cerda vertical exterior; **pafc**, parafacial; **ped**, pedicelo; **pgn**, pós-gena; **poc s**, cerda pós-ocelar; **scp**, escapo.

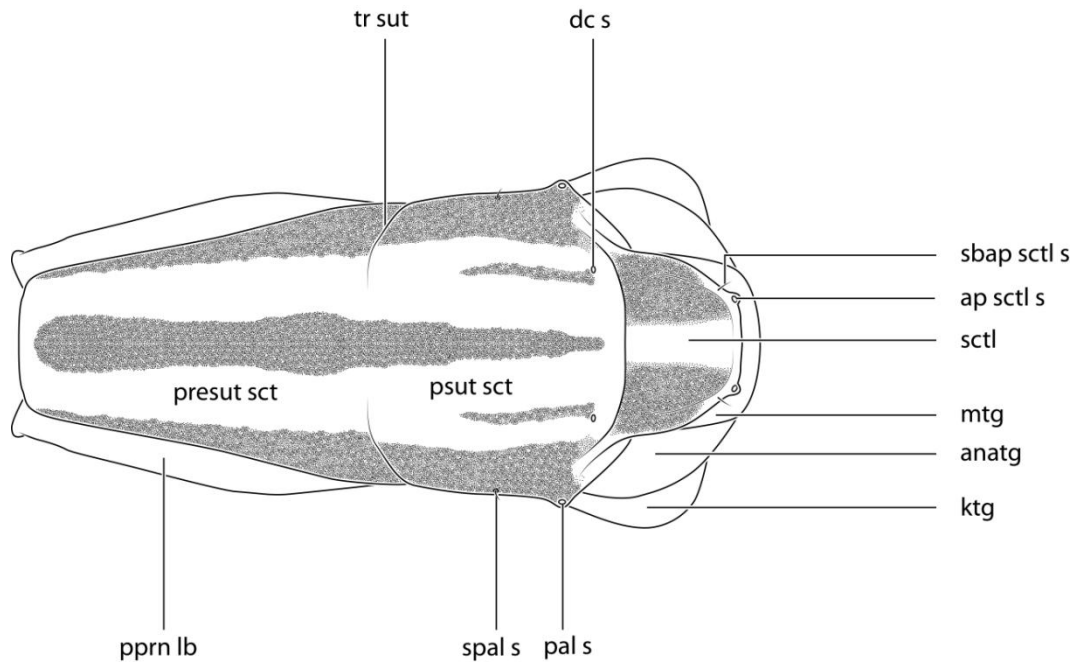


Figura 3. *Nerijs czernyi* Aczél. Torax, vista dorsal. Legenda: **anatg**, anatergito (pleurotergito superior); **ap sctl s**, cerda escutelar apical; **dc s**, cerda dorso-central; **ktg**, catatergito (pleurotergito inferior); **mtg**, tergito médio (metanotum); **pal s**, cerda pós-alar; **pptn lb**, lobo pós-pronotal (calohumeral); **presut sct**, escuto pré-sutural (mesoscutum); **psut sct**, escuto pós-sutural; **sap sctl s**, cerda escutelar subapical; **sctl**, escutelo; **spal s**, cerda supra-alar; **tr sut**, sutura transversal.

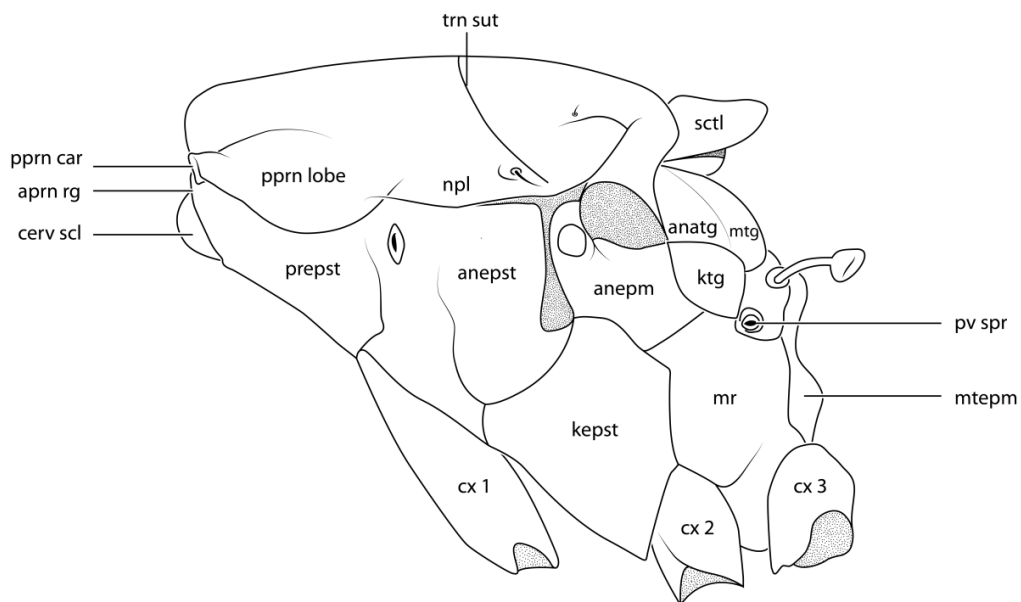


Figura 4. *Nerijs czernyi* Aczél. Tórax, vista lateral. Legenda: **anatg**, anatergito; **aprn rg**, aneu antepronotal; **anepm**, anepimeron (pteropleuron); **anepst**, anepisterno; **cerv scl**, esclerito cervical (cervical lateral); **cx**, coxa; **kepst**, katepisterno (esternopleuron); **ktg**, katatergito; **mr**, meron (meropleurito; hypopleuron, part), observação: usualmente fusionado ao metepisterno; **mtepm**, metepímero; **mtg**, mediotergito; **npl**, notopleuron; **pprn car**, carena postpronotal (carena humeral); **pprn lb**, lobopós-pronotal; **prepst**, proepisterno; **p spr**, espiráculo posterior; **sctl**, escutelo; **trn sut**, sutura transversal.

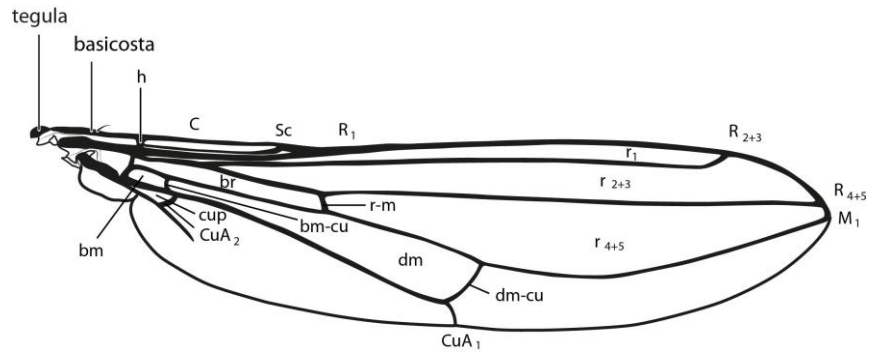


Figura 5. *Nerius czernyi* Aczél. Asa.

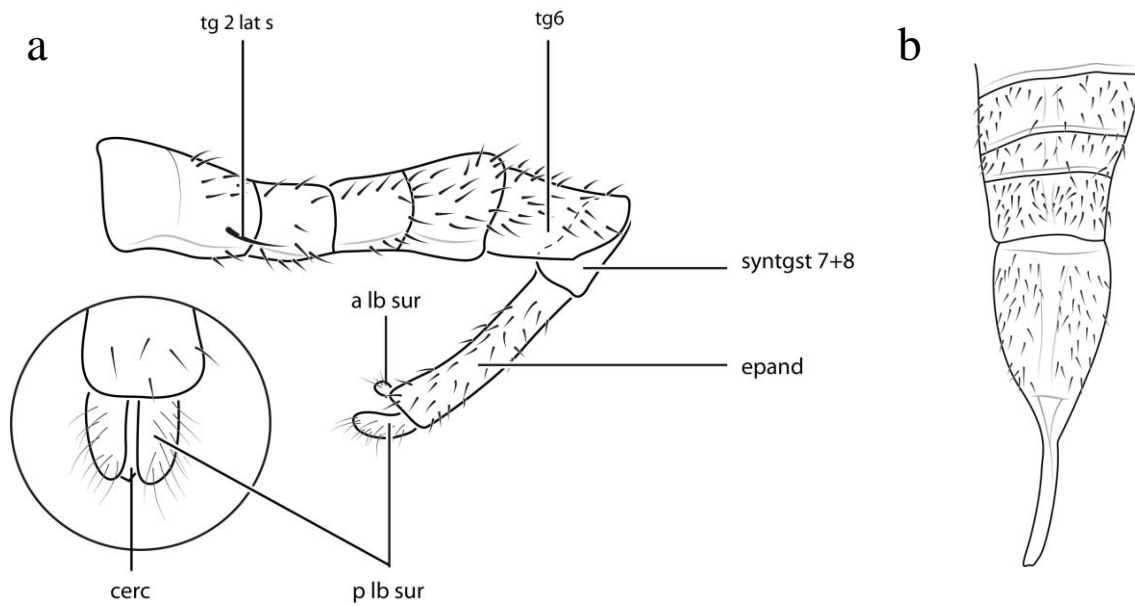


Figure 6. *Eoneria aczeli* Sepúlveda & Carvalho. Genitalia externa. **a)** Macho, vista lateral (zoom no ápice do epândrio, vista dorsal). **b)** Fêmea, vista dorsal. Legenda: **tg 2 lat s**, cerda lateral do tergito 2; **tg 6**, tergito 6; **syn 7+8**, syntergostre 7+8; **epand**, epândrio; **a lb sur**, lobo anterior dos surstyli; **p lb sur**, lobo posterior dos surstyli; **cerc**, cercos.

CHAPTER 1

PICTORICAL KEY AND DIAGNOSIS OF THE COLOMBIAN GENERA OF NERIIDAE
(DIPTERA)

Journal chosen for submission: ZOOKEYS

In preparation

Pictorial key and diagnosis of the Colombian genera of Neriidae (Diptera)

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Abstract

Here we present a dichotomous illustrated key to identify the genera of Neriidae found in Colombia. Six genera, *Eoneria* Aczél, *Longina* Wiedemann, *Cerantichir* Hennig, *Nerius* Fabricius, *Glyphidops* Enderlein and *Loxozus* Enderlein, are included with pictures of the principal characteristics, along with a list of Colombian species and a diagnosis based on adult morphology.

Key words

Cactus flies, natural parks of Colombia, neotropical fauna, taxonomy.

Resumen

Presentamos una clave dicotómica ilustrada para identificar los géneros de Neriidae que se encuentran en Colombia. Seis géneros, *Eoneria* Aczél, *Longina* Wiedemann, *Cerantichir* Hennig, *Nerius* Fabricius, *Glyphidops* Enderlein y *Loxozus* Enderlein, fueron incluidos, con fotografías de las principales características, junto con una lista de especies y diagnósis basadas en morfología de los adultos.

Palabras clave

Fauna neotropical, moscas del cactus, Parques naturales de Colombia, taxonomía.

Introduction

The family Neriidae comprises a small group of acaliptrate flies that are easily identified due to their characteristic appearance. They have rather long legs, porrect antennae with dorsoapical or apical arista and ventral femora spine-like setae. Species in this family are very diverse in size, form and color, especially some Oriental species, may be very different from Neotropical species (Aczél 1951, 1961).

Of the species of Neriidae whose biology is known, they develop in decaying plant tissue and feed on sap, rotten fruit and other decaying material (Mangan and Baldwin 1986, Buck 2011). Despite its poorly known biology, this family is very important in studies of sexual selection and phenotypic plasticity in Australia (Bath et. al. 2012; Adler and Bonduriansky 2012), where only two species are known (*Telostylinus angusticollis* Enderlein and *T. lineolatus* Wiedemann (Pitkin 1989; Bath et. al. 2012). Nine genera are known to occur in the neotropics, with four previously reported from Colombia with 8 species (Aczel 1961; Steyskal 1968). Indeed, here we provide the first study of taxonomy of the Neriidae from Colombia.

Buck & Marshall (2004), published a review of *Longina* Wiedemann and with exception of that work, there are no recent studies (~50 years) of this family in the neotropics and consequently some genera need revision and many species have not yet been described (Buck & Marshall 2004; Buck 2011). Here we describe the information gathered from visits to the most important entomological collections in Colombia as well as two important entomological collections in Brazil and one in the United States. We found 19 species in six genera from 51 localities spanning the entire country (all natural regions). Here we provide a dichotomous key for the six genera of Neriidae with a diagnosis and a list of species currently known to occur in Colombia.

Material and Methods

For preparation of the key, we analyzed specimens deposited in the most important Colombian entomological collections and international collections as follows: IAvH- Instituto Alexander von Humboldt, Villa de Leyva, CEUA- Colección Entomologica de la Universidad de Antioquia, Medellín, DZUP- Coleção Entomológica Padre Jesus Santiago Moure, Universidade Federal doParaná, Brazil, MZUSP- Museu de Zoologia Universidade de São Paulo, Brazil, USNM- National Museum of Natural History, United States, ZMHB- Museum für Naturkunde, Humboldt-Universität, Germany and SMT-Staaliches Museum für Tierkunde, Germany.

Genera were identified following Aczél (1961) and Buck (2011), terminology is based on Cumming and Wood (2009) and distribution of the genera is based on Steyskal (1968). Specimens were examined using Zeiss Stemi DV4 stereoscopic microscope. Photographs were coupled with the Auto-Montage Imaging System®. Drawings and photos were edited using Adobe Illustrator CS5.1 and Adobe Photoshop CS5.

Results

We identified 19 species of Neriidae for Colombia in six genera (Table I).

Pictorial key to Colombian genera (modified from Buck, 2011)

- 1 Presutural scutum and anteprenotal ring distinctly anterior to postpronotal carina (Fig. 1). Wing partially covered by microtrichia; basally has bare areas (extending beyond level of r-m in cells r_1 , r_{2+3} and r_{4+5}) (Fig. 2) ... **2**
- Presutural scutum anteriorly ending at level of postpronotal carina (Fig. 3). Wing completely covered by microtrichia (Fig. 4) ... **3**
- 2 Post-cranium shiny, narrowing posteriorly (longer than high, Fig. 5). Scape length less than twice the length of its diameter in dorsal view (Fig. 6) ... ***Cerantichir***
- Post-cranium velvet, at most subshiny; wide posteriorly (higher than long, Fig. 7). Scape length twice or more as long as its diameter in dorsal view (Fig. 8) ... ***Longina***
- 3 Six pairs of dorsocentral setae (Fig. 9). Tergite 2 with one lateral seta and two conspicuous setae on posterior margin. (Fig. 10) ... ***Eoneria***
- One pair of dorsocentral setae (Fig. 11). Tergite 2 without lateral seta and two or more conspicuous setae on posterior margin (Fig. 12) ... **4**
- 4 Antennae at base separated by more than twice the diameter of the scape (Fig. 13). Wing vein dm-cu oblique, almost parallel to wing hind margin (Fig. 14) ... ***Loxozus***
- Antenna approximated, separated by less than diameter of the scape at base (Fig. 15). Wing vein dm-cu not oblique, diverging from wing hind margin (Fig. 16) ... **5**
- 5 Prosternum narrow, separated from the proepisternum by membranous area (Fig. 17). Apicomedian process of pedicel with narrow base and pointed apex (Fig. 18) ... ***Glyphidops***
- Prosternum wide, united with proepisternal plate having no membranous area between them (Fig. 19). Apicomedian process of pedicel with wide base and triangular body (Fig. 20) ... ***Nerius***

Diagnosis of the genera

Cerantichir Enderlein

Figures 5–6

Cerantichir Enderlein 1922: 155. Type species: *Nerius flavifrons* Bigot, 1886 (misidentification, original designation). Type-locality: Costa Rica.

Diagnosis. Occiput shiny elongate and as long as high. Postgena shiny and relatively narrow and either bare or with a few several black setulae. Pedicel laterally flattened, scape less than half of pedicel length; arista densely white pilose. Orbital plate shiny wide. Vibrissa absent. Ocellar tubercle large, raised and blackish velvet. Thorax elongate, with mesoscutum and anteprenotal ring distinctly anterior to postpronotal carina. Anterior margin of prosternum wide and truncated. One pair of dorsocentral setae. Mesoscutum with one pair of apical setae on anterior margin. Wing partially covered by microtrichia; basally has small bare areas (extending beyond level of r-m in cells r1, r2+3 and r4+5). Scutellum with one pair of stout apical setae and two weaker subapical setae. Epandrium extends forward to level of anterior margin (at most) of tergite 4.

Distribution. Guatemala, Costa Rica, Colombia, Brasil, Perú, Bolivia.

Species for Colombia: *C. peruana* (Hennig) [Putumayo: PNN. La Paya].

Eoneria Aczél

Figures 3–4, 9–10

Eoneria Aczél 1951: 570. Type-species: *Eoneria blanchardi* Aczél, 1951 (original designation). Type-locality: Argentina, Corrientes.

Diagnosis. Anterior margin of frons straight. Behind the ocellar tubercle is a small protuberance between the postocellar setae. Body setae longer than those in the other species of neotropical Neriidae and not spine-like. Head moderately elongate, twice as long as antennae. Fronto-orbital plate with three pairs of fronto-orbital setae. Antennal base longer than wide; clothed with a dense yellow dusting and consequently only subshiny. Inner process of pedicel elongate, triangular, reaching the proximal half of the first flagellomere. First flagellomere testaceous in color, covered with tiny white pilosity; posterior margin ovate. Arista brown and micropilose on the dorso-apical margin of the first flagellomere. Postocellar setae large and convergent. Vibrissa present. Thorax with one dorsal gray vitta equal in width

with scutellum, separated by a narrow, median, yellowish brown stripe; pleuron covered with gray pruinescence. Six pairs of dorsocentral setae, variable in size. Scutellum with one pair of apical scutellar setae and one pair of weak subapical setae. Mid and hind coxae with two lateral setae. Basal portion of the costa with one dorsal seta and one ventral seta. Tergite 2 with one lateral seta, subequal to anterior notopleural setae and two conspicuous setae on posterior margin.

Distribution. Colombia, Argentina.

Species for Colombia: *E. aczeli* Sepúlveda & Carvalho [Magdalena: PNN. Tayrona; Atlántico: Barranquilla].

Glyphidops Enderlein

Figures 11–12, 15–18

Glyphidops Enderlein, 1922: 150. Type species: *Nerius filosus* Fabricius, 1805 (original designation). Type-locality: Ecuador, Arquidonia.

Diagnosis. Three pairs of well-developed fronto-orbital setae. Posterior margin of head in dorsal view, with two small to medium pruinescent protuberances between postocellar and outer vertical setae. Vibrissa absent. Occiput velvet. Antennal base shiny. Pedicel laterally flattened; inner process of pedicel finger-like and relatively narrow. One pair of dorsocentral setae. Pleuron rather dull. Anterior notopleural seta absent. Postprototal lobe yellow with one ventral brown stripe; postpronotal carina projected, but not ending prior to the level of antepronotal ring. Proepisternum yellow anteriorly. Prosternum separated from the proepisternal plate by a wide membranous area. Fore coxa yellow with one anteroapical seta. Tibiae same color or paler than femora, with dark apex. Wing microtrichose, with cross-vein dm-cu not oblique.

Distribution. Mexico, Guatemala, Honduras to Surinam and South to Bolivia, Brazil and Argentina.

Species for Colombia: *G. bullatus* (Enderlein) [Risaralda: SFF Otún Quimbaya; Huila: PNN Cueva de Los Guacharos; Nariño: RN La Planada].

G. carrerai Aczél [Antioquia: Girardota; Amazonas: PNN Amacayacu].

G. dispar (Cresson) [Risaralda: SFF Otún Quimbaya; Huila: PNN Cueva de Los Guacharos; Valle del Cauca: PNN Farallones de Cali; Valle del Cauca: Ginebra; Cauca: PNN Gorgona].

G. durus (Cresson) [Antioquia: Nariño, San Luis; Chocó: PNN Los Katíos].

G. filusus (Fabricius) [Antioquia: SantaBarbara, La Pintada, Jericó; Meta: PNN La Macarena; Vaupés: Estacion Biologica Moshiro-Itajura (Caparú)].

G. flavifrons (Bigot) [Antioquia: Carepa, La Pintada, Maceo, San Luis, Nariño, Santa Bárbara; Caldas: Norcasia; Chocó: Nuquí; Putumayo: PNN La Paya; Amazonas: PNN. Amacayacu].

G. neuter (Hennig) [Chocó: PNN Los Katíos; Putumayo: PNN La Paya; Vaupés: Estación Biológica Mosiro-Itajura (Caparú); Amazonas: PNN Amacayacu].

G. pluricellatus (Schiner) [Antioquia: Carepa, la Pintada, San Luis, Anorí, Jericó; Chocó: Jobi, PNN Los Katios].

***Longina* Wiedemann**

Figures 1–2, 7–8

Longina Wiedemann, 1830: 554. Type species: *Longina abdominalis* Wiedemann, 1830 (by monotypy). Type-locality: Brazil.

Diagnosis. Frontal vitta dark brown, projected anteriorly between antennal bases. Fronto-orbital plate brown pruinose and narrower anteriorly. Vibrissa present and strong, except in females of *L. anguliceps*. Scape length at least twice width. Postgena narrowing posteriorly. Occiput inflated, with several strong black setulae in the posterior margin of head. Arista densely white pubescent always on anterior half. Mesoscutum with one pair of apical setae on anterior margin. Anterior notopleural seta present and hair-like. One pair of dorsocentral setae. Fore femur with anteroventral and posteroventral rows of small spine-like setae, all same size. Wing partially covered by microtrichia; basally has large bare areas (extending beyond level of r-m in cells r_1 , r_{2+3} and r_{4+5}); cross-vein dm-cu not oblique. Scutellum with widely rounded margins.

Distribution. Colombia, Ecuador, Brazil, Paraguay, Argentina.

Species in Colombia: *L. anguliceps* Buck & Marshall [Boyacá: SFF Iguaqué; Santander: Pie de Cuesta; Risaralda: SFF Otún Quimbaya; Huila: PNN Cueva de Los Guacharos; Norte de Santander: Cucutilla; Quindío: Finlandia].

L. semialba Buck & Marshall [Nariño: RN La Planada; Huila: PNN Cueva de Los Guacharos; Quindío: SFF Otún Quimbaya].

Loxozus Enderlein

Figures 13–14

Loxozus Enderlein 1922: 156. Type-species: *Loxozus clavicornis* Enderlein, 1922 (original designation). Type-locality: Colombia, Cordilleras, “template lands”.

Diagnosis. Frontal vitta yellowish brown pruinescent, projected anteriorly between antennal bases; with one “U” shaped yellow line that separates from the fronto-orbital plate. Face yellow, very wide and rounded. Vibrissa black, strong and spine-like. Postgena subshiny, narrowing posteriorly and separated from occiput by a bend, giving rise to the shiny brown vitta behind the eye; with two long and weak pale brown setulae at posteroventral margin of head. Antennal base shiny brown with interior margin yellow, barely inflated and completely separated by the projection of the frons. Antennae elongate, same length of head; separated by more than twice the width of scape at base. Scape yellowish brown pruinescent; length twice the maximum width. Pedicel length more than thrice its maximum width and slightly less than twice scape length; inner process of pedicel reaching the proximal fourth of first flagellomere. First flagellomere length thrice its width. Arista white pubescent with tiny basal segments brown. Prosternum narrow in front of the fore coxa and widening anteriorly to join the proepisternal plate in distal half. Mid coxa with three lateral setae. Cross-vein dm-cu oblique.

Distribution. Colombia.

Species for Colombia: *L. clavicornis* Enderlein, 1922 [Colombian Andes].

Nerius Fabricius

Figures 19–20

Nerius Fabricius, 1805: 264. Type-species: *Nerius pilifer* Fabricius (subsequent designation by Coquillett, 1910: 575). Type-locality: “South America”.

Diagnosis. Fronto-orbital plate black narrow; with white pruinescence; three pairs of orbital setae. Ocellar tubercle black velvet and not raised or surrounded by furrows. Postgena with one patch of white and weak setulae. Occiput wide, brown to black, velvet or shiny. Antennal base polished brown to black and shiny, except *N. czernyi*, with a rather subshiny antennal base, covered by slight yellow pruinescence. Antenna not elongate, near half the length of the head. Inner process of pedicel reaching the basal third of first flagellomere; triangular and wide on base. First flagellomere wide with widely rounded apex; arista brown and bare. Prosternum very wide, hastate; joining to proepisternal plate at the height of the anterior

margin of fore coxa. Postpronotal carina shiny protuberant. Legs brown to blackish brown. Fore coxa with two strong antero-apical spine-like setae. Basicosta with a conspicuous dorsal seta. Cross-vein dm-cu curved and not oblique. Male terminalia relatively long and slender; when folded, extends to level of posterior margin of tergite 2.

Distribution. Mexico, Dominican Republic, El Salvador, Costa Rica, Panama, Bolivia, Colombia, Venezuela, Trinidad, Guyana, Surinam, Brazil, Ecuador, Peru, Paraguay, Argentina.

Species for Colombia: *N. plurivittatus* Bigot [Meta: Villavicencio, Rio Oca; Antioquia: Alejandría, Betulia, Carepa, La Pintada, Maceo, Nariño, San Luis, San Roque; Chocó: Nuquí; Caldas: Norcasia, La Victoria; Santander: Carmen de Chucurí].

N. pilifer Fabricius [La Guajira: Corregimiento El Abra; Atlántico: Barranquilla; Magdalena: Santa Marta; Bolivar: El Arenal; Sucre: San Onofre; Antioquia: Jericó, La Pintada, Medellín, Nariño; Santander, Campamento, San Luis; Caldas: Norcasia; Santander: Cimitarra].

Table 1. The genera and species of Neriidae in Colombia.

| Genus | Species | Author |
|--------------------|----------------------|-----------------------|
| <i>Cerantichir</i> | <i>peruana</i> | (Hennig, 1937) |
| <i>Eoneria</i> | <i>aczeli</i> | Sepúlveda & Carvalho |
| <i>Glyphidops</i> | <i>bullatus</i> | (Enderlein, 1922) |
| | <i>carrerae</i> | Aczél, 1961 |
| | <i>dispar</i> | (Cresson, 1926) |
| | <i>durus</i> | (Cresson, 1926) |
| | <i>filosus</i> | (Fabricius, 1805) |
| | <i>flavifrons</i> | (Bigot, 1886) |
| | <i>neuter</i> | Hennig, 1937 |
| | <i>pluricellatus</i> | (Schiner, 1868) |
| | new species 1 | To be described |
| | new species 2 | To be described |
| new species 3 | To be described | |
| <i>Longina</i> | <i>anguliceps</i> | Buck & Marshall, 2004 |
| | <i>semialba</i> | Buck & Marshall, 2004 |
| <i>Loxozus</i> | <i>clavicornis</i> | Enderlein, 1922 |
| <i>Nerius</i> | <i>pilifer</i> | Fabricius, 1805 |
| | <i>plurivittatus</i> | Bigot, 1886 |
| | <i>purpusianus</i> | Aczél, 1961 |

Acknowledgments

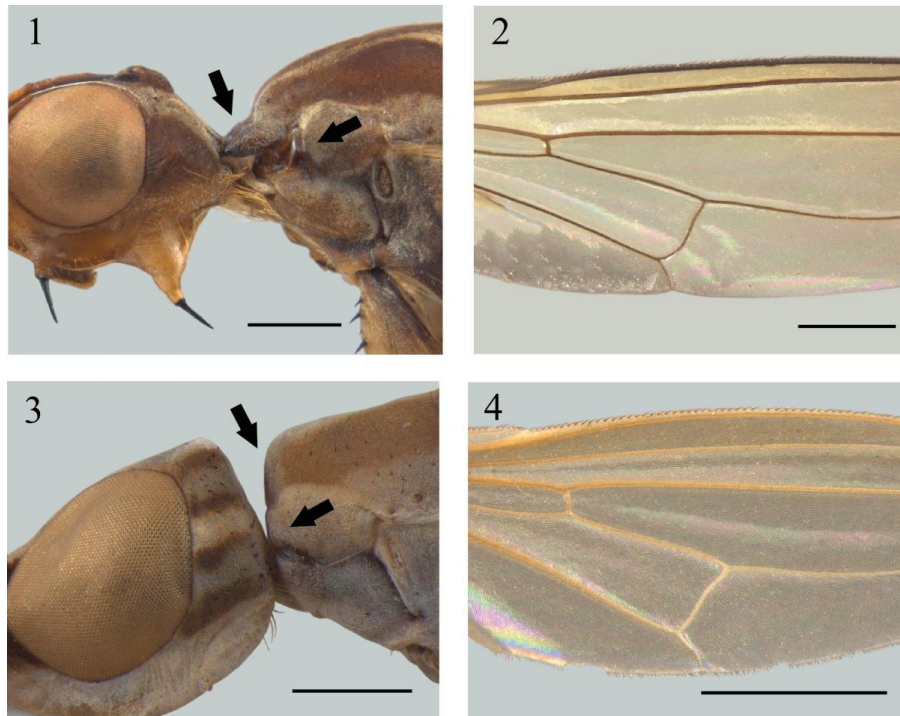
We thank the curators of the collections, Dra. Claudia Alejandra Medina Uribe (IAvH), Dr. Carlos Einicker Lamas (MZUSP) and Dr. Allen L. Norrbom (USNM) by the loan of the specimens. Special thanks to Joachim Ziegler of the Museum für Naturkunde, Humboldt-Universität, Berlin, Germany for sending us the holotype of *L. clavicornis*. We also thank to Rede Paranaense de Coleções Biológicas (TAXonline) for the photographs and the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the research grant (TAS proc. 130370/2011-8; CJBC proc. 304713/2011-2). Also thanks James Roper for the English revision.

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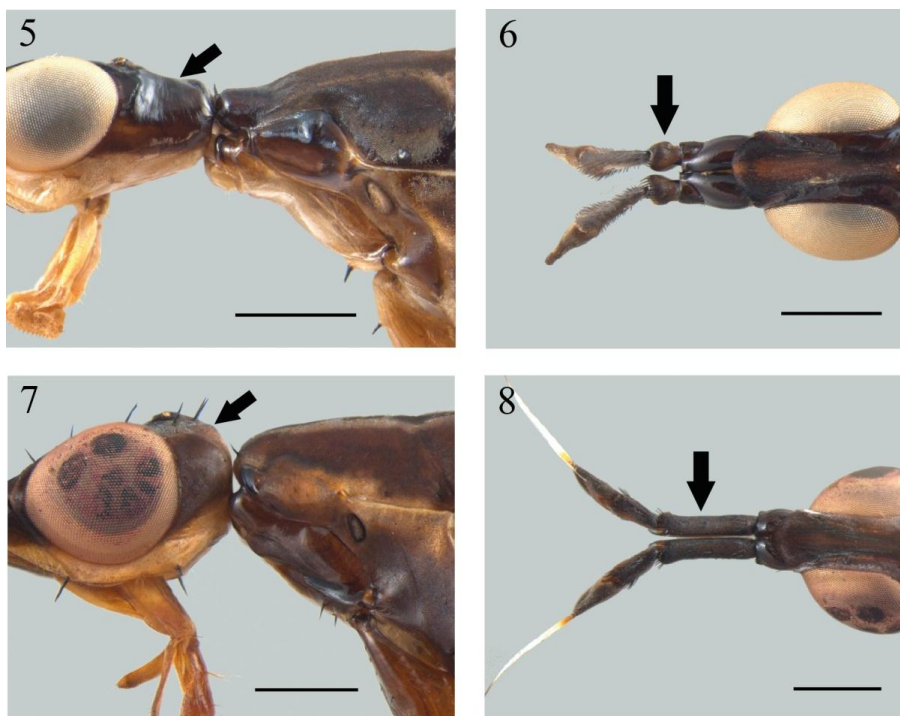
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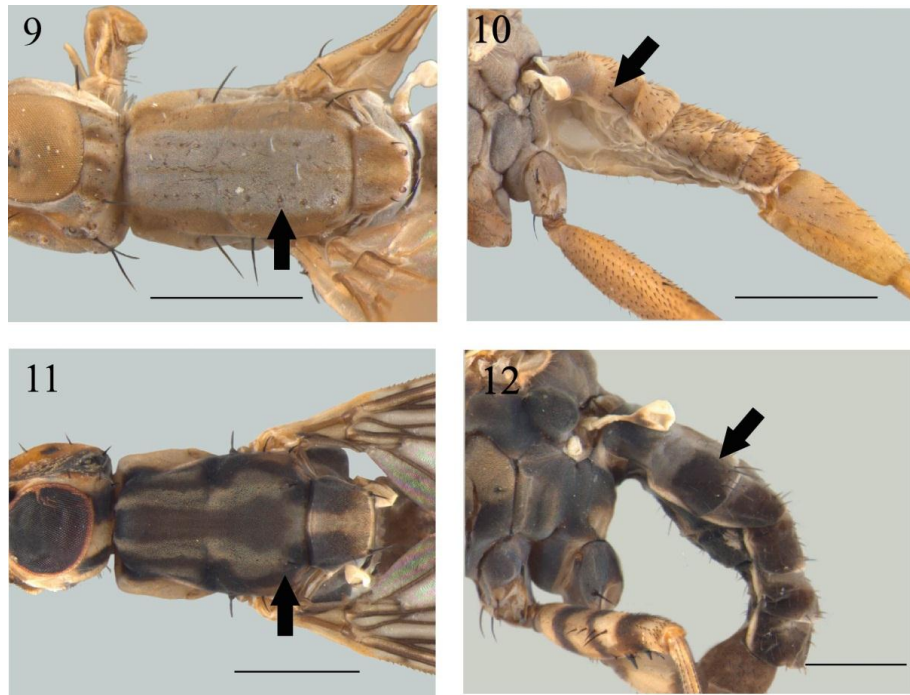
Figures



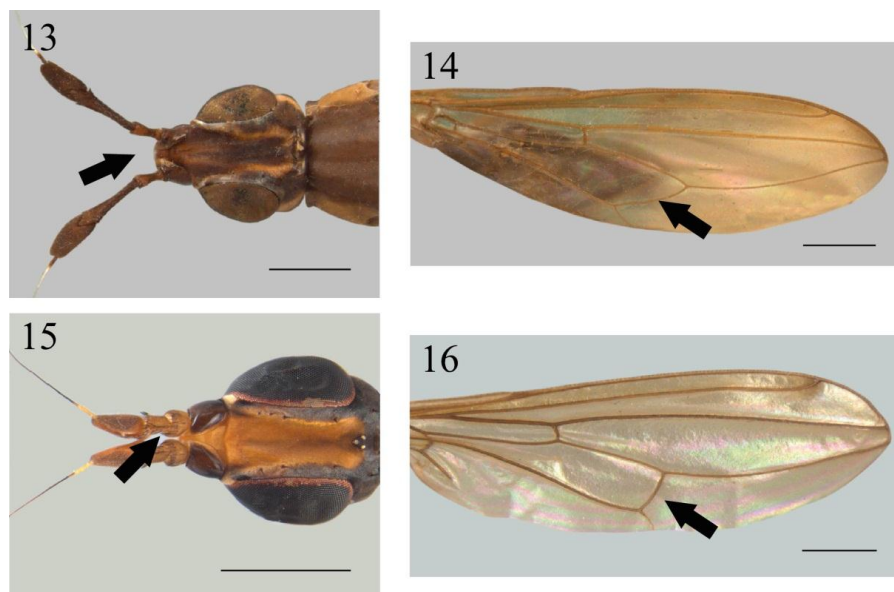
Figures 1–4. Presutural scutum and wing microtrichia. 1, 2. *Longina anguliceps* Buck & Marshall; 3, 4. *Eoneria aczeli* Sepúlveda & Carvalho.



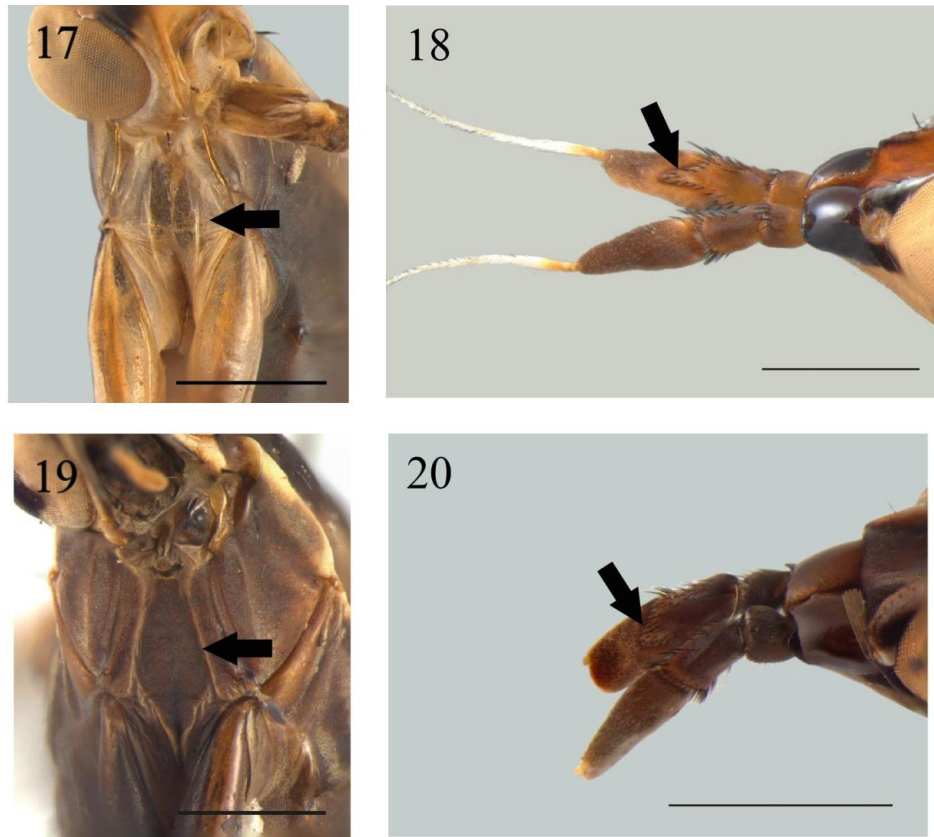
Figures 5–8. Occiput and scape length. 5, 6. *Cerantichir peruana* (Hennig); 7, 8. *Longina semialba* Buck & Marshall.



Figures 9–12. Dorsocentral setae and tergite 2 lateromedial seta. 9, 10. *Eoneria aczeli* Sepúlveda & Carvalho; 11, 12. *Glyphidops pluricellatus* (Schiner).



Figures 13–16. Antennal distance and cross-vein dm-cu. 13, 14. *Loxozus clavicornis* Enderlein; 15, 16. *Glyphidops flavifrons* (Bigot).



Figures 17–20. Prosternum and inner process of pedicel. 17, 18. *Glyphidops filusus* (Fabricius); 19, 20. *Nerius plurivittatus* Bigot.

CHAPTER 2

REVISION OF THE NEOTROPICAL GENUS *Eoneria* ACZÉL (DIPTERA: NERIIDAE)
WITH DESCRIPTION OF A NEW SPECIES FROM COLOMBIA

Journal chosen for submission: ZOOTAXA

Submitted: 20 October 2012

Accepted: 7 January 2013

Revision of the Neotropical genus *Eoneria* Aczél (Diptera: Neriidae) with description of a new species from Colombia

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Abstract

Here we revise *Eoneria* Aczél, 1951, a small genus of flies in the Neriidae previously known from two species from Argentina. We describe *E. aczeli* **Sepúlveda & Carvalho, new species** from Colombia, provide new records from Brazil and a distribution extension from Argentina and a new genus diagnosis, as well as an identification key based on adult morphology.

Key words: Argentina, Brazil, cactus fly, new records, taxonomy.

Resumen

En este trabajo, revisamos *Eoneria* Aczél, un pequeño género de Neriidae, previamente conocidos por dos especies de Argentina. Describimos una, *E. aczeli* **Sepúlveda & Carvalho, nueva especie** de Colombia, presentamos un nuevo registro de Brasil, una extensión de sus áreas de distribución para Argentina y una nueva diagnosis para el género, así como una clave de identificación basada en caracteres morfológicos de los adultos.

Palabras clave: Argentina, Brasil, mosca del cactus, nuevos registros, taxonomía.

Introduction

The cactus fly genus *Eoneria* Aczél, 1951 (Neriidae: Neriinae) was described as monotypic in the *División sistemática de los Tanypezidiformes*, based on the following characters of *E. blanchardi* Aczél, 1951: (1) setae strong and relatively short, but less so than in the other genera of Neriidae, not spine-like, (2) gena below the eye singularly wide, (3) arista subapical, bare and dark, (4) frons with two or three pairs of fronto-orbital setae, (5) prothorax slightly elongate, (6) with two pairs of strong notopleural setae, (7) five or six pairs of dorsocentral setae, (8) one pair of scutellar setae, (9) wings without supernumerary cross-veins and (10) vein dm-cu slightly “S” shaped, (11) the basal portion of oviscape with ventral margin slightly convex. The genus was named and described from a holotype female from Corrientes, Argentina (Aczél 1951).

Ten years later, *E. maldonadoi* Aczél, 1961 was described from a female holotype from La Rioja, Argentina with all the described characters for the genus, except that it has supernumerary cross veins (Aczél 1961). The only other Neriidae with supernumerary cross-veins are *Glyphidops (Oncopsia) pluricellatus* (Schiner) in the Neotropics, and *Stypocladus appendiculatus* (Hendel) from the Oriental Region, the latter of which also has six pairs of dorsocentral setae, as in *Eoneria*.

Eoneria belongs to a small and basal group of Neriidae comprising the *Eoneria*-group (Aczél 1961), which has antennal bases that are unpolished, not shiny or with a faint greasy luster. The other genera contained in this group are *Eoloxozus* Aczél and *Antillonerius* Hennig in the Neotropical Region and *Indonesicesa* Koçak & Kemal and *Telostylinus* Enderlein in the Oriental and Australian Regions respectively.

The genus is putatively restricted to South America (Steyskal 1987; Buck 2010) and while its biology is little known, collection data suggests that it occurs in low and arid places (Aczél 1949, 1951, 1961; Steyskal 1965, 1968). Here, we delimit the genus *Eoneria* Aczél, 1951 and review new characters and distributional information. The internal genitalia is not included in this study, since it have essentially the same configuration for the family species of three spermathecae with a sometimes visible fourth vestigial duct in females (Buck & Marshall, 2004), and in the case of male genitalia, Aczél (1961) describes it in detail and states that its structure and general shape are uniform. Similarly, structures such as sternites, are reduced to homogeneous longitudinal bars (Steyskal, 1987) and have no taxonomic relevance.

We describe previously unknown males of these species along with a new species from Colombia. Summarizing this new information, we provide a revised diagnosis for the genus and an identification key based on adult morphological characters.

Material and Methods

The type-material of *Eoneria blanchardi* and *E. maldonadoi* that we examined is in the entomological collection of Museo Miguel Lillo de Ciencias Naturales (MUL), Argentina and the *E. aczeli* **Sepúlveda & Carvalho, new species** in the Instituto Alexander von Humboldt (IAvH), Colombia. We also studied material from Museu de Zoologia Universidade de São Paulo (MZUSP), Brazil, the entomological collection Padre Jesus Santiago Moure (DZUP) at the Universidade Federal do Paraná, Brazil and the entomological collection of the Universidad de Antioquia (CEUA), Colombia.

We examined specimens using a Zeiss Stemi DV4 stereoscopic microscope. Photographs were coupled with the Auto-Montage Imaging System®. Drawings and photos were edited using Adobe Illustrator CS5.1 and Adobe Photoshop CS5. Terminology follows Cumming & Wood (2009).

Results

***Eoneria* Aczél**

Eoneria Aczél 1951: 570. Type-species: *Eoneria blanchardi* Aczél, 1951 (original designation); Aczél 1961: 276 (key); Steyskal 1968: 2 (catalogue); Buck 2010: 818 (key).

Diagnosis. Body setae longer than those in the other species of neotropical Neriidae and not spine-like. Head moderately elongate, twice as long as antennae. Ocellar plate slightly raised on the posterior margin of head, between the postocellar setae. Fronto-orbital plate with three pairs of well-developed setae. Antennal base clothed with a dense yellow dusting and consequently only subshiny. First flagellomere yellowish in color and whitish pubescent; posterior margin ovate. Arista brown and micropilose on the dorso-apical margin of the first flagellomere. Vibrissa present. Thorax with one dorsal gray vitta equal in width with scutellum, separated by a narrow, median, yellowish brown stripe; pleuron densely covered with gray pruinescence; with one faint yellowed gray vitta covering the lateral margin of mesoscutum, the postpronotal lobe and the notopleuron throughout the alar base. Six pairs of dorsocentral setae, variable in size. Mid and hind coxae with two lateral setae. Basicosta with one dorsal seta and one ventral seta. Tergite 2 with one lateral seta, subequal to anterior notopleural setae and two conspicuous setae on posterior margin.

Distribution. Colombia, Brazil, Argentina.

Key to adult *Eoneria* Aczel

1. Distal margin of antennal base bare, without black setulae. Fore femur yellowish brown with several anteroventral and posteroventral spine-like setae, stronger on the distal half. Frontal vitta mainly ochraceous pruinulent; with one yellowish brown stripe from anterior margin of frons to ocellar tubercle ... 2

- Distal margin of antennal base with two or three conspicuous black setulae. Fore femur yellowish and pruinulent, with inconspicuous anteroventral and posteroventral spine-like setae. Frontal vitta completely yellow pruinulent ... *E. aczeli* Sepúlveda & Carvalho, **new species.**

2. Wing veins R_{2+3} and M_1 with 11 and 8 intercalated cross-veins respectively, one cross-vein emerging from Costa between apices of veins R_{2+3} and R_{4+5} . Frontal vitta ochraceous pruinulent, with a wide yellowish brown stripe from anterior margin of frons to ocellar tubercle ... *E. maldonadoi* Aczél

- Wing without supernumerary cross-veins. Frontal vitta ochraceous pruinulent, except for two lateral yellowish brown stripes “Y” shaped from the anterior margin of frons to converge in front of the ocellar tubercle ... *E. blanchardi* Aczél

***Eoneria blanchardi* Aczél**

(Figs. 1–8)

Eoneria blanchardi Aczél 1951: 571 (description), 572 (fig. 20); Aczél 1961: 278 (key), 281 (fig. 1); Steyskal 1968: 2 (catalogue).

Diagnosis. Frontal vitta mainly ochraceous pruinulent, except for two lateral yellowish brown “Y” shaped stripes from the anterior margin of frons to converge in front of the ocellar tubercle. Fronto-orbital plate with three pairs of well-developed setae, increasing in size posteriorly. Male fore tibiae with two ventral rows of small spine-like setae. Fore femur with one dorsal distomedial seta.

Male. Body length (excluding antenna and epandrium) 7.1–7.5 mm. Wing length 5.0–5.2 mm and width 1.4 mm. Dark yellowish brown colored with partly yellow head and thorax; pleuron gray pruinulent (Fig. 1).

Head. Moderately elongate; 1.6–1.7 mm length and 1.1–1.3 mm width. Frons wide and concave; anterior margin almost straight; frontal vitta ochraceous pruinulent except for

two lateral yellowish brown “Y” shaped stripes from the anterior margin of frons to converge in front of the ocellar tubercle. Fronto-orbital plate white pruinose and narrow, with three pairs of well-developed setae, increasing in size posteriorly (Fig. 2). Postocellar setae large and convergent, length 3.0–3.5 times the transversal diameter of ocellar tubercle; inner vertical setae slightly convergent, subequal to outer vertical setae; outer vertical setae long and divergent, subequal to postocellar setae. Ocellar tubercle velvet blackish brown, triangular, large and somewhat raised, isolated from the yellowish brown vitta behind the eye. Parafacial velvet brown with one yellow median spot. Face yellow, wide and straight with several tiny setulae on ventral margin. Vibrissa spine-like, subequal to genal seta. Gena subshiny whitish yellow, wide and ventrally rounded; with one genal spine-like seta half as long as postocellar setae. Postgena whitish yellow pruinose; narrowing posteriorly and separated from occiput by a bend, giving rise to the yellowish brown vitta behind the eye; with a dense patch of long and weak pale setulae at posterior margin of head. Occiput mainly yellowish brown pruinose, separated by one yellow median vitta and the ventral yellowish brown vitta with one paler median vitta; with black strong and short setulae towards posterior margin of the head; length 40–50% height (Fig. 4). Antennal base pale yellowish brown, longer than wide in dorsal view. Antennae half of head length. Scape testaceous yellow, darkened on lateral margins; 0.2 mm long. Pedicel same color as scape; 0.2 mm long; laterally flattened; with strong black setulae on dorsal, ventral and distal margins; inner process of pedicel triangular and narrow, reaching the proximal half of first flagellomere. First flagellomere ochraceous and ovate; length 1.4–1.6 times width.

Thorax. Anterior notopleural setae directed backwards, equal to posterior notopleural setae and 70% of postalar setae length. Supra-alar setae half as long as postalar setae. Postalar setae curved and the longest thoracic setae. Presutural pairs of dorsocentral setae weaker and four postsutural pairs increasing in size towards the scutellum, prescutellar pair the longest and subequal to postalar setae. Scutellum yellowish brown pruinose with a median yellow stripe narrowing in the middle; lateral margins faintly rounded with one pair of hair-like subapical setae; distal margin truncated with one pair of strong apical setae, same length as scutellum. Postpronotal lobe yellowish dark with a dorsal paler stripe. Postpronotal carina shiny yellowish brown, projecting anteriorly to postpronotal lobe. Prosternum shiny yellowish brown; linear with rounded anterior margin and separated from the proepisternal plate by one wide membranous area. Proepisternum yellow anteriorly and yellowish brown posteriorly, densely pruinose with a small brown seta above fore coxa. Katepisternum brown pruinose with one black and straight seta subequal to postalar setae. Katatergite

pruinulent, same color as pleuron; length is 1.1 times width. Anatergite and mediotergite yellowish brown and white pruinulent.

Legs. Fore coxa yellowish brown and paler than the other coxae; whitish pruinulent; with one anteroapical well-developed seta and one or two much weaker setae; anterior margin with several yellowish brown setulae and two strong setae on anterolateral margin. Mid and hind coxae each with two lateral setae and one anteroapical seta accompanied by several weak setulae. All femora yellowish brown with gray pruinulences. Fore femora with several anteroventral and posteroventral spine-like setae and one dorsal distomedial seta (Fig. 5). Mid femur anterior margin with a row of five median setae. Hind femur with two dorsal distomedial setae more conspicuous than those on fore femur. Tibiae yellow and darker at the apex with several apical spine-like setae, which are stronger in mid and hind tibiae; covered with rows of short black setulae that are denser distally; fore tibiae in some males with two ventral rows of small spines. Tarsi yellow, darkening distally.

Wing (Fig. 6). Yellowish with brownish veins and microtrichose. Basicosta with one dorsal seta and one ventral seta. Vein dm-cu straight, not oblique. Margin of upper calypter whitish yellow with fringe of long white setulae and margin of lower calypter whitish yellow and bare. Halteres whitish yellow, with darkened and orbicular knob.

Abdomen. Yellowish brown with short black setulae; with a median yellow stripe and each tergite with a pair of distinct white pruinulent spots at anterior margin, widely separate from lateral margin. Tergite 2 with one lateral seta, subequal to supra-alar seta and two conspicuous setae on posterior margin (Fig. 3). Tergite 6 somewhat longer, narrowing distally. Genitalia pale yellowish brown. Syntergosternum 7+8 subshiny pale yellowish brown; half epandrium length. Epandrium same color as syntergosternum 7+8, dorsally darker; laterally and apically pruinulent with short yellowish brown setulae; extends to level of posterior margin of tergite 4. Anterior lobe of surstylus shiny yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus shiny yellow and wide, with dorsally white pruinulences and yellow setulae (Figs. 7, 8).

Female. Much like male, differs as follows: Body length (excluding antenna and oviscape) 6.4–7.1 mm. Wing length 4.5–5.7 mm and width 1.5–1.6 mm. Oviscape pale yellowish brown, with white pruinulences and brown setulae, except in a bare mid stripe; length 1.7 times maximum width. Segment 8 brown except for yellow apex.

Holotype: (not examined) female. ARGENTINA: Corrientes, i.1950, D'Angelo. The holotype was part of the E. Blanchard's collection, which was donated to the Museo

Argentino de Ciencias Naturales Bernardino Rivadavia after his death, but the specimen is lost.

Type material examined. Paratype: ARGENTINA: 1 female (without head), same data as holotype (MUL).

Other material examined. BRAZIL: 1 female, Bahia, Milagres, 23.vi.1974, S. Laroca-Leg. (DZUP); ARGENTINA: 1 male, Sur. Prov. De Jujuy, ii.1970, L. E. Peña (DZUP); 1 male, 1 female, Prov. La Rioja, 7km, NW de Patquia, 28-29 (MZUSP); 1 male, Chaco, ii.1974, En Eriocereus (MUL).

Distribution. Brazil, Argentina.

Eoneria maldonadoi Aczél

(Figs. 9–15)

Eoneria maldonadoi Aczél 1961: 278 (description), 278 (key); 281 (figs. 2–3); Steyskal 1968: 2 (catalogue).

Diagnosis. Frontal vitta ochraceous pruinulent, with a wide dark yellowish brown stripe from anterior margin of frons to ocellar tubercle. All femora dark yellowish brown with gray pruinescence. Veins R_{2+3} and M_1 , with 11 and 8 intercalated cross-veins, respectively, one cross-vein emerging from Costa between apices of veins R_{2+3} and R_{4+5} .

Male. Body length (excluding antenna and epandrium) 6.1 mm. Wing length 4.2 mm and width 1.3 mm. A dark yellowish brown species with partly yellow head and thorax; pleuron gray pruinulent (Fig. 9).

Head. Moderately elongate; 1.5 mm length and 1.1 mm width. Frons wide and concave; anterior margin almost straight; frontal vitta ochraceous pruinulent, with a wide dark yellowish brown stripe from anterior margin of frons to ocellar tubercle (Fig. 10). Fronto-orbital plate whitish yellow with three pairs of well developed setae, the posterior pair larger than the others and equal to inner vertical setae. Postocellar setae large and convergent; length 2.5 times the transverse diameter of ocellar tubercle; inner vertical setae slightly convergent, equal to outer vertical setae; outer vertical setae large and slightly divergent, subequal to postocellar setae. Ocellar tubercle blackish brown with faint white pruinescence, triangular, large and only slightly raised, not delimited by lateral furrows, isolated in the median yellow vitta coming from the frons. Parafacial velvet brown with one yellow median spot. Face whitish yellow, wide and rounded with several tiny setulae on ventral margin. Vibrissa spine-like, subequal to genal seta. Gena subshiny whitish yellow, wide and ventrally

rounded; with one genal spine-like seta half length of postocellar setae. Postgena posteriorly wide with a dense patch of long and weak pale setulae at posterior margin of head. Occiput yellowish brown pruinulent with black short setulae towards posterior head margin; with one narrow yellow median vitta; length is half the height (Fig 11). Antennal base dark yellowish brown with inner margins yellow; same length as width in dorsal view. Antennae 40% of head length. Scape testaceous yellow, darkened on lateral margins; 0.1 mm long. Pedicel colored as scape; 0.1 mm long, with strong black setulae on dorsal, ventral and distal margins; inner process of pedicel triangular and narrow, reaching the proximal half of first flagellomere. First flagellomere ochraceous and ovate, slightly constricted in the distal third; length 1.5 times width. Arista inserted at dorso-apical margin of the first flagellomere to almost subapical.

Thorax. Anterior notopleural setae straight and directed backwards; equal in length with posterior notopleural setae and half as long as the postalar setae. Posterior notopleural setae erect. Supra-alar setae subequal to postalar setae. Postalar setae curved and the longest thoracic setae. Presutural pairs of dorsocentral setae weaker and four postsutural pairs increasing in size towards scutellum, prescutellar pair the longest and subequal to postalar setae. Scutellum yellowish brown pruinulent with a median yellow stripe narrow in the middle; lateral margins with one pair of hair-like subapical setae; distal margin faintly rounded with one pair of strong apical setae. Postpronotal lobe dark yellowish brown. Postpronotal carina shiny pale yellowish brown, projecting anteriorly to postpronotal lobe. Prosternum shiny yellowish brown linear with rounded anterior margin and separated from the proepisternal plate by one wide membranous area. Proepisternum yellow anteriorly and yellowish brown posteriorly, densely pruinulent; with a brown seta above fore coxa, subequal to vibrissa. Katepisternum yellowish brown pruinulent on ventral half and paler on dorsal half; with one black and straight seta, equal to supra-alar setae. Katatergite same color as pleuron; length 1.1 times the width. Anatergite and mediotergite yellowish brown and white pruinulent.

Legs. Fore coxa yellowish brown and paler than the other coxae; whitish pruinulent; with one anteroapical seta and one or two much weaker setae; anterior margin with several yellowish brown setulae and a row of three strong setae along anterolateral margin. Mid and hind coxae with two lateral setae each, one anteroapical seta accompanied by several weak setulae. All femora dark yellowish brown with gray pruinulences. Fore femur with several anteroventral and posteroventral spine-like setae and two dorsal distomedial setae (Fig. 12). Mid femur anterior margin with a row of five median setae. Hind femur with several small

anteroventral spine-like setae on distal fourth, two dorsal distomedial setae more conspicuous than the same setae on fore femur. Tibiae yellow with darkened apex and faintly white pruinescence; apex with several spine-like setae, which are stronger in mid and hind femora; covered by rows of short black setulae that are denser distally. Tarsi yellow, darkening distally.

Wing (Fig. 13). Yellowish with yellowish brown veins and microtrichose. Basicosta with one dorsal seta and one ventral seta. Veins R_{2+3} and M_1 , with 11 and 8 intercalated cross-veins respectively, one cross-vein emerging from costa between apices of veins R_{2+3} and R_{4+5} . Vein dm-cu straight, not oblique. Margins of upper and lower calypteres whitish yellow with fringe of long white hairs. Halteres whitish yellow, with orbicular knob blackish brown.

Abdomen. Velvet brown with short black setulae; with a median white stripe and each tergite with a pair of distinct white pruinescent spots at anterior margin, which are broadly separated from lateral margin. Tergite 2 with one lateral seta, subequal to supra-alar seta and two setae on posterior margin. Tergite 6 longer and narrower than the others. Genitalia pale yellowish brown. Syntergosternum 7+8 subshiny and darker than epandrium; half of epandrium length. Epandrium pale yellowish brown with whitish pruinescence and short black setulae; extends to level of posterior margin of tergite 3. Anterior lobe of surstylus shiny yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus yellow and wide, with white pruinescence and yellow setulae (Fig. 14–15).

Female. Much like male, differs as follows: Body length (excluding antenna and oviscape) 7.1–7.4 mm. Wing length 5.1–5.3 mm and width 1.6–1.7 mm. Lateral margins of scutellum without subapical setae. Fore femur with only one dorsal distomedial setae. Oviscape subshiny dark yellowish brown; length 1.4 times maximum width. Segment 8 brown.

Type material examined. Holotype: female (without right wing), ARGENTINA: La Rioja, xi.1952 (MUL).

Other material examined. ARGENTINA: 1 male, La Rioja, 5 km S. de Chilecito, 28-29.x.1978, P. Sene & C. Viela (MZUSP); 1 female, 344, Vinagre D, La S. 9.ix.65; 1 female, R. A. Catamarca, Andalhuallas (2000m), 19.i.1968, Golbach-Terán-Willink/ Entomofauna subandina (MUL).

Distribution. Argentina.

Eoneria aczeli Sepúlveda & Carvalho, new species.

(Figs. 16–25)

Diagnosis. Relatively small and pale compared to congeners. Body pale yellowish brown and covered by whitish pruinescence. Frontal vitta yellow pruinescent. Fronto-orbital plate with three well developed setae, the anterior is weaker. Antennal base pale yellowish brown; ventral margin with two or three black setulae. Fore femur yellowish and pruinescent, with several anteroventral and posteroventral inconspicuous spine-like setae.

Male. Body length (excluding antenna and epandrium) 4.4 mm. Wing length 3.3 mm and width 1.1 mm. A pale yellowish brown species, with extensive pleural whitish pruinescence, including dorsally on the thorax (Fig. 16).

Head. Moderately elongate; subconical; 1.1 mm length and 0.8 mm width. Frons very concave, especially on anterior margin; frontal vitta yellow pruinescent. Head setae lost. Fronto-orbital plate testaceous yellow, covered with dense white pruinescence; narrowing anteriorly; with three well developed setae, the anterior pair is weaker. Ocellar tubercle dark yellowish brown, rounded, well delimited by color, small and relatively raised; isolated from the yellowish brown vitta behind the eye. Parafacial velvet yellowish brown with one yellow median spot. Face whitish yellow pruinescent, wide and straight, with several pale setulae close to the antennal base. Vibrissa strong, spine-like; half the length of the genal seta. Gena whitish yellow, wide and rounded. Postgena separated from occiput in a bend, giving rise to the yellowish brown vitta behind the eye; with a patch of several weak pale setulae at the posterior margin of head. Occiput yellowish brown pruinescent with one narrow median yellow vitta, forming two separated yellowish brown vittae, each with one paler whitish median vitta, giving the impression of four yellowish brown vittae on the occiput; with black short and strong setulae towards posterior margin of the head; length is 30% of height (Fig. 18). Antennal base pale yellowish brown, longer than wide in dorsal view; on ventral margin with two or three small black setulae, distinct from the row of setulae of the face. Antennae half of head length. Scape colored as antennal base, dorsally with a brown spot; 0.1 mm long. Pedicel yellow, paler than scape but darker than first flagellomere; 0.2 mm long; inner process of pedicel elongate and triangular, reaching the proximal half of first flagellomere. First flagellomere testaceous yellow with posterior margin ovate; length 1.3 times width.

Thorax (Fig. 19). Anterior notopleural setae large, strong and directed backwards; posterior notopleural setae lost. Presutural pairs of dorsocentral setae weaker and four postsutural pairs increasing in size towards the scutellum. Scutellum yellowish brown and white pruinescent with a diffuse median yellow stripe; lateral margins faintly rounded with one pair of hair-like subapical setae; distal margin widely rounded with one pair of apical

setae. Postpronotal lobe yellowish brown and yellow pruinulent. Postpronotal carina shiny brown, projecting anteriorly to postpronotal lobes. Prosternum shiny yellowish brown, linear with rounded anterior margin and separated from the proepisternal plate by one wide membranous area. Proepisternum pruinulent, with one seta equal in length with lateral scutellar setae. Katatergite rounded, as long as high, and, along with the anatergite and mediotergite, the same color and pruinulence as the pleuron.

Legs. Coxae pale yellowish brown, white pruinulent with several pale short setulae. Fore coxa with one anteroapical seta and four setae on anterolateral margin. Mid coxa with two lateral setae: one median erect and one apical directed backwards; with one weak anteroapical seta, accompanied by several long black setulae. Hind coxa with two lateral setae accompanied by several black setulae; with one anteroapical seta and several pale setulae. Femora yellowish and pruinulent. Fore femur with several anteroventral and posteroventral spine-like inconspicuous setae and one dorsal distomedial seta (Fig. 20). Hind femur with two dorsal distomedial setae more conspicuous than the same seta on fore femur. Tibiae yellow with apex yellowish brown, covered by rows of short black setulae that are denser distally; mid and hind tibiae with one strong anteroventral spine-like seta on the apical margin and mid tibia also with several weaker setae. Tarsi yellow, with dense rows of black setulae.

Wing (Fig. 21). Yellow tinged with yellow veins without dark areas and microtrichose. Basicosta with one dorsal seta and one ventral seta. Margins of upper and lower calypter yellow, with fringe of white, long and conspicuous hairs. Halteres whitish orbicular.

Abdomen. Yellow pruinulent with short black setulae; with one median paler yellow stripe. Tergite 2 with one lateral seta, subequal to anterior notopleural seta and two conspicuous setae on posterior margin. Tergite 6 longer, narrowing distally. Genitalia yellow. Syntergosternum 7+8 shiny, half of epandrium length. Epandrium yellow pruinulent with weak black setulae, extending to middle of tergite 3. Anterior lobe of surstylus shiny, with two or three setulae on apical margin. Posterior lobe of surstylus large with white pruinulence and black setulae (Fig. 22–23).

Female. Much like male, differs as follows: Body length (excluding antenna and oviscape) 4.7–5.0 mm. Head 1.3–1.4 mm length and 1.0 mm width. Wing length 3.9–4.2 mm width 1.2–1.3 mm. Postocellar setae convergent, length 3.7–3.8 times the transverse diameter of ocellar tubercle; inner vertical setae straight and equal to postocellar and outer vertical setae; outer vertical setae divergent and reclinate. First flagellomere length 1.2–1.4 times width. Thoracic setae larger than in male. Anterior notopleural setae 70% of length of

scutellar setae. Posterior notopleural seta erect; equal to anterior notopleural seta. Postalar and supra-alar setae subequal to scutellar setae. Scutellar setae 1.5 times length of scutellum. Katepisternum with one seta equal to anterior notopleural seta. Oviscape (Fig. 24) subshiny yellow with weak pruinescence, except on base; 2.6 times as long as maximum width. Segment 8 colored as oviscape and with several yellowish brown long setulae.

Material examined. Holotype: male, COLOMBIA: Magdalena, PNN Tayrona, Neguanje, 11°20'N, 74°2'W, 10m, Malaise, 21.iii.2001, R. Henriquez (IAvH).

Paratypes: COLOMBIA: 2 females, same data as holotype, except 21.iii.5.iv.2001 and 5-21.iii.2001. (IAvH); 1 female, Atlántico, Barranquilla, Uniatlántico, 11°01'07.58"N, 72°55'47.45"W, 48m, VSR Fruta, Noche, 6.viii.2010, C. Valverde & E. Perdomo, CEUA 51504 (CEUA).

Distribution. Colombia.

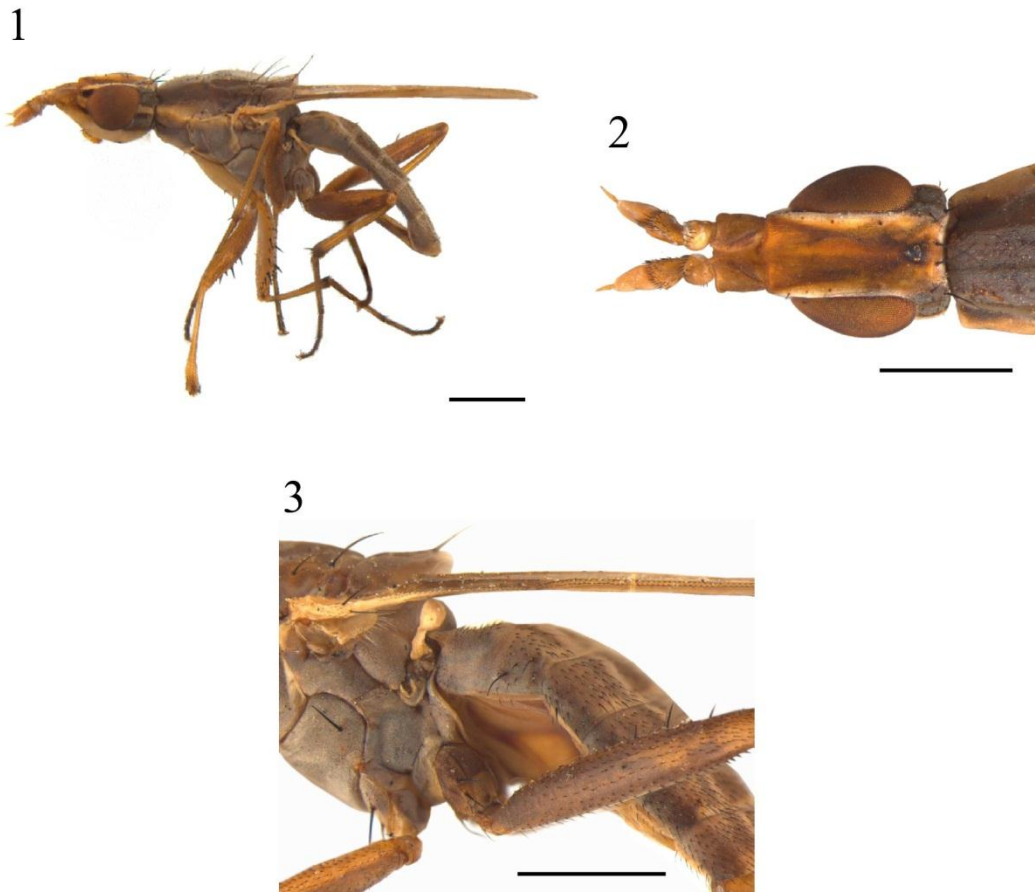
Etymology. This new species is named after the Hungarian dipterist Dr. Martin Ladislao Aczél, for his dedication and contribution to the entomology of Diptera.

Acknowledgments

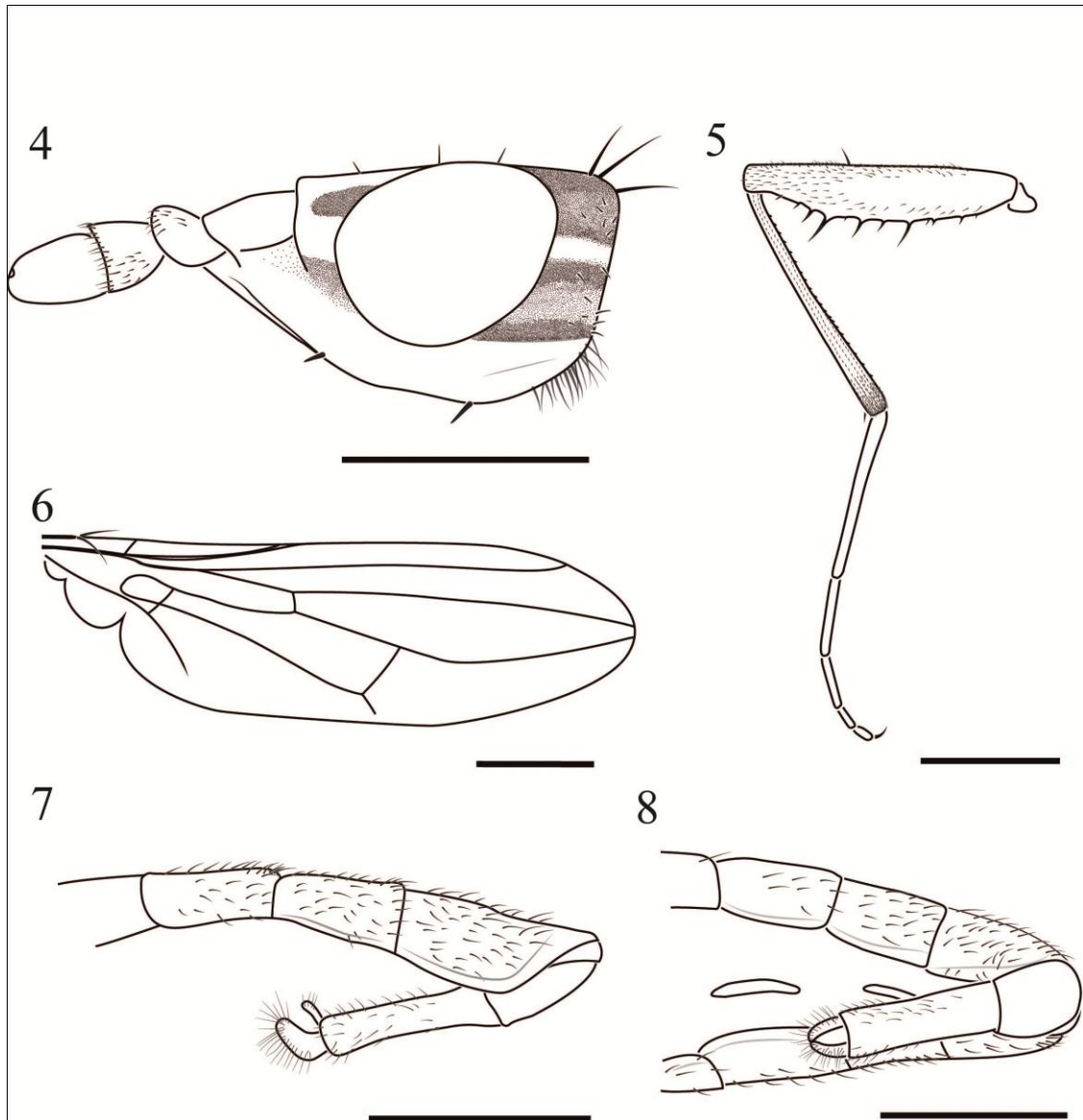
We thank Dr. Guillermo Claps (MUL) and Dra. Claudia Alejandra Medina Uribe (IAvH) for permission to study their materials. Thanks are extended to Dr. Arturo Roig Alsina from the Museo Argentino de Ciencias Naturales Bernardino Rivadavia (MACN) for the valuable information on the E. Blanchard's collection. We also thank both, the Rede Paranaense de Coleções Biológicas (TAXon line) for the photos and the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the research grant (TAS proc. 130370/2011-8; CJBC proc. 304713/2011-2). And thanks to James J. Roper for the English revision.

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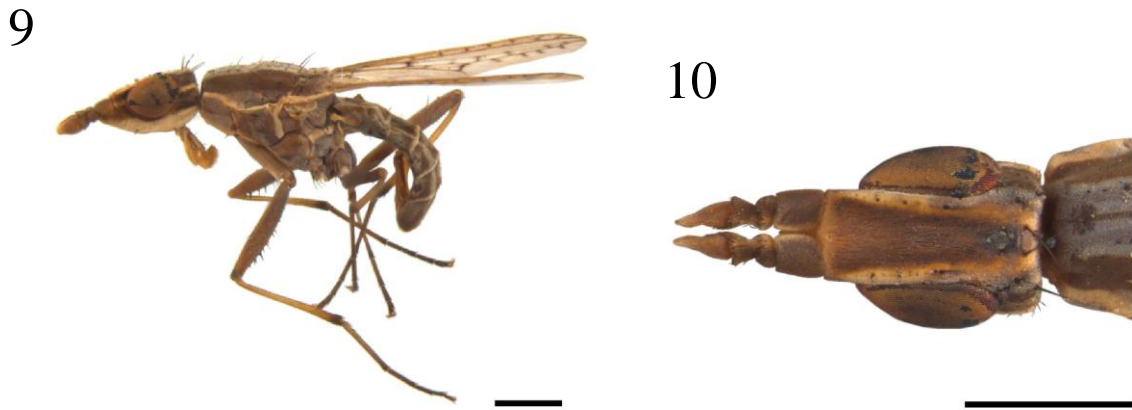
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Figures

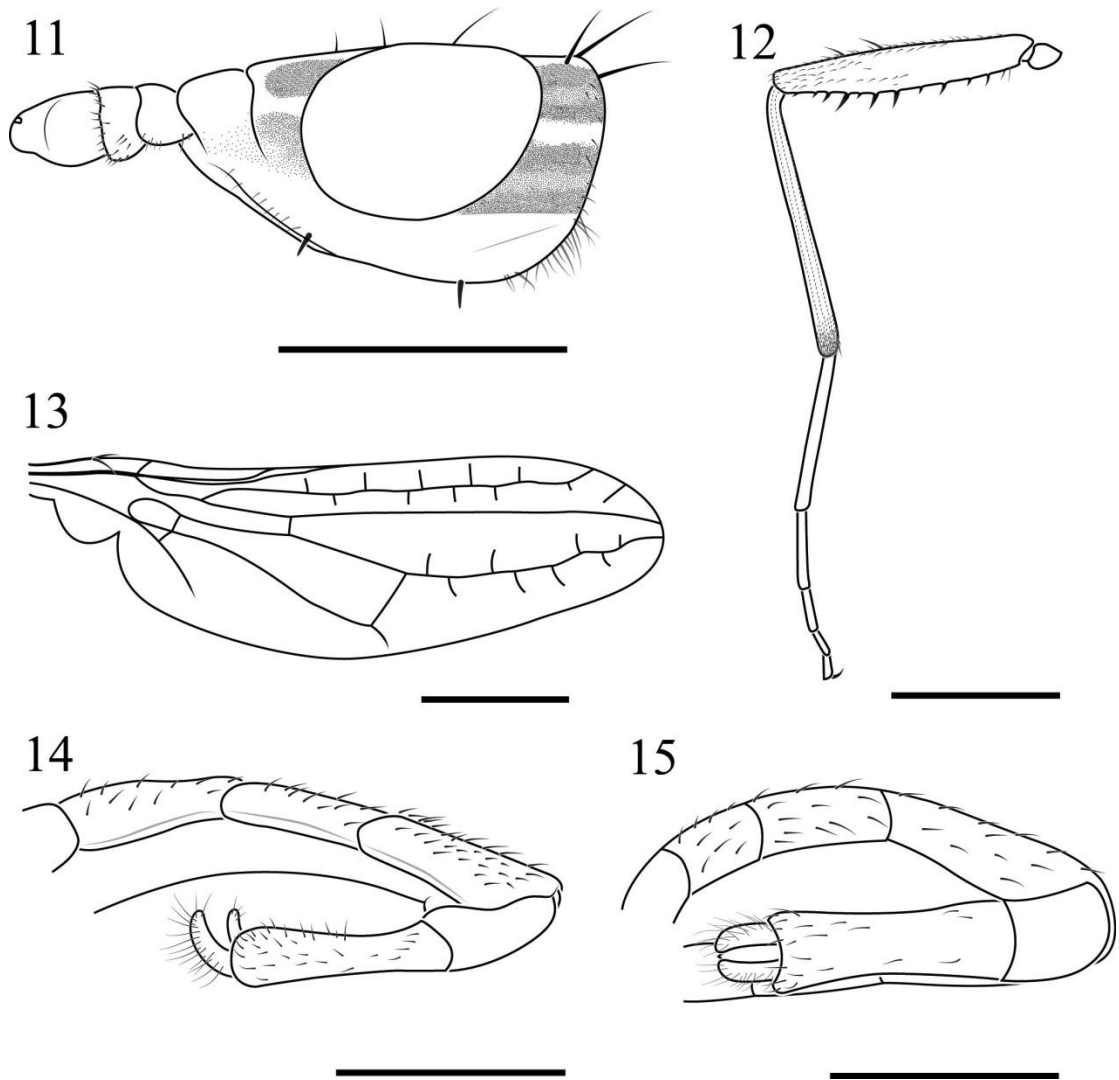
Figures 1–3. *Eoneria blanchardi* Aczél, male; 1. Habitus; 2. Head, dorsal view; 3. Abdomen, lateral view. Scales: 1 mm.



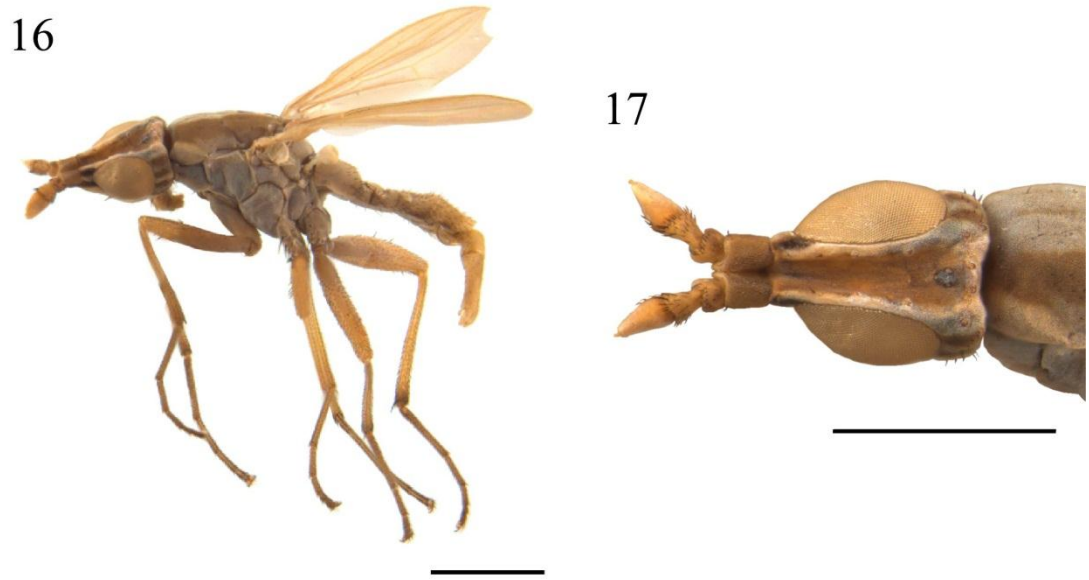
Figures 4–8. *Eoneria blanchardi* Aczél, male; 4. Head, lateral view; 5. Fore leg, anterior view; 6. Wing; 7. Epaandrium, lateral view. 8. Epaandrium, dorsal view. Scales: 1 mm.



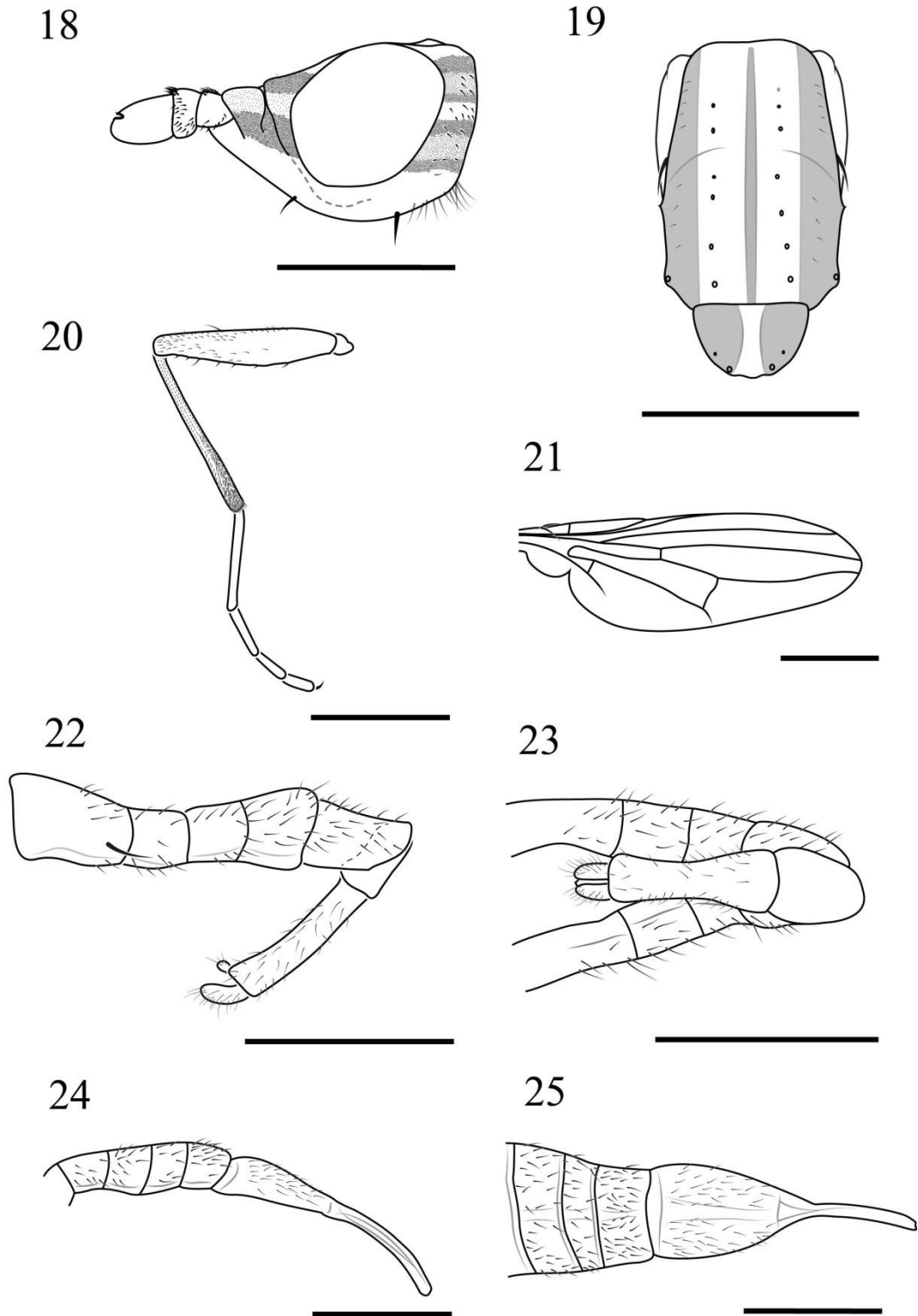
Figures 9–10. *Eoneria maldonadoi* Aczél, male; 9. Habitus; 10. Head, dorsal view. Scales: 1 mm.



Figures 11–15. *Eoneria maldonadoi* Aczél, male; 11. Head, lateral view; 12. Fore leg, anterior view; 13. Wing; 14. Epandrium, lateral view; 15. Epandrium, dorsal view. Scales: 1 mm.



Figures 16–17. *Eoneria aczeli*, Sepúlveda & Carvalho, new species, male; 16. Habitus; 17. Head, dorsal view. Scales: 1 mm.



Figures 18–25. *Eoneria aczeli*, Sepúlveda & Carvalho, new species, male; 18. Head, lateral view; 19. Thorax, dorsal view; 20. Fore leg, anterior view; 21. Wing; 22. Epandrium, lateral view; 23. Epandrium, dorsal view. Female; 24. Oviscape, lateral view; 25. Oviscape, dorsal view. Scales: 1 mm.

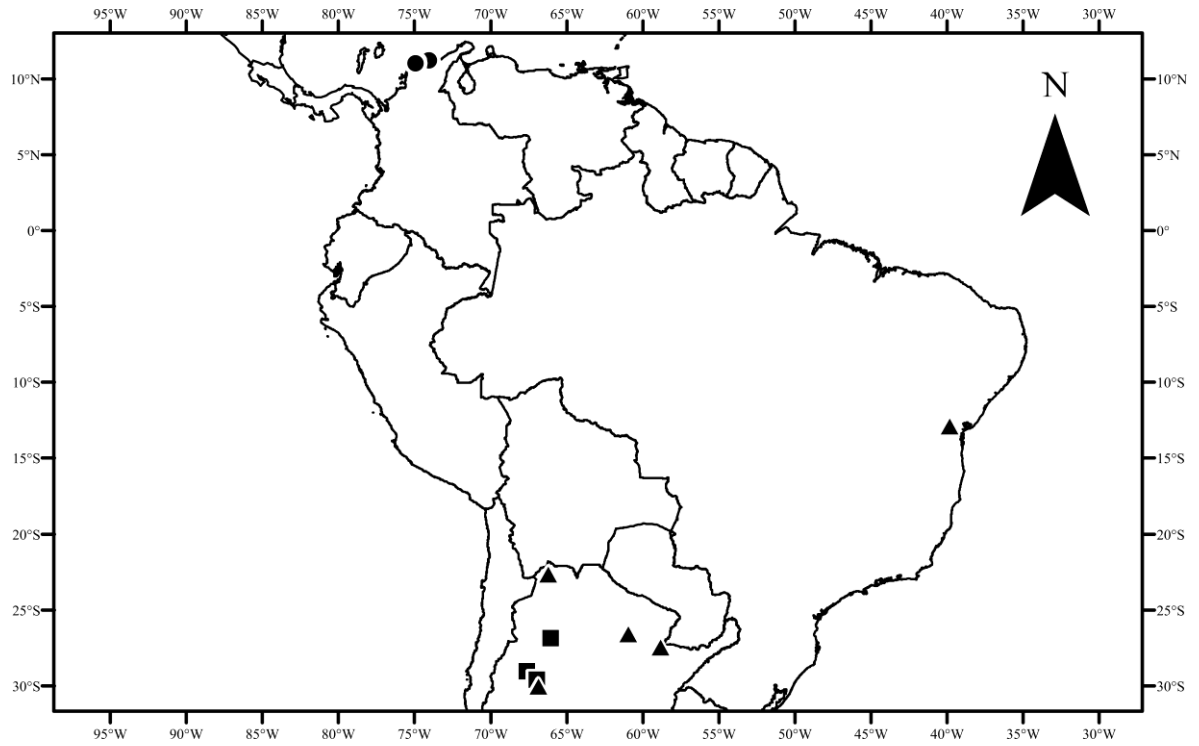


Figure 26. Localities for the species of *Eoneria* Aczél examined. (▲) *E. blanchardi* Aczel, 1951; (■) *E. maldonadoi* Aczél, 1961; (●) *E. aczeli*, Sepúlveda & Carvalho, new species.

CHAPTER 3

REVISION OF THE NEOTROPICAL GENUS *Glyphidops* ENDERLEIN (DIPTERA:
NERIIDAE) WITH DESCRIPTION OF THREE NEW SPECIES AND NEW SYNONYMS

Journal chosen for submission: ZOOTAXA

Revision of the Neotropical genus *Glyphidops* Enderlein (Diptera: Neriidae) with description of three new species and new synonyms.

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Abstract

Here we revise *Glyphidops* Enderlein, 1922, the neotropical genus of Neriidae with the largest number of species and more widely distributed in the neotropics. Here we describe *Glyphidops* sp. 1, **new species**, *Glyphidops* sp. 2, **new species** and *Glyphidops* sp. 3, **new species**. We redescribe the valid known species and propose the following synonyms: *G. peruanus* (Enderlein) synonym for *G. bullatus* (Enderlein); *G. dubia* (Hennig), synonym for *G. dispar* (Cresson) and *G. seductrix* (Hennig), synonym for *G. flavifrons* (Bigot). A new diagnosis for the genus and its species, a key to identification and new records for Costa Rica, Colombia, Venezuela, Guyana, Ecuador and Brazil are provided.

Key words: biodiversity, cactus flies, new records, taxonomy.

Resumen

Es revisado *Glyphidops* Enderlein, 1922, el género de Neriidae más numeroso y ampliamente distribuido en el neotrópico. Son descritas *Glyphidops* sp. 1, **new species**, *Glyphidops* sp. 2, **new species** and *Glyphidops* sp.3, **new species**. Son redescritas las especies válidas y propuestas las siguientes sinonimias: *G. peruanus* (Enderlein) sinónimo de *G. bullatus* (Enderlein); *G. dubia* (Hennig), sinónimo de *G. dispar* (Cresson) y *G. seductrix* (Hennig), sinónimo de *G. flavifrons* (Bigot). Es presentada una nueva diagnosis para el género y cada una de sus especies, una clave de identificación y nuevos registros para Costa Rica, Colombia, Venezuela, Guyana, Ecuador y Brasil.

Palabras clave: biodiversidad, moscas del cactus, nuevos registros, taxonomía.

Introduction

The Neriidae comprise a small family of acalyprate flies, with 110 species in 10 genera (Steyskal 1965, 1968, 1977, 1980; Soós 1984; Mangan and Baldwin 1986; Pitkin 1989; Barraclough 1993; Buck and Marshall 2004), that feed on sap and decaying plant tissues (Aczél 1961; Steyskal 1987; Buck 2010). These flies are found in all biogeographic regions, and tend to predominate in the tropics (Steyskal 1968, 1987) while the subfamily Neriinae is found exclusively in America from the south of the United States to Argentina.

The most widespread genus of this subfamily is *Glyphidops*, which also has the larger number of species. This genus was described by Enderlein (1922), based on the following characters: (1) arista apical and completely pubescent, (2) one pair of apical scutellar setae, (3) fore femur with anteroventral and posteroventral rows of spine-like setae and (4) inner process of pedicel pointed, extending to the posterior half of first flagellomere. In the same paper, Enderlein described the genus *Oncopsia*, based on (1) the arista apical, brown and bare, (2) one pair of scutellar setae, (3) spine-like setae on ventral margin of fore femur and (4) dm-cu straight and not oblique, to include the species *Oncopsia mexicana* Enderlein, subsequently identified by Hennig as *Glyphidops flavifrons* (Bigot). Nonetheless, Hennig (1937) widens the description and retains the name to include into the genus several known species, as well as four new species and starts the discussion about if *Nerius flavipes* Widemann along with *Nerius bistriatus* Williston, belong to *Glyphidops* Enderlain or *Odontoscelia* Enderlein, which was embraced by Steyskal (1968), who transferred the species to *Odontoscelia*.

Aczél (1961) made what up to today might be considered as the most complete revision of the genus, including the *Oncopsia* species within *Glyphidops* as a subgenus and mainly differentiated by arista. However, the identifications and redescriptions were not compared with the type-material, which may be the biggest weakness of the author in his attempt to place the taxonomy of the family.

Here we describe *Glyphidops* sp. 1, **new species**, *Glyphidops* sp. 2, **new species** and *Glyphidops* sp. 3, **new species**, redescribe the valid species and propose the following synonyms: *G. peruanus* (Enderlein) synonym for *G. bullatus* (Enderlein); *G. dubia* (Hennig), synonym for *G. dispar* (Cresson) and *G. seductrix* (Hennig), synonym for *G. flavifrons* (Bitot). A new diagnosis for the genus, a key to identification and new records for Costa Rica, Colombia, Venezuela, Guyana, Ecuador and Brazil are provided.

Material and Methods

The type-material that we examined is in the Museum für Naturkunde, Humboldt-Universität, (ZMHB), Berlin, Germany; Staatliches Museum für Tierkunde, (SMT), Dresden, Germany; Smithsonian National Museum of Natural History (USNM), Washington, United States and Museu de Zoologia da Universidade de São Paulo (MZUSP), São Paulo, Brazil. Also photographs of type-material were obtained from Zoological Museum Natural History Museum of Denmark (SNM), Copenhagen, Denmark and the Oxford University Museum of Natural History (OUM), Oxford, England, were examined.

We also studied material from the Instituto Nacional de Biodiversidad (INBio), Costa Rica; Instituto Alexander von Humboldt (IAvH), Colombia; Colección Entomológica de la Universidad de Antioquia (CEUA), Colombia and the Coleção Entomológica Padre Jesus Santiago Moure (DZUP), Brazil.

We examined specimens using a Zeiss Stemi DV4 stereoscopic microscope. Photographs were coupled with the Auto-Montage Imaging System®. Drawings and photos were edited using Adobe Illustrator CS5.1 and Adobe Photoshop CS5. Terminology follows Cumming & Wood (2009) and countries marked with asterisk (*) are new records.

Results

Glyphidops Enderlein

Glyphidops Enderlein, 1922: 150. Type-species: *Nerius filiosus* Fabricius, 1805 (original designation). Type-locality: Ecuador, Arquidonia.

Diagnosis. Three pairs of well-developed fronto-orbital setae. Posterior margin of head in dorsal view, with two small to medium pruinose protuberances between postocellar and outer vertical setae. Vibrissa absent. Occiput velvet. Antennal base shiny. Pedicel laterally flattened; inner process of pedicel finger-like and relatively narrow. One pair of dorsocentral setae. Pleuron rather dull. Anterior notopleural seta absent. Postprototal lobe yellow with one ventral brown stripe; postpronotal carina projected, but not ending prior to the level of antepronotal ring. Proepisternum yellow anteriorly. Prosternum separated from the proepisternal plate by a wide membranous area. Fore coxa yellow with one anteroapical seta. Tibiae same color or paler than femora, with dark apex. Wing microtrichose, with cross-vein dm-cu not oblique.

Key to adults of *Glyphidops* Enderlein

1 Arista entirely or at least its basal third whitish pubescent ... 2

- Arista brown, bare or with conspicuous faint brown pubescence ... 9
- 2 Frontal vitta testaceous yellow with one black spot on posterior third that covers the ocellar tubercle and continues towards vertex. Supra-alar seta absent... 3
- Frontal vitta without black spot on posterior margin, when present, not limited to posterior third. Supra-alar seta present... 4
- 3 First flagellomere lanceolate; arista apical. Frontal dark vitta at posterior margin ovate, separated by one narrow yellow vitta to the brown vittae of the occiput ... *G. filusus* (Fabricius)
- First flagellomere ovate; arista subapical. Frontal dark vitta at posterior margin, fused to the brown vitta of the occiput ... *G. etele* Aczél
- 4 Arista completely white pubescent. Body dark brown with violet-bluish reflections, specially at pleuron ... 5
- Arista white pubescent at base and shiny brown and bare distally. Body rather brown, at most with faintly violet bluish reflections ... 7
- 5 Femora ochraceous yellow. First flagellomere with dorsal and ventral margins almost parallel and apex rounded. Postocellar seta twice longer than the transversal diameter of ocellar tubercle. Scutellum posterior margin truncate ... 6
- Femora dark brown with apex paler to yellowish. First flagellomere lanceolate, tapering towards apex. Postocellar seta three times longer than the transversal diameter of ocellar tubercle. Scutellum posterior margin widely rounded ... *Gliphidops* sp. 2, **Sepúlveda & Carvalho, new species**
- 6 Fronto-orbital plate always black on anterior margin. Arista dorso-apical. Syntergosternum 7+8 not inflated ... *G. obscurus* Hennig
- Fronto-orbital plate rather black, with anterior half or less yellow. Arista subapical. Syntergosternum 7+8 inflated ... *Gliphidops* sp. 3, **Sepúlveda & Carvalho, new species**
- 7 Posterior notopleural seta and apical scutellar seta spine-like; inserted on cylindrical tubercles, half as long as the seta. Legs dark brown, slightly yellowish distally. Katatergite elongate, length more than twice height ... *G. bullatus* (Enderlein)
- Posterior notopleural seta and apical scutellar seta not spine-like nor inserted on cylindrical tubercles. Legs dark yellowish brown with one or two darker rings. Katatergite length, at most twice height ... 8
- 8 Antennal base in dorsal view, inflated and rounded. Pleuron rather brown, same color as thorax dorsal. Frontal vitta ochraceous yellow. Fronto-orbital plate shiny black with three well-developed setae ... *G. ochreus* Hennig

- Antennal base in dorsal view, slightly longer than wide with distal margin not rounded. Pleuron with one testaceous yellow vitta throughout the postpronotal lobe to the mid coxa. Frontal vitta testaceous yellow with two lateral blackish brown “Y” shaped stripes; fronto-orbital plate black whitish pruinose, with two pairs of well-developed fronto-orbital setae, anterior pair inconspicuous ... *Gliphidops* sp. 1, **Sepúlveda & Carvalho, new species**
- 9 Head not elongate, with antennal bases conspicuously reduced. Veins R_{2+3} and M_1 , with 11 and 8 intercalated cross-veins respectively, associate to one brown spot. Occiput very narrow: height more than three times length ... *G. pluricellatus* (Schiner)
- Head at least slightly elongate in lateral view, with antennal bases conspicuously porrect. Veins without supernumerary cross-veins. Occiput height at most twice length ... 10
- 10 Pleuron yellowish brown and partly yellow with katatergite yellow. Abdomen with one median yellow stripe on dorsal margin. Occiput brown, with one yellow submedian vitta, being the ventral brown vitta very narrow ... 11
- Pleuron brown with violet-bluish reflections, even the inferior katatergite. Abdomen without dorsal yellow vittae. Occiput brown, with one yellow median vitta not as wide as the brown vittae ... 12
- 11 Arista apical, brown with conspicuous faint pubescence. ... *G. limbatus* Enderlein
- Arista subapical, brown and bare ... *G. flavifrons* (Bigot)
- 12 Femora testaceous yellow. Fronto-orbital plate black; two anterior pairs of fronto-orbital setae spaced by half or less the distance from posterior pair. Prosternum linear with wide and rounded anterior margin ... 13
- Femora yellow with brown rings or rather brown. Fronto-orbital plate black and yellow on anterior half or the limit with frons to completely yellow; fronto-orbital setae rather equally spaced. Prosternum linear with curved lateral margins and rounded anterior margin ... 14
- 13 First flagellomere ovate with widely rounded apex. Frontal vitta testaceous yellow with one brownish “V” shaped stripe, darker in front of the ocellar tubercle. Anterior margin of frons almost straight, with one faint concavity projected anteriorly between antennal bases ... *G. carrerai* Aczél
- First flagellomere ovate with truncate apex; dorsal and ventral margins almost parallel. Frontal vitta testaceous yellow. Frons widening towards the straight anterior margin ... *G. neuter* (Hennig)
- 14 Femora brown with one distomedial to apical yellow ring. First flagellomere ovate with ventral margin slightly curved upwards ... *G. dispar* (Cresson)

- Femora yellow with three conspicuous pale brown rings. First flagellomere ovate, with rounded apex ... *G. durus* (Cresson)

Glyphidops bullatus (Enderlein)

(Figs. 1–8, 119)

Chaetomeristes bullatus Enderlein, 1922: 151.

Glyphidops bullatus; Hennig, 1937: 259; Aczél, 1949: 380; Aczél, 1961: 305; Steyskal, 1968:

2.

Chaetomeristes peruanus Enderlein, 1922; Hennig, 1937: 259; Aczél, 1949: 381; Aczél,

1961: 305; Steyskal, 1968: 2. **New synonymy.**

Diagnosis. First flagellomere lanceolate with anterior half slightly wider and rounded apex. Arista apical; white pubescent in anterior half and brown bare in posterior half. Posterior notopleural setae and scutellar setae inserted on cylindrical tubercles, half length as the seta. Supra-alar seta present and short. Katatergite elongate, length more than twice height. Legs dark brown, slightly yellowish on distal portion. Lateral margins of abdomen not yellow, or differentiated, colored as the rest of the abdomen. Tergite 6 testaceous yellow on male and partly yellow on female as well as the oviscapae, contrasting with the blackish brown abdomen.

Male. Body length (excluding antenna and epandrium) 7.7–9.8 mm. Wing length 7.4–8.8 mm and width 2.1–2.6 mm. Blackish brown with head and thorax partly yellow (Fig. 1).

Head. Moderately elongate; 1.5–2.1 mm length and 1.1–1.4 mm width. Frons narrow; anterior margin straight; frontal vitta rather black whitish pruinose, except for one yellowish brown stripe from half of anterior margin and two narrower stripes in lateral margins between anterior and posterior fronto-orbital setae (Fig. 3). Fronto-orbital plate blackish brown, densely white pruinose on dorsal eye margin; relatively wide; fronto-orbital setae same size and equally spaced. Ocellar tubercle black pruinose, rounded and raised, posteriorly fused to the black vittae of the occiput; ocelli yellow, large and equal. Postocellar spine-like setae parallels; same length as the transversal diameter of ocellar tubercle; inner vertical setae spine-like, slightly convergent and longer than postocellar setae; outer vertical setae spine-like, divergent and same length as inner vertical setae. Face subshiny yellow, relatively narrow and rounded; white pruinose near the eye margin. Gena yellow whitish pruinose; relatively narrow with ventral margin slightly rounded; concave in the point of join with face and convex below genal seta; with one black genal seta, spine-

like and half length of postocellar seta. Postgena yellow, narrowing towards posterior margin; ventral margin straight; posterior margin with only one or two white short setulae. Occiput black; height 1.5–2.2 times length (Fig. 4). Antennal base black; inner margins separated in proximal half or less. Antenna 60% of head length. Scape blackish brown with yellow pubescence and inner margin yellow; 0.2 mm long. Pedicel yellowish brown and darkened in dorsal margin; 0.2–0.3 mm long; inner process of pedicel elongate, finger-like with pointed apex (Fig. 6). First flagellomere blackish yellow; lanceolate with anterior half slightly wider and rounded apex; 0.6–0.7 mm long length 2.0–2.3 times width (Fig. 5). Apical arista densely white pubescent on proximal half and brown bare in distal half.

Thorax. Blackish brown; dorsal median stripe widens and fades after transversal suture; with one testaceous yellow stripe on postpronotal lobe, dorsal margin of anepisternum and ventral notopleuron; pleuron subshiny blackish brown with inconspicuous violet-bluish reflections; thoracic setae spine-like and short. Posterior notopleural seta same length as scutellar seta and inserted on cylindrical tubercle half length as the seta. Supra-alar seta subequal to postalar seta. Dorsocentral setae length, half length of scutellar setae. Scutellum may present one median yellow stripe or none; lateral margins widely rounded; distal margin truncate with one pair of apical setae straight, half of scutellum length and inserted in cylindrical tubercles, half length as the setae. Prosternum shiny yellow, lanceolate with anterior margin triangular. Proepisternum with one short seta on anteroventral margin; half or less the length of katapisternal seta. Katapisternal seta inserted on a very small tubercle; length 60% of scutellar seta length. Katatergite length 2.3 times height. Metepimeron testaceous yellow with one dorsal black spot.

Legs. Fore coxa with two anterolateral spine-like setae, inserted in small but wide tubercles with black apex. Mid coxa with two lateral setae in cylindrical tubercles and one antero-apical seta slender; hind coxa with one lateral spine-like seta. All femora subshiny brown to blackish brown with apex paler to almost yellow; anteroventral and posteroventral spine-like setae inserted on cylindrical tubercles; fore femur anteroventral setae distinctly developed; mid femur with row of three median setae on anterior margin.

Wing (Fig. 6). Brownish, with rounded apex. Cells r_1 and r_{2+3} darker towards apex and anterior margin. Margins of upper and lower calypter blackish brown. Halter whitish with orbicular knob same color or brownish.

Abdomen. Blackish with violet-bluish reflections; lateral margins not yellow or differentiated, same color as the rest of the abdomen. Tergite 6 testaceous yellow. Syntergosternum 7+8 subshiny yellow; length is half of epandrium length. Epandrium

yellowish brown and dorso-apically darker and velvet; lateral margin with row of yellow setulae; extends forward to posterior margin of tergite 4. Anterior lobe of surstylus subshiny testaceous yellow, linear and very narrow with yellow setulae on distal half. Posterior lobe of surstylus yellow, long and wide, covered with white pruinescence and brown setulae (Fig. 7).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscap) 7.2 mm; brown to blackish brown, body setae shorter and slender (Fig. 2). Wing length 7.1 mm and width 0.2 mm. Anterior margin of frons slightly curved. Frontal vitta and vertex darker than the brown vittae of the occiput. Occiput height 1.7 times length. Antenna as male, but slightly shorter; scape 0.2 mm long; pedicel 0.2 mm long. First flagellomere 0.5 mm long; length 2.2 times width. Prosternum linear. Katerpisternal seta very short or absent. Scutellum with one narrow yellow stripe. Fore coxa with one small spine-like seta on anterior margin; lateral setae on mid and hind coxae not inserted on tubercles. Abdomen as male to yellowish brown with lateral margins darker. Tergite 6 same color as the other tergites, at most yellowish on posterior margin. Oviscape testaceous yellow, withish setulose; length 1.8 times maximum width (Fig. 8). Segment 8 testaceous yellow.

Comments. *G. bullatus* was described by Enderlein (1922), as type species for the genus *Chetomeristes*, from a dark male specimen, and the other species of the genus, *G. peruanus* was described from one only pale female specimen, and considered as two different species, based on the color pattern, as well as the size and number of setae on anterior femur. After examine the type-material of both species, we consider *G. peruanus* to be a synonym of *G. bullatus*, with the principal differences corresponding only to sexual dimorphism.

Type material examined. Holotype: *G. bullatus*: m#, Ecuador, Napo, Archidona, R. Haensch S. (ZMHB); *G. peruanus* Enderlein, synonym, holotype: f#, Peru, Coll. H. Loew (ZMHB).

Other material examined: COLOMBIA: 1 f#, Risaralda, SFF Otún Quimbaya, Cuchilla camino, 4°44'N 76°35'W, 1960m, Malaise, 11.viii-26.ix.2001, G. López; 2 f#, Huila, PNN Cueva de los Guacharos, Alto del mirador, 1°38'N 76°8'W, 1800m, Malaise, 21.iii-5.iv.2002, J. Fonseca; 2 m# 1 f#, Nariño, RN La Planada, Via Hondón, 1°15'N 78°15'W, 1930m, Malaise, 16.iv.2001, G. Oliva (IAvH).

Distribution. Colombia*, Ecuador, Peru (Fig. 119).

Glyphidops etele Aczél

(Figs. 9–16, 120)

Glyphidops etele Aczél, 1961: 302.

Diagnosis. Frontal vitta rather testaceous yellow; with one black spot on posterior margin, after the posterior pair of fronto-orbital setae, covering the ocellar tubercle and fused to the brown vittae of the occiput. Antennal base shiny yellowish brown to brown, with dorsoapical margin yellowish. Inner process of pedicel ending without reach the posterior half of first flagellomere. First flagellomere dorsal and ventral margins almost parallel. Arista yellow with dense white pubescence; inserted subapically on the first flagellomere. Supra-alar seta absent. Scutelum dark brown, without median yellow vitta; at most, one median yellowish region anteriorly.

Male. Body length (excluding antenna and epandrium) 6.6–8.4 mm. Wing length 5.5 mm and width 1.5 mm. Dark brown species with head and thorax partly yellow; pleuron brown and gray pruinose (Fig. 9).

Head. Moderately elongate; length 5.2–6.4 mm and 1.4–1.8 mm width. Frons wide; anterior margin slightly projected anteriorly or straight; frontal vitta testaceous yellow whitish pruinose, with one wide black spot on posterior margin. Vertex black pruinose, with one black spot extending over the posterior margin of frons and fused to the blackish brown vittae of the occiput (Fig. 11). Fronto-orbital plate blackish brown whitish pruinose; two anterior pairs of fronto-orbital setae weaker and shorter than posterior pair, which is subequal to postocellar seta, all separated by the same distance and one more anterior weaker seta in one side. Postocellar seta large and parallel; 2.2 times length of transversal diameter of ocellar tubercle; inner vertical seta erect and equal to outer vertical seta; outer vertical seta curve and divergent, length is 60% of postocellar seta length. Ocellar tubercle black and velvet, triangular and slightly raised; ocelli yellow and large, in some specimens, anterior ocellus smaller. Face yellow with white pruinoscence near the margin of the eye; ventral margin shiny yellow and almost straight. Gena yellow and white pruinose; wide and ventrally rounded; concave in the point of join with face; with one black genal seta, 80% as long as postocellar seta length. Postgena yellow with faint white pruinoscence; ventral margin rounded, narrows posteriorly; with one patch of six or seven white setulae on posteroventral margin. Occiput dark; height three times the length (Fig. 12). Antennal base yellowish brown to brown, with dorso-apical margin yellowish and inner margins separate at base. Antenna length, 70% of head length. Scape yellowish brown with yellow inner margin; 0.2 mm long. Pedicel same color as scape; 0.2–0.3 mm long; inner process of pedicel wide in base, triangular, slowly tapering towards the apex. First flagellomere yellow, densely white pubescent and blackish on dorsal margin and apex; dorsal and ventral margins almost parallel with a subtle tightening in

posterior half and apex rounded; 0.5–0.6 mm long; length 2.2 times width (Fig. 13). Arista yellow with dense white pubescence; inserted subapically on the first flagellomere.

Thorax. Dark brown; two dorsal inconspicuous, faintly whitish stripes; pleuron with violet-bluish reflections. Posterior notopleural seta erect or directed backwards, same length as scutellar seta and stronger. Supra-alar seta subequal to postalar seta. Postalar seta length, 70% of scutellar seta length. Dorsocentral setae equal to postalar setae. Scutellum dark brown and pruinulent, may present one median yellowish region anteriorly; lateral margins rounded and distal margin truncate; one pair of apical setae parallel, half of scutellum length and inserted in small shiny tubercles. Prosternum shiny yellow; cuneate. Proepisternum without setae or setulae on anteroventral margin. Katepisternum with one supramediial hair-like to spine-like setae on posterior half. Katatergite same color as pleuron; length 1.3 times height. Metepimeron testaceous yellow, contrasting to rather dark pleuron.

Legs. Fore coxa with one or two spine-like setae inserted on small yellow tubercles with black apex on anterolateral margin. Mid and hind coxae with one strong lateral spine-like setae and one paler antero-apical hair-like seta. All femora subshiny ochraceous yellow, each one with one more or less distinct brown distomedian ring; anteroventral and posteroventral spine-like setae, inserted on small subconical yellow tubercles with black apex; mid femur with three or four median setae on anterior margin.

Wing (Fig. 14). Brownish. Margin of upper and lower calypter pale yellowish brown. Halter white with orbicular knob brown or at least with one basal brown spot.

Abdomen. Dark brown with violet-bluish reflections and lateral margins subshiny reddish brown or testaceous yellow. Syntergosternum 7+8 shiny brown; length is half of epandrium length. Epandrium shiny with white pruinescence, paler than syntergosternum 7+8 and dorso-apically darker; extends forward to anterior margin (at most) of tergite 5. Anterior lobe of surstylus shiny yellowish brown, linear and narrow at base, with wide and rounded apex; with brown setulae on apical margin. Posterior lobe of surstylus yellowish brown, covered with white pruinescence and yellowish brown setulae (Fig. 15).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscape) 6.4–8.4 mm (Fig. 10). Wing length 5.0–6.4 mm and width 1.4–2.8 mm. Head 1.2–1.5 mm length and 1.1–1.4 mm width. Occiput length, 30–40% height. Antenna as male, length is 70% head length; scape 0.2 mm long; pedicel 0.2 mm long. First flagellomere 0.5–0.6 mm long; length 2.5–3.0 times width. Prosternum linear, narrower than male. Katepisternal setae absent. Fore coxa with one slender antero-apical seta; anterolateral margin without spine-like setae. Oviscape brown yellowish pruinulent with distal third yellow;

abundant brown setulae on dorsal margin; length twice the maximum width (Fig. 16). Segment 8 shiny brown.

Type material: Holotype: m#, Brasil, São Paulo, Juquiá, x.1946, M. Carrera (MZUSP) (with only basal third of the left wing, right wing lost).

Material examined: PERU: 1 f#, Loreto, San Antonio, 19.vii.1965. J. C. Hitchcock; 1 f#, Huanuco, Cochicote, 12.ix.1965. J. C. Hitchcock; 1 f#, Huanuco, Tingo Maria (1 km S.). 6.ii.1984, W. M. Mathis; 1 f#, Madre de Dios, Manu, Rio Manu, 250m, Pakitza, 12°7'S 70°58'W, 9-23.ix.1988, A. Freidberg; 1 f#, Cuzco, Paucartambo, Puente San Pedro (50 km NW Pilcopata), 3.ix.1988, 1600m, A. Freidberg; 1 f#, Pucalpa, 23.x.1950, Shunke, 1 m#, Pucalpa, 20.ii.1951, Shunke. ECUADOR: 1 m#, Pastaza, Puyo (12 kms. W), 5.ii.1976, Spangler; 1 m#, Pastaza, Tewaeno, 32 km SW of Tzapino, 31.v.1976, sweeping, J. Cohen. BRAZIL: 1 f#, Minas Gerais, Polo Club, S. of Belo Horizonte, 19.i.1977, L. Knutson (USNM).

Distribution. Ecuador, Peru, Brazil (Fig. 120).

Glyphidops filusus (Fabricius)

(Figs. 16–23, 121)

Nerius filusus Fabricius, 1805: 265.

Telostylus vittatus Cresson, 1912: 230.

Glyphidops filusus; Enderlein, 1922: 151; Cresson, 1930: 315; Curran, 1930: 451; Hennig, 1937: 258; Aczél, 1949: 380; Aczél, 1961: 305; Steyskal, 1968: 2.

Diagnosis. Frontal-vitta testaceous yellow with ovate black spot on posterior third, covering the ocellar tubercle and continuing towards vertex, separated by one yellow vitta to the brown vittae of the occiput. Anterior pair of fronto-orbital setae separate by half of the distance to the posterior pair. First flagellomere lanceolate with narrow rounded apex and arista apical, completely white and pubescent. Supra-alar setae absent.

Male. Body length (excluding antenna and epandrium) 6.0–8.5 mm. Wing length 5.0–7.6 mm and width 1.5–2.1 mm. A brown species with partly yellow head and thorax and pleuron brown velvet (Fig. 16).

Head. Moderately elongate; length 1.2–1.8 mm and 1.0–1.5 mm width. Frons relatively wide; anterior margin weakly rounded, in some specimens may be medially projected, without been actually between antennal bases; frontal-vitta testaceous yellow with ovate black spot on posterior third, covering the ocellar tubercle, continuing towards posterior margin of head and separated by one yellow vitta to the brown vittae of the occiput (Fig. 19).

Fronto-orbital plate subshiny reddish brown whitish pruinulent; anterior seta short and hair-like, and may be absent on one side; the anterior pair of setae separated by half the distance to the posterior pair. Vertex black pruinulent and raised behind the ocellar tubercle; lateral margin yellow. Ocellar tubercle black pruinulent, rounded and raised, fused to the black posterior frontal vitta; ocelli yellow, large and equal. Postocellar setae convergent, equal to transversal diameter of ocellar tubercle; inner vertical setae slightly convergent, and equal to the postocellar setae; outer vertical setae divergent and 70% postocellar setae. Face subshiny yellow; ventral margin shiny and white pruinulent near the eye margin. Gena subshiny yellow and ventrally rounded; with one genal seta, slender and equal to the postocellar setae. Postgena wide and narrowing distally; posterior margin with row of four or five setulae ventrally. Occiput blackish brown; with a wide median yellow stripe; length 2.7 times height (Fig. 20). Antennal base brown, polished and rounded; inner margins yellow and separated by a small space at base. Antenna 60–80% of head length. Scape brown and velvet, with base and inner margin yellow; 0.2 mm long. Pedicel same color as scape with inner margin yellow; 0.2–0.4 mm long; inner process of pedicel narrow, finger-like. First flagellomere brown, lanceolate with narrow rounded apex; 0.5–0.6 mm long; length 2.1–2.5 times maximum width (Fig. 21). Arista apical, densely white pubescent.

Thorax. Brown pruinulent; dorsal median brown stripe widens behind transversal suture; pleuron brown. Posterior notopleural seta subequal in length to the scutellar setae. Supra-alar seta absent. Postalar seta 60% of scutellar seta length. Dorsocentral setae subequal to scutellar setae. Scutellum rather brown whitish pruinulent, with one median yellow stripe; elongate and narrowing distally; lateral margins angulate and distal margin widely rounded; one pair of strong apical setae 40% scutellum length. Prosternum shiny yellow; linear with anterior margin wider, almost spatulate in some males. Proepisternum with one short spine-like seta above fore coxa. Anepisternum dorsal margin paler to yellowish. Katepisternal seta, if present, may be spine-like or hair-like and short. Katatergite generally yellowish brown or colored as pleuron in darker specimens; length 1.5 times height.

Legs. Fore coxa with two spine-like setae along the anterolateral margin. Mid and hind coxae with one lateral spine-like seta and one antero-apical hair-like seta, which in mid coxa may be accompanied by several setulae. All femora ochraceous yellow, each one with two brown distomedian rings, in some specimens is possible to perceive only one or none; anteroventral and posteroventral spine-like setae, inserted on small subconical yellow tubercles with black apex; mid femur with median row of five or six setae on anterior margin.

Wing (Fig. 22). Brownish. Margin of upper and lower calypter whitish yellow; lower calypter with setulae on distal half. Halter whitish yellow.

Abdomen. Dark brown with violet-bluish reflections and lateral margins yellow and bare. Syntergosternum 7+8 shiny polished; length is 40–60% of epandrium length. Epandrium pale yellowish brown and dorso-apically velvet; lateral margin with row of yellow setulae; extends forward to anterior margin (at most) of tergite 4. Anterior lobe of surstylus subshiny yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus blackish yellow and wide, covered with white pruinescence and black setulae (Fig. 23).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscape) 6.4–7.2 mm (Fig. 18). Wing length 5.4–6.4 mm and width 1.6–1.8 mm. Occiput length 30–40% height. Antenna as male, length is 60–80% head length; scape 0.2 mm long; pedicel 0.2–0.3 mm long. First flagellomere 0.5–0.6 mm long; length 2.0–2.3 times width. Prosternum only slightly wider at distally. Katerpisternal seta absent. Fore coxa whitout setae on anterolateral margin. Mid femur with median row of two or three setae on anterior margin. Oviscape yellowish brown with lateral and distal margins paler; velvet with brownish setulae; length 1.6–2.0 times maximum width (Fig. 24). Segment 8 black.

Comments. This is one of the most widely distributed neotropical species of Neriidae. Similar to *G. etele*, are easily differentiated by characters in the key.

Type material. Holotype: (destroyed, only one wing present). Type-locality: “America Meridional” (SNM).

Other material examined. GUATEMALA: 1 m#, Obispo, La Providencia, C. M. Ronilland. COSTA RICA: 1 f#, San Mateo Higuito/ P. Schild; 1 f#, Limon, Bribri, 4 km E, 50 m, 10°00'N 83°15'W, vii–ix.1990, Malaise trap, P. Hanson. PANAMA: 1 f#, Gamboa, 29.x.1987, Jazeh/ Trap in papaya; 5 m# 2 f#, Barro Colorado Is., vii–ix.1936/ Fruit fly trap/ Jas Zetek; 5 m# 3 f#, La Campana, ix–xi.1937, J. Zetek. COLOMBIA: 3 f#, Antioquia, Sta. Barbara, 21.x.1988, D. Lopez; 1 ♀, Antioquia, Santa Barbara, 27.x.1988, D. Lopez, McPhail trap (USNM); 3 m# 1 f#, Antioquia, La Pintada, Hda. Montenegro, 850m, 5°43'24N 75°37'15'W, VSR cebolla-pezu, Bosque, 27.vi.2007, N. Uribe; 5 m# 3 f#, Antioquia, La Pintada, Hda. Montenegro, 770m, 5°43'25N 75°37'26'W, VSR cebolla, Potrero, 27.vi.2007, M. C. Velez; 2 m# 1 f#, Antioquia, Jericó, Cauca Viejo, Bosque Intervenido, Cerca a la Quebrada Los Cruces, 614m, VSR fruta, 7–10.ix.2010, M. Wolff & A. Rios (CEUA); 1 f#, Meta, PNN La Macarena Caño Curía. Sendero Cachicamos, 3°21'N 73°56'W, 460m, Malaise, 24–31.xii.2001, D. Campos; 1 f#, Vaupes, Estación Biológica Moshiro-Itajura (Caparú), Centro Ambiental, 1°4'S 69°31'W, 60m, Malaise, 20.i–1.ii.2003, M. Sharkey & D.

Arias (IAvH). VENEZUELA: 1 m#, TFA 7 km E San Carlos de Rio Negro, 10–12.iii.1984, O. Flint & J. Louton. WEST INDIES: 1 m#, Trinidad, Monserrat/ vi.1927/ Ang. Busck Coll. GUYANA: 1 f#, Mazaruni-Potaro, Distr. Kartabu Point, 6°23'N 58°42'W, 5.i.1983, J. D. Weintraub (USNM). BRAZIL: 6 m# 5 f#, Amazonia, Manaus, RFA Ducke, VSR banana-cebolla-frutas, 18–26.ix.2010, Cordeiro, Grisales, Guedes & Haseyama (DZPR); 1 f#, Roraima, Rio Uraricoera, Ilha de Maraca, 2–3.v.1987/ J. A. Rafael, J. E. N. Brasil, L. S. Aquino/ Armadilha de Malaise (USNM); 1 m#, Pará, Obidos, P. Kibler & Rolle V. (ZMHB); 1 m#, Pará, Rio Xingu, Camp. (52°22'W 3°39'S) ca. 60 km S Altamira, 2–8.x.1986, P. Spangler & O. Flint (USNM); 1 m#, Bahia (ZMHB); 3 m# 2 f#, Rio de Janeiro, Distrito Federal/ ix.1937/ Serviço febre amarela, MES, Brasil; 5 m# 10 f#, Rio de Janeiro, Distrito Federal/ v.1938/ Serviço febre amarela, MES, Brasil; 1 m# 3 f#, Rio de Janeiro, Distrito Federal/ i.1939/ Serviço febre amarela, MES, Brasil; 1 m# 1 f#, Matto Grosso, Maracaju, ii. 1937 (USNM); 1 f#, São Paulo, Onda Verde, Faz. São João, i.1946, F. Lane (MZUSP). ECUADOR: 1 m#, Guayas, Naranjal, xii.1955/ Levi Castillo Coll. PERU: 1 m#, Cuzco, Paucartambo, Puente San Pedro (50 km NW Pilcopata), 23.ix.1988, 1600m, A. Freidberg; 1 f#, Madre de Dios: Manu, Rio Manu, 250m, Pakitza, 12°7'S 70°58'W, 9–23.ix.1988, A. Freidberg; Huanuco, Tingo Maria (14 km N), 7.ii.1984, W. Mathis (USNM).

Distribution. Guatemala and Honduras to Surinam and South to Bolivia and Brazil (Fig. 121).

***Glyphidops obscurus* Hennig**

(Figs. 25–32, 122)

Glyphidops obscurus Hennig 1937: 260; Aczél, 1949: 380 Aczél, 1961: 311; Steyskal, 1968:

2.

Diagnosis. Body brown with loud violet bluish reflections. Fronto-orbital plate rather brown, sometimes paler on mid area, but always brown anteriorly; anterior fronto-orbital seta hair-like and weak. First flagellomere with almost parallel margins and rounded apex; arista dorso-apical, completely white pubescent. Genal setae hair-like.

Male. Body length (excluding antenna and epandrium) 5.8–9.0 mm. Wing length 5.2–7.0 mm and width 1.6–1.9 mm. Brown specimen with loud violet-bluish reflections; head and thorax partly yellow (Fig. 25).

Head. Slightly elongate in lateral view; dorsally as long as wide: 1.4–1.8 mm length and 1.4–1.6 mm width. Frons widening discretely in anterior half; anterior margin wide and

slightly projected anteriorly; frontal vitta rather ochraceous yellow (Fig.27). Fronto-orbital plate brown whitish pruinulent; relatively wide, anteriorly narrowing and posteriorly joining the postcranium brownish vittae; anterior fronto-orbital seta slender and weak; anterior pair of fronto-orbital setae, separated by half the distance of posterior pair. Ocellar tubercle black pruinulent, rounded and raised, posteriorly fused to the black vittae of occiput; anterior and lateral margins surrounded by one faint blackish brown vitta, triangular and narrow; ocelli yellow, large and equal. Postocellar setae convergent; twice longer than the transversal diameter of ocellar tubercle; inner vertical setae erect and equal to postocellar setae; outer vertical setae curved, divergent and same length as postocellar setae. Face subshiny yellow and straight; white pruinulent near the eye margin. Gena yellow whitish pruinulent with ventral margin slightly rounded; with one brown genal seta, hair-like and length half of postocellar setalength. Postgena yellow and relatively wide, discretely narrowing towards posterior margin; posterior margin with several white short setulae. Occiput violet-bluish and narrow; height three times length (Fig. 28). Antennal base brown, polished and rounded; inner margins yellow and separated in proximal half. Antenna 60% of head length. Scape testaceous yellow and darkened in lateral margin; 0.2 mm long. Pedicel same color as scape; 0.2–0.3 mm long; inner process of pedicel elongate, finger-like (Fig. 9). First flagellomere blackish yellow; anterior half slightly wider; dorsal and ventral margins almost parallel and apex rounded; 0.5–0.6 mm long; length twice width (Fig. 29). Arista densely white pubescent; inserted on the dorso-apical margin of the first flagellomere.

Thorax. Brown with loud violet-bluish reflections; dorsal median wide brown stripe fades after transversal suture; with one faint yellow stripe throughout postpronotal lobe, dorsal margin of anepisternum and ventral notopleuron to alar base; pleuron same color as thorax dorsal; thoracic setae long, except supra-alar seta. Posterior notopleural seta slightly curved; slightly longer than scutellar seta. Supra-alar seta equal to scutellar seta. Postalar seta equal to posterior notopleural seta. Dorsocentral setae subequal to scutellar setae. Scutellum may present one faintly yellow median stripe; lateral margins rounded and distal margin truncate; one pair of apical setae parallel, 40% of scutellum length. Postpronotal carina sometimes not protuberant, ending below anterior margin of postpronotal lobe. Prosternum shiny yellow, linear with rounded anterior margin. Proepisternum with three or four yellow setulae on anteroventral margin. Katepisternum with one supramediial and inconspicuous hair-like to spine-like setae on posterior half. Katatergite length 1.6 times height. Metepimeron testaceous yellow with dorsal brown violet bluish spot.

Legs. Fore coxa with two or three spine-like setae on anterior margin separated by row of four yellow setulae. Mid coxa with one lateral seta and one antero-apical seta slender. Hind coxa with one long lateral seta and one antero-apical slender seta accompanied by one yellow setulae. All femora dull ochraceous yellow; with proximal, median and apical inconspicuous yellowish brown rings, which are not always detectable, in some cases two, one or none and even when are present, are detectable in posterior margin only; mid femur with row of two or three median setae on anterior margin.

Wing (Fig. 30). Brownish. Margins of upper and lower calypter yellow. Halter whitish with orbicular knob blackish brown.

Abdomen. Same color as thorax with dorsal margin paler brown and lateral margin testaceous yellow setulose. Syntergosternum 7+8 shiny polished; length is half of epandrium length. Epandrium pale yellowish brown and dorso-apically velvet; lateral margin with row of yellow setulae; extends forward to posterior margin of tergite 4. Anterior lobe of surstylus subshiny yellowish brown or paler, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus yellow and wide, covered with white pruinescence and brown setulae (Fig. 31).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscape) 5.9–7.6 mm (Fig. 26). Wing length 5.0–6.6 mm and width 1.3–1.8 mm. Occiput length 30–40% height. Antenna as male, length is 60–80% head length; scape 0.2–0.3 mm long; pedicel 0.2–0.3 mm long. First flagellomere 0.5–0.6 mm long; length 2.0–2.2 times width. Prosternum only slightly wider anteriorly. Katerpisternal seta absent. Fore coxa whitout setae on anterolateral margin. Mid femur with median row of two or three setae on anterior margin. Oviscape yellowish brown with lateral and distal margins paler; velvet with brownish setulae; length 1.6–2.0 times maximum width (Fig. 32). Segment 8 black.

Comments. From the species with arista pubescent, this is the most similar species to the group with arista brown and bare, by the small body size, general coloration and size of the setae. This species was misidentified and described by Aczél (1961) as *G. flavipes*, species declared “inquerenda” by Steyskal (1968) and transferred to the genus *Odontocelia*; therefore, has not been considered in this review. The *G. flavipes* type material was not examine, but we consider that the material cited next, corresponds to the species described by Hennig as *G. obscurus*. From the paratype series of Hennig, only three female paratypes are considered as *G. obscurus*, the other specimens are described and included in the new species *Glyphidops* sp. 3 **Sepúlveda & Carvalho, new species.**

Type material. Holotype: m#, Peru, 150m, 22.xi.1903, Pachitea-Münd./ Typus, *Glyphidops obscurus*, Hennig (ZMHB) (right fore leg lost). **Paratypes:** 1 f#, Peru, 150m, 22.xi.1903, Pachitea-Münd./ Paratypus, *Glyphidops obscurus*, Hennig; 1 f#, Peru, Meshagua, 26.ix.1903, Urubamba river./Paratypus, *Glyphidops obscurus*, Hennig; 1 f# (without head), Bolivia, Maipirisame, 9.i.1903, S. Carlos, 800m/ Coll.W. Schnuse/ Paratypus, *Glyphidops obscurus*, Hennig; (ZMHB).

Other material examined. VENEZUELA: 1 m#, Aragua, H. Pittier, N. P. Cumbato River, 21.vii.1990, D. G. Furth; 1 m# 1 f#, Valle seco, Carabobo, i.1940, P. Anduze/ *Glyphidops flavipes* (Wied.) Dr. M. Aczél det.; 1 f#, Carabobo nr. Canoabo, 850m, 24.i.1983, O. S. Flint; 2 f#, Guatopo, 18.xi.1980, M. R. Condon; 1 f#, Guatopo, 28.xii.1980; 1 f#, Lago de Valencia, 15.iv.1972, L. Knutson. PERU: 1 m#, Huanuco, Cochicote, 9.ix.1965, Coll.J. C. Hitchcock, Jr (USNM).

Distribution. Venezuela, Peru, Bolivia (Fig. 122).

Glyphidops ochreus Hennig

(Figs. 33–40, 123)

Glyphidops ochraceus Enderlein, 1922: 151 (nec Schiner, 1868); Aczél, 1949: 381; Aczél, 1961: 312; Steyskal, 1968: 2.

Glyphidops ochreus Hennig, 1937: 258.

Diagnosis. Head not elongate. Frontal vitta ochraceous yellow with two narrow stripes in lateral margins anteriorly. Fronto-orbital plate shiny blackish brown, with faint white pruinescence on dorsal margin of the eye; relatively wide and narrowing towards anterior margin, forming one continuous plate with parafacial and dorsally, separated from frontal vitta in a bend. Ocellar tubercle black pruinescent, rounded and raised, surrounded by one brown vitta and isolated from the black vittae of the occiput. Parafacial with dorsal margin straight and point of join with orbital plate rounded in lateral view. Antennal base brown, polished and inflated; lateral and distal margins rounded in dorsal view. Thorax brown with one dorsal gray vitta as wide as the scutellum, separated by one narrow median brown stripe.

Male. Body length (excluding antenna and epandrium) 9.0–9.8 mm. Wing length 7.7–8.5 mm and width 2.0–2.2 mm. A brown species with partly yellow head and thorax (Fig. 33).

Head. Not elongate; 1.6–1.8 mm length and 1.5–1.7 mm width. Frons wide; anterior margin straight; frontal vitta ochraceous yellow white pruinescent and two narrow stripes in

lateral margins anteriorly, next to the fronto-orbital plate; posterior margin with one small brown vitta from the ocellar tubercle (Fig. 35). Fronto-orbital plate shiny blackish brown, with faint white pruinescence on dorsal margin of the eye; relatively wide and narrowing towards anterior margin, forming one continuous plate with parafacial and dorsally, one carina that clearly separates from frontal vitta; fronto-orbital setae increasing in size posteriorly: the two anterior pair hair-like and the posterior pair subequal to postocellar seta. Ocellar tubercle black pruinescent, rounded and raised, surrounded by one brown vitta and isolated from the black vittae of the occiput; ocelli whitish, circular and equal. Postocellar setae convergent; twice longer than the transversal diameter of ocellar tubercle; inner vertical setae slightly convergent, and equal to outer vertical setae; outer vertical setae erect and length 60% of postocellar setae length. Parafacial dorsal margin straight. Face subshiny yellow; relatively wide with ventral margin widely rounded; white pruinescent near the eye margin. Gena yellow whitish pruinescent; relatively wide with ventral margin rounded; concave in the point of join with face and convex below genal seta; with one genal seta, slender and subequal to postocellar seta. Postgena wide and rounded at posterior margin; posterior margin with row of four or five setulae ventrally. Occiput blackish brown; height 2.7–3.0 times length (Fig. 36). Antennal base brown, polished, rounded and inflated; inner margins separated in proximal half or less; lateral and distal margins rounded in dorsal view. Antenna 60–80% of head length. Scape testaceous yellow with several yellow setulae on lateral margin; 0.2–0.3 mm long. Pedicel testaceous yellow, darkened in dorsal margin; elongate; one outstanding dorsoapical seta; 0.4–0.5 mm long; inner process of pedicel triangular, with pointed apex. First flagellomere blackish yellow; lanceolate, with anterior half slightly wider and pointed apex; 0.7–0.8 mm long; length 2.7 times width (Fig. 37). Apical arista densely white pubescent on proximal half and brown pubescent in distal half.

Thorax. Brown with one dorsal gray vitta, as wide as the scutellum, separated by one narrow median brown stripe; with one testaceous yellow stripe on postpronotal lobe, continues in dorsal margin of anepisternum and notopleuron; pleuron same color as thorax dorsal. Posterior notopleural seta same length as scutellar seta. Supra-alar seta subequal to postalar seta. Dorsocentral setae length, 40% of scutellar setae. Scutellum elongate; with one median yellow stripe very wide, almost 80% of scutellum width; lateral margins widely rounded; distal margin truncate with one pair of apical setae straight, 40% of scutellum length. Prosternum shiny yellow, lanceolate with anterior margin triangular. Proepisternum with three or four short setulae on anteroventral margin. Katepisternum with two pruinescent

patches in dorsal and ventral margins; without katapisternal setae. Katatergite protuberant; length 1.5 times height. Metepimeron may be testaceous yellow or same color as pleuron.

Legs. Fore coxa with two spine-like setae on anterior margin, inserted on very small tubercles with black apex. Mid coxa with two lateral spine-like setae and one antero-apical seta slender; hind coxa with one lateral spine-like seta and one antero-apical slender seta. All femora subshiny yellowish brown with two brown rings: one anteromedian and one distomedian; several few but strong anteroventral and posteroventral spine-like setae, inserted on subconical tubercles; mid femur with row of four or five median setae on anterior margin.

Wing (Fig. 38). Yellowish. Cells r_1 and r_{2+3} slightly darker towards apex and anterior margin. Basicosta broad with one slender brown ventral seta and one inconspicuous dorsal seta. Margins of upper and lower calypter testaceous yellow. Halter whitish yellow with orbicular knob.

Abdomen. Brown and dull, with one yellow dorsal vitta; lateral margin testaceous yellow with yellow setulae. Syntergosternum 7+8 shiny brown and polished; length is 60% of epandrium length. Epandrium yellowish brown; covered by brown setulae; extends forward to anterior margin of tergite 5. Anterior lobe of surstylus subshiny yellowish brown, linear and very narrow with yellow setulae on distal half. Posterior lobe of surstylus testaceous yellow, relatively long and wide, covered with white pruinescence and brown setulae (Fig. 39).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscapae) 7.0–7.7 mm (Fig. 34) and body setae shorter and slender. Wing length 5.9–8.3 mm and width 1.6–2.2 mm. Vertex paler and brown vitta surrounding the ocellar tubercle narrower. Occiput height 2.4 times length. Antenna as male, length is 80% head length; scape 0.2 mm long; pedicel 0.3–0.4 mm long. First flagellomere 0.6–0.7 mm long; length 2.7–3.0 times width. Fore coxa without setae on anterior margin. Mid coxa with one lateral seta. Fore femur with anteroventral and posteroventral spine-like setae on distal half. Oviscapae yellowish brown pruinescent with one dark brown median stripe; length 2.3 times maximum width (Fig. 40). Segment 8 black and wide.

Comments. The species was described by Hennig (1937) from female holotype and was erroneously identified by Aczél (1961). Turning this work, the first redescription of this species, as the female *G. ochreus* described by Aczél (1961) corresponds to *G. filusus*, with supra-alar seta absent and arista completely white pubescent.

Type material. Holotype: f#, Bolivia, Mapiro, 28.iii.1903, Sarampioni, 700m/ Coll. Schnuse (ZMHB) (the specimen has only one fore leg, but in general good order); **Paratypes:**

1 f#, same data as holotype; 2 f#, Mapiri, ii.1903, S. Carlos, 800m; 1 f#, Peru, Meshagua (ZMHB).

Other material examined: BRAZIL: 1 m#, Amazonas, Manaus, RFA Ducke, VSR. Banana, 18.ix.2010, Cordeiro, Grisales, Guedes & Haseyama; 1 m# 2 f#, Amazonas, Rio Nhamundá, Ig. Areias, 1°35'11''S 57°37'32''W, 17–20.v.2008, R. Ale-Rocha, Arm. McPhil (DZUP). PERU: 2 m# 1 f#, Madre de Dios: Manu, Erika (near Salvación), 550m, 5–6.ix.1988, A. Freidberg; 1 m#, Madre de Dios: Tambopata, 30 km SW Puerto Maldonado, 12°50'S 69°20'W, 290m, 15–31.x.1982, J. Anderson (USNM).

Distribution. Peru, Bolivia, Brazil (Fig. 123):

***Glyphidops* sp. 1** Sepúlveda & Carvalho, new species

(Figs. 41–48, 124)

Diagnosis. Frontal vitta testaceous yellow with two lateral blackish brown “Y” shaped stripes from the anterior margin of frons to converge in half of frons to the ocellar tubercle. Two pairs of well-developed fronto-orbital setae, anterior pair inconspicuous. Postgena with one median longitudinal bend from the posterior margin of head; posterior margin with patch of white setulae. First flagellomere blackish yellow dorsally and ochraceous yellow ventrally; ovate with slightly pointed apex. Arista apical, with short white pubescence on proximal half and distal half brown and bare. Pleuron with one testaceous yellow vitta throughout the postpronotal lobe, dorsal and posterior margins of the anepisternum and posterior half of the katepisternum to the mid coxa.

Male. Body length (excluding antenna and epandrium) 10.8 mm. Wing length 9.2 mm and width 2.4 mm. Brown specimen with head and thorax partly yellow, especially the pleuron, with one well defined yellow vitta from pospronotal tubercle to mid coxa (Fig. 41).

Head. Barely elongate in dorsal view; 1.7 mm length and 1.6 mm width. Frons wider and more concave between compound eyes and towards anterior margin; anterior margin straight; frontal vitta testaceous yellow, faint whitish pruinescent, except for two lateral blackish brown “Y” shaped stripes from the anterior margin of frons to converge in half of frons to the ocellar tubercle (Fig. 43). Fronto-orbital plate black whitish pruinescent, relatively subshiny and narrow; with two pairs of fronto-orbital setae, one inconspicuous anterior seta on one side; fronto-orbital setae and inner vertical seta equally spaced. Ocellar tubercle black pruinescent, rounded and raised, posteriorly fused to the black vittae of occiput and anteriorly to the blackish brown vitta of frons; ocelli yellow, relatively large and anterior one smaller.

Postocellar setae slightly convergent; 2.5 times longer than the transversal diameter of ocellar tubercle; inner vertical setae erect and subequal to outer vertical setae; outer vertical setae curved, divergent and 70% length of postocellar setae. Face subshiny yellow, relatively narrow and straight; yellow pruinescent near the eye margin. Gena subshiny yellow; wider than face; with ventral margin rounded, convex below genal seta; with one genal seta one third the length of postocellar setalength. Postgena yellow and relatively wide, discretely narrowing towards posterior margin; with one median longitudinal bend from the posterior margin of head; posterior margin with patch of several white setulae. Occiput blackish brown; one median yellow stripe very wide occupies most of the ventral half; height 2.3 times length. Antennal base brown and polished; inner margins rather separated (Fig. 44). Antenna 50% of head length. Scape testaceous yellow with one dorsal black spot; 0.3 mm long. Pedicel same color as scape; 0.3 mm long; inner process of pedicel wide in base and tapering distally, with pointed apex. First flagellomere blackish yellow dorsally and ochraceous yellow ventrally; ovate with slightly pointed apex; 0.7 mm long; length 2.2 times width (Fig. 45). Arista apical, with short white pubescence on proximal half and distal half brown and bare.

Thorax. Brown; dorsally with two weak longitudinal and parallel yellowish stripes, separated for one median wide brown and fuse near the scutellum; pleuron same color as thorax dorsal, with one testaceous yellow vitta throughout the postpronotal lobe, dorsal and posterior margins of the anepisternum and posterior half of the katepisternum to the mid coxa; thoracic setae relatively short and slender. Posterior notopleural seta length, 80% of scutellar seta length. Supra-alar seta very slender. Postalar seta lost. Dorsocentral setae less than half the length of scutellar setae. Scutellum with one median yellow stripe; lateral margins rounded and distal margin narrow and widely rounded; one pair of apical setae parallel, 60% of scutellum length. Prosternum shiny whitish yellow, lanceolate with anterior margin triangular. Proepisternum with patch of five yellow setulae on anteroventral margin. Katepisternal seta absent. Katatergite yellow; length twice height. Meron yellow on anterior margin, as part of the pleural yellow vitta. Metepimeron testaceous yellow.

Legs. Forecoxa with two spine-like setae on anterior margin, inserted on conical tubercles with black apex. Mid coxa yellow with two lateral setae on conical tubercles and two antero-apical slender setae. Hind coxa brown with one lateral seta slender and one antero-apical slender seta accompanied by one yellow setulae. All femora subshiny yellowish brown with one distal yellow ring; fore femur anteroventral spine-like seta distinctly developed; mid femur with one median row of three setae on anterior margin.

Wing (Fig. 46). Yellowish. Cells r_1 and r_{2+3} slightly darker towards apex and anterior margin. Basicosta with one dorsal weak seta and one ventral seta stronger. Margins of upper and lower calypter brown; lower calypter with several few detulae. Halter whitish yellow.

Abdomen. Dark brown with violet-bluish reflections; lateral margin wide testaceous yellow with ventral rows of brown setulae. Tergite 6 with posterior margin subshiny yellow. Syntergosternum 7+8 shiny brown and polished; length is half of epandrium length. Epandrium shiny brown with lateral and dorsoapical margins with white pruinescence and brown setulae; extends forward to anterior margin of tergite 4. Anterior lobe of surstylus shiny yellow; cuneate; with yellow setulae on apical margin. Posterior lobe of surstylus yellowish brown; very wide with lateral margins almost parallel and widely rounded apex, with white pruinescence and brown setulae (Fig. 47).

Variation. Body length (excluding antenna and epandrium) 8.4–10.2 mm. Wing length 8.4–9.1 mm and width 2.0–2.2 mm. **Head.** Rather elongate; length 1.6–2.1 and width 1.2–1.4. Occiput height 1.7–2.0 times length. **Thorax.** Pleural yellow vitta may extend dorsally to ventral margin of notopleuron and lateral mesoscutum. Postalar seta subequal to dorsocentral seta. Katatergite brown. **Legs.** Mid coxa with one antero-ventral setae. Femora darker brown with conspicuous yellow rings or in other cases, the femora paler yellow, resembling two distal brown rings. Mid femur with two median setae on anterior margin. **Wing.** Basicosta without dorsal setae.

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscapae) 8.1–8.4 mm (Fig. 42). Wing length 7.7–8.0 mm and width 2.1–2.3 mm. Head length 1.7–1.8 mm and width 1.2–1.4 mm. Occiput height 2.0–2.2 times length. Antenna as male, length is 60% head length; scape 0.2 mm long; pedicel 0.2 mm long. First flagellomere 0.6–0.7 mm long; length 2.0–2.5 times width. Prosternum lineal. Fore coxa without setae on anterior margin. Mid coxa with one lateral seta. Mid femur with one median seta on anterior margin. One female with knob blackish yellow. Oviscapae shiny brown with distal margin testaceous yellow; with brownish setulae; length, 2.5–3.0 times maximum width (Fig. 48). Segment 8 testaceous yellow or black.

Comments. This species is described from Colombia at heights between 1700–2400 m. The general morphology and coloration are constant, allowing a fast identification by the presence of only two pairs of well developed fronto-orbital setae and one pleural yellow vitta, the latter being a feature very constant for the species, despite to be widely known that coloration patterns are not constant characters in the family.

Type material. Holotype: m#, Colombia, Antioquia, La Ceja. Vda. El Tabor, Finca Torrejón, Bosque, 2150m, VSR pez, 18.ix.2009, T. Sepúlveda (CEUA). **Paratypes:** 1 f#, Colombia, Antioquia, same data as the holotype, except 10.i.2010; 1 f#, Colombia, Antioquia, Santa Helena, Parque Ecológico Piedras Blancas, Bosque, VSR pez, 18.xi.2009, A. Velez; 1 f#, Antioquia, Medellín, Corr. Santa Helena, Vda. El Placer, “Robledal”, VSR pez, iii.2006, Grupo de Entomología; 1 m#, Colombia, Andes, Paramo de Caramanta; 1 m#, Colombia, Santander, Carmen de Chucurrí, Vda. La Bodega, Hda. La Bodega, 1820-1950m, 6°40′55.3″N 73°26′41″W, VSR pez, Bosque, 15.i.2000, Duque & Velez (CEUA); 1 m#, Colombia, Huila, PNN Cueva de Los Guacharos, Cabaña Cedros, 1°37′N 76°6′W, 2100m, Malaise, 21.xii.2001–5.i.2002, C. Cortés (IAvH); 1 f# Caldas, Anselma, Vda. Palo Blanco, Granadillera, 1700m, VSR pez, 4.i.2009, A. Montoya; 1 f#, Antioquia, Carepa, Tunelapa, CORPOICA, 7°46′46″N 70°40′24″W, VSR visceras de pollo, 8.ii.2009, N. Uribe; 1 m#, Antioquia, Medellín, Corr. San Antonio de Prado, Alto El Silencio, Bosque secundario, 6°10′29″N 75°40′20″W, 2301m, VSR pez, 30.i.2010, Y. Correa & A. Clavijo (CEUA); 1 f#, Antioquia, Medellín, Corr. Santa Helena, Vda. Piedras Blancas, Send. Puente Amarillo, Robledal, 2300m, VSR pez, 3–7.vi.2006, Velez & Grisales (MEPB); 2 f#, Santander, Pie de Cuesta, Vda. La Cristalina, Finca Rasgón, 2300-2400m, Bosque, VSR. pez, 16.viii.2001, P. Duque & A. Vélez; 2 f#, Santander, Pie de Cuesta, Vda. Acopeña, Finca Pilas, 5°95′55″N 73°65′2″W, 1925m, Malaise guayaba, i.2009, L. Nuñez; 1 m# 1 f#, Norte de Santander, Cucutilla, Vda. Sisavita, Carrizales, Bosque robledal, VSR. pez, 7°28′16.6″N 72°49′48″W, 1900m, 13–19.viii.2001, Duque & Vélez; 2 m# 5 f#, Risaralda, SFF Otún Quimbaya, Bosque nativo, 1890m, VSR pez, 7–8.v.2001, Grupo de Entomología; 1 f#, Quindío, Finlandia, Granja Experimental Bengala UdeA, 4°41′10″N 75°27′2″W, 2020m, VSR fruta, 13–16.xi.2007, Grupo de Entomología (CEUA); 1 m#, Huila, PNN Cueva de Los Guacharos, Cabaña Cedros, 1°37′N 76°6′W, 2100m, Malaise, 4–18.ii.2002, C. Cortés; 1 m#, Valle del Cauca, PNN Farallones de Cali, Jamundí, Corr. Meseta (Cabecera) la Selva, 1960m, Malaise, 20.i-3.ii.2005, S. Sarria & M. Lasso (IAvH). ECUADOR: 1 m#, Napo, Lomoncocha, 8.vi.1977, P. J. Spangler & D. R. G. Givens (USNM).

Distribution. Colombia, Ecuador (Fig. 124).

***Glyphidops* sp. 2** Sepúlveda & Carvalho, new species

(Figs. 49–56, 125)

Diagnosis: Blackish brown with violet-bluish reflections. Supra-alar seta present, same length as postalar seta. Head slightly elongate. Frontal vitta ochraceous yellow with one wide

blackish vitta “Y” shaped from antennal base to ocellar tubercle, which fades in the middle. Fronto-orbital plate black whitish pruinulent. Genal seta slender and straight. First flagellomere with pointed apex; arista apical, densely pubescent, without bare areas. Anterior fronto-orbital seta shorter; two anterior pairs, separated by half the distance from posterior pair. Legs dark brown with apex paler to yellowish. Male anterior lobe of surstylus spatulate.

Male. Body length (excluding antenna and epandrium) 7.2 mm. Wing length 7.2 mm and width 5.9 mm. Blackish brown specimen with violet-bluish reflections; head and thorax partly yellow (Fig. 49).

Head. Slightly elongate; dorsally almost as long as wide; 1.5 mm length and 1.3 mm width. Frons anterior margin slightly convex; frontal vitta barely yellow with one wide blackish vitta “Y” shaped from antennal base to ocellar tubercle, which fades in the middle (Fig. 51). Fronto-orbital plate brown whitish pruinulent; anterior fronto-orbital setae the shorter; two anterior pairs of fronto-orbital setae separated by half the distance from posterior pair. Ocellar tubercle black pruinulent, rounded and raised, fused to the black vitta of frons and the dark vittae of the occiput; ocelli yellow and equal. Postocellar setae slightly convergent; length three times the transversal diameter of ocellar tubercle; inner vertical setae erect and 80% length of postocellar setae; outer vertical setae curved, divergent and same length as inner vertical setae. Face subshiny yellow and straight; white pruinulent near the eye margin. Gena yellow whitish pruinulent with ventral margin slightly rounded; with one black genal seta, same length as postocellar seta. Postgena yellow and relatively wide, discretely narrowing towards posterior margin; posterior margin with three yellow setulae. Occiput rather brown violet-bluish; height 3.2 times length (Fig. 52). Antennal base brown and polished; inner margins separated in proximal half. Antenna 60% of head length. Scape blackish brown and paler to yellowish inner margin; 0.2 mm long. Pedicel same color as scape; 0.2 mm long; inner process of pedicel elongate, finger-like with pointed apex. First flagellomere blackish yellow; lanceolate with anterior half slightly wider and tapering towards apex; 0.6 mm long; length 2.3 times width (Fig. 53). Arista apical, densely white pubescent.

Thorax. Blackish brown with loud violet-bluish reflections; dorsal median blackish brown stripe widens and fades after transversal suture; with one yellow stripe on postpronotal lobe, dorsal and posterior margins of anepisternum and ventral notopleuron; pleuron same color as thorax dorsal; thoracic setae long and slender. Posterior notopleural seta same length as scutellar seta but stronger and inserted in one small tubercle. Supra-alar seta same length as postalar seta but slender. Dorsocentral setae, subequal to scutellar setae. Scutellum without

median yellow stripe; lateral margins slightly angulate and more densely white pruinose; distal margin widely rounded, with one pair of apical setae parallel, 70% of scutellum length. Prosternum subshiny testaceous yellow, cuneate with anterior margin rounded. Proepisternum with three brown setulae on anteroventral margin. Katepisternum more densely pruinose than the rest of the pleuron; with one suprasedial and spine-like setae on posterior half, half length of the posterior notopleural seta. Katatergite length 1.7 times height. Metepimeron testaceous yellow.

Legs. Fore coxa with one or two spine-like setae on anterior margin. Mid coxa with one lateral seta and one antero-apical slender seta accompanied by several setulae. Hind coxa with one large lateral seta and one antero-apical slender seta. All femora dark brown and dull, distally paler to yellowish; mid femur with one median setae on anterior margin.

Wing (Fig. 54). Brownish with brown veins. Cells r_1 and r_{2+3} slightly darker towards apex and anterior margin. Margins of upper and lower calypter yellow; lower calypter with several long setulae. Halter testaceous yellow with orbicular knob blackish.

Abdomen. Same color as thorax, dorsally paler brown and lateral margin testaceous yellow with ventral row of brown setulae. Tergite 6 yellowish dorsally. Syntergosternum 7+8 shiny yellowish brown and polished; length is almost half of epandrium length. Epandrium rather brown with white pruinoscence; small basal portion shiny and polished; lateral and dorsal margins with denser rows of yellow setulae on distal half; extends forward to posterior margin of tergite 4. Anterior lobe of surstylus subshiny yellowish brown, spatulate and slightly inflated, with several few setulae on apical margin. Posterior lobe of surstylus whitish yellow, narrow and long; with white pruinoscence and brown setulae.

Variation. Body length (excluding antenna and epandrium) 5.2–8.2 mm. Wing length 4.5–7.2 mm and width 1.3–1.8 mm. **Head.** Frontal dark vitta reduced to the posterior margin of frons in one triangular vitta, and two lateral minor dark vittae in anterior margin of frons. Fronto-orbital plate paler to yellowish brown. Occiput height twice length. In several specimens, the first flagellomere apex is not pointed but slightly rounded. **Thorax.** Katatergite testaceous yellow in the male specimen from Peru. **Legs** may be dark yellowish brown or present the paler distal portion as one subapical ring; the number of median setae on anterior margin of mid femur may vary from one to four. **Wing** cells r_1 and r_{2+3} and even r_{4+5} dark brown towards apex and anterior margin; halter completely testaceous yellow or whitish yellow. **Abdomen.** Syntergosternum 7+8 length, 60% of epandrium length. Anterior lobes of surstylus may be considerably spatulate and inflated, also variable in color; posterior lobes of surstylus paler and subshiny.

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscapae) 6.6–7.6 mm (Fig. 50). Wing length 5.6–6.2 mm and width 1.8–1.5 mm. Anterior margin of frons slightly curved. Occiput height, 3.2–3.5 times length. Antenna as male, length is 60–80% head length; scape 0.2 mm long; pedicel 0.2–0.3 mm long. First flagellomere 0.6 mm long; length three times width. Katerpisternal seta absent. Oviscapae rather subshiny brown with brownish setulae and testaceous yellow in one Colombian specimen; length 2.0–2.5 times maximum width (Fig. 56). Segment 8 dark brown and wide in base.

Comments. The specimens from Ecuador and Colombia are differentiated from Brazilian species for being darker and present the anterior lobes of surstylus very inflated, which is one of the more conspicuous features of the species. This species is very similar to *Glyphidops* sp. 3, in size and color, with violet-bluish reflections, but are easily differentiated by (1) the anterior lobes cuneate and inflated in *Glyphidops* sp. 2, and linear in *Glyphidops* sp. 3, (2) the syntergosternum 7+8, not inflated in *Glyphidops* sp. 2 and soberly inflated in *Glyphidops* sp. 3, (3) the first flagellomere shorter, with anterior half slightly wider and tapering towards apex in *Glyphidops* sp. 2, different from the dorsal and ventral margins almost parallel and rounded apex on the first flagellomere of *Glyphidops* sp. 3 and (4) the yellowish brown legs in *Glyphidops* sp. 3 and dark brown in *Glyphidops* sp. 2.

Type material. Holotype: m#, Ecuador, Prt. Orellana: Rio Tiputini (0°38.2'S 76°8.9'W), 12–26.viii.1999, W. Mathis, A. Baptista & M. Kotrba (USNM) (without right fore leg). **Paratypes:** COLOMBIA: 1 f#, Caqueta, Sucre nr.km 35, 24.i.1969, Duckworth & Dietz (USNM); 1 f#, Huila, PNN Cueva de los Guacharos, Cedros 1°37'S 76°6'W, 1950m, Malaise, 20.iv–5.v.2003, C. Cortés; 3 m#, Meta, PNN Sumapaz, Jardin Botánico, 3°48'N 73°56'W, 730m, Malaise, 4–24.i.2002, H. Vargas; 1 m# 2 f#, Vaupés, Estación Biológica Moshiro-Itajura (Caparú) Centro Ambiental, 1°4'S 69°31'W, 60m, Malaise, 20.i–1.ii.2003, M. Hharkey & D. Arias; 1 m#, Amazonas, PNN Amacayacu, Matamata, 3°41'S 70°15'W, 150m, Malaise, D. Chota; (IAvH). ECUADOR: 1 m# 1 f#, m#, Prt. Orellana: Rio Tiputini (0°38.2'S 76°8.9'W), 12–26.viii.1999, W. Mathis, A. Baptista & M. Kotrba; 2 m# 2 f#, Zam-Chin. Prov. Cumaratza, 12.vi.1977, P. J. Spangler & D. R. Givens; 7 m# 2 f#, Prt. Orellana: Rio Tiputini (0°38.2'S 76°8.9'W), 12–26.viii.1999, W. Mathis, A. Baptista & M. Kotrba. PERU: 1 m#, Loreto, San Antonio, 14.viii.1965, J. C. Hitchcock Jr.; 1 m# Huanuco, Cochicote, 12.ix.1965, J. C. Hitchcock Jr.; 1 m#, Madre de Dios: Manu, Rio Manu, Patkitza (5 km E), Aguajal, 19.ix.1988, A. Freidberg (USNM). BRAZIL: 1 m# 5 f#, Amazonas, São Gabriel Cachoeira, 3–6.iv.2008, B. Ronchi-Teles/ Acampamento da torre da LBA, McPhil,

Concentrado Bia; 2 m#, Amazonas, Manaus, RFA Ducke, VSR fruta, 18–20.ix.2010, Cordeiro, Guedes, Grisales & Haseyama (DZUP).

Distribution. Colombia, Ecuador, Brazil, Peru (Fig. 125).

***Glyphidops* sp. 3** Sepúlveda & Carvalho, new species

(Figs. 57–64, 126)

Diagnosis: Dark brown with loud violet-bluish reflections. Supra-alar seta present, same length as postalar seta. Head slightly elongate. Frontal vitta rather yellow with one brownish vitta “Y” shaped from antennal base to converge in front of the ocellar tubercle. Fronto-orbital plate yellow in anterior half and brown in posterior half. Genal seta hair-like. First flagellomere with narrow and rounded apex; arista densely pubescent, without bare areas; apical or subapical. Anterior lobe of surstylus linear and narrow. Syntergosternum 7+8 soberly inflated in relation with any other species of the genus.

Male. Body length (excluding antenna and epandrium) 5.6 mm. Wing length 4.6 mm and width 1.4 mm. Dark brown specimen with loud violet-bluish reflections; head and thorax partly yellow (Fig. 57).

Head. Slightly elongate; dorsally almost as long as wide: 4.8 mm length and 4.2mm width. Frons; anterior margin straight; frontal vitta testaceous yellow, faint whitish pruinulent, except for two lateral blackish brown “Y” shaped stripes from the anterior margin of frons to converge in anterior third, to the ocellar tubercle (Fig. 59). Fronto-orbital plate brown whitish pruinulent with yellow spot between two anterior pairs of orbital setae; relatively wide; with three pairs of fronto-orbital setae, the anterior pair hair-like and short; two anterior pairs separated by half or less the distance from posterior pair. Ocellar tubercle black pruinulent, rounded and raised, posteriorly fused to the black vittae of occiput; ocelli yellow, large and equal. Postocellar setae convergent; twice longer than the transversal diameter of ocellar tubercle; inner vertical setae erect and 80% length of postocellar setae; outer vertical setae curved, divergent and same length as inner vertical setae. Face subshiny yellow, narrow and straight; white pruinulent near the eye margin. Gena yellow whitish pruinulent and ventral margin slightly rounded; with one brown genal seta, hair-like and 70% of postocellar seta length. Postgena yellow and relatively wide, discretely narrowing towards posterior margin; posterior margin with several white short setulae. Occiput violet-bluish; height 3.3 times length (Fig. 60). Antennal base brown and polished; inner margins separated in proximal half. Antenna 70% of head length. Scape yellowish brown and

darkened in lateral margin; 0.2 mm long. Pedicel same color as scape; 0.2 mm long; inner process of pedicel elongate, finger-like with pointed apex. First flagellomere blackish yellow; anterior half slightly narrower; dorsal and ventral margins almost parallel and apex rounded; 0.5 mm long, length 2.4 times width (Fig. 61). Arista subapical lost.

Thorax. Brown with loud violet-bluish reflections; dorsal median brown stripe widens and fades after transversal suture; with one faint yellow stripe on postpronotal lobe, dorsal margin of anepisternum and ventral notopleuron throughout the alar base; pleuron same color as thorax dorsal; thoracic setae relatively long and slender. Posterior notopleural seta length, 80% of scutellar seta length. Supra-alar seta subequal to postalar seta. Dorsocentral setae subequal to scutellar setae. Scutellum without median yellow stripe; lateral margins slightly angulate and distal margin truncate; one pair of apical setae parallel, 80% of scutellum length. Prosternum shiny whitish yellow, linear with rounded anterior margin. Proepisternum with three or four yellow setulae on anteroventral margin. Katepisternal seta absent. Katepisternal seta length 1.1 times height. Metepimeron testaceous yellow.

Legs. Fore coxa with one spine-like setae on anterior margin. Mid coxa with one lateral seta and one antero-apical slender seta. Hind coxa with one long lateral seta and one antero-apical slender seta accompanied by one yellow setulae. All femora subshiny ochraceous yellow with proximal and distomedian yellowish brown rings; mid femur with one or two median setae on anterior margin.

Wing (Fig. 62). Brownish. Cells r_1 and r_{2+3} darker towards apex and anterior margin. Margins of upper and lower calypter yellow. Halter whitish with orbicular knob blackish brown.

Abdomen. Same color as thorax with dorsal margin paler brown and lateral margin testaceous yellow setulose. Tergite 6 dorsally yellowish towards posterior margin. Syntergosternum 7+8 shiny yellow and polished; soberly inflated in relation with any other species; length is half of epandrium length. Epandrium pale yellowish brown and dorso-apically velvet; lateral margin with row of yellow setulae; extends forward to anterior margin of tergite 4. Anterior lobe of surstylus subshiny yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus yellow and wide, covered with white pruinescence and brown setulae (Fig.63).

Variation. Body length (excluding antenna and epandrium) 6.0–7.4 mm. Wing length 4.3–5.4 mm and width 1.6 mm. **Head.** Length 1.1–1.5 mm and width 0.1–1.3 mm. Occiput height 2.5–3.1 times length. Arista completely white pubescent. **Legs.** Femora yellowish brown rings are not always conspicuous, in some cases one or two rings are detectable.

Abdomen. Syntergosternum 7+8 length, 60% of epandrium length. Anterior and posterior lobes of surstylus yellowish brown.

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscape) 5.8–7.3mm (Fig.58). Wing length 4.8–6.1 mm and width 1.4–1.7 mm. Anterior margin of frons slightly curved. Occiput height 3.0–4.0 times length. Antenna as male, length is 60–70% head length; scape 0.2 mm long; pedicel 0.1–0.2 mm long. First flagellomere 0.5–0.6 mm long; length 2.0–2.5 times width. Oviscape yellowish brown with lateral and distal margins paler; velvet with brownish setulae; length 1.6 times maximum width (Fig. 64). Segment 8 black.

Comments. *Glyphidops* sp. 3 is very similar to *Glyphidops obscurus*, but can be easily differentiated by (1) the frontal vitta with one brown “Y” shaped stripe, (2) the fronto-orbital plate yellow on anterior half and (3) the first flagellomere tapering towards apex. For this reason, from the eight specimens on the type-material of *Glyphidops obscurus*, four female specimens that present those characteristics and differentiated inner process of pedicel, genitalia and legs, are included and described in *Glyphidops* sp. 3

Type material. Holotype: m#, Colombia, Risaralda, SFF. Otún Quimbaya, Robledal, 4°44'N 75°35'W, 1980m, Malaise, 11.v.2004, G. López (IAvH). **Paratypes:** COLOMBIA: 2 m# 2 f#, Amazonas, PNN. Amacayacu, San Martin, 3°46'S 70°18'W, 150m, Malaise, 5-9.xi.2001, D. Chota; 1 m#, Amazonas, PNN. Amacayacu, San Martin, 3°0'S 69°59'W, 210m, Malaise, 2-27.viii.2001, D. Campos; 1 ♀, Colombia, Putumayo, PNN La Paya, Loma Baja, 0°6'S 74°58'W, 320m, Malaise, 1-15.viii.2004, M. Trejos (IAvH). BOLIVIA: 1 f#, Maipiri, 6.i.1903, S. Carlos, 800m/ Paratypus, *Glyphidops obscurus*, Hennig; 1 f#, Maipiri, 13.iii.1903, Sarampioni 700/ Paratypus, *Glyphidops obscurus*, Hennig (ZMHB). PERU: 2 m# 1 f#, Madre de Dios: Manu, Erika (near Salvación), 550m, 5-6.ix.1988, A. Freidberg; 1 m#, Madre de Dios: Manu, 250m Pakitza, 12°7'S 70°58'W, 9-23.ix.1988, A. Freidberg; 1 f#, Iquitos, iii-iv.1981, R. C. Shannon; 1 f#, Cuzco: Paucartambo, Puente San Pedro (50 km NW. Pilcopata) 3.ix.1988, 1600m, A. Freidberg; 1 f#, Cuzco: Machupichu, 2400m, 29.ix.1988, A. Freidberg (USNM); 1 f#, Pichis-Weg, 2.i.1904/ Paratypus, *Glyphidops obscurus*, Hennig; Perú, Pichis, xii.1903, Pto. Yessup/ Paratypus, *Glyphidops obscurus*, Hennig (ZMHB); 1 m# 1 f#, Peru, Madre de Dios: Manu, Erika (near Salvación), 550m, 5-6.ix.1988, A. Freidberg; 1 m#, Peru, Cuzco: Paucartambo, Puente San Pedro (50 km NW. Pilcopata) 3.ix.1988, 1600m, A. Freidberg (USNM)

Distribution. Colombia, Peru, Bolivia (Fig. 126).

Glyphidops carrerai Aczél

(Figs. 65–70, 127)

Glyphidops carrerai Aczél, 1961: 316.

Diagnosis. Frons relatively narrow; anterior margin almost straight, with one faint concavity projected anteriorly between antennal bases; frontal vitta testaceous yellow with one brownish “V” shaped stripe, darker in front of the ocellar tubercle. Postgena discretely narrowing posteriorly and posterior margin relatively wide. First flagellomere ochraceous and ovate with widely rounded apex; dorsal and ventral margins almost parallel. Arista apical, blackish brown. Thorax with two dorsal gray vittae, separated by a wide median brown stripe, which widens and fades behind transversal suture. Anterior notopleural seta hair-like and very slender. All femora testaceous yellow. Hind femur with two dorsal distomedian setae.

Male. Body length (excluding antenna and epandrium) 5.2–7.6 mm. Wing length 4.4–5.4 mm and width 1.1–1.5 mm. Brown species with partly yellow head, thorax and legs; pleuron brown and dull, with faint violet-bluish reflections (Fig. 65).

Head. Moderately elongate in lateral view; 1.0–1.2 mm length and 1.0–1.2 mm width. Frons relatively narrow; anterior margin almost straight, with one faint concavity projected anteriorly between antennal bases; frontal vitta testaceous yellow with one brownish “V” shaped stripe, darker in front of the ocellar tubercle (Fig. 66). Fronto-orbital plate black whitish pruinulent; fronto-orbital setae increasing in size posteriorly, the two anterior pairs spaced by half the distance from posterior pair. Postocellar setae curved but almost parallel, length twice the transversal diameter of ocellar tubercle; inner vertical setae straight, equal to outer vertical setae; outer vertical setae curved and divergent, 80% as long as postocellar setae length. Ocellar tubercle velvet blackish brown, triangular and not raised; clearly delimited by color from the testaceous yellow frontal vitta; ocelli yellow, rounded and equal. Face yellow, relatively narrow and rounded. Gena whitish yellow, velvet and narrow; ventral margin rounded and barely concave at the point of join with parafacial; with one genal seta, 80% as long as postocellar seta length. Postgena whitish yellow pruinulent; discretely narrowing posteriorly and posterior margin relatively wide; with row of four or five yellow setulae. Occiput brown; height is 2.5 times length (Fig. 67). Antennal base brown with yellow and separated inner margins; distal margin blackish brown. Antennae length, 60% of head length. Scape yellowish brown, darkened on dorsal margin; 0.1 mm long. Pedicel same color as scape; 0.1–0.2 mm long; with one outstanding seta on the apex of dorsal margin; inner process of pedicel finger-like and narrow. First flagellomere ochraceous ovate with widely

rounded apex; dorsal and ventral margins almost parallel; length 1.7–2.1 times width (Fig. 68). Arista apical, blackish brown.

Thorax. Brown pruinulent with faint violet-bluish reflections; dorsal median brown stripe widens and fades behind transversal suture; with one yellow stripe throughout the postpronotal lobe and the dorsal margin of anepisternum. Anterior notopleural seta hair-like and very slender; half as long as posterior notopleural seta. Posterior notopleural seta length, 60% of scutellar seta length and inserted on a very small shiny tubercle. Supra-alar seta slightly curved and subequal to postalar seta. Postalar seta curved and 80% as long as scutellar seta length. Dorsocentral setae 70% as long as scutellar seta length. Scutellum brown pruinulent with a median yellow stripe; lateral margins slightly angulate; distal margin truncate and wide, with one pair of apical setae, 70% as long as scutellum length. Prosternum subshiny yellow; linear with wide and rounded anterior margin. Proepisternum bare. Katepisternum with one inconspicuous seta or absent. Katatergite same color as pleuron or slightly paler; length is 1.7 times height.

Legs. Fore coxa with two spine-like setae on anterolateral margin. Mid and hind coxae, each with one lateral seta and one anteroapical seta. All femora testaceous yellow. Mid femur with two median setae on anterior margin. Hind femur with two dorsal distomedian setae.

Wing (Fig.69). Yellowish with brownish veins. Cells r_1 and r_{2+3} slightly darker towards apex and anterior margin. Margin of upper calypter whitish yellow. Halter whitish yellow, with orbicular knob only slightly blackish.

Abdomen. Same color as thorax, with violet-bluish reflections; with lateral margin yellow, wide and scarcely setulose. Tergite5 and 6 without violet-bluish reflections. Tergite 6 rather yellowish brown. Syntergosternum 7+8 shiny yellowish brown or paler; 40% as long as epandrium length. Epandrium same color as syntergosternum 7+8; with brown setulae and dense row of yellow setulae on lateral margin; extends to level of posterior margin of tergite3. Anterior lobe of surstylus shiny yellowish brown, linear, narrow and large; with yellow setulae on apical margin. Posterior lobe of surstylus subshiny yellowish brown, narrowing towards apex and relatively large; with white pruinescence and brown setulae (Fig. 70).

Female. Fore coxa without setae on anterior margin. Oviscape subshiny yellowish brown with narrow dark brown median vitta and scattered hairs, which are short, fine appressed and shiny dark brown; it is 1.6 mm long and 0.9 mm wide; only 1.8 times longer than wide (Aczél, 1961).

Comments. The female of this species was not seen by the authors. In the original description, Aczél (1961) notes that legs present several inconspicuous brown rings and tergite 6 is yellowish brown, traits not seen by the authors of this work in the holotype or other specimens. It is possible to perceive changes in the intensity of colors in this and almost every species of the family, but we consider that these characters cannot be diagnostic, since it may be a very particular interpretation of the author of the species, that doesn't corresponds to its actual general traits. In the particular case of tergite 6, it is actually only paler brown than the other tergites, however, we consider the characters listed in the diagnosis more informative for the species. About the size of epandrium, Aczél describes it like just twice as long as the syntergosternum⁷⁺⁸, and it corresponds to an imprecision, since it is slightly longer, as indicated in this description. Finally, the same author related this species with *G. durus*, as very similar species, distinguishing them by (1) katapisternal seta absent in both sexes, (2) head less high, (2) postcranium long behind the eye, (3) frons narrower, (4) pedicel and oviscape shorter than in *G. dura*, (5) median dark vitta of the mesonotum broader behind the transverse suture, but rather inconspicuous. All the latest characters have been considered like very variable in the family, especially in the group *Oncopsia*. The authors consider that this species is morphologically more similar to *G. neuter*, and can be differentiated by the characters in the key.

Type material. Holotype: m#, Brasil, São Paulo, São Vicente, Barreiros, i.1945, M. Carrera (MZUSP). **Paratype:** 1 f# (not examined), Rio de Janeiro, x.1938 (USNM)

Other material examined. COLOMBIA: 1m#, Antioquia, Girardota, Vda. Manga arriba, Bosque secundario, VSRvisceras, 22–26.viii.2009, N. Uribe, A. Montoya, & G. Valencia (CEUA); 1 m#, Amazonas, PNN Amacayacu, Matamata, 3°41'S 70°15'W, 150m, Malaise, 1–15.x.2001, D. Chota (IAvH). GUYANA: 1 m#, Mazaruni-Potaro District Takutu Mountains, 6°15'N 59°5'W, 19.xii.1983/ Earthwatch Research Expedition, W. E. Steiner & P. J. Spangler (USNM)

Distribution. Colombia*, Brazil, Guyana* (Fig. 127).

Glyphidops dispar (Cresson)

(Figs. 71–77, 128)

Nerius dispar Cresson, 1926: 261.

Oncopsia dispar; Hennig, 1937: 253; Aczél, 1949: 377; Aczél, 1961: 319.

Oncopsia dubia Hennig, 1937. **New synonymy.**

Diagnosis. Fronto-orbital plate black, whitish pruinose on the dorsal margin of the eye and yellow towards frontal vitta. First flagellomere ochraceous and ovate with ventral margin slightly curved upwards and apical brown bare arista. Posterior notopleural seta inserted on a very small shiny tubercle. Legs rather brown, all femora brown with one distomedial to apical yellow ring.

Male. Body length (excluding antenna and epandrium) 4.8–5.6 mm. Wing length 4.3–4.6 mm and width 1.3 mm. Brown species with partly yellow head and thorax; pleuron brown and dull, with violet-bluish reflections (Fig. 71).

Head. Moderately elongate; 0.9–1.1 mm length and 0.8–1.1 mm width. Frons relatively narrow; anterior margin straight; frontal vitta ochraceous yellow may present one brown vitta surrounding the ocellar tubercle and in some cases even reach the anterior margin of frons (Fig. 73). Fronto-orbital plate black whitish pruinose on the dorsal margin of the eye and yellow towards frontal vitta; rather narrow; fronto-orbital setae increasing in size posteriorly, mainly equally spaced, but the two anterior pairs may be spaced by half the distance from posterior pair. Postocellar setae convergent, length 2.2–3.0 times the transversal diameter of ocellar tubercle; inner vertical setae straight, equal to outer vertical setae; outer vertical setae curved and divergent, 80% as long as postocellar setae length. Ocellar tubercle velvet blackish brown, triangular and somewhat raised; may be well delimited by color when there is no brown frontal vitta or fused to the brown vitta of frons; posteriorly fused to the dark vittae of occiput; ocelli yellow and rounded and anterior ocellus equal to smaller to posterior ocelli. Face yellow, relatively narrow and straight. Gena whitish yellow, velvet and narrow; with one black genal seta, 80% as long as postocellar seta length. Postgena whitish yellow pruinose; discretely narrowing posteriorly; with row of three or four yellow setulae. Occiput brown; height three times length (Fig. 74). Antennal base brown with yellow and separated inner margins and black distal margin. Antennae length, 60–70% of head length. Scape testaceous yellow, darkened on dorsal and lateral margins; 0.1 mm long. Pedicel same color as scape; 0.1–0.2 mm long; inner process of pedicel finger-like and relatively wide (Fig. 75). First flagellomere ochraceous and ovate; ventral margin slightly curved upwards; length 1.8–1.9 times width. Arista apical, blackish brown.

Thorax. Brown pruinose; dorsal median brown stripe branches after transversal suture, forming three narrow brown stripes or one wide brown vitta towards apex; with one yellow stripe throughout the postpronotal lobe and the dorsal margin of anepisternum. Posterior notopleural seta length, 90% of scutellar seta length and inserted on a very small

shiny tubercle. Supra-alar seta hair-like and subequal to postalar seta. Postalar seta curved and same length as scutellar seta. Dorsocentral setae same length as scutellar seta. Scutellum brown pruinulent with a median yellow stripe; lateral margins rounded; distal margin rounded and narrow, with one pair of apical setae, 60% as long as scutellum length. Postpronotal carina shiny yellow. Prosternum subshiny yellowish brown; linear with curved lateral margins and rounded anterior margin. Proepisternum bare. Katepisternum brown with violet-bluish reflections and one dorsal white pruinulent spot; with one black and straight seta equal to notopleural seta. Katatergite same color as pleuron; length is 1.7 times width. Anatergite and mediotergite densely white pruinulent.

Legs. Fore coxa with one or two spine-like setae on anterolateral margin. Mid and hind coxae, each with one lateral seta and one anteroapical seta. All femora brown with one distomedial to apical yellow ring. Mid femur anterior margin two or three median setae. Tibiae with one subapical pale brown ring.

Wing (Fig.76). Yellowish with brownish veins. Cells r_1 and r_{2+3} darker towards apex and anterior margin. Margin of upper and lower calypter whitish yellow. Halter whitish yellow.

Abdomen. Same color as thorax with short black setulae; with lateral margin yellow, wide and scarcely setulose. Syntergosternum 7+8 shiny yellowish brown; half epandrium length. Epandrium darker than syntergosternum 7+8; with white pruinulence and brown setulae; extends to level of anterior margin of tergite 4. Anterior lobe of surstylus shiny whitish yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus subshiny yellow, narrow and relatively large; with white pruinulence and yellow setulae (Figs. 77).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscape); 5.8–7.2 mm (Fig. 72). Wing length 5.1–5.6 mm and width 1.2–1.6 mm. Prosternum narrower and lineal. Katepisternal seta absent or hair-like. Oviscape brown with lateral and posterior margins paler yellow; with white pruinulence and brown setulae; length 1.5–2.0 times maximum width (Fig. 78). Segment 8 shiny brown.

Comments: This species is very similar to *G. durus*, however, they can be easily differentiated by the characters in the key. Here is proposed *G. dubia* as junior synonym, based in the fact that each species were described from one only specimen, and the characters that differentiate them are highly variable.

Type material. Holotype: m#, Panamá, Porto Bello, 13.iii.1911, August Busck (USNM); *Oncopsia dubia* Hennig, 1937, synonym, holotype m#, Ecuador, Bucay, Dr. Ohaus/1907/ Typus, *Oncopsia dubia* Hennig (ZMHB).

Other material examined. COLOMBIA: 2 m#, Risaralda, SFF Otún Quimbaya, El Molinillo, 4°43'N 75°34'W, 220m, Malaise, 24.v-19.vi.2003, G. López; 1 f#, Huila, PNN Cueva de Los Guacharos, Cabaña Cedros, 1°32'N 76°6'W, 2100m, Malaise, 18.ii-7.iii.2002, C. Cortés; 1 m#, Cauca, PNN Gorgona, Antigua Laguna, 2°58'N 78°11'W, 70m, Malaise, 23.x-8.xi.2000, H. Torres; 1 m# 1 f#, Valle del Cauca, PNN Farallones de Cali, Anchicaya, 3°26'N 76°48'W, 730m, Malaise, 8.v-19.vi.2001, S. Sarria; (IAvH); 1 f#, Valle del Cauca, Ginebra, Loma Gorda, 3°43'N 76°16'W, 1100m, 26.vi.2003, J. Martinez/ Trampa casera con miel, En *Citrus* sp. (Rutacea)-limon. VENEZUELA: 1 f#, Bolivar, 83 km S El Dorado, 900m, 28.vi.1984, D. S. Bogar (USNM). BRAZIL: 4 f#, Amazonas, Manaus, RFA Ducke, VSR banana- peixe-figado, 18-26.ix.2010, Cordeiro, Grisales, Guedes&Haseyama (DZUP). ECUADOR: 1 m#, Los Rios, Vic. Quebrada, iii.iv.1955, E. N. O'Rourke (USNM).

Distribution. Panama, Colombia*, Venezuela*, Brazil*, Ecuador* (Fig. 128).

Glyphidops durus (Cresson)

(Figs. 79–86, 129)

Nerius durus Cresson, 1926: 260.

Oncopsia dura; Hennig, 1937: 253; Aczél, 1949: 378 Aczél, 1961: 319.

Diagnosis. Head setae rather long, with the postocellar setae conspicuously larger. Pedicel short, with one outstanding seta on dorso-apical margin. First flagellomere ovate, with rounded apex and apical arista. Thorax with two dorsal gray vittae, separated by one wide median yellowish brown stripe, which widens after transversal sutura and to the scutellum. Posterior notopleural seta inserted in a very small and velvet tubercle. Femora yellow with three conspicuous pale brown rings. Tibiae yellow and darker at the apex; with one median pale brown ring, more conspicuous at mid and hind tibiae. Halter whitish yellow.

Male. Body length (excluding antenna and epandrium) 6.0–7.4 mm. Wing length 5.0–6.0 mm and width 1.4–1.7 mm. Brown species with partly yellow head, thorax and legs; pleuron brown and dull with violet bluish reflections (Fig. 79).

Head. Moderately elongate in lateral view; 1.2–1.3 mm length and 1.1–1.2 mm width. Frons relatively narrow; anterior margin straight; frontal vitta ochraceous yellow pruinose, except for one brown “V” shaped stripe from the anterior margin of frons to converge in front

of the ocellar tubercle (in some specimens not conspicuous and only perceptible two lateral brown stripes on anterior margin and the brown stripe surrounding the ocellar tubercle) (Fig.81). Fronto-orbital plate black whitish pruinulent or with one yellow spot on anterior half or completely yellow; fronto-orbital setae increasing in size posteriorly, mainly equally spaced, but the two anterior pairs may be spaced by half the distance from posterior pair. Postocellar setae convergent, length 2.3 times the transversal diameter of ocellar tubercle; inner vertical setae slightly convergent, subequal to outer vertical setae; outer vertical setae divergent, 60% as long as postocellar setae length. Ocellar tubercle blackish brown, triangular and somewhat raised, fused to the brown vitta of frons and posteriorly to the brown vittae of occiput; ocelli rounded, yellow and small, all same size. Face yellow, relatively narrow and straight. Gena subshiny whitish yellow and narrow, concave in the point of join with face and convex below genal seta; with one black genal seta, one third as long as postocellar seta. Postgena whitish yellow pruinulent; discretely narrows posteriorly; posterior margin wide, with row of three or four yellow setulae. Occiput brown; height 2.8–3.3 times length (Fig. 82). Antennal base brown with yellow and separated inner margins and black distal margin. Antennae length, 60% of head length. Scape testaceous yellow, darkened on dorsal and lateral margins; 0.1 mm long. Pedicel paler than scape; 0.1–0.2 mm long; inner process of pedicel finger-like and relatively wide (Fig. 83). First flagellomere ochraceous and ovate; length 1.5–1.7 times width. Arista apical, blackish brown.

Thorax. Brown pruinulent; dorsal median brown stripe widens after transversal suture and towards the scutellum; with one faint yellow stripe throughout the lateral margin of mesoscutum, the postpronotal lobe, the dorsal margin of anepisternum and the notopleuron to the alar base. Posterior notopleural seta length, 90% of scutellar seta length and inserted on a very small tubercle. Supra-alar seta subequal to postalar seta. Postalar seta curved and 80% as long as scutellar seta. Dorsocentral setae subequal to scutellar seta. Scutellum brown pruinulent with a median yellow stripe; lateral margins faintly angulate; distal margin rounded and narrow, with one pair of large apical setae, 80-90% as long as scutellum length. Prosternum subshiny yellowish brown; linear with curved lateral margins and rounded anterior margin. Proepisternum bare. Katepisternum brown with violet-bluish reflections and one dorsal white pruinulent spot; with one black and straight seta equal to notopleural seta. Katatergite same color as pleuron or yellow; length is 1.5 times width. Anatergite and mediotergite densely white pruinulent.

Legs. Fore coxa with one or two spine-like setae on anterolateral margin. Mid and hind coxae, each with one lateral seta and one anteroapical seta. All femora yellow with three

conspicuous pale brown rings. Mid femur anterior margin with one or two median setae. Tibiae yellow with one median pale brown ring, more conspicuous at mid and hind tibiae.

Wing (Fig.84). Yellowish with brownish veins. Cells r_1 and r_{2+3} darker towards apex and anterior margin. Margin of upper and lower calypter whitish yellow. Halter whitish yellow.

Abdomen. Same color as thorax; with lateral margin yellow, wide and scarcely setulose. Syntergosternum 7+8 shiny yellowish brown; half epandrium length. Epandrium darker than syntergosternum 7+8; with white pruinescence and brown setulae; extends to level of anterior margin of tergite 4. Anterior lobe of surstylus shiny yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus subshiny yellow, narrow and relatively large; with white pruinescence and yellow setulae (Figs. 85).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscapae) 5.2–7.4 mm (Fig. 80). Wing length 4.3–6.1 mm and width 1.3–1.6 mm; in darker females, one dark brown spot at the end of vein R_1 . Prosternum narrower and linear. Fore coxa without setae on anterolateral margin. Oviscapae brown with apex yellow and one ventral yellow stripe; with white pruinescence and brown setulae; length 1.9–2.2 times maximum width (Fig. 86). Segment 8 shiny brown.

Comments: This species belong to a group of morphologically very similar species, along with *G. dispar* and *G. neuter*. Can be found several intraspecific and interspecific differences, like the presence of katapisternal seta as appointed by Aczél (1961) in his key and the general coloration of thorax, which at first sight, seems like one easy trait to separate species, but when a big number of specimens is examined, is possible to conclude that there are different combinations of these characters that can be found interspersed between the three species.

Type material. Holotype: f#, Costa Rica, Higuito, San Mateo/ Pablo Schild Coll. (USNM).

Other material examined. COSTA RICA: 1 m#, Prov. Alajuela, PN Volcan Tenorio, Valle Rios Roble, Palmital arriba la caliza, 1000-1100m, 16.ix–6.x.2006, Malaise, J. A. Azofeifa; 1m# 1f#, Alajuela, Upala, Bijagua, PN Volcán Tenorio Send. Heliconias, 700m, 1–3.x.2002, Libre, J. D. Gutierrez; 1 f#, Prov. Alajuela, PN Volcán Tenorio, Estación Pilou, 1.5 SO C. Camela, 700–800m, 5.vii–17.viii.2006, Malaise, J. A. Azofeifa; 1 f#, Prov Puntarenas, PN La Amistad, Estacion Altamira, 1320m, 1–15.xi.1994, Malaise, M. Segura; 2 f#, Prov. Puntarenas, Buenos Aires, Estación Altamira, Sendero a Casa Coca, 1700m, 4.iii–14.iv.2000, Malaise, D. Ruby; 1 f#, Prov. Puntarenas, Buenos Aires, Estación Altamira, Cerro Biolley,

1766m, 4.i–3.ii.2000, Malaise, D. Ruby (INBio); 1 m#, Puntarenas, Prov. Osa Península, 3.5mi S Rincon, 8°42'N 83°29'W, 1.iii.1969/ D. C. Bentz Coll.; 2 f#, Prov. Puntarenas, 5km NW Puerto Jimenez, 10m, 8°33'N 83°21'W, xi.1991, Malaise, P. Hanson; 1 f#, Prov. Puntarenas, Res. GolfoDulce, Rincón (3 km SW), x.1989–iii.1990, P. Hanson. PANAMA: 1 m#, San Blas, Nusagandi, 350m, 9°20'N 78°56'W, 1–6.iii.1985, Flint & Louton; 3 f#, Bananas, ix.8–22.1932 (USNM). COLOMBIA: 1 m#, Antioquia, Nariño, Vda. Puente Linda, Cerca al Rio Samaná, 5°34'01.9"N 75°06'47.7"W, 700m, 24–26.vii.2009, A. Bustamante; 1 f#, Antioquia, San Luis, Corr. Rio Claro, RN Cañón del Rio Claro, VSR pez, 5°54'02"N 74°51'25"W, xi.2009, I. Ceballos (CEUA); 1f#, Chocó, PNN Los Katíos, Centro Administrativo Sautatá, Fuera de bosque, 7°51'N 77°8'W, 30m, Malaise, P. López (IAvH).

Distribution. Costa Rica, Panama, Colombia* (Fig. 129).

Glyphidops flavifrons (Bigot)

(Figs. 87–94, 130)

Nerius flavifrons Bigot, 1886:373; Wulp, 1897: 364; Cole, 1923: 476; Cresson, 1930: 316.

Oncopsia mexicana Enderlein, 1922:153.

Brachycrotaphus flavifrons; Czerny, 1932:301.

Oncopsia flavifrons; Hennig, 1937: 252 Aczél, 1949: 378; Aczél, 1961: 322

(missidentification).

Oncopsia seductrix Hennig, 1937. **New synonymy.**

Diagnosis. Frontal vitta ochraceous yellow pruinulent. Ocellar tubercle blackish brown, rounded and raised; well delimited by color behind the yellow frontal-vitta and posteriorly fused to the brown vittae of the occiput. Postgena whitish yellow pruinulent; not narrowing posteriorly; with posterior margin wide and rounded ventrally. Occiput brown, with one yellow submedian vitta, being the ventral brown vitta very narrow. Thorax with two dorsal gray vittae separated by one wide median brown stripe, that narrows after transversal suture towards scutellum or fades (specimens from the Amazon). Pleuron very variable in color, from pale brown with one yellow transversal stripe to rather yellow.

Male. Body length (excluding antenna and epandrium) 6.3–8.2 mm. Wing length 4.8–6.4 mm and width 1.4–1.6 mm. Yellowish brown or paler species with partly yellow head and thorax; pleuron partly yellow to almost yellow and dull (Fig. 87).

Head. Faintly elongate; 1.1–1.6 mm length and 1.0–1.1 mm width. Frons wide; anterior margin straight; frontal vitta ochraceous yellow pruinulent (Fig.89). Fronto-orbital

plate blackish brown and white pruinescent; may present one yellow spot on anterior half, between two anterior pair of fronto-orbital setae or be rather yellow; narrowing towards anterior margin; fronto-orbital setae increasing in size posteriorly, the two anterior pairs spaced by half or less the distance from posterior pair. Postocellar setae slightly convergent, length 1.7–2.5 times the transversal diameter of ocellar tubercle; inner vertical setae slightly convergent, equal to outer vertical setae; outer vertical setae divergent, subequal to postocellar setae. Ocellar tubercle blackish brown, rounded and raised; well delimited by color behind the yellow frontal-vitta and posteriorly fused to the brown vittae of occiput; ocelli ovate and large, all same size. Face yellow, relatively wide and rounded. Gena subshiny whitish yellow relatively narrow; ventral margin rounded; with one genal seta, 80% as long as postocellar seta length. Postgena whitish yellow pruinescent; not narrowing posteriorly; with posterior margin wide and rounded ventrally; posterior margin with row of five or six yellow setulae. Occiput brown, with one yellow submedian vitta very wide, being the ventral brown vitta very narrow; length 50–60% height (Fig. 90). Antennal base brown with yellow and separated inner margins. Antennae 50–60% of head length. Scape testaceous yellow, slightly darker on lateral margin; 0.1–0.2 mm long. Pedicel same color as scape; 0.2 mm long; inner process of pedicel finger-like and relatively narrow (Fig. 91). First flagellomere ochraceous and ovate; 0.4–0.5 mm long; length 1.6–1.8 times width. Arista subapical, brown and bare.

Thorax. Pale brown pruinescent; dorsal median brown stripe narrows after transversal suture towards scutellum or fades, as in specimens from the Amazon; with one faint lateral yellow stripe on mesonotum from postpronotal lobe to dorsal margin of anepisternum and ventral margin of the notopleuron to the alar base. Pleuron very variable in color, from pale brown with one yellow transversal stripe to rather yellow. Posterior notopleural seta length, 60% of scutellar seta length; inserted on a small blackish brown tubercle. Supra-alar seta slender and subequal to postalar seta. Postalar seta equal to dorsocentral seta. Dorsocentral setae, 70% as long as scutellar setae length. Scutellum pale brown or yellowish brown pruinescent with a median yellow stripe; lateral margins faintly angulate; distal margin rounded, with one pair of strong apical setae, 80–90% as long as scutellum length. Prosternum subshiny yellowish brown, cuneate. Proepisternum with one short spine-like seta above fore coxa. Katepisternum variable in color; with one black and straight seta, which may be absent in several males. Katatergite yellow; length is 1.6 times width. Anatergite and mediotergite rather yellowish brown or with anatergite yellow.

Legs. Fore coxa with two spine-like setae (rarely one) on anterolateral margin. Mid and hind coxae, each with one lateral seta and one anteroapical seta, sometimes mid coxa with

only one lateral seta. All femora rather ochraceous yellow with one distomedian brown ring on hind femur, sometimes perceptible at mid femur or even fore femur. In best color defined species, it is possible to appreciate that the rings on femora are actually as follows: fore femur with two rings, one basal inconspicuous and one median conspicuous only at posterior margin; on mid femur are three rings: one basal very weak, almost inconspicuous, one distomedian and one subapical and three rings on hind femur: one at base, one distomedian and one subapical; rather weak on fore and mid femora. Mid femur anterior margin with three or four median setae.

Wing (Fig.92). Brownish with brownish veins. Basicosta with one ventral conspicuous short and slender seta. Margin of upper and lower calypter whitish yellow. Halter whitish yellow.

Abdomen. Pale brown to yellow; dorsal margin with one median yellow stripe; lateral margin yellow and scarcely setulose. Tergite 6 somewhat longer. Syntergosternum 7+8 shiny yellow; half epandrium length. Epandrium same color as syntergosternum 7+8; dorsal and lateral margins distally with short whitish yellow setulae and white pruinescence; extends to level of posterior margin of tergite 4. Anterior lobe of surstylus shiny yellowish brown, linear and relatively wide with yellow setulae on apical margin. Posterior lobe of surstylus yellowish brown and relatively narrow, with dorsally white pruinescence and yellow setulae (Fig. 90).

Comments: The specimens from Ecuador, present the most pale pleuron, going from one yellow stripe throughout anepisternum and dorsal margin of katapisternum, to completely yellow; even the anepimeron and meron, which are normally darker. This specimens may present the most pale abdomen, even completely yellow. The specimens from the Amazon may be slightly paler at vertex, isolating the ocellar tubercle from the brown vittae of the occiput. Aczél (1961) suggested that *G. seductrix* could be a synonym of either *G. limbatus* or *G. flavifrons*, but as he didn't get to place the species on his Revision of American Neriidae. . Here is proposed a synonym: *G. seductrix*, after compare the holotype material of *G. seductrix* with specimens of *G. flavifrons* from Central and South America, founding that *G. seductrix* corresponds to a group of paler specimens in *G. flavifrons*.

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscape) 5.9–8.0 mm (Fig. 88). Wing length 4.8–6.4 mm and width 1.4–1.8 mm. Fore coxa with one seta on anterolateral margin. Prosternum linear. Fore femur with anteroventral and posteroventral spine-like setae on posterior half. Oviscape yellowish brown with one dorsal brown stripe narrowing posteriorly; with white pruinescence and brown setulae; length twice maximum width (Fig. 94). Segment 8 shiny brown.

Type material. Holotype: f#, (examined in photographs) Mexico, Vera Cruz (OUM). *Oncopsia mexicana* Enderlein, 1933, synonym, holotype f#, Mexico/ Type/ *Oncopsia mexicana*, f#, Dr. Enderlein, 1922 (ZMHB). *Oncopsia seductrix* Hennig, 1937, synonym, holotype f#, Bolivia, Mapiri, iv.1903, S. Carlos, 800m/ Type, *Oncopsia seductrix* Hennig/ Staatl. Museum für Tierkunde, Dresden, Coll. W. Schnuse, 1911 (SMT).

Other material examined. MEXICO: 1 f#, Sonora, Alamos, 27.ii.1963, P. H. Arnaud; 1 ♀, Veracruz, Catemaco, 7–9.viii.1964, P. J. Spangler. HONDURAS: 1 m# 2 f#, Pie de la Cuesta, San Pedro Sula/ 8.iv.1957, Zahote y Citrus Aguiluz. NICARAGUA: 1 f#, Santa Maria de Ostuma/ xi. 1959, N. L. Krauss; 1 f#, El Castillo, G. G. R., 26.v.1961. COSTA RICA: 2 m# 3 f#, Heredia, 1200m, el Luko Hilje-Quiros, ex. Aristolochia sp.; 2 f#, Arajuela, Prov. Bijagua, Albergue de Heliconias, 10°42'48"N 85°02'27"W, 750–800m, 22.vi.2000, N. E. Woodley; 2 f#, Prov. Cartago, Pejibaya, 24–25.iii.1987, W. E. Steiner; 1 m#, Prov. Guanacaste, 14km NE Tilaran, 5.vi.1973/ Erwin & Hevel Central American Expedition. PANAMA: 8 m# 1f#, Ancon, Canal Zone, 26.iii–20.iv.1926/ C. T. Greene Coll.; 8 m# 8 f#, Canal Zone, Barro Colorado Isl., viii–ix.1936/ Friut fly trap/ J. Zetek. PANAMA: 1 f#, Canal Zone, Barro Colorado Isl., 21.viii.1978, N. E. Woodley; 1 f#, La Campana, x–xi.1937, J. Zetek (USNM). COLOMBIA: 1 m#, Antioquia, Carepa, Tunelapa, CORPOICA, 7°46'46"N 70°40'24"W, VSR. visceras de pollo, 8.ii.2009, N. Uribe; 1 m#, Antioquia, Carepa, Resguardo Tunelapa, VSR fruta, 8.ii.2009, N. Uribe; 1 m#, Antioquia, La Pintada, Hda. Montenegro, Comfenalco, 6°43'24"N 75°37'26"W, 770m, Potrero, VSR. cebolla, 15–16.ii.2007, M. C. Velez; 1 m# 2 f#, Antioquia, La Pintada, Hda. Montenegro, Comfenalco, 5°43'24"N 75°37'15"W, 850m, Bosque, VSR. cebolla-pezu, 15–16.iii.2007, N. Uribe; 1 f#, Antioquia, Maceo, Reserva Cañón del Rio Alicante, Bosque nativo, 400m, VSR pezu, 6.viii.2009, M. Wolff; 1 f#, Antioquia, San Luis, Proyecto Porvenir, Rio Samaná Norte, 400m, 22–26.viii.2011, Manual, S. Angel & C. Bota; 1 f#, Antioquia, Nariño, Vda. Puente Linda, Cerca al rio Samaná, 5°34'01.9"N 75°05'47.7"W, 700m (aprox.), 24–26.vii.2009 (CEUA); 3 f#, Antioquia, Santa Bárbara, 27.x.1988, D. López & T. McPhail (USNM); 1 m# 1 f#, Caldas, Norcasia, El Tigre, Bosque, VSR pezu, 19.ii.2000, Grupo de Entomología; 1 f#, Chocó, Nuquí, Corr. Jobi, Patio de casa a 50m de playa, VSR fruta, 6.viii.2006, P. Duque & M. Wolff; 2 m#, Putumayo, PNN. La Paya, Loma Alta, 0°6'S 74°58'W, 350m, Malaise, 18.vi–1.vii.2003, R. Cobete; 1 m# 1 f#, Amazonas, PNN. Amacayacu, Matamata, 3°41'S 70°15'W, 150m, Malaise, 17.ix–1.x.2001, D. Chota; 1 m#, Amazonas, PNN. Amacayacu, San Martin, 3°46'S 70°18'W, 150m, Malaise, 5–19.xi.2001, D. Chota. TOBAGO: 1 m#, St. John: Hermitage, 11°18.9'N 60°34.5'W, 22.iv.1994, W. N. Mathis; 1 m#, St. John, Charlotteville,

14–21.iii.1979, D. Hardly & W. Rowe. ECUADOR: 8 m# 11 f#, Napo, Prov. Limoncocha, 6–16.vi.1977, Malaise, P. J. Spangler & D. R. Givens/ Malaise; 1 f#, Napo, Tena, 27.v.1977, Malaise, P. J. Spangler & D. R. Givens; 1 f#, Zamora Chin Yantzaza, 16.vi.1976, A. Langley. BRAZIL: 1 m#, Amazonas, Manaus, Reserva Biológica Cuieiras, 18–23.xi.2009, Luminosa, M. Mendonça; 2 f#, Espirito Santo, Baixo Guandu, x.1970, P. C. Elias (DZUP)

Distribution. United States of America south to Panama, Trinidad and Tobago, Guyana, Colombia, Ecuador*, Bolivia, Brazil (Fig. 130).

Glyphidops limbatus (Enderlein)

(Figs. 95–102, 131)

Glyphidops limbatus Enderlein, 1922: 151.

Odontoscelia striativentris Czerny, 1932; Aczél, 1961: 325 (synonymy).

Oncopsia limbata; Hennig, 1937: 253; Aczél, 1949: 378; Aczél, 1961: 325.

Diagnosis. Body rather yellowish brown. Frontal vitta ochraceous yellow pruinose except for one yellowish brown “Y” shaped stripe from the anterior margin of frons to converge in front of the ocellar tubercle, faintly diffuse to absent at the point of split. Vertex yellow around the ocellar tubercle, separating the brown vittae of occiput. First flagellomere ovate; arista apical, with conspicuous faint pubescence. Thorax with two dorsal gray vittae, separated by one wide median brown stripe, that widens after transversal suture towards scutellum. All femora yellowish brown with one inconspicuous pale brown supramedian ring.

Male. Body length (excluding antenna and epandrium) 6.5–8.8 mm. Wing length 4.8–6.8 mm and width 1.4–1.9 mm. Yellowish brown species with partly yellow head and thorax; pleuron partly yellow and dull (Fig. 95).

Head. Moderately elongate; mm length and 1.1–1.5 mm width. Anterior margin of frons, straight; frontal vitta ochraceous yellow pruinose except for one yellowish brown “Y” shaped stripe from the anterior margin of frons to converge in front of the ocellar tubercle, faintly diffuse to absent at the point of split (Fig. 97). Fronto-orbital plate yellow on anterior half, yellowish brown in posterior half and white pruinose; narrowing towards anterior margin; fronto-orbital setae increasing in size posteriorly, the two anterior pairs spaced by half the distance from posterior pair. Postocellar setae convergent, length 2.3–2.5 times the transversal diameter of ocellar tubercle; inner vertical setae slightly convergent, equal to outer vertical setae; outer vertical setae divergent, subequal to postocellar setae. Ocellar tubercle velvet blackish brown, rounded and somewhat raised, fused to the yellowish

brown vitta of frons and isolated from the vittae of the occiput; ocelli ovate and large, all same size. Face yellow, wide and straight. Gena subshiny whitish yellow relatively wide, concave in the point of join with face and ventrally rounded; with one black genal hair-like seta, 70% as long as postocellarseta length. Postgena whitish yellow pruinulent; narrowing posteriorly; posterior margin with row of five or six yellow setulae. Occiput brown; height 2.5–2.7 length (Fig. 98). Antennal base brown with yellow and separated inner margins. Antennae 60–80% of head length. Scape testaceous yellow, darkened on lateral margin; 0.2 mm long. Pedicel paler than scape; 0.2 mm long; with one outstanding seta dorso-apical; inner process of pedicel finger-like and relatively wide (Fig. 99). First flagellomere ochraceous and ovate; darker on dorsal and apical margins; length 1.5–1.7 times width. Arista apical, brown with conspicuous faint pubescence.

Thorax. Brown pruinulent; dorsal median brown stripe widens after transversal suture towards scutellum; with one faint yellow stripe throughout postpronotal lobe, dorsal margin of anepisternum and ventral margin of the notopleuron to the alar base. Posterior notopleuralseta length, equal or slightly shorter than scutellar seta. Supra-alar seta subequal to postalar seta. Postalar seta subequal to scutellar seta. Dorsocentral setae half or more as long as scutellar setae length. Scutellum yellowish brown pruinulent with a median yellow stripe; lateral margins faintly angulate with one pair of hair-like subapical setae; distal margin truncated and wide, with one pair of strong apical setae, 70% as long as scutellum length. Prosternum subshiny yellowish brown; linear with curved lateral margins and rounded anterior margin, separated from the proepisternal plate by a wide membranous area. Proepisternum bare. Katepisternum brown with one dorsal white pruinulent spot; with one black and straight seta equal to postalar seta. Katatergite yellow; length is 1.8–2.0 times width.

Legs. Fore coxa with two spine-like setae on anterolateral margin. Mid and hind coxae, each with one lateral seta and one anteroapical seta accompanied by several weak setulae. All femora yellowish brown with one inconspicuous pale brown supramedian ring. Mid femur anterior margin with three median setae.

Wing (Fig. 100). Brownish with brownish veins. Apex widely rounded. Margin of upper and lower calypter whitish yellow. Halter whitish yellow.

Abdomen. Dark yellowish brown; in dorsal margin with one median yellow stripe and lateral margin yellow and setulose. Syntergosternum 7+8 shiny yellowish brown; half epandrium length. Epandrium same color as tergite 8, white pruinulent with shiny base; laterally with short yellowish brown setulae; extends to level of anterior margin of tergite 4.

Anterior lobe of surstylus shiny yellowish brown, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus shiny yellow and relatively narrow, with dorsally white pruinescence and yellow setulae (Fig. 101).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscapae) 6.2–8.0 mm and rather paler than male (Fig. 96). Wing length 6.1–6.8 mm and width 1.8–2.2 mm. Fore coxa without setae on anterolateral margin. Oviscapae yellowish brown with lateral margin and apex yellow; with white pruinescence and brown setulae; length twice the maximum width (Fig. 102). Segment 8 shiny brown.

Type material. Holotype: f#, Brasil. Santa Catarina, E. Ule V. (ZMHB).

Other material examined. BRAZIL: 1 m#, Rondonia, Vilhena, 13.x.1986, C. Elias, Polonoroeste (DZUP); 1 m#, São Paulo, Guarujá, i.1942, M. Carrera; 1 f#, São Paulo, R. Paraná, Porto Cabral, 1–25.iv.1944, Trav. Fo. & Carrera & E. Dente; 1 f#, Rio de Janeiro, Angra do Reis, Faz-Japuhya, L. T. F., viii.1945 (MZUSP); 1 f#, Rio de Janeiro, i.1939, R. C. Shannon; 2 m# 1 f#, Rio de Janeiro, x.1937–i.1938, R. C. Shannon; 1 f#, Rio de Janeiro, Mangaratiba/ Serviço febre amarela, M. E. S; 1 f#, Rio de Janeiro, Distrito Federal/ x.1937/ Serviço febre amarela, M. E. S (USNM); 5 m#, Rio de Janeiro, Distrito Federal/ ix–x.1938/ Serviço febre amarela, M. E. S; 1 f#, Rio de Janeiro, x.1938/ YellFevServ, M. E. S., R. C. S. Shannon (MZUSP).

Distribution. Brazil (Fig. 131).

Glyphidops neuter (Hennig)

(Figs. 103–110, 132)

Oncopsia neutra Hennig, 1937: 254; Aczél, 1949: 378; Aczél, 1961: 238.

Diagnosis. Frontal vitta rather testaceous yellow. Two anterior pairs of fronto-orbital setae spaced one third the distance from posterior pair. First flagellomere ovate with truncate apex and apical brown and bare arista. Katepisternum with one dorsal yellow spot, whitish pruinescent. All femora testaceous yellow; mid femur with two median setae on anterior margin.

Male. Body length (excluding antenna and epandrium) 5.2–6.1 mm. Wing length 4.4–4.8 mm and width 1.3–1.4 mm. Brown species with partly yellow head, thorax and legs; pleuron brown and dull, with violet-bluish reflections (Fig. 103).

Head. Moderately elongate; 1.0 mm length and 1.1 mm width. Frons narrower on the middle, widening towards anterior margin; anterior margin straight; frontal vitta testaceous

yellow (Fig.105). Fronto-orbital plate black whitish pruinulent; narrowing anteriorly; shiny yellowish brown in the point of join with parafacial; fronto-orbital setae increasing in size posteriorly, the two anterior pairs spaced by one third the distance from posterior pair. Postocellar setae curved but almost parallel, length twice the transversal diameter of ocellar tubercle; inner vertical setae straight, equal to outer vertical setae; outer vertical setae curved and divergent, 80% as long as postocellar setae length. Ocellar tubercle velvet blackish brown, triangular and not raised; clearly delimited by color from the testaceous yellow frontal vitta and fused posteriorly to the brown vittae of the occiput; ocelli yellow, rounded, small and equal. Face yellow, relatively narrow and straight; with one row of brown setula on ventral margin. Gena whitish yellow, velvet and narrow; ventral margin rounded and concave at the point of join with parafacial; with one genal seta, same length as postocellar seta. Postgena whitish yellow pruinulent; discretely narrowing posteriorly and posterior margin relatively wide; with row of four or five yellow setulae. Occiput brown; length is half height (Fig. 106). Antennal base brown with yellow and separated inner margins. Antennae length, 60% of head length. Scape testaceous yellow, darkened on lateral margin; 0.1 mm long. Pedicel same color as scape; 0.1–0.2 mm long; with one outstanding setae dorsoapical; inner process of pedicel finger-like and relatively wide (Fig. 107). First flagellomere ochraceous and ovate with truncate apex; dorsal and ventral margins almost parallel; length 1.4–1.7 times width. Arista apical, blackish brown.

Thorax. Brown pruinulent with violet-bluish reflections; dorsal median brown stripe widens and fades after transversal suture; with one yellow stripe covering the postpronotal lobe and the dorsal margin of anepisternum. Posterior notopleural seta length, half of scutellar seta length and inserted on a very small pruinulent tubercle. Supra-alar seta slightly curved and subequal to postalar seta. Postalar seta slightly curved and same length as dorsocentral seta. Dorsocentral setae 70% as long as scutellar seta length. Scutellum brown pruinulent with a median yellow stripe; lateral margins slightly rounded with one pair of hair-like subapical setae; distal margin truncate and wide, with one pair of apical setae, 70% as long as scutellum length. Prosternum subshiny whitish yellow; linear with wide and rounded anterior margin. Proepisternum bare. Katepisternum with one dorsal yellow spot, whitish pruinulent; with one black and straight seta equal to notopleural seta or absent. Katatergite same color as pleuron; length is 1.4 times height.

Legs. Fore coxa with two spine-like setae on anterolateral. Mid and hind coxae, each with one lateral seta and one anteroapical seta. All femora testaceous yellow. Mid femur with two median setae on anterior margin.

Wing (Fig. 108). Yellowish with brownish veins. Cells r_1 and r_{2+3} darker towards apex and anterior margin. Margin of upper and lower calypter whitish yellow. Halter whitish yellow.

Abdomen. Same color as thorax and ventrally without violet-bluish reflections; with short black setulae; with lateral margin yellow, wide and setulose. Syntergosternum 7+8 shiny yellowish brown; half epandrium length. Epandrium same color as syntergosternum 7+8; with white pruinescence and brown setulae; extends to level of posterior margin of tergite 4. Anterior lobe of surstylus shiny whitish yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus subshiny yellow, narrowing towards apex and relatively large; with white pruinescence and brown setulae (Fig. 109).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscape) 5.8–7.4 mm (Fig. 104). Wing length 4.8–6.4 mm and width 1.4–1.8 mm. One female from Colombia with fronto-orbital plate yellow. One female from Colombia and one from Brazil with one weak brownish vitta surrounding the ocellar tubercle. Antenna as male, length is 60% of head length; scape 0.1 mm long; pedicel 0.1–0.2 mm long. First flagellomere 0.4–0.5 mm long; length 0.2–0.3 width. Prosternum narrower and lineal. Femora may be yellowish brown with paler yellow subapical ring, resembling a paler leg of *G. dispar*, but always rather yellow. Oviscape brown with lateral and posterior margins paler yellow; with white pruinescence and brown setulae; length 2.0–2.3 times maximum width (Fig. 110). Segment 8 shiny brown.

Comments: The general morphology and coloration of this species is fairly constant, unlike his morphologically closest species *G. durus* and *G. dispar*. This species is the most differentiated and can be quickly recognized by the characters in the key and diagnosis, unlike the other two species, which can lead to some confusion by the concatenation of characters as the shape of the firstflagellomere, the presence and size of setae and the overall coloration, especially frontal vitta and dorsal thorax; all well-defined and constant characters to *G. neuter*.

Type material. Holotype: m#, Perú, Meshagua, 2.x.1903, Urabamba river (SMT). **Paratypes:** 2 m#, Perú, 150m, 23–24.xi.1903, Pachitea-Mund; 2 f#, Bolivia, Maipiri, 12–13.i.2003, S. Carlos, 800m; 1 f#, Bolivia, Mapiri, iii.1903, Sarampioni, 700m (SMT)

Other material examined. COSTA RICA: 1 f#, Turrialba, 15–19.vii.1965. P. J. Spangler (USNM). COLOMBIA: 1 f#, Chocó, PNN Los Katíos, Centro Administrativo Satuatá, Fuera del bosque, 7°51'N 77°8'W, 30m, Malaise, 4–20.viii.2004, R. Yépez; 1 f#, Chocó, PNN Los Katíos, Centro Administrativo Satuatá, Centro del bosque, 7°51'N 77°8'W,

30m, Malaise, 15.viii–12.ix.2003, P. López; 1 f#, Putumayo, PNN La Paya, Loma Alta, 0°6′N 74°59′W, 350m, Malaise, 15–30.v.2003, L. M. Magno; 1 m#, Vaupés, Estación Biológica Mosiro-Itajura (Caparú), Centro Ambiental, 1°4′S 69°31′W, 60m, Malaise, 19–25.v.2004, J. Cortés; 1 f#, Vaupés, Estación Biológica Mosiro-Itajura (Caparú), Centro Ambiental, 1°4′S 69°31′W, 60m, Malaise, 20.i–01.ii.2003, M. Sharkey & D. Arias; 1 m#, Amazonas, PNN Amacayacu, Matamata, 3°41′N 70°15′W, 150m, Malaise, 7.ix–1.x.2001, D. Chota; 3 f#, Amazonas, PNN Amacayacu, San Martín, 3°46′N 70°18′W, 150m, Malaise, 5–19.xi.2001, D. Chota (IAvH). VENEZUELA: 1 f#, T. F. Amaz. Cerro de la Neblina, Basecamp, 0°50′N 66°9′W, 140m, 1–10.iii.1984, D. Davis & T. McCabe. BRAZIL: 2 f#, Amazonas, Manaus, RFA. Ducke, VSR banana, 18.ix.2010, Cordeiro, Grisales, Guedes & Haseyama (DZUP); 1 f#, São Paulo, Praia de Ipiranga, x.1959 (MZUSP); 1 f#, Rio de Janeiro, Angra dos reis/ 17.viii.1972, H. S. Lopes; 1 f#, Paraná, Guaratuba, 7.xi.1968, C. Dipterologia (DZUP).

Distribution. Costa Rica*, Colombia*, Venezuela*, Peru, Bolivia, Brazil*, Argentina (Fig. 132).

Glyphidops pluricellatus (Schiner)

(Figs. 111–118, 133)

Nerius pluricellatus Schiner, 1868: 248.

Dyctionerius pluricellatus; Enderlein, 1922: 159; Cresson, 1930: 313; Hendel, 1933: 59; Hennig, 1937: 261; Aczél, 1949: 382.

Glyphidops pluricellatus; Aczél, 1961: 329.

Diagnosis. Partly brown and yellow; pleuron brown pruinose, with patches of yellow pruinescence. Head not elongate, with antennal bases conspicuously reduced. Occiput rather yellow, with brown vittae reduced to dorsal and ventral spots separated by one yellow median vitta very wide; with a row of black short and slender setulae towards posterior margin of the head. Ventral margin of gena widely rounded. Thorax rather brown pruinose with yellow pruinose spots. Veins R_{2+3} and M_1 , with 11 and 8 intercalated cross-veins respectively, associate to one brown spot.

Male. Body length (excluding antenna and epandrium) 4.2–6.8 mm. Wing length 4.0–5.2 mm and width 1.4–1.8 mm. Small species, partly brown and yellow; pleuron brown pruinose with patches of yellow pruinescence (Fig. 111).

Head. Not elongate; 4.0–4.4 mm length and 5.2–6.2 mm width. Frons wide and not clearly separated from fronto-orbital plate; anterior margin straight to slightly triangular and

discretely narrower; frontal vitta ochraceous yellow with one median brown stripe from ocellar tubercle, narrowing towards antennal base (Fig. 113). Fronto-orbital plate testaceous yellow with brown spots anterior to each pair of fronto-orbital setae; with two pairs of well-developed fronto-orbital setae, the anterior pair weaker to inconspicuous and posterior pair equal to inner vertical seta; the testaceous yellow vitta of fronto-orbital plate extends to the posterior margin of head, separating the brown vittae of the occiput. Postocellar setae large and slightly convergent, length 2.2–2.5 times the transversal diameter of ocellar tubercle; inner vertical setae erect and equal to outer vertical setae; outer vertical setae long and divergent, length is 80% of postocellar setae length. Ocellar tubercle blackish brown, ovate and protuberant, isolated from the brown vitta behind the eye and fuse to the brown frontal vitta. Posterior margin of head in dorsal view, protuberant in the point of insertion of outer vertical setae. Parafacial velvet rather yellow with dorsal and ventral brown spots; conspicuously narrow. Face yellow, narrow and rounded; with one brown spot on ventral margin, near gena. Gena whitish yellow with one brown spot on the genal seta area; wide and ventrally rounded; with one genal hair-like seta 60% as long as postocellar setae length. Postgena whitish yellow pruinulent; very wide and rounded, with several short brown setulae at posterior margin. Occiput rather yellow, with brown vittae reduced to dorsal and ventral spots separated by one yellow median vitta very wide; with a row of black short and slender setulae towards posterior margin of the head; conspicuously narrow, height 7.0–8.0 times length (Fig. 114). Antennal base shiny testaceous yellow with slight yellow pruinescence in dorsal margin; conspicuously reduced. Antennae length, 80% of head length. Scape testaceous yellow, darkened on dorsal margin; with row of strong setulae on posterodorsal margin and weaker setulae on ventral margin; 0.1–0.2 mm long. Pedicel same color as scape; 0.2 mm long; with one outstanding seta dorsoapical; inner process of pedicel linear (Fig. 116). First flagellomere blackish ochraceous ovate and widely rounded apex; 0.4–0.5 mm long; length 2.0–2.3 times width. Arista apical, brown and bare.

Thorax. Rather brown pruinulent with yellow pruinulent spots; dorsal brown stripe widens behind the transversal suture and fades without reaching the prescutellar margin; with two yellow spots next to the dorsal yellowish stripes, one presutural and one postsutural; posteriorly with one conspicuous yellow spot over dorsal margin of postpronotal lobe. Anterior margin of postpronotal lobe protuberant above the postpronotal carina. Pleuron brown with faintly violet-bluish reflections and white pruinescence; thoracic setae long and slender. Posterior notopleural seta length, 80% of scutellar seta length; inserted in a small cylindrical tubercle. Supra-alar seta slightly curved and subequal to postalar seta. Postalar seta

straight and half as long as scutellar seta. Dorsocentral setae subequal to scutellar seta. Scutellum brown pruinulent with a very wide median yellow vitta that extends to posterior margin; lateral margins faintly angulate; distal margin truncated and wide with one pair of strong apical setae, half as long as scutellum. Prosternum subshiny brown with violet-blish reflections; linear with triangular or rounded apex. Proepisternum densely pruinulent with one brown longitudinal stripe on ventral margin and one small brown seta above fore coxa. Katepisternum with one yellowish pruinulent spot on dorsal margin and densely white pruinulent on ventral half; with one black and straight seta equal to postalar setae. Katatergite pruinulent and protuberant, same color as pleuron; length is 1.6–2.0 times width.

Legs. Fore coxa yellowish brown with brown spots on anterobasal, anteroventral and posterodorsal margins; whitish pruinulent; with two spine-like setae on anterolateral margin. Mid and hind coxae each with one lateral setae and one anteroapical seta. All femora testaceous yellow with gray pruinulences and three conspicuous brown rings; mid femur with three median setae on anterior margin. Tibiae yellow with one distomedian brown ring and dark apex.

Wing (Fig. 116). Brownish with brown veins. Veins R_{2+3} and M_1 , with 11 and 8 intercalated cross-veins respectively, associate to one brown spot. Margin of upper and lower calypter whitish yellow. Halter whitish yellow, with one bluish brown spot at knob base.

Abdomen. Same color as thorax, each tergite with a pair of distinct white pruinulent spots at anterior margin, which are broadly separated from lateral margin; lateral margin yellow and relatively narrow. Syntergosternum 7+8 subshiny pale yellowish brown to brown; two thirds epandrium length. Epandrium darker than syntergosternum 7+8; white pruinulent with short yellowish brown setulae; extends to level of anterior margin of tergite 3. Anterior lobe of surstylus shiny yellow, linear with rounded apex and yellow setulae on apical margin. Posterior lobe of surstylus yellow and wide, with dorsally white pruinulences and yellow setulae (Fig. 117).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscapae) 6.7–7.1 mm (Fig. 112). Wing length 4.2–4.5 mm and width 5.4–6.2 mm. Fore coxa without setae on anterolateral margin. Oviscapae rather brown with two lateral yellow spots and apex testaceous yellow; with white pruinulences and brown setulae; length 1.8–2.3 times maximum width (Fig. 118). Segment 8 shiny yellowish brown.

Comments. This is the smallest species of Neriidae along with *Eoneria aczeli* Sepúlveda & Carvalho, and as one of the species of the genus *Eoneria*, has wings with cross-veins, being the only species with this trait in the neotropical region. This species was

allocated in the genus *Glyphidops* based on the shape of the inner process of pedicel, the antero-apical seta on fore coxa and the brown and bare arista. However, different authors have noted that this is an aberrant species, which may belong to an independent genus and the lack of phylogenetic analysis difficult his precise classification (Aczél, 1961; Hennig, 1937).

Type material. Holotype: (not examined) m#, “South America” (Brazi) (NHM)

Material examined. PANAMA, 1 m#, Gamboa C. Z., Rio Agua Salud, vii.1967. W. Wirth/ Reared from *Cariudovica*; 1 m# 1 f#, Canal Zone: Barro Colorado Isl., 10–11.vi.1978, Silberglied & Aiello, on fruits of *carludovica*; 2 f#, Canal Zone, Barro Colorado Isl., 20.viii.1978/ N. E. Woodley (USNM). COLOMBIA: 5 m# 3 f#, Antioquia, Carepa, Tunelapa, CORPOICA, 7°46′46″N 76°40′24″W, 48m, VSR fruta-visceras de pollo, 8.ii.2009, N. Uribe; 1 m#, Antioquia, La Pintada, Camping Los Farallones, 5°44′48″N 75°36′34″W, 660m, VSR visceras, 26.vii.2007, M. Velez & C. Bota; 1 m#, Antioquia, Rio Claro, Camino “La Mulata”, VSR banana, 9.xi.2007, Grupo de Entomologia (CEUA); 1 f#, Antioquia, Aljibes, Providencia, 33km SW Zaragosa, 1.xii.1970, E. Pinger (USNM); 1 f#, Antioquia, Cauca Viejo, Bosque intervenido, Cerca a quebrada Los Cruces, 614m, VSR fruta, 1–5.vii.2009, M. Wolf & A. Bustamante; 1 f#, Chocó, Jobi, Patio de casa, VSR fruta, 4.viii.2006, P. Dique & M. Wolff (CEUA); 1 f#, Chocó, PNN Los Katios, Centro Administrativo Sautatá, Fuera del bosque, 7°51′N 77°8′W, 30m, Malaise, 20.xi–5.xii.2003, P. López (IAvH).

Distribution. Costa Rica, Panama, Colombia, Venezuela, Brazil (Fig. 133).

Acknowledgements

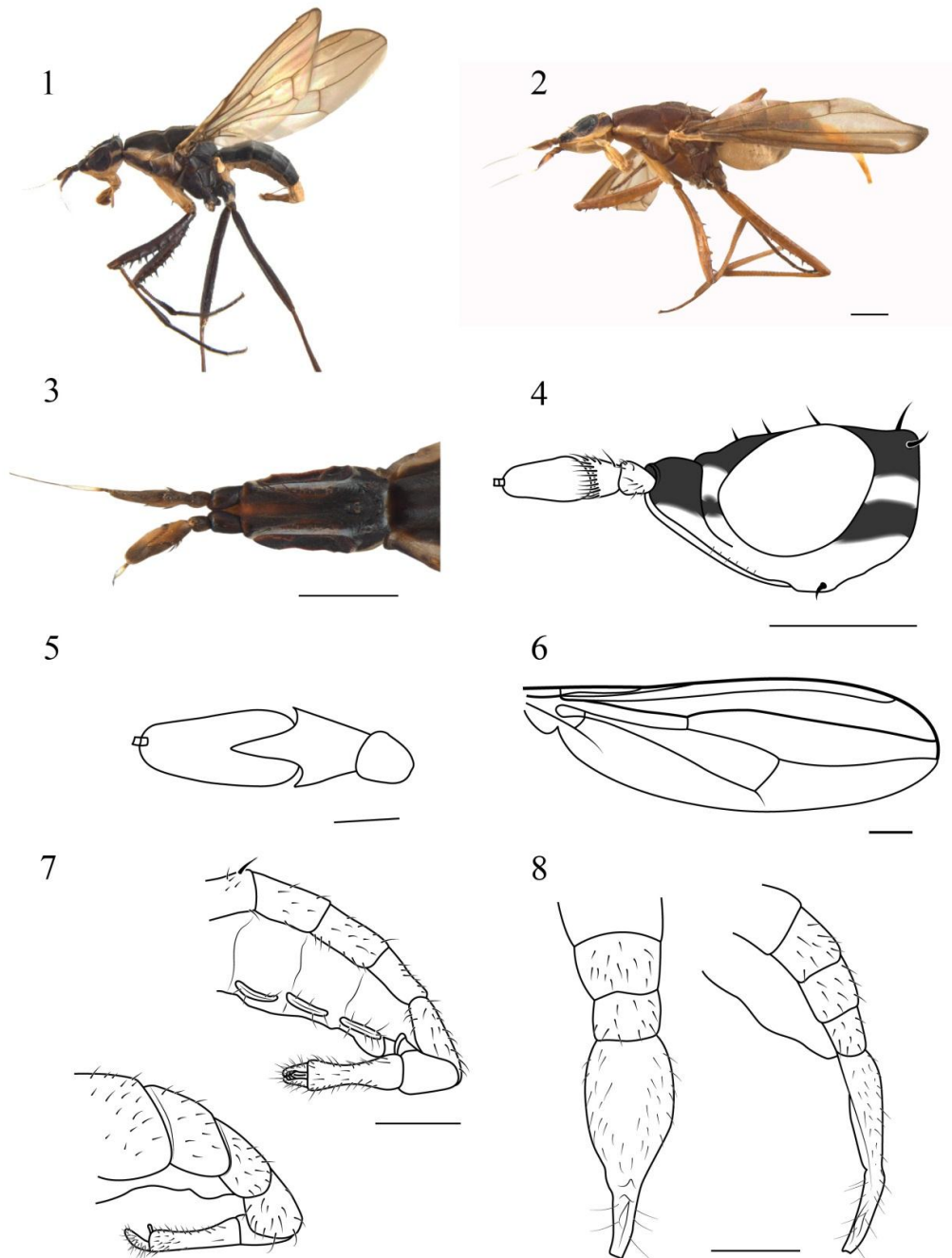
The authors would like to thank Joachim Ziegler (ZMHB), Uwe Kallweit (SMT) and Allen Norrbom and Lucrecia Rodriguez (USNM) for loan and acces to type-material. We are grateful to the curators Dr. Manuel Zumbado (INBio), Dra. Claudia Alejandra Medina Uribe (IAvH) and Dr. Carlos Einicker Lamas (MZUSP) for permission to study the material and Zoe Simmons (OUM) for sending us photographs of the type-material. Thanks are extended to Alessandre Colavite for helping in the location of the type material and the photographs of specimens in the Zoological Museum Natural History Museum of Denmark. We are thankful either to the Rede Paranaense de Coleções Biológicas (TAX-on line) for supporting the photos used here and to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the research grant (TAS proc. 130370/2011-8; CJBC proc. 304713/2011–2).

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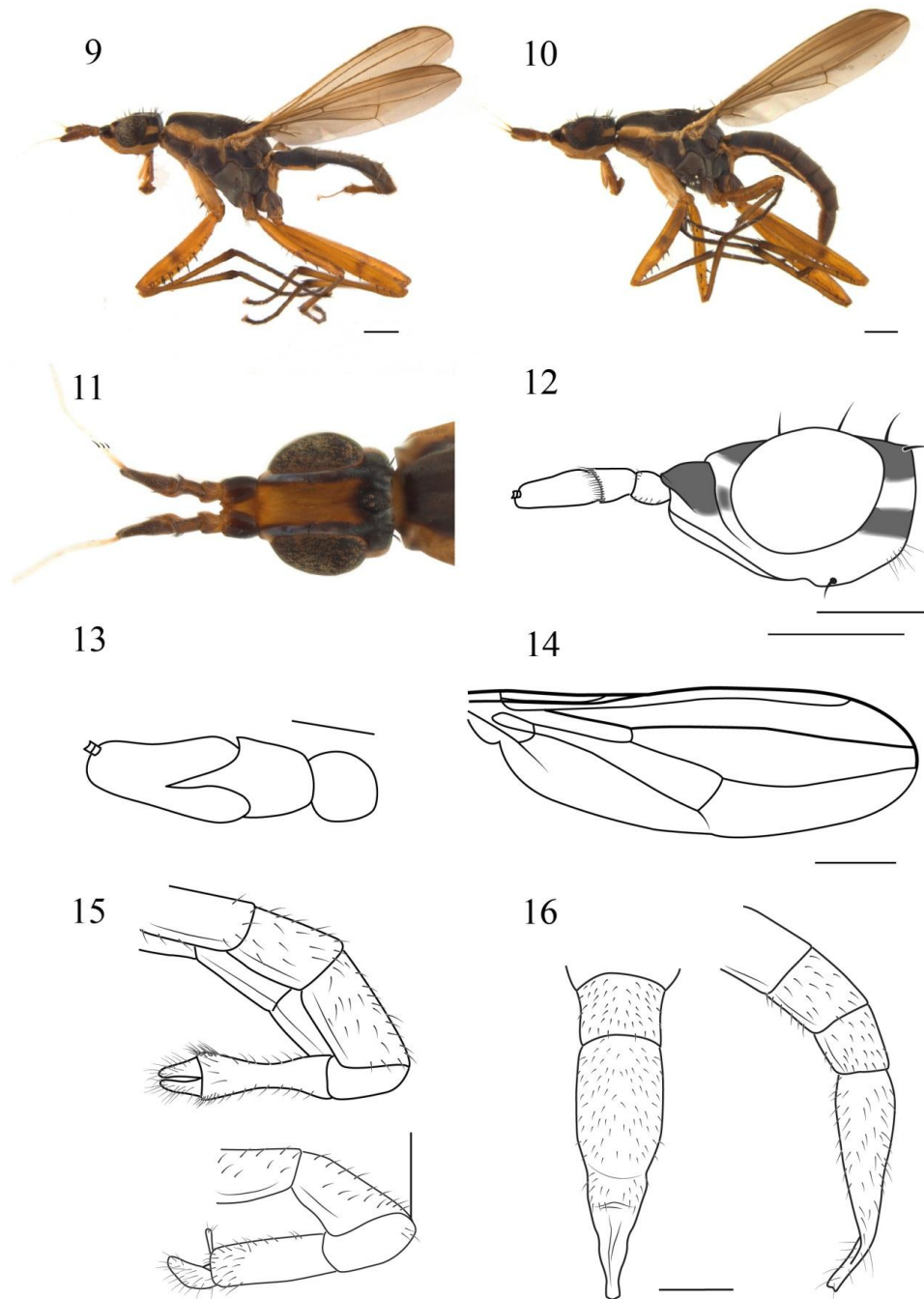
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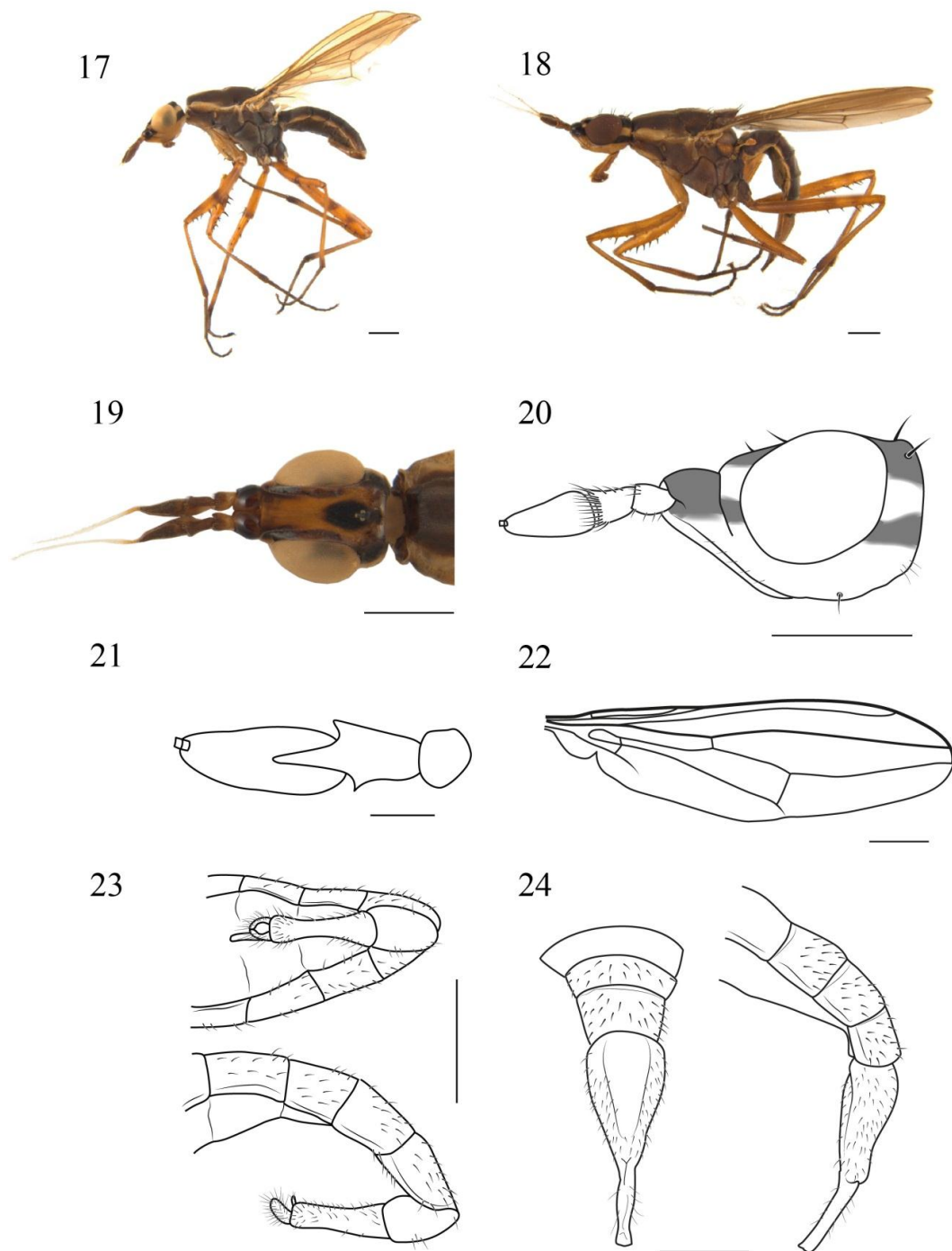
Figures



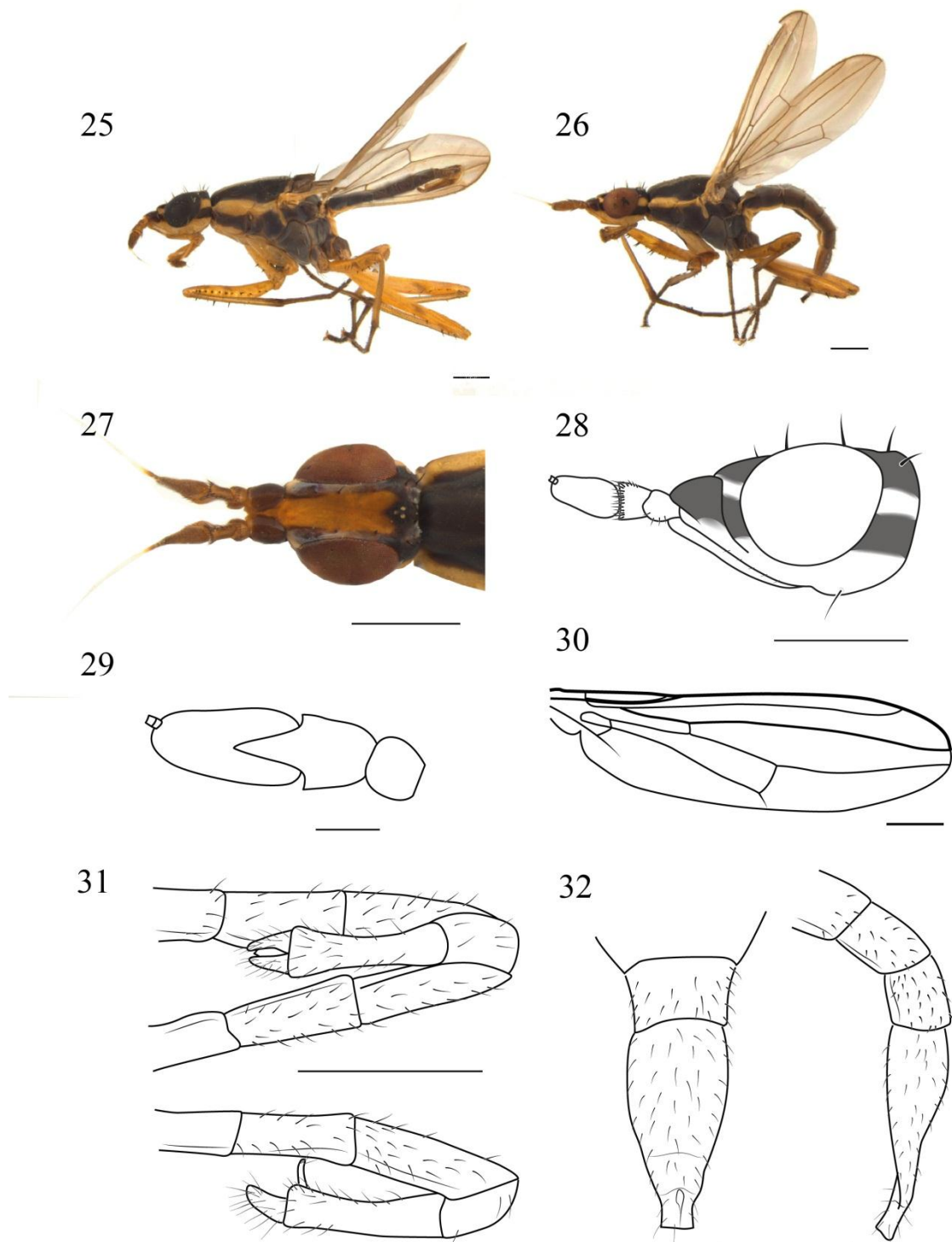
Figures 1–8. *Glihidops bullatus* (Enderlein); 1. Male, habitus; 2. Female, habitus; 3. Head, dorsal view; 4. Head, lateral view; 5. Inner process of pedicel; 6. Wing; 7. Epandrium, dorsal and lateral view; 8. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



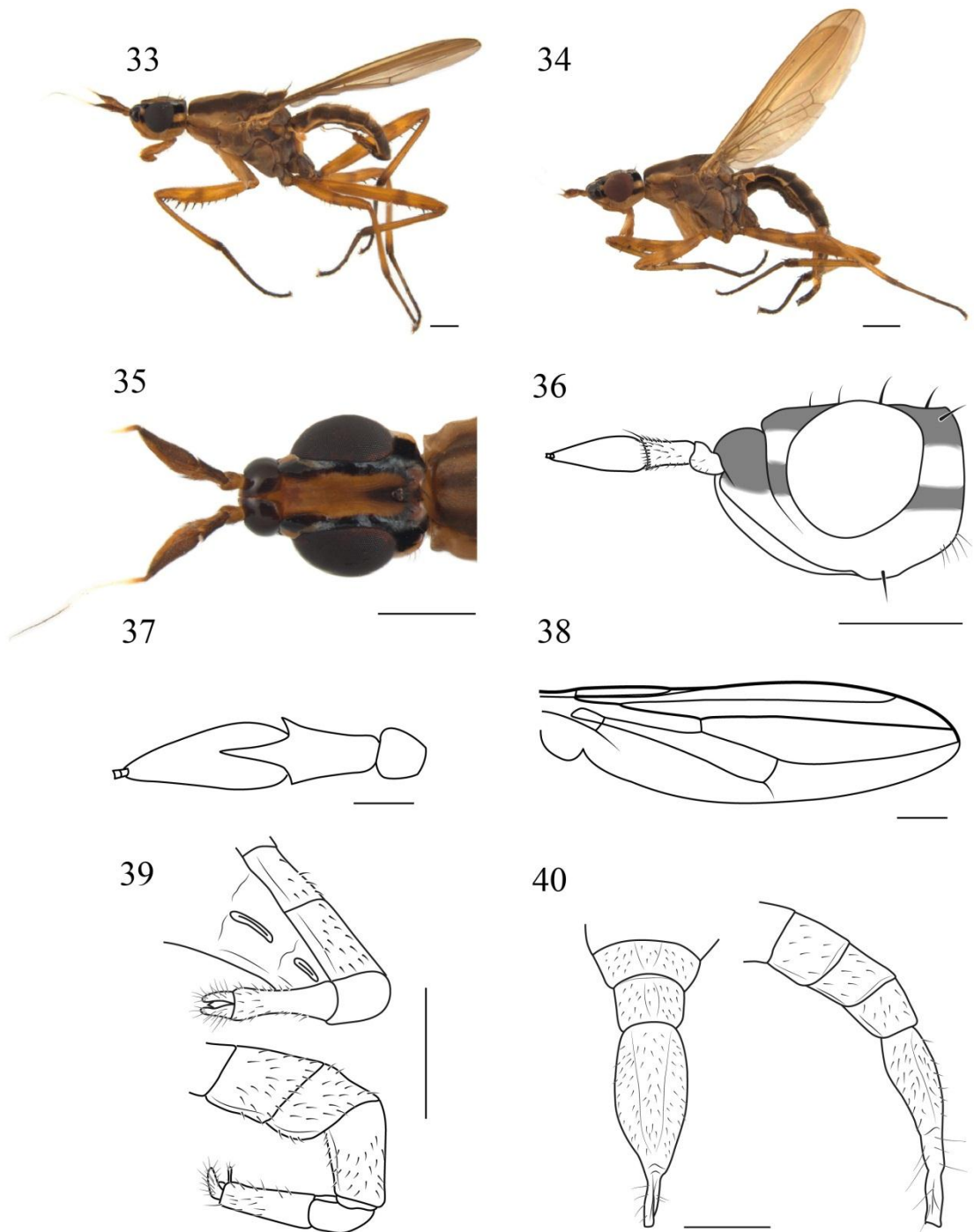
Figures 9–16. *Gliphidops etele* Aczél; 9. Male, habitus; 10. Female, habitus; 11. Head, dorsal view; 12. Head, lateral view; 13. Inner process of pedicel; 14. Wing; 15. Epandrium, dorsal and lateral view; 16. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



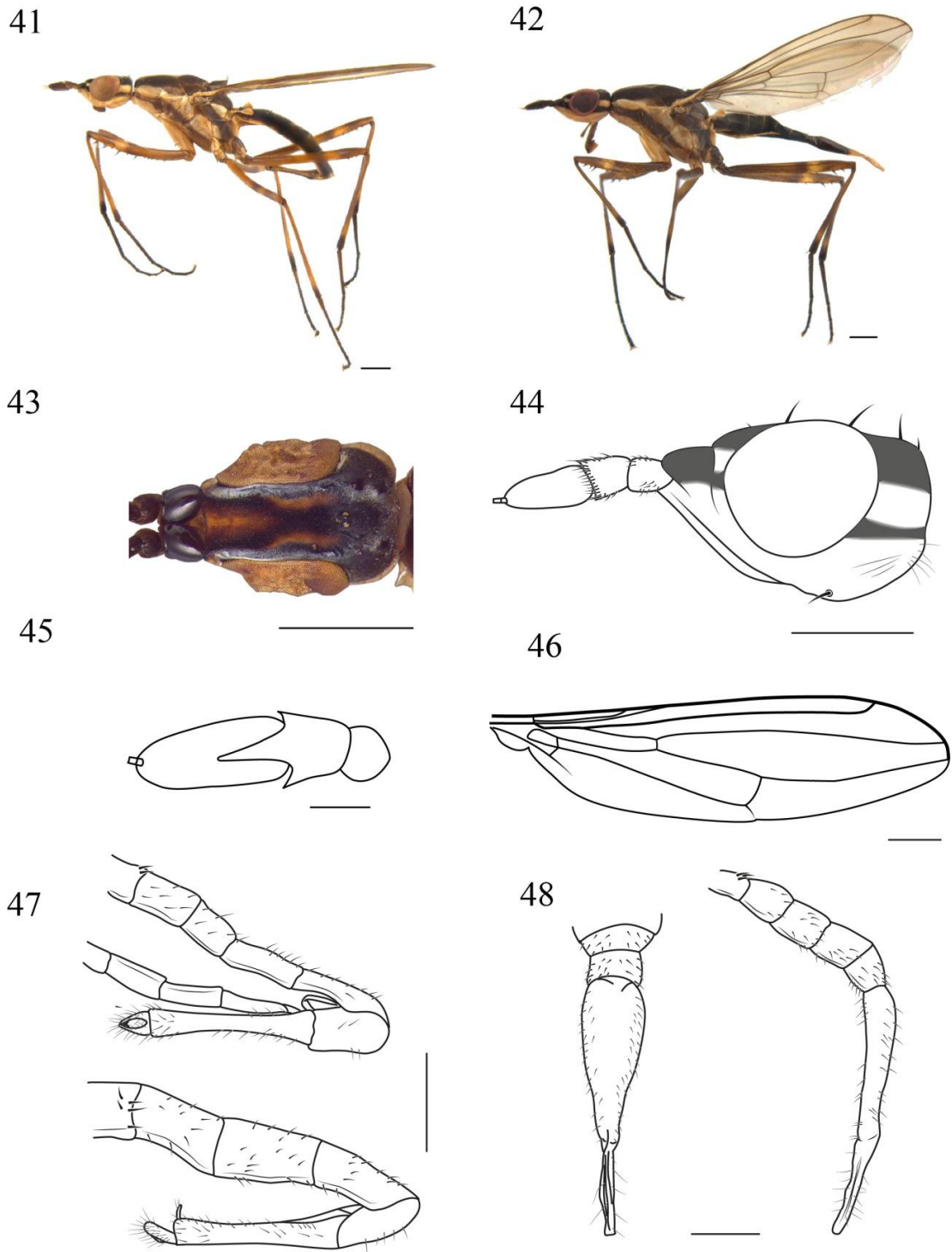
Figures 17–24. *Gliphidops filosus* (Fabricius); 17. Male, habitus; 18. Female, habitus; 19. Head, dorsal view; 20. Head, lateral view; 21. Inner process of pedicel; 22. Wing; 23. Epandrium, dorsal and lateral view; 24. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



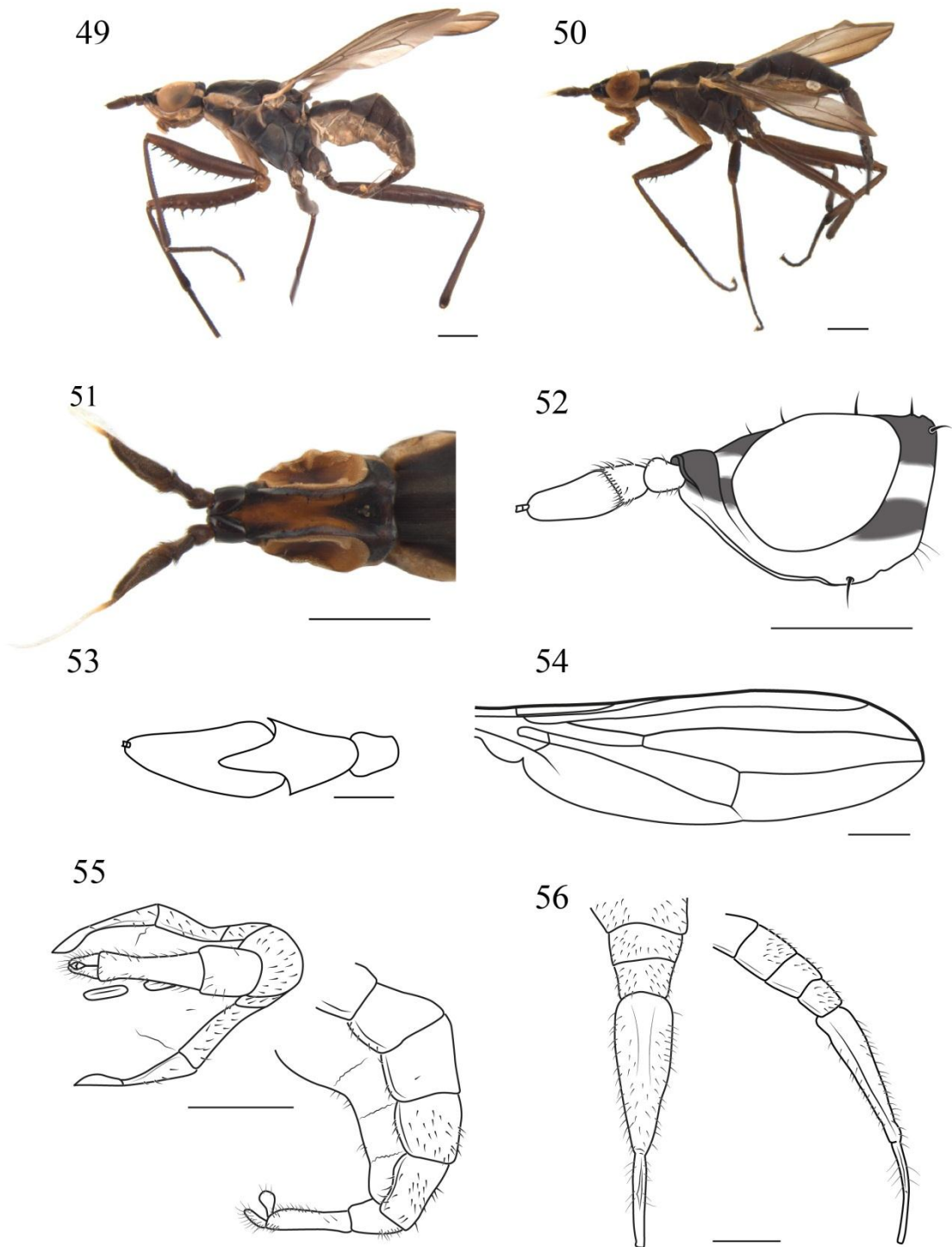
Figures 25–32. *Glihidops obscurus* Hennig; 25. Male, habitus; 26. Female, habitus; 27. Head, dorsal view; 28. Head, lateral view; 29. Inner process of pedicel; 30. Wing; 31. Epandrium, dorsal and lateral view; 32. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



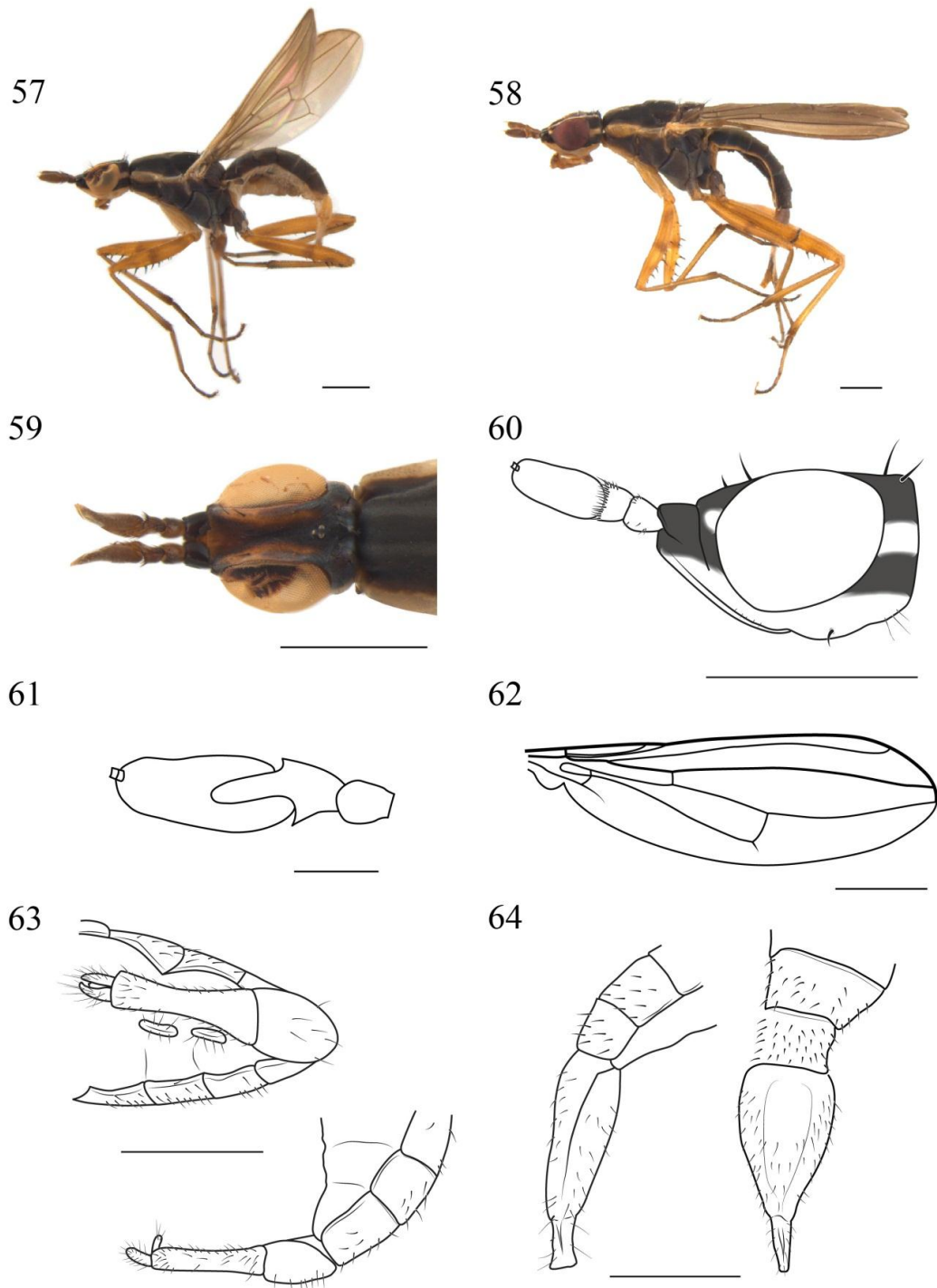
Figures 33–40. *Glihidops ochreus* Hennig; 33. Male, habitus; 34. Female, habitus; 35. Head, dorsal view; 36. Head, lateral view; 37. Inner process of pedicel; 38. Wing; 39. Epandrium, dorsal and lateral view; 40. Oviscap, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



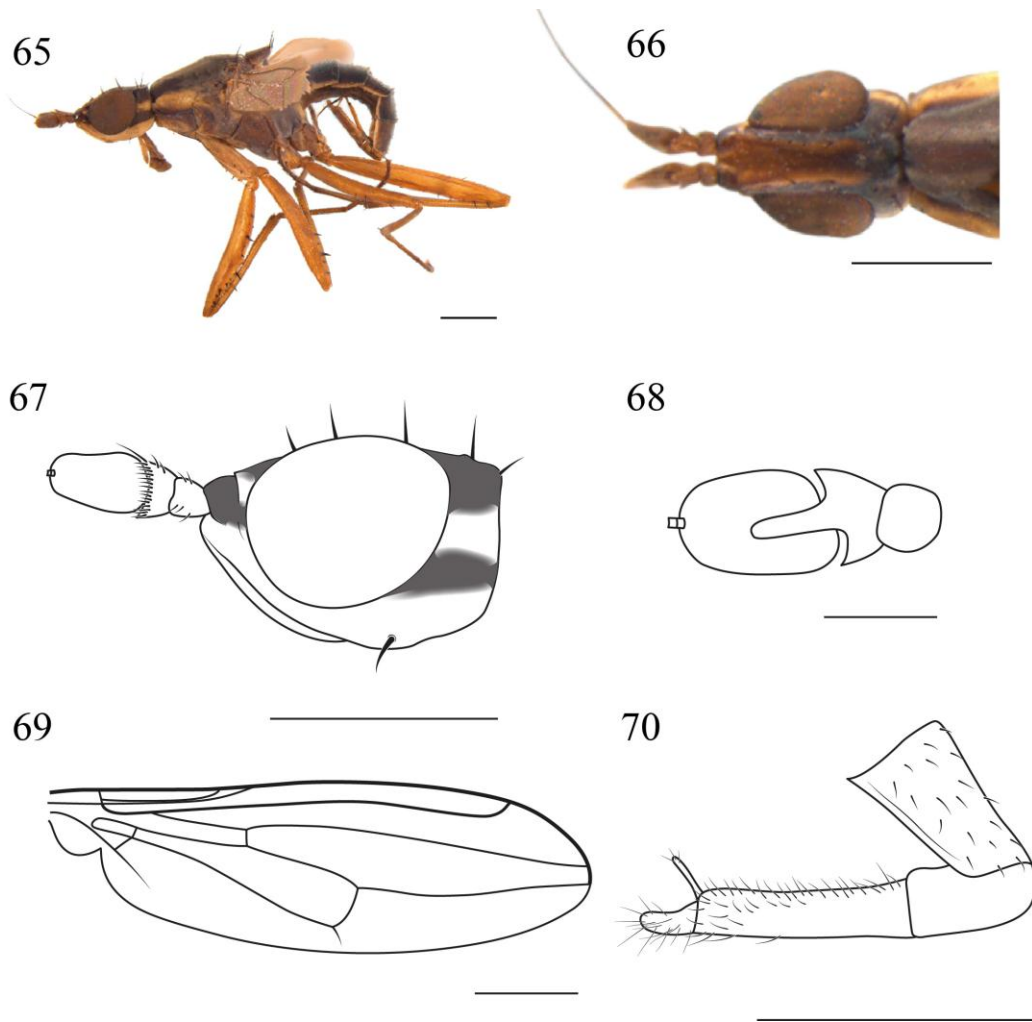
Figures 41–48. *Gliphidops* sp. 1, **new species**; 41. Male, habitus; 42. Female, habitus; 43. Head, dorsal view; 44. Head, lateral view; 45. Inner process of pedicel; 46. Wing; 47. Epandrium, dorsal and lateral view; 48. Oviscapae, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



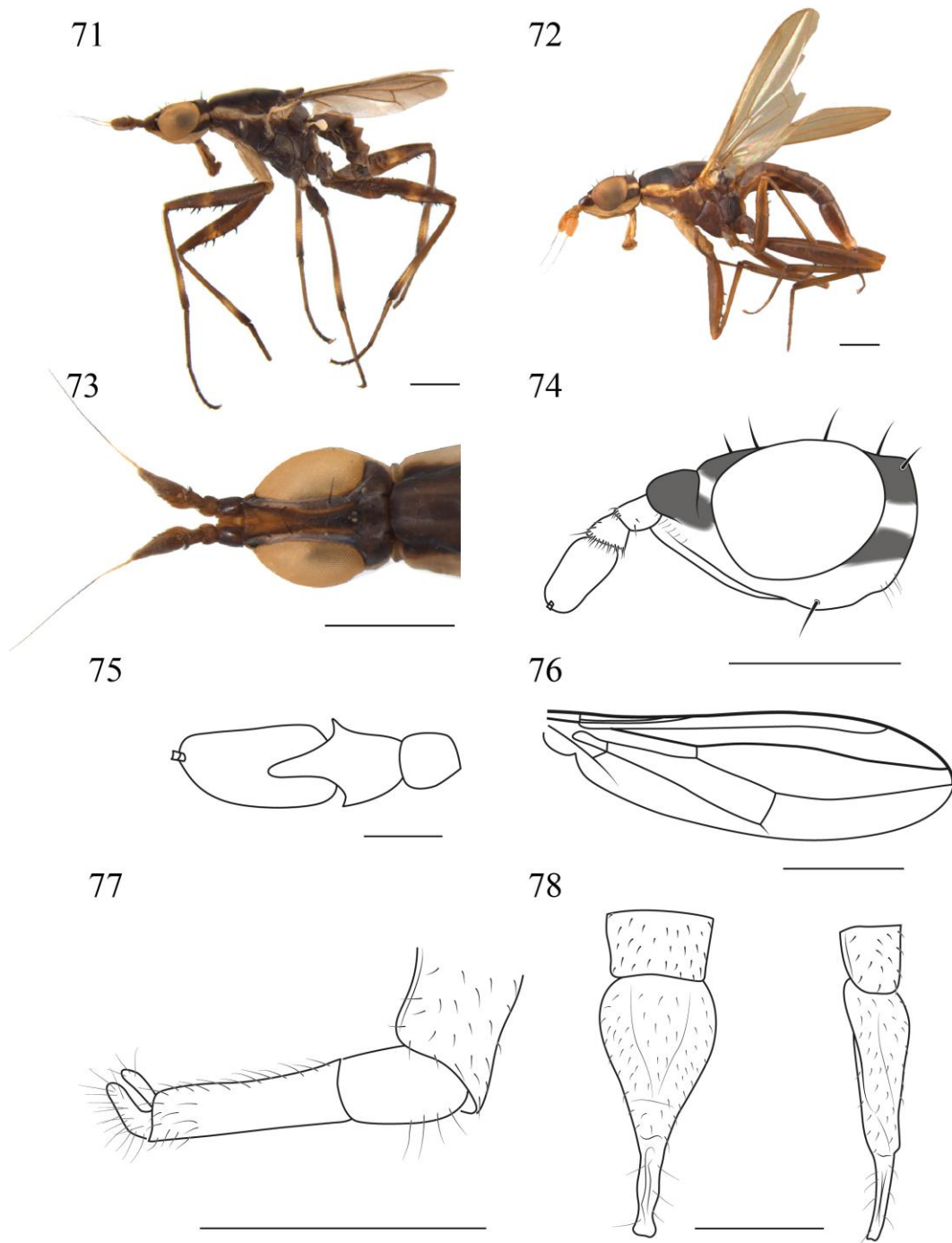
Figures 49–56. *Glihidops* sp. 2, **new species**; 49. Male, habitus; 50. Female, habitus; 51. Head, dorsal view; 52. Head, lateral view; 53. Inner process of pedicel; 54. Wing; 55. Epandrium, dorsal and lateral view; 56. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



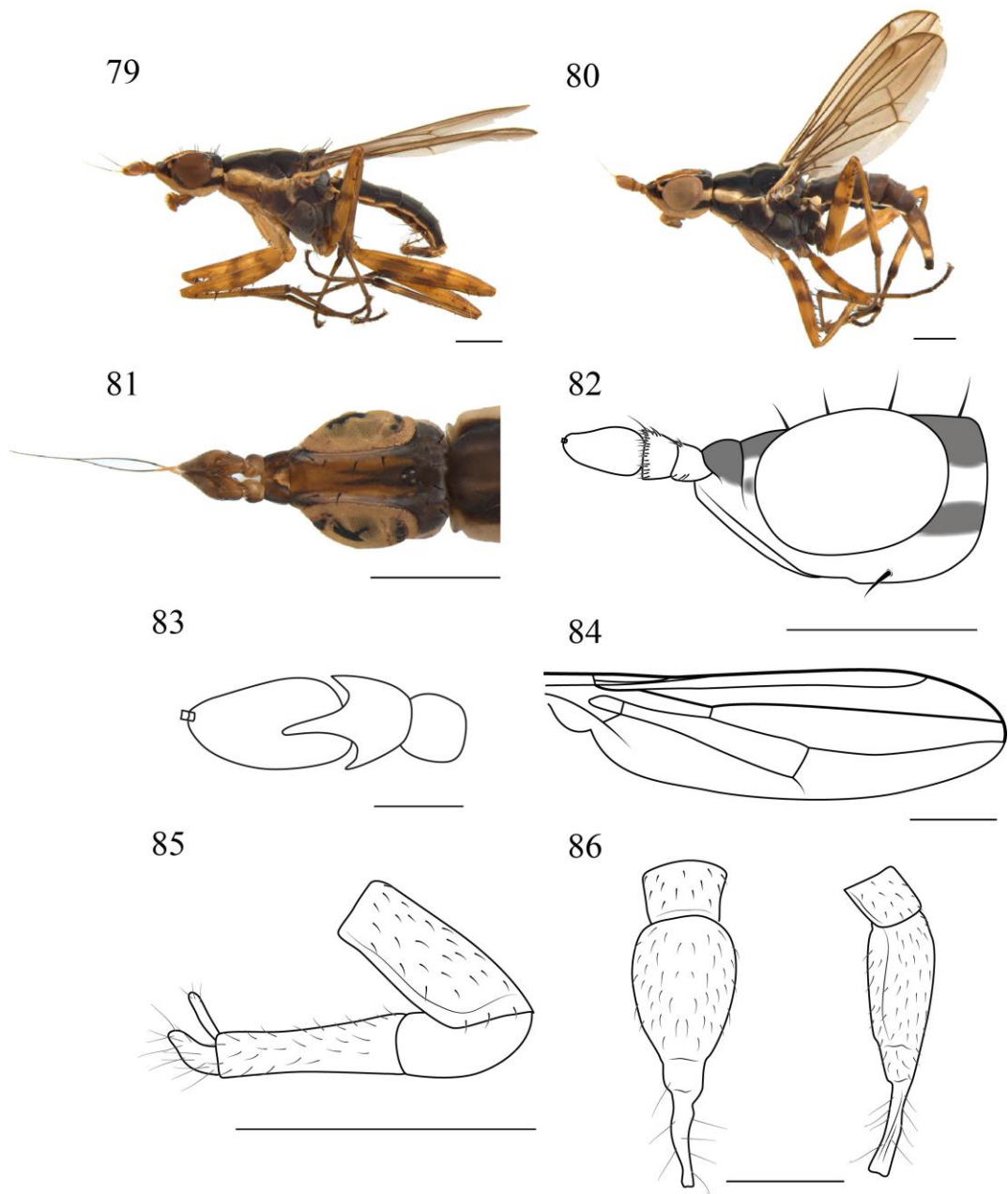
Figures 57–64. *Glihidops* sp. 3, new species; 57. Male, habitus; 58. Female, habitus; 59. Head, dorsal view; 60. Head, lateral view; 61. Inner process of pedicel; 62. Wing; 63. Epandrium, dorsal and lateral view; 64. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



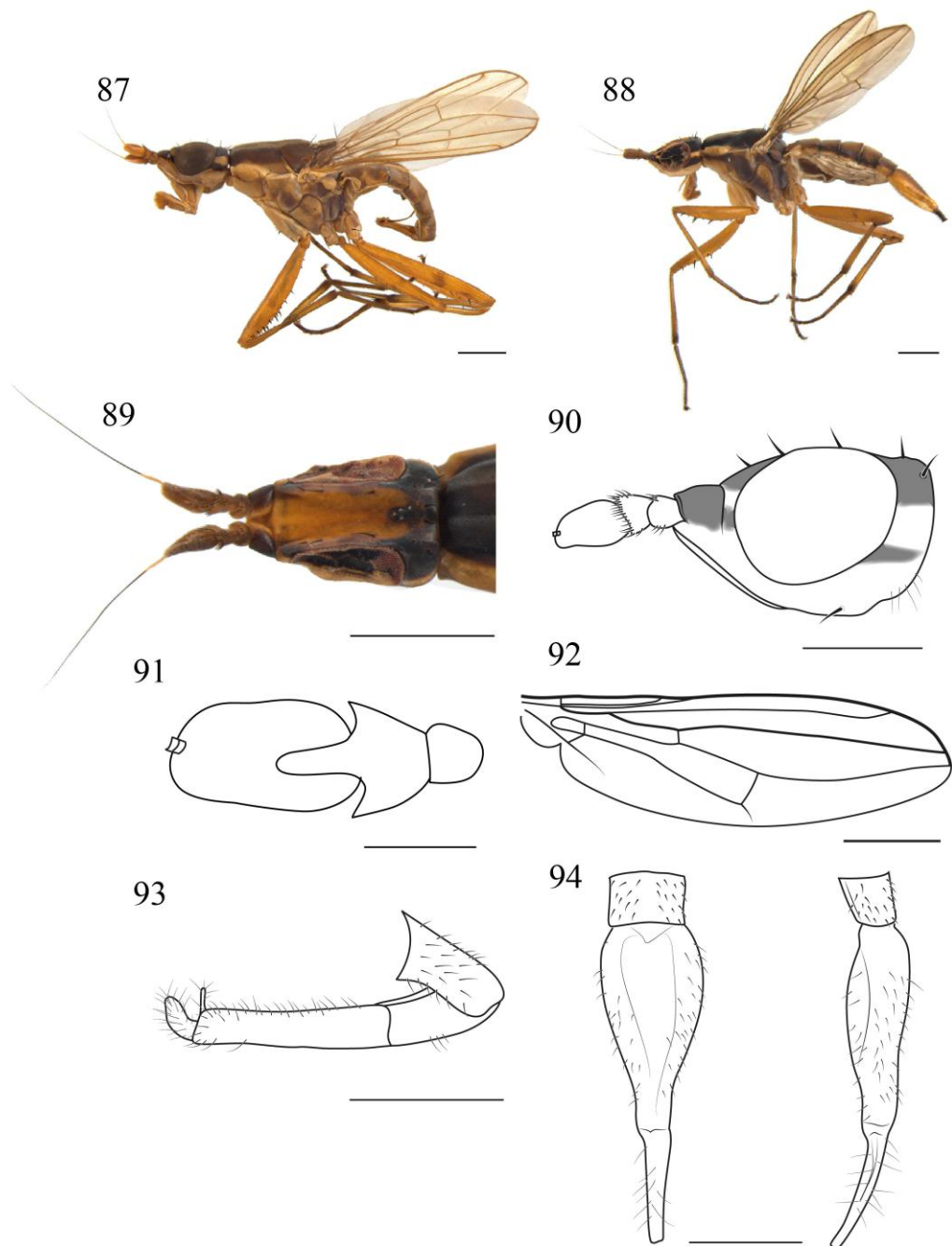
Figures 65–70. *Glihidops carrerai* Aczél; 65. Male, habitus; 66. Head, dorsal view; 67. Head, lateral view; 68. Inner process of pedicel; 69. Wing; 70. Epandrium, lateral view. Scales: 1 mm (except 68. Scale: 0.25 mm).



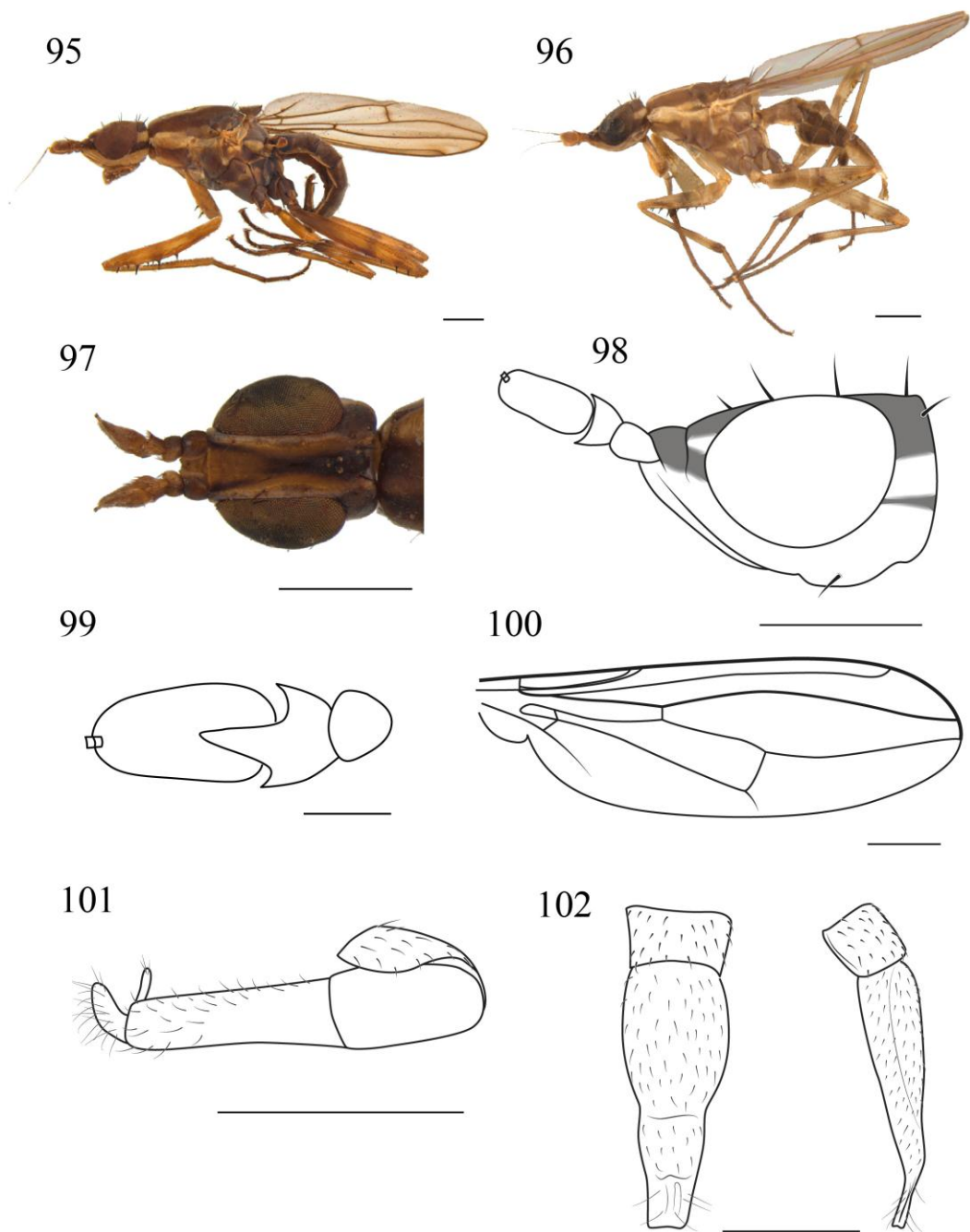
Figures 71–78. *Glihidops dispar* (Cresson); 71. Male, habitus; 72. Female, habitus; 73. Head, dorsal view; 74. Head, lateral view; 75. Inner process of pedicel; 76. Wing; 77. Epandrium, lateral view; 78. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



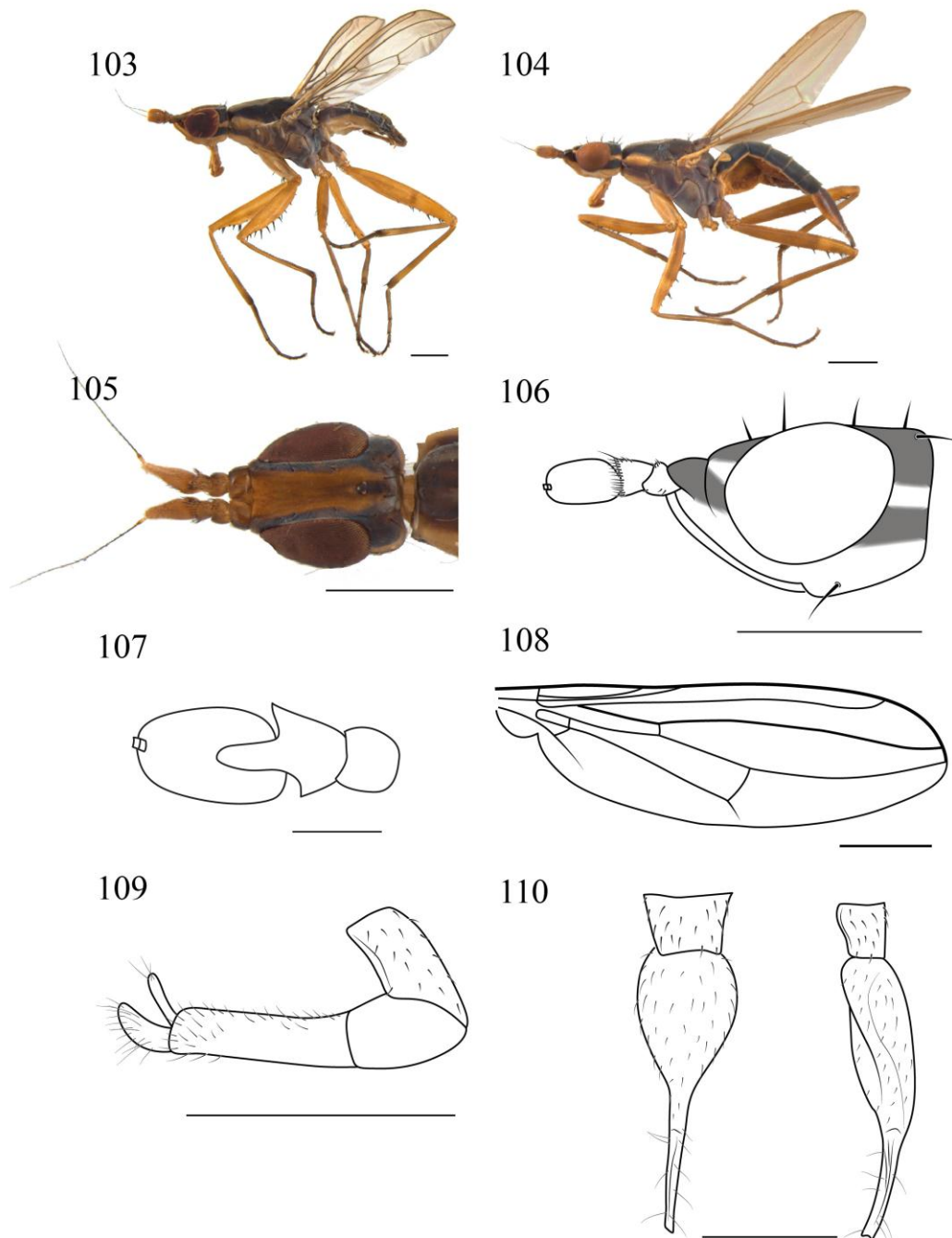
Figures 79–86. *Glyphidops durus* (Cresson); 79. Male, habitus; 80. Female, habitus; 81. Head, dorsal view; 82. Head, lateral view; 83. Inner process of pedicel; 84. Wing; 85. Epandrium, lateral view; 86. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



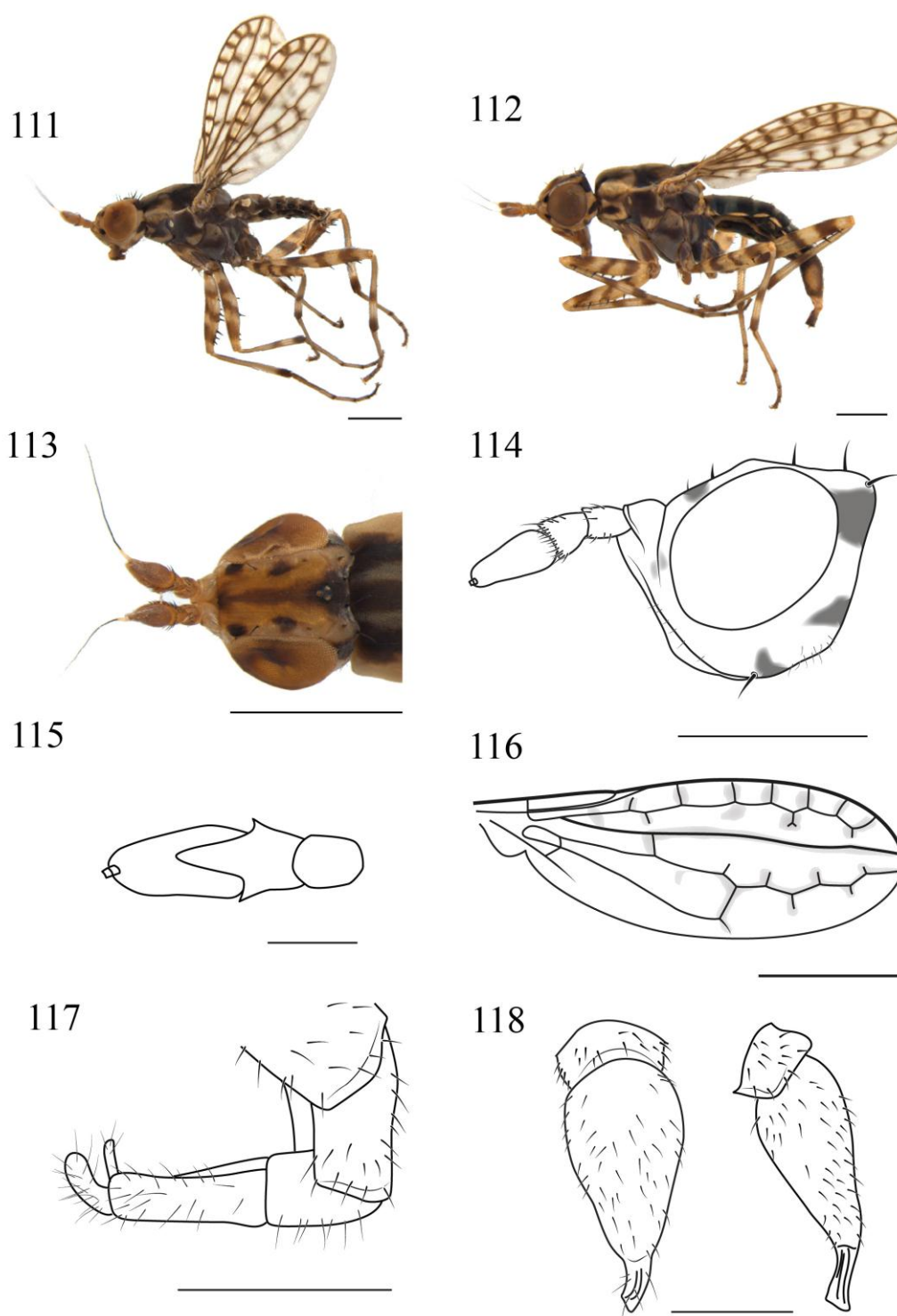
Figures 87–94. *Glyphidops flavifrons* (Bigot); 87. Male, habitus; 88. Female, habitus; 89. Head, dorsal view; 90. Head, lateral view; 91. Inner process of pedicel; 92. Wing; 93. Epandrium, lateral view; 94. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



Figures 95–102. *Gliphidops limbatus* (Enderlein); 95. Male, habitus; 96. Female, habitus; 97. Head, dorsal view; 98. Head, lateral view; 99. Inner process of pedicel; 100. Wing; 101. Epandrium, lateral view; 102. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



Figures 103–110. *Gliphidops neuter* (Hennig); 103. Male, habitus; 104. Female, habitus; 105. Head, dorsal view; 106. Head, lateral view; 107. Inner process of pedicel; 108. Wing; 109. Epandrium, lateral view; 110. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).



Figures 111–118. *Glihidops pluricellatus* (Schiner); 111. Male, habitus; 112. Female, habitus; 113. Head, dorsal view; 114. Head, lateral view; 115. Inner process of pedicel; 116. Wing; 117. Epandrium, lateral view; 118. Oviscape, dorsal and lateral view. Scales: 1 mm (except 5. Scale: 0.25 mm).

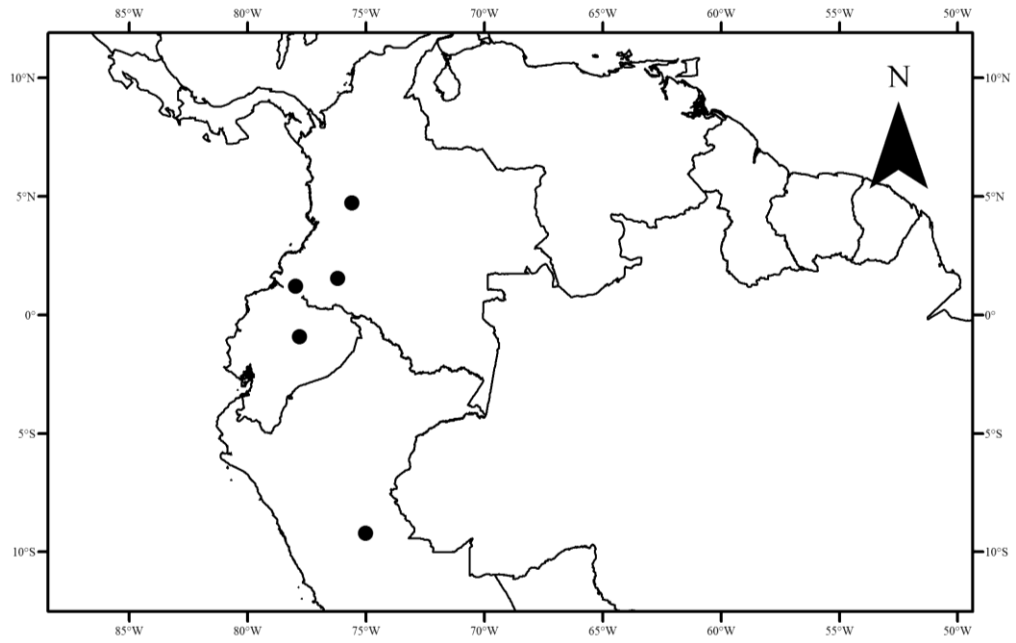


Figure 119. Maps of geographical distribution of *G. bullatus* (Enderlein).

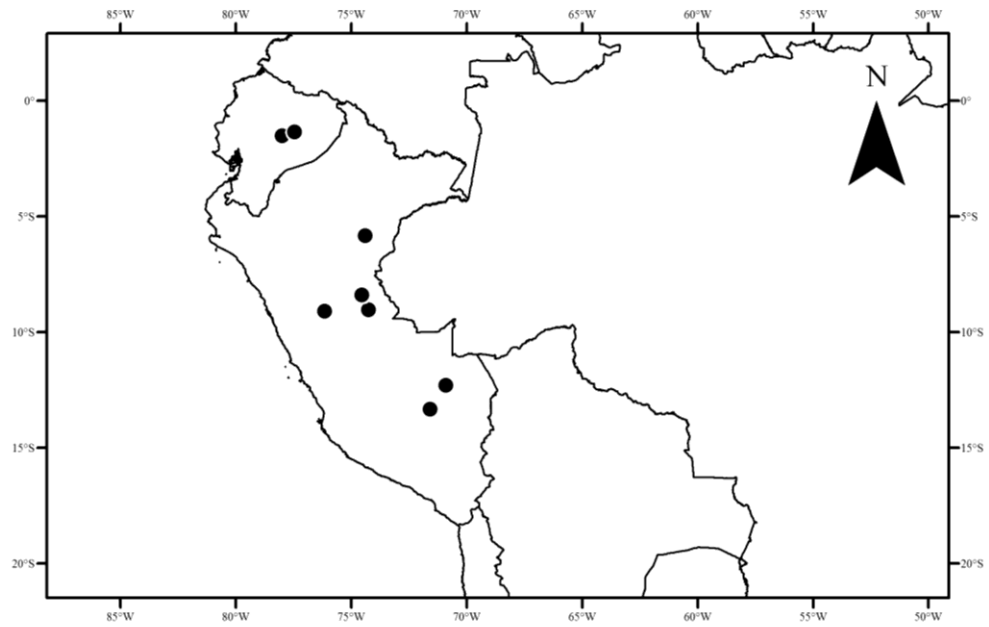


Figure 120. Maps of geographical distribution of *G. etele* Aczél.

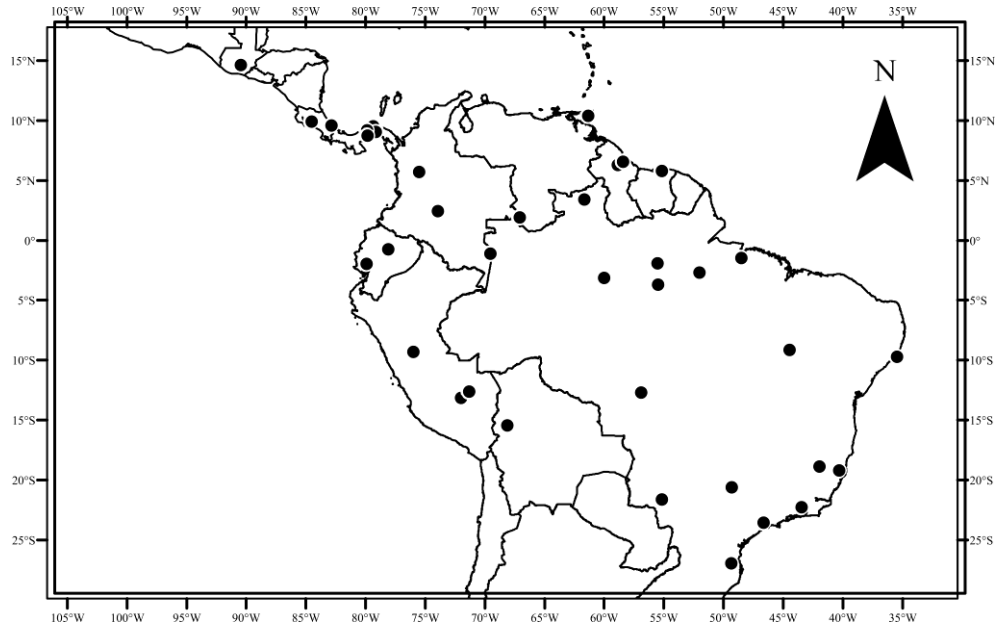


Figure 121. Maps of geographical distribution of *G. filosus* (Fabricius).

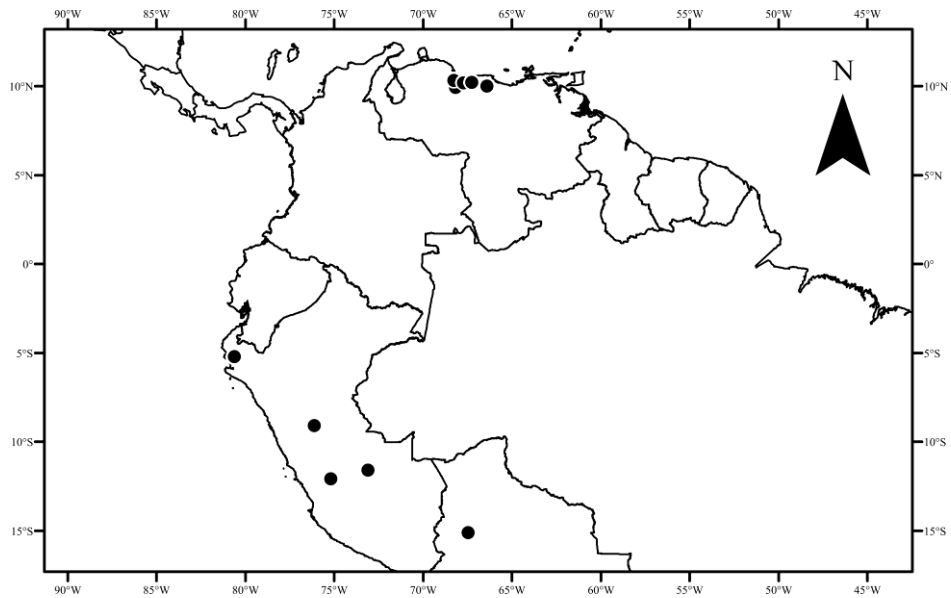


Figure 122. Maps of geographical distribution of *G. obscurus* Hennig.

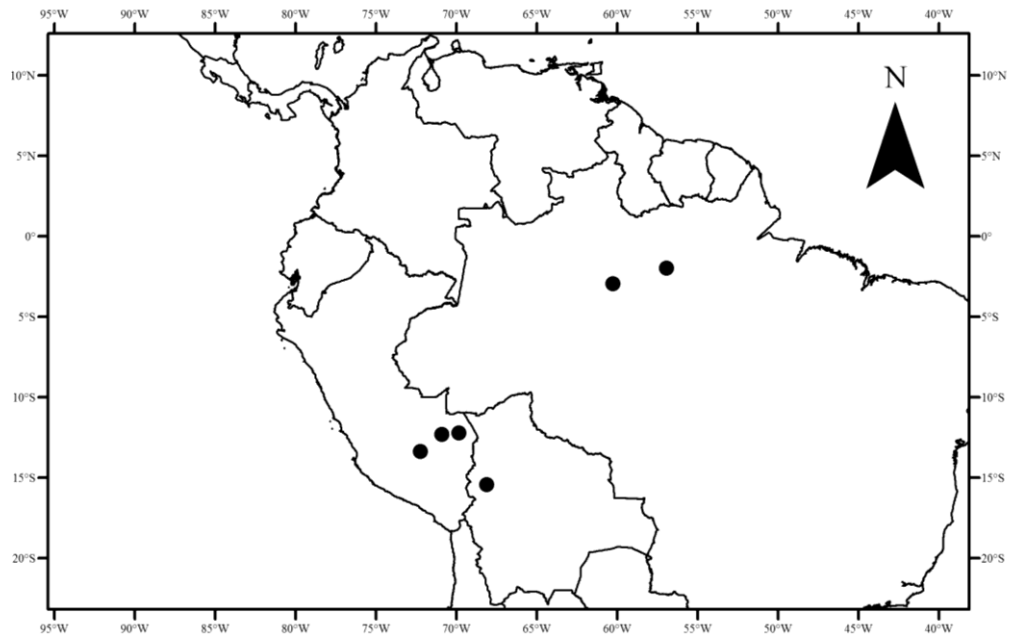


Figure 123. Maps of geographical distribution of *G. ochreus* Hennig.

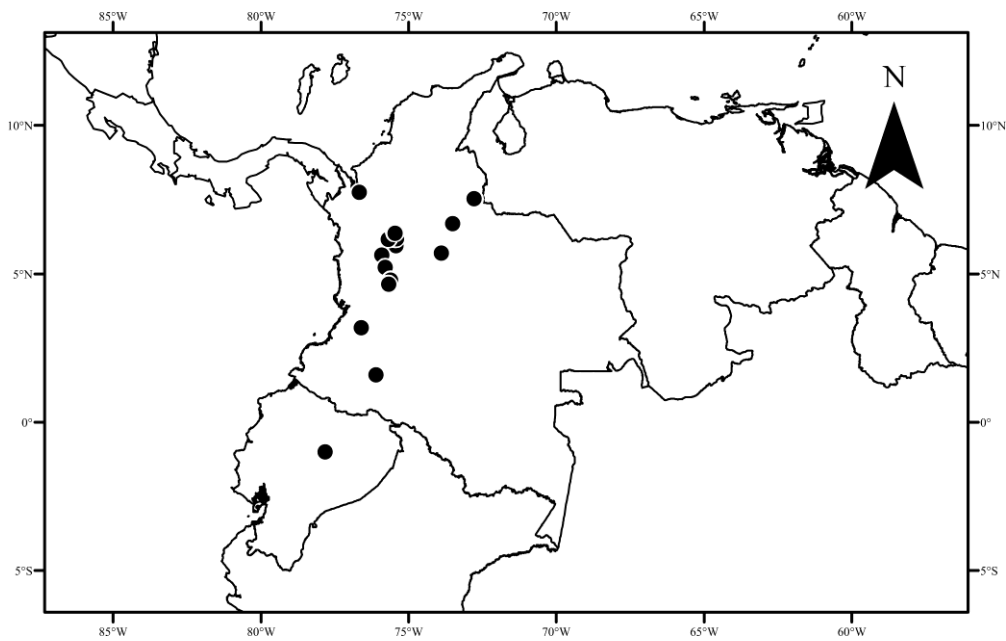


Figure 124. Maps of geographical distribution of *Glyphidops* sp. 1.

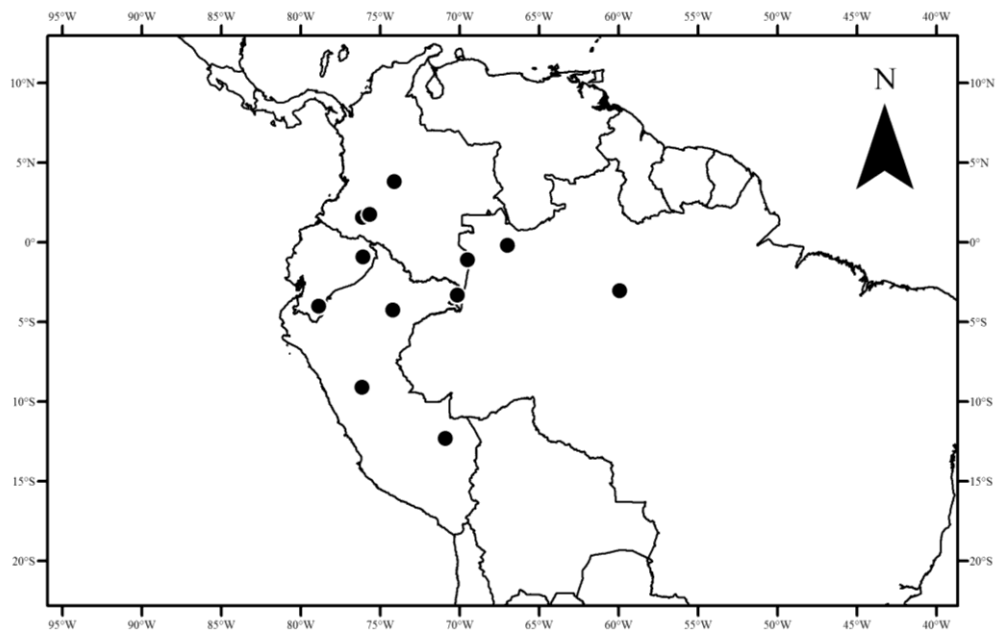


Figure 125. Maps of geographical distribution of *Glyphidops* sp. 2.

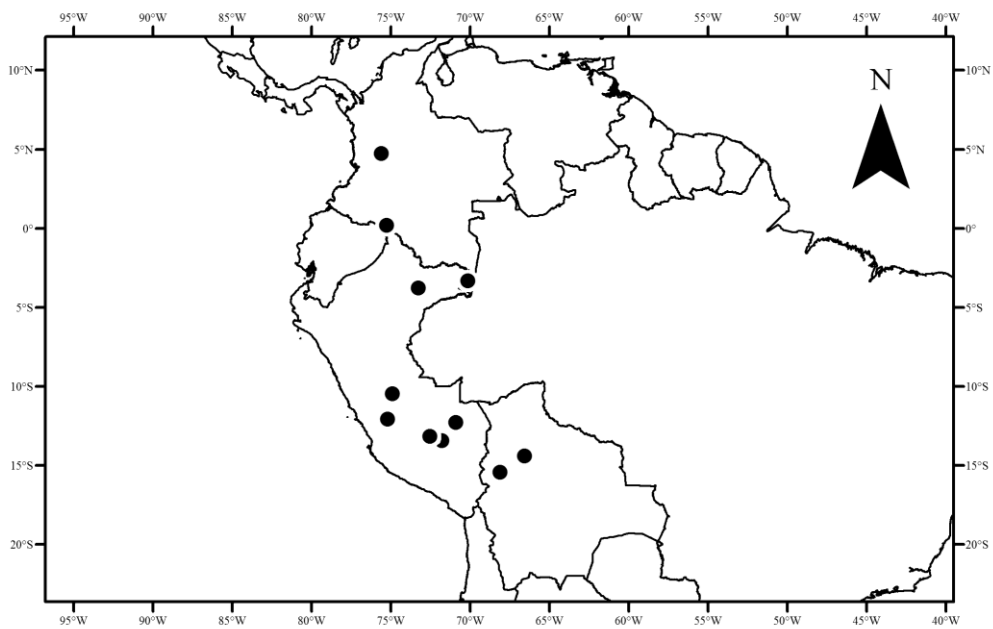


Figure 126. Maps of geographical distribution of *Glyphidops* sp. 3.

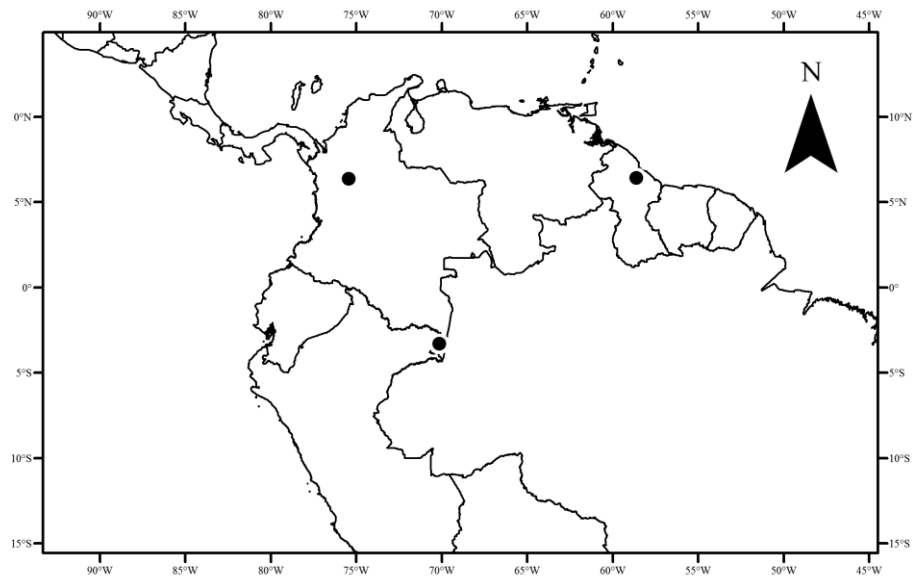


Figure 127. Maps of geographical distribution of *G. carrerai* Aczél.

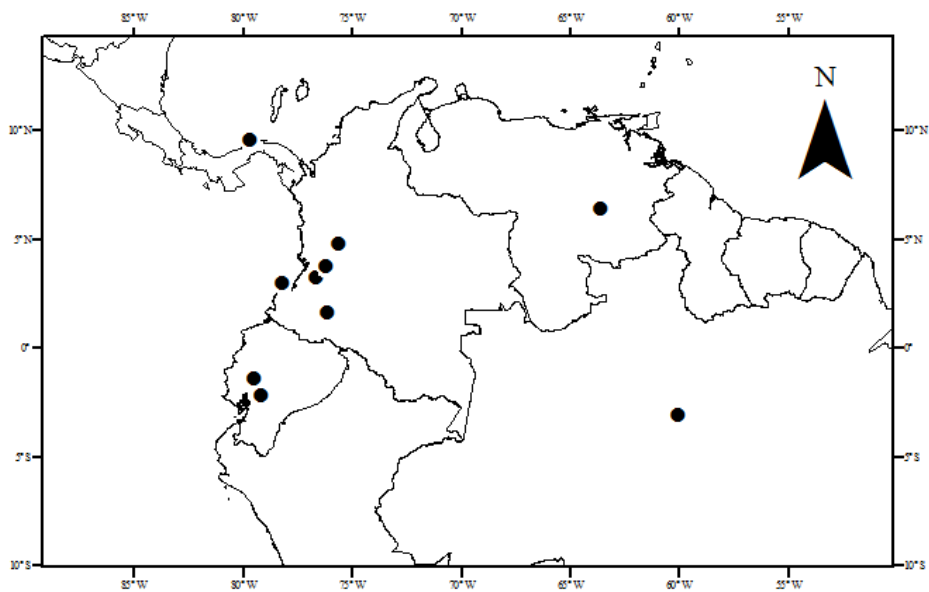


Figure 128. Maps of geographical distribution of *G. dispar* (Cresson).

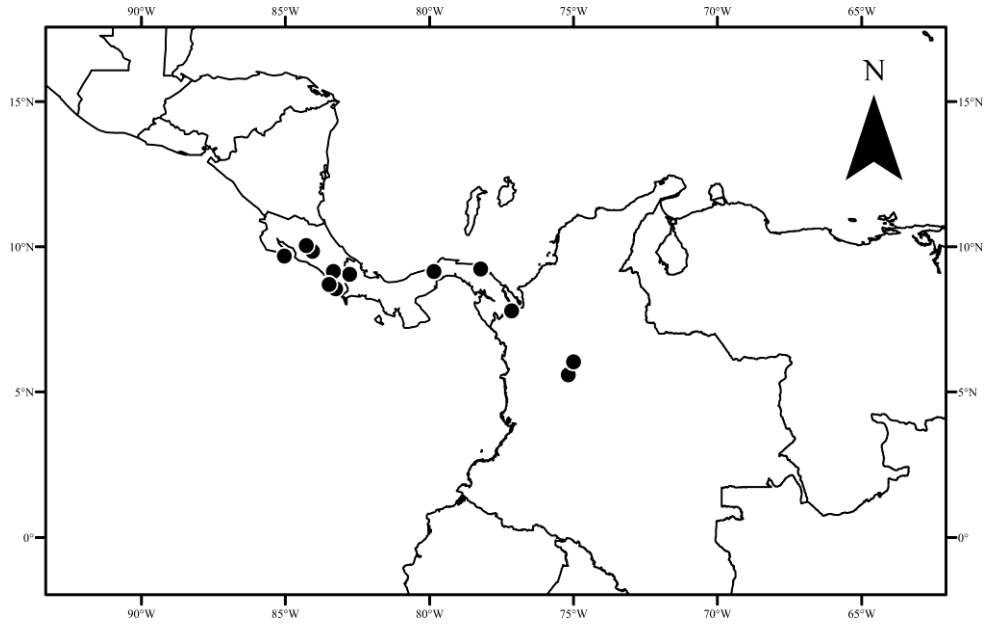


Figure 129. Maps of geographical distribution of *G. durus* (Cresson).

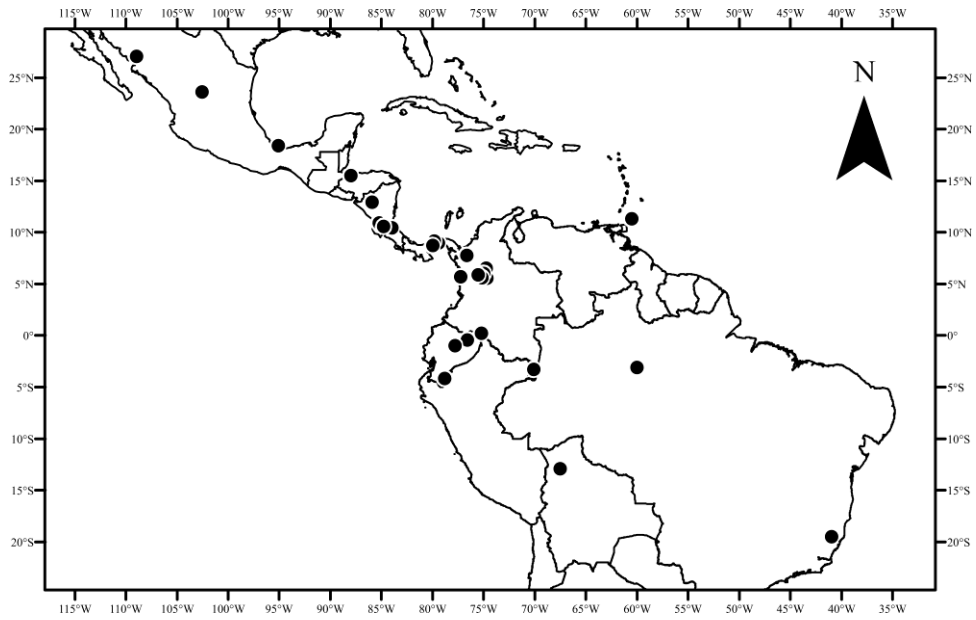


Figure 130. Maps of geographical distribution of *G. flavifrons* (Bigot).

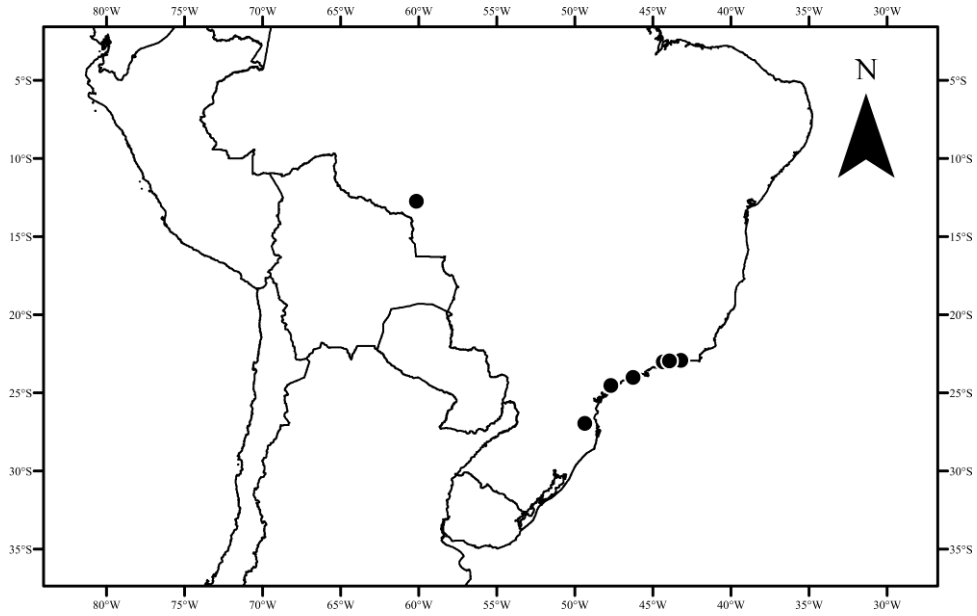


Figure 131. Maps of geographical distribution of *G. limbatus* Enderlein.

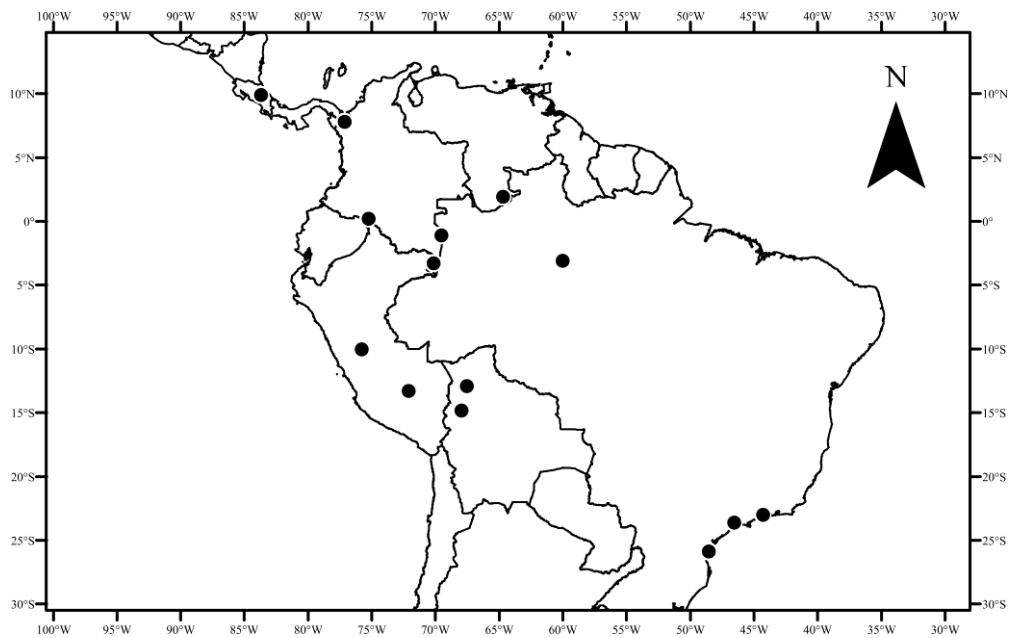


Figure 132. Maps of geographical distribution of *G. neuter* (Hennig).

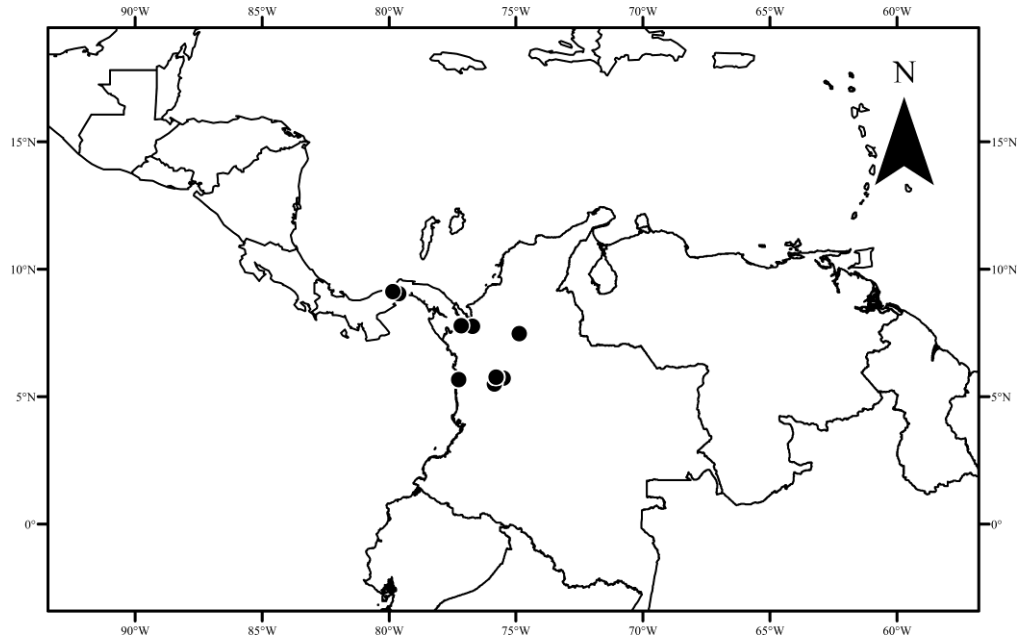


Figure 133. Maps of geographical distribution of *G. pluricellatus* (Schiner).

CHAPTER 4

A REDESCRIPTION OF THE NEOTROPICAL GENUS *Cerantichir* ENDERLEIN
(DIPTERA: NERIIDAE) WITH NEW RECORDS AND A KEY

Journal chosen for submission: REVISTA COLOMBIANA DE ENTOMOLOGIA

Submitted: 9 November/ 2011

Redescripción del género Neotropical *Cerantichir* Enderlein (Diptera, Neriidae) con nuevos registros y clave de identificación

A redescription of the Neotropical genus *Cerantichir* Enderlein (Diptera, Neriidae) with new records and a key

Título breve: Redescripción de *Cerantichir* Enderlein (Diptera, Neriidae)

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Número de palabras: 4506

Resumen: Revisamos el género Neotropical de “moscas del cactus” *Cerantichir* Enderlein y presentamos nueva información sobre morfología y distribución. Incluimos una nueva diagnosis, redescripción y clave para la identificación de las dos especies actualmente conocidas, así como fotografías e ilustraciones

Palabras clave: *Cerantichir*, Diptera, Moscas del cactus, Neotropical, Neriidae

Abstract: Here we revise the Neotropical “cactus fly” genus *Cerantichir* Enderlein and provide new information on morphology and distribution. We include a new diagnosis, redescription and a key to identification of the two currently known species, along with photographs and illustrations

Keywords: Cactus fly, *Cerantichir*, Diptera, Neotropical, Neriidae

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Introduction

The Neriidae comprise a small family of acalyptrate flies, with 110 species in 19 genera (Steyskal 1965, 1968, 1977, 1980; Soós 1984; Mangan and Baldwin 1986; Pitkin 1989; Barraclough 1993; Buck and Marshall 2004). While these flies are found in all biogeographic regions, they tend to predominate in the tropics (Steyskal 1968, 1987). All neriids feed on sap and decaying plant tissues (Aczél 1961; Steyskal 1987; Buck 2010).

The genus *Cerantichir* Enderlein, 1922 comprises two species, *C. enderleini* Hennig, 1937 and *C. peruana* (Hennig, 1937) that occurs in the neotropics from Guatemala to the midwestern Brazil. Originally, the genus was proposed with *Nerius flavifrons* Bigot, 1886 based on the following characters: (1) arista dorso-apical and pubescent, (2) flagellum with truncate apex, (3) long finger-like inner process of the pedicel, (4) fore legs with ventral spine-like setae towards the apex, (5) scutellum with two setae in tubercles and (6) vein dm-cu short and perpendicular (Enderlein 1922).

Hennig (1937) reviewed the genus in which *Cerantichir flavifrons* Enderlein nec Bigot was called *Cerantichir enderleini*. Hennig defined the genus as having (1) an oval flagellum apex, (2) a dorso-subapical arista with white pubescence, (3) one upper orbital, paravertical, weak inner and outer vertical setae, (4) a palpus broad at the base and pointed forward, (5) a thorax moderately extended, (6) a scutellum with slightly S-shaped curved edges, (7) one dorsocentral, one supra-alar, one postalar and one scutellar setae, all weak, (8) a weak anterior and a strong posterior notopleural setae, (9) mid and hind femora with spine-like anteroventral and posteroventral setae and (10) dm-cu slightly convex. Aczél (1961) defined the genus only as having (1) pedicel elongate in both sexes, (2) a single pair of reduced notopleural setae and (3) dm-cu straight, not oblique.

Recently, Buck (2010) stated that the *Cerantichir* Enderlein have (1) anterior margin of frons at most weakly convex, not produced between antennal bases, (2) proepisternum anterodorsally bare, (3) scutum anteriorly projecting distinctly beyond level of humeral carina, (4) anteprenotal ridge prominent and distinctly anterior to humeral carina and (5) dm-cu not oblique, strongly diverging from wing hind margin. Based on the shared apomorphic condition of the anterior part of the thorax, Buck (2010) transferred *Odontoloxozus peruanus* Hennig, 1937 to *Cerantichir*, but this character is shared with *Longina* Wiedemann. Other characters, such as the number 1, 2 and 5 (see above) do not include (or describe) the species newly transferred to the genus and which can be easily confused with characters of *Longina*, except for the word “distinctly”, describing the projected scutum.

In addition, Buck & Marshall (2004) emphasized that the similarities shared by these genera may suggest a “possible monophylum” *Longina*+*Cerantichir*, and Buck (2010) questions the validity of some Neotropical genera in the Neriidae and suggest that the genera need to be critically evaluated. Thus, to promote this critical evaluation, we begin with a detailed description of *Cerantichir* (*Longina* has been studied in detail; Buck & Marshall, 2004).

Here we examine the *Cerantichir* species. We propose a new diagnosis for the genus, redescribe the two known species and include new records along with an identification key that is based on adult morphological characters.

Material and Methods

The specimens examined are deposited in the following institutions: Coleção Entomológica Padre Jesus Santiago Moure (DZUP), Curitiba, Brazil; Instituto Nacional de Biodiversidad (INBio), Santo Domingo de Heredia, Costa Rica; Colección Entomológica de la Universidad de Antioquia (CEUA), Medellín, Colombia; Instituto Alexander von Humboldt (IAvH), Villa de Leyva, Colombia and Colección Entomológica de la Fundación Miguel Lillo (FML), Tucumán, Argentina.

The material was examined using a Zeiss Stemi DV4 stereoscopic microscope. Photographs were taken with the Auto-Montage Imaging System®. Drawings and photos were edited using Adobe Illustrator CS5.1 and Adobe Photoshop CS5. The terminology and descriptions of the position of setae follow Cumming and Wood (2009).

The following abbreviations are used in the text: cat. = catalogue; comb. n. = new combination; excl. = excluding; fig./figs. = figure/figures; misid. = misidentification; nom. n. = nomen novum; orig. des. = by original designation; pp. = pages; pls = plates.

Results

Cerantichir Enderlein

Enderlein 1922: 149 (key), 155 (description; *Nerius flavifrons* Bigot, 1886b orig. des., misid.); Cresson 1930: 314 (listed, = *Nerius*); Hennig 1937: 244 (key), 256 (redescription); Aczél 1949: 379 (cat.); Aczél 1951: 569 (key); Aczél 1961: 298 (genus conspectus); Steyskal 1965: 637 (cat., = *Oncopsia*); Steyskal 1968: 1 (cat.); Buck 2010: 818 (key), 819 (synopsis of the fauna).

Diagnosis. Occiput shiny elongate and as long as high. Postgena shiny and relatively narrow and either bare or with a few several black setulae. Pedicel laterally flattened, scape less than half of pedicel length; arista densely white pilose. Orbital plate shiny wide. Vibrissa absent. Ocellar tubercle large, raised and blackish velvet. Thorax elongate, with mesoscutum and anteprenotal ring distinctly anterior to postpronotal carina. Anterior margin of prosternum wide and truncated. One pair of dorsocentral setae. Mesoscutum with one pair of apical setae on anterior margin. Wing partially covered by microtrichia; basally has small bare areas (extending beyond level of r-m in cells r1, r2+3 and r4+5). Scutellum with one pair of stout apical setae and two weaker subapical setae. Epandrium extends forward to level of anterior margin (at most) of tergite 4.

Distribution. Guatemala, Costa Rica, Colombia, Brazil, Peru, Bolivia.

Key to adults of *Cerantichir* Enderlein

Antennal base dorsally longer than wide; inner margins separated by a small space. Inner process of pedicel elongate, finger-like, reaching the proximal half of first flagellomere. Apex of first flagellomere rounded. Occiput with black setae towards posterior head margin ... *C. enderleini*

Antennal base rounded and inflated; inner margins together, with no space between them. Inner process of pedicel obtuse with widely rounded apex and extending over a very short proximal portion of the first flagellomere. Apex of first flagellomere truncate. Occiput without black setae towards posterior head margin ... *C. peruana*

Cerantichir enderleini Hennig

Figs 1, 3, 5, 7, 9, 12, 14–16, 20–21, 24

Cerantichir flavifrons Enderlein, 1922: 155 (type-species *Nerius flavifrons* Bigot, 1886, orig. des.; misid.).

Cerantichir enderleini Hennig 1937: 256 (nom.n. to *Cerantichir flavifrons* Enderlein, 1922, not *Nerius flavifrons* Bigot, 1886); Aczél, 1949: 379 (cat.); Aczél, 1951: 569 (key); Aczél, 1961: 263–275 (genus, morphological aspects), 277 (key), 299 (redescription), 303 figs. 28–31 (28. male, head, lateral view; 29. male, head, dorsal view; 30. female, antennae, inner process; 31. male, fore femur, lateral view); Steyskal 1968: 2 (cat.); Buck, 2010: 816 fig. 2 (head (antennae excluded) and anterior part of thorax, lateral view). Mello & Ziegler 2012: 152 (cat., type-material).

Male. Body length (excluding antenna and epandrium) 8.6–12.8 mm (Fig. 1). Wing length 7.5–9.4 mm and width 2.1–2.7 mm. Yellowish brown, head partly yellow and shiny; pleuron shiny yellowish brown and bare; thorax with two longitudinal wide pruinulent yellowish brown stripes as wide as scutellum.

Head. Elongate; length 1.5–1.9 times width; below the eyes velvet testaceous yellow. Frons concave between compound eyes and tapering towards the ocellar plate; anterior margin not concave nor projecting between antennal bases. (Fig. 5); frontal vitta ochraceous whitish pruinulent, anterior half with two lateral blackish stripes and posteriorly continuing to the occiput, separating the brown lateral areas of the postcranium. Fronto-orbital plate subshiny dark yellowish brown and wide; narrowing anteriorly in a white pruinulent carina reaching the parafacial plate; posteriorly joining to the postcranium brownish vittae; with two well developed fronto-orbital setae and several hair-like setulae on the pruinulent carina. Vertex brown and velvet behind the ocellar tubercle and yellow pruinulent between the inner vertical and postocellar setae. Postocellar setae convergent; 1.5 times longer than the transversal diameter of ocellar tubercle; inner vertical setae slightly divergent and equal to postocellar setae; outer vertical setae absent. Ocellar tubercle subshiny blackish brown, rounded, large and raised; isolated in the median yellow vitta coming from the frons; ocelli yellow,

large and equal; one pair of tiny ocellar setae. Vertex yellowish brown pruinose and relatively ovate and raised. Parafacial blackish brown with yellow spot over mid of height of the eye. Face yellow and straight. Vibrissa absent. Gena subshiny yellow and ventrally rounded; with one brown genal seta, hair-like and shorter than postocellar seta. Postgena yellow and wide; with some white and brown short setulae. Occiput shiny brown with short black setae towards posterior head margin; length 1.1–1.5 height. Antennal base dark brown dorsally longer than wide; apical margin black, projecting dorsally after a bend very close to the distal margin (Fig. 5). Antenna 70–80% of head length. Scape yellowish brown, darkened in dorsal margin; 0.3–0.4 mm long. Pedicel paler than scape; 0.5–0.8 mm long; laterally flattened; with strong black setulae on dorsal and ventral margins; inner process of pedicel elongate, finger-like (Fig. 9), reaching the proximal half of first flagellomere. First flagellomere ochraceous, darkened in dorsal margin and covered with short yellow pruinoscence; dorsal and ventral margins parallel and apex widely rounded; length 1.8–2.1 times width. Arista densely white pilose, except for the small basal portion brown pubescent; inserted on the dorso-apical margin of the first flagellomere.

Thorax. Shiny brown with two dorsal and parallel yellow stripes, separated for a median relatively narrow brown stripe (Fig. 7); pleuron shiny brown, except white pruinose metepimeron and mid posterior half of meron; thoracic setae short and slender. Mesoscutum anteriorly beyond level of postpronotal carina (Fig. 11); with two weak apical hair-like setae. Anterior notopleural setae straight, as long as postalar setae. Posterior notopleural setae stronger and subequal to scutellar setae. Supra-alar setae subequal to postalar setae, which are 30% of scutellar setae length. One pair of dorsocentral setae, twice as long as postalar setae. Scutellum brownish pruinose with a diffuse median yellow stripe narrowing anteriorly; lateral margins angulate and distal margin truncate; one pair of strong apical setae almost half length of scutellum on small conical tubercles; one pair of weaker hair-like subapical setae, which may be accompanied by smaller setulae. Postpronotal lobes shiny brown; postpronotal carina shiny brown, ending anteriorly prior to the level of antepronotal ring. Prosternum whitish yellow, linear with rounded anterior margin and separated from the proepisternal plate by a relatively narrow membranous area. Proepisternum yellow anteriorly and shiny brown posteriorly; with one pale brown, hair-like seta. Katepisternum ventrally elongate; ventral margin yellow pruinose; with one pale brown, hair-like seta. Katatergite same color as pleuron; length 1.8 times height. Anatergite and mediotergite yellowish and white pruinose. **Legs.** Fore coxa yellow with one antero-apical slender brown seta and several yellow setulae on anterior margin. Mid coxa with two lateral dark brown setae and two antero-apical brown setae accompanied by several weaker setulae. Hind coxa with one straight lateral seta plus several white setulae and one pair of antero-apical setae. All femora ochraceous yellow with distomedial and apical inconspicuous yellowish brown rings which can be absent in fore femur of paler specimens; several few anteroventral and posteroventral spine-like seta on distal third, except fore femur, with spine-like setae on all ventral margin; mid femur with row of four or five submedian setae on anterior margin that may be absent in some males. Tibiae

paler than femora and darker at the apex; covered by rows of short black setulae that are most dense distally. **Wing** (Fig. 12). Brownish; microtrichia absent in cells bc, c and bm and absent basally in cell br. Vein dm-cu oblique. Margins of upper and lower calypteres yellowish brown with fringe of short setulae of the same color. Halter whitish with orbicular knob blackish brown.

Abdomen. Pale yellowish brown, darkening anterior and laterally; dorsally pruinulent with brown setulae and laterally shiny. Terminalia shiny reddish yellow, semicylindrical and elongate (Figs. 14, 15). Syntergosternum 7+8 shiny; length is 40–50% of epandrium length. Epandrium shiny pale yellowish brown, dorso-apically darkened; extends forward to anterior margin (at most) of tergite 4. Anterior lobe of surstylus shiny blackish yellow, linear and narrow with brown setulae on apical margin. Posterior lobe of surstylus blackish yellow and wide, covered with white pruinescence and black setulae.

Female. Similar to male, differs as follows: Body length (excl. antenna and oviscape) 10.0–10.5 mm (Fig. 16). Wing length 9.0–9.5 mm and width 2.1–2.4 mm. Occiput length 70–90% height. Antenna as male, length is 60–80% head length; scape 0.3–0.4 mm long; pedicel 0.6 mm long. First flagellomere 0.7–1.0 mm long; length 1.9–2.0 times width. Oviscape (Fig. 10) shiny ochraceous with several brown setulae; length 1.9 times maximum width. Segment 8 brown, except yellow apex.

Type material: Holotype (examined in photographs) (Figs 20, 21, 24): ♀, Costa Rica (ZMHB).

Other material examined. COSTA RICA: 1♂ Prov. Punta, Mellizas Sabalito. 700m SE de Mellizas, Sector Las Tablas. 1500m. 21-24-sep-1995. E. Navarro; 2♂ Prov. Puntarenas, P.N. La Amistad. Estación Altamira. 1320m. Malaise. 1-15-nov-1994. M. Segura; 1♂ Prov. Puntarenas, Buenos Aires. Estación Altamira. 1320m. Malaise. Oct-1994. Z. Fuentes; 1♂ Prov. Puntarenas, Buenos Aires. Estación Altamira, Cerro Frantzius. 2134m. Malaise. 5-ene-5-feb-2000. D. Rubí; 1♀ Prov. Puntarenas, Coto Brus. Sendero a Pittier 1km Norte de la Estación. 1800-2000m. Malaise. 13-sep -13-oct-1996. A. M. Maroto. 1♂ Prov. Puntarenas, Buenos Aires. Estación Altamira. 1400m. Malaise. 8-oct-1994. M. Segura; 1♀ Prov. Puntarenas, Buenos Aires. Estación Altamira, Sendero Los Gigantes. 1450m. Malaise. 4-ene-feb-2000. D. Rubí (INBio).

Cerantichir peruana (Hennig)

Figs 2, 4, 6, 8, 10–11, 13, 17–19, 22–23, 25

Odontoloxozus peruanus Hennig, 1937: 261 (description); Aczél, 1949: 382 (cat.); Aczél, 1961: 291 figs. 23–27 (23. female, head, lateral view; 24. female, head, dorsal view; 25. ovipositor, dorsal view; 26. ovipositor, lateral view; 27. female, thorax, dorsal view), 293 (key), 296 (taxonomy); Steyskal, 1968: 5 (cat.); Rohlfien&Ewald 1970: 411 (cat., type-material); Carvalho-Filho & Esposito, 2008: 59 (listed), 60 (key).

Cerantichir peruana Buck, 2010: 819 (comb. n.).

Male. Body length (excluding antenna and epandrium) 9.5–11.9 mm (Fig. 2). Wing length 6.9–7.8 mm and width 1.8–2.0 mm. A brown species with partly yellow and shiny head; pleuron subshiny brown, with patches of white pruinescence and thorax with two longitudinal narrow pruinescent yellowish brown stripes.

Head. Conspicuously elongate; length 1.7–2.3 times width; below the eyes velvet whitish yellow. Frons concave between compound eyes and narrowing towards the ocellar tubercle; anterior margin weakly convex, projecting between antennal bases (Fig. 6). Fronto-orbital plate shiny brown and wide; with three fronto-orbital setae, the anterior pair separated by half of the distance to the posterior pair, some specimens may have four setae on one side. Vertex brown pruinescent and relatively narrow, with two furrows surrounding the ocellar tubercle. Postocellar setae slightly convergent, subequal to transversal diameter of ocellar tubercle; inner vertical setae parallels, and equal to the postocellar setae; outer vertical setae absent. Ocellar tubercle subshiny dark brown, ovate and relatively large and raised; ocelli yellow and small. Parafacial velvet blackish brown, with yellow spot over mid of height of the eye. Face yellow, straight and narrow. Vibrissa absent. Gena whitish yellow and ventrally straight; with one genal seta, spine-like and half as long as the paraverticlar setae. Postgena elongate, narrows posteriorly. Occiput shiny yellowish brown and longitudinally elongate; with a narrow horizontal yellow stripe on inferior third, that does not reach the posterior head margin; length 1.3–1.9 times height. Antennal base shiny dark brown, polished, rounded and inflated; distal margin projecting dorsally after a bend in the apical fourth (Fig. 6). Antenna 70% of head length. Scape blackish brown and velvet, but ventrally yellow; 0.2–0.3 mm long. Pedicel same color as scape but pale yellowish ventrally; laterally flattened; ventral and dorsal margins have strong black setulae; 1.0–1.2 mm long; inner process of pedicel obtuse with widely rounded apex and projecting over a very short proximal portion of the first flagellomere (Fig. 10). First flagellomere blackish yellow, covered with tiny white pruinescence; dorsal and ventral margins parallel with truncate apex; length 2.4–2.7 times width. Arista densely white pubescent, except for the small basal portion brown pubescent; on the dorso-apical angle of the first flagellomere.

Thorax. Shiny brown, dorsally dull and partially white pruinescent in delimited areas, with two inconspicuous narrow yellowish brown pruinescent stripes, separated by a broad median brown stripe narrowing behind suture towards the scutellum (Fig. 8); thoracic setae short, strong and spine-like. Mesoscutum anteriorly beyond level of postpronotal carina; anterior margin with two setae equal in length as the dorsocentral setae and on small tubercles. Anterior notopleural setae and supra-alar setae of same length. Posterior notopleural seta equal in length to the scutellar setae, on cylindrical tubercles of the same size of the setae. Supra-alar and postalar setae subequal to scutellar setae. One pair of dorsocentral setae as long as postalar setae. Scutellum shiny yellowish brown, rounded and medially concave; with a median pruinescent stripe; one pair of strong apical setae 30% scutellum length on conical tubercles; one pair of weaker hair-like subapical setae. Postpronotal lobes shiny

brown with one dorsal spine-like seta in the dorsoposterior area, subequal to the other thoracic setae; postpronotal carina shiny brown, ending anteriorly prior to the level of antepronotal ring. Prosternum whitish yellow; cuneate with truncate anterior margin, separated from the proepisternal plate by a very narrow membranous area. Proepisternum pale yellowish brown in anterior half, darkening posteriorly; with one spine-like setae and two or three weak white setulae above front coxa. Anepisternum mostly pruinose with small shiny areas. Katepisternum with three patches of white pruinoscence on anterior, dorsal and posterior margins; with one seta equal to or longer than postalar setae; ventral margin paler pruinose. Anepimeron with white pruinose patch in dorsal margin. Katatergite polished blackish brown, rounded and protuberant; length 1.2 times height. Anatergite and mediotergite same color as pleuron and gray pruinose. Meron shiny brown with gray pruinoscence on posterior half towards the metepimeron which is completely pruinose. **Legs.** Coxae shiny pale yellowish brown with black spine-like setae on small conical tubercles. Fore coxa paler and inflated, with several yellowish brown setulae and two antero-apical setae, one brownish, long and slender and the other black and strong, and a row of four black setae along the anterolateral margin. Mid and hind coxae with two black lateral setae and one larger brown latero-apical seta. All femora pale yellowish brown with two paler distomedial and subapical rings and several small anteroventral and posteroventral spine-like setae; mid femur of some males with a median stripe of five or six setae on anterior margin. Tibiae same color as femora, with a broad subapical paler yellow ring and the fore tibia with two dorsal rows of small spines; covered with rows of short black setulae that are most dense distally. Tarsi black, with rows of short black setulae. **Wing** (Fig 13). Brownish; cells r_1 y r_{2+3} darkened anteriorly; microtrichia absent in cells bc, c, bm and cup and absent only basally in cells r_1 , r_{2+3} , br, dm and around vein A_1+CuA_2 . Vein dm-cu not oblique. Margin of upper calypter whitish yellow with fringe of short white setulae; margin of lower calypter blackish brown with short white setulae. Halter whitish with knob darkened.

Abdomen. Pale yellowish brown, dorsally velvet with several brownish setulae and laterally paler, subshiny, almost bare; tergites 5 and 6 paler yellow; some males tend to have a paler abdomen and some Colombian and Peruvian specimens have completely yellow abdomen. Male terminalia subshiny yellow, semicylindrical and elongate (Figs. 17, 18). Syntergosternum 7+8 shiny polished; length is 40–60% of epandrium length. Epandrium pale yellowish brown and dorso-apically velvet; lateral margin with row of yellow setulae; extends forward to anterior margin (at most) of tergite 4. Anterior lobe of surstylus subshiny yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus blackish yellow and wide, covered with white pruinoscence and black setulae.

Female. Similar to male, differs as follows: Body length (excl. antenna and ov scape) 9.9–11.8 mm (Fig. 19). Wing length 7.2–8.1 mm and width 2.1–2.4 mm. Occiput length 20–30% height. Antenna as male, length is 70–80% head length; scape 0.2–0.3 mm long; pedicel 0.8–1.1 mm long.

First flagellomere 0.7–1.0 mm long; length 1.9–2.0 times width. Oviscape (Fig. 10) shiny brown with several brownish setulae; length 1.8–2.2 times maximum width. Segment 8 black, except yellow apex.

Type material: Holotype (not examined) ♂, Staatliches Museum für Tierkunde, Dresden, Germany (SMT). Type locality: Peru, Umahuankilia, Urubamba river. **Paratype** (examined in photographs) (Figs 22, 23, 25): ♀, SMT. Type locality: Bolivia, Mapiri.

Other material examined. COSTA RICA: 1♂ Prov. Heredia, Sarapiquí. Z.P. La Selva. 50–100m. Trampa luz. 13-jun-2005. J. Mata y M. Solis; 1♂ Prov. Cartago, Paraiso. P.N. Tapanti, Send. Pava Catarata. 1345m. Trampa frutas. 14-dic-2008. R. Gonzales; 1♂ Prov. Limón. Res. Biol. Hitoy Cerere, Sendero Espavel. 560m. Libre. 9-jul-2003. W. Arana, B. Gamboa y F. Rojas; 1♀ Prov. Limón, Valle de La Estrella. Res. Biol. Hitoy Cerere, Send. Toma de Agua. 100–400m. Malaise. 11-oct-11-nov-1999. F. Umaña; 1♂ Prov. Limón, Veragua Rainforest. 300–400m. Trampa frutas. 19-jun-2008. J. Mata; 1♀ Prov. Limón, Veragua Rainforest. 400–440m. Colecta Libre. Jul-2008. R. Villalobos; 1♀ Prov. Guanacaste, Tilarán. P.N. Volcán Tenorio, Sendero Rancho Capú. 740m. 18-sep-2001. J. D. Gutiérrez; 1♀ Prov. Guanacaste, Cañas. P.N. Volcán Tenorio, Sector Montezuma. 1300m. Libre. 22-jul-2002. J. D. Gutiérrez. 1♀ Prov. Guanacaste, Cañas. P.N. Volcán Tenorio, Río Naranjo. 1400m. Manual. 16-feb-2001. J. D. Gutiérrez; 1♂ Prov. Alajú. Res. Biol. San Ramón. 800m. nov-1994. G. Carballo (INBio); COLOMBIA: 1♂ Putumayo. PNN. La Paya. 330m. 0°2′S, 75°12′W. Malaise. 05-25-dic-2001. E. Lozano (IAvH); PERÚ: 1♀ Madre de Dios, Itahuania. Refugio Pantiacolla. Manual. 2-oct-2010. C. Bota (CEUA); BRAZIL: 1♂ Rôndonia, Ariquemes 58 km leste. 15-20-mar-1987. Mielke; 1♂ Mato Grosso, Cáceres. Coronel Rio Branco. 400m. 2-jul-1972. Mielke y Brown; 1♀ Rôndonia, Caucalândia. Rancho Grande. 16-nov-1991. Mielke (DZUP); Valle Chanchamayo, 25-feb-1929, Leg Weyrauch (FML).

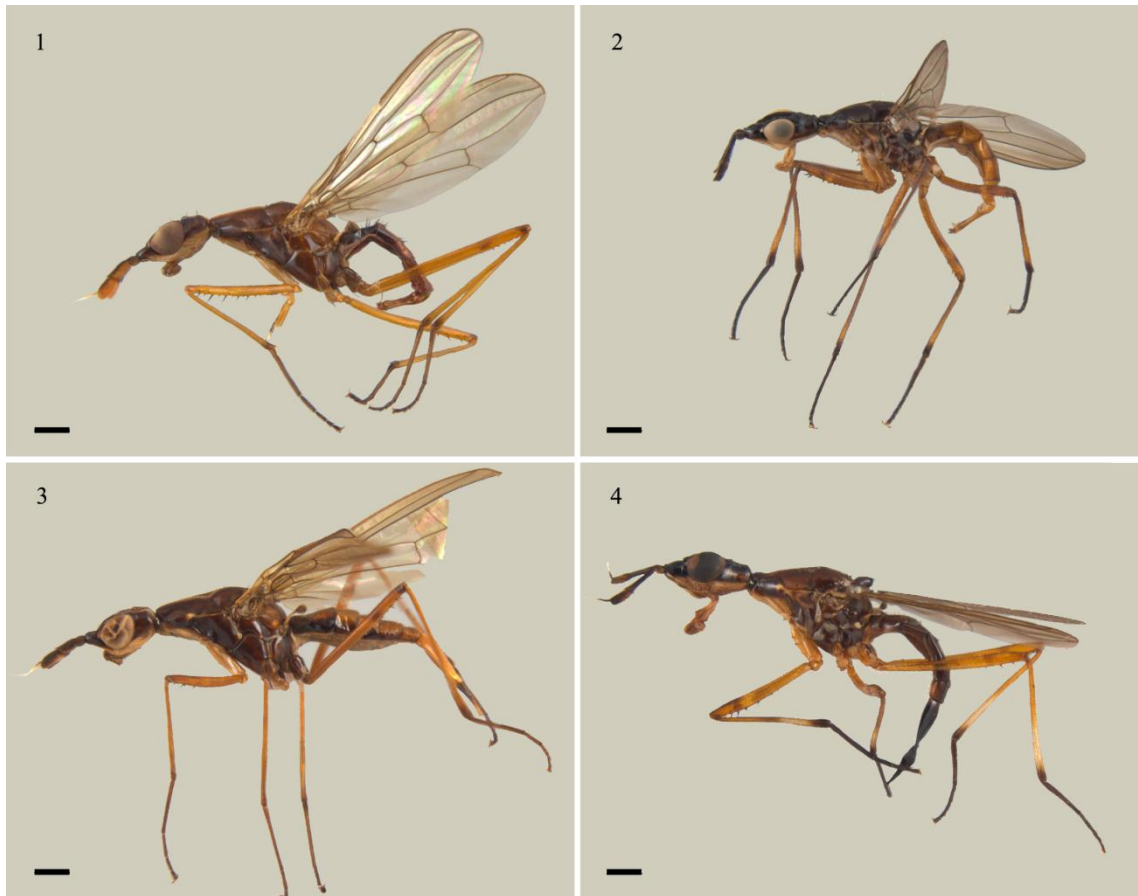
Acknowledgments

The authors would like to thank Dr Manuel Zumbado (INBio), Claudia Alejandra Medina Uribe (IAvH) for permission to study the material, and to the curators Joachim Ziegler of the Museum für Naturkunde, Humboldt-Universität, Berlin, Germany and Uwe Kallweit of the Staatliches Museum für Tierkunde, Dresden, Germany for sending us photographs of the type-material. We are thankful either to the Rede Paranaense de Coleções Biológicas (TAX-on line) for supporting the photos used here and to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the research grant (TAS proc. 130370/2011-8; APC proc. 140754/2011-3; CJBC proc. 304713/2011-2). Thanks to James J. Roper for the English revision.

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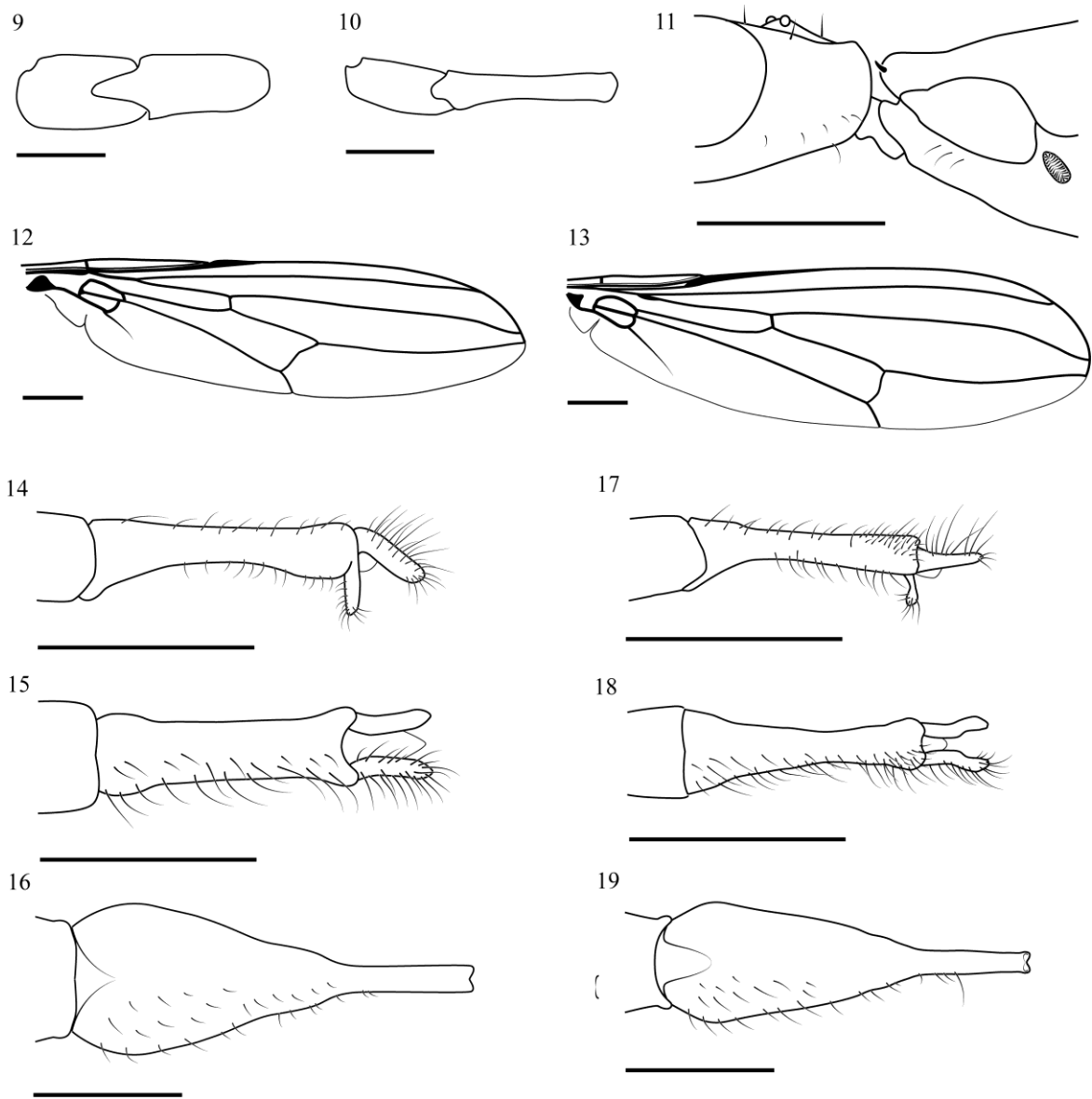
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Figures

Figures 1–4. Habitus of *Cerantichir enderleini* and *Cerantichir peruana*. 1. *C. enderleini*, ♂, lateral view. 2. *C. peruana*, ♂, lateral view. 3. *C. enderleini*, ♀, lateral view. 4. *C. peruana*, ♀, lateral view. Scales: 1 mm.



Figures 5–8. Head and thorax of *Cerantichir enderleini* and *Cerantichir peruana*. 5. *C. enderleini*, ♂, head, dorsal view. 6. *C. peruana*, ♂, head, dorsal view. 7. *C. enderleini*, ♂, thorax, dorsal view. 8. *C. peruana*, ♂, thorax, dorsal view. Scales: 1 mm.



Figures 9–19. Morphological features of *Cerantichir enderleini* and *Cerantichir peruana*. 9. *C. enderleini*, ♂, inner process of pedicel. 10. *C. peruana*, ♂, inner process of pedicel. 11. *C. peruana*, ♂, mesoscutum, lateral view. 12. *C. enderleini*, ♂, wing. 13. *C. peruana*, ♂, wing. 14. *C. enderleini*, ♂, terminalia, lateral view. 15. *C. enderleini*, ♂, terminalia, dorsal view. 16. *C. enderleini*, ♀, terminalia, dorsal view. 17. *C. peruana*, ♂, terminalia, lateral view. 18. *C. peruana*, ♂, terminalia, dorsal view. 19. *C. peruana*, ♀, terminalia, dorsal view. Scales: 9–10, 0,5 mm; 11–19, 1 mm.



Figures 20–21. Habitus of *Cerantichir enderleini* (holotype ♀, ZMHB). 20. Lateral view. 21. Dorsal view.



Figures 22–23. Habitus of *Cerantichir peruana* (paratype ♀, SMT). 22. Lateral view. 23. Dorsal view.



Figures 24–25. Type-material labels. 24. *Cerantichir enderleini* Hennig; 25. *Cerantichir peruana* (Hennig).

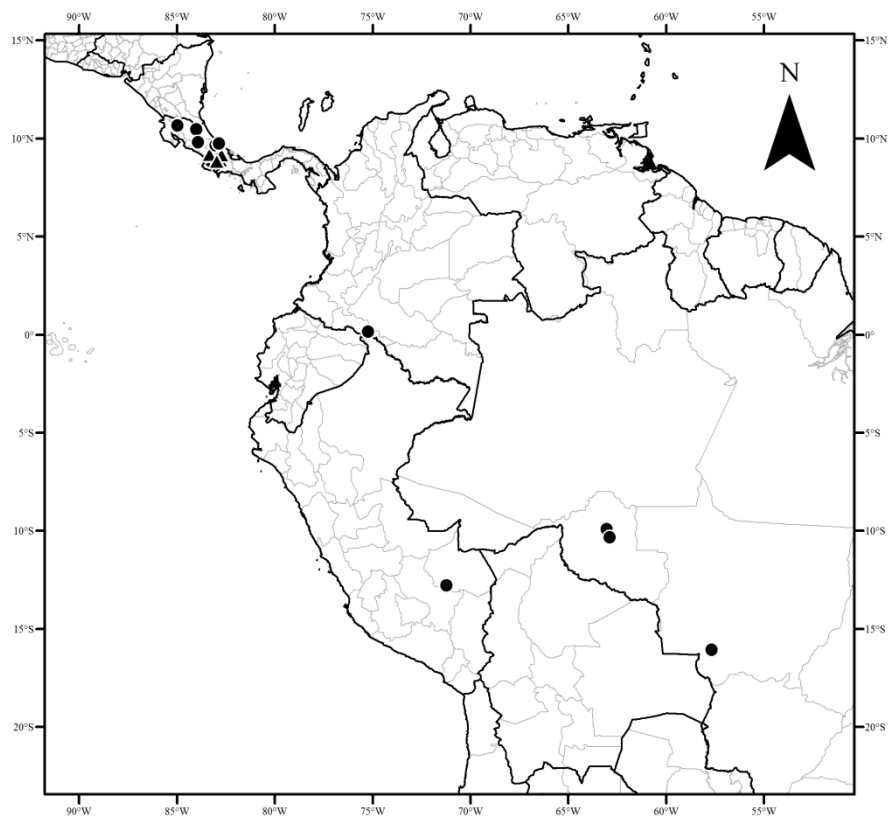


Figure 26. Distribution map for the species of *Cerantichir enderleini* Hennig, 1937 (▲) and *Cerantichir peruana* (Hennig, 1937) (●).

CHAPTER 5

REDESCRIPTION OF THE NEOTROPICAL GENERA *Loxozus* ENDERLEIN AND
Nerius FABRICIUS (DIPTERA: NERIIDAE)

Redescription of the Neotropical genera *Loxozus* Enderlein and *Nerius* Fabricius (Diptera: Neriidae)

Redescripción de los géneros Neotropicales *Loxozus* Enderlein y *Nerius* Fabricius (Diptera: Neriidae)

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Abstract

Here we revise and redescribe the Neotropical “cactus fly” genera *Loxozus* Enderlein and *Nerius* Fabricius. For the genera, we include new diagnosis, redescrptions and a key to identification of the currently known species, along with photographs and illustrations, as part of the study of Neriidae from Colombia, providing new information on morphology and distribution.

Key words: biodiversity, cactus flies, Colombian fauna, taxonomy.

Resumen

Revisamos y redescrimos los géneros Neotropicales de “moscas del cactus” *Loxozus* Enderlein y *Nerius* Fabricius. Para los cada género es presentada una diagnosis, redescrpciones y una clave de identificación de las especies conocidas, junto con fotografías e ilustraciones, como parte del estudio Neriidae de Colombia, entregando nueva información sobre su morfología y distribución.

Palabras clave: biodiversidad, fauna colombiana, moscas del cactus, taxonomía.

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Introduction

The Neriidae comprise a small family of acalyptrate flies, with 110 species in 19 genera (Steyskal 1965, 1968, 1977, 1980; Soós 1984; Mangan and Baldwin 1986; Pitkin 1989; Barraclough 1993; Buck and Marshall 2004). While these flies are found in all biogeographic regions, they tend to predominate in the tropics (Steyskal 1968, 1987). All neriids feed on sap and decaying plant tissues (Aczél 1961; Steyskal 1987; Buck 2010).

The most recent work on Neriidae was made by Buck & Marshall (2004), who reviewed the genus *Longina* Wiedemann, describing two new species for Colombia and Ecuador, providing a synonymic list for *L. abdominalis* Wiedemann, new diagnosis and figures.

The monospecific genus *Loxozus* Enderlein, 1922 from Colombia, was described from one known female from highlands, specially differentiated from other species of the family by the antennal base barely inflated (not common in the neotropical species, except for the aberrant *Glyphidops pluricellatus* Schiner, 1830), the scape and pedicel elongate and vein dm-cu oblique, these two, typical characteristics of larger species as *Longina* or *Cerantichir*, although it is a medium size species. No new material of the genus was found in the collections examined for this work, being the lack of material and the insufficient descriptions, the main obstacle for the improvement of its knowledge.

The first neriid known, belongs to *Nerius*, described by Aczél (1961) as the most chaotic Neotropical genus, including a considerable number of insufficiently described species. The same author suggested several synonym names, as *N. brachantichirinus* Hennig with *N. ochraceus* Schiner, *N. brunneus* Macquart, *Brachantichir rubescens* (Macquart) and *N. terebrans* Enderlein with *N. pilifer* Fabricius; *B. robustus* Enderlein and *N. robustus* Cresson with *N. plurivittatus* Fabricius, appointing that certainly, many other *Nerius* species are rather problematic, as *N. purpusiana* Enderlein, which probably was erroneously described and *N. terebrans* Hennig, described from a single male specimen from British Guiana on the basis of four pairs of fronto-orbital setae, although some *N. plurivittatus* may present four fronto-orbital setae on one side of the head and this has been largely considered a problematic trait within the family (Bonduriansky, 2009). The remaining species, *N. lanei* Hennig from Brazil and *N. laticornis* Aczél from Perú, were not considered in this work, because we found no material in the collections examined.

Here we examine the *Loxozus* and *Nerius* species in attempt to increase the knowledge of the family, that eventually lead us to place the taxonomy of the Neriidae species, hoping that the information contained in this work may assist to settle definitively the status of all species in the future. We propose new diagnosis for the genera, redescribe the available known species, include distribution extensions, along with identification keys based on adult morphological characters.

Material and Methods

We studied material from United States National Museum (USNM), United States of America; Instituto Nacional de Biodiversidad (INBio), Costa Rica; Entomological Collection of the

Universidad de Antioquia (CEUA), Colombia; Entomological Collection of the Fundación Miguel Lillo, Argentina; Museum of Zoology of the University of São Paulo (MZUSP), Brazil and the Entomological Collection Padre Jesus Santiago Moure (DZUP) at the Universidade Federal de Paraná, Brazil. Also photographs of types from the Zoological Museum of the Natural History Museum of Denmark (SNM) and the Oxford University Museum of Natural History (OUM) were examined.

We examined specimens using a Zeiss Stemi DV4 stereoscopic microscope. Photographs were taken with the Auto-Montage Imaging System®. Drawings and photos were edited using Adobe Illustrator CS5.1 and Adobe Photoshop CS5. Terminology follows Cumming & Wood (2009).

Results

Loxozus Enderlein

Loxozus Enderlein 1922: 156. Type-species: *Loxozus clavicornis* Enderlein, 1922 (original designation). Type-locality: Colombia, Cordilleras, “temperate lands”.

Diagnosis. Frontal vitta yellowish brown pruinose, projected anteriorly between antennal bases; with one “U” shaped yellow line that separates from the fronto-orbital plate. Face yellow, very wide and rounded. Vibrissa black, strong and spine-like. Postgena subshiny, narrowing posteriorly and separated from occiput by a bend, giving rise to the shiny brown vitta behind the eye; with two long and weak pale brown setulae at posteroventral margin of head. Antennal base shiny brown with interior margin yellow, barely inflated and completely separated by the projection of the frons. Antennae elongate, same length of head; separated by more than twice the width of scape at base. Scape yellowish brown pruinose; length twice the maximum width. Pedicel length more than thrice its maximum width and slightly less than twice scape length; inner process of pedicel reaching the proximal fourth of first flagellomere. First flagellomere length thrice its width. Arista white pubescent with tiny basal segments brown. Prosternum narrow in front of the fore coxa and widening anteriorly to join the proepisternal plate in distal half. Mid coxa with three lateral setae. Vein dm-cu oblique.

Loxozus clavicornis Enderlein

Figs. 1–4

Female. Body length (excluding antenna and ov scape) 7.7 mm. Wing length 7.4 mm and width 1.9 mm. Yellowish brown colored with partly yellow head and thorax; pleuron gray pruinose (Fig. 25).

Head. Not elongate; 1.9 mm length and 1.8 mm width. Anterior margin of frons convex, projecting between antennal bases; frontal vitta rather brown, with one subshiny “U” shaped yellow line that separates from the orbital plate; covered by white pruinoscence. Fronto-orbital plate brown

with pruinescence and not clearly separate from frons as in other neotropical Neriidae (Fig. 26); with three pairs of well-developed fronto-orbital setae, two anterior pairs hair-like and subequal to posterior pair. Postocellar setae straight and convergent, length 1.7 times the transversal diameter of ocellar tubercle; inner vertical setae weak, almost hair-like and subequal to outer vertical setae; outer vertical setae erect and half length of postocellar seta. Ocellar tubercle brown, densely white pruinescent, rounded, relatively small and not raised, fused to the brown frontal vitta and the brown vitta behind the eye. Parafacial brown very narrow, with one yellow ventral and white pruinescent spot. Face yellow pruinescent, wide and rounded ventrally. Vibrissa spine-like, inserted on small ventral tubercle; subequal to genal seta. Gena subshiny yellow, wide and ventrally straight; with one genal spine-like seta same size as postocellar seta. Postgena whitish yellow, densely white pruinescent; narrowing posteriorly; with several black and white long hair-like setulae at posterior margin of head. Occiput rather brown, separated by one wide yellow median vitta; ventral brown vitta inflated and shiny, with several weak brown setulae; dorsal brown vitta velvet and covered by dense white pruinescence dorsally; length 30% height (Fig. 27). Antennal base subshiny yellowish brown; inner margin yellow; completely separate from each other by anterior margin of frons. Antennae very narrow and elongate; same head length. Scape yellowish brown pruinescent; 0.5 mm length and 0.2 maximum width. Pedicel subshiny brown, with black strong setulae in dorsal, ventral and external margins; 0.8 mm length and 0.2 mm the maximum width; inner process of pedicel reaching the proximal third of first flagellomere. First flagellomere brown whitish pubescent; dorsal and ventral margins parallel and apex widely rounded; 0.7 mm length and 0.3 mm width. Arista white pubescent with tiny basal segments brown; inserted at dorso-apical margin of the first flagellomere.

Thorax. Yellowish brown pruinescent with two dorsal and parallel white stripes, separated for a median relatively wide yellowish brown stripe; pleuron completely covered by gray pruinescence. Posterior notopleural spine-like seta subequal to scutellar seta and inserted on a small tubercle. Supra-alar setae subequal to postalar setae, which are 30% of scutellar setae length. Two pairs of dorsocentral setae; 70% of scutellar seta length. Scutellum yellowish brown pruinescent with a median wide yellow vitta; lateral margins rather rounded with one pair of hair-like subapical setae; distal margin rounded with one pair of strong apical setae, 70% of scutellum length. Postpronotal lobes dorsally testaceous yellow and ventrally yellowish brown; postpronotal carina shiny yellowish brown and half as high as postpronotal lobes maximum height. Prosternum brown pruinescent; narrow between fore coxae, widening anteriorly to join the proepisternal plate in distal half. Proepisternum yellowish brown pruinescent with one black seta above fore coxa. Katepisternum with one small seta subequal to supra-alar seta. Katatergite anterior margin narrow and posterior margin very wide; length is 1.1 times width. **Legs.** Fore coxa yellowish brown, same color as the other coxae; whitish pruinescent; with two anteroapical well-developed setae; anterior margin with several yellowish brown setulae and two strong setae on anterolateral margin. Mid coxa with three lateral spine-like setae and one paler anteroapical seta. Hind coxa with one lateral spine-like seta

accompanied by several hair-like setulae and one long anteroapical seta. All femora rather yellow. Fore femora with several anteroventral and posteroventral spine-like setae on distal third. Mid femur anterior margin with two median setae; anteroventral and posteroventral margins with one or two spine-like setae on distal fourth. Hind femur with two dorsal distomedial; anteroventral and posteroventral margins with one or two spine-like setae on distal fourth. Tibiae yellow and darker at the apex with several apical spine-like setae, which are stronger in mid and hind tibiae; covered with rows of short black setulae that are denser distally. Tarsi subshiny brown. **Wing** (Fig. 28). Yellowish with pale veins, microtrichose; brownish in cell r_1 and r_{2+3} near to wing apex. Basicosta moderately inflated with one dorsal brown seta. Vein dm-cu oblique. Margin of upper calypter whitish yellow with fringe of long white setulae and margin of lower calypter whitish yellow and bare. Halter testaceous yellow, with black and orbicular knob.

Abdomen. Dark yellowish brown with short black setulae and lateral margins yellow. Tergite 6 somewhat longer, narrowing distally. Oviscape dark yellowish brown, darker in the middle and at apex; covered with white pruinescence, except in the shiny base; length twice the maximum width. Segment 8 brown except for yellow apex.

Type material: Holotype (Figs. 25–26): ♀, Columbién, Cordillieren (terra templada) Gesammelt von Professor Dr. Thieme (ZMHB).

Distribution. Colombia.

Nerius Fabricius

Nerius Fabricius, 1805: 264. Type-species: *Nerius pilifer* Fabricius (posterior designation by Coquillett, 1910: 575). Type-locality: “South America”.

Diagnosis. Fronto-orbital plate black narrow; with white pruinescence; three pairs of orbital setae. Ocellar tubercle black velvet and not raised or surrounded by furrows. Postgenawith one patch of white and weak setulae. Occiput wide, brown to black, velvet or shiny. Antennal base polished brown to black and shiny, except *N. czerny*, with a rather subshiny antennal base, covered by slight yellow pruinescence. Antenna not elongate, near half the length of the head. Inner process of pedicel reaching the basal third of first flagellomere; triangular and wide on base. First flagellomere wide with widely rounded apex; arista brown and bare. Prosternum very wide, hastate; joining to proepisternal plate at the height of the anterior margin of fore coxa. Postpronotal carina shiny protuberant. Legs brown to blackish brown. Fore coxa with two strong antero-apical spine-like setae. Basicosta with a conspicuous dorsal seta. Vein dm-cu curved and not oblique. Male terminalia relatively long and slender; when folded, extends to level of posterior margin of tergite 2.

Key to adults of *Nerius* Fabricius.

In this key are not included the species *N. lanei* and *N. laticornis*, differentiated by the shape of the first flagellomere, widening towards apex, described by Aczél (1961) as orbicular and hardly longer than wide, respectively.

1. Thorax dorsally with two grayish stripes, separate by one median wide stripe. Inner vertical seta and outer vertical seta well-developed. Occiput velvet 2
- Thorax dorsally with only one grayish stripe very wide with one median inconspicuous and narrow brown stripe. Occiput shiny brown, partly pruinose and inflated *N. pilifer*
2. Antennal base clothed with a slight brownish pruinoscence and consequently only subshiny; distal margin concave in dorsal view. Pleuron densely gray pruinose. Fronto-orbital plate black pruinose and narrow..... *N. czernyi*
- Antennal base shiny; distal margin slightly concave in dorsal view. Pleuron brown and partly gray pruinose. Fronto-orbital plate on anterior half yellow and posterior half brown; slightly pruinose *N. plurivittatus*

Nerius czernyi Aczél

Figs. 5, 8, 11, 14, 17

Nerius czernyi Aczél 1961: 334 (key and description), 335 fig. 61 (female, thorax dorsal). Type locality: Misiones, Argentina.

Male. Body length (excluding antenna and epandrium) 10.0–11.1 mm Wing length 8.1–8.2 mm and width 2.0–2.1 mm. Rather dark brown and velvet, head and thorax partly yellow; pleuron partly yellowish brown and densely gray pruinose (Fig. 29).

Head. Moderately elongate; length only 60% of width or height; length 2.1–2.2 mm and 1.2–1.4 mm width. Frons very concave and relatively narrow; anterior margin triangular, slightly projected between antennal bases; frontal vitta rather black with yellow pruinoscence, with yellowish inconspicuous vittae in the mid of anterior margin and lateral margins of posterior half. Fronto-orbital plate black pruinose and narrow, with three pairs of well-developed fronto-orbital setae, increasing in size posteriorly. Vertex black, velvet and wide behind the ocellar tubercle and delimited by two strong lateral furrows. Postocellar seta large and convergent; twice length of transversal diameter of ocellar tubercle; inner vertical seta reclinate and half length of postocellar seta; outer vertical seta erect and two third length of postocellar seta. Ocellar tubercle velvet, rounded, small and not raised; fused to the blackish brown vittae of the occiput; ocelli dark and relatively small. Parafacial black pruinose. Face yellow pruinose with ventral margin shiny brown; ventral margin rounded;

widening anteriorly. Vibrissa short and spine-like, half length of genal seta. Gena subshiny yellow and ventrally straight; with one black genal seta, same length as postocellar seta. Postgena yellow and long, narrowing posteriorly; with several white and brown short setulae on posterior margin. Occiput brownish black and velvet with one submedian yellow vitta; height 1.5 length. Antennal base blackish brown, clothed with a slight brownish pruinescence and consequently only subshiny; distal margin concave in dorsal view. Antenna 60% of head length. Scape blackish brown pruinescent; 0.3 mm long. Pedicel same color as scape, except inner margin paler; 0.4–0.6 mm long; laterally flattened; with strong black setulae on dorsal and ventral margins; inner process of pedicel wide, triangular, reaching the proximal third of first flagellomere. First flagellomere almost black, with short white pruinescence; dorsal and ventral margins parallel and apex widely rounded; length 1.5–1.7 times width. Arista shiny blackish brown and bare, except for the small yellowish basal portion; inserted on the dorso-apical margin of the first flagellomere.

Thorax. Dark brown pruinescent with two dorsal and parallel grayish stripes, separated for a median relatively narrow brown stripe that widens after transversal suture, where each of the parallel grayish stripes are divided into two narrower stripes (Fig. 35); pleuron partly yellowish brown and densely gray pruinescent. Anterior notopleural setae absent. Posterior notopleural seta erect and equal to scutellar seta. Supra-alar setae subequal to postalar setae, which are 60% of scutellar setae length. One pair of dorsocentral setae, twice as long as postalar setae. Scutellum brownish pruinescent with a wide median yellow stripe; lateral margins angulate and distal margin widely rounded; one pair of strong apical setae 60% of scutellum length, inserted on very small tubercles; one pair of weaker hair-like subapical setae, which may be accompanied by smaller setulae. Postpronotal lobes pruinescent, dorsally yellow and ventrally brown; postpronotal carina shiny yellow, anteriorly projected, but not ending prior to the level of anteppronotal ring. Prosternum dark brown pruinescent; hastate, joining to proepisternal plate at the height of the anterior margin of fore coxa (Fig.41). Proepisternum yellowish brown and velvet; anterior margin with several yellow setulae and one ventral spine-like seta equal to supra-alar seta. Katepisternum with one black, spine-like seta equal to posterior notopleural seta. Katatergite same color as pleuron, densely covered by yellowish pruinescence; length twice the height. Anatergite and mediotergite dark brown pruinescent. **Legs.** Coxae same color as pleuron, except fore coxa, yellowish brown with two strong antero-apical spine-like setae; anterior margin with several long yellow setulae and one row of two spine-like setae on anterolateral margin. Mid coxa with two lateral strong black spine-like setae and one antero-apical long setae accompanied by several weaker setulae. Hind coxa with one strong lateral spine-like seta and one antero-apical setae accompanied by several weaker setulae. All femora subshiny brown; with two rows of anteroventral and posteroventral spine-like setae on distal third, except fore femur, with spine-like setae on all ventral margin, inserted in subconical tubercles; mid femur with row of three or four submedian setae on anterior margin; hind femur with one or two dorsomedian setae. Tibiae paler than femora and darker at the apex; slightly widening distally; covered by rows of short black setulae that are most dense distally; fore tibia with

two ventral rows of short conical black spinules (absent in the female). Tarsi black. **Wing.** Yellowish, with cells r_1 , r_{2+3} and r_{4+5} darkening towards wing apex; completely microtrichose. basicosta with one dorsal seta. Vein dm-cu curved and not oblique. Margins of upper and lower calypteres yellowish brown; upper calypter with fringe of long yellow setulae and lower calypter with several short brown setulae. Halter white with orbicular knob blackish brown.

Abdomen. Brown with lateral margins yellow; dorsally velvet; with brown setulae. Tergite 6 longer and narrower. Terminalia subshiny brown, semicylindrical and elongate (Fig. 38). Syntergosternum 7+8 shiny brown with several dorsal setulae and white pruinescence towards lateral margins; length is 45% of epandrium length. Epandrium subshiny brown, dorso-apically darkened and covered by white pruinescence, except in dorsoanterior margin; extends forward to anterior margin (at most) of tergite 2. Anterior lobe of surstylus shiny yellow, spatulate, with brown setulae on apical margin. Posterior lobe of surstylus brown, covered with white pruinescence and yellowish brown setulae.

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscapae) 8.7–9.8 mm and rather paler than male (Fig. 32). Wing length 7.0–7.8 mm and width 1.7–2.0 mm. Frontal vitta paler with two lateral brown “Y” shaped stripes from the anterior margin of frons to converge in front of the ocellar tubercle. Fronto-orbital plate densely white pruinescent. Postcranium length 60–65% height. Antenna as male, length is 55–60% head length; scape 0.2–0.3 mm long; pedicel 0.3–0.4 mm long. First flagellomere 0.7–1.0 mm long; length 1.9–2.0 times width. Prosternum slightly narrower than male. Fore coxa with one hair-like setae on anterolateral margin. Fore femur with spine-like setae on distal half and not inserted in subconical tubercles. Mid femur with one or two median setae on anterior margin. Hind femur without dorsomedian seta. Oviscapae blackish brown, velvet and setulose; length 2.6–2.8 times maximum width. Segment 8 black.

Type material: Holotype: ♀, Puerto Aguirre, Misiones, Argentina (FML). **Paratype:** 1♂, Serra da Bocaina, São Paulo, Brazil (MZUSP).

Other material examined: BRAZIL: 1♂ 3♀ Paraná, Curitiba, Centro Politécnico UFPR, VSR peixe, 2-10.xii.2011, M Wolff; 1♂ Paraná, Canta Galo, 13.viii.2007, M. Costa (DZUP).

Distribution: Brazil, Argentina.

Nerius pilifer Fabricius

Figs. 6, 7, 12, 15, 18

Nerius pilifer Fabricius 1805: 264 (description). Type locality: “South America”.

Male. Body length (excluding antenna and epandrium) 5.9–8.4 mm Wing length 4.6–7.0 mm and width 1.3–1.7 mm. Rather dark brown and partly subshiny, head and thorax partly yellow; pleuron dark brown and densely gray pruinescent (Fig. 30).

Head. Barely elongate; length only 60–70% of width or height; length 1.3–1.8 mm and 1.0–1.4 mm width. Frons very concave and relatively narrow; anterior margin triangular, slightly projected between antennal bases; frontal vitta testaceous yellow with white pruinescence (described by Aczél (1951) as blackish on lateral margins anteriorly and in the middle posteriorly as in Panamanian and Brazilian specimens). Fronto-orbital plate black pruinose and narrow, with three pairs of well-developed fronto-orbital setae, the anterior hair-like, very small and short. Vertex dark brown behind ocellar tubercle and testaceous yellow in posterior half. Postocellar seta large and slightly convergent; 1.5 times length of transversal diameter of ocellar tubercle; inner vertical seta and outer vertical seta absent, in some specimens like very weak setulae. Ocellar tubercle black pruinose, triangular, small and slightly raised; isolated from the blackish brown vittae of the occiput; ocelli yellow and relatively small. Parafacial brown and velvet, with one yellow median spot; shiny in the point of join with orbital plate. Face yellow and white pruinose; ventral margin shiny yellow and straight. Vibrissa short and spine-like, one third the length of genal seta. Gena yellow with dense white pruinescence; ventrally straight; with one black genal seta, subequal to postocellar seta, but weaker. Postgena yellow with white pruinescence; separated from occiput in a bend, giving rise to the shiny brown stripe behind the eye; narrowing posteriorly; with several yellow short setulae on posterior margin. Occiput shiny brown and partly pruinose, with one narrow median shiny yellow stripe; height twice length. Antennal base shiny dark brown, with distal margin black; posterior margin only slightly concave in dorsal view. Antenna 60% of head length. Scape blackish brown pruinose and yellow in base; 0.2 mm long. Pedicel same color as scape, except on yellow inner margin; 0.2–0.4 mm long; laterally flattened; with strong black setulae on dorsal and ventral margins; inner process of pedicel wide, triangular (Fig. 42), reaching the proximal third of first flagellomere. First flagellomere almost black, with short white pruinescence; dorsal and ventral margins parallel and apex truncate; length twice width. Arista shiny blackish brown and bare, except for the small yellowish basal portion; inserted on the dorso-apical margin of the first flagellomere.

Thorax. Dark brown pruinose with one dorsal and wide grayish stripe, separate for one inconspicuous median brown stripe (Fig. 36); pleuron brown and densely gray pruinose. Anterior notopleural setae absent. Posterior notopleural seta erect and equal to scutellar seta. Supra-alar seta subequal to postalar seta, which is 70% of scutellar seta length. One pair of dorsocentral setae, subequal to postalar setae. Scutellum brownish with dense white pruinescence and one median testaceous yellow stripe; lateral margins rounded and distal margin truncated; one pair of apical setae, 60% of scutellum length; one pair of weaker hair-like subapical setae. Postpronotal lobes pruinose, dorsally yellow and ventrally brown; postpronotal carina shiny brown, anteriorly projected, but not ending prior to the level of antepronotal ring. Prosternum dark brown pruinose; hastate, joining to proepisternal plate at the height of the anterior margin of fore coxa, apparently forming a continuous sclerite. Proepisternum dark brown, covered by white pruinescence; with one ventral spine-like seta equal to katapisternal seta and half supra-alar seta length. Katapisternum with one black, spine-like

seta. Katatergite same color as pleuron, densely covered by yellowish pruinescence; same length as height. Anatergite same color as katatergite. Medio tergite darker than anatergite and equally pruinulent. **Legs.** Coxae same color as pleuron; fore coxa with two strong antero-apical spine-like setae; anterior margin with several short yellow setulae and one row of two spine-like setae on anterolateral margin (frequently only one setae on one side). Mid coxa with two lateral black spine-like setae and one antero-apical setae accompanied by several weaker setulae. Hind coxa with one strong lateral spine-like seta and one antero-apical setae. All femora subshiny brown; with two rows of anteroventral and posteroventral spine-like setae on distal third, except fore femur, with spine-like setae on all ventral margin, inserted in subconical tubercles; mid femur with row of three or four submedian setae on anterior margin; hind femur with one or two dorsomedian setae. Tibiae same color as femora and black at the apex; slightly widening distally; covered by rows of short black setulae that are most dense distally; fore tibia with two ventral rows of short conical black spinules (absent in the female). Tarsi blackish brown. **Wing.** Brownish, with cells r_1 , r_{2+3} and r_{4+5} darker towards wing apex; completely microtrichose. basicosta with one dorsal seta. Vein dm-cu curved and not oblique. Margin of upper calypter brown, with fringe of long yellow setulae; margin of lower calypter yellowish and bare. Halter white with orbicular knob blackish brown.

Abdomen. Brown with lateral margins yellow; dorsally velvet; with brown setulae. Tergite 6 longer and narrower. Terminalia subshiny brown, semicylindrical and elongate (Fig. 39). Syntergosternum 7+8 subshiny brown with several dorsal setulae and slight white pruinescence towards lateral margins; length is half of epandrium length. Epandrium subshiny brown, dorso-apically darkened and covered by white pruinescence, except in dorsoanterior margin; extends forward to anterior margin (at most) of tergite 2. Anterior lobe of surstylus shiny yellow, linear and rounded in apex, with brown setulae on apical margin. Posterior lobe of surstylus yellow, covered with white pruinescence and yellowish brown setulae.

Female. Similar to male, differs as follows: Body length (excluding antenna and ov scape) 5.2–8.5 mm and rather paler than male (Fig. 33). Wing length 4.2–8.1 mm and width 1.1–1.9 mm. Postcranium length 60% height. Antenna as male, length is 60–70% head length; scape 0.3–0.5 mm long; pedicel 0.4–0.7 mm long. First flagellomere 0.4–0.7 mm long; length twice width. Prosternum slightly narrower than male. Fore coxa with one spine-like setae on anterolateral margin. Fore femur with spine-like setae on distal half and not inserted in subconical tubercles. Oviscape subshiny blackish brown and setulose; length 2.8–3.6 times maximum width. Segment 8 black.

Type material: (examined in photographs): ♂, “Meridional America” (SNM).

Material examined: PANAMA: 1♂, 1♀ Canal zone, Barro Colorado Isl., 21.viii. 1978, N. E. Woodley (USNM). COLOMBIA: 2♂, 2♀ La Guajira, Riohacha, Corr. El Abra- Finca Doña Chefa, 44m, 11°18′36.69″N 72°53′55.83″W, VSR. copro/pescado, 11.x.2010, Dia, C. Valverde & J. D. Sánchez; 6♂, 7♀ Atlántico, Barranquilla, Uniatlántico, 11°01′07.58″N 72°55′47.45″W; 48m, VSR copro/fruta/pescado, 5.viii.2010, C. Valverde & E. Perdomo; 22♂, 38♀ Magdalena, Santa Marta-

Colegio INEM SB. 11°13'42.45"N 74°10'13.17"W, 28m, VSR copro/fruta/pescado, 25-27.viii.2010, Dia, C. Valverde & E. Perdomo; 5♂, 8♀ Bolivar, Corr. El Arenal- Finca El Peligro, 10°26'56.08"N 72°16'20.53"W, 600m, VSR copro/fruta/pescado, 17-19.viii.2010, C. Valverde & E. Perdomo; 6♂, 5♀ Sucre, San Onofre, Reserva Sanguaré, 09°42'21.60"N 75°40'45.63"W, 8m, VSR fruta, Grupo de Entomología, 28.x-4.xii.2009; 1♀ Antioquia, Maceo, Cañon del rio Alicante, Guardasol, Pastizal, VSR. 5.x.2000, S. Pérez; 3♂, 4♀ Antioquia, La Pintada, Hda. Montenegro, Comfenalco, 5°43'25"N 75°37'26"W, 770m, Bosque, VSR. copro/cebolla/pez, 21-22.vi.2007, H: 6-18, M. C. Velez & A. L. Montoya; 11♂, 10♀ Antioquia, La Pintada, Hda. Montenegro, Comfenalco, 5°43'24"N 75°37'15"W, 850m, Bosque, VSR. copro/pez/visceras, 15-16.ii.2007, N. Uribe; 7♂, 2♀ Antioquia, Jericó, Cauca Viejo, Bosque intervenido, cerca a la quebrada Los Cruces, 614m, VRS fruta, 7-10.ix.2010, M. Wolff & L. Rios; 2♀ Antioquia, Nariño – Vda. Puente Linda, cerca al rio Samaná, 5°34'01.9"N 75°06'47.7"W, 700m (aprox.), VSR pez, 24-26.vii.2009, A. Bustamante; 1♀ Santander, Campamento - Santa Isabel, Hda. El Bosque, VSR, 4.x.2001, Castaño & Velez; Caldas, Norcasia, Sector El Tigre, 5°33'09.8"N 74°52'23.1"W, 700m, Bosque conservado, VSR pez, 20.ii.2010, D. Gaurisas & L. Rios (CEUA); 1♂ Putumayo, PNN La Paya, Nacimiento Qda. Blanca, 0°1'S 75°12'W, 330m, Malaise, 24-25.ix.2001, D. Campos, Leg. M2078 (IAvH). BRASIL: 1♀ Amazonas, Presidente Figueredo, AM 240 km 24, 30.ix-2.x.2010, Cordeiro, Grisales, Guedes & Haseyama; 1♂, 1♀ Amazonas, Manaus, RFA Ducke, VSR fígado, 18.x.2010, Cordeiro, Grisales, Guedes & Haseyama; Paraná, Canta Galo, 13.viii.2007, M. Costa (DZUP).

Distribution: Mexico, Panama, Guyana, Suriname, Colombia, Venezuela, Paraguay, Peru, Bolivia, Argentina, Brazil.

Nerius plurivittatus Bigot

Figs. 7, 12, 15, 18

Nerius plurivittatus Bigot, 1886: 372 (description). Type locality: Mexico.

Male. Body length (excluding antenna and epandrium) 9.7–12.8 mm Wing length 7.0–9.1 mm and width 1.7–2.4 mm. Brown to dark brown species and partly subshiny, head and thorax partly yellow; pleuron brown and partly gray pruinose (Fig. 31).

Head. Barely elongate; length 70–80% of width or height; length 1.8–2.3 mm and 1.2–1.9 mm width. Frons concave and relatively narrow; anterior margin rounded and barely projected between antennal bases; frontal vitta testaceous yellow with white pruinescence and a median brown vitta “Y” shaped. Fronto-orbital anterior half yellow and posterior half brown; slightly pruinose and narrow, with three pairs of well-developed fronto-orbital setae, increasing in size posteriorly. Vertex black behind ocellar tubercle with slight lateral furrows. Postocellar seta large and convergent; 1.4–1.7 times length of transversal diameter of ocellar tubercle; inner vertical seta erect and equal to outer vertical

seta; outer vertical seta divergent and half length of postocellar seta. Ocellar tubercle black and velvet, triangular, small and not raised; fused by the posterior margin to the blackish brown vittae of the occiput; ocelli yellow and large, except anterior ocellus which tends to disappear. Parafacial brown and velvet, with one yellow median spot; shiny in the point of join with orbital plate. Face yellow with dense white pruinescence; ventral margin shiny brown and straight. Vibrissa absent. Gena yellowish brown with dense white pruinescence; very narrow and ventral margin slightly rounded; with one black genal seta, equal to postocellar seta. Postgena yellow with dense white pruinescence and very narrow; with one row of four or five brownish setula on posteroventral margin. Occiput dark brown and velvet, with one wide submedian shiny yellow stripe; slightly inflated over postgena and extending (at most) one third below the eye, over the gena; with short and black setulae; height 40–50% the length. Antennal base shiny blackish brown, with distal margin black; posterior margin slightly concave in dorsal view. Antenna 50–60% of head length. Scape blackish brown pruinescent; 0.2 mm long. Pedicel same color as scape; 0.3 mm long; laterally flattened; with strong black setulae on dorsal and ventral margins; inner process of pedicel wide, triangular, reaching the proximal third of first flagellomere. First flagellomere almost black, with short white pruinescence; dorsal and ventral margins parallel and apex widely rounded; length twice width. Arista shiny blackish brown and bare, except for the small yellowish basal portion; inserted on the dorso-apical margin of the first flagellomere.

Thorax. Brown pruinescent with two dorsal grayish stripes, separate for one median brown stripe and divided after transversal suture, forming four grayish stripes (Fig. 37); pleuron brown and partly gray pruinescent. Anterior notopleural setae absent. Posterior notopleural seta erect and equal to scutellar seta. Supra-alar seta half postalar seta length and weaker. Postalar seta length 60% of scutellar seta length. One pair of dorsocentral setae, equal to postalar setae. Scutellum dark brown and white pruinescent, with one median testaceous yellow stripe; lateral margins slightly rounded and distal margin widely rounded; one pair of apical setae inserted in small tubercles, 70% of scutellum length; one pair of weaker hair-like subapical setae. Postpronotal lobes pruinescent, dorsally yellow and ventrally brown; postpronotal carina shiny yellow, anteriorly projected, but not ending prior to the level of anteppronotal ring. Prosternum brown pruinescent; cuneate, separated from the prosternal plate by a very narrow membranous area. Proepisternum brown, covered by slight white pruinescence; with one ventral spine-like seta half length of katapisternal seta. Katapisternum with one black, spine-like seta equal to supra-alar seta. Katatergite same color as pleuron, with yellowish pruinescence; length 1.7 times height. Anatergite and mediotergite darker than pleuron and white pruinescent. **Legs.** Coxa same color as pleuron and subshiny; fore coxa with two strong antero-apical spine-like setae; anterior margin with several black setulae and one row of two strong spine-like setae inserted on small tubercles on anterolateral margin. Mid coxa with two strong lateral spine-like setae inserted on small tubercles and one antero-apical. Hind coxa with one strong lateral spine-like seta inserted in small tubercle and one antero-apical setae. All femora subshiny brown; with two rows of anteroventral and

posteroventral spine-like setae on distal third, except fore femur, with spine-like setae on all ventral margin, inserted in subconical tubercles of the same size as the setae (Fig. 43); mid femur with row of four or five submedian setae on anterior margin; hind femur without dorsomedian setae. Tibiae same color as femora and black at the apex; slightly widening distally; covered by rows of short black setulae that are most dense distally; fore tibia with two ventral rows of short conical black spinules (absent in the female). Tarsi blackish brown. **Wing.** Brownish, with cells r_1 , r_{2+3} and r_{4+5} darker towards wing apex; completely microtrichose. basicosta with one dorsal seta. Vein dm-cu curved and not oblique. Margin of upper calypter yellowish brown, with fringe of long yellow setulae; margin of lower calypter whitish yellow and bare. Halter white with orbicular knob brown or at least with one basal brown spot.

Abdomen. Blackish brown with lateral margins yellow; dorsally velvet; with brown setulae. Tergite 6 longer and narrower. Terminalia shiny brown, semicylindrical and elongate (Fig. 40). Syntergosternum 7+8 shiny brown with several dorsal setulae; length is 20% epandrium length. Epandrium shiny, paler than syntergosternum 7+8, dorso-apically darker, with white pruinescence on distal margin; extends forward to anterior margin (at most) of tergite 2. Anterior lobe of surstylus shiny yellow, almost linear, with slightly wider and rounded apex, with brown setulae on apical margin. Posterior lobe of surstylus yellow, covered with white pruinescence and yellowish brown setulae.

Female. Similar to male, differs as follows: Body length (excluding antenna and ov scape) 8.6–10.6 mm (Fig. 34). Wing length 4.5–6.7 mm and width 1.8–2.2 mm. Head 2.0–2.2 mm length and 1.4–1.9 mm width. Postcranium length 40–50% height. Antenna as male, length is 50–60% head length; scape 0.1–0.2 mm long; pedicel 0.3–0.4 mm long. First flagellomere 0.5–0.7 mm long; length twice width. Prosternum slightly narrower than male. Proepisternal and katapisternal setae reduced and equal. Fore coxa spine-like setae weaker and not inserted on tubercles. Fore femur with spine-like setae on distal half and inserted in very short tubercles. Oviscape shiny brown and setulose; length 3.8–4.0 times maximum width. Segment 8 black.

Type material: (examined in photographs): ♂, Mexico (OUM).

Material examined: EL SALVADOR: 3♀ Soyapango, 15.vi.1966, S. Rivera-Garcia (USNM); COSTA RICA: 1♀ 5km W. Rincon Punta, 15m, 3.iii.1968, B. Cornaby; 1♀ Prov. Heredia, Santo Domingo, INBio Parque, 9°59'N 85°05'W, 1150m, 8.viii.2001, N. E. Woodley (INBio). PANAMA: 1♂ Gamboa, 3.iii.1988, J. A. Zeh; 1♂ Canal Zone, Plantation RD. 2miles from Gallaird Hwy, 28.viii.1978, N. E. Woodley; 1♀ Canal Zone, Barro Colorado Is., 25.iv. 1977, Silberglied/Aiello (USNM). COLOMBIA: 1♀ Caldas, Norcasia, VSR [Van Sommeren Ryden] Copro, 21.ii.2010, Dia 1-3 pm, D. Gaurisas & L. Rios; 1♀ Caldas, La Victoria-Sector El Tigre, 600m, VSR Copro, 21.ii.2010, Dia 11-13, D. Gaurisas & L. Rios; 1♂, 2♀ Antioquia, Maceo, Cañón del río Alicante, Guardasol, Bosque, VSR, 5.xii.2000, S. Pérez; 1♂, 2♀ Antioquia, San Roque, Cto. [Corregimiento] San José del Nus, Corpoica, VSR Hígado, Borde de bosque, 1.v.2007. N. Uribe; 1♂, 1♀ Antioquia, La Pintada,

Hda. [Hacienda] Montenegro, Comfenalco, 5°43'24"N 75°37'15"W, 850m, VSR, 19.iv.2007, Bosque, N. Uribe; 1♀ Antioquia, Nariño-Vda. [Vereda] Puente Linda, Cerca del Río Samaná, 5°34'1.9"N 75°6'47.7"W, 700m (aprox.), VSR fruta, 24-26.vii.2009, A. Bustamante; 1♂, 1♀ Antioquia, Carepa, Tunelapa, CORPOICA, 7°46'46"N 70°40'24"W, 48m, VSR Visceras de pollo, 8.11.2009. N. Uribe, CEUA 47416 (CEUA); Meta, PNN Sumapaz, Jardín Botánico, 3°48'N 73°56'W, 730m, Malaise, 4-24.i.2002, H. Vargas, Leg 3109; 1♀ Putumayo, PNN La Paya, 0°2'S 75°12'W, 330m, Malaise, 5-25.xii.2001, E. Lozano, Leg. 2797 (IAvH). ECUADOR: 2♂, 4♀, Puerto Orllna, Río Tiputini, 0°38.2'S 76°8.9'W, 12-26.viii.1999, W. N. Mathis, A. Baptista & M. Kotrba (USNM). BRASIL: 1♂, 4♀ Amazonia, 2♀ Manaus, RFA Ducke, VSR. Cebola, 23-26.ix.2010, Cordeiro, Grisales, Guedes & Haseyama (DZUP).

Distribution: Mexico, Panama, Dominican Republic, Trinidad, Guyana, Venezuela, Colombia, Peru, Bolivia, Brazil.

Acknowledgements

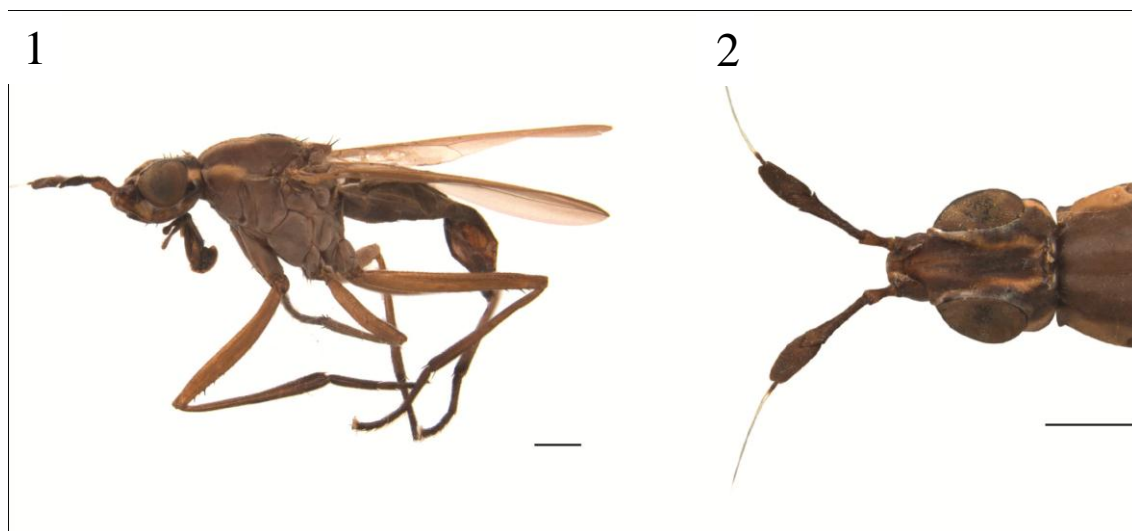
The authors would like to thank Joachim Ziegler (ZMHB), Claudia Medina (IAvH), Dr. Carlos Einicker Lamas (MZUSP) and Dr. Guillermo Claps (FML) for allowing the examination of type-material. Thanks to Manuel Zumbado (INBio) for permission to study the material and Zoe Simmons (OUM) for sending us photographs of the type-material in Oxford. Thanks are extended to Alessandre Colavite for the photographs of specimens in the Zoological Museum of the Natural History Museum of Denmark (SNM). We are thankful either to the Rede Paranaense de Coleções Biológicas (TAX-on line) for supporting the photos used here and to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the research grant (TAS proc. 130370/2011-8; CJBC proc. 304713/2011-2).

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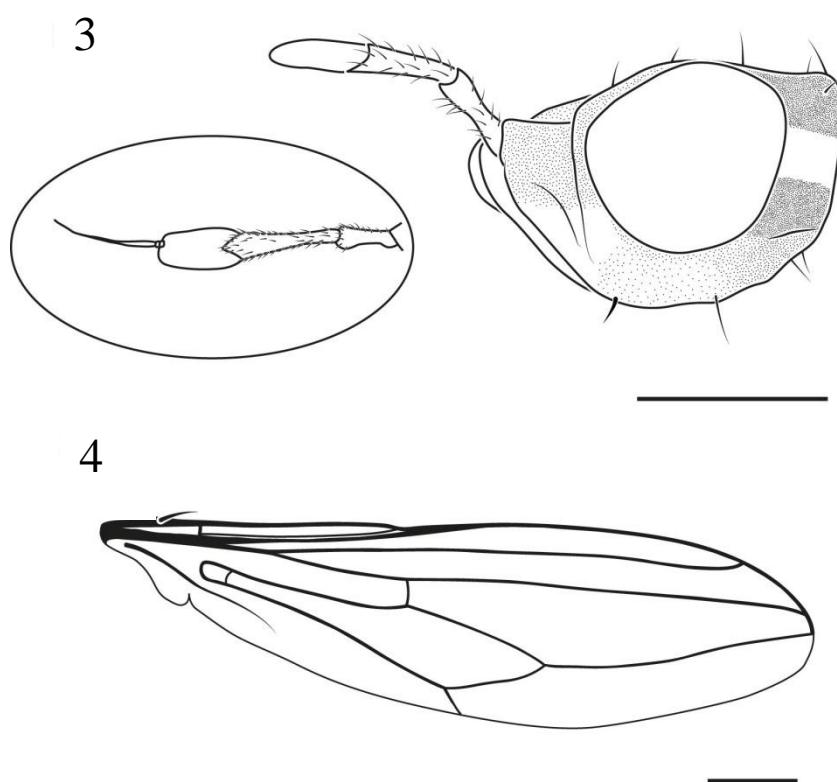
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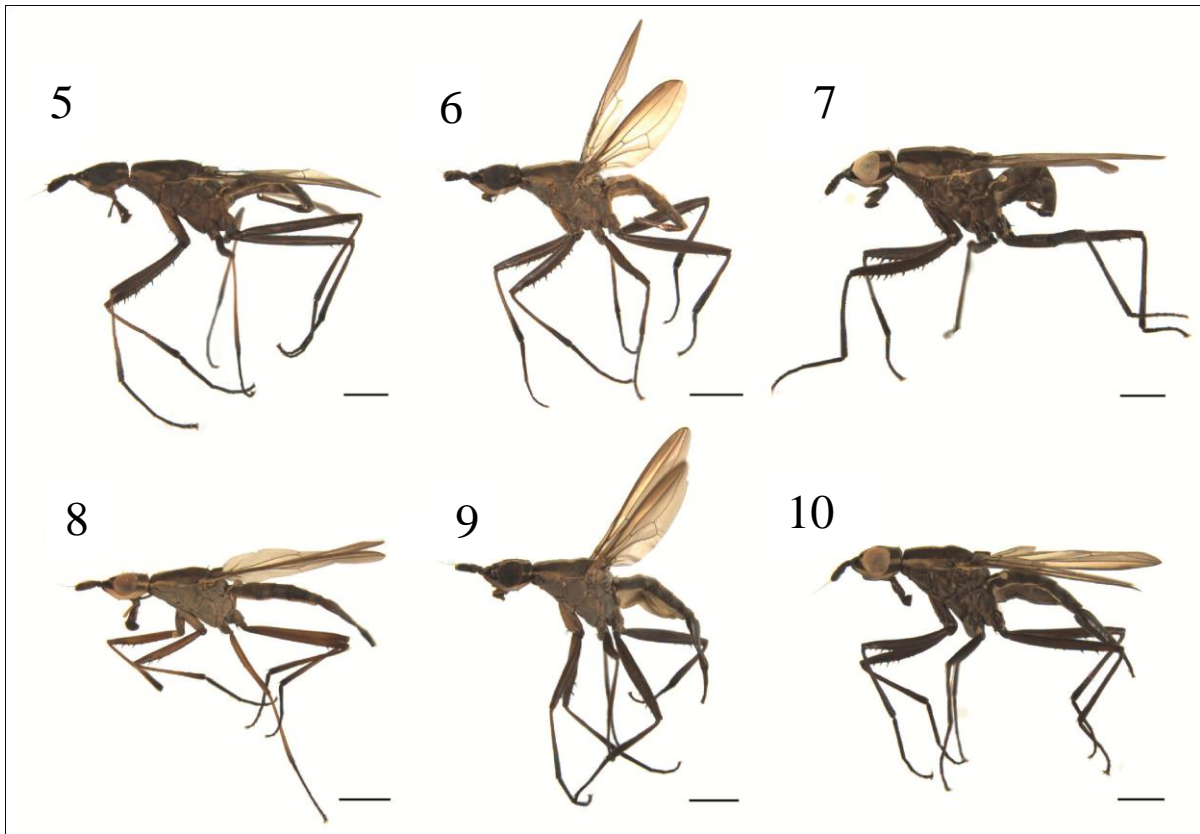
Figures



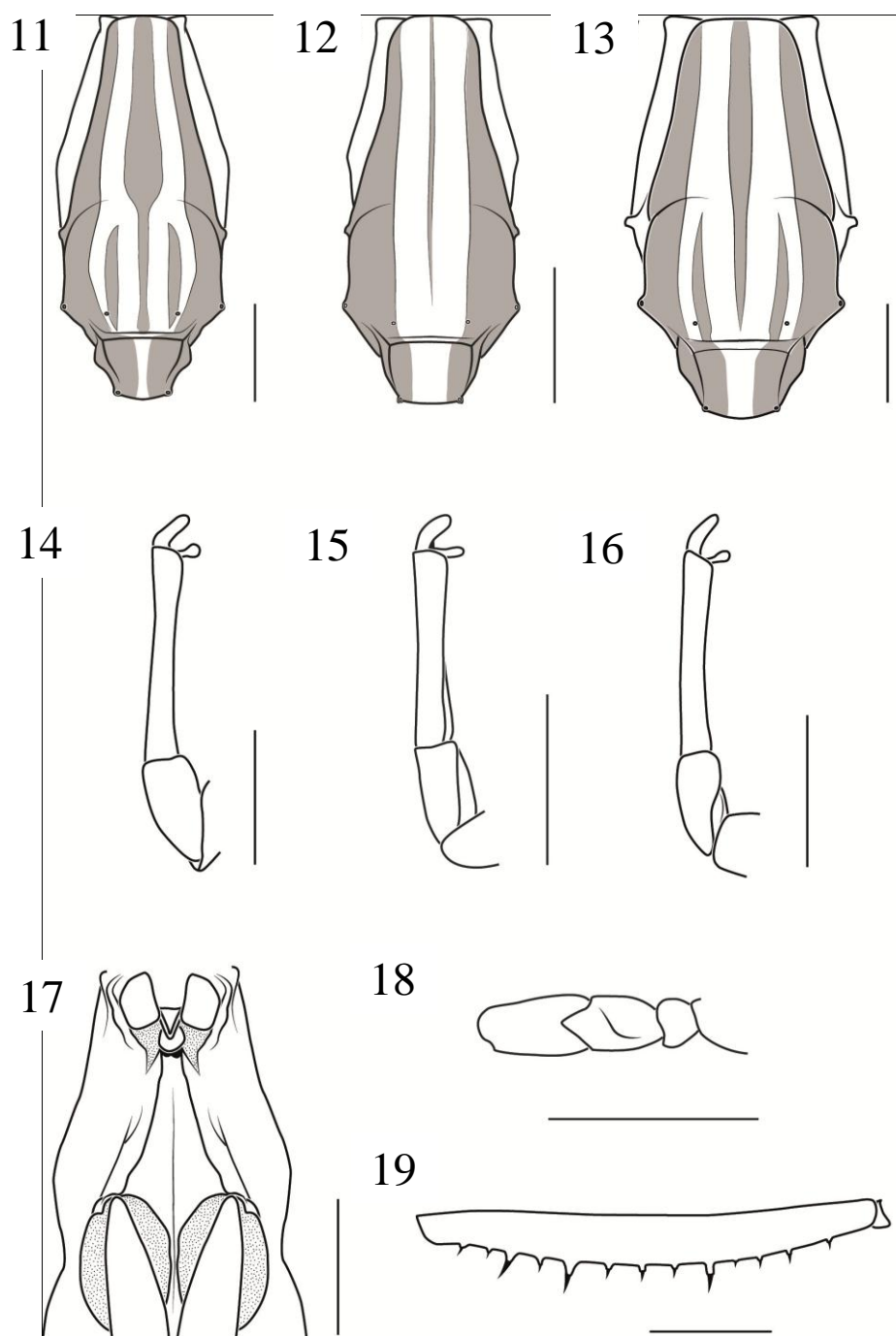
Figures 1–2. *Loxozus clavicornis* ♀. 1. Habitus; 2. Head, dorsal view. Scales: 1 mm.



Figures 3–4. *Loxozus clavicornis* ♀. 3. Head, lateral view; 4. Wing.



Figures 5–10. Habitus of *N. czernyi*, *N. pilifer* and *N. plurivittatus*, lateral view. 5. *N. czernyi*, ♂. 6. *N. pilifer*, ♂. 7. *N. plurivittatus*, ♂. 8. *N. czernyi*, ♀. 9. *N. pilifer*, ♀. 10. *N. plurivittatus*, ♀. Scales: 2 mm.



Figures 11–19. Morphological features of *N. czernyi*, *N. pilifer* and *N. plurivittatus*, ♂. 11. *N. czernyi*, thorax, dorsal view. 12. *N. pilifer*, thorax, dorsal view. 13. *N. plurivittatus*, thorax, dorsal view. 14. *N. czernyi*, terminalia, lateral view. 15. *N. pilifer*, terminalia, lateral view. 16. *N. plurivittatus*, terminalia, lateral view. 17. *N. czernyi*, prosternum. 18. *N. pilifer*, inner process of pedicel. 19. *N. plurivittatus*, fore femur, anterior view. Scales: 1 mm.

APPENDIX

APPENDIX 1:



Revision of the Neotropical genus *Eoneria* Aczél (Diptera: Neriidae) with description of a new species from Colombia

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Abstract

Here we revise *Eoneria* Aczél, 1951, a small genus of flies in the Neriidae, previously known from two species from Argentina. We describe a new species, *E. aczeli* Sepúlveda & Carvalho from Colombia, provide new records from Brazil, a distribution extension from Argentina and a new genus diagnosis, as well as an identification key based on adult morphology.

Key words: Argentina, Brazil, cactus fly, new records, taxonomy

Resumen

En este trabajo, revisamos *Eoneria* Aczél, un pequeño género de Neriidae, previamente conocidos por dos especies de Argentina. Describimos una nueva especie, *E. aczeli* Sepúlveda & Carvalho de Colombia, presentamos un nuevo registro de Brasil, una extensión de sus áreas de distribución para Argentina y una nueva diagnosis para el género, así como una clave de identificación basada en caracteres morfológicos de los adultos.

Palabras clave: Argentina, Brasil, mosca del cactus, nuevos registros, taxonomía

Introduction

The cactus fly genus *Eoneria* Aczél, 1951 (Neriidae: Neriinae) was described as monotypic in the *División sistemática de los Tanypezidiformes*, based on the following characters of *E. blanchardi* Aczél, 1951: (1) setae strong and relatively short, but less so than in the other genera of Neriidae, not spine-like, (2) gena below the eye singularly wide, (3) arista subapical, bare and dark, (4) frons with two or three pairs of fronto-orbital setae, (5) prothorax slightly elongate, (6) with two pairs of strong notopleural setae, (7) five or six pairs of dorsocentral setae, (8) one pair of scutellar setae, (9) wings without supernumerary cross-veins and (10) vein dm-cu slightly “S” shaped, (11) the basal portion of oviscapae with ventral margin slightly convex. The genus was named and described from a holotype female from Corrientes, Argentina (Aczél 1951).

Ten years later, *E. maldonadoi* Aczél, 1961 was described from a female holotype from La Rioja, Argentina with all the described characters for the genus, except that it has supernumerary cross veins (Aczél 1961). The only other Neriidae with supernumerary cross-veins are *Glyphidops (Oncopsia) pluricellatus* (Schiner) in the Neotropics, and *Styopcladius appendiculatus* (Hendel) from the Oriental Region, the latter of which also has six pairs of dorsocentral setae, as in *Eoneria*.

Eoneria belongs to a small and basal group of Neriidae comprising the *Eoneria*-group (Aczél 1961), which has antennal bases that are unpolished, not shiny or with a faint greasy luster. The other genera contained in this group

are *Eoloxozus* Aczél and *Antillonarius* Hennig in the Neotropical Region and *Indonesicesa* Koçak & Kemal, 2009 and *Telostylinus* Enderlein, 1922 in the Oriental and Australian Regions respectively.

The genus is putatively restricted to South America (Steyskal 1987; Buck 2010) and while its biology is little known, collection data suggests that it occurs in low and arid places (Aczél 1949, 1951, 1961; Steyskal 1965, 1968). Here, we delimit the genus *Eoneria* Aczél, 1951 and review new characters and distributional information. The internal genitalia is not included in this study, since it has essentially the same configuration within the family, with species having three spermathecae with a sometimes visible fourth vestigial duct in females (Buck & Marshall, 2004), and in the case of male genitalia, Aczél (1961) describes it in detail and states that its structure and general shape are uniform. Similarly, structures such as sternites, are reduced to homogeneous longitudinal bars (Steyskal, 1987) and have no taxonomic relevance.

We describe previously unknown males of these species along with a new species from Colombia. Summarizing this new information, we provide a revised diagnosis for the genus and an identification key based on adult morphological characters.

Material and methods

The type-material of *Eoneria blanchardi* and *E. maldonadoi* that we examined is in the Entomological Collection of Fundación Miguel Lillo (MUL), Argentina and the *E. aczeli* Sepúlveda & Carvalho, new species in the Instituto Alexander von Humboldt (IAvH), Colombia. We also studied material from Museum of Zoology of the Universidade de São Paulo (MZUSP), Brazil, the Entomological Collection Padre Jesus Santiago Moure (DZUP) at the Universidade Federal de Paraná, Brazil and the Entomological Collection of the Universidad de Antioquia (CEUA), Colombia.

We examined specimens using a Zeiss Stemi DV4 stereoscopic microscope. Photographs were coupled with the Auto-Montage Imaging System®. Drawings and photos were edited using Adobe Illustrator CS5.1 and Adobe Photoshop CS5. Terminology follows Cumming & Wood (2009).

Results

Eoneria Aczél

Eoneria Aczél 1951: 570. Type-species: *Eoneria blanchardi* Aczél, 1951 (original designation); Aczél 1961: 276 (key); Steyskal 1968: 2 (catalogue); Buck 2010: 818 (key).

Diagnosis. Anterior margin of frons straight. Behind the ocellar tubercle is a small protuberance between the postocellar setae. Body setae longer than those in the other species of neotropical Neriidae and not spine-like. Head moderately elongate, twice as long as antennae. Three pairs of fronto-orbital setae. Antennal base clothed with a dense yellow dusting and consequently only subshiny. Inner process of pedicel elongate, triangular, reaching the proximal half of the first flagellomere. First flagellomere yellowish and ovate, with tiny white pilosity. Arista brown and micropilose on the dorso-apical margin of the first flagellomere. Postocellar setae large and convergent. Vibrissa present. Thorax with one dorsal gray pruinose vitta equal in width with scutellum, separated by a narrow, median, yellowish brown stripe; pleuron with gray pruinescence. Six pairs of dorsocentral setae, variable in size. Scutellum with one pair of apical scutellar setae and one pair of weak subapical setae. Mid and hind coxae with two lateral setae. Basicosta with one dorsal seta and one ventral seta. Tergite 2 with one lateral seta, subequal to anterior notopleural setae and two conspicuous setae on posterior margin.

Distribution. Colombia, Brazil, Argentina.

Key to adult *Eoneria* Aczel

1. Distal margin of antennal base bare, without black setulae. Fore femur yellowish brown with several anteroventral and posteroventral spine-like setae, stronger on the distal half. Frontal vitta mainly ochraceous pruinose; with one yellowish brown pru-

- inose stripe from anterior margin of frons to ocellar tubercle. 2
- Distal margin of antennal base with two or three conspicuous black setulae. Fore femur yellowish pruinose, with inconspicuous anteroventral and posteroventral spine-like setae. Frontal vitta completely yellow pruinose
2. *E. aczeli* Sepúlveda & Carvalho, new species
2. Wing veins R_{2+3} and M_1 with 10 and 8 intercalated cross-veins respectively, one cross-vein emerging from Costa between apices of veins R_{2+3} and R_{4+5} . Frontal vitta ochraceous pruinose, with a wide yellowish brown pruinose stripe from anterior margin of frons to ocellar tubercle *E. maldonadoi* Aczél
- Wing without supernumerary cross-veins. Frontal vitta ochraceous pruinose, except for two lateral yellowish brown pruinose stripes “Y” shaped from the anterior margin of frons to converge in front of the ocellar tubercle *E. blanchardi* Aczél

Eoneria blanchardi Aczél

(Figs. 1–8)

Eoneria blanchardi Aczél 1951: 571 (description), 572 (fig. 20); Aczél 1961: 278 (key), 281 (fig. 1); Steyskal 1968: 2 (catalogue).

Diagnosis. Frontal vitta mainly ochraceous pruinose, except for two lateral yellowish brown “Y” shaped pruinose stripes from the anterior margin of frons to converge on the ocellar tubercle. Fronto-orbital plate with three pairs of well-developed fronto-orbital setae. Male fore tibiae with two ventral rows of small spine-like setae. Fore femur with one dorsal distomedial seta.

Male. Body length (excluding antenna and epandrium) 7.1–7.5 mm. Wing length 5.0–5.2 mm and width 1.4 mm. Dark yellowish brown colored with partly yellow head and thorax; pleuron gray pruinose (Fig. 1).

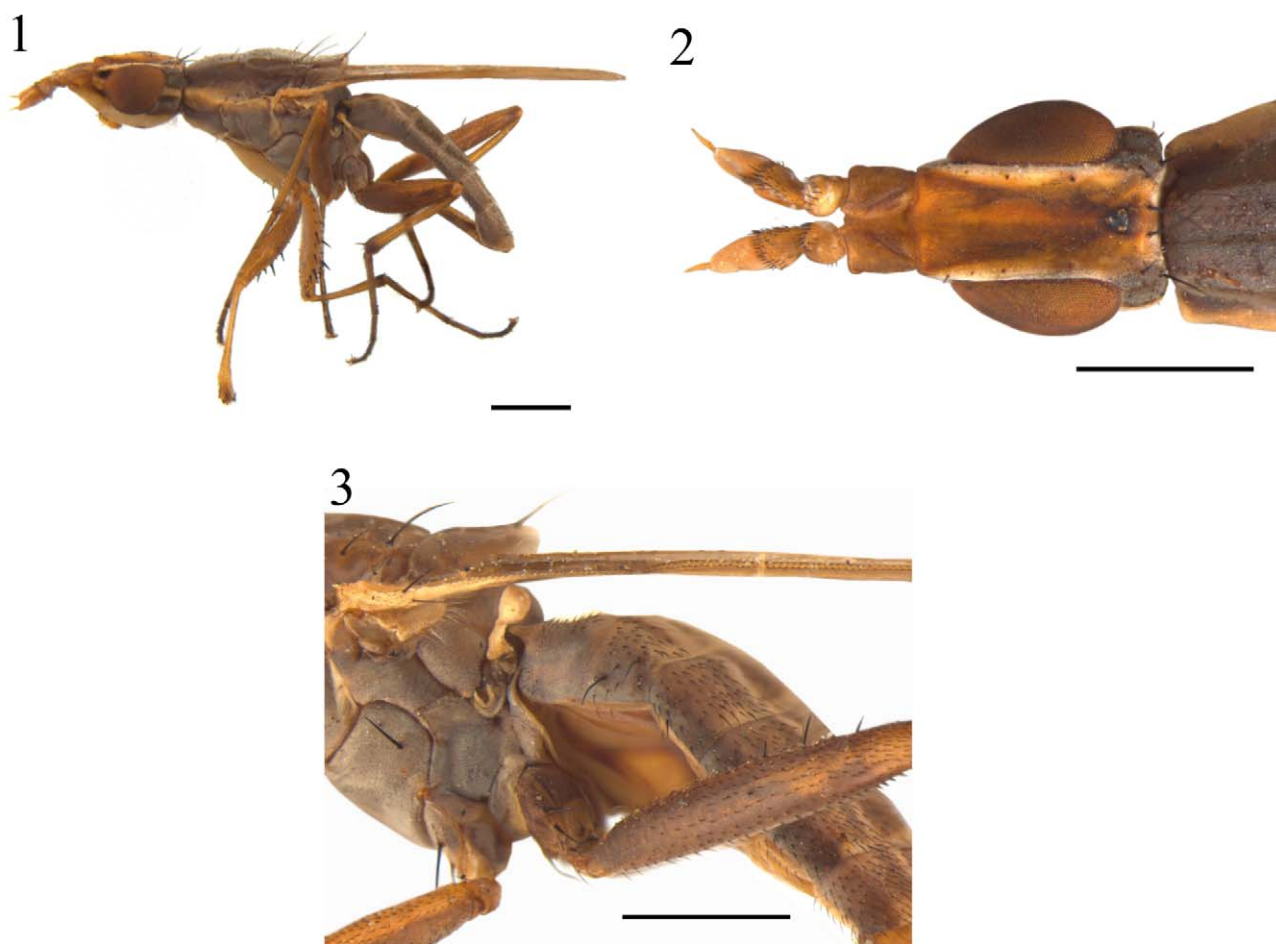
Head. Moderately elongate; 1.6–1.7 mm length and 1.1–1.3 mm width. Frons wide and concave; compound eyes; anterior margin almost straight; frontal vitta ochraceous pruinose except for two lateral yellowish brown pruinose “Y” shaped stripes from the anterior margin of frons to converge in front of the ocellar tubercle. Fronto-orbital plate white pruinose and narrow, with three pairs of well-developed setae, increasing in size posteriorly (Fig. 2). Postocellar setae large and convergent, length 3.0–3.5 times the transversal diameter of ocellar tubercle; inner vertical setae slightly convergent, subequal to outer vertical setae; outer vertical setae long and divergent, subequal to postocellar setae. Ocellar tubercle velvet blackish brown, triangular, large and somewhat raised, isolated from the yellowish brown pruinose vitta behind the eye; the ocellar plate slightly raised on the posterior margin of head, between the postocellar setae. Parafacial velvet brown with one yellow median spot. Face yellow, wide and straight with several tiny setulae on ventral margin. Vibrissa spine-like, subequal to genal setae. Gena subshiny whitish yellow, wide and ventrally rounded; with one genal spine-like seta half as long as postocellar setae. Postgena whitish yellow pruinose; narrowing posteriorly and separated from occiput by a bend, giving rise to the yellowish brown pruinose vitta behind the eye; with a dense patch of long and weak pale setulae at posterior margin of head. Occiput mainly yellowish brown pruinose, separated by one yellow median vitta and ventral yellowish brown vitta with one paler median pruinose vitta; with black strong and short setulae towards posterior margin of the head; length 40–50% height (Fig. 4). Antennal base pale yellowish brown with slight yellow pruinose; longer than wide in dorsal view; on ventral margin it may present two or three inconspicuous black setulae, coming from the row of setulae of the face. Antennae half of head length. Scape testaceous yellow, darkened on lateral margins; 0.2 mm long. Pedicel same color as scape; 0.2 mm long; laterally flattened; with strong black setulae on dorsal, ventral and distal margins; inner process of pedicel triangular and narrow, reaching the proximal half of first flagellomere. First flagellomere ochraceous ovate; length 1.4–1.6 times width. Arista blackish brown and microscopically pubescent; inserted at dorso-apical margin of the first flagellomere.

Thorax. Yellowish brown pruinose with one dorsal gray pruinose vitta same width as scutellum, separated by a narrow median yellowish brown stripe; with one faint yellowed gray pruinose vitta covering the lateral margin of mesoscutum, the postpronotal lobe and the notopleuron throughout the alar base; pleuron densely covered by gray pruinose; thoracic setae long and slender. Anterior notopleural setae directed backwards, equal to posterior notopleural and 70% of postalar setae length. Supra-alar setae half as long as postalar setae. Postalar setae curved and the longest thoracic setae. Six pairs of dorsocentral setae: two presutural pairs weaker and four postsutural pairs increasing in size towards the scutellum, prescutellar pair the longest and subequal to postalar setae. Scutellum yellowish brown pruinose with a median yellow vitta narrowing in the middle; lateral margins faintly

rounded with one pair of hair-like subapical setae; distal margin truncated with one pair of strong apical setae, same length as scutellum. Postpronotal lobe yellowish dark with a dorsal paler stripe. Postpronotal carina shiny yellowish brown, projecting anteriorly to postpronotal lobe. Prosternum shiny yellowish brown; linear with rounded anterior margin and separated from the proepisternal plate by one wide membranous area. Proepisternum yellow anteriorly and yellowish brown posteriorly, densely pruinose with a small brown seta above fore coxa. Katepisternum brown pruinose with one black and straight seta subequal to postalar setae. Katatergite pruinose, same color as pleuron; length is 1.1 times width. Anatergite and mediotergite yellowish brown and white pruinose.

Legs. Fore coxa yellowish brown and paler than the other coxae; whitish pruinose; with one antero-apical well developed seta and one or two much weaker setae; anterior margin with several yellowish brown setulae and two strong setae on anterolateral margin. Mid and hind coxae each with two lateral setae and one antero-apical seta accompanied by several weak setulae. All femora yellowish brown with gray pruinescence. Fore femora with several anteroventral and posteroventral spine-like setae and one dorsal distomedial seta (Fig. 5). Mid femur anterior margin with a row of five median setae. Hind femur with two dorsal distomedial setae more conspicuous than those on fore femur. Tibiae yellow and darker at the apex with several apical spine-like setae, which are stronger on mid and hind tibiae; covered with rows of short black setulae that are denser distally; fore tibiae in some males with two ventral rows of small spines. Tarsi yellow, darkening distally.

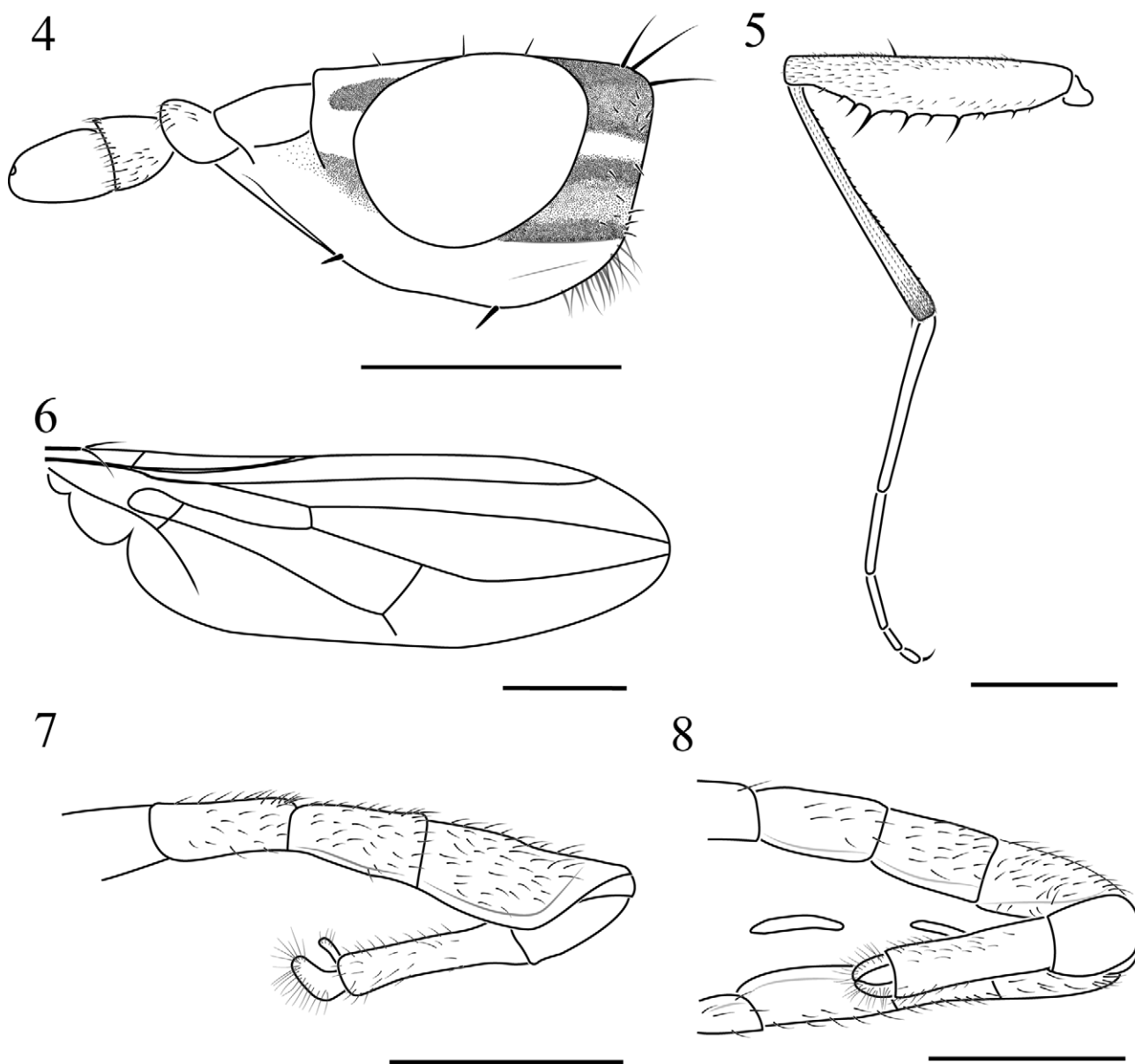
Wing (Fig. 6). Yellowish with brownish veins, microtrichose. Basicosta with one dorsal seta and one ventral seta. Vein dm-cu straight, not oblique. Margin of upper calypter whitish yellow with fringe of long white setulae and margin of lower calypter whitish yellow and bare. Halteres whitish yellow, with darkened and orbicular knob.



FIGURES 1–3. *Eoneria blanchardi* Aczél, male; 1. Habitus; 2. Head, dorsal view; 3. Abdomen, lateral view. Scales: 1 mm.

Abdomen. Yellowish brown with short black setulae; with a median yellow pruinose vitta and each tergite with a pair of distinct white pruinose spots at anterior margin, widely separate from lateral margin. Tergite 2 with

one lateral seta, subequal to supra-alar seta and two conspicuous setae on posterior margin (Fig. 3). Tergite 6 somewhat longer, narrowing distally. Genitalia pale yellowish brown. Syntergosternum 7+8 subshiny pale yellowish brown; half epandrium length. Epandrium same color as syntergosternum 7+8, dorsally darker; laterally and apically pruinose with short yellowish brown setulae; extends to level of posterior margin of tergite 4. Anterior lobe of surstylus shiny yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus shiny yellow and wide, with dorsally white pruinescence and yellow setulae (Figs. 7, 8).



FIGURES 4–8. *Eoneria blanchardi* Aczél, male; 4. Head, lateral view; 5. Fore leg, anterior view; 6. Wing; 7. Epandrium, lateral view. 8. Epandrium, dorsal view. Scales: 1 mm.

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscapae) 6.4–7.1 mm. Wing length 4.5–5.7 mm and width 1.5–1.6 mm. Oviscapae pale yellowish brown, with white pruinescence and brown setulae, except in a bare mid stripe; length 1.7 times maximum width. Segment 8 brown except for yellow apex.

Holotype: (not examined) female. ARGENTINA: Corrientes, i.1950, D'Angelo. The holotype was part of the E. Blanchard's collection, which was donated to the Museo Argentino de Ciencias Naturales Bernardino Rivadavia after his death, but the specimen is lost.

Type material examined. Paratype: ARGENTINA: 1 female (without head), same data as holotype (MUL)

Other material examined. BRAZIL: 1 female, Bahia, Milagres, 23.vi.1974, S. Laroca-Leg. (DZUP); ARGENTINA: 1 male, Sur. Prov. De Jujuy, ii.1970, L. E. Peña (DZUP); 1 male, 1 female, Prov. La Rioja, 7km, NW de Patquia, 28–29 (MZUSP); 1male, Chaco, ii.1974, En Eriocereus (MUL).

Distribution. Brazil, Argentina.

Eoneria maldonadoi Aczél

(Figs. 9–15)

Eoneria maldonadoi Aczél 1961: 278 (description), 278 (key); 281 (figs. 2–3); Steyskal 1968: 2 (catalogue).

Diagnosis. Frontal vitta ochraceous pruinose, with a wide dark yellowish brown stripe from anterior margin of frons to ocellar tubercle. All femora dark yellowish brown with gray pruinescence. Veins R_{2+3} and M_1 , with 10 and 8 intercalated cross-veins, respectively, one cross-vein emerging from costa between apices of veins R_{2+3} and R_{4+5} .

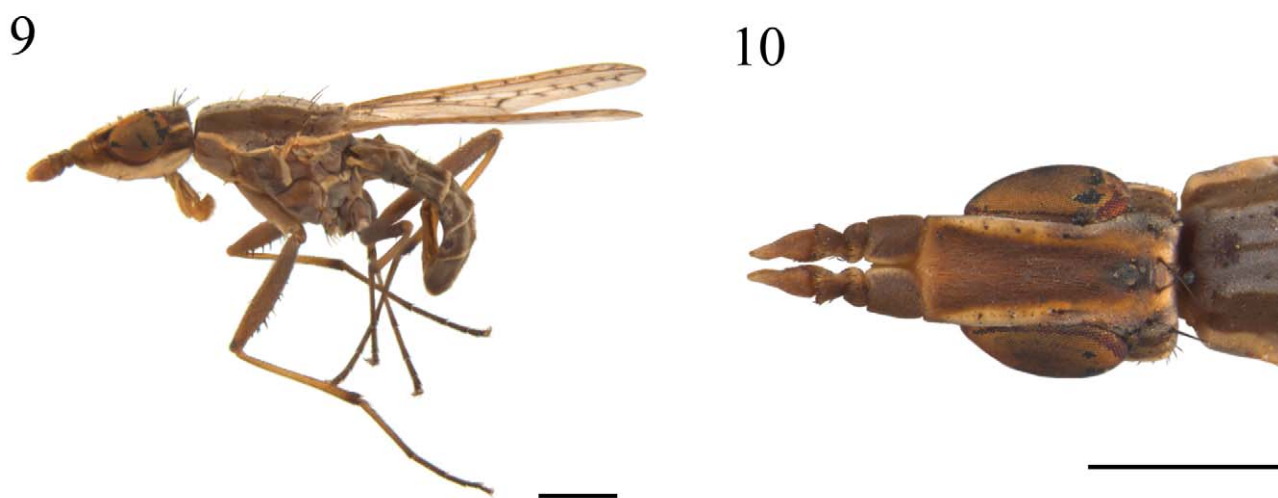
Male. Body length (excluding antenna and epandrium) 6.1 mm. Wing length 4.2 mm and width 1.3 mm. A dark yellowish brown species with partly yellow head and thorax; pleuron gray pruinose (Fig. 9).

Head. Moderately elongate; 1.5 mm length and 1.1 mm width. Frons wide and concave; frontal vitta ochraceous pruinose, with a wide dark yellowish brown stripe from anterior margin of frons to ocellar tubercle (Fig. 10). Fronto-orbital plate whitish yellow with three pairs of well developed setae, the posterior pair larger than the others and equal to inner vertical setae. Postocellar setae large and convergent; length 2.5 times the transverse diameter of ocellar tubercle; inner vertical setae slightly convergent, equal to outer vertical setae; outer vertical setae large and slightly divergent, subequal to postocellar setae. Ocellar tubercle blackish brown faintly white pruinose, triangular, large and only slightly raised, not delimited by lateral furrows, isolated in the median yellow vitta coming from the frons; ocellar plate slightly raised on the posterior margin of head between postocellar setae. Parafacial velvet brown with one yellow median spot. Face whitish yellow, wide and rounded with several tiny setulae on ventral margin. Vibrissa spine-like, subequal to genal setae. Gena subshiny whitish yellow, wide and ventrally rounded; with one genal spine-like seta half length of postocellar setae. Postgena posteriorly wide with a dense patch of long and weak pale setulae at posterior margin of head. Occiput yellowish brown pruinose with black short setulae towards posterior head margin; with one narrow yellow median vitta; length is half the height (Fig 11). Antennal base subshiny dark yellowish brown with inner margins yellow; same length as width in dorsal view. Antennae 40% of head length. Scape testaceous yellow, darkened on lateral margins; 0.1 mm long. Pedicel colored as scape; 0.1 mm long, with strong black setulae on dorsal, ventral and distal margins; inner process of pedicel triangular and narrow, reaching the proximal half of first flagellomere. First flagellomere ochraceous whitish pubescent and ovate, slightly constricted in the distal third; length 1.5 times width. Arista inserted at dorso-apical margin of the first flagellomere, almost subapical.

Thorax. Yellowish brown pruinose with one dorsal faint gray pruinose vitta, as wide as scutellum, separated by a narrow median yellowish brown stripe; with one gray pruinose vitta covering the lateral margin of mesoscutum, the postpronotal lobe and the notopleuron throughout the alar base; pleuron densely pruinose; thoracic setae large and slender. Anterior notopleural setae straight and directed backwards; equal in length with posterior notopleural and half as long as the postalar setae. Posterior notopleural setae erect. Supra-alar setae subequal to postalar setae. Postalar setae curved and the longest thoracic setae. Six pairs of dorsocentral setae; two weaker presutural pairs, four postsutural pairs increasing in size towards scutellum, prescutellar pair the longest and subequal to postalar setae. Scutellum yellowish brown pruinose with a median yellow vitta narrow in the middle; lateral margins with one pair of hair-like subapical setae; distal margin faintly rounded with one pair of strong apical setae. Postpronotal lobe dark yellowish brown. Postpronotal carina shiny pale yellowish brown, projecting anteriorly to postpronotal lobe. Prosternum shiny yellowish brown linear with rounded anterior margin and separated from the proepisternal plate by one wide membranous area. Proepisternum yellow anteriorly and yellowish brown posteriorly, densely pruinose; with a brown seta above fore coxa, subequal to vibrissa. Katepisternum yellowish brown pruinose on ventral half and paler on dorsal half; with one black and straight seta, equal to supra-alar setae. Katatergite same color as pleuron; length 1.1 times the width. Anatergite and mediotergite yellowish brown and white pruinose.

Legs. Fore coxa yellowish brown and paler than the other coxae; whitish pruinose; with one antero-apical seta and one or two much weaker setae; anterior margin with several yellowish brown setulae and a row of three strong setae along anterolateral margin. Mid and hind coxae with two lateral setae each, one antero-apical seta accompanied by several weak setulae. All femora dark yellowish brown with gray pruinescence. Fore femur with several anteroventral and posteroventral spine-like setae and two dorsal distomedial setae (Fig. 12). Mid femur anterior margin with a row of five median setae. Hind femur with several small anteroventral spine-like setae on distal fourth, two dorsal distomedial setae more conspicuous than the same setae on fore femur. Tibiae yellow with darkened apex and faintly white pruinescence; apex with several spine-like setae, which are stronger in mid and hind femora; covered by rows of short black setulae that are denser distally. Tarsi yellow, darkening distally.

Wing (Fig. 13). Yellowish with yellowish brown veins and microtrichose. Basicosta with one dorsal seta and one ventral seta. Veins R_{2+3} and M_1 , with 10 and 8 intercalated cross-veins respectively, one cross-vein emerging from Costa between apices of veins R_{2+3} and R_{4+5} . Vein dm-cu straight, not oblique. Margins of upper and lower calypteres whitish yellow with fringe of long white hairs. Halteres whitish yellow, with orbicular knob blackish brown.



FIGURES 9–10. *Eoneria maldonadoi* Aczél, male; 9. Habitus; 10. Head, dorsal view. Scales: 1 mm.

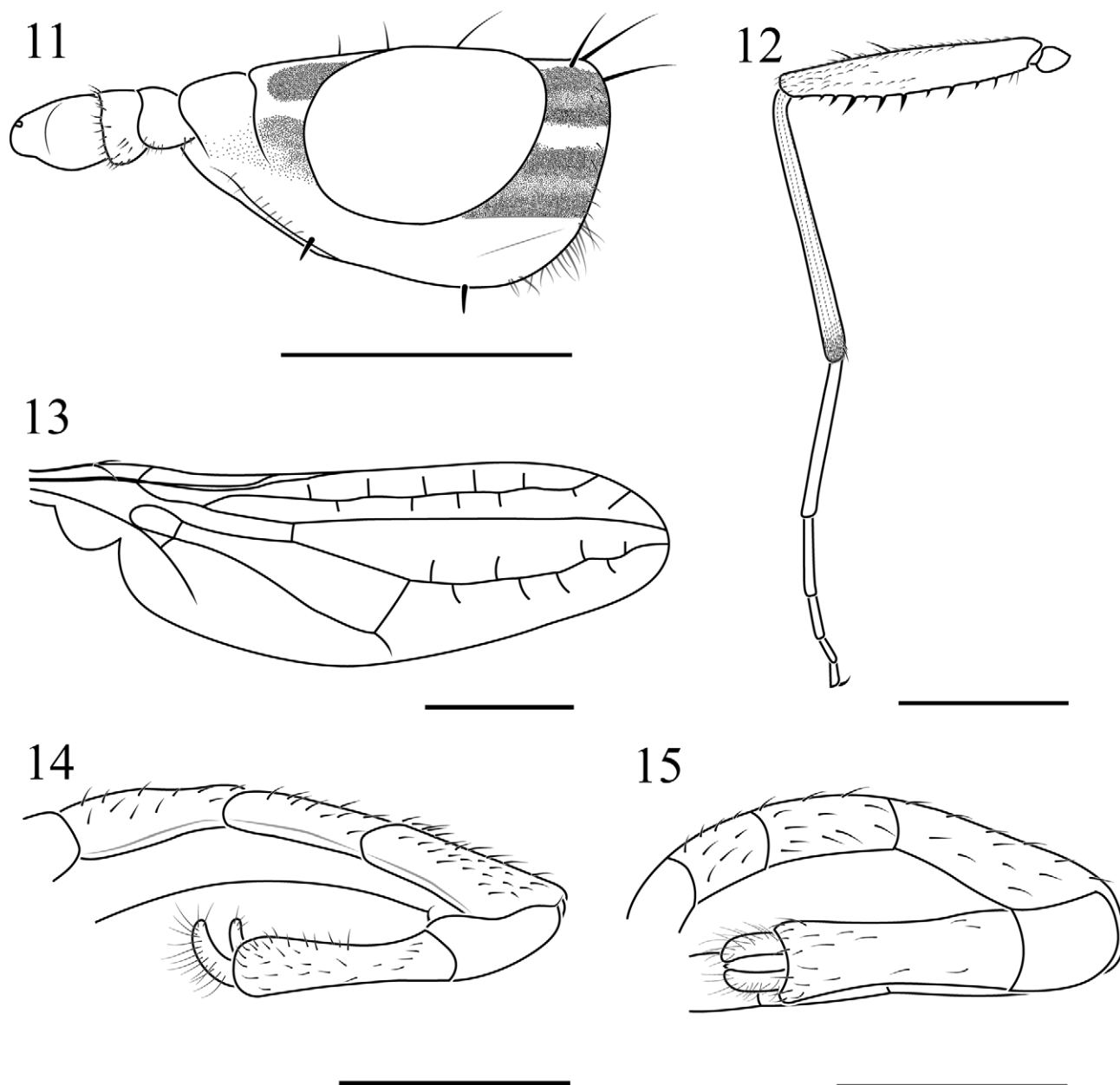
Abdomen. Velvet brown with short black setulae; with a median white pruinose vitta and each tergite with a pair of distinct white pruinose spots at anterior margin, which are broadly separated from lateral margin. Tergite 2 with one lateral seta, subequal to supra-alar seta and two setae on posterior margin. Tergite 6 longer and narrower than the others. Genitalia pale yellowish brown. Syntergosternum 7+8 subshiny and darker than epandrium; half of epandrium length. Epandrium pale yellowish brown with whitish pruinescence and short black setulae; extends to level of posterior margin of tergite 3. Anterior lobe of surstylus shiny yellow, linear and narrow with yellow setulae on apical margin. Posterior lobe of surstylus yellow and wide, with white pruinescence and yellow setulae (Fig. 14–15).

Female. Similar to male, differs as follows: Body length (excluding antenna and oviscape) 7.1–7.4 mm. Wing length 5.1–5.3 mm and width 1.6–1.7 mm. Lateral margins of scutellum without subapical setae. Fore femur with only one dorsal distomedial setae. Oviscape subshiny dark yellowish brown; length 1.4 times maximum width. Segment 8 brown.

Type material examined. Holotype: female (without right wing), ARGENTINA: La Rioja, xi.1952 (MUL).

Other material examined. ARGENTINA: 1 male, La Rioja, 5 km S. de Chilecito, 28–29.x.1978, P. Sene & C. Viela (MZUSP); 1 female, 344, Vinagre D, La S. 9.ix.65; 1 female, R. A. Catamarca, Andalhuallas (2000m), 19.i.1968, Golbach-Terán-Willink/ Entomofauna subandina (MUL).

Distribution. Argentina.



FIGURES 11–15. *Eoneria maldonadoi* Aczél, male; 11. Head, lateral view; 12. Fore leg, anterior view; 13. Wing; 14. Epandrium, lateral view; 15. Epandrium, dorsal view. Scales: 1 mm.

***Eoneria aczeli* Sepúlveda & Carvalho, new species.**

(Figs. 16–25)

Diagnosis. Relatively small and pale compared to congeners. Body pale yellowish brown with white pruinescence. Frontal vitta yellow pruinose. Three pairs of well-developed fronto-orbital setae, the anterior pair is weaker. Antennal base pale yellowish brown; distal margin with two or three small black setulae. Fore femur yellowish pruinose, with several anteroventral and posteroventral inconspicuous spine-like setae.

Male. Body length (excluding antenna and epandrium) 4.4 mm. Wing length 3.3 mm and width 1.1 mm. A pale yellowish brown specimen, with extensive pleural whitish pruinescence, including dorsally on the thorax (Fig. 16).

Head. Moderately elongate; subconical; 1.1 mm length and 0.8 mm width. Frons very concave between compound eyes, especially on anterior margin; frontal vitta yellow pruinose. Head setae lost. Fronto-orbital plate testaceous yellow, covered with dense white pruinescence; narrowing anteriorly; with three pairs of well-developed

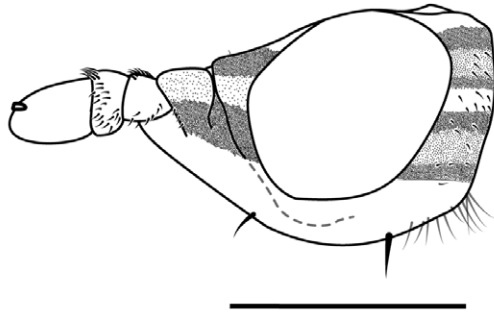
setae, the anterior pair is weaker. Ocellar tubercle dark yellowish brown, rounded, well delimited by color, small and relatively raised; isolated from the yellowish brown pruinose vitta behind the eye. Parafacial velvet yellowish brown with one yellow median spot. Face whitish yellow pruinose, wide and straight, with several pale setulae close to the antennal base. Vibrissa strong, spine-like; half the length of the genal seta. Gena whitish yellow, wide and rounded. Postgena separated from occiput in a bend, giving rise to the yellowish brown pruinose vitta behind the eye; with a patch of several weak pale setulae at the posterior margin of head. Occiput yellowish brown pruinose with one narrow median yellow vitta, forming two separated yellowish brown pruinose vittae, each with one paler whitish median vitta, giving the impression of four yellowish brown vittae on the occiput; with black short and strong setulae towards posterior margin of the head; length is 30% of height (Fig. 18). Antennal base pale yellowish brown, longer than wide in dorsal view; on distal margin with two or three small black setulae. Antennae half of head length. Scape colored as antennal base, dorsally with a brown spot; 0.1 mm long. Pedicel yellow, paler than scape but darker than first flagellomere; 0.2 mm long; inner process of pedicel elongate and triangular, reaching the proximal half of first flagellomere. First flagellomere testaceous yellow, whitish pubescent; posterior margin ovate; length 1.3 times width. Arista lost; inserted at dorso-apical margin of the first flagellomere.



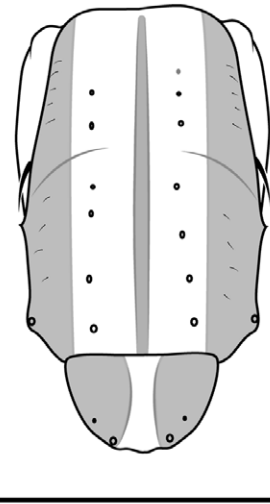
FIGURES 16–17. *Eoneria aczeli* Sepúlveda & Carvalho, new species, male; 16. Habitus; 17. Head, dorsal view. Scales: 1 mm.

Thorax. Yellowish brown and covered by yellow pruinescence; with one dorsal gray pruinose vitta, same width as scutellum, separated by a narrow median yellowish brown stripe (Fig. 19); with one gray pruinose vitta covering the lateral margin of mesoscutum, the postpronotal lobe and the notopleuron throughout the alar base; pleuron densely covered by whitish pruinescence. Anterior notopleural setae large, strong and directed backwards; posterior notopleural setae lost. Six pairs of dorsocentral setae; two presutural pairs weaker and four postsutural pairs increasing in size towards the scutellum. Scutellum yellowish brown and white pruinose with a diffuse median yellow vitta; lateral margins faintly rounded with one pair of hair-like subapical setae; distal margin widely rounded with one pair of apical setae. Postpronotal lobe yellowish brown and yellow pruinose. Postpronotal carina shiny brown, projecting anteriorly to postpronotal lobes. Prosternum shiny yellowish brown, linear with rounded anterior margin and separated from the proepisternal plate by one wide membranous area. Proepisternum pruinose, with one seta equal in length with lateral scutellar setae. Katatergite rounded, as long as high, and, along with the anatergite and mediotergite, the same color and pruinescence as the pleuron.

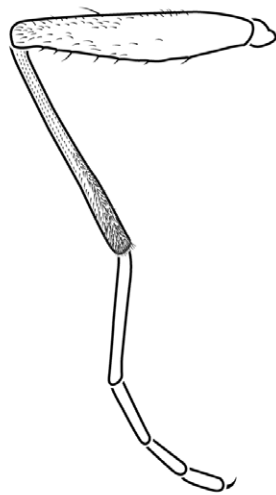
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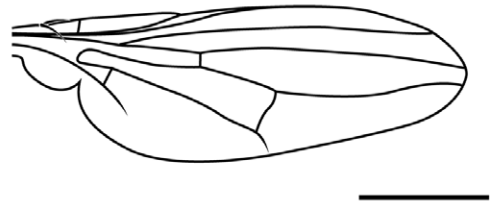
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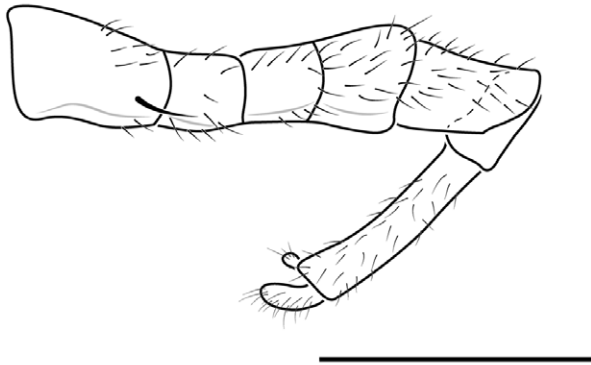
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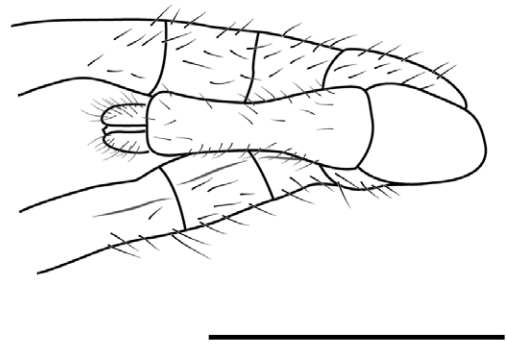
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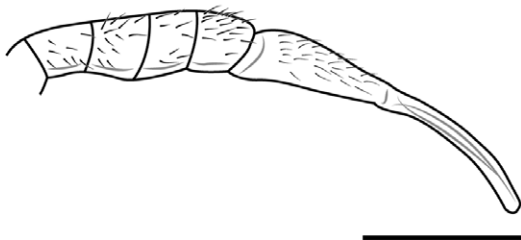
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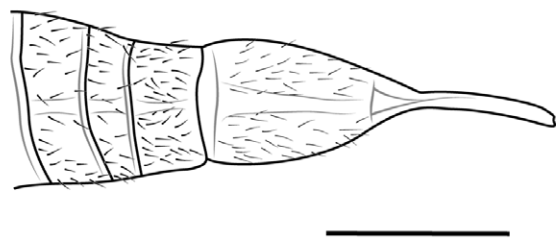
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FIGURES 18–25. *Eoneria aczeli* Sepúlveda & Carvalho, new species, male; 18. Head, lateral view; 19. Thorax, dorsal view; 20. Fore leg, anterior view; 21. Wing; 22. Epandrium, lateral view; 23. Epandrium, dorsal view. Female; 24. Oviscape, lateral view; 25. Oviscape, dorsal view. Scales: 1 mm.

Legs. Coxae pale yellowish brown, white pruinose with several pale short setulae. Fore coxa with one antero-apical seta and four setae on anterolateral margin. Mid coxa with two lateral setae: one median erect and one apical directed backwards; with one weak antero-apical seta, accompanied by several long black setulae. Hind coxa with two lateral setae accompanied by several black setulae; with one antero-apical seta and several pale setulae. Femora yellow and white pruinose. Fore femur with several anteroventral and posteroventral spine-like inconspicuous setae and one dorsal distomedial seta (Fig. 20). Hind femur with two dorsal distomedial setae more conspicuous than the same seta on fore femur. Tibiae yellow with apex yellowish brown, covered by rows of short black setulae that are denser distally; mid and hind tibiae with one strong anteroventral spine-like seta on the apical margin and mid tibia also with several weaker setae. Tarsi yellow, with dense rows of black setulae.

Wing (Fig. 21). Yellow tinged with yellow veins, without dark areas and microtrichose. Basicosta with one dorsal seta and one ventral seta. Margins of upper and lower calypter yellow, with fringe of white, long and conspicuous hairs. Halteres whitish orbicular.

Abdomen. Yellow pruinose with short black setulae; with one median paler yellow pruinose vitta. Tergite 2 with one lateral seta, subequal to anterior notopleural seta and two conspicuous setae on posterior margin. Tergite 6 longer, narrowing distally. Genitalia yellow. Syntergosternum 7+8 shiny, half of epandrium length. Epandrium yellow pruinose with weak black setulae, extending to middle of tergite 3. Anterior lobe of surstylus shiny, with two or three setulae on apical margin. Posterior lobe of surstylus large with white pruinescence and black setulae (Fig. 22–23).

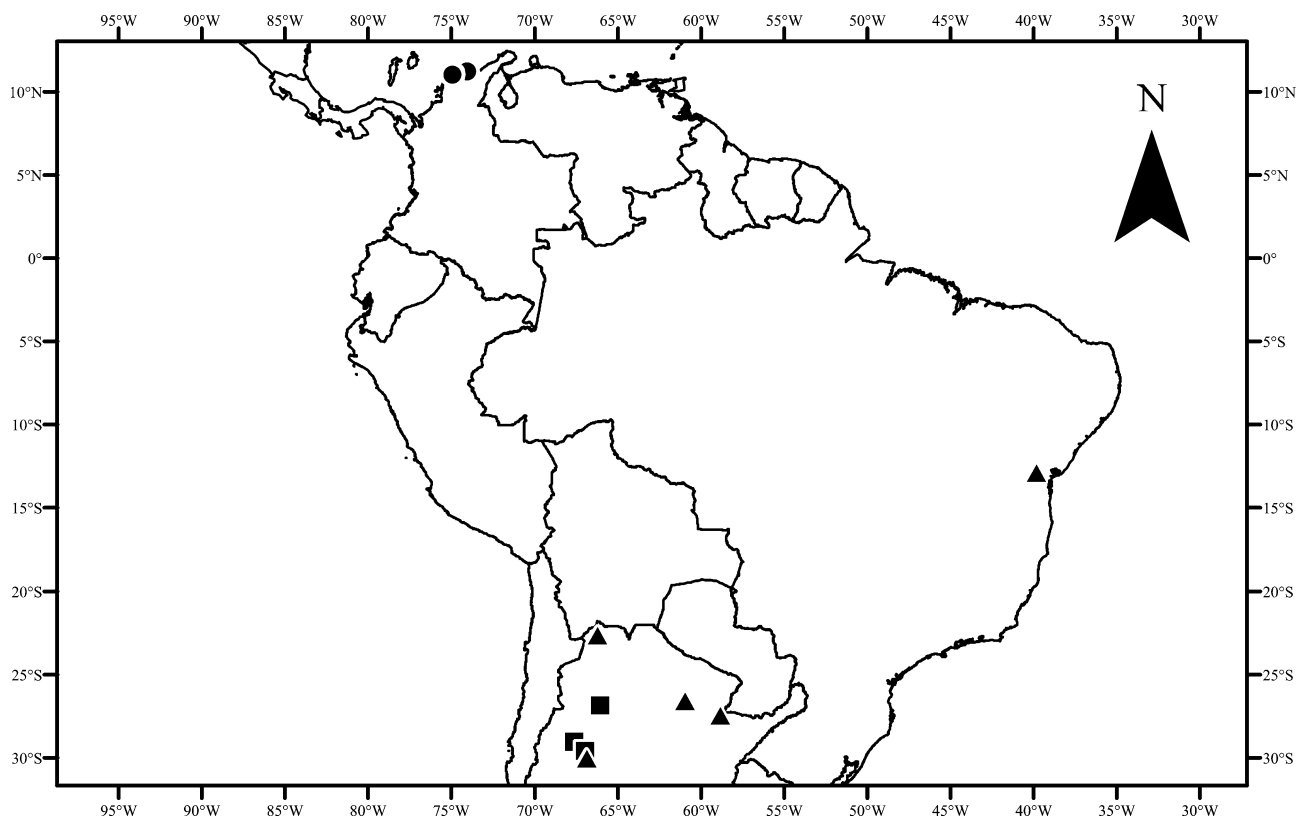


FIGURE 26. Localities for the species of *Eoneria* Aczél examined. (▲) *E. blanchardi* Aczel, 1951; (■) *E. maldonadoi* Aczél, 1961; (●) *E. aczeli* Sepúlveda & Carvalho, new species.

Female. Similar to male, differs as follows: Body length (excluding antenna and ov scape) 4.7–5.0 mm. Head 1.3–1.4 mm length and 1.0 mm width. Wing length 3.9–4.2 mm width 1.2–1.3 mm. Postocellar setae convergent, length 3.7–3.8 times the transverse diameter of ocellar tubercle; inner vertical setae straight and equal to postocellar and outer vertical setae; outer vertical setae divergent and reclinate. First flagellomere length 1.2–1.4 times width. Thoracic setae larger than in male. Anterior notopleural setae length, 70% of scutellar setae length. Posterior notopleural seta erect; equal to anterior notopleural seta. Postalar and supra-alar setae subequal to scutellar setae. Scutellar setae 1.5 times length of scutellum. Katapisternum with one seta equal to anterior notopleural seta. Oviscape (Fig. 24) subshiny yellow with weak pruinescence, except on base; 2.6 times as long as maximum width. Segment 8 colored as oviscape and with several yellowish brown long setulae.

Material examined. Holotype: male, COLOMBIA: Magdalena, PNN Tayrona, Neguanje, 11°20'N, 74°2'W, 10m, Malaise, 21.iii.2001, R. Henriquez (IAvH).

Paratypes: COLOMBIA: 2 females, same data as holotype, except 21.iii.5.iv.2001 and 5–21.iii.2001. (IAvH); 1 female, Atlántico, Barranquilla, Uniatlántico, 11°01'07.58"N, 72°55'47.45"W, 48m, VSR Fruta, Noche, 6.viii.2010, C. Valverde & E. Perdomo, CEUA 51504 (CEUA).

Distribution. Colombia.

Etymology. This new species is named after the Hungarian dipterist Dr. Martin Ladislao Aczél, for his dedication and contribution to the entomology of Diptera.

Acknowledgments

We thank Dr. Guillermo Claps (MUL) and Dra. Claudia Alejandra Medina Uribe (IAvH) for permission to study their materials. Thanks are extended to Dr. Arturo Roig Alsina from the Museo Argentino de Ciencias Naturales Bernardino Rivadavia (MACN) for the valuable information on the E. Blanchard's collection. We also thank both, the Rede Paranaense de Coleções Biológicas (TAXon line) for the photos and the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the research grant (TAS proc. 130370/2011-8; CJBC proc. 304713/2011–2). And thanks to James J. Roper for the English revision.

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APPENDIX 2:

ZOOKEYS. Information for authors

Main Text

Title: The title should be in a sentence case (only scientific, geographic or person names should be with a first capital letter, i.e. *Elater ferrugineus* L., Germany, etc.), and should include an accurate, clear and concise description of the reported work, avoiding abbreviations. The higher taxa within the title should be separated with commas and not with a semicolon, e.g.: (Coleoptera, Elateridae, Elaterini).

Authors and Affiliations: Provide the complete names of all authors, and their addresses for correspondence, including e.g., institutional affiliation (e.g. university, institute), location (street, boulevard), city, state/province (if applicable), and country. One of the authors should be designated as the corresponding author. It is the corresponding author's responsibility to ensure that the author list, and the individual contributions to the study are accurate and complete. If the article has been submitted on behalf of a consortium, all consortium members and their affiliations should be listed after the Acknowledgements section.

Abstract and Keywords: Please have your abstract and keywords ready for input into the submission module.

Body Text: All papers should be in grammatically correct English. Non-native English speaking authors are required to have their manuscripts checked by a native English speaker prior to submission. Use either British/Commonwealth or American English provided that the language is consistent within the paper. A manuscript must be written with precision, clarity, and economy, whenever appropriate in active voice and first person. Avoid the use of parenthetical comments and italics or bold for emphasis. This journal discourages the use of quotation marks except for direct quotations, words defined by the author, and words used in unusual contexts. Short quotations should be embedded in the text and enclosed in double quotation marks (""). Long quotations should be on a separate line, italicized, but without quotation marks. Single quotation marks are to be used only for a quotation that occurs within another quotation.

Spacing, Fonts, and Page Numbering: Single-space all material (text, quotations, figure legends, tables, references, etc.). Separate paragraphs with a blank line. Use a 12-point font

(preferably Times New Roman or Arial). **NOTE: FOR EASIER READING THIS MANUSCRIPT, HAS BEEN LEFT A MINIMUM SPACING OF 1,5.**

Capitals: First capital letters should be used only in the beginning of a sentence, in proper names and in headings and subheadings, as well as to indicate tables, graphs and figure/s within the text. Software programmes should be written with capital letters (e.g., ANOVA, MANOVA, PAUP).

Italicization/Underlining: Scientific names of species and genera, long direct quotations and symbols for variables and constants (except for Greek letters), such as p, F, U, T, N, r, but not for SD (standard deviation), SE (standard error), DF (degrees of freedom) and NS (non significant) should be italicized. These symbols in illustrations and equations should be in italics to match the text. Italics should not be used for emphasis, and not in abbreviations such as e.g., i.e., et al., etc., cf. Underlining of any text is not acceptable.

Abbreviations: Abbreviations should be followed by '.' (full stop or period; for instance: i.e., e.g., cf., etc.). Note that you shouldn't add a full stop at the end of abbreviated words if the last letter of the abbreviation is the same as the last letter of the full word. For example, you should abbreviate "Eds", "Dr", "Mr" without full stop at the end. All measures, for instance mm, cm, m, s, L, should be written without full stop.

On the use of dashes: (1) Hyphens are used to link words such as personal names, some prefixes and compound adjectives (the last of which vary depending on the style manual in use) (2) En-dash or en-rule (the length of an 'n') is used to link spans. In the context of our journal en-dash should be used to link numerals, sizes, dates and page numbers (e.g., 1977–1981; figs 5–7; pp. 237–258); geographic or name associations (Murray–Darling River; a Federal–State agreement); and character states combinations such as long–pubescent or red–purple. (3) Em-dash or em-rule (the length of an 'm') should be used rarely, only for introducing a subordinate clause in the text that is often used much as we use parentheses. In contrast to parentheses an em-dash can be used alone. En-dashes and em-dashes should not be spaced.

Headings and subheadings: Main headings: The body text should be subdivided into different sections with appropriate headings. Where possible, the following standard headings should be used: Introduction, Methods, Results, Discussion,

Conclusions, Acknowledgements, References. These headings need to be in bold font on a separate line and start with a first capital letter. Please do not number headings or subheadings.

Introduction. The motivation or purpose of your research should appear in the Introduction, where you state the questions you sought to answer, and then provide some of the historical basis for those questions.

Methods. Provide sufficient information to allow someone to repeat your work. A clear description of your experimental design, sampling procedures, and statistical procedures is especially important in papers describing field studies, simulations, or experiments. If you list a product (e.g., animal food, analytical device), supply the name and location of the manufacturer. Give the model number for equipment used. Supply complete citations, including author (or editor), title, year, publisher, and version number, for computer software mentioned in your article.

Results. Results should be stated concisely and without interpretation.

Discussion. Focus on the rigorously supported aspects of your study. Carefully differentiate the results of your study from data obtained from other sources. Interpret your results, relate them to the results of previous research, and discuss the implications of your results or interpretations. Point out results that do not support speculations or the findings of previous research, or that are counter-intuitive. You may choose to include a Speculation subsection in which you pursue new ideas suggested by your research, compare and contrast your research with findings from other systems or other disciplines, pose new questions that are suggested by the results of your study, and suggest ways of answering these new questions.

Conclusion. This should state clearly the main conclusions of the research and give a clear explanation of their importance and relevance. Summary illustrations may be included.

References. The list of References should be included after the final section of the main article body. A blank line should be inserted between single-spaced entries in the list. Authors are requested to include links to online sources of articles, whenever possible!

Where possible, the standard headings should be used in the order given above. Additional headings and modifications are permissible.

Subordinate headings: Subordinate headings (e.g. Field study and Simulation model or Counts, Measurements and Molecular analysis), should be left-justified, italicized, and in a regular sentence case. All subordinate headings should be on a separate line.

Citations and References

Citations within the text: Before submitting the manuscript, please check each citation in the text against the References and vice-versa to ensure that they match exactly. Citations in the text should be formatted as follows: Smith (1990) or (Smith 1990), Smith et al. (1998) or (Smith et al. 1998) and (Smith et al. 1998, 2000, Brock and Gunderson 2001, Felt 2006).

References: It is important to format the references properly, because all references will be linked electronically as completely as possible to the papers cited. It is desirable to add a DOI (digital object identifier) number for either the full-text or title and abstract of the article as an addition to traditional volume and page numbers. If a DOI is lacking, it is recommended to add a link to any online source of an article. Please use the following style for the reference list (or download the Pensoft EndNote style): here

Published Papers:

Polaszek A, Alonso-Zarazaga M, Bouchet P, Brothers DJ, Evenhuis NL, Krell FT, Lyal CHC, Minelli A, Pyle RL, Robinson N, Thompson FC, van Tol J (2005) ZooBank: the open-access register for zoological taxonomy: Technical Discussion Paper. *Bulletin of Zoological Nomenclature* 62: 210-220.

Accepted Papers:

Same as above, but "in press" appears instead the year in parentheses.

Electronic Journal Articles:

Mallet J, Willmott K (2002) Taxonomy: renaissance or Tower of Babel? *Trends in Ecology and Evolution* 18 (2): 57-59. doi: 10.1016/S0169-5347(02)00061-7.

Paper within conference proceedings:

Orr AG (2006) Odonata in Bornean tropical rain forest formations: Diversity, endemism and applications for conservation management. In: Cordero Rivera A (Ed) Forest and Dragonflies. Fourth WDA International Symposium of Odonatology, Pontevedra (Spain), July 2005. Pensoft Publishers, Sofia-Moscow, 51-78.

Book chapters:

Mayr E (2000) The biological species concept. In: Wheeler QD, Meier R (Eds) Species Concepts and Phylogenetic Theory: A Debate. Columbia University Press, New York, 17-29.

Books:

Goix N, Klimaszewski J (2007) Catalogue of Aleocharine Rove Beetles of Canada and Alaska. Pensoft Publishers, Sofia-Moscow, 166 pp.

Illustrations, Figures and Tables

Figure legends: All figures should be referenced consecutively in the manuscript; legends should be listed consecutively immediately after the References. For each figure, the following information should be provided: Figure number (in sequence, using Arabic numerals – i.e. Figure 1, 2, 3 etc.); short title of figure (maximum 15 words); detailed legend, up to 300 words.

Tables: Each table should be numbered in sequence using Arabic numerals (i.e. Table 1, 2, 3 etc.). Tables should also have a title that summarizes the whole table, maximum 15 words. Detailed legends may then follow, but should be concise.

Small tables can be embedded within the text, in portrait format (note that tables on a landscape page must be reformatted onto a portrait page or submitted as additional files). These will be typeset and displayed in the final published form of the article. Such tables should be formatted using the 'Table object' in a word processing program to ensure that columns of data are kept aligned when the file is sent electronically for review. Do not use tabs to format tables or separate text. All columns and rows should be visible, please make

sure that borders of each cell display as black lines. Colour and shading should not be used; neither should commas be used to indicate decimal values. Please use a full stop to denote decimal values (i.e., 0.007 cm, 0.7 mm).

APPENDIX 3:

ZOOTAXA. Information for authors

Preparation of manuscripts

1) General. All papers must be in English. Authors whose native language is not English are encouraged to have their manuscripts read by a native English-speaking colleague before submission. Nomenclature must be in agreement with the International Code of Zoological Nomenclature (4th edition 1999), which came into force on 1 January 2000. Author(s) of species name must be provided when the scientific name of any animal species is first mentioned (the year of publication needs not be given; if you give it, then provide a full reference of this in the reference list). Authors of plant species names need not be given. Metric systems should be used. If possible, use the common font New Times Roman and use as little formatting as possible (use only bold and italics where necessary and indentions of paragraphs except the first). Special symbols (e.g. male or female sign) should be avoided because they are likely to be altered when files are read on different machines (Mac versus PC with different language systems). You can code them as *m#* and *f#*, which can be replaced during page setting. The style of each author is generally respected but they must follow the following general guidelines.

2) The title should be concise and informative. The higher taxa containing the taxa dealt with in the paper should be indicated in parentheses: e.g. A taxonomic revision of the genus *Aus* (Order: family).

3) The name(s) of all authors of the paper must be given and should be typed in the upper case (e.g. ADAM SMITH, BRIAN SMITH & CAROL SMITH). The address of each author should be given in italics each starting a separate line. E-mail address(es) should be provided if available.

4) The abstract should be concise and informative. Any new names or new combinations proposed in the paper should be mentioned. Abstracts in other languages may also be included in addition to English abstract. The abstract should be followed by a list of key words that are not present in the title. Abstract and key works are not needed in short correspondence.

5) The arrangement of the main text varies with different types of papers (a taxonomic revision, an analysis of characters and phylogeny, a catalogue etc.), but should usually start with an introduction and end with a list of references. References should be cited in the text as Smith (1999), Smith and Smith (2000) or Smith et al. 2001 (3 or more authors), or alternatively in a parenthesis (Smith 2000; Smith & Smith 2000; Smith et al. 2001). All literature cited in the text must be listed in the references in the following format (see a sample page here in PDF).

A) Journal paper:

Smith, A. (1999) Title of the paper. Title of the journal in full, volume number, page range.

B) Book chapter:

Smith, A. & Smith, B. (2000) Title of the Chapter. In: Smith, A, Smith, B. & Smith, C. (Eds), Title of Book. Publisher name and location, pp. x–y.

C) Book:

Smith, A., Smith, B. & Smith, C. (2001) Title of Book. Publisher name and location, xyz pp.

C) Internet resources

Author (2002) Title of website, database or other resources, Publisher name and location (if indicated), number of pages (if known). Available from: <http://xxx.xxx.xxx/> (Date of access).

Dissertations resulting from graduate studies and non-serial proceedings of conferences/symposia are to be treated as books and cited as such. Papers not cited must not be listed in the references.

Please note that (1) journal titles must be written in full (not abbreviated); (2) journal titles and volume numbers are followed by a ","; (3) page ranges are connected by "n dash", not hyphen "-", which is used to connect two words. For websites, it is important to include the last date when you see that site, as it can be moved or deleted from that address in the future.

On the use of dashes: (1) Hyphens are used to link words such as personal names, some prefixes and compound adjectives (the last of which vary depending on the style manual in

use). (2) En-dash or en-rule (the length of an ‘n’) is used to link spans. In the context of our journal that means numerals mainly, most frequently sizes, dates and page numbers (e.g. 1977–1981; figs 5–7) and also geographic or name associations (Murray–Darling River; a Federal–State agreement). (3) Em-dash or em-rule (the length of an ‘m’) are used far more infrequently, and are used for breaks in the text or subject, often used much as we used parentheses. In contrast to parentheses an em-dash can be used alone; e.g. What could these results mean—that Niel had discovered the meaning of life? En-dashes and em-dashes should not be spaced.

6) Legends of illustrations should be listed after the list of references. Small illustrations should be grouped into plates. When preparing illustrations, authors should bear in mind that the journal has a matter size of 25 cm by 17 cm and is printed on A4 paper. For species illustration, line drawings are preferred, although good quality B&W or colour photographs are also acceptable. See a guide here for detailed information on preparing plates for publication.

7) Tables, if any, should be given at the end of the manuscript. Please use the table function in your word processor to build tables so that the cells, rows and columns can remain aligned when font size and width of the table are changed. Please do not use Tab key or space bar to type tables.

8) Keys are not easy to typeset. In a typical dichotomous key, each lead of a couplet should be typed simply as a paragraph as in the box below:

1 Seven setae present on tarsus I ; four setae present on tibia I; leg I longer than the body; legs black in color ... Genus A

- Six setae present on tarsus I; three setae present on tibia I; leg I shorter than the body; legs brown in color ... 2

2 Leg II longer than leg I ... Genus B

- Leg II shorter than leg I ... Genus C

APPENDIX 4:

REVISTA COLOMBIANA DE ENTOMOLOGIA. Information for authors

Form and preparation of manuscripts

Papers should be submitted electronically. The file can be a word document. Do not send figures and tables separately. Figures are sent separately only when the paper is accepted and following specifications indicated below.

Every paper will receive a code that authors should use to maintain correspondence with the editorial board. Papers should conform to the instructions. A recent issue of the journal should be consulted in order to conform with style.

Structure of the paper

The manuscript should be on letter size paper with wide margins (2.5 cm each side), font “Times New Roman” 11 pts, line spacing 1.5, and left margin justified. All pages should be numbered on the right top corner. Figures and tables should be at the end of the paper on separate pages. If the paper is submitted in print, please do not send final artwork until acceptance. Language should be direct, short, and precise using passive voice (use “specimens were preserved in alcohol” not “alcohol was used to preserve specimens”).

The first page should include in order: 1. Title, 2. English title and short title, 3. Author (s), 4. Physical and electronic addresses indicating correspondence author if coauthored (as a footnote), 5. The author may suggest up to three potential referees providing: name, institution, electronic and physical addresses, 6. Word count (from title to references), The abstract may start a line below the word count

Title: Should be short but informative, and not exceed 15 words. It should include the order and family of the entomological species and suprageneric groups studied.

English title: A strict translation of the Spanish title.

Short title: Used as page header and not to exceed six words.

Authors: Complete name of the authors; if possible use first name, first last name and first letter of the second last name. For each author, use a footnote to indicate institutional affiliation, academic title, postal and electronic addresses.

Spanish Abstract: Should be a single paragraph not exceeding 250 words. It is a brief and concrete description of the main topics addressed in the paper, major results and conclusions. Do not include references, figures or tables.

Key words: Maximum of five. Separated by periods. Should be different than the words used in the title.

English Abstract. Should be a strict translation of the Spanish version. A review by a native English speaker is highly recommended.

English Key words: These should be a strict translation of the Spanish key words.

Introduction: This should make explicit the problem, the relationship of this work with other papers, and the justification. It is appropriate to indicate the objectives. This section is not a literature review.

Materials and Methods: Only include information that is necessary for the research to be reproducible. If the methods have been already published, a brief description and the references should be presented. If the method has been modified, these changes should be indicated. When describing statistical methods, indicate: experimental design, number of repetitions, number of insects per repetition and sample size. Specify the place where and the time when research was conducted. If possible, include coordinates.

Results: These should be limited to the data obtained and be presented in a logical sequence. When the study requires statistical analysis, the text should contain all the data necessary for a clear understanding. The authors should not only present the statistical results, but their interpretation. When results are described that depend on statistical analyses not presented in tables, (i.e. there was no difference between treatment A and B), basic parameters of the test

should be indicated in parenthesis (i.e.: if ANOVA, state ($F = X.XX$; $df = X.X$; $P < X.XX$). When the information is extensive it should be abbreviated in tables. Data that appear in figures and tables data should not be repeated in the text.

Discussion: This section is the interpretation of the data; it addresses the generalizations and scientific principles being experimentally tested; clarifies exceptions, modifications or contradictions with the hypotheses, theories and principles directly related with the facts; points out the practical or theoretical applications of the results; relates current observations with other relevant studies, and if pertinent, explains why authors got results that differed from other publications. Data mentioned in the results section should not be repeated. This part of the paper reflects the intellectual capacity of the authors. Results and discussion can go in the same section.

Sometimes subtitles are desirable to clarify the structure and content of the paper, particularly in the Results and Discussion sections. Write short subtitles and avoid making repetitions with parts of the methodology.

Conclusions. Avoid presenting this section as a list of the more obvious results. Elaborate on the implications of your results for the theoretical models that explain your problem. This is the final culmination of your work and should present clearly, concisely and logically the contribution that the author makes. It should be conclusions and not recommendations.

Acknowledgements: This section is optional. Only contributions that significantly contributed to the paper should be included. The following order is recommended: people (omit professional titles), groups, funding entities with grant number. Avoid being very specific in the acknowledgements for each person. It is recommended to thank the referees who have reviewed the work.

Tables. These should be numbered in the order that they appear in the text. The title should be concise and self-explanatory of the table's content and should be on the top of the table (Table XX in bold font, legend in regular font). Footnotes can be used. Horizontal lines of the main body of the table are recommended but internal horizontal lines should be avoided. No vertical lines are allowed. Explicative text in the table should not duplicate methods section.

Figures. This includes drawings, maps, graphs, and pictures. These should be cited and numbered in the order they appear in the text. If the citation appears between parenthesis it should be indicated as (Fig. XX), Example: In Figure 1 or (Fig. 1). Compound figures should be indicated by letters: Example: (Fig. 1a) (Fig. 1b) etc. The figure legend goes below the figure itself (**Figure XX** in bold font, legend in normal font). Abbreviations and symbols used in the figures should be consistent with these used in the text; if new, these should be explained in the legend. Drawings may be sent as originals done in china ink or printed as high quality images; text should be large enough so it is still legible after reduction. Images are preferable as digital files; this option will significantly speed up the editorial process. If printed photographs are sent, make them on glossy and high quality paper.

It is preferable to make compound figures (mosaics) over individual figures (see example below). Figures should be as simple as possible and use grey tones rather than patterns to fill fields (see example below). Even though visual options provided by statistical or graphing programs are attractive, these are complex to print and difficult to read.

Both tables and figures should be informative and not duplicate information provided in the text.

How to include references in the text

The RCDE uses a modification of the Harvard citation system as follows:

- Bustillo (1998), Tróchez and Rodríguez (1989) or López et al. (1989) if the name of the author(s) is part of the sentence.

- (Gutiérrez 1999), (Bustillo and Rodríguez 1999) or (Ramírez et al. 1999) if the name of the author appears at the end

- (Bueno 1998, 1999) to cite two papers of the same author order references from the oldest to the more recent.

- (Portilla 1998a, 1998b) to cite two papers of the same author, same year

- (Gutiérrez 1987; Rodríguez 1998; Ramírez 1999) to cite multiple papers, order these according to the year of publication. If two papers of different authors are of the same year, follow alphabetic order.

(Parra, in press). If not published but accepted. Cite the journal where the paper will be published in the Cited References section

(P. Reyes, pers. com.) for personal communications

How to cite specimens

Species citations in the text : Scientific names of genus and species should be italicized and follow the international codes of nomenclature (ICZN, ICBN, etc). Add author and description year the first time a species is cited in the paper (i.e.: *Apis mellifera* L., 1752). Do no use them in the title or abstract. Genus names should only have the first letter capitalized.

The list of specimens used in the study should follow the following format: Species name in italics . Number of specimens studied, sex. COUNTRY. Department (state). Municipality. Locality. Coordinates if available (without spaces between grades, minutes, latitude or longitude). Elevation. Collection date (day-month by the first three letters-full year). Collector. Acronym of the collection where voucher specimens were deposited (between brackets). Please check official acronym lists such as Arnett et al . 1993 "The Insect and Spider Collections of the World", 2nd edition, (<http://hbs.bishopmuseum.org/codens/codensearch.html>)

Literature cited. Ordered alphabetically and chronologically, the list should include only these references that were cited in the text. Last names and initials of first names should be written in capitals. Please avoid citing theses, extension papers, meeting abstracts, or local reports; cite the published papers related to those instead. The RCdE follows a variation of the Vancouver citation system.

- Citation of a paper in a journal. This part should include the following parts: Author (s) (last name and first name initial). Year. Title. Journal full name. If the journal is poorly known,

include country of origin. Volume (write the number). Issue number between parenthesis. Colon and page numbers.

Example: POSADA F., F. J. 1992. Ciclo de vida, consumo foliar y daño en fruto de melón por *Diaphania hyalinata* (L.) (Lepidoptera: Pyralidae). *Revista Colombiana de Entomología* 18 (1): 26-31.

- Reference with more than one author. Authors are separated by a semicolon.

Examples: VALLEJO, L. F.; ORDUZ, S. 1996. Producción de un plaguicida a base de *Bacillus thuringiensis*, en laboratorio. *Revista Colombiana de Entomología* 22 (1): 61-67.

ZENNER DE POLANÍA, I.; QUINTERO, J.; QUINTERO, F. 2001. Evaluación de la mezcla de creolina, melaza y ceniza sobre la broca del café, *Hypothenemus hampei* (Coleoptera: Scolytidae) y algunos de sus enemigos naturales. *Revista Colombiana de Entomología* 27 (1-2): 55-60.

- Citation of a book: Author. Year. Title. Publisher (editorial or institution responsible for the printing). City of printing. Number of pages.

Examples: PENNAK, R. W. 1978. *Fresh-water invertebrates of the United States*. John Wiley, New York. 767 p.

GÓMEZ A., A.; RIVERA P., H. 1987. *Descripción de malezas en plantaciones de café. Cenicafé, Chinchiná, Colombia*. 481 p.

- Citation of a chapter in a multiauthored book: Author. Year. Title of the chapter. Pages of the chapter (p. XX-XX). En: Editor (ed.). Title of the book. Publisher. City. Country. Number of book pages.

Example: MONTOYA-LERMA, J.; FERRO, C. 1999. Flebótomos (Diptera: Psychodidae) de Colombia. p. 211-245. En: Amat, G.; Andrade-C., G.; Fernández, F. (eds.). *Insectos de Colombia. Volumen II. Academia Colombiana de Ciencias Exactas, Físicas y Naturales. Colección Jorge Alvarez Lleras. No. 13. Editora Guadalupe Ltda. Bogotá. Colombia. 492 p.*

- Internet references. (Harvard model is followed)

AUTHOR/EDITOR. Year. Title. Disponible en:URL [date of revision i.e.: 1 January 2007]

Example: SAMUELSON, A.; EVENHUIS, N.; NISHIDA, G. 2001. Insect and spider collections of the world web site. Disponible en: <http://www.bishopmuseum.org/bishop/ento/codens-r-us.html> [review date: 27 March 2001]