LÍVIA AGUIAR COELHO

CONTRIBUIÇÃO À TAXONOMIA E BIOGEOGRAFIA DO GÊNERO *Prepops* REUTER, 1905 (HEMIPTERA: MIRIDAE)

Tese apresentada à Universidade Federal de Viçosa, como parte das exigências do Programa de Pós-Graduação em Entomologia, para obtenção do título de *Doctor Scientiae*.

VIÇOSA
MINAS GERAIS - BRASIL
2012

Ficha catalográfica preparada pela Seção de Catalogação e Classificação da Biblioteca Central da UFV

T
C67c
2012

Coelho, Lívia Aguiar, 1981-
Contribuição à taxonomia e biogeografia do gênero *Prepops* Reuter, 1905 (Hemiptera: Miridae) / Lívia Aguiar Coelho. – Viçosa, MG, 2012.
viii, 132f. : il. ; 29cm.

Orientador: Paulo Sérgio Fiuza Ferreira.
Tese (doutorado) - Universidade Federal de Viçosa.
Inclui bibliografia.

1. Miridae - Classificação. 2. *Prepops.* 3. Biogeografia. 4. Hemiptera. I. Universidade Federal de Viçosa. II. Título.

CDD 22. ed. 595.754

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APROVADA: 25 de fevereiro de 2012.

Carlos Molineri

David dos Santos Martins

Lúcio A. de Oliveira Campos
(Coorientador)

José Eduardo Serrão

Paulo Sérgio Fiuza Ferreira
(Orientador)

Dedico

Ao querido vovô Gil, que infelizmente não me espera mais chegar de viagem com os olhos cheios de lágrimas e de quem não recebo mais os saquinhos com balas e bombons para dividir com meus colegas... E que mesmo sendo um homem muito simples, apoiou meu trabalho e me fez sentir o orgulho que tinha de mim...

AGRADECIMENTOS

Agradeço ao meu orientador, prof. Paulo Sérgio Fiuza Ferreira, pelo entusiasmo em dividir comigo seu enorme conhecimento em taxonomia de Miridae, grupo pelo qual me encantei. Tenho certeza que este é apenas o início de uma grande parceria!

À minha co-orientadora Prof. Lucimar Gomes Dias, pelo apoio, por sempre me escutar nos momentos de dúvidas e por transmitir um entusiasmo contagiante pela entomologia!

Ao meu co-orientador, Prof. Carlos Molineri, agradeço por sempre estar disponível em me ajudar, pelos importantes ensinamentos em biogeografia e por ter me recebido tão bem em seu lindo país!

Aos membros da banca Prof. Lúcio A. de O. Campos, Dr. David dos Santos Martins e Prof. José Eduardo Serrão pelas sugestões e críticas ao trabalho.

À Universidade Federal de Viçosa, ao departamento de Entomologia e ao Programa de Pós-Graduação em Entomologia pela oportunidade de cursar o mestrado e doutorado nesta instituição. Ao Conselho Nacional de desenvolvimento Científico e Tecnológico (CNPq) por financiar meus estudos nos últimos seis anos.

Às secretárias da pós-graduação em Entomologia, D. Paula, Myriam e Silvânea pelo carinho e atenção. Quero agradecer de forma especial à querida D. Paula, uma profissional excelente e incrível ser humano!

A todos que contribuiram para a realização deste trabalho: Dra. Aline Barcellos Prates dos Santos (MCNZ), Profa. Jocélia Grazia (UFRGS); ao MSc. Luís Antônio Alves Costa, por me receber no Museu nacional da UFRJ e compartilhar importantes conhecimentos em Miridae; ao futuro Dr. Daniel dos Santos (IMLA) por sempre estar disponível para ajudar e ao Dr. Frederico F. Salles por me receber tão bem em seu laboratório e por estar disponível todas as vezes que precisei de ajuda.

Aos meus pais Ivan A. Coelho e Ivanete R. Coelho quero agradecer a confiança, o apoio e amor incondicional. É emocionante sentir o orgulho que vocês tem de mim! Aos meus irmãos Cássia e Ivan Júnior agradeço por terem torcido por mim todo esse tempo! À vovó Marly e vovô Gil, grandes exemplos de puro amor em nossa família e às tias Eliete e Ivone por todo carinho que sempre demonstraram por mim.

Ao meu marido Guilherme me faltam palavras... obrigada por sonhar junto comigo todos esses anos. Por ter suportado a distância durante o estágio e o mestrado e por ter deixado Governador Valadares para ficar comigo em Viçosa. Por ser sempre um grande companheiro e meu melhor amigo... *O amor é o calor que aquece a alma*...

Agradeço também ao Sr. José Maria, Marlene, Gustavo, Eduardo e Mariana, por também fazerem parte de minha família.

Neste momento quero agradecer não só ao orientador, mas ao amigo Fiuza... por todos esses anos de amizade, respeito e apoio. Por ter recebido a mim e ao Guilherme como parte de sua família e ter tornado a saudade que sentíamos de nossos parentes mais amena. E também não posso deixar de demonstrar o enorme carinho que sinto por Marisa, Lilah e Luciano, que igualmente se tornaram queridos amigos.

À Lucimar G. Dias e Tito Bacca quero agradecer todos os divertidos momentos que passamos juntos e a grande amizade! Espero conhecer a princesa Juliana em breve!

À Lorena F. Uceli, Victor D. Pirovani e Natállia M. F. Vicente agradeço os inúmeros momentos de diversão em nosso laboratório, por estarem sempre dispostos a ajudar e por terem se tornado amigos para sempre! E a mais nova amiga de laboratório, Irina T. M. Castaño, agradeço o grande companheirismo e espero que possamos trabalhar juntas no futuro! Também agradeço ao antigo colega de laboratório, David dos S. Martins pela ótima convivência e conhecimentos que compartilhou conosco!

Aos amigos de pós-graduação Ricardo Solar, Marcelo Pereira e Silma agradeço a ajuda e as inúmeras risadas!

À Camilah Antunes, Rafael, Sara, Rubens e Ighor quero agradecer o enorme carinho que a família de vocês sempre demonstrou por mim e pelo Guilherme! E as amigas Rafaela Porcaro, Graziele Araújo e Joseane Bessa agradeço por sempre torcerem muito por mim.

BIOGRAFIA

Lívia Aguiar Coelho, filha de Ivan Aguiar Coelho e Ivanete Ribeiro Coelho, nasceu em Governador Valadares, Minas Gerais, em 21 de Dezembro de 1981.

Cursou a educação infantil, o ensino fundamental e médio no Instituto Imaculada Conceição (1986-1999) e obteve o título de bacharel em Ciências Biológicas no ano de 2003 na Universidade Vale do Rio Doce (UNIVALE), Governador Valadares, Minas Gerais.

Em 2006, iniciou o Mestrado em Entomologia, no Departamento de Biologia Animal da Universidade Federal de Viçosa, Viçosa, Minas Gerais, completando as exigências do curso em 25 de fevereiro de 2008. Neste mesmo ano e instituição iniciou o curso de doutorado em Entomologia, defendendo a tese em 25 de fevereiro de 2012. Neste período de pós-graduação recebeu o apoio do CNPQ como bolsista.

Como produção acadêmica, publicou sete artigos em revistas indexadas nacionais e internacionais na área de sistemática.

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RESUMO

COELHO, Lívia Aguiar, D. Sc., Universidade Federal de Viçosa, fevereiro de 2012. **Contribuição à taxonomia e biogeografia do gênero *Prepops* Reuter, 1905 (Hemiptera: Miridae)**. Orientador: Paulo Sérgio Fiuza Ferreira. Coorientadores: Lucimar Gomes Dias e Lúcio Antônio de Oliveira Campos.

Miridae representa uma das maiores famílias de insetos, com aproximadamente 11000 espécies descritas e compreende cerca de 25% de todos os Heteroptera. É um dos grupos de insetos mais importantes devido à grande diversidade de espécies, a sua ampla distribuição, aos diferentes hábitos alimentares e danos causados em plantas cultivadas. O gênero *Prepops* está inserido na subfamília Mirinae, tribo Resthenini. Possui 197 espécies distribuídas apenas no continente americano, desde o Canadá até a Argentina e algumas espécies são consideradas pragas de cultivos. Com o objetivo de contribuir para o conhecimento de *Prepops* Reuter, estudos taxonômicos e biogeográficos foram conduzidos nesta tese. Os resultados foram organizados em três artigos. No primeiro, foram registradas 14 espécies de *Prepops* para o estado do Rio Grande do Sul, Brasil. Dentre elas, sete espécies se apresentam como novos registros e duas são novos táxons (*P. cangussuensis* e *P. turvoensis*). Para cada espécie foi apresentada a distribuição geográfica e diagnose. E por fim, uma chave de identificação regional foi apresentada. No segundo artigo, todas as referências de trabalhos publicados, distribuição geográfica, diagnose, plantas hospedeiras e ilustrações do hábito dorsal e genitálias foram preparadas para 58 espécies do gênero. E no terceiro artigo foi conduzida pela primeira vez uma análise biogeográfica com um gênero da subfamília Mirinae além de ser a primeira tentativa de usar dados de Miridae em um método qualitativo para identificar áreas de endemismo. A Análise de Redes reconheceu 14 unidades naturais de co-ocorrência (UCs) inseridas nos reinos Neártico e Neotropical. Algumas das UCs reconhecidas concordam (parcialmente ou totalmente) com áreas de endemismo tradicionais ou com a regionalização biogeográfica proposta por diferentes autores para diferentes táxons.

ABSTRACT

COELHO, Lívia Aguiar, D. Sc., Universidade Federal de Viçosa, February of 2012. **Taxonomic and biogeographic contributions in genus *Prepops* Reuter, 1905 (Hemiptera: Miridae).** Adviser: Paulo Sérgio Fiuza Ferreira. Co-advisers: Lucimar Gomes Dias and Lúcio Antônio de Oliveira Campos.

The Miridae (Hemiptera: Heteroptera) is one of the most species rich families of insects, with about 11,000 described species and comprises about 25% of the Heteroptera. It is one of the most important groups of insects due to the great diversity of species, wide distribution, the range of feeding habits and damage caused to crops. The *Prepops* genus lies in subfamily Mirinae, tribe Resthenini. Contains 197 species distributed only in American continent, from Canada to Argentina and a few species are pests in food crops. In order to contribute with the knowledge of *Prepops* Reuter, taxonomic and biogeographic studies were done in this thesis. The results were organized into three papers. In the first one, a total of fourteen species of *Prepops* genus were recorded from Rio Grande do Sul state, Brazil. New records include seven species. Two new species *P. cangussuensis* and *P. turvoensis* are described. For each species geographic distribution and diagnosis were presented. And ultimately, a key to Rio Grande do Sul species are provided to assist identification. The second paper brings for 58 *Prepops* species, all the published references, their geographic distribution, diagnosis, host plants and illustrations of dorsal habitus, male and female genitalia. And in the third paper, a biogeographic analysis was carried out for the first time in Mirinae subfamily. In addition, it was the first attempt to use data from Miridae in a qualitative method to identify areas of endemism. Network analysis recognized 14 natural units of co-occurrence (UCs), embedded in Neartic and Neotropic realms. Some of the UCs recognized agree (totaly or partially) with tradicional areas of endemism, or with biogeographic regionalization proposed by different authors for unlike taxa.

1. INTRODUÇÃO GERAL

1.1. Aspectos gerais da família Miridae (Hemiptera: Heteroptera)

Miridae Hahn (Hemiptera: Heteroptera: Cimicomorpha) representa uma das maiores famílias de insetos, com aproximadamente 11000 espécies descritas (Schuh 2011) e compreendendo cerca de 25% de todos os Heteroptera (Henry 2009). É um dos grupos de insetos mais importantes devido à grande diversidade de espécies, a sua ampla distribuição, aos diferentes hábitos alimentares e danos causados em plantas cultivadas (Henry & Froeschner 1988; Wheeler 2001).

As principais características que definem o grupo são (Figs. 1 e 2): antenas e rostro com quatro segmentos, tarsos 2 ou 3 segmentados, um par de glândulas de cheiro no metatórax, presença de cúneo, uma ou duas células na membrana da asa anterior, genitália masculina assimétrica e, ocelo ausente exceto em Isometopinae (Henry & Froeschner 1988; Schuh & Slater 1995; Wheeler 2001).

De acordo com a classificação mais recente Miridae possui oito subfamílias: Bryocorinae, Cylapinae, Deraeocorinae, Isometopinae, Mirinae, Orthotylinae, Phylinae e Psallopinae (Schuh 1995; Schuh & Slater 1995; Wheeler 2001; Henry 2009; Schuh 2011; Cassis & Schuh 2012).

Mirinae representa a maior subfamília, com seis tribos, 419 gêneros e mais de 4000 espécies descritas (Schuh 2011; Cassis & Schuh 2012). Esta subfamília é cosmopolita e pode ser diagnosticada por: genitália masculina com vésica membranosa, espículos esclerosados e abertura do gonoporo secundário bem definida (Fig. 2a); parede posterior da câmara genital feminina portando um processo mediano (= processo sigmóide) (Fig. 3e); pré-tarsos com parempódios divergentes (Fig. 1) e mais de seis tricobothria no fêmur II e oito no fêmur III (Schwartz 1987; Schuh & Slater 1995; Schwartz 2008; Henry 2009; Cassis & Schuh 2012).

Comparada com outros Mirinae, a tribo Resthenini tem distribuição restrita ao continente americano, possui indivíduos com coloração aposemática e glândulas de odor reduzidas (Schwartz 1987; Schuh & Slater 1995; Schwartz 2008; Cassis & Schuh 2012). *Prepops* Reuter, 1905 é o maior gênero de Resthenini com 197 espécies (Schuh, 2011).

1.2. O gênero *Prepops* Reuter

O gênero *Prepops* Reuter, 1905 foi descrito como um subgênero de *Resthenia* Spinola, 1837. Mais tarde, sua espécie tipo *Prepops frontalis* (Reuter, 1905) foi transferida por Reuter (Reuter, 1913) para o gênero *Platytylellus* Reuter, 1907. Devido a esta mudança genérica,

Reuter inferiu a sinonímia de *Platytylellus* Reuter, 1907 (tipo: *Resthenia nigripennis* Stål, 1860) com o gênero *Prepops* Reuter, 1905 que foi descrito dois anos antes. Bergroth (1922) listou as espécies brasileiras de *Platytylellus* inseridas no gênero *Prepops* sem fazer menção à sinonímia. E somente em 1954, Carvalho estudou as espécies tipo *Resthenia (Prepops) frontalis* Reuter, 1905 e *Resthenia nigripennis* Stål, 1860 demonstrando que pertenciam ao mesmo gênero. Portanto, concluiu que *Prepops* era um gênero válido e considerou *Platytylellus* como sinônimo júnior. O gênero *Opistheuria* Reuter, 1908 (tipo: *Resthenia latipennis* Stål, 1862) também foi sinonimizado com *Prepops* por Carvalho (1952).

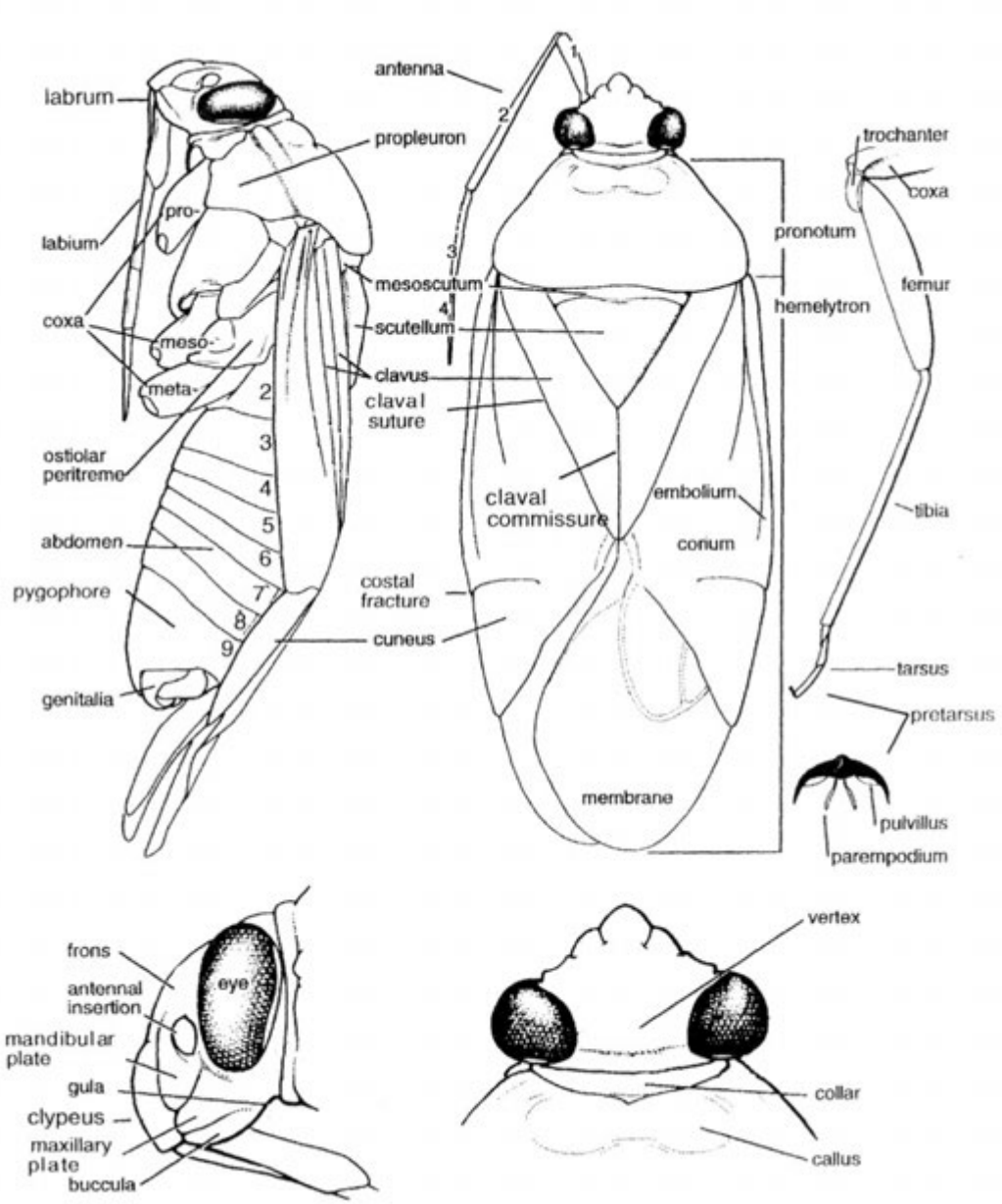
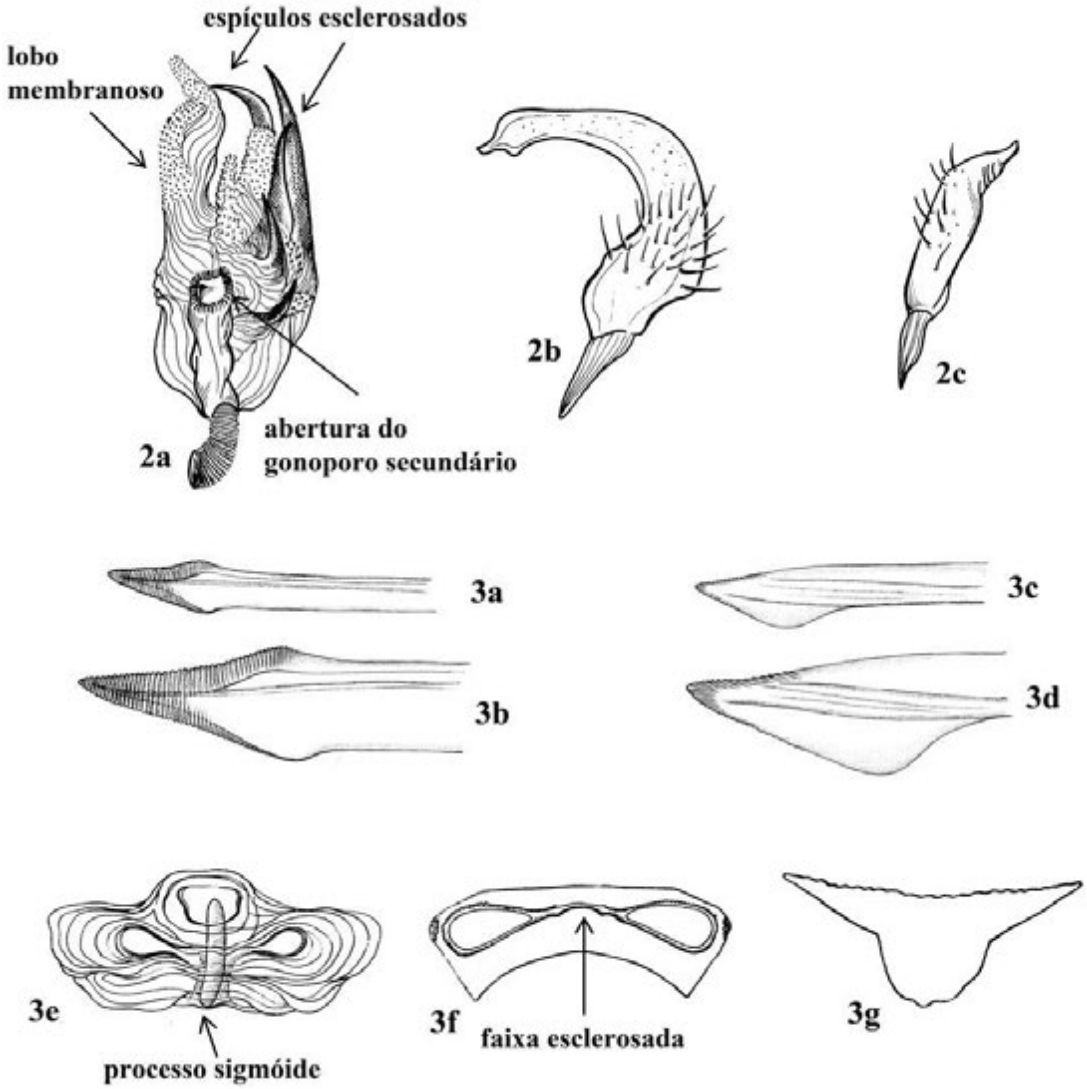


Figura 1: Morfologia geral de Miridae (modificado de Schuh & Slater 1995).



Figuras 2-3: Genitálias masculina e feminina de *Prepops*. Masculina: Fig. 2a, vesica do edeago; 2b, parâmero esquerdo; 2c, parâmero direito (modificado de Carvalho & Costa, 1997). Feminina: Fig. 3a, gonapófise anterior; 3b, detalhe do ápice; 3c, gonapófise posterior; 3d, detalhe do ápice; 3e, parede posterior da câmara genital (ilustrado por Luiz A. A. Costa); 3f, anéis esclerosados; 3g, placa esclerosada do suporte das gonapófises anteriores (modificado de Fontes, 1989).

Atualmente, este gênero possui 197 espécies distribuídas apenas no continente americano, desde o Canadá até a Argentina (Schuh 2011) e existe pouca informação disponível sobre a biologia de suas espécies (Wheeler 2001). *Prepops latipennis* (Stål, 1862) é conhecido por causar clorose foliar em cultivos de feijão e batata na América Central (Saunders *et al.* 1983; King & Saunders 1984; Saunders *et al.* 1998; Wheeler 2001) e *Prepops insitivus* (Say, 1832) é encontrado em plantações de uvas no estado da Flórida (Estados Unidos) com os adultos se alimentando dos botões florais. Mas os hábitos das espécies de *Prepops* são insuficientemente conhecidos e não é possível afirmar se estes mirídeos se alimentam nas inflorescências, frutos ou folhas das plantas (Wheeler 2001).

Figura 4: *Prepops zetterstedti*, vista lateral da cabeça e pronoto (modificado de Ferreira & Coelho 2006).

Prepops é diagnosticado pelas seguintes características: corpo alongado; a maioria das espécies possui coloração preta ou preta e vermelha; a cabeça é vertical e a gula curta; o pronoto possui a forma de trapézio com as margens laterais arredondadas (Kelton 1980) e o colar é proeminente com o sulco posterior interrompido lateralmente, não alcançando a fenda coxal anterior (Fig. 4) (Kelton 1980; Ferreira & Coelho 2006). Schwartz (1987, 2008) salientou que o sistema eferente de produção de odor de *Prepops* possui a condição mais apomórfica da tribo Resthenini. O canal osteolar termina ventralmente na superfície lateral da meso e metacoxa e não possui os remanescentes da superfície evaporativa e do disco peritremal exceto por poucos e isolados corpos evaporativos que podem ser vistos apenas em alta resolução, como por microscopia eletrônica. Outra característica é a faixa situada entre os anéis esclerosados (Fig. 3f) que não ocorre em outros gêneros de Resthenini (Slater 1950; Schwartz 1987, 2008).

A identificação das espécies de *Prepops* é feita a partir de características da morfologia externa (Fig. 1), incluindo principalmente a coloração e através de características da genitália masculina (Fig. 2) e feminina (Fig. 3), embora existam apenas dois estudos que utilizem a genitália feminina (Slater 1950; Fontes 1989).

Foram publicadas três chaves de identificação parciais para as espécies de *Prepops*. Uma que contempla 19 espécies com o pronoto e escutelo avermelhados, amarelados ou alaranjados (Carvalho & Fontes 1969). Outra produzida por Kelton (1980) com sete espécies coletadas em três províncias do Canadá e, por fim, uma chave também com sete espécies coletadas na ilha de Cuba (Hernández & Henry 2010).

1.3. Biogeografia

A biogeografia estuda a distribuição dos organismos no tempo e no espaço, reconhecendo padrões de distribuição, propondo hipóteses acerca dos processos que os

causaram e proporcionando um sistema de regionalização biótica do planeta (Brown & Lomolino 1998; Morrone 2004; Santos & Amorim 2007).

A biogeografia difere de muitas outras disciplinas por ser uma ciência de comparação e observação e não de experimentação, pois usualmente lida com escalas de tempo e espaço em que a manipulação experimental é impossível. Também é frequentemente dependente de dados coletados por muitos indivíduos que trabalharam em extensas áreas e por longos períodos de tempo. E, por fim, trabalha na interface de várias disciplinas tradicionais (ecologia, sistemática, biologia evolutiva, geografia, paleontologia, etc). Muitos trabalhos surgem a partir da união de duas ou mais destas disciplinas (Brown & Lomolino 1998).

Dentre as possibilidades de uso da biogeografia estão: definir prioridades para conservação de áreas com grande diversidade biológica, fornecer informações sobre a distribuição das espécies no passado, além de desenvolver estratégias no controle de vetores de doenças humanas e guiar o desenvolvimento de iniciativas para a restauração de áreas degradadas (Crisci *et al.* 2006).

Foram desenvolvidos dois principais enfoques de estudo durante a história da biogeografia: o ecológico e o histórico (Morrone & Crisci 1995; Crisci *et al*. 2003; Huggett 2004; Morrone 2004). A biogeografia ecológica estuda como os processos ecológicos que acontecem em curtos períodos de tempo agem nos padrões de distribuição dos seres vivos. Destaca os padrões adaptativos, gradientes, etc., sem ressaltar se os organismos são ou não relacionados. Enquanto a biogeografia histórica estuda como os processos que aconteceram durante longos períodos de tempo (milhões de anos) influenciam os padrões conhecidos (Cox & Moore 1993 *in* Crisci *et al*. 2003) enfatizando as relações genealógicas dos mesmos.

Segundo Hovenkamp (1997) a biogeografia histórica possui dois objetivos principais. O primeiro é o estudo da história da Terra, ou seja, das relações entre as áreas de endemismo e o segundo é o estudo da história dos táxons. Para desenvolver o primeiro objetivo, existem várias teorias e métodos propostos como a Panbiogeografia e a Biogeografia cladista. Mas um passo prévio necessário é definir quais áreas de endemismos serão as utilizadas na análise.

A área de endemismo é tradicionalmente a principal unidade básica de estudo da biogeografia histórica (Crisci *et al.* 2003; Dos Santos *et al.* 2008) e muitos conceitos foram propostos para sua definição (Nelson & Platnick 1981; Platnick 1991; Harold & Mooi 1994; Morrone 1994; Humphries & Parenti 1999 *in* Crisci *et al.* 2003). Atualmente, é definida pela maioria dos pesquisadores como uma área que apresenta dois ou mais táxons que não se encontram distribuídos em nenhum outro local (Szumik & Goloboff 2004).

Tanto a biogeografia ecológica quanto a histórica possuem métodos para identificar as áreas de endemismo e seus limites. Dentre os métodos desenvolvidos pela biogeografia

histórica estão: a superposição de áreas, a análise de parcimônia de endemismos, a análise de traços, análises de endemicidade e a análise de redes.

O método de superposição de áreas (Müller 1973) requer a coincidência de distribuição de vários táxons cuja validade taxonômica seja inquestionável. Além disso, a área de distribuição de cada táxon deve ser menor do que a área total de estudo e seus limites devem ser claramente definidos. O método consiste em sobrepor as áreas de distribuição dos táxons para calcular as áreas em comum, que serão as áreas (ou área) de endemismo (Crisci *et al.* 2003).

A análise de traços (Croizat 1958), um conceito utilizado na Panbiogeografia, compartilha características com o conceito de áreas de endemismo, quando um traço generalizado resulta da sobreposição da distribuição de dois ou mais táxons (Crisci *et al.* 2003). Apesar dos traços generalizados serem, de certa forma, análogos às áreas de endemismo, em sentido estrito são fragmentos vicariantes (que foram isolados) de áreas de endemismo existentes no passado.

A análise de Parcimônia de Endemismos (PAE) (Morrone 1994) é baseada em quadrantes para identificar áreas de endemismo. Consiste em dividir a região a ser analisada em quadrantes e construir uma matriz quadrantes x táxons a partir dos dados de distribuição dos táxons. Nesta matriz os quadrantes representam as unidades de estudo e a presença ou ausência dos táxons representam os caracteres. Através da aplicação de máxima parcimônia um cladograma é obtido, e os grupos de quadrantes que são unidos pela presença de dois ou mais táxons são considerados áreas de endemismo. Finalmente, os quadrantes escolhidos são mapeados para delimitar as bordas da área de endemismo (Crisci *et al.* 2003).

Segundo Szumik & Goloboff (2007) existem sérios problemas em usar programas de filogenia para avaliar áreas de endemismo: os programas de filogenia lidam apenas com árvores (isto é, subconjuntos hierárquicos que não se sobrepõem) e o critério de avaliação das árvores considera a ancestralidade comum, o que não é aplicável ao endemismo (áreas de endemismo não descendem uma da outra).

A análise de endemicidade (Szumik *et. al.* 2002; Szumik & Goloboff 2004) propõe considerar aquelas espécies que estão mais ou menos distribuídas uniformemente em uma área e que não são encontradas fora desta região de estudo. A regra da uniformidade consiste em contar como endêmicas aquelas espécies que estão presentes em cada célula do conjunto ou, se ausente, ausente em não mais que Q (1>Q>8) do total das células que circundam o quadrante em questão. O valor de Q é escolhido pelo pesquisador (1, mais estrito; 8 menos estrito) (Szumik & Goloboff 2004). Compartilha com o PAE quase todos os passos, incluindo o uso de quadrantes, mas não utiliza o critério da parcimônia e sim o critério da uniformidade na

distribuição das espécies. Este foi especialmente desenvolvido para lidar com áreas de endemismo, não um método adaptado de outra disciplina, como é a parcimônia.

As várias abordagens propostas para identificar e delimitar as áreas de endemismo possuem problemas metodológicos. Problemas comuns à maioria dos métodos publicados são os critérios para identificar estas unidades básicas de estudo e a ênfase excessiva que é dada para reconhecer seus limites. O uso de quadrantes traz problemas relativos à escala (Dos Santos *et al*. 2008) que pode variar consideravelmente, desde áreas restritas até áreas continentais. Quadrantes maiores podem incluir um elevado número de espécies únicas e resultar em áreas com maior suporte, entretanto, quanto maior o tamanho dos quadrantes maior a probabilidade de se incluir áreas com maior heterogeneidade de ecossistemas, o que pode obscurecer possíveis padrões biológicos ao agrupar áreas com pouco suporte (Morrone & Escalante, 2002; Sigrist & Carvalho, 2008 *in* Ferrari *et al.* 2010).

Diante das várias abordagens propostas para identificar áreas de endemismo e de seus problemas metodológicos Dos Santos *et al.* (2008, 2011) propuseram o método de análise de redes. A maior diferença entre dados convencionais e de rede é que dados convencionais focam espécies e atributos, enquanto que dados de rede focam em espécies e relações (Hanneman & Riddle 2005 *in* Dos Santos *et al*. 2008). Diante desta afirmação, grupos de espécies que satisfaçam a exigência de simpatria dentro de grupos e alopatria entre grupos se conformarão com as unidades naturais de co-ocorrência (UCs). As UCs estão incluídas em uma rede global quando existem outras espécies conectando-as. Elas serão evidentes depois que estas espécies intermediárias forem removidas. A expressão espacial das UCs resultantes serão as candidatas para áreas de endemismo e as espécies pertencentes a cada UC serão estritamente endêmicas. O status final das candidatas a áreas de endemismo vai depender da história filogenética dos táxons envolvidos (Humphries & Parenti 1999; Mast & Nyfeller 2003 *in* Dos Santos *et al*. 2008). A análise de redes representa uma nova e consistente plataforma de análise biogeográfica. A noção de espécies intermediárias apresentada só é empreendida com uma abordagem holística, como a análise de redes. Além disso, a identificação das UCs e a derivação de suas expressões espaciais libera a todos da tradicional e controversa necessidade de delimitar as áreas de endemismo (Dos Santos *et al*. 2008).

1.4. Aspectos Biogeográficos da família Miridae

A família Miridae é cosmopolita, e é amplamente encontrada em todas as regiões biogeográficas, com centros de diversidade em habitats tropicais e mediterrâneos (Cassis & Schuh 2012).

Em relação às subfamílias, apenas Psallopinae não é conhecida para as regiões Neártica, Afrotropical e Australiana; as outras sete são encontradas em todas as regiões biogeográficas. Muitas tribos e gêneros apresentam padrões de endemismo restritos, como os indivíduos da tribo Resthenini que são limitados ao continente Americano e com a maior parte de sua diversidade no neotrópico (Wheeler 2001; Cassis & Schuh 2012).

O emprego de estudos biogeográficos em Miridae, embora em pequena quantidade, está começando a identificar centros de endemismo, a analisar suas interrelações, e a determinar se áreas com riqueza de espécies tendem a se correlacionar com áreas de alto endemismo (Wheeler 2001). Os trabalhos se concentram em estudos de determinadas áreas (Ribes 1984; Wheeler & Henry 1992; Williams 2002; Hernández & Henry 2010) ou de uma subfamília ou gênero específicos (Schuh 1974, 1984; Schuh & Stonedahl 1986; Schuh 1991; Lu & Zheng 1998; Paula 2000; Schuh 2006). Mas até o presente momento, trabalhos que fazem menção a subfamília Mirinae são escassos (Williams 2002, Cassis & Schuh 2012), e para a tribo Resthenini, ausentes.

2. OBJETIVO GERAL

Contribuir para a taxonomia do gênero *Prepops* Reuter, através da reunião de informações publicadas sobre o gênero, novos registros de distribuição e descrição de novas espécies; além de analisar o gênero como indicador de áreas de endemismo para o continente americano.

2.1. OBJETIVOS ESPECÍFICOS

- Desfazer dúvidas em relação ao histórico taxonômico de espécies do gênero *Prepops*.
- Apresentar para cada uma das espécies investigadas a bibliografia de todos os trabalhos já publicados que tratem ou façam alguma menção sobre as mesmas; sua distribuição geográfica; plantas hospedeiras (quando conhecidas); diagnose e ilustrações existentes do hábito dorsal, genitália masculina e feminina.
- Descrever novas espécies.
- Indicar novos registros de localidade.
- Apresentar uma chave de identificação para as espécies encontradas no estado do Rio Grande do Sul (Brasil).
- Apresentar uma discussão sobre o gênero *Prepops* como indicador de áreas de endemismo para o continente americano.

3. MATERIAL E MÉTODOS

3.1. Obtenção do material

O material examinado para a realização deste trabalho foi proveniente de empréstimos das seguintes instituições: Museu de Ciências Naturais da Fundação Zoobotânica do Rio Grande do Sul, MCNZ (Porto Alegre, Rio Grande do Sul, Brasil); Departamento de Zoologia, Universidade Federal do Rio Grande do Sul, DZRS (Porto Alegre, Rio Grande do Sul, Brasil); Departamento de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro, MNRJ (Rio de janeiro, Rio de Janeiro, Brasil); Museu Regional de Entomologia, Universidade Federal de Viçosa, UFVB (Viçosa, Minas Gerais, Brasil); Universidade Federal do Paraná, Coleção Padre Jesus Santiago Moure, DZUP (Curitiba, Paraná, Brasil); Instituto-Fundación Miguel Lillo, IFML (San Miguel de Tucumán, Tucumán, Argentina) e Universidade Federal de Pelotas, Museu de Entomologia Ceslau Biezanko, MECB (Pelotas, Rio Grande do Sul, Brasil).

3.2. Estudos taxonômicos

As informações sobre o gênero *Prepops* foram obtidas através da investigação da literatura da família Miridae.

As identificações dos exemplares de *Prepops* foram realizadas com auxílio de chaves taxonômicas, descrições originais e comparação com exemplares de museus (material tipo ou não). As descrições originais foram utilizadas para a elaboração de diagnoses de espécies cujos exemplares de museus não foram estudados. Para a identificação de algumas espécies foi necessário a extração e preparo de genitálias. Para tanto, foi retirado o ápice do abdome do espécime, o qual foi imerso em KOH 10%, a frio, durante 24 horas. As peças foram dissecadas em água destilada e preservadas em glicerina para posteriores estudos.

Os desenhos foram elaborados com o auxílio de câmara clara acoplada a um estereomicroscópio pertencentes ao Museu Nacional da Universidade Federal do Rio de Janeiro e Museu Regional de Entomologia da Universidade Federal de Viçosa. As ilustrações foram realizadas a lápis, e em seguida redesenhadas com caneta nanquin em papel vegetal. Após o processo de digitalização foram editadas em computador, utilizando-se o programa Adobe Photoshop CS2.

3.3. Análise biogeográfica

Os dados dos locais de coleta das espécies de *Prepops* foram reunidos através da literatura e das etiquetas de espécimes de museus. As coordenadas geográficas foram obtidas através dos sites Falling Rain Genomics, Inc. (http://www.fallingrain.com/world) e Google Earth (http://www.google.com/earth) além das etiquetas dos espécimes.

A busca por áreas de endemismo foi feita através da Análise de Redes (Dos Santos *et al*., 2008; Dos Santos et *al*., 2011) que é implementada por meio do software R (R Development Core Team, 2011) e dos pacotes SyNet (Dos Santos, 2011) e TKRplot (Tierney, 2010). A visualização da expressão espacial das unidades de co-ocorrência, dos mapas de ecorregiões e político foi feita através do software Diva-Gis (Hijmans *et al.* 2004).

3.4. Formatação

A presente tese encontra-se organizada sob a forma de artigos científicos, como disposto no item 2.4 das normas para redação de teses desta instituição. Cada artigo encontra-se formatado de acordo com as normas da revista que será submetido, com exceção das figuras que foram inseridas dentro do texto para melhor organização.

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The genus *Prepops* Reuter (Hemiptera: Miridae) in Rio Grande do Sul State, Brazil: new species, new records and key to species

LÍVIA A. COELHO[1], PAULO SÉRGIO F. FERREIRA[2] & LUIZ A. A. COSTA[3]

[1,2]Museu Regional de Entomologia, Departamento de Entomologia, Universidade Federal de Viçosa, 36570-000. Viçosa, MG, Brazil. E-mails: [1]liviaguiar04@gmail.com; [2]pfiuza@ufv.br

[3]Museu Nacional. Departamento de Entomologia. Universidade Federal do Rio de Janeiro, 20.940-040. Rio de Janeiro, RJ, Brazil. E-mail: tlcosta@uol.com.br

Abstract

A total of fourteen species of Miridae belonging to *Prepops* genus were recorded from Rio Grande do Sul state, Brazil. New records include seven species. Two new species *Prepops cangussuensis* and *P. turvoensis* are described and illustrated. Geographic distribution, diagnosis and a key to Rio Grande do Sul species are provided to assist identification.

Key words: Taxonomy, Heteroptera, Mirinae, Resthenini, Neotropical, Plant Bugs.

Introduction

The Miridae genus *Prepops* was described by Reuter, 1905 and included in the subfamily Mirinae, tribe Resthenini. At present this genus has two junior synonyms: *Platytylellus* Reuter, 1907 and *Opistheuria* Reuter, 1908.

Prepops is recognized for the following characteristics: elongate species, mostly black or black and red; head vertical and short gula; pronotum trapeziform with lateral margins rounded (Kelton 1980) and collar prominent with posterior sulcus interrupted laterally, not reaching the anterior coxal cleft (Kelton 1980; Ferreira & Coelho 2006).

Nowadays this genus contains 197 species distributed only in American continent, from Canada to Argentina (Schuh 2011) and little information is available on the biology of the species (Wheeler 2001). *Prepops latipennis* (Stål, 1862) is known to cause foliar chlorosis on beans and potato in Central America (Saunders *et al.* 1983; King & Saunders 1984; Saunders *et al.* 1998; Wheeler 2001) and *Prepops insitivus* (Say, 1832) develops on wild muscadine grape in Florida, USA, with the adults feeding

on flowers buds. The habits of the *Prepops* species are so little known that it is uncertain if these bugs are typical inflorescence, fruit or leaves feeders (Wheeler 2001).

In Brazil, there are 74 *Prepops* species recorded (Schuh 2011), occurring from north to south regions. Only *Prepops flavicostus* (Berg, 1884) was recognized in Rio Grande do Sul state (RS) (Reuter 1910; Carvalho 1959; Carvalho & Fontes 1971A; Schuh, 2011). However, Barcellos *et al*. (2011) studying the miridae assemblage in Parque Estadual do Turvo identified *Prepops cruciferus* (Berg, 1878), *P. paranaensis* Carvalho & Fontes, 1969 *P. seminiger* (Stål, 1860) and *P. setosipes* (Reuter, 1910). Thus, it is necessary to increase the knowledge about *Prepops* of this state, composed of important biomes that differ, in part, from the rest of the country. One of them, the Pampa, occurs only in RS, occupying 63% of its territory (RS Biodiversidade 2008).

There are three partial keys to identify *Prepops*. One that contemplates species with pronotum and scutellum reddish, yellowish or orange described until 1969 (Carvalho & Fontes 1969). Another covers seven species collected on Canada prairie provinces (Kelton 1980) and Hernández & Henry (2010) produced a key to the seven species found on Cuba island.

The identification of *Prepops* species is based on the features of the external morphology, including colors, and characteristics of the male genitalia. Slater (1950) in his attempt to investigate the female genitalia as taxonomic characters in Miridae described the female genitalia of *Prepops atroluteus* (Walker, 1873), *P. circummaculatus* (Stål, 1854), *P. costalis* (Stål, 1860), *P. flavicostus* (Berg, 1884) and *P. insitivus* (Say, 1832). And Fontes (1989) studied the female genitalia of seventeen *Prepops* species verifying the value of some morphological characters in genus and species diagnosis.

In this paper, a total of fourteen species of Miridae belonging to *Prepops* genus were recorded from RS. New records include seven species. Two new species, *Prepops cangussuensis* and *P. turvoensis* are described and illustrated. The geographic distribution is provided, and a key to RS species and diagnosis are presented to assist identification. When the male genitalia was not available, the female genitalia was dissected and illustrated to certify the species status.

Material and Methods

This study is based on adults borrowed from the Museu de Ciências Naturais of the Fundação Zoobotânica do Rio Grande do Sul (MCNZ), Porto Alegre, RS, Brazil;

Departamento de Zoologia, Universidade Federal do Rio Grande do Sul (DZRS), Porto Alegre, RS, Brazil and Museu de Entomologia Ceslau Biezanko (MECB), Universidade Federal de Pelotas, Pelotas, RS, Brazil. Terminology follows Schuh & Slater (1995), Kelton (1959) and Fontes (1981). Species not previously illustrated in the literature were drawn by the third author. The sources of borrowed illustrations are cited in the figure legends. New records are marked with an asterisk (∗). The abbreviation used for the word collection is "col." The geographic distribution given is: countries, followed by Brazil states, with emphasis in Rio Grande do Sul cities.

Taxonomy (*Prepops* species found in Rio Grande do Sul state)

***Prepops cangussuensis* sp. n.** (Fig. 1–2)

Diagnosis: Body dull black. Head reddish with eyes, antennae, maxillary plate, apex of buccula, rostrum and a mark on frons, black. Ventral sides of collar, xiphus, propleura (partially) and middle area of hind femora reddish. First and second sterna of abdomen partially reddish. Tibiae with hairs longer than diameter of segment. Vesica of aedeagus with two sclerotized spines, one straight and other with a bent apex. Apex of one membranous lobe sharp and sclerotized. Left paramere curved with an acute and twisted apex, sensorial lobe sclerotized with long, erect setae. Right paramere curved with 1/3 apical area twisted ending in a long acute apex. Anterior gonapophyses bent and narrowing towards the base. Apex sharpened and folded in ventral margin. Posterior gonapophyses strongly toothed and with a rough aspect throughout its length. Sclerotized rings with anterior, lateral and posterior margins with approximate sizes. Sclerotized area between the rings long. Posterior wall with the dorsal membranous area of the interramal sclerites smooth. Interramal sclerites slightly sclerotized, lateral margins convex, posterior margins expanded near the lateral margins, anterior margins sinuous.

Description: Male, holotype (measurements in millimeters): Body length, 6.12; width, 2.25. Head length, 0.56; width, 1.43. Vertex width, 0.87. Length of antennal segments I, 0.50; II, 1.81; III, 1.15; IV, 0.96. Rostrum length, 2.03. Pronotal length, 1.07; base width, 1.65. Scutellum length, 0.65; width 0.80. Cuneal length, 0.92; width, 1.00. Hind femur length, 2.15; hind tibia length, 2.60; hind tarsus, missing.

General coloration dull black with reddish areas. Head shinning reddish. Eyes, maxillary plate and buccula apex, rostrum and a spot on frons, dull black. Clypeus shinning black. Antennal segments uniformly black with a small lutescent area close to base of segments. Pronotum uniformly black; propleura partially reddish. Mesoscutum, scutellum and hemelytra uniformly black, except for a pale area in membrane near apex of cuneus. Ventral side mostly black with collar sides, xiphus and a band near hind femora middle part, reddish. First and second sterna of abdomen partially reddish.

Dorsal surface roughened. Dorsal vestiture intermixed with pruinosity. Head slightly broader than long, smooth, declivous and with long erect setae dorsally. Frons noticeably produced. Clypeus convex and well delimited from frons, slightly bulbous basally, narrowing to the apex. Eyes prominent, produced laterally and contiguous to anterior margin of pronotum. Antennal vestiture with short setae intermixed with long, erect setae on first and second segments. Length of hairs on antennal segment I and II greater than thickness of segments. Antennal segments I and II linear, III and IV, slender. Relative lengths of segments from shortest to longest I-IV-III-II. Segment I shorter than vertex width. Rostrum extending between hind coxae. Pronotum collar larger than width of antennal segment I and with dense erect pubescence. Calli well delimited, elevated. Pronotum lateral margins rounded, posterior margin straight or weakly convex, discal area moderately convex. Mesoscutum partially exposed. Scutellum convex, with sparce pilosity. Hemelytra elongate, with dense short and dark semi adpressed pubescence. Cuneus nearly as long as wide. Membrane glabrous. Femora and tibiae thickly clothed with long hairs, mixed with short adpressed pilosity. Length of hairs on tibiae greater than thickness of segment.

Male genitalia: Vesica of aedeagus (Fig. 1c) with a gap on the opening of secondary gonoporo; two sclerotized spines, one straight and other with a bent apex and one membranous lobe supporting a sharp and sclerotized apex. Left paramere (Fig. 1d) curved with an acute and twisted apex, sensorial lobe sclerotized with long, erect setae. Right paramere (Fig. 1e) curved with 1/3 apical area twisted ending in a long acute apex.

Female, paratype (measurements in millimeters): Body length, 6.12; width, 2.25. Head length, 0.62; width, 1.43. Vertex width, 0.93. Length of antennal segments I, 0.50; II, 1.65; III, 0.69; IV, missing. Rostrum length, 2.07. Pronotal length, 1.15; base width, 1.65. Scutellum length, 0.66; width, 0.90. Cuneal length , 0.69; width, 0.65. Hind femur length, 1.96; hind tibia length, 2.57; hind tarsus length, 0.76. Similar to male in color

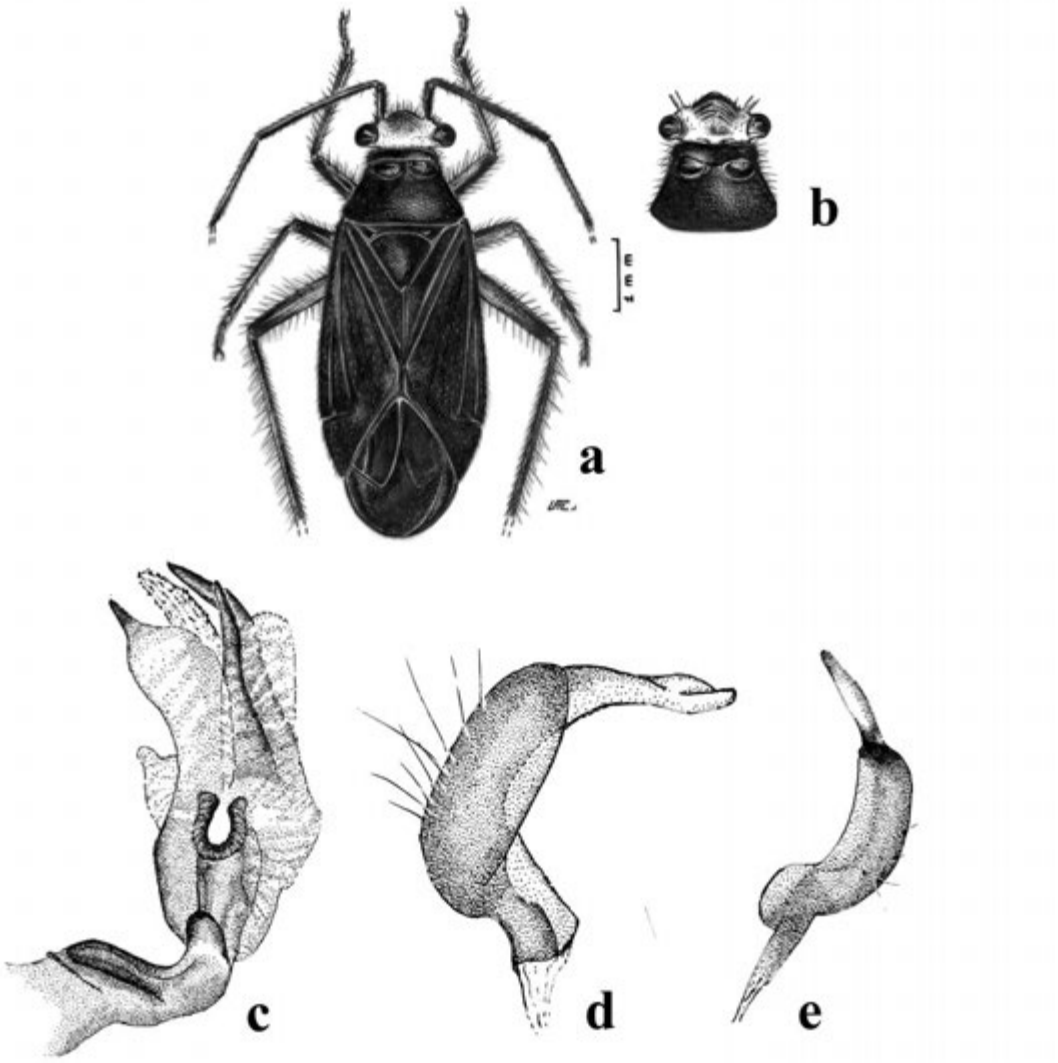


Figure 1: *Prepops cangussuensis* sp. n., male, holotype; a, dorsal view; b, head and pronotum (illustration by Luiz A. A. Costa); c, vesica of aedeagus; d, left paramere; e, right paramere (illustration by Paulo S. F. Ferreira).

and size, except for the base of the first antennal segment lutescent, frons with a fuscous mark and collar sides black.

Female genitalia: Anterior gonapophyses (Fig. 2a,b) bent and narrowing towards the base. Apex sharpened, with grooves limited to this area. Apex showing a fold in ventral margin. Posterior gonapophyses (Fig. 2c,d) strongly toothed and with a rough aspect throughout its length. Sclerotized rings (Fig. 2e) with anterior, lateral and posterior margins with approximate sizes. Median margin short. Sclerotized area between the rings long, about twice the width of one sclerotized ring. Posterior wall (Fig. 2f) with the dorsal membranous area of the interramal sclerites smooth. Interramal

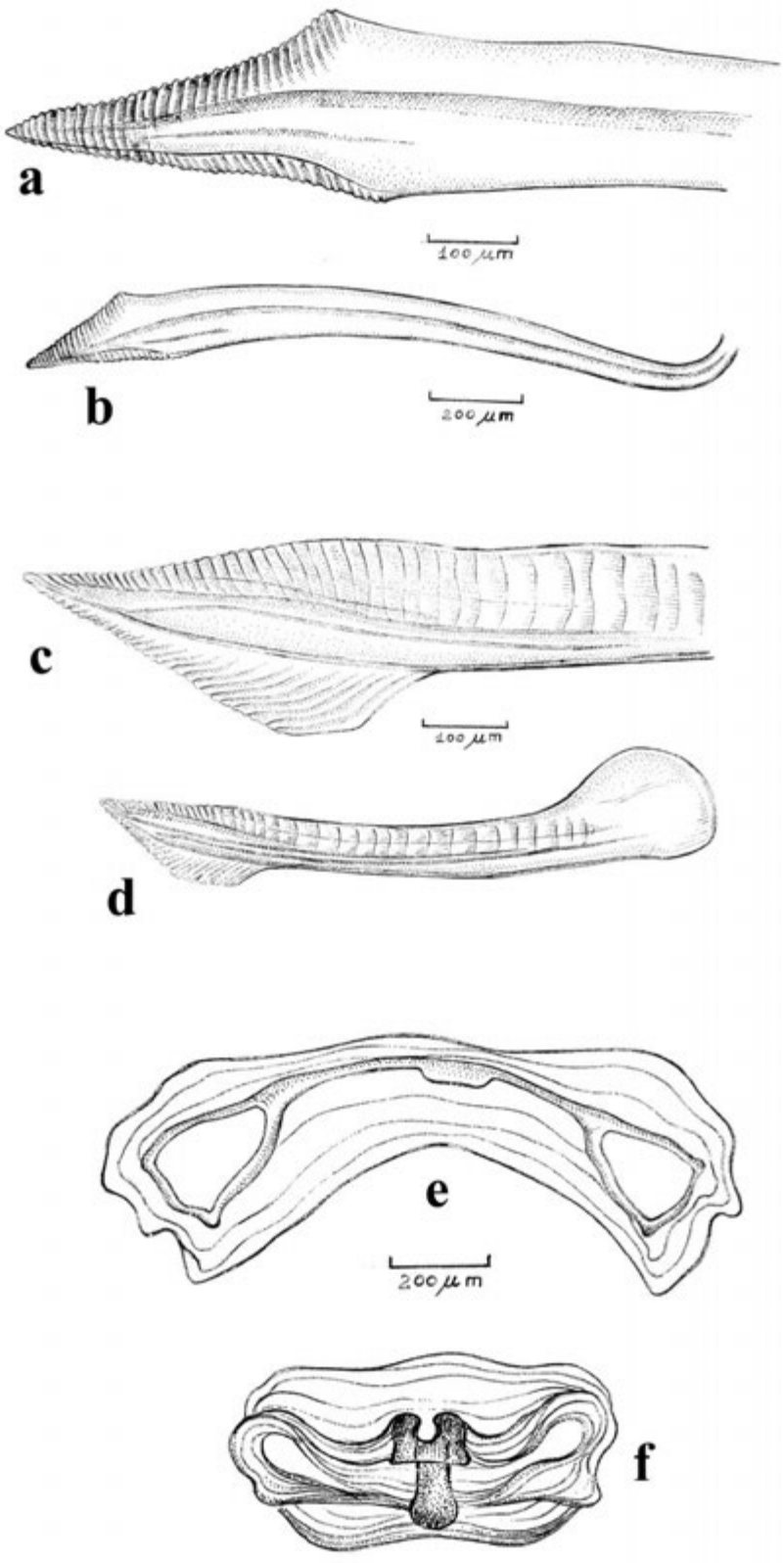


Figure 2: Female genitalia of *Prepops cangussuensis* sp. n. Anterior gonapophyses, a, apex detailed, b, complete view. Posterior gonapophyses, c, apex detailed, d, complete view. Sclerotized rings, e. Posterior wall, f (illustration by Luiz A. A. Costa).

sclerites slightly sclerotized, lateral margins convex, posterior margins expanded near the lateral margins, anterior margins sinuous.

Host: unknown

Etymology: This species is named after the type locality, Canguçu, in Rio Grande do Sul state, Brazil.

Type specimens: male, holotype, and female, paratype. BR, RS, Canguçu, Rincão da Ronda. Campo. 09/IV/2003, aleatória. Bunde col. (In MCNZ collection).

Geographic distribution: Brazil, Rio Grande do Sul state.

Discussion: This species closely resembles *Prepops catamarcanus* Carvalho, 1988 but differs in the eyes, more prominent; the collar, that is wider and totally black and the absence of two transversal and oblique stripes on vertex; mandibular plate totally reddish, body with long pubescence and tibiae thickly clothed with prominent long hairs, length of hairs on tibiae greater than thickness of segment. It was not possible compare the male genitalia because the unique male exemplar of *P. catamarcanus* has a missing abdomen. So, the female genitalia of the two species was extracted and compared. It shows sufficient differences to confirm *P. cangussuensis* as a new species.

Material examined: *P. catamarcanus* (In MNRJ collection), paratype, female; Catamarca, El Manchado, 19.I.59. 4000, R. Golbach. Paratype, male (without abdomen), Nº 5653, Rpa. Argentina. Prov. Tucuman, 21.VII.1899, S. Venturi (not cited in original description).

Description of female genitalia of *Prepops catamarcanus* Carvalho (Fig: 3): Anterior gonapophyses (Fig. 3 a,b) with approximately the same width throughout its length. Distal part angulated forming an almost 90 degrees angle. Apex blunted with grooves that do not reach the apical third of the structure. Posterior gonapophyses (Fig. 3c,d) with shallow teeth in small amount and smooth aspect. Basal portion with dorsal margin round shapped and ventral marging with fingerlike projection. Sclerotized rings (Fig.

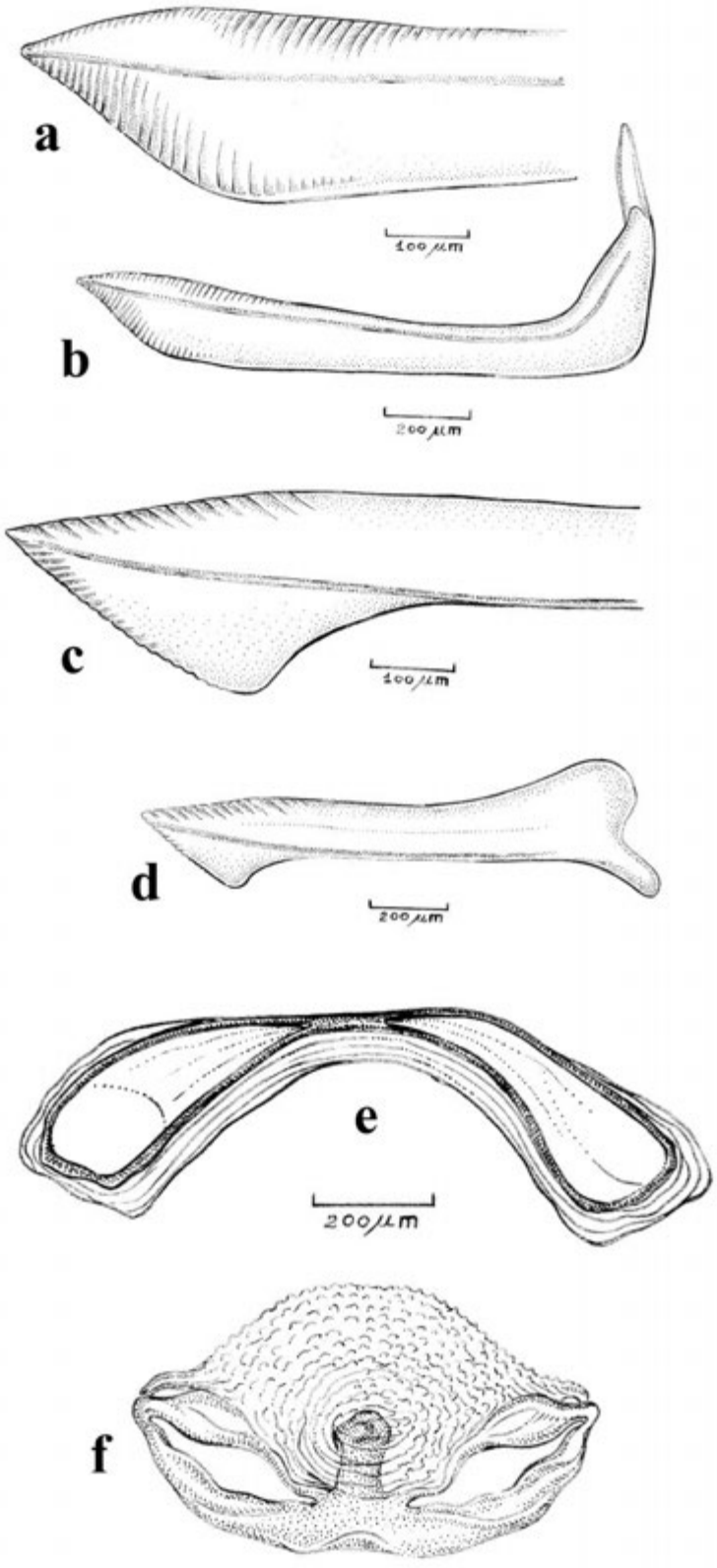


Figure 3: Female genitalia of *Prepops catamarcanus* Carvalho, 1988. Anterior gonapophyses, a, apex detailed, b, complete view. Posterior gonapophyses, c, apex detailed, d, complete view. Sclerotized rings, e. Posterior wall, f (illustration by Luiz A. A. Costa).

3e) with long anterior and posterior margins and approximate lengths, about twice the size of the lateral margin. Median margin very short. Sclerotized area between the rings short. Posterior wall (Fig. 3f) with the dorsal membranous area of the interramal sclerites with several spicules. Interramal sclerites sclerotized, lateral margins short, posterior margins expanded in the middle portion, anterior margins slightly sinuous.

Discussion of female genitalia: The female genitalia of *P. cangussuensis* difers from *P. catamarcanus* in the width of the anterior gonapophyses, that narrows towards its base. The apex is sharpened. The posterior gonapophyses are strongly toothed and with a rough aspect throughout its length. Sclerotized rings with anterior, lateral and posterior margins with approximate sizes. Sclerotized area between the rings long. Posterior wall with the dorsal membranous area of the interramal sclerites smooth. Interramal sclerites slightly sclerotized, lateral margins convex, posterior margins expanded near the lateral margins, anterior margins sinuous.

***Prepops circummaculatus* (Stål, 1854)** (Fig. 4)

Diagnosis: General coloration black with lutescent areas. Posterior portion from vertex, median part from collar and area between calli narrowing through the base of pronotum, lateral margins of pronotum, propleuron, buccula, gula, rostrum segment I, xiphus, abdomen basal median part and laterally (frequently interrupted in segments III through VI), lutescent. Ventral part, antennae and legs black. Vesica of aedeagus with one median sclerotized spine; left paramere curved and with a rounded apex; right paramere with apical third curved and an acute apex.

Geographic distribution: Cuba, Suriname, Chile, Argentina, Paraguay, Uruguay (Stål 1854; Carvalho & Drake 1943AB; Carvalho 1951A; Carvalho & Hussey 1954; Carvalho 1959; Carvalho & Rosas 1965; Carvalho & Fontes 1970A; Alayo 1974; Fontes 1989; Carpintero & Carvalho 1993, Schuh 1995; Schuh 2011). Brazil: Bahia, Minas Gerais, Rio de Janeiro, São Paulo (Carvalho & Drake 1943B; Slater 1950; Carvalho 1959; Carvalho & Fontes 1970A; Carvalho 1975; Schuh 1995; Ferreira *et al*. 2006; Schuh 2011), Rio Grande do Sul: Guaíba (Col. MCNZ).

Material examined: In MCNZ collection. Male, 13865, Guaíba, RS; 13-14/II/1980; M. E. L. Souza leg.

***Prepops cruciferus* (Berg, 1878)** (Fig. 5)

Diagnosis: General coloration brownish with lutescent areas (the intensity of these colors can vary). Head (except clypeus. frons and eyes, sometimes fuscous), the median part of collar, area between calli, a median longitudinal stripe on pronotal disc and a transversal stripe behind calli sometimes forming a cross mark, scutellum (except basal angles), claval commissure, a longitudinal stripe in apical 2/3 of endocorium and cuneus, lutescent. Base of antennal segments I and II, basal half of femora and sterna, lutescent. Abdomen lutescent with rounded fuscous spots laterally. Vesica of aedeagus with two sclerotized spines; left paramere curved and with an acute apex and subapical distension; right paramere with an acute and sclerotized apex.

Geographic distribution: United States, Cuba, Grenada, Panama, Suriname, Colombia, Ecuador, Peru, Paraguay, Argentina (Berg 1878; Uhler 1894; Pennington 1921; Carvalho & Drake 1943A; Carvalho 1951A; Carvalho & Hussey 1954; Carvalho 1959; Carvalho & Rosas 1965; Carvalho & Fontes 1970A; Carvalho & Afonso 1977; Henry 1990; Schuh 1995; Coscarón & Carpintero 1996; Carvalho & Carpintero 1992; Carpintero & Carvalho 1993; Hernández & Henry 2010; Schuh 2011). Brazil: Amazonas, Pará, Goiás, Bahia, Mato Grosso do Sul, Minas Gerais, São Paulo, Rio de Janeiro, Santa Catarina (Carvalho 1951B; Carvalho 1959; Carvalho & Fontes 1970A; Ferreira & Rossi 1979; Fontes 1989; Henry 1990; Ferreira *et al*. 2001; Ferreira *et al*. 2006; Hernández & Henry 2010), Rio Grande do Sul: Derrubadas (Barcellos *et al*. 2011); Pelotas (Col. MECB); Triunfo, Porto Alegre, Viamão, Guaíba, Novo Hamburgo (Col. MCNZ).

Material examined: In MCNZ collection. Male, 11110, Triunfo, RS; 20/X/1977; H. A. Gastal leg. Female, 13867, Guaiba, RS; 11-13/I/1980; M. E. L. Souza leg. Male, 15879, Guaiba, RS; 6-7/II/1980; H. A. Gastal leg. Male, 15238, Viamão, RS; 8-10/II/1980; M. E. L. Souza leg. Female, 13864, Porto Alegre, RS; 3-4/III/1980; H. A. Gastal leg. Male, 13870, Guaiba, RS; 7-9/III/1980; M. H. Galileo leg. Male, 52010, Novo Hamburgo, RS; 13/IV/1984; C. J. Becker leg. Male, 52008 and female, 52009, Novo Hamburgo, RS; 08/IV/1988; C. J. Becker leg. In MECB collection. Brasil, Pelotas,7.XII.952.

***Prepops flavicostus* (Berg, 1884)** (Fig. 6)

Diagnosis: General coloration black and lutescent; collar (except median part or, sometimes, the anterior part, not including the sides), humeral angles from pronotum, embolium and corium thin external border, external part from cuneus, femora base, coxae, xiphus, rostrum base and inferior part from propleuron lutescent to pale yellow. Vesica of aedeagus with one sclerotized spine; left paramere curved with an acute apex and a subapical tooth; right paramere with an acute apex (modified from Carvalho & Fontes 1970B).

Geographic distribution: Peru, Uruguay, Argentina (Berg 1884; Carvalho 1959; Carvalho & Fontes 1970B; Fontes 1989; Carvalho & Carpintero 1992; Carpintero & Carvalho 1993; Schuh 1995; Coscarón & Carpintero 1996; Schuh 2011). Brazil: Amazonas, Goiás, Mato Grosso, Rio de Janeiro, Rio Grande do Sul: Porto Alegre (Reuter 1910; Slater 1950; Carvalho 1959; Carvalho & Fontes 1970B; Carvalho & Fontes 1971A; Schuh 1995; Schuh 2011).

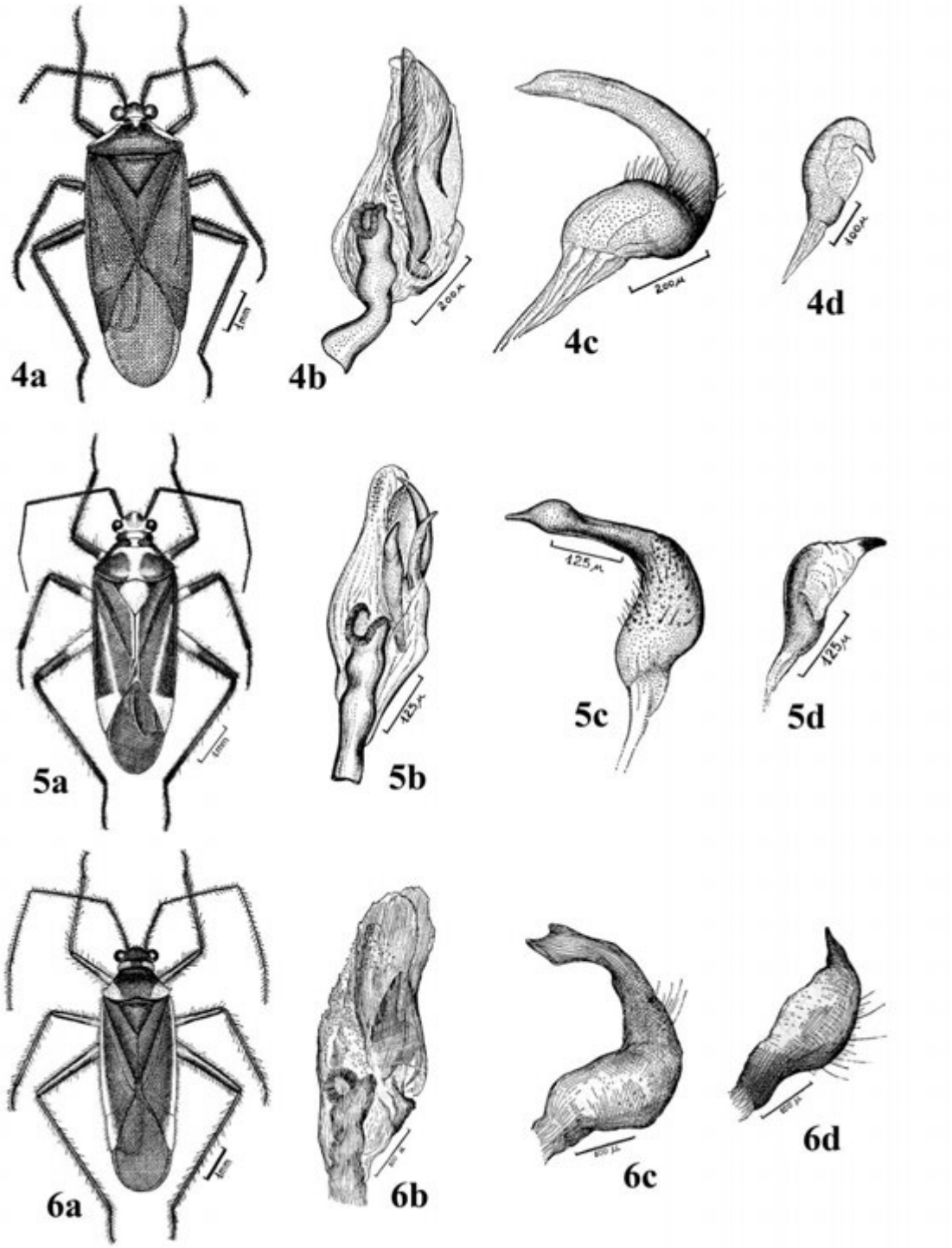
Rio Grande do Sul literature examined: Reuter (1910) (Brazil, Porto Alegre); Carvalho & Fontes (1971A) (Porto Alegre, Rio Grande do Sul).

∗*Prepops luteiceps* (Stål, 1859) (Fig. 7)

Diagnosis: General coloration black with reddish areas. Head (except clypeus and eyes), collar, a small stripe between calli, pronotum lateral anterior margin, xiphus, propleuron (except the superior part of posterior margin), basal plate and a small spot in mesopleuron and metapleuron, reddish. Vesica of aedeagus with three sclerotized spines; left paramere curved with a subapical distension and a short and acute apex; right paramere with ventral side less sclerotized.

Geographic distribution: Argentina (Stål 1859; Carvalho & Drake 1943A; Carvalho & Fontes 1970A; Carpintero & Carvalho 1993; Schuh 1995; Schuh 2011). Brazil: Minas Gerais, São Paulo (Carvalho & Fontes 1970A, Carvalho 1959; Schuh 1995; Ferreira *et al*. 2006; Schuh 2011), Rio Grande do Sul: Torres (Col. MCNZ).

Material examined: In MCNZ collection. Male, 177347, Torres, RS, P. E. Itapeva, afloramento rochoso; 11.I.2005; A. Barcellos & R. Ott.



Figures 4–6: Fig. 4a, *Prepops circummaculatus* (Stål), female, compared with type, 4b, vesica of aedeagus; 4c, left paramere; 4d, right paramere (redrawn from Carvalho & Fontes 1970A). Fig. 5a, *Prepops cruciferus* (Berg), male, compared with type, 5b, vesica of aedeagus; 5c, left paramere; 5d, right paramere (redrawn from Carvalho & Fontes 1970A). Fig. 6a, *Prepops flavicostus* (Berg), male, compared with type, 6b, vesica of aedeagus; 6c, left paramere; 6d, right paramere (redrawn from Carvalho & Fontes 1970B).

∗***Prepops minutulus* (Reuter, 1910)** (Fig. 8)

Diagnosis: General coloration black with reddish areas. Head (except clypeus or its apex), collar, calli and its posterior area, pronotum sides and ventral part reddish. Disc and posterior part of pronotum fuscous. Middle part of mesosternum, abdomen apex and legs black. Vesica of aedeagus with three sclerotized spines and a lobe with spines at apex; left paramere curved with a rounded apex; right paramere with an acute apex.

Geographic distribution: Bolivia, Paraguay, Argentina (Reuter 1910; Carvalho & Fontes 1970A; Carpintero & Carvalho 1993; Schuh 1995; Schuh 2011). Brazil: Rio de Janeiro, Santa Catarina (Carvalho & Fontes 1970A; Schuh 1995; Schuh 2011), Rio Grande do Sul: Derrubadas (Col. MCNZ).

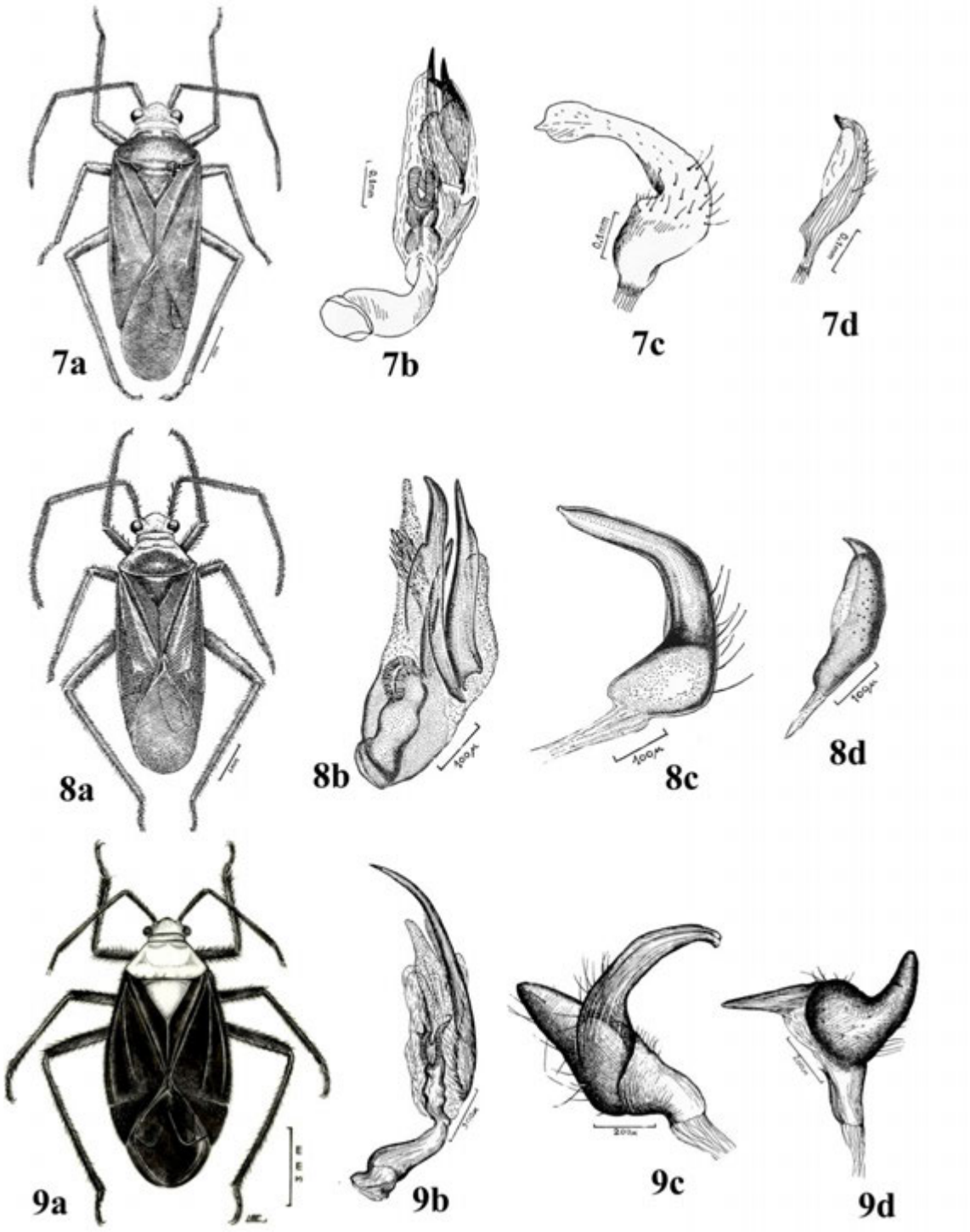
Material examined: In MCNZ collection. Male, 178111, Derrubadas, RS; (P. E. Turvo); 26.IV.2005; Barcellos, A., Ott, R. & Heydrich, I. Trilha para o Salto do Yucumã.

***Prepops paranaensis* Carvalho & Fontes, 1969** (Fig. 9)

Diagnosis: General coloration black with reddish areas. Head (except eyes and apex of clypeus), pronotum, scutellum and ventral side (except middle part to apex of coxae, legs and a median spot in abdomen that is black) reddish. Vesica of aedeagus with one long sclerotized spine; left and right parameres forked (modified from Carvalho & Fontes 1969).

Geographic distribution: Argentina (Carvalho & Fontes 1969; Carpintero & Carvalho 1993; Schuh 1995; Schuh 2011). Brazil: Paraná, Santa Catarina (Carvalho & Fontes 1969; Schuh 1995; Schuh 2011), Rio Grande do Sul: Derrubadas (Barcellos *et al*. 2011); Marcelino Ramos (Col. MCNZ).

Material examined: In MCNZ collection. Female, 54714, Derrubadas, RS; (P. E. Turvo); 28.X.2003; Barcellos, A., Ott, R. & Heydrich, I. 27°14'48.9"S; 53°57'36.7"W; guarda-chuva ent. Two specimens in the same pin (fixed in cards, so it was not possible to see the gender), 7817, MR, 12.11.34.



Figures 7–9: Fig. 7a, *Prepops luteiceps* (Stål), male, compared with type, 7b, vesica of aedeagus; 7c, left paramere; 7d, right paramere (redrawn from Carvalho & Fontes 1970A). Fig. 8a, *Prepops minutulus* (Reuter), 8b, vesica of aedeagus; 8c, left paramere; 8d, right paramere (redrawn from Carvalho & Fontes, 1970A). Fig. 9a, *Prepops paranaensis* Carvalho & Fontes, female (illustration by Luiz A. A. Costa), 9b, vesica of aedeagus; 9c, left paramere; 9d, right paramere (redrawn from Carvalho & Fontes 1969).

∗***Prepops plaumann* Carvalho, 1989** (Fig. 10)

Diagnosis: General coloration black with reddish areas. Head (except eyes and antenna), pronotum, scutellum, rostrum segment II, lateral areas of pleurae and mesosternum reddish. The other parts of body uniformly black. Frons distinctly tumid. Vesica of aedeagus with one sclerotized spine, and one of the lobes with apex showing small teeth-like structures on superior margin; left paramere curved with a rounded apex; right paramere with ventral side less sclerotized (modified from Carvalho 1989).

Geographic distribution: Venezuela (Carvalho & Fontes 1971B). Brazil: Santa Catarina (Carvalho & Fontes 1971B; Carvalho 1989; Schuh 1995; Schuh 2011), Rio Grande do Sul: Derrubadas, Sobradinho, Tenente Portela (Col. MCNZ), Maquiné (Col. DZRS).

Material examined: In MCNZ collection. Female, 484112, Sobradinho, RS, 10/01/1985, A. Lise leg. Female, 48471, Tenente Portela, RS, 15/01/1985, A. Lise leg. Female, 177062, Derrubadas, RS; (P. E. Turvo); 22.X.2004; Barcellos, A., Ott, R. & Heydrich, I. 27°14'08,9"S; 53°58'43,9"W; guarda-chuva ent. In DZRS collection. Female, 1042, BR, RS, Maquiné-Garapiá; 10/I/2007; C. F. Schwertner col. 29°30'10"S; 50°14'33"W.

∗***Prepops procorrentinus* Carvalho & Carpinteiro, 1992** (Fig. 11)

Diagnosis: General coloration black with reddish areas. Pronotum (except humeral angles, a median stripe on collar, calli area and a median large stripe on pronotum disc) and propleuron reddish. Ventral side black. Vesica of aedeagus with one sclerotized spine; left paramere curved with an arrow-shaped apex; right paramere with an acute apex forming a right angle.

Geographic distribution: Paraguay, Argentina (Carvalho & Fontes 1970A; Carvalho & Carpintero 1992; Carpintero & Carvalho 1993; Schuh 1995; Coscarón & Carpintero 1996; Schuh 2011). Brazil: Bahia, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo, Paraná (Carvalho & Fontes 1970A; Carvalho 1975; Fontes 1989; Carvalho & Carpintero 1992; Schuh 1995; Ferreira *et al*. 2006; Schuh 2011), Rio Grande do Sul: Cachoeirinha (Col. MCNZ).

Material examined: In MCNZ collection. Female, 46313, Cachoeirinha, RS; 12/I/1981; M. E. L. Souza leg. In MNRJ collection (paratypes): Three males and three females, Carmo do Rio Claro, MG, 1.1958, Carvalho & Becker col. Two males, Corrientes, San

Roque, II.1920, Bosq col. One male, Argentina, Delta, B. Aires, 33773, Almir col. 22/9/62. One male and three females, Tucuman, Argentina, Wygodz. XII, 49. Two males and six females, Parque Rio Doce, Cel. Fabriciano, MG, Alvarenga col. III, 78. One male, Los Perales, JuJuy, R. A. , III, 1948.

Note: The RS specimen did not show black humeral angles as noted in the *P. procorrentinus* original description. However, reviewing the paratypes in MNRJ collection showed that some individuals do not have the black humeral angles and others have in different intensities.

***Prepops seminiger* (Stål, 1860)** (Fig. 12)

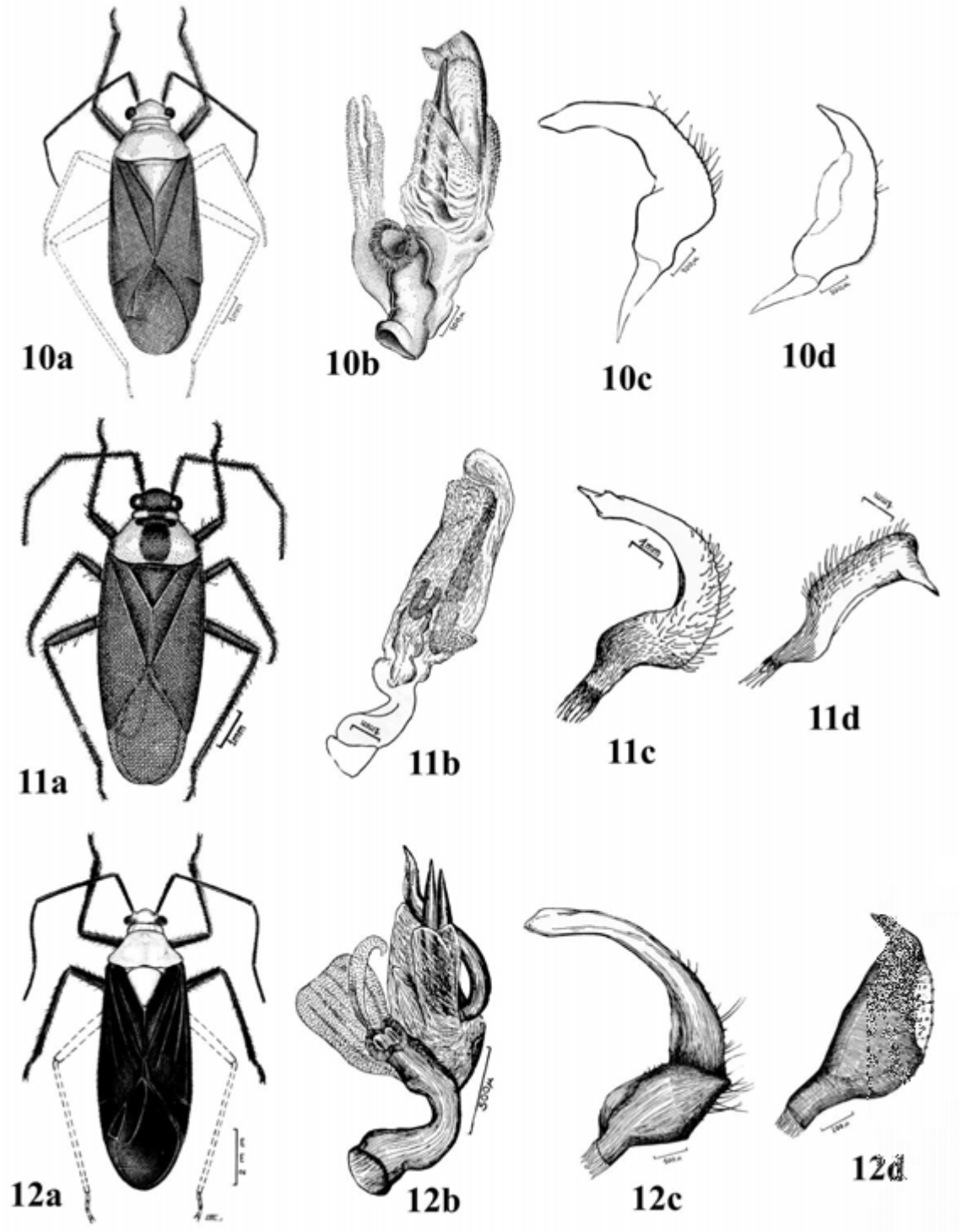
Diagnosis: General coloration dull black with lutescent areas. Head (except eyes and clypeus), pronotum, scutellum, xiphus, propleuron and basal plate, lutescent. The remainder parts of the body are black. Vesica of aedeagus with three sclerotized spines; left paramere curved, with an apical two thirds elongated and a rounded apex; right paramere short, thick and with an acute apex (modified from Carvalho & Fontes 1969).

Geographic distribution: Paraguay, Argentina (Carvalho & Hussey 1954; Carvalho 1959; Carpintero & Carvalho 1993) Brazil: São Paulo, Rio de Janeiro, Minas Gerais, Paraná, Rio Grande do Sul (Stål 1860; Carvalho 1959; Carvalho & Fontes 1969; Fontes, 1989; Schuh 1995; Ferreira, *et al.* 2006; Schuh 2011; Barcellos *et al.* 2011).

Rio Grande do Sul literature examined: Barcellos *et al.* (2011) (Brazil, Rio Grande do Sul, Derrubadas).

***Prepops setosipes* (Reuter, 1910)** (Fig. 13)

Diagnosis: General coloration brownish with lutescent to reddish brown areas. Head, pronotum, scutellum and ventral part of body reddish to reddish brown (some specimens with calli, median part of head and clypeus fuscous or black). Embolium pale yellow. Rostrum and legs pale brown to dark brown. Antennae segment I, femora and tibiae, with long and erect setae equal or greater than thickness of segment. Vesica of aedeagus with three sclerotized spines; left paramere curved, with a rounded apex and a tumid basal lobe; right paramere with ventral side less sclerotized.



Figures 10–12: Fig. 10a, *Prepops plaumann* Carvalho, male, 10b, vesica of aedeagus; 10c, left paramere; 10d, right paramere (redrawn from Carvalho & Fontes 1971B). Fig. 11a, *Prepops procorrentinus* Carvalho & Carpinteiro, male, 11b, vesica of aedeagus; 11c, left paramere; 11d, right paramere (redrawn from Carvalho & Fontes 1970A). Fig. 12a, *Prepops seminiger* (Stål) (illustration by Luiz A. A. Costa), 12b, vesica of aedeagus; 12c, left paramere; 12d, right paramere (redrawn from Carvalho & Fontes 1969).

Geographic distribution: Paraguay, Argentina (Carvalho & Fontes 1970B; Carpintero & Carvalho 1993; Schuh 1995; Schuh 2011). Brazil: Bahia, Santa Catarina (Reuter 1910; Carvalho 1959; Carvalho & Fontes 1970B; Schuh 1995; Schuh 2011), Rio Grande do Sul: Derrubadas (Barcellos *et al.* 2011); Tenente Portela (Col. MCNZ).

Material examined: In MCNZ collection. Female, 45403, Tenente Portela, RS; 29/XI/1978; H. Bischoff leg. Female, 45404, Tenente Portela, RS; 28/XI/1978; H. Bischoff leg. Female, 54930, Derrubadas, RS; (P. E. Turvo); 29.X.2003; Heydrich, I. & Ott, R. 27°13'49.5"S; 53°58'57.6"W; guarda-chuva ent. Male, 175016, Derrubadas, RS; (P. E. Turvo); 29.X.2003; Barcellos, A., Ott, R. & Heydrich, I. 27°11'58.0"S; 53°50'42.8"W; guarda-chuva ent. Female, 54903, and male, 54901 Derrubadas, RS; (P. E. Turvo); 30.X.2003; Barcellos, A., Ott, R. & Heydrich, I. 27°14'14.7"S; 53°58'46.0"W; guarda-chuva ent. Male, 175041, Derrubadas, RS; (P. E. Turvo); 30.X.2003; Barcellos, A., Ott, R. & Heydrich, I. 27°13'36.0"S; 53°59'11.1"W; guarda-chuva ent. Male, 175069, Derrubadas, RS; (P. E. Turvo); 31.X.2003; Barcellos, A., Ott, R. & Heydrich, I. 27°12'34.3"S; 53°51'18.1"W; guarda-chuva ent. Male, col. MCNZ 177169 and female, col. MCNZ 177168, Derrubadas, RS; (P. E. Turvo); 20.X.2004; Barcellos, A., Ott, R. & Heydrich, I. Trilha para o Garcia; guarda-chuva ent. Female, 176611, Derrubadas, RS; (P. E. Turvo); 20.X.2004; L. Schmidt & L. Podgaisky 27°12'38.5"S; 53°51'15.3"W; guarda-chuva ent. Female, 176714, Derrubadas, RS; (P. E. Turvo); 20.X.2004; Barcellos, A., Ott, R. & Heydrich, I. 27°08'21.6"S; 53°52'50.5"W; guarda-chuva ent. Three females, col. MCNZ 177055, 177057, 177056, Derrubadas, RS; (P. E. Turvo); 22.X.2004; Barcellos, A., Ott, R. & Heydrich, I. 27°14'08.9"S; 53°58'43.9"W; guarda-chuva ent. Female, 176836, Derrubadas, RS; (P. E. Turvo); 21.X.2004; Barcellos, A., Ott, R. & Heydrich, I. 27°13'26.4"S; 53°51'02.8"W; guarda-chuva ent. Male, 176896, Derrubadas, RS; (P. E. Turvo); 21.X.2004; L. Schmidt & L. Podgaisky 27°13'19.6"S; 53°51'06.1"W; guarda-chuva ent. Two males, 176582, 176583, Derrubadas, RS; (P. E. Turvo); 19.X.2004; A. Barcellos & L. Schmidt Trilha para o Garcia; manual noturna. In DZRS collection: Male, Pq. F. Est. do Turvo, RS, Brasil; 13. X. 1981; S. L. Bonatto.

∗***Prepops subannulatus* (Stål, 1860)** (Fig. 14)

Diagnosis: General coloration brownish with lutescent areas. Head (except clypeus, eyes, mandibular plate, buccula, a spot on frons - in a few specimens a spot also in vertex), median area of collar, area between calli, a longitudinal median stripe on disc, scutellum (except basal angles), pronotum lateral margins and basal plate lutescent. Ventral part (except mesosternum and pleurae anterior margin and lateral margins of abdomen) including coxae and femora base lutescent. Femora apex, tibiae, tarsi and rostrum apex fuscous to dark brown. Vesica of aedeagus with three sclerotized spines; left paramere curved, with a rounded apex; right paramere curved on apical third and enlarged in middle part.

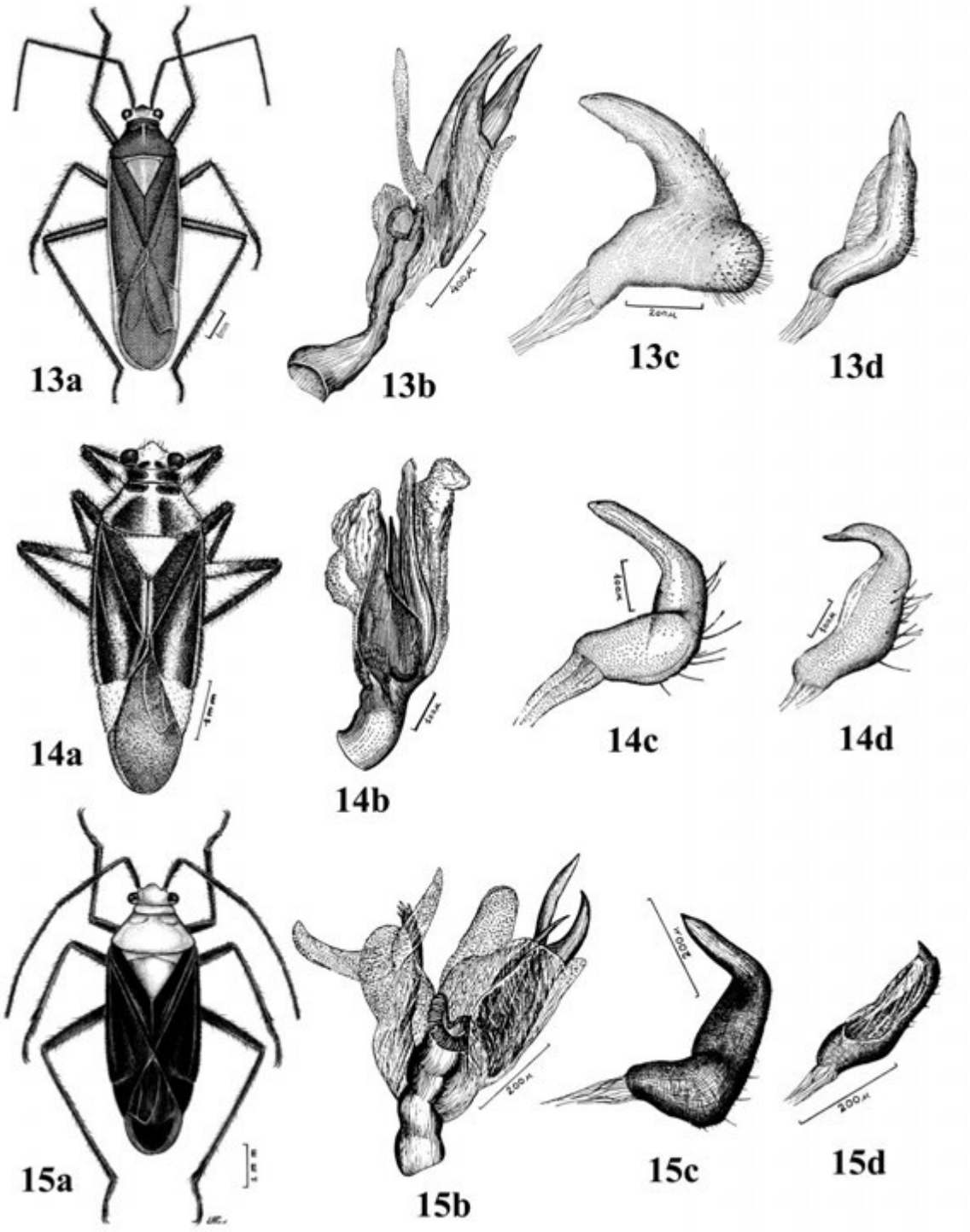
Geographic distribution: Venezuela, Argentina (Reuter 1905; Carvalho 1959; Carvalho & Fontes 1970A; Carvalho & Fontes 1971A; Carvalho 1988B; Carpintero & Carvalho 1993; Schuh 1995; Schuh 2011). Brazil: Rio de Janeiro, Paraná, Santa Catarina (Stål 1860; Carvalho & Fontes 1970A; Carvalho & Afonso 1977; Schuh 1995; Schuh 2011), Rio Grande do Sul: Derrubadas (Col. MCNZ).

Material examined: In MCNZ collection. Female, 175123, Derrubadas, RS; (P. E. Turvo); 31.X.2003; Moura, L. 27°14'09.6"S; 53°58'42.5"W; guarda-chuva ent. Male, 177542, Derrubadas, RS; (P. E. Turvo); 26.IV.2005; Schmidt, L. 27°12'41,1"S; 53°51'16,6"W; guarda-chuva ent.

Note: One specimen studied in this work (col. MCNZ, 175123) showed the embolium lutescent and cuneus with more than one color (brownish and lutescent), differently of the other *P. subannulatus* specimens.

∗***Prepops teutonianus* Carvalho & Fontes, 1969** (Fig. 15)

Diagnosis: General coloration black with reddish areas. Head, (except part of clypeus) pronotum and scutellum reddish. Ventral side with median areas of sterna, femora, tibiae, tarsi and abdomen apex black. Vesica of aedeagus with three sclerotized spines and one with toothed apex; left paramere curved, with a rounded apex; right paramere with ventral side less sclerotized and acute apex (modified from Carvalho & Fontes 1969).



Figures 13–15: Fig. 13a, *Prepops setosipes* (Reuter), male, compared with type; 13b, vesica of aedeagus; 13c, left paramere; 13d right paramere (redrawn from Carvalho & Fontes 1970B). Fig. 14a, *Prepops subannulatus* (Stål), female, holotype (*Resthenia suturalis*) (Carvalho 1988B); 14b, vesica of aedeagus; 14c, left paramere; 14d, right paramere (redrawn from Carvalho & Fontes 1970A). Fig. 15a, *Prepops teutonianus* Carvalho e Fontes, female (illustration by Luiz A. A. Costa); 15b, vesica of aedeagus; 15c, left paramere; 15d, right paramere (redrawn from Carvalho & Fontes 1969).

Geographic distribution: Argentina (Carpintero & Carvalho 1993). Brazil: Minas Gerais, Santa Catarina (Carvalho & Fontes 1969; Carvalho & Afonso 1977; Schuh 1995; Schuh 2011), Rio Grande do Sul: Derrubadas (Col. MCNZ).

Material examined: In MCNZ colection. Female, 175067, Derrubadas, RS; (P. E. Turvo); 31.X.2003; Barcellos, A., Ott, R. & Heydrich, I. 27°12'34.3"S; 53°51'18.1"W; guarda-chuva ent.

***Prepops turvoensis* sp. n.** (Fig. 16)

Diagnosis: Body uniformly dull black (except reddish areas of eyes and discolored base of mesosternum). Tibiae with hairs smaller than diameter of segment. Vesica of aedeagus with two sclerotized spines and distinct membranous lobes. One lobe with small spines along its entire length and another one with blunt apex. Left paramere curved and with an acute apex and subapical distension. Right paramere curved, thinner in basal third, with ventral side less sclerotized and acute apex.

Description: Male, holotype (measurements in millimeters): Body length, 7.69; width, 2.85. Head length, 0.60; width, 1.25. Vertex width, 0.65. Length of antennal segments I, 1.10; II, 2.85; III-IV, missing. Rostrum length, 1.84. Pronotal length, 1.43; base width, 2.12. Scutellum length, 0.92; width 1.07. Cuneal length, 1.15; width, 0.80. Hind femur length, 2.80; hind tibia length, 3.61; hind tarsus, 0.73.

General coloration dull black. Body uniformly dull black (except reddish areas of eyes and discolored base of mesosternum).

Dorsal surface roughened. Dorsal vestiture intermixed with pruinosity. Head broader than long, smooth, declivous and with short erect setae dorsally. Frons not produced. Clypeus convex and well delimited from frons, slightly bulbous and produced basally, narrowing distally. Eyes prominent, produced laterally and near to anterior margin of pronotum. Antennal vestiture with setae shorter than width of segments. Antennal segments I and II linear, III and IV, missing. Segment II two times longer than segment I. Segment I longer than vertex width. Rostrum extending between middle coxae. Pronotum collar larger than width of antennal segment I and with dense short erect pubescence. Calli weakly delimited. Lateral margins rounded, posterior margin strongly convex with a short indentation at middle, discal area moderately convex and

with dense short erect pubescence. Mesoscutum not exposed. Scutellum convex, with dense short pilosity. Hemelytra elongate, with dense, short, erect and semi-erect pubescence. Cuneus longer than broad. Membrane glabrous. Femora and tibiae thickly clothed with short semi-adpressed and adpressed pilosity. Length of hairs on tibiae shorter than thickness of segment.

Male genitalia: Vesica of aedeagus (Fig. 16b,c) with two sclerotized spines and distinct membranous lobes. One lobe with small spines along its entire length and another one with blunt apex. Left paramere (Fig. 16d) curved and with an acute apex and subapical distension. Right paramere (Fig. 16e) thinner in basal third, with ventral side less sclerotized and acute apex.

Host: unknown

Etymology: This species is named after the type locality, Parque Estadual do Turvo, in Derrubadas, Rio Grande do Sul state, Brazil.

Type specimens: Male, holotype, 176924, Derrubadas, RS; (P. E. Turvo); 21.X.2004; Barcellos, A., Ott, R. & Heydrich, I. 27°13'19.6"S; 53°51'06.1"W; guarda-chuva ent. (In MCNZ collection).

Material examined: *P. minensis* (MNRJ), paratype, male, Minas Gerais, Brasil, Viçosa, 11-44, ASB del. 16-4-69, J.C.M.Carvalho det., 1969.

Geographic distribution: Brazil, Rio Grande do Sul state.

Discussion: This species closely resembles *Prepops minensis* Carvalho & Fontes, 1970 differing in the general color uniformly black; frons not produced; and vesica of aedeagus, with one lobe with small spines along its entire length and another one with blunt apex. This new species also resembles *Prepops missionesus* Carvalho, 1988, differing in not having the lutescent longitudinal median stripe between calli and on pronotum disc.

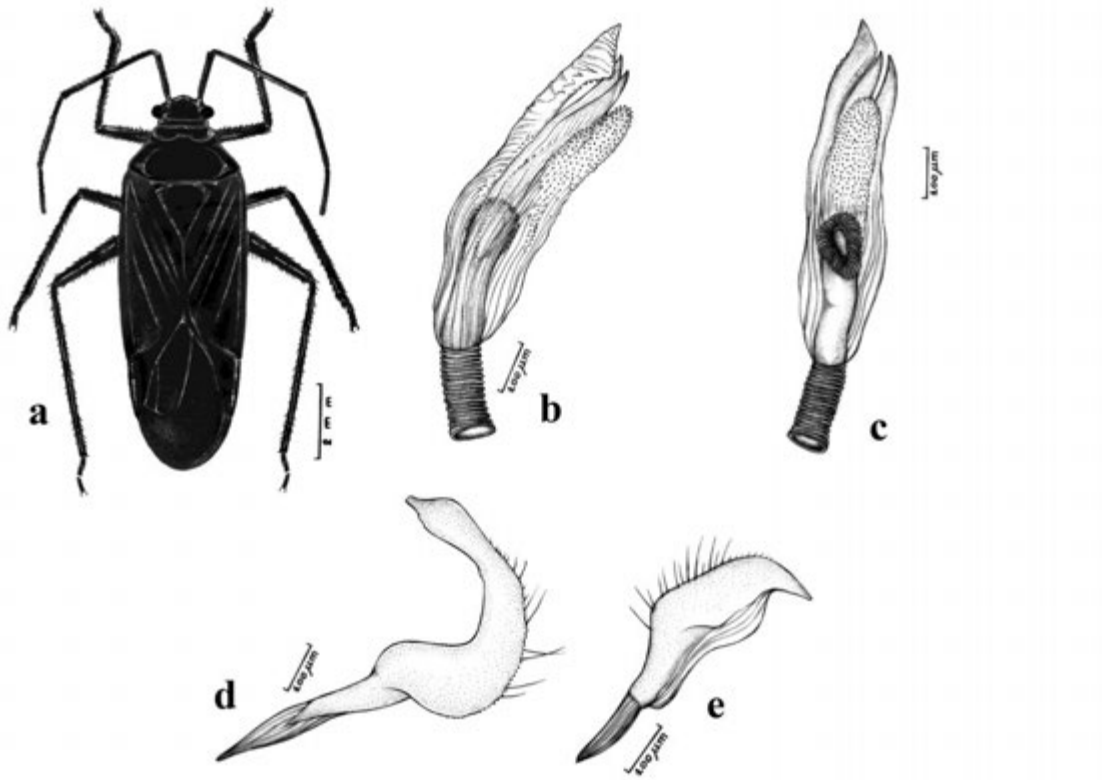


Figure 16: *Prepops turvoensis* sp. n., male, holotype; a, dorsal view (illustration by Paulo S. F. Ferreira); b-c, vesica of aedeagus; d, left paramere; e, right paramere (illustration by Luiz A. A. Costa).

Key to *Prepops* species from Rio Grande do Sul state, Brazil

1. Length of hairs on femora greater than thickness of segment; pronotum reddish to reddish brown; abdomen uniformly reddish (Fig. 13) .... ***Prepops setosipes* (Reuter, 1910)**

1'. Length of hairs on femora equal or shorter than thickness of segment; pronotum not reddish to reddish brown (if reddish, length of hairs on femora not greater than thickness of segment); abdomen not uniformly reddish 2

(1') 2. Length of hairs on antennal segment I greater than thickness of segment; left paramere with an acute and twisted apex; abdomen black with first and second sterna partially reddish (Fig. 1)..... ***Prepops cangussuensis* sp. n.**

2'. Length of hairs on antennal segment I equal or shorter than thickness of segment; left paramere not with an acute and twisted apex; abdomen not black with first and second sterna partially reddish 3

(2') 3. Length of hairs on tibiae greater than thickness of segment; pronotum pattern brownish with lutescent longitudinal and transversal stripes sometimes forming a cross mark; abdomen lutescent with rounded fuscous spots laterally (Fig. 5)..... .....***Prepops cruciferus*** **(Berg, 1878)**

3'. Length of hairs on tibiae equal or shorter than thickness of segment; pronotum pattern not brownish with lutescent longitudinal and transversal stripes sometimes forming a cross mark; abdomen not lutescent with rounded fuscous spots laterally..... 4

(3') 4. Pronotum pattern black with sides of collar and humeral angles lutescent; embolium without the same color of clavus, generally pale; cuneus with more than one color; left paramere with an acute apex and a subapical tooth (Fig. 6) ....***Prepops flavicostus*** **(Berg 1884)**

4'. Pronotum pattern not black with sides of collar and humeral angles lutescent; embolium with the same color of clavus; cuneus with only one color (if embolium without the same color of clavus and cuneus with more than one color, than pronotum pattern not black with sides of collar and humeral angles lutescent); left paramere not with an acute apex and a subapical tooth..... 5

(4') 5. Pronotum lutescent, black, or showing the patterns brownish with large longitudinal middle stripe from apex to base and anterior lateral margin lutescent, or black with apical third reddish, except calli; vesica of aedeagus with two or three simple sclerotized spines 6

5'. Pronotum reddish or showing the patterns reddish with black large longitudinal middle stripe from apex to base (including calli) and sometimes black humeral angles, or black with middle part of collar, area between calli and lateral margins lutescent, or still pattern black with collar, calli (including its posterior area) and pronotum sides reddish; vesica of aedeagus with one simple sclerotized spine or with three simple sclerotized spines plus one spine or lobe with toothed apex..... 9

(5) 6. Head reddish, black or prevailing these colors, pronotum black or showing the pattern black with apical third reddish, except calli; left paramere with an acute apex and subapical expansion..... 7

6'. Head brownish to lutescent; pronotum lutescent or showing the pattern brownish with large longitudinal middle stripe from apex to base and anterior lateral margins lutescent; left paramere with a rounded apex..... 8

(6) 7. Size of antennal segment I equal or shorter than vertex width; body dorsally with more than one color; head reddish or prevailing the reddish color; pronotum pattern black with apical third reddish, except calli; vesica of aedeagus with three simple sclerotized spines (Fig. 7) ..... ***Prepops luteiceps* (Stål, 1859)**

7'. Size of antennal segment I greater than vertex width; body dorsally with only one color; head and pronotum black; vesica of aedeagus with two simple sclerotized spines (Fig. 16)..... ***Prepops turvoensis* sp. n.**

(6') 8. Pronotum brownish with large longitudinal middle stripe from apex to base and anterior lateral margins lutescent; scutellum with more than one color; abdomen lutescent with superior lateral margins black (Fig. 14)..... ..... ***Prepops subannulatus* (Stål, 1860)**

8'. Pronotum lutescent; scutellum with only one color; abdomen black (Fig. 12) .... ***Prepops seminiger* (Stål, 1860)**

(5') 9. Head black or prevailing the black color; pronotum pattern reddish with black large longitudinal middle stripe from apex to base (including calli) and sometimes black humeral angles, or black with middle part of collar, area between calli and lateral margins lutescent; abdomen brownish, or black with basal half medially and laterally lutescent (frequently interrupted in segments III through VI) 10

9'. Head reddish or prevailing the reddish color; pronotum reddish, or pronotum black with collar, calli (including its posterior area) and pronotum sides reddish; abdomen

black, or black with base reddish (segments IV and V partially reddish), or still reddish with a median black spot, or reddish with black apex 11

(9) 10. Pronotum pattern black with middle part of collar, area between calli and lateral margins lutescent; left paramere with a rounded apex; abdomen black with basal half medially and laterally lutescent (frequently interrupted in segments III through VI) (Fig. 4) .....***Prepops circummaculatus* (Stål, 1854)**

10'. Pronotum pattern reddish with black large longitudinal middle stripe from apex to base (including calli) and sometimes black humeral angles; left paramere with an arrow-shaped apex; abdomen brownish (Fig. 11) ....***Prepops procorrentinus* Carvalho & Carpinteiro, 1992**

(9') 11. Vesica of aedeagus with three simple sclerotized spines plus one spine or lobe with toothed apex; abdomen black with base reddish (segments IV and V partially reddish) or reddish with black apex 12

11'. Vesica of aedeagus with one simple sclerotized spine; abdomen black, or reddish with a median black spot..... 13

(11) 12. Vesica of aedeagus with three simple sclerotized spines plus one spine with toothed apex; pronotum reddish; abdomen reddish with black apex (Fig. 15)..... .....***Prepops teutonianus* Carvalho & Fontes, 1969**

12'. Vesica of aedeagus with three simple sclerotized spines plus one lobe with toothed apex; pronotum black with collar, calli (including its posterior area) and pronotum sides reddish; abdomen black with base reddish (segments IV and V partially reddish) (Fig. 8) ..... ***Prepops minutulus* Carvalho & Fontes, 1970**

(11') 13. Frons not tumid; left and right parameres forked; abdomen reddish with a median black spot (Fig. 9)..... ***Prepops paranaensis* Carvalho & Fontes, 1969**

13'. Frons tumid; left and right parameres not forked, left paramere with a rounded apex; abdomen black (Fig. 10)..... ***Prepops plaumann* Carvalho, 1989**

Acknowledgments

We are grateful to Aline Barcellos P. dos Santos and Jocélia Grazia for sending mirids for identification from the Museu de Ciências Naturais of the Fundação Zoobotânica do Rio Grande do Sul and the Departamento de Zoologia, Universidade Federal do Rio Grande do Sul; to Carlos Molineri for provinding *Prepops* from Fundación y Instituto Miguel Lillo for study. To Leandra Pereira de Oliveira and Fabiano Gomes Ferreira (Museu Nacional of Rio de Janeiro) for providing some important mirid bibliography. We are also grateful to CNPq for providing funds to the first author to conduct post-graduate studies at the Universidade Federal de Viçosa.

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The genus *Prepops* Reuter, 1907 (Hemiptera: Miridae): current state of taxonomic knowledge (Part I)

LÍVIA A. COELHO[1], PAULO SÉRGIO F. FERREIRA[2]

[1,2]Museu Regional de Entomologia, Departamento de Entomologia, Universidade Federal de Viçosa, 36570-000. Viçosa, MG, Brazil. E-mails: [1]liviaguiar04@gmail.com; [2]pfiuza@ufv.br

Abstract

All literature on new world Miridae and museums specimens were studied in order to gather *Prepops* species informations and assist future identifications. In addition to five new distributional records, we present here for each species, all the published references, their geographic distribution, diagnosis, host plants and illustrations of dorsal habitus, male and female genitalia (when available). When necessary, explanations of some taxonomic doubts were done. Because of the substantial number of species, this work was divided into three parts. The present paper is the first, covering 58 of the 199 described species.

Key words: Taxonomy, Heteroptera, Mirinae, Resthenini, *Prepops*, Plant Bugs.

Introduction

The Miridae (Hemiptera: Heteroptera) is one of the most species rich families of insects, with about 11,000 described species. Among the eight recognized subfamilies, the cosmopolitan Mirinae is the most speciose, comprising more than 4,000 species in 419 genera and six tribes (Schuh 2011; Cassis & Schuh 2012). The Resthenini is a New World tribe of aposematically colored bugs that often have the metepisternal scent efferent system present in a reduced or apomorphic condition compared with other mirines (Schwartz 1987, 2008; Schuh & Slater 1995; Wheeler 2001; Cassis & Schuh 2012).

The genus *Prepops* Reuter, 1905 (Mirinae: Resthenini) was erected as a subgenus of *Resthenia* Spinola, 1837. Its type species, *Prepops frontalis* (Reuter, 1905) was later placed by Reuter (Reuter, 1913) in the genus *Platytylellus* Reuter, 1907. But, doing this, he placed *Platytylellus* Reuter, 1907 (type: *Resthenia nigripennis* Stål, 1860) under his *Prepops* Reuter, 1905. Bergroth (1922) listed the brazilian species of *Platytylellus* under *Prepops* without further comments. So, Carvalho (1954) studied both *Resthenia (Prepops) frontalis* Reuter, 1905, and *Resthenia nigripennis* Stål, 1860, and found them congeneric. He concluded that *Prepops* was a valid genus and placed *Platytylellus* as a junior synonym. Also, the genus *Opistheuria* Reuter, 1908 (type: *Resthenia latipennis* Stål, 1862) was synonymized with *Prepops* by Carvalho (1952B).

Nowadays this genus contains 199 species distributed only in American continent, from Canada to Argentina (Schuh 2011; Coelho *et al.* (*in prep*.)) and little information is available on the biology of the species (Wheeler 2001). *Prepops latipennis* (Stål, 1862) is known to cause foliar chlorosis on beans and potato in Central America (Saunders *et al.* 1983; King & Saunders 1984; Saunders *et al.* 1998; Wheeler 2001) and *Prepops insitivus* (Say, 1832) develops on wild muscadine grape in Florida, USA, with the adults feeding on flowers buds. The habits of the *Prepops* species are so little known that it is uncertain if these bugs are typical inflorescence, fruit or leaves feeders (Wheeler 2001).

Prepops is recognized for the following characteristics: elongate species, mostly black or black and red; head vertical and short gula; pronotum trapeziform with lateral margins rounded (Kelton 1980) and collar prominent with posterior sulcus interrupted laterally, not reaching the anterior coxal cleft (Kelton 1980; Ferreira & Coelho 2006). Schwartz (1987, 2008) argued that the most apomorphic condition of the resthenine scent efferent system lies in *Prepops*, where the ostiolar channel terminates even with the ventralmost lateral surface of the meso and metacoxa, and lacks all remnants of the evaporative surface and peritremal disk except for a few solitary evaporative bodies made visible only with high resolution, like scanning microscopy. Another feature of the genus is the narrow, straplike, sclerotized bar between the sclerotized rings that does not occur in the other resthenine genera (Slater 1950; Schwartz 1987, 2008).

The identification of *Prepops* species is based on the features of the external morphology, including colors and characteristics of the male and female genitalia, although for the last one the studies are still incipient. Slater (1950) in his attempt to investigate the female genitalia as taxonomic characters in Miridae described the genitalia of *Prepops atroluteus* (Walker, 1873), *P. circummaculatus* (Stål, 1854), *P. costalis* (Stål, 1860), *P. flavicostus* (Berg, 1884) and *P. insitivus* (Say, 1832). And Fontes (1989) studied the female genitalia of seventeen *Prepops* species verifying the value of some morphological characters in genus and species diagnosis. Coelho *et al.* (*in prep.*) described *Prepops cangussuensis* and due to the impossibility to compare the male genitalia of the closely resemble species, *Prepops catamarcanus* Carvalho, 1988 the female genitalia of the two species was extracted and studied. Through the examination of the gonapophyses, sclerotized rings and posterior wall, they saw sufficient differences to confirm *P. cangussuensis* as a new species.

There are only four partial keys to identify *Prepops* species. One that contemplates 19 species with pronotum and scutellum reddish, yellowish or orange (Carvalho & Fontes 1969A). Another one covers seven species collected on Canada prairie provinces (Kelton 1980). Hernández & Henry 2010 produced a key to the seven species found on Cuba island. And ultimately, Coelho *et al.* (*in prep.*) prepared a key for 14 species found in Rio Grande do Sul state (Brazil).

Facing the enormous and spread quantity of published taxonomic information about *Prepops* and the absence of a key that facilitates the identification of its species, this study aimed to put together all the existing information about this genus and its species. In addition to new distributional records, we present here, for each species, all the published references, their geographic distribution, diagnosis, host plants and illustrations of dorsal habitus, male and female genitalia. When necessary, explanations of some taxonomic doubts were done.

Because of the substantial number of species, this work was divided into three parts. The present work is the first part, covering 58 of the 199 described species.

Metodology

All literature on new world Miridae and museums specimens were studied in order to gather *Prepops* species informations. The specimens examined were borrowed from or studied at the following institutions: Museu de Ciências Naturais from Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, RS, Brazil (MCNZ); Departamento de Zoologia from Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil (DZRS); Departamento de Entomologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de janeiro, RJ, Brazil (MNRJ); Museu Regional de Entomologia, Universidade Federal de Viçosa, Viçosa, MG, Brazil, (UFVB); Universidade Federal do Paraná, Coleção Padre Jesus Santiago Moure, Curitiba, PR, Brazil, (DZUP); Instituto-Fundación Miguel Lillo, San Miguel de Tucumán, Tucumán, Argentina (IFML) and Universidade Federal de Pelotas, Museu de Entomologia Ceslau Biezanko, Pelotas, RS, Brazil (MECB).

After the valid name for each species, is the list of published works and names, diagnosis, geographic distribution and, whenever possible, examined material, new records and host plants.

The authors of scientific plant names were obtained from Tropicos page (Tropicos 2012). Terminology follows Schuh & Slater (1995), Kelton (1959) and Fontes (1981). The sources of borrowed illustrations are cited in the figure legends. The geographic distribution given is countries, followed by their sources.

Results

Genus *Prepops* Reuter, 1907

Resthenia (Prepops) frontalis Reuter, 1905: 15 (original description)
Prepops: Bergroth, 1922: 5 (not seen)
Prepops: Carvalho, 1954: 426 (fixed *Prepops* as a genus)
Prepops: Carvalho, 1955B: 109
Prepops: Carvalho, 1959: 331
Prepops: Maldonado Capriles, 1969: 56
Prepops: Carvalho & Fontes, 1969A: 259
Prepops: Carvalho & Fontes, 1971D: 144
Prepops: Steyskal, 1973: 208
Prepops: Alayo, 1974: 14 (not seen)
Prepops: Kelton, 1980: 48
Prepops: Carvalho, 1988A: 350
Prepops: Henry & Froeschner, 1988: 376
Prepops: Schuh, 1995: 985
Prepops: Ferreira & Coelho: 65
Prepops: Schuh, 2011 (catalog)
Prepops: Hernández & Henry, 2010: 90

Diagnosis: elongate specimens, mostly black or black and red; head vertical and short gula; pronotum trapeziform with lateral margins rounded (Kelton 1980) and collar prominent with posterior sulcus interrupted laterally, not reaching the anterior coxal cleft (Kelton 1980; Ferreira & Coelho 2006). Ostiolar channel terminating on the ventralmost lateral surface of the meso and metacoxa, and lacking all remnants of the evaporative surface; peritremal disk, except for a few solitary evaporative bodies, made visible only by scanning microscopy (Schwartz 1987, 2008). And a sclerotized bar narrow, straplike, between the sclerotized rings (Slater 1950; Schwartz 1987, 2008).

List of published works that deals with *Prepops* synonyms

Opistheuria Reuter, 1907: 75 (fixed *Resthenia latipennis* Stål as type species of *Opistheuria*) (not seen)
Opistheuria Reuter, 1908: 170 (original description)
Opistheuria: Reuter, 1910B: 156 (not seen)
Opistheuria: Reuter, 1913: 10, 50 (not seen)
Opistheuria: Van Duzee, 1916A: 205
Opistheuria: Knight, 1923: 550, 551
Opistheuria: Knight, 1941: 131
Opistheuria: Carvalho, 1952B: 98 (synonymized with *Prepops*) (not seen)
Opistheuria: Carvalho, 1959: 331
Opistheuria: Alayo, 1974: 13 (not seen)
Opistheuria: Henry & Froeschner, 1988: 376
Opistheuria: Schuh, 1995: 986
Opistheuria: Schuh, 2011

Platytylellus Reuter, 1907: 71 (original description) (not seen)
Platytylellus: Reuter, 1910B: 156 (not seen)
Platytylellus: Reuter, 1912: 40 (not seen)
Platytylellus: Reuter, 1913: 9, 22 (not seen)
Platytylellus: Van Duzee, 1916A: 205
Platytylellus: Van Duzee, 1917A: 309 (not seen)
Platytylellus: Knight, 1923: 550, 551
Platytylellus: Knight, 1941: 131, 132
Platytylellus: Slater, 1950: 36
Platytylellus: Carvalho, 1952B: 98 (not seen)
Platytylellus: Carvalho, 1954: 426 (synonymized with *Prepops*)
Platytylellus: Carvalho, 1959: 331
Platytylellus: Carvalho & Fontes, 1970A: 379
Platytylellus: Alayo, 1974: 14 (not seen)
Platytylellus: Henry & Froeschner, 1988: 376
Platytylellus: Schuh, 1995: 986
Platytylellus: Schuh, 2011

Note: Carvalho's world catalog (1959) stated that, beyond *Platytylellus* and *Opistheuria*, the genus *Prepops* has one more synonym: *Resthenia* Reuter, 1876. *Resthenia*, 1837 Spinola is a valid Resthenini genera and no other catalog shows this synonymy. The works cited in Carvalho's catalog are from Reuter (1876), Distant (1883) and Provancher (1887). The papers from Distant and Provancher were seen and deal with *Resthenia* from Spinola. It was not possible to see Reuter's paper.

***Prepops accinctus* (Distant, 1893) (Fig. 01)**

Resthenia accincta Distant, 1893: 425 (original description)
Platytylellus accinctus: Carvalho, 1952A: 2 (not seen)
Prepops accincta: Carvalho, 1959: 331
Prepops accinctus: Steyskal, 1973: 208
Resthenia accincta: Carvalho & Dolling, 1976: 791
Prepops accinctus: Schuh, 1995: 986
Prepops accinctus: Schuh, 2011

Diagnosis: General coloration black, yellowish and reddish. Head black, pronotum reddish, with a longitudinal fuscous strip that starts narrow between collar and becomes thicker toward its base. Scutellum black with basal angles reddish. Hemielytra black with lateral margins of corium and cuneus yellowish. Antennae dark fuscous with basal third of first segment yellowish. Ventral side (except apex of abdomen, tibiae and tarsi, that are black) reddish (modified from Distant 1893).

Geographic distribution: Panamá (Distant 1893; Carvalho 1959; Carvalho & Dolling 1976; Schuh 1995, 2011).

***Prepops adluteiceps* Carvalho, 1988 (Fig. 02)**

Prepops adluteiceps Carvalho, 1988A: 354 (original description)
Prepops adluteiceps: Ferreira et al. 2001: 165
Prepops adluteiceps: Ferreira et al. 2006: 15
Prepops adluteiceps: Schuh, 1995: 986
Prepops adluteiceps: Schuh, 2011

Diagnosis: General coloration black, lutescent and reddish. Head (except clypeus, anterior part of maxillary plate and frons), collar (except for a short median spot in posterior half) and anterior and lateral sides of calli, lutescent. Ventral side reddish (except median part of mesoesternum, apex of abdomen, coxae and legs). Hind femora with lutescent sub-basal strip. The remainder parts of body, black. Vesica of aedeagus with two sclerotized spines, one of them with small teeth; left paramere curved and with a long and acute apical third; right paramere thick, with an acute and sclerotized apex (modified from Carvalho 1988A).

Geographic distribution: Brazil (Carvalho 1988A; Schuh 1995; Ferreira *et al.* 2001; Ferreira *et al.* 2006; Schuh 2008).

***Prepops albomarginatus* (Reuter, 1910) (Fig. 03)**

Platytylellus albomarginatus Reuter, 1910A: 23 (original description)
Prepops albomarginatus: Carvalho, 1959: 331
Prepops albomarginatus: Carvalho *et al.*, 1968: 388
Prepops albomarginatus: Carvalho & Fontes, 1971C: 319
Prepops albomarginatus: Carvalho & Ferreira, 1972: 183
Prepops albomarginatus: Schuh, 1995: 986
Prepops albomarginatus: Schuh, 2011

Diagnosis: General coloration black, yellowish and white. Base of antennal segment I, rostrum segment I (except for the fuscous apex), pronotum (except a median stripe on collar, that extends between calli and becomes larger on pronotum disc) and prosternum yellowish. Embolium, cuneus external border and femora base, white. The remainder parts of body, black. Left paramere curved with a rounded apex; right paramere with a forked apex (modified from Carvalho *et al.* 1968).

Geographic distribution: Peru (Reuter 1910A; Carvalho 1959; Carvalho *et al.* 1968; Carvalho & Fontes 1971C; Carvalho & Ferreira 1972; Schuh 1995, 2011).

***Prepops alienus* (Reuter, 1910) (Fig. 04)**

Platytylellus alienus Reuter, 1910A: 33 (original description)
Prepops alienus: Carvalho, 1959: 331
Prepops alienus: Carvalho & Fontes, 1970B: 793
Prepops alienus: Schuh, 1995: 986
Prepops alienus: Schuh, 2011

Diagnosis: General coloration lutescent and black. Antennae (except base), eyes, calli, pronotum posterior margin (with expansions in middle and lateral portions), internal and external margins of clavus and corium, claval commissure, embolium, cuneus apex and membrane, black. Ventral side lutecent with clypeus, rostrum apex, middle part of mesosternum, femora superior margin, tibiae and tarsi, fuscous. Vesica of aedeagus with sclerotized spines and membranous lobes with superficial spines; left paramere curved, with an acute apex and subapical distension; right paramere curved on distal portion and with an acute and sclerotized apex (modified from Carvalho & Fontes 1970B).

Geographic distribution: Peru (Reuter 1910A; Carvalho 1959; Carvalho & Fontes 1971B; Schuh 1995, 2011).

***Prepops anasueliae* Carvalho & Fontes, 1970 (Fig. 05)**

Prepops anasueliae Carvalho & Fontes, 1970A: 367 (original description)
Prepops anasueliae: Carpintero & Carvalho, 1993: 411
Prepops anasueliae: Schuh, 1995: 986
Prepops anasueliae: Schuh, 2011

Diagnosis: General coloration black and reddish. Head, collar, middle and lateral areas of calli, xiphus and propleuron anterior margin, reddish. Antennal segment I reddish towards the base. The remainder parts of body, black. Vesica of aedeagus with sclerotized spines and membranous lobes with superficial spines; left paramere curved and with a rounded apex; right paramere with a long acute apex (modified from Carvalho & Fontes 1970A).

Geographic distribution: Paraguay (Carvalho & Fontes 1970; Schuh 1995, 2011) and Argentina (Carpintero & Carvalho 1993).

***Prepops areatus* (Reuter, 1910) (Fig. 06)**

Platytylellus areatus Reuter, 1910A: 20 (original description)
Prepops areatus: Carvalho, 1959: 331
Prepops areatus: Schuh, 1995: 986

Prepops areatus: Schuh, 2011

Diagnosis: General coloration black and yellowish. Collar, lateral margins and a middle stripe on pronotum, yellowish. On hemelytron, the costal margin (except cuneus apex), clavus internal margin, claval commissure and corium posterior margin are yellowish. Ventral side with xiphus and basal half of femora, yellowish. The remainder parts of body, black (modified from Reuter 1910A).

Geographic distribution: Colombia (Reuter 1910A; Carvalho 1959; Schuh 1995, 2011).

***Prepops atratus* (Distant, 1883) (Fig. 07)**

Resthenia atrata Distant, 1883: 254 (original description)
Resthenia atrata: Atkinson, 1890: 56 (not seen)
Platytylellus atratus: Carvalho, 1952A: 3
Prepops atrata: Carvalho, 1959: 332
Prepops atratus: Steyskal, 1973: 208
Resthenia atrata: Carvalho & Dolling, 1976: 793
Prepops atratus: Schuh, 1995: 986
Prepops atratus: Schuh, 2011

Diagnosis: General coloration black and reddish. Body dorsally, antennae, legs, rostrum, head and sterna, black. Abdomen reddish with the median part and apical segment black. The remainder parts of body, reddish (modified from Distant 1883).

Geographic distribution: Guatemala (Distant 1883; Carvalho 1959; Carvalho & Dolling 1976; Schuh 1995, 2011).

***Prepops atripennis* (Reuter, 1876) (Fig. 08)**

Resthenia atripennis Reuter, 1876: 65 (original description) (not seen)
Resthenia atripennis: Atkinson, 1890: 56 (not seen)
Resthenia atripennis: Gillette & Baker, 1895: 29 (not seen)
Platytylellus atripennis: Van Duzee, 1917A: 310 (not seen)
Platytylellus atripennis: Knight, 1927: 41
Prepops atripennis: Carvalho, 1959: 332
Prepops atripennis: Knight, 1968: 182
Prepops atripennis: Carvalho & Fontes, 1971B: 791
Platytylellus atripennis: Alayo, 1974: 14 (not seen)
Prepops atripennis: Henry & Froeschner, 1988: 376
Prepops atripennis: Schuh, 1995: 986
Prepops atripennis: Hernández & Henry, 2010: 91
Prepops atripennis: Schuh, 2011

Diagnosis: General coloration black and reddish. Head (except eyes and antennae, that are black) and pronotum reddish; scutelum black, becoming reddish towards the base. Ventral side reddish, except femora apex, clypeus, rostrum and ovipositor, that are black. The remainder parts of body, black. Vesica of aedeagus with sclerotized spines and membranous lobes; left paramere curved with a chamfered apex; right paramere curved in apical third (modified from Carvalho & Fontes, 1971B).

Geographic distribution: United States of America (USA) (Reuter 1876; Knight 1927; Carvalho 1959; Knight 1968; Carvalho & Fontes 1971B; Henry & Froeschner 1988; Schuh 1995, 2011), Cuba (Alayo 1974; Schuh 1995; Hernández & Henry 2010; Schuh 2011).

Note: Schuh's catalog (2011) equivocally assigned Brazil as one geographic distribution of *P. atripennis* in Alayo's work (1974). This paper deals only with Cuban Hemiptera. *P. atripennis* is not found in Brazil.

***Prepops atroluteus* (Walker, 1873) (Fig. 09)**

Capsus atroluteus Walker, 1873: 109 (original description) (not seen)
Resthenia atrolutea: Atkinson, 1890: 56 (not seen)
Resthenia atroluteus: Distant, 1904: 205
Platytylellus atroluteus: Slater, 1950: 38
Platytylellus atroluteus: Carvalho, 1951C: 131
Prepops atroluteus: Carvalho & Fontes, 1969A: 261
Prepops atroluteus: Fontes, 1989: 3
Prepops atroluteus: Carpintero & Carvalho, 1993: 411
Prepops atroluteus: Ferreira et al., 2006: 15
Prepops atroluteus: Carvalho, 1959: 332
Prepops atroluteus: Schuh, 1995: 986
Prepops atroluteus: Schuh, 2011

Diagnosis: General coloration black and lutescent. Head (except eyes and part of clypeus), pronotum, scutelum and basal angles of hemelytra lutescent. Ventral side black, except xiphus, metacoxae base, basal plate, sterna, propleuron, mesopleuron, and metapleuron basal part, that are lutescent. The remainder parts of body, black. Vesica of aedeagus with two simple sclerotized spines (one sclerotized spine with superficial teeth) and membranous lobes with and without sclerotized teeth; left paramere curved with a rounded apex; right paramere thick with an acute apex.

Geographic distribution: Brazil (Walker 1873; Slater 1950; Carvalho 1951C; Carvalho & Fontes 1969A; Fontes 1989; Ferreira *et al.* 2006; Carvalho 1959; Schuh 1995, 2011), Argentina (Carvalho & Fontes 1969A, Carpintero & Carvalho, 1993).

Material examined. In DZUP collection: One female, 212309 and three males, 212316, 212317, 212310. Antonina, PR, Brasil (Morro da Mina - SPVS) 25° 21' 46''S / 48° 46' 39'' W. A. J. Donatti & J. M. T. Souza 26-IX-2009. Pol. 129-nova. *Tibouchina trichopoda.* One male, 212311 and two females 212312, 212314. Antonina, PR, Brasil (Morro da Mina - SPVS) 25° 21' 42''S / 48° 46' 36'' W. A. J. Donatti & J. M. T. Souza 13-XI-2009. Pol. 129-orig. *Tibouchina trichopoda*. Two males, 212313, 212318 and three females 212306, 212307, 212308. Antonina, PR, Brasil (Morro da Mina - SPVS) 25° 21' 46''S / 48° 46' 39'' W. A. J. Donatti & J. M. T. Souza 21-X-2009. Pol. 129-nova. *Tibouchina trichopoda*. One male, 212319. Antonina, PR, Brasil (Morro da Mina - SPVS) 25° 21' 46''S / 48° 46' 39'' W. A. J. Donatti & J. M. T. Souza 10-IV-2010. Pol. 129-nova. *Tibouchina aff trichopoda.* One female, 212315. Antonina, PR, Brasil (Res. Cachoeira - SPVS) 25° 18' 27''S / 48° 41' 57'' W. A. J. Donatti & J. M. T. Souza 10-X-2009. Pol. 1110. *T. trichopoda.*

New records: Paraná (Brazil).

***Prepops bachmanni* Carvalho & Carpintero, 1990 (Fig. 10)**

Prepops bachmanni Carvalho & Carpintero, 1990: 1123 (original description)
Prepops bachmanni: Carpintero & Carvalho, 1993: 411
Prepops bachmanni: Schuh, 1995: 987
Prepops bachmanni: Schuh, 2011

Diagnosis: General coloration black and reddish. Eyes, antennae (except base of segment I), hemelytra, rostrum, pygophore and legs, black. Head, pronotum, scutellum and ventral side (except rostrum and pygophore) reddish (modified from Carvalho & Carpintero 1990).

Geographic distribution: Argentina (Carvalho & Carpintero 1990; Carpintero & Carvalho 1993; Schuh 1995, 2011).

***Prepops banosus* Carvalho, 1988 (Fig. 11)**

Prepops banosus Carvalho, 1988B: 411 (original description)
Prepops banosus: Schuh, 1995: 987
Prepops banosus: Schuh, 2011

Diagnosis: General coloration black and lutescent. Head, collar sides, two longitudinal stripes on pronotum, mesoscutum sides, lateral margins of scutellum, claval commissure, a stripe that extends from embolium to corium internal apex and cuneus, black. Ventral side lutescent, except clypeus, mandibular plate, anterior margin of maxillary plate, rostrum, mesosternum, inferior margin of propleuron, coxae base, femora, tibiae and pygophore, that are black. The remainder parts of body, lutescent. Vesica of aedeagus with four simple sclerotized spines, a curved spine near secondary gonopore and membranous lobes with superficial spines (the largest one distinct with superficial teeth); left paramere curved with a chamfered apex and a tumid basal lobe (modified from Carvalho 1988B).

Geographic distribution: Ecuador (Carvalho 1988B; Schuh 1995, 2011).

***Prepops barueriensis* Carvalho, 1988 (Fig. 12)**

Prepops barueriensis Carvalho, 1988A: 356 (original description)
Prepops barueriensis: Schuh, 1995: 987
Prepops barueriensis: Schuh, 2011

Diagnosis: General coloration black and lutescent. Head (except clypeus), a stripe on pronotum that extends from median part of collar to posterior margin, mesoscutum, scutellum, ventral side (except ovipositor, the apical segment of abdomen and legs), lutescent. The remainder parts of body, black (modified from Carvalho 1988A).

Geographic distribution: Brazil (Carvalho 1988A; Schuh 1995, 2011).

***Prepops bastensis* Carvalho & Costa, 1991 (Fig. 13)**

Prepops bastensis Carvalho & Costa, 1991: 52 (original description)
Prepops bastensis: Schuh, 1995: 987
Prepops bastensis: Schuh, 2011

Diagnosis: General coloration black with posterior part of maxillary plate, gena, gula, inferior part of collar, a spot on propleuron, coxae, inferior margin of femora and ventral portion of abdomen, pale. Vesica of aedeagus with two median sclerotized spines, membranous lobes and a distinct lateral lobe with spines on apex; left paramere curved with internal margin serrated; right paramere long and curved on apical third (modified from Carvalho & Costa 1991).

Geographic distribution: Brazil (Carvalho & Costa 1991; Schuh 1995, 2011).

***Prepops bechynei* Carvalho, 1988 (Fig. 14)**

Prepops bechynei Carvalho, 1988A: 356 (original description)
Prepops bechynei: Schuh, 1995: 987
Prepops bechynei: Schuh, 2011

Diagnosis: General coloration black and reddish. Three spots on vertex, sides of the head; pronotum with collar, calli area and two large stripes on disc; scutellum with lateral margins; coxae and basal part of femora, reddish. The remainder parts of body, black. Vesica of aedeagus with three simple sclerotized spines (plus one sclerotized spine with superficial teeth) and one membranous lobe; left paramere curved with a rounded apex; right paramere spherical and a curved apical region.

Geographic distribution: Brazil (Carvalho 1988A; Schuh 1995, 2011), Ecuador (Carvalho 1988A; Schuh 1995, 2011), Peru (Carvalho 1988A; Schuh 1995, 2011).

Material examined: In MNRJ collection. Female, paratype, Peru, Huanuco, Tingo Maria, IX-10-44, EJ Hambleton.

***Prepops beniensis* Carvalho, 1988 (Fig. 15)**

Prepops beniensis Carvalho, 1988B: 412 (original description)
Prepops beniensis: Schuh, 1995: 987
Prepops beniensis: Schuh, 2011

Diagnosis: General coloration black, reddish and lutescent. Pronotum, scutellum and ventral side, reddish. Hemelytra base (till scutellum apical third) lutescent. The remainder parts of body, black (except for pale areas of head, metacoxa and trochanters). Vesica of aedeagus with three simple sclerotized spines and a membranous lobe with a characteristic apex; left paramere curved, with an acute apex and subapical distension; right paramere with an acute apex (modified from Carvalho 1988B).

Geographic distribution: Bolivia (Carvalho, 1988B; Schuh 1995, 2011).

***Prepops bicolor* (Distant, 1883) (Fig. 16)**

Resthenia bicolor Distant, 1883: 256, 425 (original description)

Resthenia bicolor: Atkinson, 1890: 57 (not seen)
Resthenia bicolor: Carvalho & Dolling, 1976: 793
Prepops bicolor: Carvalho & Fontes, 1971B: 792
Platytylellus bicolor: Carvalho, 1952A: 4
Prepops bicolor: Carvalho, 1959: 332
Prepops bicolor: Schuh, 1995: 987
Prepops bicolor: Schuh, 2011

Diagnosis: General coloration black and reddish. Eyes, antennae, clypeus, pronotum apical 2/3, scutellum, hemelytra, femora apex, tibiae, tarsi and rostrum segments II-IV, black. Abdomen fuscous or with ovipositor and pygophore fuscous. The remainder parts of body, reddish. Vesica of aedeagus with two sclerotized spines (one of them curved) and membranous lobes covered by minute teeth; left paramere curved with a rounded apex and a thickened basal portion; right paramere curved and with a long acute apex (modified from Carvalho & Fontes 1971B).

Geographic distribution: Mexico (Distant 1883; Carvalho & Fontes 1971B; Carvalho 1959; Schuh 1995, 2011), Guatemala (Distant 1883; Carvalho & Dolling, 1976; Carvalho & Fontes, 1971B; Carvalho 1959; Schuh 1995, 2011).

***Prepops bicoloroides* Carvalho & Schaffner, 1987 (Fig. 17)**

Prepops bicoloroides Carvalho & Schaffner, 1987: 36 (original description)
Prepops bicoloroides: Schuh, 1995: 987
Prepops bicoloroides: Schuh, 2011

Diagnosis: General coloration black, reddish and lutescent. Head (except clypeus), pronotum collar, area of calli with continuous triangular middorsal inflection and sides reddish. Coxae, trochanters, pleural and sternal regions of thorax and abdomen, lutescent. The remainder parts of body, black (basal half of first antennal segment, rostrum, femora, tibiae, tarsi and apex of pygophore fuscous to black). Vesica of aedeagus with several sclerotized spiculi and membranous lobes; left paramere curved with a chamfered apex; right paramere curved at apex (modified from Carvalho & Schaffner 1987).

Geographic distribution: Mexico (Carvalho & Schaffner 1987; Schuh 1995, 2011).

***Prepops bivittatus* (Stål, 1860) (Fig. 18)**

Resthenia bivittata Stål, 1860: 47 (original description)
Resthenia patruelis Stål, 1860: 47 (original description)
Capsus bivittatus: Walker, 1873: 107 (not seen)
Capsus patruelis: Walker, 1873: 107 (not seen)
Resthenia bivittata: Reuter, 1876: 64 (not seen)
Resthenia patruelis: Reuter, 1876: 64 (not seen)
Resthenia bivittata: Atkinson, 1890: 57 (not seen)
Resthenia patruelis: Atkinson, 1890: 60 (not seen)
Platytylellus bivittatus: Reuter, 1913: 39 (not seen)
Platytylellus bivittatus var. *patruelis* Reuter, 1913: 39 (original description) (not seen)

Prepops bivittata: Bergroth, 1922: 7 (not seen)
Prepops bivittata var. *patruelis*: Bergroth, 1922: 7(not seen)
Prepops bivittatus: Carvalho, 1959: 332
Prepops bivittatus: Schuh, 1995: 987
Prepops bivittatus: Schuh, 2011

Diagnosis: General coloration black and pale lutescent. Pronotum sides, base of clavus, a longitudinal stripe in middle part of corium, cuneus, apex of coxae, trochanters and basal half of femora, pale lutescent. The remainder parts of body, dull black (modified from Stål 1860).

Geographic distribution: Brazil (Stål 1860; Carvalho 1959; Schuh 1995, 2011).

***Prepops bivittis* (Stål, 1862) (Fig. 19)**

Resthenia bivittis Stål, 1862: 318 (original description)
Capsus bivittis: Walker, 1873: 98 (not seen)
Resthenia bivittis: Reuter, 1876: 64 (not seen)
Resthenia bivittis: Distant, 1883: 256
Resthenia exornata Distant, 1883: 257 (original description)
Resthenia bivittis: Atkinson, 1890: 57 (not seen)
Resthenia exornata: Atkinson, 1890: 58 (not seen)
Resthenia exornata: Distant, 1893: 426
Resthenia intercidenda Distant, 1893: 426 (original description)
Resthenia bivittis: Gillette & Baker. 1895: 29 (not seen)
Platytylellus intercidendus: Reuter, 1908: 170
Platytylellus intercidendus: Reuter, 1913: 35 (not seen)
Oncerometopus bivittis Reuter, 1913: 49 (original description) (not seen)
Platytylellus basivittis: (sic) Van Duzee, 1914: 25
Resthenia intercidenda: Barber, 1914: 501 (not seen)
Platytylellus bivittis: Van Duzee, 1916B: 36 (not seen)
Platytylellus bivittis: Van Duzee, 1917B: 262
Platytylellus intercidendus: Van Duzee, 1917B: 262
Platytylellus bivittis: Van Duzee, 1917A: 311 (not seen)
Platytylellus bivittis evittatus Knight, 1929A: 192 (original description)
Platytylellus bivittis: Knight, 1929A: 192
Platytylellus intercidendus: Brimley, 1938: 76 (not seen)
Platytylellus exornatus: Carvalho, 1952A: 6
Platytylellus intercidendus: Carvalho, 1952A: 118
Prepops bivittis: Carvalho, 1959: 332
Prepops bivittis: Knight, 1968: 181
Prepops bivittis evittatus: Carvalho & Fontes, 1969A: 262
Prepops bivittis: Carvalho & Fontes, 1971B: 793
Prepops bivittis var. *evittatus*: Carvalho & Fontes, 1971B: 794
Prepops intercidendus: Carvalho & Fontes, 1971B: 795
Resthenia exornata: Carvalho & Dolling, 1976: 796
Resthenia intercidenda: Carvalho & Dolling, 1976: 799
Prepops bivittis: Kelton, 1980: 54
Prepops bivittis: Henry & Froeschner, 1988: 376
Prepops bivittis: bivittis Henry & Froeschner, 1988: 377
Prepops bivittis evittatus: Henry & Froeschner, 1988: 377

Prepops bivittis: Schuh, 1995: 987
Prepops bivittis: Schuh, 2011

Diagnosis: General coloration black and reddish. Posterior portion of head, pronotum with collar, calli, lateral margins, a large stripe on disc extending to posterior margin, median part of mesoscutum and scutellum, ventral side (except rostrum segments II-IV, coxae and the last abdominal segment) reddish. Vesica of aedeagus with three sclerotized spines and membranous lobes covered by minute teeth; left paramere curved with an acute apex and subapical distension, and a tumid basal lobe; right paramere with an acute apex (modified from Carvalho & Fontes 1971B).

Geographic distribution: Canada (Knight 1968; Kelton 1980; Henry & Froeschner 1988), USA (Gillette & Baker 1895; Van Duzee 1914; Barber 1914; Knight 1929A; Brimley 1938; Carvalho 1959; Carvalho & Fontes 1969A; Knight 1968; Carvalho & Fontes 1971B; Kelton 1980; Henry & Froeschner 1988; Schuh 1995, 2011).

Host Plants: Collected on herbaceous plants (Kelton 1980). *Galium angustifolium* Nutt. ex A. Gray (Knight 1968; Schuh 2011).

***Prepops bolivianus* Carvalho & Fontes, 1969 (Fig. 20)**

Prepops bolivianus Carvalho & Fontes, 1969A: 262 (original description)
Prepops bolivianus: Schuh, 1995: 987
Prepops bolivianus: Schuh, 2011

Diagnosis: General coloration black and reddish. Base of antennal segment I, head (except clypeus), pronotum (except a longitudinal median stripe on disc in a few specimens), scutellum (except apex), base of hemelytra, ventral side and a sub-basal spot on femora, reddish. The remainder parts of body, black (modified from Carvalho & Fontes 1969A).

Geographic distribution: Bolivia (Carvalho & Fontes 1969A; Schuh 1995; Schuh 2011).

***Prepops borealis* (Knight, 1923) (Fig. 21)**

Platytylellus borealis Knight, 1923: 551 (original description)
Platytylellus borealis: Blatchley, 1926: 688 (not seen)
Platytylellus borealis: Knight, 1928
Platytylellus borealis notatus: Knight, 1929A: 192
Platytylellus borealis: Knight, 1929B
Platytylellus borealis: Knight, 1941: 132, 136
Platytylellus borealis: Moore, 1950: 245 (not seen)
Prepops borealis: Carvalho, 1959: 332
Prepops borealis: Kelton, 1980: 53
Prepops borealis: Henry & Froeschner, 1988: 377
Prepops borealis: borealis Henry & Froeschner, 1988: 377
Prepops borealis notatus: Henry & Froeschner, 1988: 377
Prepops borealis: Schuh, 1995: 987
Prepops borealis: Schuh, 2011

Diagnosis: General coloration black and reddish. Posterior margin of head, pronotum collar and apical lateral margins and the first four ventral segments of abdomen, reddish. The remainder parts of body, black (modified from Knight 1923).
Geographic distribution: Canada (Knight 1923; Knight 1941; Moore 1950; Carvalho 1959; Kelton, 1980; Henry & Froeschner 1988), USA (Knight 1923; Knight 1928; Knight 1929AB; Knight 1941; Carvalho 1959; Henry & Froeschner 1988; Schuh 1995, 2011)

Host Plants: Collected on herbaceous plants (Kelton 1980).

***Prepops caatinganus* Carvalho, 1988 (Fig. 22)**

Prepops caatinganus Carvalho 1988A: 357 (original description)
Prepops caatinganus: Schuh, 1995: 987
Prepops caatinganus: Schuh, 2011

Diagnosis: General coloration black, reddish and yellowish. Head, pronotum, scutellum and abdomen, reddish. Embolium, cuneus external margin and ventral side (except abdomen, reddish, and femora toward the apex, tibiae and tarsi that are black) yellowish. The remainder parts of body, black. Vesica of aedeagus with three sclerotized spines and membranous lobes covered by minute teeth; left paramere curved with a rounded apex; right paramere with an acute and curved apex (modified from Carvalho 1988A).

Geographic distribution: Brazil (Carvalho 1988A; Schuh 1995, 2011).

***Prepops cajuruensis* Carvalho & Costa, 1991 (Fig. 23)**

Prepops cajuruensis Carvalho & Costa, 1991: 52 (original description)
Prepops cajuruensis: Schuh, 1995: 987
Prepops cajuruensis: Schuh, 2011

Diagnosis: General coloration black and yellowish. Head (except two spots on vertex, eyes, clypeus and maxillary plate apex), pronotum (except humeral angles) and ventral side (except coxae I, apex of coxae II and III, mesosternum sides, pygophore and legs) yellowish. The remainder parts of body, black. Vesica of aedeagus with three sclerotized spines, membranous lobes covered by minute teeth and a serrated lobe; left paramere curved with an acute apex and subapical distension; right paramere with an acute and subapically depressed apex (modified from Carvalho & Costa 1991).

Geographic distribution: Brazil (Carvalho & Costa 1991; Schuh 1995, 2011).

***Prepops caliensis* Carvalho, 1989 (Fig. 24)**

Prepops caliensis Carvalho, 1989: 441 (original description)
Prepops caliensis: Schuh, 1995: 987
Prepops caliensis: Schuh, 2011

Diagnosis: General coloration black and lutescent. Head (except clypeus, buccula and maxillary plate anterior parts, eyes, antennae and rostrum), pronotum apical third (except middle of collar and calli), apical and basal portion (preceding cuneus and membrane) of hemelytra, sterna, pleurae (except a black spot on mesopleuron and metapleuron), coxae base and lateral parts of abdominal segments II and III, lutescent. The remainder parts of body, black (modified from Carvalho 1989).

Geographic distribution: Colombia (Carvalho 1989; Schuh 1995, 2011).

***Prepops candelariensis* Hernández & Henry, 2010 (Fig. 25)**

Prepops candelariensis Hernández & Henry, 2010: 91 (original description)
Prepops candelariensis: Schuh, 2011

Diagnosis: General coloration black and reddish. Head, antennal segment I (except apex), rostrum segment I, pronotum, scutellum, femora and abdomen ventrally, red. The remainder parts of body, black. Vesica of aedeagus with a sclerotized structure near secondary gonoporo, that has a gap on its opening; left paramere curved with an acute apex and subapical distension; right paramere with a rounded apex forming a 90 degrees angle (modified from Hernández & Henry 2010).

Geographic distribution: Cuba (Hernández & Henry 2010; Schuh 2011).

***Prepops canelae* Carvalho & Fontes, 1970 (Fig. 26)**

Prepops canelae Carvalho & Fontes, 1970B: 794 (original description)
Prepops canelae: Schuh, 1995: 987
Prepops canelae: Schuh, 2011

Diagnosis: General coloration brownish and lutescent. Head, pronotum, scutellum (in a few specimens, brownish with a lutescent longitudinal median stripe), cuneus external margin, xiphus, propleuron, mesopleuron posterior portion, basal plate and a few spots and stripes on abdomen, lutescent (in a few specimens, ventral side totally lutescent). The remainder parts of body, brownish. Vesica of aedeagus with sclerotized spines and membranous lobes covered by minute teeth; left paramere curved with an acute apex and subapical distension; right paramere with a subapical tooth (modified from Carvalho & Fontes 1970B).

Geographic distribution: Brazil (Carvalho & Fontes 1970B; Schuh 1995, 2011).

***Prepops cangussuensis* Coelho *et al.* (*in prep*.) (Fig. 27)**

Prepops cangussuensis Coelho *et al.* (*in prep.)*

Diagnosis: General coloration black and reddish. Head reddish with eyes, antennae, maxillary plate, apex of buccula, rostrum and a mark on frons, black. Ventral sides of collar, xiphus, propleura (partially) and middle area of hind femora reddish. First and second sterna of abdomen partially reddish. The remainder parts of body, black. Vesica of aedeagus with two

sclerotized spines, one straight and other with a bent apex, apex of one membranous lobe sharp and sclerotized; left paramere curved with an acute and twisted apex, sensorial lobe sclerotized with long, erect setae; right paramere curved with 1/3 apical area twisted ending in a long acute apex (modified from Coelho *et al. - in prep*).

Geographic distribution: Brazil

Material examined: In MCNZ collection. Male, holotype, and female, paratype. BR, RS, Canguçu, Rincão da Ronda. Campo. 09/IV/2003, aleatória. Bunde col.

***Prepops caracensis* Carvalho, 1974 (Fig. 28)**

Prepops caracensis Carvalho, 1974: 467 (original description)
Prepops caracensis: Schuh, 1995: 988
Prepops caracensis: Ferreira et al. 2001: 165
Prepops caracensis: Ferreira et al. 2006: 15
Prepops caracensis: Schuh, 2011

Diagnosis: General coloration black, orange and lutescent. Median longitudinal stripe beginning in the middle of the collar, widening towards posterior margin of disc and occupying most of scutellum, orange. Xyphus, pleurae, coxae basally, abdomen (except pygophore) and a wide band on hind femora, lutescent. The remainder parts of body, black. Vesica of aedeagus with sclerotized spiculi and membranous lobes covered by minute teeth; left paramere curved with an acute apex; right paramere with an acute apex forming a 90 degrees angle (modified from Carvalho 1974).

Geographic distribution: Brazil (Carvalho 1974; Schuh 1995; Ferreira *et al.* 2001; Ferreira *et al.* 2006; Schuh 2011).

Material examined: In MNRJ collection. Two paratypes and one allotype, Minas Gerais, Serra do Caraça, III-1971, FM Oliveira.

***Prepops carioca* Carvalho & Fontes, 1970 (Fig. 29)**

Prepops carioca Carvalho & Fontes, 1970B: 795 (original description)
Prepops carioca: Schuh, 1995: 988
Prepops carioca: Schuh, 2011

Diagnosis: General coloration brownish and yellowish. Head with a longitudinal stripe on vertex extending towards the frons, a transversal stripe between vertex and frons widening towards eyes margins, head sides (except clypeus), a portion of collar, three longitudinal stripes on pronotum, one longitudinal stripe on scutellum, clavus apex, embolium base, portions on corium apex and cuneus base, yellowish. Ventral side with xiphus, propleuron, spots on mesopleuron and metapleuron, basal plate, abdomen with base and a few spots on other segments, yellowish. The remainder parts of body, brownish. Vesica of aedeagus with distinct lobes; left paramere curved with an acute apex; right paramere irregular with a sclerotized apex (modified from Carvalho & Fontes 1970B).

Geographic distribution: Brazil (Carvalho & Fontes 1970B; Schuh 1995, 2011).

***Prepops casualis* Carvalho, 1988 (Fig. 30)**

Prepops casualis Carvalho, 1988B: 414 (original description)
Prepops casualis: Schuh, 1995: 988
Prepops casualis: Schuh, 2011

Diagnosis: General coloration black and yellowish. Base of antennal segment I, pronotum, embolium, cuneus external margin, a longitudinal stripe on scutellum and ventral side (except abdomen sides and pygophore, femora apex and tibiae), yellowish. The remainder parts of body, black. Vesica of aedeagus with one long sclerotized spine and membranous lobes covered by minute teeth; right paramere with a forked apex (modified from Carvalho 1988B).

Geographic distribution: Colombia (Carvalho 1988B; Schuh 1995, 2011).

***Prepops catamarcanus* Carvalho, 1988 (Fig. 31)**

Prepops catamarcanus Carvalho, 1988B: 415 (original description)
Prepops catamarcanus: Carpintero & Carvalho, 1993: 411
Prepops catamarcanus: Coscarón & Carpintero, 1996
Prepops catamarcanus: Schuh, 1995: 988
Prepops catamarcanus: Schuh, 2011
Prepops catamarcanus: Coelho et al. (in prep.)

Diagnosis: General coloration black and reddish. Two transversal and oblique stripes on vertex, collar sides, buccula, maxillary plate, gula, propleuron, xiphus and a sub-basal band on hind femora (in one specimen) reddish. The remainder parts of body, black (modified from Carvalho 1988B).

Geographic distribution: Argentina (Carvalho 1988B; Carpintero & Carvalho 1993; Coscarón & Carpintero 1996; Schuh 1995, 2011; Coelho *et al.* (*in prep*.)).

Material examined: In MNRJ collection. Paratype, female; Catamarca, El Manchado, 19.I.59. 4000, R. Golbach. Paratype, male (without abdomen), Nº 5653, Rpa. Argentina. Prov. Tucuman, 21.VII.1899, S. Venturi.

New record: Tucumán (Argentina).

***Prepops catarinensis* Carvalho & Fontes, 1970 (Fig. 32)**

Prepops catarinensis Carvalho & Fontes, 1970B: 797 (original description)
Prepops catarinensis: Schuh, 1995: 988
Prepops catarinensis: Schuh, 2011

Diagnosis: General coloration black and reddish. Head, pronotum, scutellum (except lateral margins and apex), rostrum (except apex), sterna, coxae and abdomen base, reddish. The remainder parts of body, black. Vesica of aedeagus with sclerotized spines and membranous

lobes covered by minute teeth, apex of one membranous lobe sharp and sclerotized; left paramere curved, with a rounded apex and a tumid basal lobe; right paramere irregular with an acute apex (modified from Carvalho & Fontes 1970B).

Geographic distribution: Brazil (Carvalho & Fontes 1970B; Schuh 1995, 2011).

Material examined: In MNRJ collection. Male, Brasil, Santa Catarina, Nova Teutonia, III-1972, Fritz Plaumman.

***Prepops chamchamaianus* Carvalho, 1988 (Fig. 33)**

Prepops chamchamaianus Carvalho, 1988B: 416 (original description)
Prepops chamchamaianus: Schuh, 1995: 988
Prepops chamchamaianus: Schuh, 2011

Diagnosis: General coloration black and reddish. Head (except anterior and posterior areas of eyes and clypeus), pronotum (except a spot on collar median part), hemelytra base, scutellum (except two stripes on apex) and ventral side (except abdominal segment IX and part of VII and VIII, ovipositor and legs), reddish. The remainder parts of body, black (modified from Carvalho 1988B).

Geographic distribution: Peru (Carvalho & Fontes 1970B; Schuh 1995, 2011).

***Prepops circumcinctus* (Say, 1832) (Fig. 34)**

Capsus circumcinctus Say, 1832: 23 (original description) (not seen)
Capsus circumcinctus: Say, 1859: 343 (not seen)
Platytylellus circumcinctus: Knight, 1923: 555
Platytylellus circumcinctus: Knight, 1927
Platytylellus circumcinctus: Knight, 1928
Platytylellus circumcinctus: Knight & McAtee, 1929
Platytylellus circumcinctus: Knight, 1941: 135
Platytylellus circumcinctus: Froeschner, 1949
Prepops circumcinctus: Carvalho, 1959: 333
Prepops circumcinctus: Khalaf, 1971: 341 (not seen)
Prepops circumcinctus: Schuh, 1995: 988
Prepops circumcinctus: Schuh, 2011

Diagnosis: General coloration black and reddish. Head (except frons, clypeus, maxillary and mandibular plates), pronotum (except calli and a stripe behind each callus that extends to basal marging of disc) mesoscutum, scutellum (except basal angles of both), embolium, corium external margin, cuneus, pleurae, sterna, abdomen (except ventrally black spots and apex), reddish. The remainder parts of body, black (modified from Knight 1923).

Geographic distribution: USA (Say 1832, 1859; Knight 1923, 1927, 1928; Knight & McAtee 1929; Knight 1941; Froeschner 1949; Carvalho 1959; Khalaf 1971; Schuh 1995, 2011).

***Prepops circummaculatus* (Stål, 1854) (Fig. 35)**

Capsus circummaculatus Stål, 1854: 236 (original description) (not seen)
Capsus circummaculatus: Stål, 1859: 257
Capsus (Resthenia) circummaculatus: Signoret, 1863: 572 (not seen)
Capsus circummaculatus: Walker, 1873: 107 (not seen)
Resthenia circummaculata: Reuter, 1876: 64 (not seen)
Resthenia circummaculata: Berg, 1878: 275 (not seen)
Resthenia circummaculata: Berg, 1879: 126 (not seen)
Resthenia circummaculata: Atkinson, 1890: 57 (not seen)
Capsus circummaculatus: Reed, 1901: 78 (not seen)
Platytylellus circummaculatus: Reuter, 1913: 43 (not seen)
Prepops circummaculata: Bergroth, 1922: 4 (not seen)
Prepops circummaculata: Carvalho & Drake, 1943A: 523
Prepops circummaculata: Carvalho & Drake, 1943B: 297
Platytylellus circummaculatus: Slater, 1950: 37
Platytylellus circummaculatus: Carvalho, 1951A: 104
Platytylellus circummaculatus: Carvalho & Hussey, 1954: 10
Prepops circummaculatus: Carvalho, 1959: 333
Prepops circummaculatus: Carvalho & Rosas, 1965: 210
Prepops circummaculatus: Carvalho & Fontes, 1970A: 368
Prepops circummaculatus: Alayo, 1974: 14 (not seen)
Prepops circummaculatus: Carvalho, 1975A: 456
Prepops circummaculatus: Fontes, 1989: 4
Prepops circummaculatus: Carpintero & Carvalho, 1993: 411
Prepops circummaculatus: Schuh, 1995: 988
Prepops circummaculatus: Ferreira *et al.* 2006: 15
Prepops circummaculatus: Schuh, 2011
Prepops circummaculatus: Coelho *et al*. (*in prep*.)

Diagnosis: General coloration black and lutescent. Posterior portion from vertex, median part from collar and area between calli narrowing through the base of pronotum, lateral margins of pronotum, propleuron, buccula, gula, rostrum segment I, xiphus, abdomen basal median part and laterally (frequently interrupted in segments III through VI), lutescent. The remainder parts of body, black. Vesica of aedeagus with one median sclerotized spine; left paramere curved and with a rounded apex; right paramere with apical third curved and an acute apex (modified from Coelho *et al.* (*in prep*.)).

Geographic distribution: Cuba (Alayo 1974; Schuh, 1995, 2011), Suriname (Carvalho & Rosas, 1965; Schuh, 1995, 2011), Brazil (Carvalho & Drake 1943B; Slater, 1950; Carvalho, 1959; Carvalho & Fontes, 1970A; Carvalho, 1975A; Schuh, 1995; Ferreira *et al.* 2006; Schuh, 2011; Coelho *et al.* (*in prep*.)), Argentina (Stål, 1859; Carvalho & Drake, 1943A; Carvalho & Drake, 1943B; Carvalho, 1959; Carvalho & Fontes, 1970A; Fontes, 1989; Carpintero & Carvalho, 1993; Schuh, 1995; Schuh, 2011), Chile (Stål, 1854; Carvalho & Drake, 1943B; Carvalho, 1959; Carvalho & Fontes, 1970A; Schuh, 1995; Schuh, 2011), Paraguay (Carvalho, 1959; Carvalho, 1951A; Carvalho & Hussey, 1954), Uruguay (Carvalho & Fontes, 1970A; Carvalho & Drake, 1943A; Fontes, 1989).

Material examined: In IMLA collection. One specimen, Rio Negro, Choele Choel. One specimen, La Rioja, Guayapa, 4-X-54, K. J. Hayward. One specimen, Rio Colorado, Rio Negro, Arg., XI-46. One specimen, Rio Colorado, Rio Negro, Lago Pelegrini, 22-I-1955, Willink-Claps. In MNRJ collection. In MCNZ collection. Male, 13865, Guaíba, RS; 13-14/II/1980; M. E. L. Souza leg.

Host plants: On swamp plants (Carvalho, 1975A); *Phylodendron* sp. (Carpintero & Carvalho, 1993).

Note: Stål (1859) Indicates Buenos Aires as a city on Chile. Actually, is the capital of Argentina.

***Prepops columbiensis* (Carvalho & Fontes, 1972) (Fig. 36)**

Platytyloides columbiensis Carvalho & Fontes, 1972: 221 (original description)
Prepops columbiensis: Carvalho & Schaffner, 1975: 707
Prepops columbiensis: Carvalho & Afonso, 1977
Prepops columbiensis: Schuh, 1995: 988
Prepops columbiensis: Schuh, 2011

Diagnosis: General coloration black, brownish and yellowish. Eyes, antenna (except segment I base), membrane, clypeus apex, rostrum, femora superior margin, tibiae, tarsi and a spot on pygophore, black. Ventral side yellowish. The remainder parts of body, brownish. Vesica of aedeagus with two long sclerotized spines, two other smaller and thinner, one membranous lobe with apex sharp and sclerotized, another one with apical small teeth and others covered by minute teeth; left paramere curved with a chamfered apex; right paramere with an acute apex (modified from Carvalho & Fontes 1972).

Geographic distribution: Colombia (Carvalho & Fontes 1972; Carvalho & Afonso 1977; Schuh 1995, 2011).

***Prepops comaparanus* Carvalho, 1988 (Fig. 37)**

Prepops comaparanus Carvalho, 1988B: 416 (original description)
Prepops comaparanus: Schuh, 1995: 988
Prepops comaparanus: Schuh, 2011

Diagnosis: General coloration black and lutescent. Buccula, gena (except a median black spot), gula, base of mandibular plate and antennal segment I, collar, calli anterior area, pronotum lateral margins, clavus and embolium apex, corium and cuneus external part, xiphus, ostiolar peritreme and hind femora base lutescent. The remainder parts of body, black (modified from Carvalho 1988B).

Geographic distribution: Bolivia (Carvalho 1988B; Schuh 1995, 2011)

***Prepops commissuralis* (Reuter, 1910)**

Platytylellus commissuralis Reuter, 1910A: 33 (original description)
Prepops commissuralis: Carvalho, 1959: 333

Prepops commissuralis: Schuh, 1995: 988
Prepops commissuralis: Schuh, 2011

Diagnosis: General coloration black, reddish and yellowish. Pronotum apical and basal margins, reddish. Lateral margins of pronotum and hemelytra (except claval commissure), yellowish. The remainder parts of body, black (modified from Reuter 1910A).

Geographic distribution: Costa Rica (Reuter 1910A; Carvalho 1959; Schuh 1995, 2011).

Note: Illustrations of this species does not exist. The unique specimen (holotype) is in a museum in Hungary.

***Prepops concinnoides* Carvalho, 1988 (Fig. 38)**

Prepops concinnoides Carvalho, 1988A: 358 (original description)
Prepops concinnoides: Fontes, 1989: 4
Prepops concinnoides: Schuh, 1995: 988
Prepops concinnoides: Ferreira et al., 2001: 165
Prepops concinnoides: Ferreira et al., 2006: 15
Prepops concinnoides: Schuh, 2011

Diagnosis: General coloration black, brownish and yellowish. Head dorsally (except for two black stripes on vertex), embolium, cuneus external margin and ventral side (except mandibular and maxillary plates and abdominal segments VIII and IX, that are reddish), yellowish. Calli black. The remainder parts of body, brownish. Vesica of aedeagus with three sclerotized spines, one of them with a blunt apex and membranous lobes with and without minute teeth; left paramere curved and with a rounded apex; right paramere curved on distal portion and with a rounded apex (modified from Carvalho 1988A).

Geographic distribution: Brazil (Carvalho 1988A; Fontes 1989; Schuh 1995; Ferreira *et al.* 2001; Ferreira *et al.* 2006; Schuh 2011).

Material examined: In MNRJ collection. Female, paratype, Brasil, Espírito Santo, Parque Sooretama, Linhares, 8-II-1959, D. Zalclw.

***Prepops concinnus* (Stål, 1860) (Fig. 39)**

Resthenia concinna Stål, 1860: 47 (original description)
Prepops concinnus: Carvalho, 1959: 333
Prepops concinnus: Carvalho & Fontes 1970A: 369
Prepops concinnus: Ferreira & Rossi, 1979
Prepops concinnus: Schuh, 1995: 988
Prepops concinnus: Ferreira et al., 2001: 165
Prepops concinnus: Ferreira et al., 2006: 15
Prepops concinnus: Schuh, 2011

Diagnosis: General coloration black, reddish and greenish. Head (except for the black antennae, clypeus, spots on frons and vertex), pronotum apical third (except for the black

collar median part and calli), scutellum and ventral side (except for the black pygophore, legs and rostrum), reddish. Pronotum disc and hemelytra greenish. Vesica of aedeagus with sclerotized spines, and membranous lobes covered by small teeth; left paramere curved, with a rounded apex and tumid basal lobe; right paramere with an acute and sclerotized apex (modified from Carvalho & Fontes 1970A).

Geographic distribution: Brazil (Stål 1860; Carvalho 1959; Carvalho & Fontes 1970A; Ferreira & Rossi 1979; Schuh 1995; Ferreira *et al.* 2001, 2006; Schuh 2011).

Material examined: In MNRJ collection. One specimen, Brasil, Minas Gerais, Viçosa, 1944, JCM Carvalho.

***Prepops concisus* (Knight, 1929) (Fig. 40)**

Platytylellus concisus Knight, 1929A: 190 (original description)
Prepops concisus: Carvalho, 1959: 334
Prepops concisus: Schuh, 1995: 988
Prepops concisus: Schuh, 2011

Diagnosis: General coloration black and reddish. Base of head, margins of vertex bordering eyes, gena , gula, basal half of buccula, collar, a stripe between calli that extends to middle of disc, a longitudinal middle stripe on scutellum, xyphus, pleurae, sides of sterna and abdomen (except for the black last three segments and triangular area on the sides of each segment), reddish. The remainder parts of body, black (modified from Knight 1929A).

Geographic distribution: USA (Knight 1929A; Carvalho 1959; Schuh 1995, 2011).

***Prepops confraternus* (Uhler, 1872) (Fig. 41)**

Resthenia confraterna Uhler, 1872: 411 (original description) (not seen)
Resthenia maculicollis Reuter, 1876: 65 (original description) (not seen)
Platytylellus robustus Reuter, 1913: 32 (original description) (not seen)
Platytylellus confraternus collaris Knight, 1926: 255 (original description)
Platytylellus confraternus: Froeschner, 1949
Prepops confraternus: Carvalho, 1959: 334
Prepops robustus: Carvalho, 1959: 341
Prepops confraternus: Khalaf, 1971: 341 (not seen)
Prepops confraternus: Carvalho & Fontes, 1971A: 121
Prepops robustus: Henry & Smith, 1979
Prepops confraternus: Schuh, 1995: 988
Prepops confraternus: Schuh, 2011

Diagnosis: General coloration black and reddish. Head (except antennae, base and margins of vertex bordering eyes), pronotum (except for a large fuscous spot on disc), mesoscutum sides and ventral side (except for the last abdominal segment, legs and rostrum), reddish. The remainder parts of body, black (modified from Knight 1926).

Geographic distribution: USA (Uhler 1872; Reuter 1876; Reuter 1913; Knight 1926; Froeschner 1949; Carvalho 1959; Khalaf 1971; Carvalho & Fontes 1971A; Henry & Smith 1979; Schuh 1995, 2011).

***Prepops cordobanus* Carvalho & Fontes, 1969 (Fig. 42)**

Prepops cordobanus Carvalho & Fontes, 1969B: 575 (original description)
Prepops cordobanus: Coscarón & Carpintero, 1996
Prepops cordobanus: Schuh, 1995: 989
Prepops cordobanus: Schuh, 2011

Diagnosis: General coloration black and yellowish. Head with eyes margins, a median stripe on frons, base of clypeus, mandibular and maxillary plates, gena and buccula, pronotum anterior lateral margins and longitudinal median stripe, mesoscutum longitudinal median stripe, scutellum (except basal angles), embolium, cuneus external margin, pleurae, xiphus, mesosternum sides, basal plate, base of hind femora and abdomen, yellowish. The remainder parts of body, black. Vesica of aedeagus with sclerotized and membranous lobes; left paramere curved, with an acute apex and subapical distension; right paramere with an acute and sclerotized apex (modified from Carvalho & Fontes 1969B).

Geographic distribution: Bolivia (Carvalho & Fontes 1969B; Schuh 1995, 2011), Argentina (Carvalho & Fontes 1969B; Schuh 1995; Coscarón & Carpintero 1996; Schuh 2011).

***Prepops correntinoides* Carvalho & Carpintero, 1987 (Fig. 43)**

Prepops correntinoides Carvalho & Carpintero, 1987: 24 (original description)
Prepops correntinoides: Carpintero & Carvalho, 1993: 411
Prepops correntinoides: Schuh, 1995: 989
Prepops correntinoides: Schuh, 2011

Diagnosis: General coloration black and reddish. Collar sides, two longitudinal stripes on pronotum disc, rostrum segment I and propleuron, reddish. The remainder parts of body, black. Vesica of aedeagus with one median sclerotized spine and five membranous lobes covered by minute teeth, segondary gonopore with an area covered by small teeth; left paramere curved and with an acute apex; right paramere with an acute apex (modified from Carvalho & Carpintero 1987).

Geographic distribution: Argentina (Carvalho & Carpintero 1987; Carpintero & Carvalho 1993; Schuh 1995, 2011).

***Prepops costalis* (Stål, 1860) (Fig. 44)**

Resthenia costalis Stål, 1860: 47 (original description)
Platytylellus costalis: Slater, 1950: 37
Prepops costalis: Carvalho, 1959: 334
Prepops costalis: Carvalho & Fontes, 1970B: 797
Prepops costalis: Fontes, 1989: 6
Prepops costalis: Carpintero & Carvalho, 1993: 411

Prepops costalis: Schuh, 1995: 989
Prepops costalis: Schuh, 2011

Diagnosis: General coloration reddish, brownish and yellowish. Head (except clypeus and eyes), pronotum, scutellum, sterna, coxae, abdomen towards the apex, reddish (one specimen with pronotum and scutellum gray blended with yellow). Embolium, corium and cuneus external margin, yellowish. The remainder parts of body, brownish. Vesica of aedeagus with three sclerotized spines and membranous lobes covered by minute teeth; left paramere forked; right paramere with an acute apex (modified from Carvalho & Fontes 1970B).

Geographic distribution: Argentina (Carpintero & Carvalho 1993), Brasil (Stål 1860; Slater 1950; Carvalho 1959; Carvalho & Fontes 1970B; Fontes 1989; Schuh 1995, 2011).

Host Plants: *Xanthium strumarium* Lour., *Beta vulgaris cycla* L., *Zea mays* L., *Citrullus vulgaris* Schrad., *Ricinus communis* L. (Carpintero & Carvalho 1993).

***Prepops crassicornis* (Reuter, 1910) (Fig. 45)**

Platytylellus crassicornis Reuter, 1910A: 24 (original description)
Prepops crassicornis: Carvalho et al. 1968: 389
Prepops crassicornis: Carvalho & Ferreira, 1972: 183
Prepops crassicornis: Carvalho, 1959: 334
Prepops crassicornis: Schuh, 1995: 989
Prepops crassicornis: Schuh, 2011

Diagnosis: General coloration black, reddish and yellowish. Pronotum sides and propleuron reddish. Hemelytra with humeral angles, femora base and rostrum, yellowish. The remainder parts of body, black (modified from Carvalho *et al.* 1968).

Geographic distribution: Peru (Carvalho & Ferreira 1972; Schuh 1995, 2011), Bolivia (Reuter 1910A; Carvalho 1959; Carvalho *et al.* 1968; Schuh 1995, 2011)

***Prepops cruciferoides* Carvalho & Fontes, 1970 (Fig. 46)**

Prepops cruciferoides Carvalho & Fontes, 1970B: 799 (original description)
Prepops cruciferoides: Schuh, 1995: 989
Prepops cruciferoides: Schuh, 2011

Diagnosis: General coloration brownish. Two stripes on frons and other two on vertex, eyes, clypeus, antennae, pronotum with collar sides, calli, two lateral stripes and two median stripes, hemelytra with embolium, clavus external margin, apical and middle region of corium, femora towards the apex, tibiae and tarsi, dark brown. The remainder parts of body, light brown. Vesica of aedeagus with sclerotized spines and membranous lobes; left paramere curved with a chamfered apex; right paramere with an acute apex.

Geographic distribution: Brazil (Carvalho & Fontes 1970B; Schuh 1995, 2011), Argentina (Carvalho & Fontes 1970B).

Material examined: In MNRJ collection. One allotype and three paratypes, two males and two females, Brasil, Santa Catarina, Nova Teutônia, XII-1944, Fritz Plaumann.

***Prepops cruciferus* (Berg, 1878) (Fig. 47)**

Resthenia crucifera Berg, 1878: 274 (original description);
Resthenia crucifera: Berg, 1879: 124 (not seen);
Resthenia crucifera: Atkinson, 1890: 57 (not seen);
Lopus militaris Uhler, 1894A: 190 (original description);
Resthenia crucifera: Pennington, 1921: 28 (not seen);
Platytylellus cruciferus: Carvalho & Drake, 1943: 523;
Platytylellus cruciferus: Carvalho, 1951A: 104;
Platytylellus cruciferus: Carvalho, 1951B: 155;
Platytylellus cruciferus: Carvalho & Hussey, 1954: 10;
Prepops militaris: Carvalho, 1955A: 226 (not seen);
Prepops militaris: Carvalho, 1959: 338;
Prepops crucífera: Carvalho, 1959: 334;
Prepops cruciferus: Carvalho & Rosas, 1965: 210;
Prepops cruciferus: Carvalho & Fontes, 1970A: 371;
Prepops cruciferus: Carvalho & Fontes, 1971A: 120;
Prepops crucifer: Steyskal, 1973: 208;
Prepops cruciferus: Carvalho & Afonso, 1977: 12;
Prepops cruciferus: Ferreira & Rossi, 1979: 141;
Prepops cruciferus: Fontes, 1989: 6;
Prepops cruciferus: Henry, 1990: 15;
Prepops cruciferus: Carvalho & Carpintero, 1992: 90
Prepops cruciferus: Carpintero e Carvalho, 1993: 411;
Prepops cruciferus: Schuh, 1995: 989;
Prepops cruciferus: Coscarón & Carpintero, 1996: 5
Prepops cruciferus: Ferreira *et al*., 2001: 165;
Prepops cruciferus: Ferreira *et al*., 2006: 15;
Prepops cruciferus: Hernández & Henry, 2010: 92;
Prepops cruciferus: Barcellos *et al*. 2011: 118;
Prepops cruciferus: Schuh, 2011.
Prepops cruciferus: Coelho *et al*. (*in prep.)*

Diagnosis: General coloration brownish and lutescent. Head (except clypeus and eyes, sometimes fuscous), the median part of collar, area between calli, a median longitudinal stripe on pronotal disc and a transversal stripe behind calli sometimes forming a cross mark, scutellum (except basal angles), claval commissure, a longitudinal stripe in apical 2/3 of endocorium, cuneus, base of antennal segments I and II, basal half of femora, sternum and abdomen, lutescent. Abdomen with rounded fuscous spots laterally. Frons with two black spots that join clypeus. The remainder parts of body, brownish. Vesica of aedeagus with two sclerotized spines; left paramere curved and with an acute apex and subapical distension; right paramere with an acute and sclerotized apex.

Geographic distribution: USA (Henry 1990; Schuh 1995; Hernández & Henry 2010; Schuh 2011), Cuba (Schuh 1995; Hernández & Henry 2010; Schuh 2011), Ecuador (Henry 1990; Schuh 1995, 2011), Grenada (Uhler 1894A; Carvalho 1959; Carvalho & Fontes 1970A; Henry 1990;

Schuh 1995; Hernández & Henry 2010; Schuh 2011), Panama (Henry 1990; Schuh 1995, 2011), Colombia (Carvalho & Fontes 1970A; Carvalho & Afonso 1977; Schuh 1995; Hernández & Henry 2010; Schuh 2011), Suriname (Carvalho & Rosas 1965; Carvalho & Fontes 1970; Schuh 1995; Hernández & Henry 2010; Schuh 2011), Brazil (Carvalho 1951B; Carvalho 1959; Carvalho & Fontes 1970A; Ferreira & Rossi 1979; Henry 1990; Schuh 1995; Barcellos *et al.* 2001; Ferreira *et al.* 2001; Ferreira *et al.* 2006; Hernández & Henry 2010; Schuh 2011; Coelho *et al*. (*in prep*.)), Peru (Carvalho & Fontes 1970A; Carvalho & Afonso 1977; Schuh 1995; Hernández & Henry 2010; Schuh 2011), Paraguay (Carvalho 1951A; Carvalho & Hussey 1954; Carvalho 1959; Carvalho & Fontes 1970A; Henry 1990; Schuh 1995; Hernández & Henry 2010; Schuh 2011), Argentina (Berg 1878; Pennington 1921; Carvalho & Drake 1943; Carvalho 1959; Carvalho & Fontes 1970A; Henry 1990; Carvalho & Carpintero 1992; Carpintero & Carvalho 1993; Coscarón & Carpintero 1996; Schuh 1995; Hernández & Henry 2010; Schuh 2011).

Material examined: In IFML collection. One specimen: Uruguay; Aº Tres Cruces (Potrero Sucio); 20.II.955; Leg. F de H y Ciencias. Det. J. C. M. Carvalho. One specimen: Salobra (M. Grosso) Janeiro de 1955. Comissão I. O. Cruz. Det. J. C. M. Carvalho. In MCNZ collection. Male, 11110, Triunfo, RS; 20/X/1977; H. A. Gastal leg. Female, 13867, Guaiba, RS; 11-13/I/1980; M. E. L. Souza leg. Male, 15879, Guaiba, RS; 6-7/II/1980; H. A. Gastal leg. Male, 15238, Viamão, RS; 8-10/II/1980; M. E. L. Souza leg. Female, 13864, Porto Alegre, RS; 3-4/III/1980; H. A. Gastal leg. Male, 13870, Guaiba, RS; 7-9/III/1980; M. H. Galileo leg. Male, 52010, Novo Hamburgo, RS; 13/IV/1984; C. J. Becker leg. Male, 52008 and female, 52009, Novo Hamburgo, RS; 08/IV/1988; C. J. Becker leg. In MECB collection. Brasil, Pelotas,7.XII.952.

New records: Tacuarembó, Arroyo Tres Cruces (Uruguay); Mato Grosso do Sul, Salobra (Brazil).

Host plants: *Ilex cornuta* Lindl. & Paxt. (Aquafoliaceae) (Henry 1990; Hernández & Henry 2010), *Ludwigia octovalvis* (Jacq.) Raven and *L. peruvianus* (L.) Hara (Onagraceae) (Henry 1990; Hernández & Henry 2010; Schuh 2011). Onagraceae (Carvalho & Fontes, 1970 *in* Henry, 1990).

Note: *Platytylellus poppii* Bergroth, 1910 was synonymized with *P. cruciferus* by Carvalho & Fontes (1970A). Henry (1990) includes this synonymy in his paper about *P. cruciferus*. Later, Schuh (1995, 2008) maintains *P. poppii* as a valid species. Here the authors follows Schuh (2011) and the distribution cited above is the real distribution of *P. cruciferus*. *P. poppii* distribution is going to be included in the part II of this revision.

***Prepops cruxnigrum* (Reuter, 1910) (Fig. 48)**

Platytylellus crux nigrum Reuter, 1910A: 31 (original description)
Prepops cruxnigrum: Carvalho, 1959: 334
Prepops cruxnigrum: Carvalho et al., 1968: 390
Prepops cruxnigra: Steyskal, 1973: 208
Prepops cruxnigrum: Froeschner, 1981
Prepops cruxnigrum: Schuh, 1995: 989
Prepops cruxnigrum: Schuh, 2011

Diagnosis: General coloration black and yellowish. Head with frons, mandibular plate apex, base of clypeus and maxillary plate; pronotum with lateral margins (except collar sides) and a

longitudinal median stripe on disc; apical half of clavus, corium and embolium; apical portion of corium and embolium; and cuneus near coastal fracture, yellowish. Ventral side yellowish (except mesosternum, a spot on mesopleuron and metapleuron, the last abdominal segment, ovipositor, rostrum and legs) (modified from Carvalho *et al.* 1968).

Geographic distribution: Ecuador (Reuter 1910A; Carvalho 1959; Carvalho *et al.* 1968; Froeschner 1981; Schuh 1995, 2011).

***Prepops cubanus* Carvalho & Schaffner, 1974 (Fig. 49)**

Prepops cubanus Carvalho & Schaffner, 1974: 625 (original description)
Prepops cubanus: Hernández & Henry, 2010: 93
Prepops cubanus: Schuh, 1995: 989
Prepops cubanus: Schuh, 2011

Diagnosis: General coloration black and reddish. Head (except eyes, antennae, clypeus, frons and vertex), rostrum segment I, pronotum (except a longitudinal spot in the middle of disc), ventral side (except pygophore and legs), reddish. Basal two thirds of middle and hind femora, reddish. The remainder parts of body, black. Vesica of aedeagus with one sclerotized spine and membranous lobes; left paramere curved and with a rounded apex; right paramere tapering towards the apex (modified from Carvalho & Schaffner 1974).

Geographic distribution: Cuba (Carvalho & Schaffner 1974; Hernández & Henry 2010; Schuh 1995, 2011).

***Prepops cuzcoensis* Carvalho, 1988 (Fig. 50)**

Prepops cuzcoensis Carvalho, 1988B: 417 (original description)
Prepops cuzcoensis: Schuh, 1995: 989
Prepops cuzcoensis: Schuh, 2011

Diagnosis: General coloration black, yellowish and reddish. Head sides (except clypeus, maxillary and mandibular plates, and a spot on gena), pronotum (except middle of collar), mesoscutum, hemelytra base and apex (including cuneus base), xiphus, propleuron and mesopleuron, reddish. Coxae apex, trochanters and femora base, yellowish. The remainder parts of body, black. Vesica of aedeagus with three simple sclerotized spines and one with superficial apical teeth, and one membranous lobe; left paramere curved with a rounded apex and a subapical tooth; right paramere with a sclerotized and acute apex (modified from Carvalho 1988B).

Geographic distribution: Peru (Carvalho 1988B; Schuh 1995, 2011).

***Prepops decoratus* (Reuter, 1910) (Fig. 51)**

Platytylellus decoratus Reuter, 1910A: 32 (original description)
Prepops decoratus: Carvalho & Fontes, 1971C: 319
Prepops decoratus: Carvalho, 1959: 334
Prepops decoratus: Schuh, 1995: 989
Prepops decoratus: Schuh, 2011

Diagnosis: General coloration black and lutescent. Head (except eyes, antennae and clypeus); collar, area between calli and two spots on disc that not reaches pronotum posterior margin, pronotum lateral margins, mesoscutum, scutellum, apical third of corium internal margin, cuneus (except apex) and ventral side (except abdominal segments II-IV, a spot on each side of mesosternum, femora superior margin, tibiae and tarsi), lutescent. The remainder parts of body, black. Vesica of aedeagus with four simple and long sclerotized spines, one sclerotized spine bent and shorter, and membranous lobes; left paramere curved, with an acute apex and subapical distension; right paramere with an acute apex (modified from Carvalho & Fontes 1971C)

Geographic distribution: Peru (Reuter 1910A; Carvalho 1959; Carvalho & Fontes 1971C; Schuh 1995, 2011).

***Prepops diamantinensis* Carvalho, 1984 (Fig. 52)**

Prepops diamantinensis Carvalho, 1984: 105 (original description)
Prepops diamantinensis: Schuh, 1995: 989
Prepops diamantinensis: Schuh, 2011

Diagnosis: General coloration brownish and lutescent. Head (except a spot on vertex and frons, eyes, clypeus and antennae), collar median portion, area between calli and a median longitudinal stripe on disc which becomes wider towards the posterior margin, a median longitudinal stripe on scutellum, cuneus (except internal margin and apex), ventral part (except femora apical half, tibiae and tarsi), lutescent. The remainder parts of body, brownish. Vesica of aedeagus with two sclerotized spines and membranous lobes covered by small teeth; left paramere with a rounded apex and a tumid and pointy basal lobe; right paramere with an acute apex.

Geographic distribution: Brazil (Carvalho 1984; Schuh 1995, 2011).

Material examined: In MNRJ collection. One specimen, paratype, Brasil, Mato Grosso, Faz. S. João, Km 20, Br 163, Roppa. Two females and one male, Goiás, Campinaçu, X.92, Roppa, col.

***Prepops diminutus* Carvalho & Fontes, 1973 (Fig. 53)**

Prepops diminutus Carvalho & Fontes, 1973: 539 (original description)
Prepops diminutus: Schuh, 1995: 989
Prepops diminutus: Schuh, 2011

Diagnosis: General coloration black, reddish and yellowish. Head (except two spots on frons, clypeus, eyes, rostrum and antennae, that are black), embolium and cuneus external margin, yellowish. Pronotum (males with a fuscous spot behind calli), scutellum and ventral side (except legs, ovipositor and pygophore, that are black), reddish. The remainder parts of body, black. Vesica of aedeagus with three sclerotized spines and two membranous lobes; left paramere curved, with an acute apex and subapical distension; right paramere with an acute apex (modified from Carvalho & Fontes 1973).

Geographic distribution: USA (Carvalho & Fontes 1973; Schuh 1995, 2011).

***Prepops dissociatus* (Berg, 1892) (Fig. 54)**

Resthenia Resthenia dissociata Berg, 1892: 87 (original description)
Prepops dissociata: Carvalho, 1959: 335
Prepops dissociatus: Carvalho & Fontes, 1970A: 372
Prepops dissociatus: Steyskal, 1973: 208
Resthenia dissociata: Carvalho & Carpintero, 1992
Resthenia dissociata: Coscarón & Carpintero, 1996
Prepops dissociata: Schuh, 1995: 989
Prepops dissociata: Schuh, 2011

Diagnosis: General coloration brownish and yellowish. Head with antennae, clypeus, frons middle area and two spots on vertex, scutellum (except a longitudinal middle stripe) and membrane, brownish. Pronotum yellowish with two large brownish longitudinal stripes on disc. Hemelytra brownish. Ventral side yellowish with a spot on mesosternum, mesopleuron, metapleuron, lateral spots on abdomen, pygophore, femora apex, tibiae and tarsi, dark brown. Vesica of aedeagus with one sclerotized spine, membranous lobes with and without superficial spines; left paramere curved, with an acute apex and subapical distension; right paramere with an acute and sclerotized apex (modified from Carvalho & Fontes 1970A).

Geographic distribution: Argentina (Berg 1892; Carvalho 1959; Carvalho & Fontes 1970A; Carvalho & Carpintero 1992; Schuh 1995; Coscarón & Carpintero 1996; Schuh 2011) Uruguay (Berg 1892; Carvalho 1959; Carvalho & Fontes 1970A; Carvalho & Carpintero 1992; Schuh 1995; Coscarón & Carpintero 1996; Schuh 2011).

***Prepops divisus* Herrich-Schaeffer, 1850 (Fig. 55)**

Capsus divisus Herrich-Schaeffer, 1850: 167 (original description) (not seen)
Resthenia divisa: Stål, 1862
Resthenia divisa: Distant, 1893: 258
Capsus divisus: Distant, 1893: 272
Prepops divisus: Carvalho, 1959: 335
Prepops divisus: Henry & Froeschner, 1988: 378
Prepops divisus: Schuh, 1995: 989
Prepops divisus: Schuh, 2011

Diagnosis: General coloration black and reddish. Head (except eyes and antennae), pronotum, mesoscutum, scutellum, xiphus, pleurae and sterna, reddish. The remainder parts of body, black.

Geographic distribution: USA (Henry & Froeschner 1988; Schuh 1995, 2011), Mexico (Distant 1893; Henry & Froeschner 1988; Schuh 1995, 2011)

***Prepops flavicostus* (Berg, 1884) (Fig. 56)**

Resthenia flavicosta Berg, 1884: 189 (original description) (not seen)

Resthenia flavicosta: Atinkson, 1890: 58 (not seen)
Platytylellus angularis Reuter, 1910A: 21 (original description)
Platytylellus flavicostus: Slater, 1950: 38
Prepops angularis: Carvalho, 1959: 331
Prepops flavicosta: Carvalho, 1959: 335
Prepops flavicosta: Carvalho & Fontes, 1970B: 800
Prepops flavicostus: Carvalho & Fontes, 1971A: 121
Prepops flavicostus: Fontes, 1989: 7
Prepops flavicostus: Carvalho & Carpintero, 1992: 91
Prepops flavicosta: Carpintero & Carvalho, 1993: 411
Prepops flavicostus: Schuh, 1995: 990
Prepops flavicostus: Coscarón & Carpintero, 1996: 5
Prepops flavicostus: Schuh, 2011
Prepops flavicostus: Coelho *et al.* (*in press.*)

Diagnosis: General coloration black and lutescent. Collar (except median part or, sometimes, the anterior part, not including the sides), humeral angles from pronotum, embolium and corium thin external border, external part from cuneus, femora base, coxae, xiphus, rostrum base and inferior part from propleuron lutescent to pale yellow. Vesica of aedeagus with one sclerotized spine; left paramere curved with an acute apex and a subapical tooth; right paramere with an acute apex (modified from Carvalho & Fontes 1970B).

Geographic distribution: Peru (Carvalho & Fontes 1970B; Schuh 1995, 2011), Brazil (Reuter 1910A; Slater 1950; Carvalho 1959; Carvalho & Fontes 1970B; Carvalho & Fontes 1971A; Schuh 1995, 2011; Coelho *et al.* (*in press.*)), Argentina (Berg 1884; Carvalho 1959; Carvalho & Fontes 1970B; Fontes 1989; Carvalho & Carpintero 1992; Carpintero & Carvalho 1993; Coscarón & Carpintero 1996; Schuh 1995, 2011;), Uruguay (Carvalho & Fontes 1970B).

***Prepops flavoniger* (Stål, 1860) (Fig. 57)**

Resthenia flavo-nigra Stål, 1860: 46 (original description)
Capsus flavoniger: Walker, 1873: 107 (not seen)
Resthenia flavonigra: Reuter, 1876: 64 (not seen)
Resthenia correntina Berg, 1878: 279 (original description)
Resthenia correntina: Berg, 1879: 127 (not seen)
Resthenia correntina: Atinkson, 1890: 56 (not seen)
Platytylellus flavoniger: Reuter, 1907: 76 (not seen)
Platytylellus flavoniger: Reuter, 1913: 44 (not seen)
Prepops flavonigra: Bergroth, 1922: 6 (not seen)
Platytylellus flavonigrus: Carvalho, 1951AB: 104
Platytylellus flavoniger: Carvalho & Hussey, 1954: 10
Prepops correntina: Carvalho, 1959: 334
Prepops flavoniger: Carvalho, 1959: 335
Prepops flavoniger: Carvalho & Fontes, 1970A: 373
Prepops correntinus: Steyskal, 1973: 208
Prepops flavoniger: Carvalho & Afonso, 1977: 12
Prepops flavoniger: Ferreira & Rossi, 1979: 141
Prepops flavoniger: Fontes, 1989: 8

Prepops flavoniger flavoniger: Carpintero & Carvalho, 1993: 411
Prepops flavoniger: Schuh, 1995: 990
Prepops flavoniger: Coscarón & Carpintero, 1996: 4
Prepops flavoniger: Maes, 1998
Prepops flavoniger: Ferreira *et al.,* 2001: 165
Prepops correntinus: Ferreira *et al.,* 2006: 15
Prepops flavoniger: Ferreira *et al.,* 2006: 15
Prepops flavoniger: Schuh, 2011

Diagnosis: General coloration black and reddish. Pronotum (except for a black longitudinal stripe on middle part of collar, between calli and becoming thicker towards the disc), propleuron and basal part of femora, reddish. The reminder parts of body, black. Vesica of aedeagus with two sclerotized spines, one simple and the other forked and membranous lobes covered by minute teeth; left paramere curved with an acute apex; right paramere forked on apex.

Geographic distribution: Nicaragua (Maes 1998), Venezuela (Carvalho & Afonso 1977; Schuh 1995; Maes 1998), Brazil (Stål 1860; Carvalho 1951B; Carvalho 1959; Carvalho & Fontes 1970A; Carvalho & Afonso 1977; Ferreira & Rossi 1979; Fontes 1989; Schuh 1995; Maes 1998; Ferreira *et al*. 2001; Ferreira *et al*. 2006), Argentina (Berg 1878; Carvalho 1951A; Carvalho 1959; Carvalho & Fontes 1970A; Carpintero & Carvalho 1993; Schuh 1995; Coscarón & Carpintero 1996; Maes 1998), Paraguay (Carvalho 1951A; Carvalho 1959; Carvalho & Hussey, 1954).

Material examined: In IFML collection. One specimen: *Prepops correntinus* (Berg). Tucuman, Dto Leales, V-47, Col. Morales. Det. J. C. M. Carvalho. In MNRJ collection. One male and one female, Aragarças, Goiás, Brasil, Carvalho col.; one specimen, Pará, Rio Gurupi, IV.963 B. Malkinsi col. Two males, R. Argentina, Santiago del estero, 935, col Carvalho. In UFVB collection. Male, Minas Gerais, Viçosa, 16-4-88, col Jair. One specimen, Viçosa, 16-4-80, col Jair.

New record: Tucuman (Argentina).

***Prepops latipennis* (Stål, 1862) (Fig. 58)**

Resthenia latipennis Stål, 1862: 318 (original description)
Capsus latipennis: Walker, 1873: 98 (not seen)
Resthenia univittata Distant, 1883: 253 (original description)
Resthenia latipennis: Distant, 1883: 253
Resthenia latipennis: Atkinson, 1890: 61 (not seen)
Resthenia pannosa Distant, 1893: 425 (original description)
Resthenia latipennis: Uhler, 1894B: 249 (not seen)
Opistheuria latipennis: Reuter, 1908: 171
Opistheuria latipennis: Reuter, 1913: 50 (not seen)
Opistheuria latipennis: Van Duzee, 1917A: 312 (not seen)
Platytylellus latipennis: Carvalho, 1951B: 155
Platytylellus latipennis: Carvalho, 1952B: 98 (not seen)
Platytylellus championi: Carvalho, 1952A: 16
Prepops latipennis: Carvalho, 1959: 337
Prepops championi: Carvalho, 1959: 333

Prepops latipennis: Carvalho & Fontes, 1970A: 375
Prepops latipennis: Carvalho & Fontes, 1971A: 119
Prepops latipennis: Alayo, 1974: 13 (not seen)
Prepops latipennis: Carvalho & Dolling, 1976: 804, 809
Prepops latipennis: Carvalho & Afonso, 1977: 12
Prepops latipennis: Fontes, 1989: 9
Prepops championi: Schuh, 1995: 988
Prepops latipennis: Schuh, 1995: 992
Prepops latipennis: Maes, 1998
Prepops latipennis: Hernández & Henry, 2010: 93
Prepops championi: Schuh, 2011
Prepops latipennis: Schuh, 2011

Geographic distribution: Mexico (Stål 1862; Distant 1883; Distant 1893; Reuter 1908; Carvalho 1951B; Carvalho 1959; Carvalho & Fontes 1970A; Carvalho & Dolling 1976; Carvalho & Afonso 1977; Fontes 1989; Schuh 1995; Maes 1998; Hernández & Henry 2010; Schuh 2011), Guatemala (Distant 1883; Carvalho 1959; Carvalho & Fontes 1970A; Carvalho & Dolling 1976; Schuh 1995, 2011), El Salvador (Maes 1998), Honduras (Carvalho 1951B; Carvalho 1959; Carvalho & Fontes 1970A; Maes 1998), Nicaragua (Maes 1998), Costa Rica (Carvalho 1951B; Carvalho 1959; Carvalho & Fontes 1970A; Maes 1998), Cuba (Hernández & Henry 2010; Schuh 2011).

Diagnosis: General coloration black, reddish and lutescent. Pronotum (except for a black longitudinal stripe on disc and sometimes, a black spot on pronotum basal angles), head lateral and ventral parts, propleuron and abdomen (except apex), reddish. Sterna, pleurae, coxae and posterior femora basal part, lutescent. The reminder parts of body, black. Vesica of aedeagus with one sclerotized spine and membranous lobes covered by minute teeth; left paramere curved with a rounded apex; right paramere with a blunt apex (modified from Carvalho & Fontes 1970A).

Note: *Resthenia univittata* Distant, 1883 is a preoccupied name by *Resthenia univittata* Berg, 1879. Thus Carvalho & Fontes (1952) proposed *Prepops championi* nom. nov. to Distant species.

Carvalho & Fontes (1970A) stated that Reuter (1913) mentioned *R. univittata* Distant as a synonym of *Prepops latipennis* (Stål, 1862) and that this work had not been considered so far. In 1969, the first author studied Distant's type and agreed with Reuter and figured R. *univittata* Distant (at that time *P. championi*) as a synonym of *P. latipennis* (Stål).

Carvalho & Dolling, 1976 also reported *Resthenia univittata* Distant, 1883 as a synonym of *Prepops latipennis* (Stål, 1862). By investigating the bibliography of this species, the authors of the present work observed that in the Supplement of Biologia Centrali Americana (Distant 1880-1893) Distant wrote that while observing other specimens convinced himself that *R. univittata* Distant, 1883 is only a variance form of *Resthenia latipennis* (Stål, 1862).

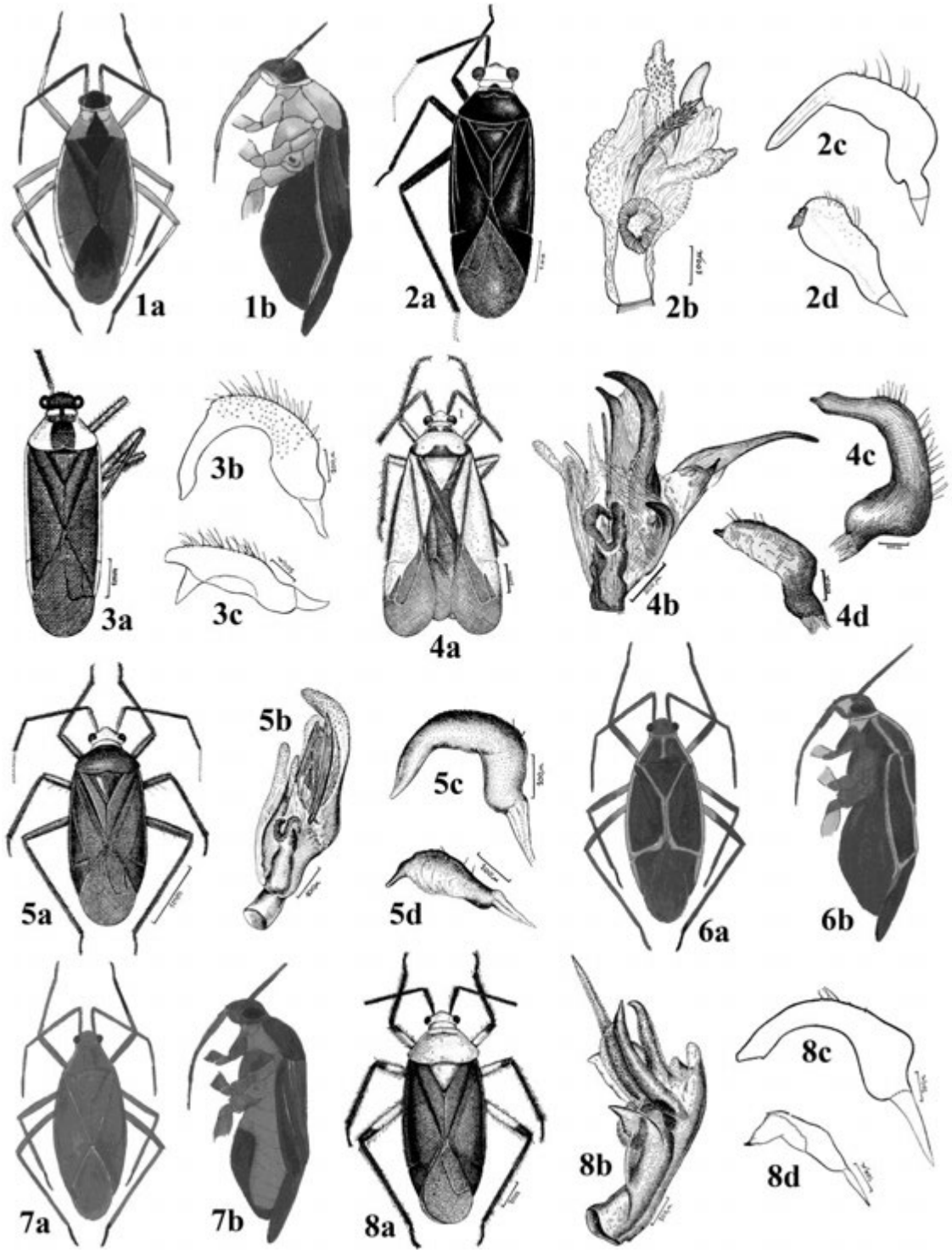
Nowadays, the most recent world's Miridae catalog (Schuh 2011) maintains Carvalho's classification (1959) and deals with *P. championi* and *P. latipennis* as distinc species.

It was not possible to observe the holotype (unique specimen of the species) from *R. univittata* Distant that is in British museum and partially damaged. But by studing the works of Carvalho & Fontes (1970A), Reuter (1913) and Distant (1880-1883), competent researchers who have had the opportunity to see the holotype of *P. championi*, the authors of the present study agree with the synonymy proposed by them.

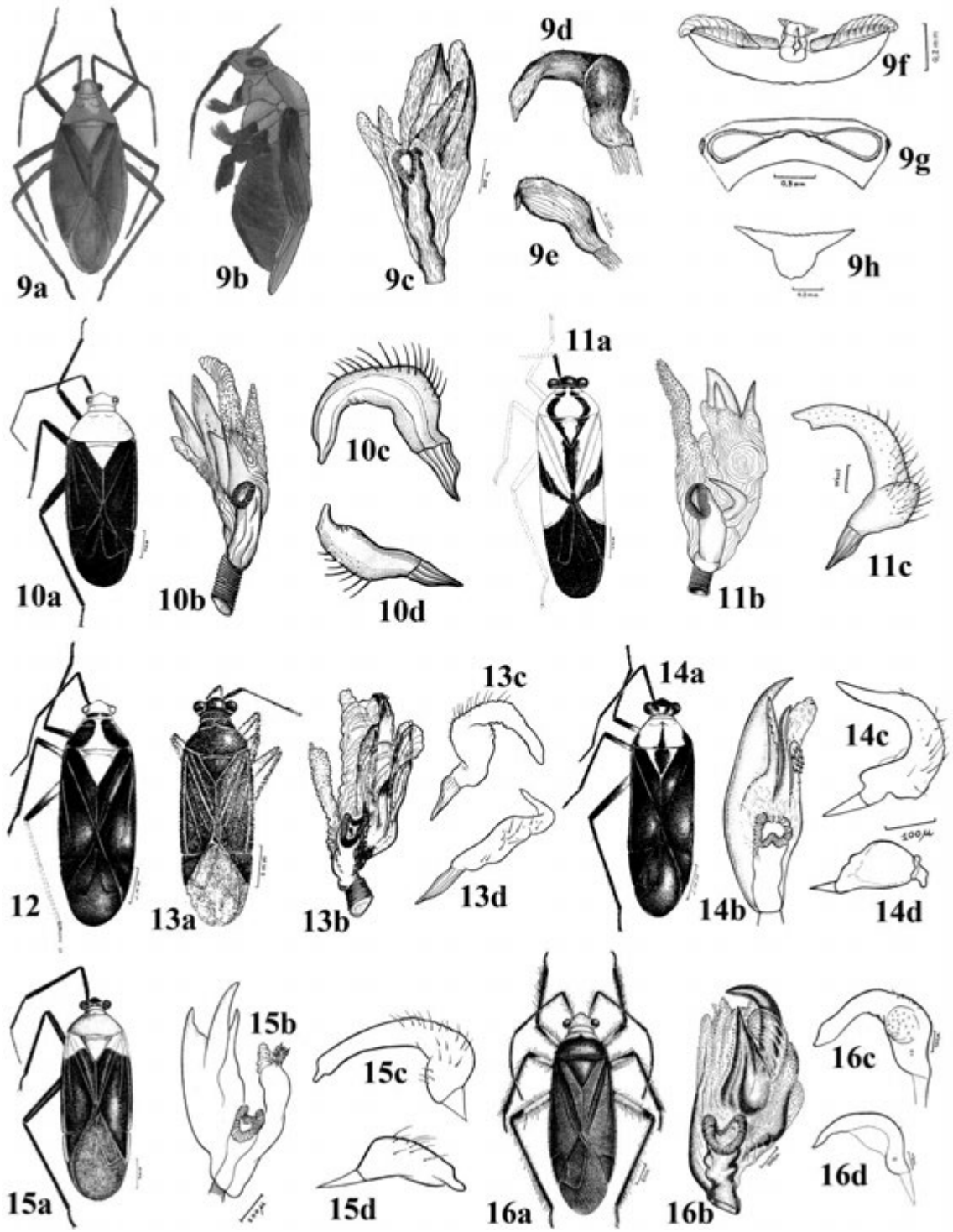
By recovering this synonymy the number of *Prepops* species now goes to 198.

Acknowledgments

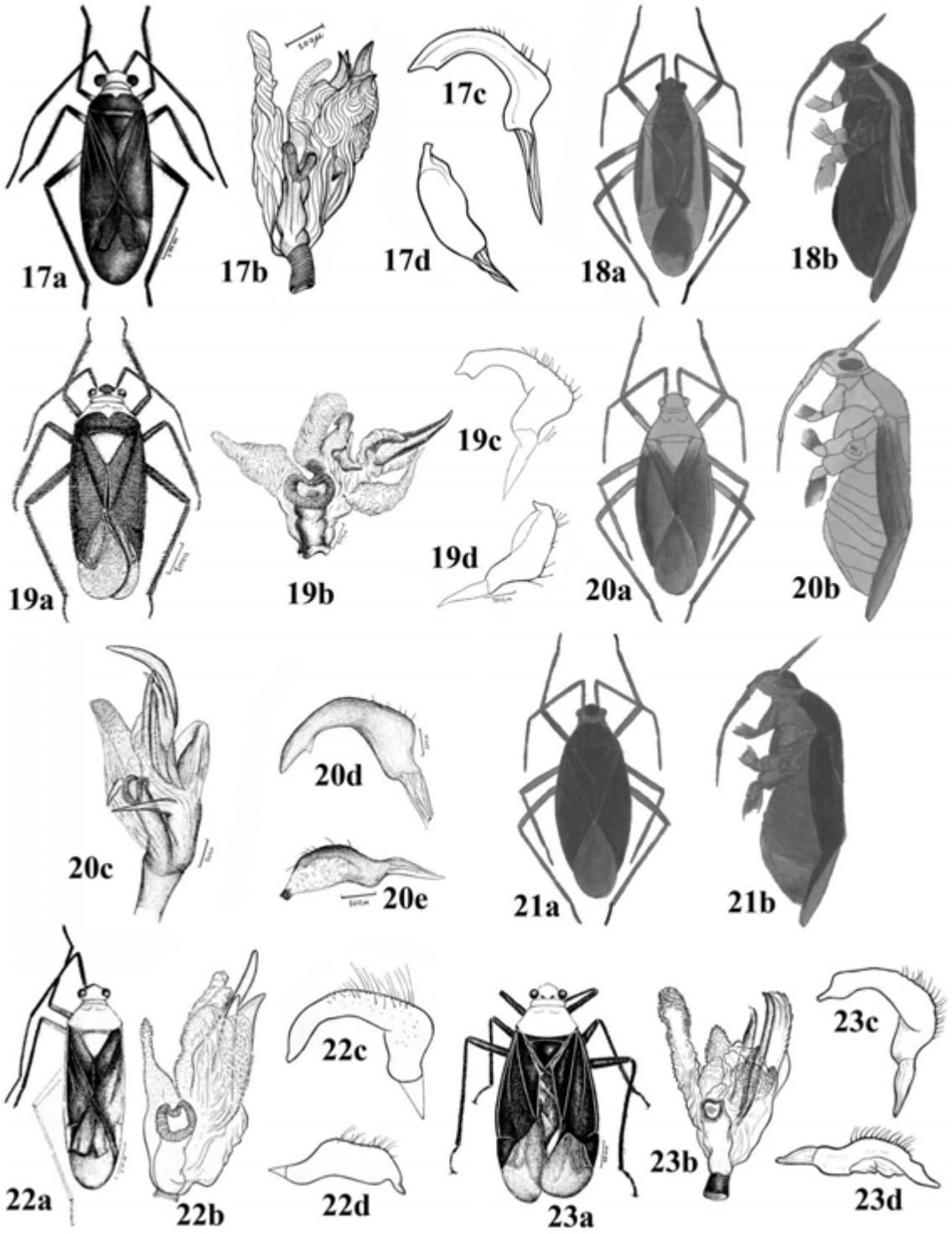
We are grateful to Aline Barcellos P. dos Santos and Jocélia Grazia for sending mirids for identification from the Museu de Ciências Naturais of the Fundação Zoobotânica do Rio Grande do Sul and the Departamento de Zoologia, Universidade Federal do Rio Grande do Sul; to Carlos Molineri for provinding *Prepops* from Fundación y Instituto Miguel Lillo for study. To Luiz Antônio Alves Costa, Museu Nacional of Rio de Janeiro, for providing some specimens and important mirid bibliography. We are also grateful to CNPq for providing funds to the first author to conduct post-graduate studies at the Universidade Federal de Viçosa.



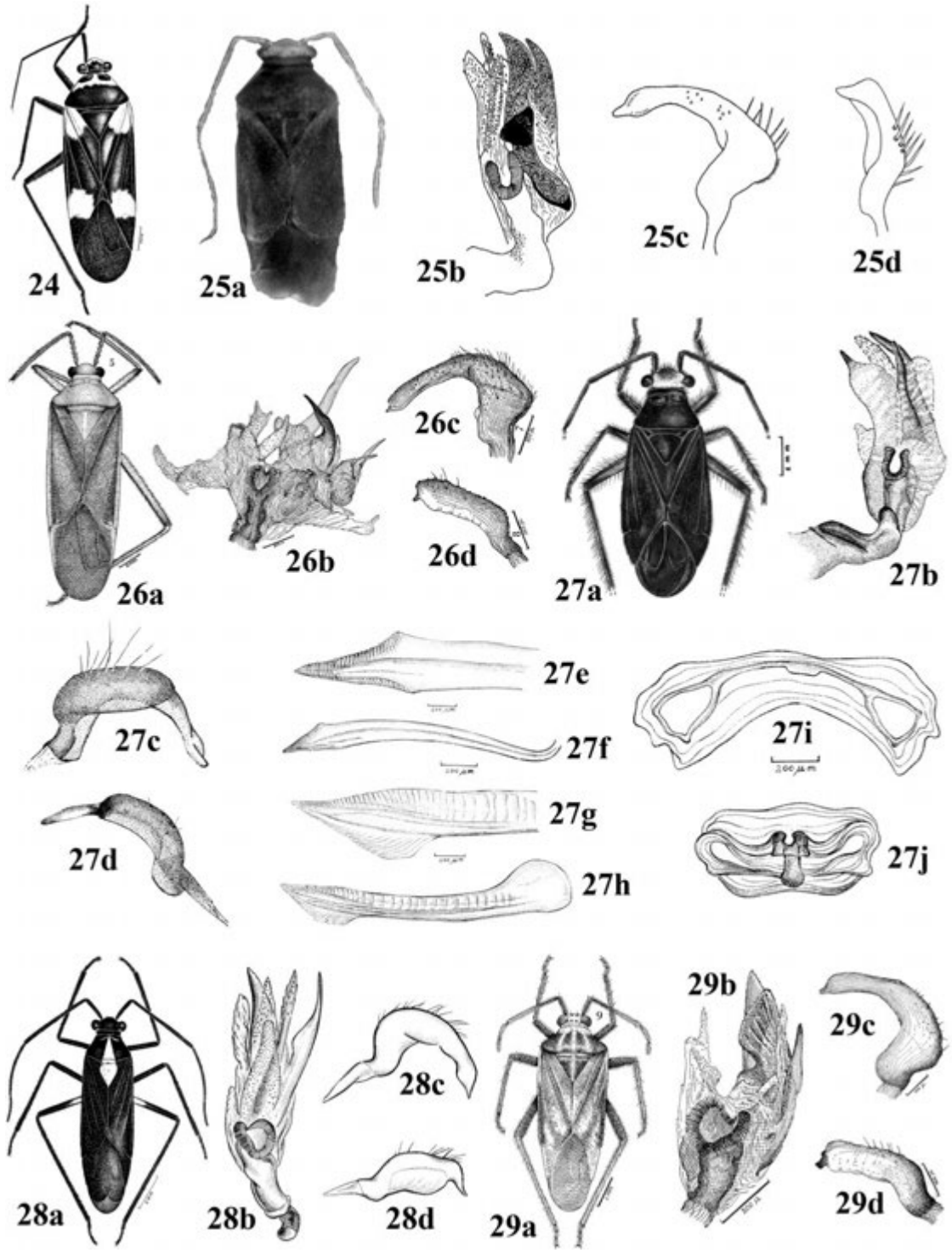
Figures 1–8: Fig. 1a, *P. accinctus* (Distant), specimen compared with type; 1b, lateral view (illustrated by J. C. M. Carvalho). Fig. 2a, *P. adluteiceps* Carvalho, male, holotype; 2b, vesica of aedeagus; 2c, left paramere; 2d, right paramere (redrawn from Carvalho 1988). Fig. 3a, *P.albomarginatus* (Reuter), male, holotype; 3b, left paramere; 3c, right paramere (redrawn from Carvalho *et al.* 1968). Fig. 4a, *P. alienus* (Reuter), male, paratype; 4b, vesica of aedeagus; 4c, left paramere; 4d, right paramere (redrawn from Carvalho & Fontes, 1970B). Fig. 5a, *P. anasueliae* Carvalho & Fontes, male, holotype; 5b, vesica of aedeagus; 5c, left paramere; 5d, right paramere (redrawn from Carvalho & Fontes, 1970A). Fig. 6a, *P. areatus* (Reuter), dorsal view; 6b, lateral view (illustrated by J. C. M. Carvalho). Fig. 7a, *P. atratus* (Distant), dorsal view; 7b, lateral view (illustrated by J. C. M. Carvalho). Fig. 8a, *P. atripennis* (Reuter), male, paratype; 8b, vesica of aedeagus; 8c, left paramere; 8d, right paramere (redrawn from Carvalho & Fontes, 1971B).



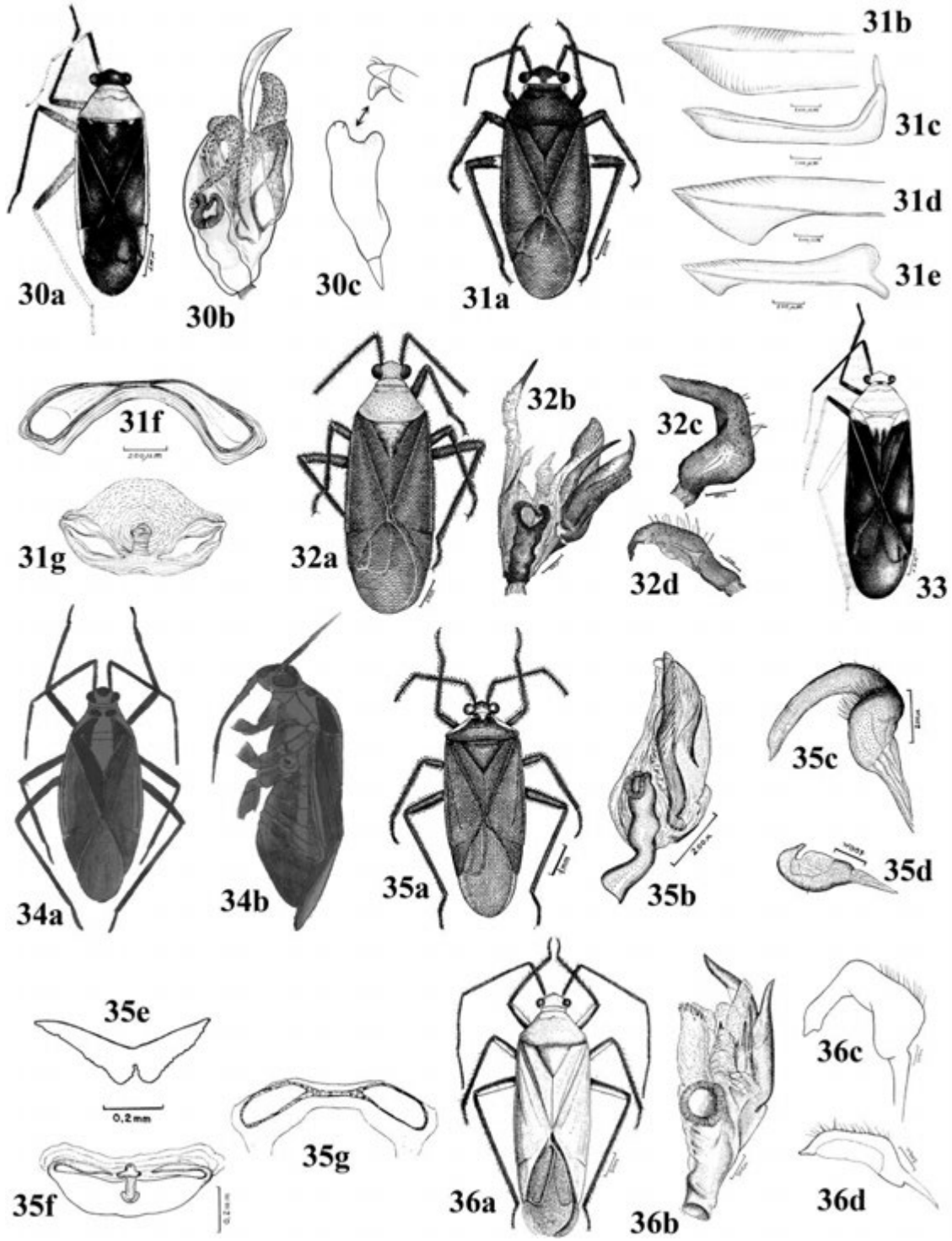
Figures 9–16: Fig. 9a, *P. atroluteus* (Walker), female compared with type; 9b, lateral view (illustrated by J. C. M. Carvalho); 9c, vesica of aedeagus; 9d, left paramere; 9e, right paramere (redrawn from Carvalho & Fontes, 1969); 9f, posterior wall; 9g, sclerotized rings; 9h, sclerotized plate of anterior gonapophyses (redrawn from Fontes, 1989). Fig. 10a, *P. bachmanni* Carvalho & Carpintero, male, holotype; 10b, vesica of aedeagus; 10c, left paramere; 10d, right paramere (redrawn from Carvalho & Carpintero 1990). Fig. 11a, *P. banosus* Carvalho, male, holotype; 11b, vesica of aedeagus; 11c, left paramere (redrawn from Carvalho 1988B). Fig. 12, *P. barueriensis* Carvalho, female, holotype (redrawn from Carvalho 1988A). Fig. 13a, *P. bastensis* Carvalho & Costa, male, holotype; 13b, vesica of aedeagus; 13c, left paramere; 13d, right paramere (redrawn from Carvalho & Costa 1991). Fig. 14a, *P. bechynei* Carvalho, female, holotype; 14b, vesica of aedeagus; 14c, left paramere; 14d, right paramere (redrawn from Carvalho 1988A). Fig. 15a, *P. beniensis* Carvalho, male, holotype; 15b, vesica of aedeagus; 15c, left paramere; 15d, right paramere (redrawn from Carvalho 1988B). Fig. 16a, *P. bicolor* (Distant), female; 16b, vesica of aedeagus; 16c, left paramere; 16d, right paramere (redrawn from Carvalho & Fontes 1971B).



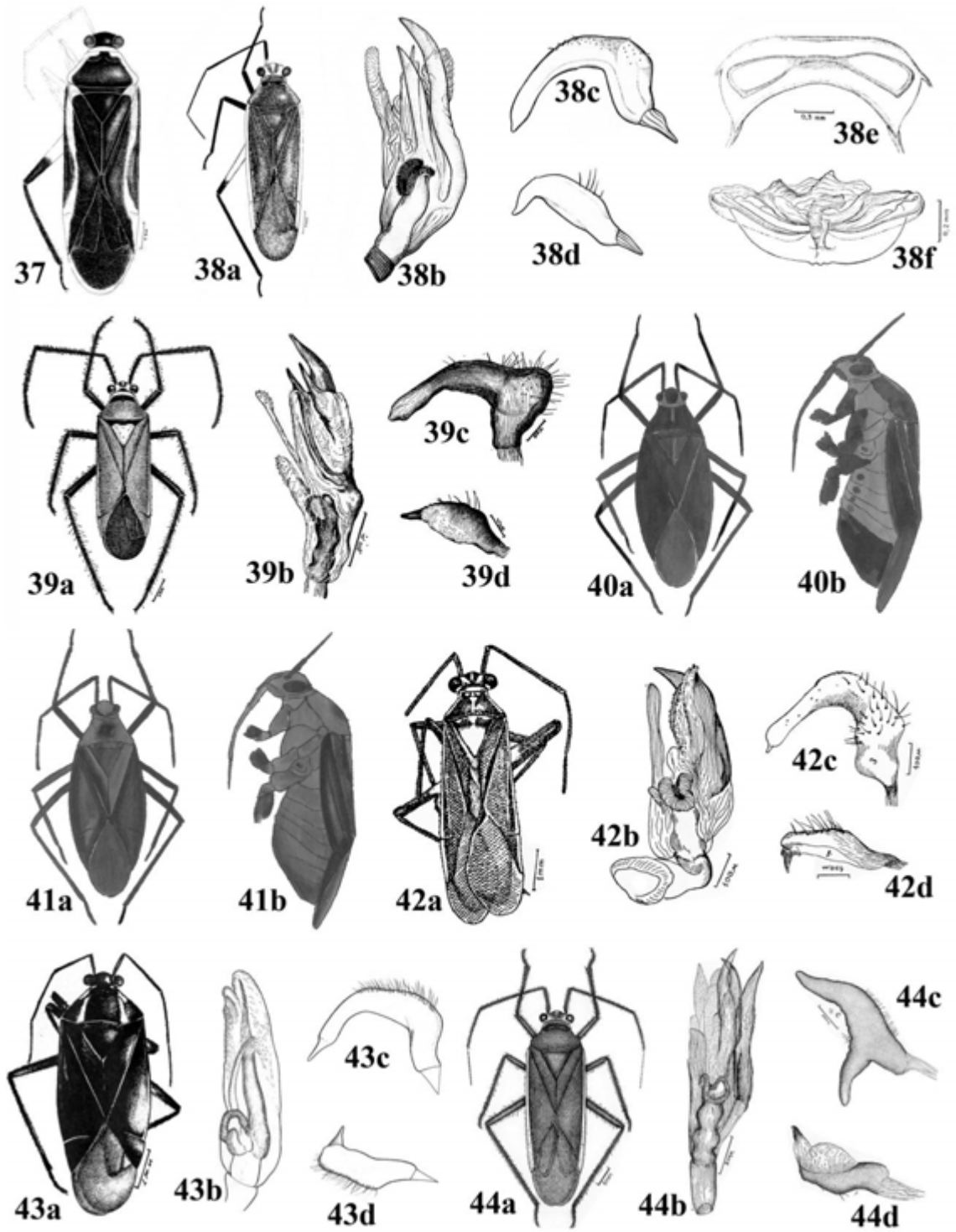
Figures 17–23: Fig. 17a, *P. bicoloroides* Carvalho & Schaffner, male; 17b, vesica of aedeagus; 17c, left paramere; 17d, right paramere (redrawn from Carvalho & Schaffner 1987). Fig. 18a, *P. bivittatus* (Stål), female, holotype; 18b, lateral view (illustrated by J. C. M. Carvalho). Fig. 19a, *P. bivittis* (Stål); 19b, vesica of aedeagus; 19c, left paramere; 19d, right paramere (redrawn from Carvalho & Fontes 1971B). Fig. 20a, *P. bolivianus* Carvalho & Fontes; 20b, lateral view (illustrated by J. C. M. Carvalho); 20c, vesica of aedeagus; 20d, left paramere; 20e, right paramere (modified from Carvalho & Fontes 1969). Fig. 21a, *P. borealis* (Knight); 21b, lateral view (illustrated by J. C. M. Carvalho). Fig. 22a, *P. caatinganus* Carvalho, male, holotype; 22b, vesica of aedeagus; 22c, left paramere; 22d, right paramere (redrawn from Carvalho 1988A). Fig. 23a, *P. cajuruensis* Carvalho & Costa, male, holotype; 23b, vesica of aedeagus; 23c, left paramere; 23d, right paramere (redrawn from Carvalho & Costa 1991).



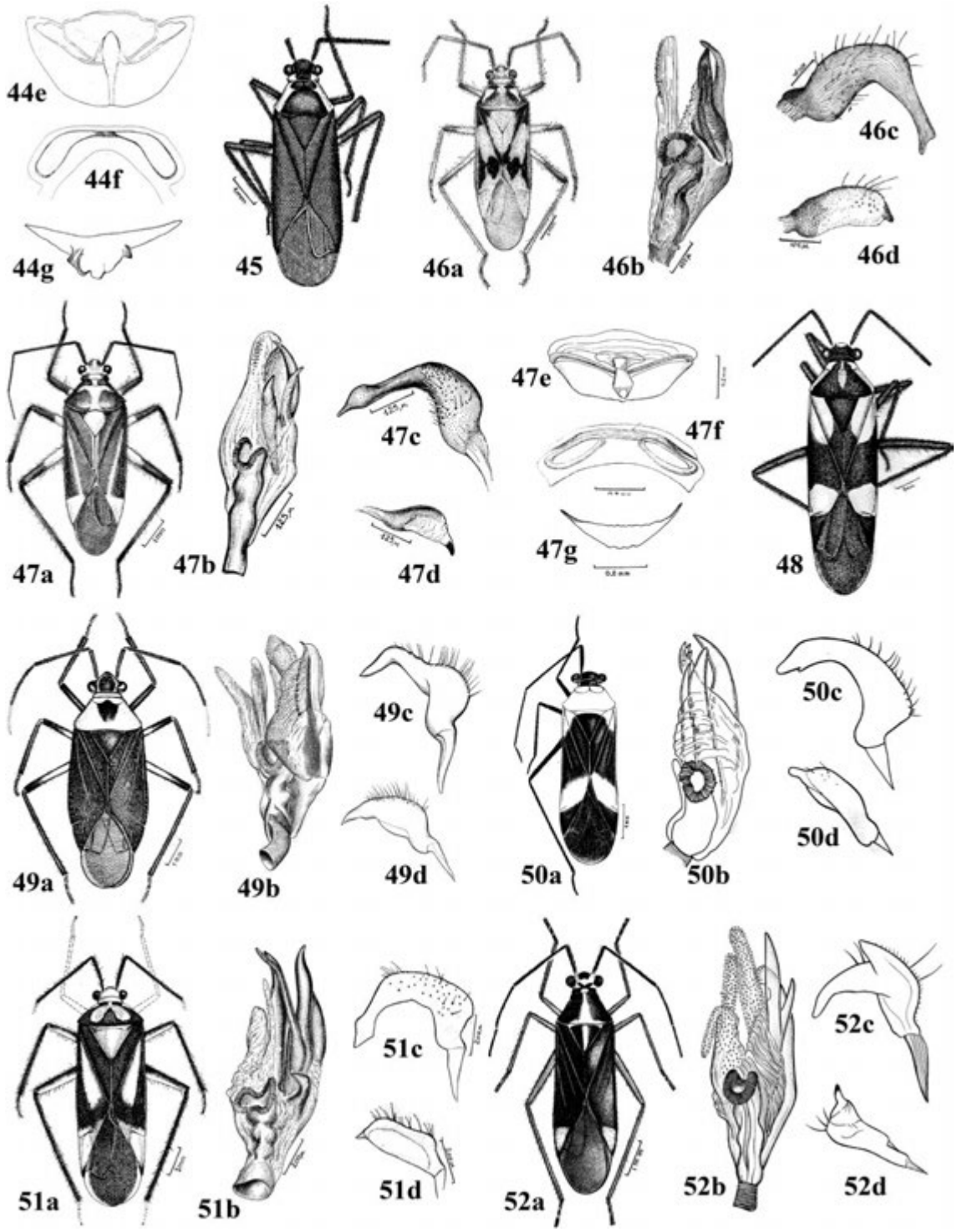
Figures 24–29: Fig. 24, *P. caliensis* Carvalho, female, holotype (redrawn from Carvalho 1989). Fig. 25a, *P. candelariensis* Hernández & Henry, holotype; 25b, vesica of aedeagus; 25c, left paramere; 25d, right paramere (redrawn from Hernández & Henry 2010). Fig. 26, *P. canelae* Carvalho & Fontes, male, holotype; 26b, vesica of aedeagus; 26c, left paramere; 26d, right paramere (redrawn from Carvalho & Fontes 1970B). Fig. 27a, *P. cangussuensis* Coelho *et al.* (*in prep.*) male, holotype; 27b, vesica of aedeagus; 27c, left paramere; 27d, right paramere; 27e,f, anterior gonapophyses; 27g,h, posterior gonapophyses; 27i, sclerotized rings; 27j, posterior wall (redrawn from Coelho *et al. in prep*.). Fig. 28a, *P. caracensis* Carvalho, male, holotype; 28b, vesica of aedeagus; 28c, left paramere; 28d, right paramere (redrawn from Carvalho 1974). Fig. 29a, *P. carioca* Carvalho & Fontes, male, holotype; 29b, vesica of aedeagus; 29c, left paramere; 29d, right paramere (redrawn from Carvalho & Fontes 1970B).



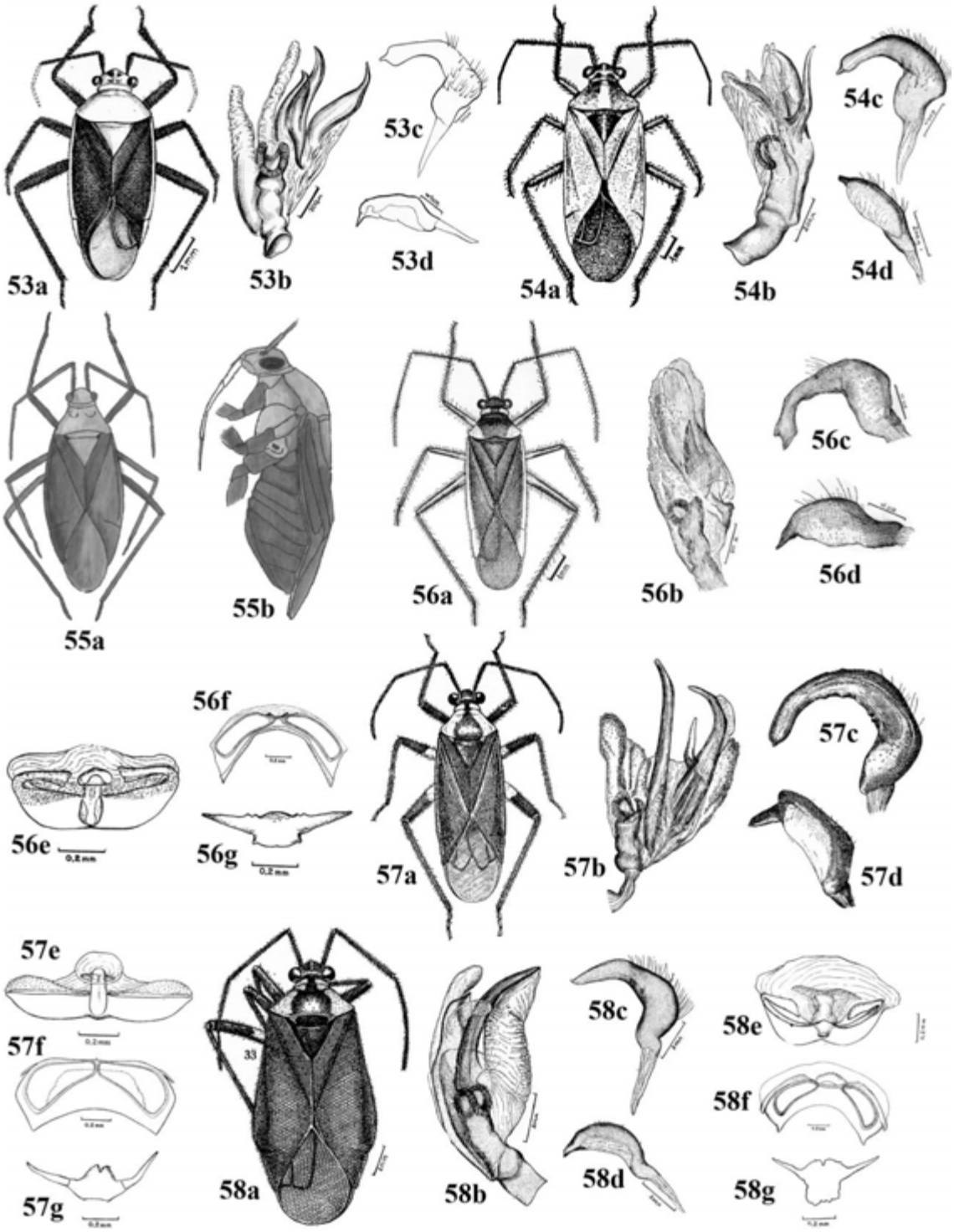
Figures 30–36: Fig. 30a, *P. casualis* Carvalho, male, holotype; 30b, vesica of aedeagus; 30c, left paramere (redrawn from Carvalho 1988B). Fig. 31a, *P. catamarcanus* Carvalho, female, holotype (redrawn from Carvalho 1988B); 31b,c, anterior gonapophyses; 31d,e, posterior gonapophyses; 31f, sclerotized rings; 31g, posterior wall (redrawn from Coelho *et al. in prep*.). Fig. 32a, *P. catarinensis* Carvalho & Fontes, male, holotype; 32b, vesica of aedeagus; 32c, left paramere; 32d, right paramere (redrawn from Carvalho & Fontes 1970B). Fig. 33, *P. chamchamaianus* Carvalho, female, holotype (redrawn from Carvalho 1988B). Fig. 34a, *P. circumcinctus* (Say), dorsal view; 34b, lateral view (illustrated by J. C. M. Carvalho). Fig. 35a, *P. circummaculatus* (Stål), female, compared with type; 35b, vesica of aedeagus; 35c, left paramere; 35d, right paramere (redrawn from Carvalho & Fontes 1970A); 35e, sclerotized plate of anterior gonapophyses; 35f, posterior wall (redrawn from Fontes 1989); 35g, sclerotized rings (redrawn from Slater, 1950). Fig. 36a, *P. columbiensis* (Carvalho & Fontes), male, holotype; 36b, vesica of aedeagus; 36c, left paramere; 36d, right paramere (redrawn from Carvalho & Fontes 1972).



Figures 37–44a-d: Fig. 37, *P. comaparanus* Carvalho, female, holotype (redrawn from Carvalho, 1988B). Fig. 38a, *P. concinnoides* Carvalho, female, holotype; 38b, vesica of aedeagus; 38c, left paramere; 38d, right paramere (redrawn from Carvalho 1988A); 38e, sclerotized rings; 38f, posterior wall (redrawn from Fontes, 1989). Fig. 39a, *P. concinnus* (Stål), male, compared with type; 39b, vesica of aedeagus; 39c, left paramere; 39d, right paramere (redrawn from Carvalho & Fontes 1970A). Fig. 40a, *P. concisus* (Knight), ventral view; 40b, lateral view (illustrated by J. C. M. Carvalho). Fig. 41a, *P. confraternus* (Uhler), ventral view; 41b, lateral view (illustrated by J. C. M. Carvalho). Fig. 42a, *P. cordobanus* Carvalho & Fontes, male, holotype; 42b, vesica of aedeagus; 42c, left paramere; 42d, right paramere (redrawn from Carvalho & Fontes 1969B). Fig. 43a, *P. corentinoides* Carvalho & Carpintero, female, holotype; 43b, vesica of aedeagus; 43c, left paramere; 43d, right paramere (redrawn from Carvalho & Carpintero 1987). Fig. 44a, *P. costalis* (Stål), male, compared with type; 44b, vesica of aedeagus; 44c, left paramere; 44d, right paramere (redrawn from Carvalho & Fontes 1970B).



Figures 44e-g–52: (continued) *P. costalis,* 44e, posterior wall; 44f, sclerotized rings (redrawn from Slater 1950); 44g, sclerotized plate of anterior gonapophyses (redrawn from Fontes 1989). Fig. 45, *P. crassicornis* (Reuter), male, holotype (redrawn from Carvalho *et al.* 1968). Fig. 46a, *P. cruciferoides* Carvalho & Fontes, male, holotype; 46b, vesica of aedeagus; 46c, left paramere; 46d, right paramere (redrawn from Carvalho & Fontes 1970B). Fig. 47a, *P. cruciferus* (Berg), male, compared with type; 47b, vesica of aedeagus; 47c, left paramere; 47d, right paramere (redrawn from Carvalho & Fontes 1970A); 47e, posterior wall; 47f, sclerotized rings; 47g, sclerotized plate of anterior gonapophyses (redrawn from Fontes 1989). Fig. 48, *P. cruxnigrum* (Reuter), female, holotype (redrawn from Carvalho *et al.* 1968). Fig. 49a, *P. cubanus* Carvalho & Schaffner, male, holotype; 49b, vesica of aedeagus; 49c, left paramere; 49d, right paramere (redrawn from Carvalho & Schaffner 1974). Fig. 50a, *P. cuzcoensis* Carvalho, male, holotype; 50b, vesica of aedeagus; 50c, left paramere; 50d, right paramere (redrawn from Carvalho 1988B). Fig. 51a, *P. decoratus* (Reuter), male; 51b, vesica of aedeagus; 51c, left paramere; 51d, right paramere (redrawn from Carvalho & Fontes 1971C). Fig. 52a, *P. diamantinensis* Carvalho, male, holotype; 52b, vesica of aedeagus; 52c, left paramere; 52d, right paramere (redrawn from Carvalho 1984).



Figures 53-58: Fig. 53a, *P. diminutus* Carvalho & Fontes, male paratype; 53b, vesica of aedeagus; 53c, left paramere; 53d, right paramere (redrawn from Carvalho & Fontes 1973). Fig. 54a, *P. dissociatus* (Berg), male; 54b, vesica of aedeagus; 54c, left paramere; 54d, right paramere (redrawn from Carvalho & Fontes 1970A). Fig. 55a, *P. divisus* Herrich-Schaeffer, dorsal view; 55b, lateral view (illustrated by J. C. M. Carvalho). Fig. 56a, *P. flavicostus* (Berg), male, compared with type; 56b, vesica of aedeagus; 56c, left paramere; 56d, right paramere (redrawn from Carvalho & Fontes 1970B); 56e, posterior wall; 56f, sclerotized rings; 56g, sclerotized plate of anterior gonapophyses (redrawn from Fontes 1989). Fig. 57a, *P. flavoniger* (Stål), male, compared with type; 57b, vesica of aedeagus; 57c, left paramere; 57d, right paramere (redrawn from Carvalho & Fontes 1970A); 57e, posterior wall; 57f, sclerotized rings; 57g, sclerotized plate of anterior gonapophyses (redrawn from Fontes 1989). Fig. 58a, *P. latipennis* (Stål), female, compared with type; 58b, vesica of aedeagus; 58c, left paramere; 58d, right paramere (redrawn from Carvalho & Fontes 1970A); 58e, posterior wall; 58f, sclerotized rings; 58g, sclerotized plate of anterior gonapophyses (redrawn from Fontes 1989).

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The genus *Prepops* Reuter (Hemiptera: Miridae) as indicator of endemism areas in the New World

LÍVIA A. COELHO[1], CARLOS MOLINERI[2], DANIEL A. DOS SANTOS[3] & PAULO S. F. FERREIRA[4]

[1, 4] Museu Regional de Entomologia, Departamento de Entomologia, Universidade Federal de Viçosa, 36570-000. Viçosa, MG, Brazil. E-mails: [1]liviaguiar04@gmail.com; [2]pfiuza@ufv.br
[2, 3] CONICET, Instituto de Biodiversidad Neotropical, Facultad de Ciencias Naturales, Universidad Nacional de Tucumán, M. Lillo 205, San Miguel de Tucumán, 4000 Tucumán, Argentina. E-mails: carlosmolineri@gmail.com; pseudalopex_79@yahoo.com

Abstract. Areas of endemism are traditional units for historical biogeography. Identify and delimit these basic units of analysis is one of the fundamental steps and one of the most problematical and several approaches have been proposed. The goal of this paper was to use the genus *Prepops* Reuter data in a network analysys to indicate areas of endemism (natural units of co-occurrence or UCs) in the new world. A set of 721 distributional records corresponding to 180 species of *Prepops* was analyzed. Network analysis recognized 14 UCs, all embedded in Neartic and Neotropic realms. Some of the UCs recognized by NAM agree (totaly or partially) with tradicional areas of endemism, or with biogeographic regionalization proposed by different authors for unlike taxa. This paper was the first attempt to use Miridae in a qualitative method to identify areas of endemism.

Introduction

The Miridae (Hemiptera: Heteroptera) is one of the most species rich families of insects, with around 11,000 described species. They are found in all major biogeographic regions of the world (Wheeler, 2001; Schuh, 2011; Cassis & Schuh, 2012), and are diverse particularly in tropical and mediterranean ecosystems (Schuh & Slater, 1995; Cassis *et al.,* 2007).

Among the eight recognized subfamilies Mirinae is the largest, comprising 419 genera in six tribes (Henry, 2009; Schuh, 2011). Endemism becomes evident at the tribe level and below. Mirines of the tribe Rethenini are restricted to the New World, with most of their diversity confined to the Neotropics (Wheeler, 2001; Cassis & Schuh, 2012). *Prepops* Reuter is the largest genus in Resthenini with 198 species distributed in most American countries (Schuh, 2011; Coelho & Ferreira (*in prep*.)).

Biogeographical studies in Miridae, although not in great amount, are beginning to identify centers of endemism, to analyze their interrelationships and to determine whether areas of species richness tend to correlate with areas of high endemism (Wheeler 2001). They are focused on studies of areas (Ribes, 1984; Wheeler & Henry, 1992; Williams, 2002;

Hernández & Henry, 2010) or specific taxa (Schuh 1974, 1984; Schuh & Stonedahl, 1986; Schuh, 1991; Lu & Zheng, 1998; Paula, 2000; Schuh, 2006). But until now, studies that mention the subfamily Mirinae are scarce (Williams 2002, Cassis & Schuh 2012), and absent to resthenine tribe.

Historical biogeography has two main goals. The first is to reconstruct the distributional history of individual groups (taxon biogeography). The second is to reconstruct the history of areas of endemism or the history of earth (the search for general area relationships) (Hovenkamp, 1997).

Areas of endemism are traditional units for historical biogeography (Crisci *et al.,* 2003; Dos Santos *et al.,* 2008) and many definitions have been proposed for its concept (Nelson & Platnick, 1981; Platnick, 1991; Harold & Mooi, 1994; Morrone, 1994; Humphries & Parenti, 1999 *in* Crisci *et al.,* 2003). Currently it is defined by most researchers as an area that has two or more taxa that are not find in any other place (Platnick, 1991).

Identify and delimit these traditional units is one of the fundamental steps and one of the most problematical in a historical biogeographic analysis. Several approaches have been proposed but all have particular methodological problems (Crisci *et al.,* 2003; Dos Santos *et al*., 2008).

Dos Santos *et al*. (2008) proposed to use network analysis (NAM) based in sympatry inference in the search of endemism areas. Biogeographic analysis focuses basically on sympatry patterns of species. Sympatric species lives in the same local community close enough to interact. In the more general sense, have broadly overlapping geographic distributions (Crisci *et al.,* 2003). Dos Santos *et al*. (2008) proposition requires a new operational definition of sympatry: that two or more species are sympatric when there are interpenetration and relative proximity among their records. Coincidence of two or more species in the same locality is the maximum expression of these properties.

Network analysis has proven to be a powerful tool for the study of different aspects of biological systems (Proulx *et al.,* 2005; Montoya *et al.,* 2006 *in* Dos Santos *et al*., 2008). The major difference between conventional and network data is that conventional data focus on species and attributes, whereas network data focus on species and relations (Hanneman & Riddle, 2005 *in* Dos Santos *et al*. 2008). So, in Dos Santos *et al.* (2008, 2011) proposition, species groups satisfying the requirement of within-group sympatry and between-groups allopatry will conform to natural units of co-occurrence (UCs) or endemism areas. A sympatry network may contain dense groups of species (UCs) connected through intermediary species. These dense groups will be evident after the intermediary species are removed. The spatial expression of the resulting UCs will be the candidates for areas of endemism, with the species belonging to each UC strictly endemic. The final status of the candidates areas of endemism will depend on the phylogenetic relationships of the involved taxa (Humphries & Parenti, 1999; Mast & Nyfeller, 2003 *in* Dos Santos *et al*. 2008).

In all biogeographical studies published for Miridae family, the areas of endemism were identified and delimited without, *a priori*, methodology. So, as a first record for Miridae

family, the goal of this work was to use the genus *Prepops* Reuter data in a network analysis to indicate areas of endemism (natural units of co-occurrence) in the new world.

Material and Methods

Compiling Records

GPS coordinates regarding distribution of species were gathered from locality data compiled by Falling Rain Genomics, Inc. (http://www.fallingrain.com/world) and Google Earth (http://www.google.com/earth).

All the available geographic records of *Prepops* species were mapped with Diva-Gis (version 7.17.2, http://www.diva-gis.org/) using terrestrial ecoregions of the world map by Olson *et al.* (2001).

A set of 721 distributional records corresponding to 180 species of *Prepops* was analyzed with Network Analysis Method (NAM). They were compiled from papers containing the descriptions of species, catalogs, books and museum specimens labels. It was not possible to assign distributional records for 18 species due to the absence of an exact inference of collection place. The list of records with their coordinates in decimal format is given in Appendix 1.

NAM analysis

The *Prepops* distributional patterns were studied through NAM based in sympatry inference (Dos Santos et *al*., 2008; Dos Santos et *al*., 2011). The NAM analysis was implemented using the software R (R Development Core Team, 2011) through the packages SyNet (Dos Santos, 2011) which is used for network analysis and TKRplot (Tierney, 2010).

First, the data that was stored in an Excell matrix were transformed in a simple text file (.txt). These data were managed in the software R in order to estimate the minimum spanning tree (MST) for each species and calculate the orthodromic distances (distances calculated over earth surface). From this result, two matrices of special association were inferred.

The analysis conducted here involved only those UCs present under both thresholds (one from ACSH and other from topological resemblance matrices), discarding those absent in just one of them. The basal network was obtained from reweighted topological resemblance >0,97 and ACSH <505 km. This is the most strict way to find areas of endemisms with NAM. The generated binary matrix corresponds to the basal network to be analyzed by NAM.

NAM was oriented to identify groups of species that meet the requirement of within-group sympatry and between-group allopatry. These groups of species corresponded to UCs in a subnetwork. Then, the removal of intermediary species segregated the different UCs.

The resulted cleavogram illustrated the spatial relationships between species within a network context. It is a simplified way to show the splitting sequence of groups as the removal of intermediary elements proceeded.

The display of the spatial expressions of the UCs, the ecoregions and political maps was done using Diva-Gis (Hijmans *et al.* 2004).

Results

Olson *et al.* (2001) subdivided the terrestrial world in 867 ecoregions nested in 14 biomes and eight biogeographic realms. NAM recognized 14 UCs (Table 1; Fig. 1) after the removal of intermediary and isolated species. All the UCs are embedded in Neartic and Neotropic realms (Figs. 2-15).

Lying on Neartic realm the UC5 (Fig. 6) is found on the borders of Canada and United States in ten ecoregions ranging from Canadian Aspen Forests and parklands to New England-Acadian forests. The species found in this UC are: *P. borealis, P. nigripilus* and *P. rubellicollis*. On the eastern half of the USA and southeastern Canada NAM recognized UC11 and UC12. UC11 (Fig. 12) is composed by *P. circumcinctus, P. nigricollis* and *P. nigroscutellatus* which inhabit 11 ecoregions ranging from Allegheny Highlands forests and Central forest-grasslands transition to Atlantic coastal pine barrens. And UC12 (Fig. 13) is composed by *P. insitivus, P. fraterculus* and *P. fraternus* included in 20 ecoregions, being the northernmost Lake and the southernmost Western Gulf coastal grasslands.

On the Neotropics, UC1 (Fig. 2) is composed by *P. erubescens*, *P. latipennis* and *P. vittifrons* which inhabit Central America in ecoregions containing dry, moist and pine-oak forests like: Balsas dry forests, Cuban moist forests and Sierra Madre del Sur pine-oak forests.

NAM recognized on Peru the UC2 (Fig. 3), composed by *P. nigritus, P. tingoensis* and *P. hambletoni* found on Peruvian Yungas and Ucayali moist forests. UC4 (Fig. 5), that includes *P. alienus, P. gracilis* and *P. limbicollis* associated to Sechura desert ecoregion. Located in the Peruvian Yungas, the large UC7 (Fig. 8), composed by four species: *P. nobilis, P. peruvianus, P. crassicornis* and *P. guttaticeps*. UC8 (Fig. 9) consisting of *P. decoratus, P. koschevnikovi* and *P. omphalophorus* which inhabit Sechura desert. The UC13 (Fig. 14) composed by *P. albomarginatus, P. flavovarius* and *P. marginalis*, with inhabit Southwest Amazon and Ucayali moist forests, Marañón dry forests and Sechura desert. And ultimately, UC14 (Fig. 15) containing the species *P. iconnicoffi*, *P. signifer* and *P. vitticollis* on Peruvian Yungas, Sechura desert and Southwest Amazon moist forests of Peru and Bolivia.

The UC10 (Fig. 11) covers Argentina, Bolivia, Brazil and Paraguay in seven ecoregions. Beni savanna is the northern one and Humid Pampas the southern. The species found in this UC are: *P. cordobanus*, *P. persimilis* and *P. platensis*.

In Brazil, three UCs were recognized: UC3 (Fig. 4) comprising *P. liliae*, *P. prepopsoides* and *P. roppai,* inhabiting Bahia interior forests. UC6 (Fig. 7) found on Araucaria moist forests of Santa Catarina, include the species *P. catarinensis*, *P. lopesi* and *P. teutoniensis* and wide UC9 (Fig. 10), composed by *P. concinnus*, *P. costalis*, *P. itatiaiensis* and *P. paulistanus* in ecoregions ranging from Bahia coastal forests to Campos rupestres montane savanna.

During analyses, 11 intermediary species were removed, 105 other species are isolated nodes mainly because they consist of single localities records in the data set that are also geographically distant from each other. Also, 10 diads were recognized. For the NAM purposes, diads are not UCs (endemism areas), but for the most used definition (Platnick, 1991) they are considered areas of endemism.

These UCs found are areas of endemism supported by strictly endemic *Prepops* species.

Table 1: Units of co-occurence (UCs) found through NAM analyses, followed by the corresponding species and ecorregions as defined by Olson (2001).

UCs	Species	Ecorregions
UC1	*P. erubescens* *P. latipennis* *P. vittifrons*	Balsas dry forests Central American pine-oak forests Costa Rican seasonal moist forests Cuban dry forests Cuban moist forests Isthmian-Atlantic moist forests Isthmian-Pacific moist forests Petén-Veracruz moist forests Sierra Madre del Sur pine-oak forests Sinaloan dry forests Talamancan montane forests Tamaulipan mezquital Trans-Mexican Volcanic Belt pine-oak forests Veracruz dry forests Veracruz moist forests
UC2	*P. hambletoni* *P. nigritus* *P. tingoensis*	Peruvian Yungas Ucayali moist forests
UC3	*P. liliae* *P. prepopsoides* *P. roppai*	Bahia interior forests
UC4	*P. alienus* *P. gracilis* *P. limbicollis*	Sechura desert
UC5	*P. borealis* *P. nigripilus* *P. rubellicollis*	Mid-continental Canadian forests Canadian Aspen Forests and parklands Nothern short grasslands Nothern mixed grasslands Upper Midwest forest-savanna transition Western great lakes forests Eastern forest-boreal transition Allegheny Highlands forests New England-Acadian forests Northeastern coastal forest
UC6	*P. catarinensis* *P. lopesi* *P. teutoniensis*	Araucaria moist forests
UC7	*P. nobilis* *P. peruvianus* *P. crassicornis* *P. guttaticeps*	Peruvian Yungas
UC8	*P. decoratus* *P. koschevnikovi* *P. omphalophorus*	Sechura desert

Table 1: Continued...

UCs	Species	Ecorregions
UC9	*P. concinnus* *P. costalis* *P. itatiaiensis* *P. paulistanus*	Alto Paraná Atlantic forests Bahia coastal forests Bahia interior forests Campos rupestres montane savanna Serra do mar coastal forests
UC10	*P. cordobanus* *P. persimilis* *P. platensis*	Alto Paraná Atlantic forests Araucaria moist forests Beni savanna Chiquitano dry forests Dry Chaco Humid Pampas Southern Andean Yungas
UC11	*P. circumcinctus* *P. nigricollis* *P. nigroscutellatus*	Allegheny Highlands forests Appalachian mixed mesophytic forests Atlantic coastal pine barrens Central forest-grasslands transition Central U. S. hardwood forests Eastern forest-boreal transition New England-Acadian Forests Northeastern coastal forests Southeastern mixed forests Southern Great Lakes forests Upper Midwest forest-savanna transition
UC12	*P. insitivus* *P. fraterculus* *P. fraternus*	Allegheny Highlands forests Appalachian mixed mesophytic forests Appalachian-Blue Ridge forests Atlantic coastal pine barrens Central forest-grasslands transition Central tall grasslands Central U. S. hardwood forests Eastern forest-boreal transition Eastern Great Lakes lowland forests Lake Middle Atlantic coastal forests Mississipi lowland forests New England-Acadian forests Northeastern coastal forests Southeastern conifer forests Southeastern mixed forests Southern Great Lakes forests Upper Midwest forest savanna transition Western Great Lakes forest Western Gulf coastal grasslands
UC13	*P. albomarginatus* *P. flavovarius* *P. marginalis*	Marañón dry forests Sechura desert Southwest Amazon moist forests Ucayali moist forests

Table 1: Continued...

UCs	Species	Ecorregions
UC14	*P. iconnicoffi*	Peruvian Yungas
	P. signifer	Sechura desert
	P. vitticollis	Southwest Amazon moist forests

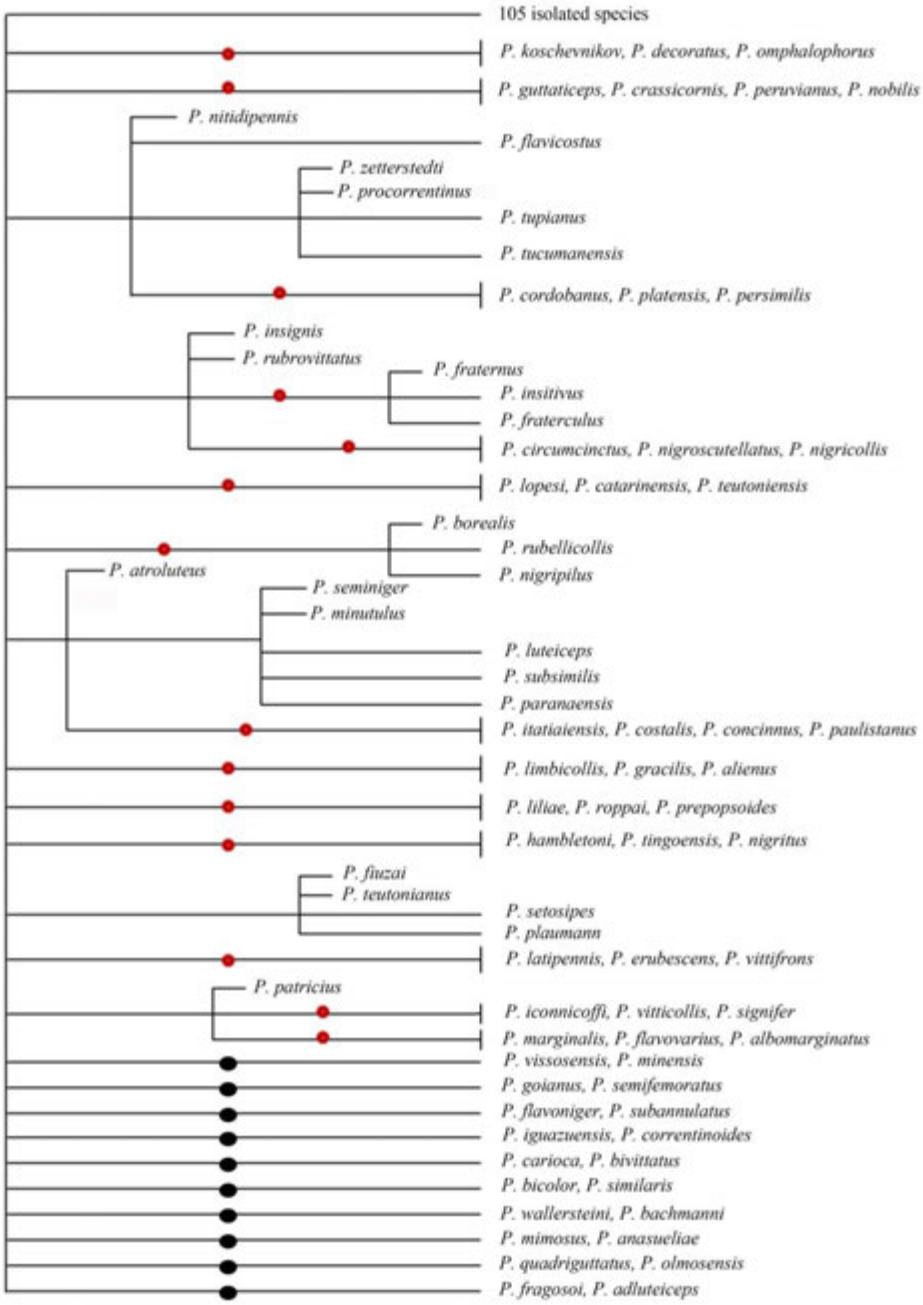

Figure 1: Cleavogram showing the candidates of areas of endemism (red dots) and diads (black dots).

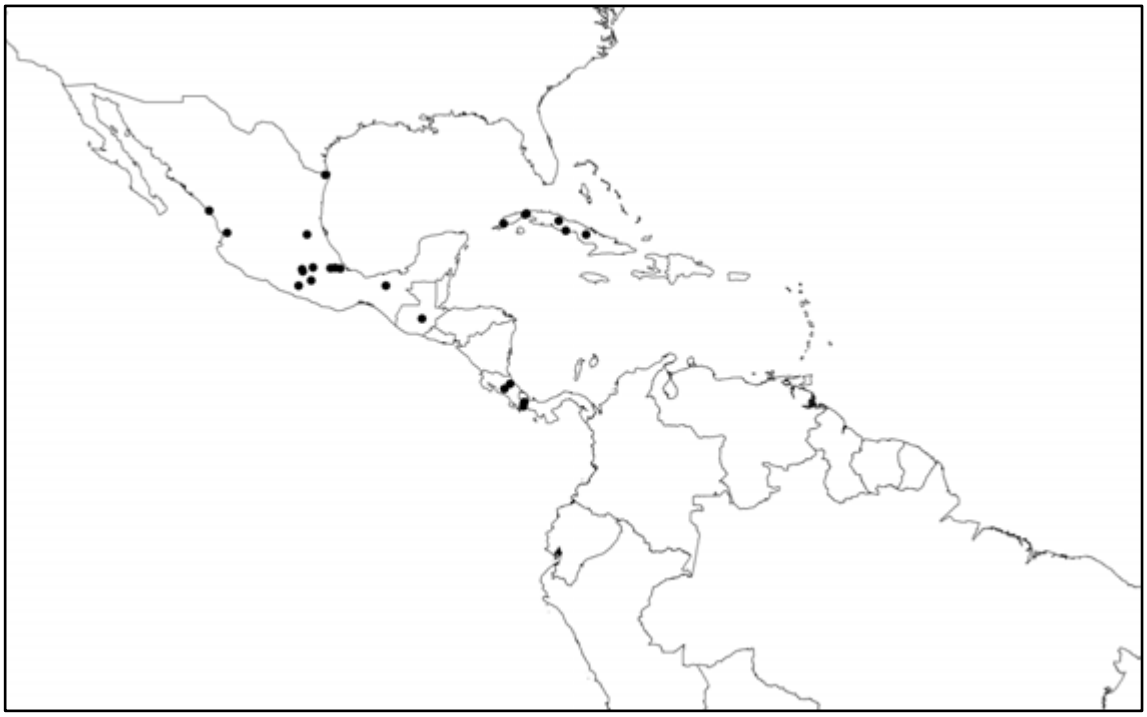

Figure 2: Spatial expression of natural unit of co-occurrence 1 (UC1).

Figure 3: Spatial expression of natural unit of co-occurrence 2 (UC2).

Figure 4: Spatial expression of natural unit of co-occurrence 3 (UC3).

Figure 5: Spatial expression of natural unit of co-occurrence 4 (UC4).

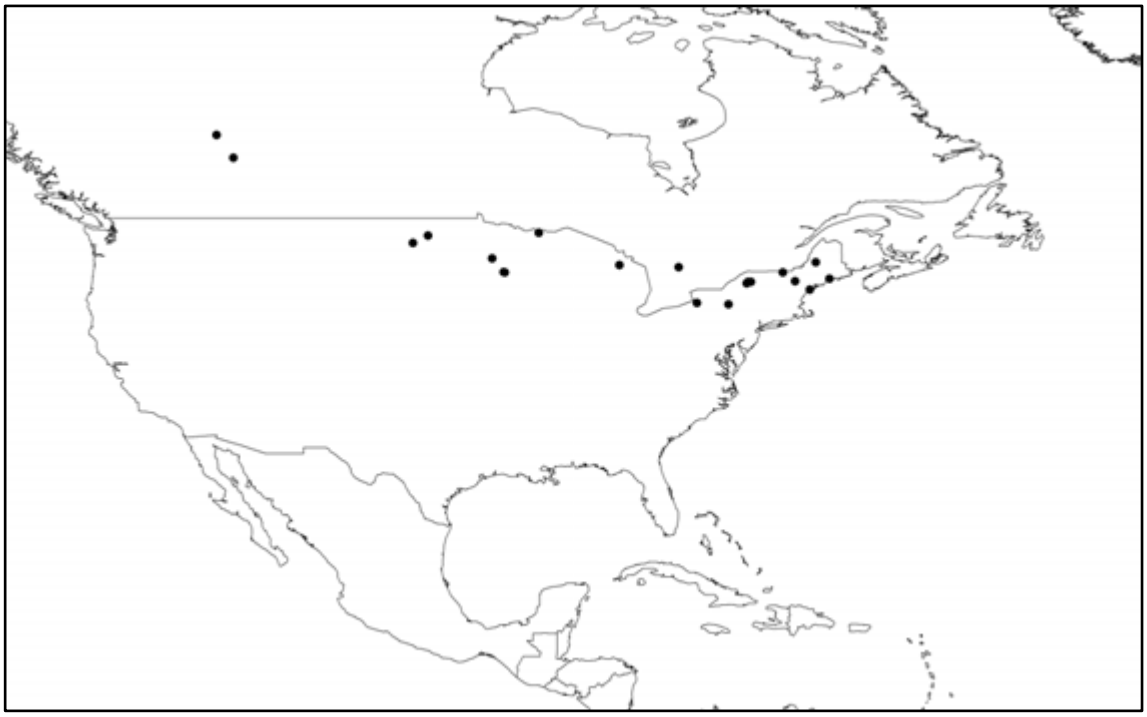

Figure 6: Spatial expression of natural unit of co-occurrence 5 (UC5).

Figure 7: Spatial expression of natural unit of co-occurrence 6 (UC6).

Figure 8: Spatial expression of natural unit of co-occurrence 7 (UC7).

Figure 9: Spatial expression of natural unit of co-occurrence 8 (UC8).

Figure 10: Spatial expression of natural unit of co-occurrence 9 (UC9).

Figure 11: Spatial expression of natural unit of co-occurrence 10 (UC10).

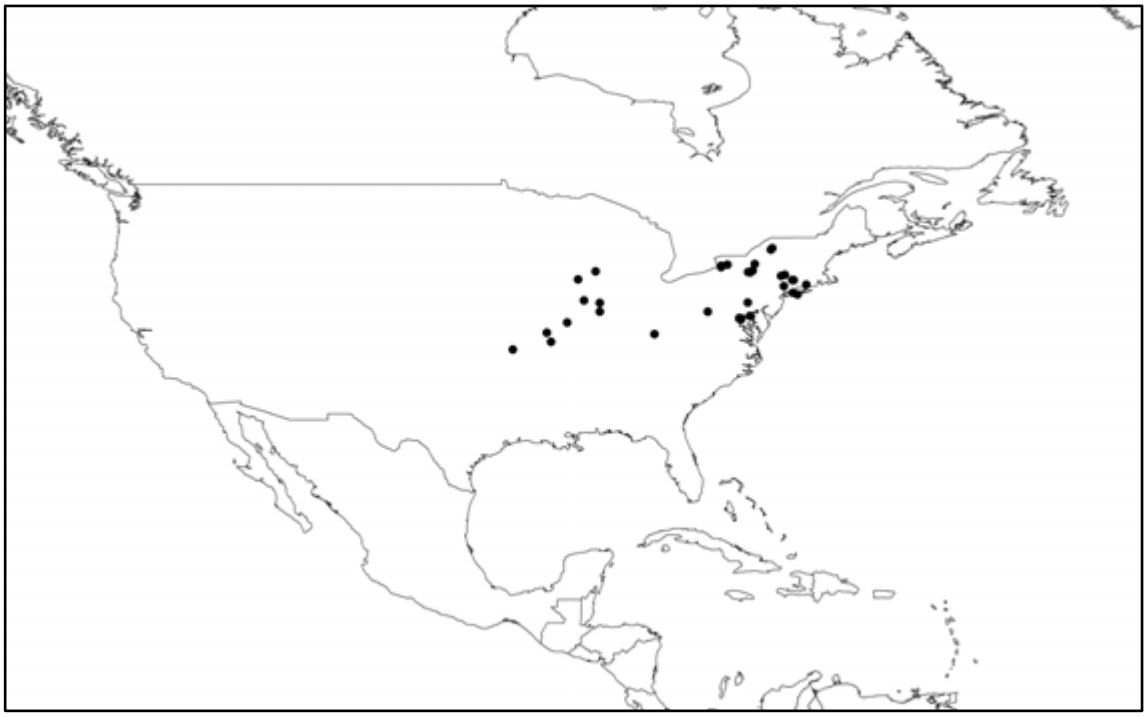

Figure 12: Spatial expression of natural unit of co-occurrence 11 (UC11).

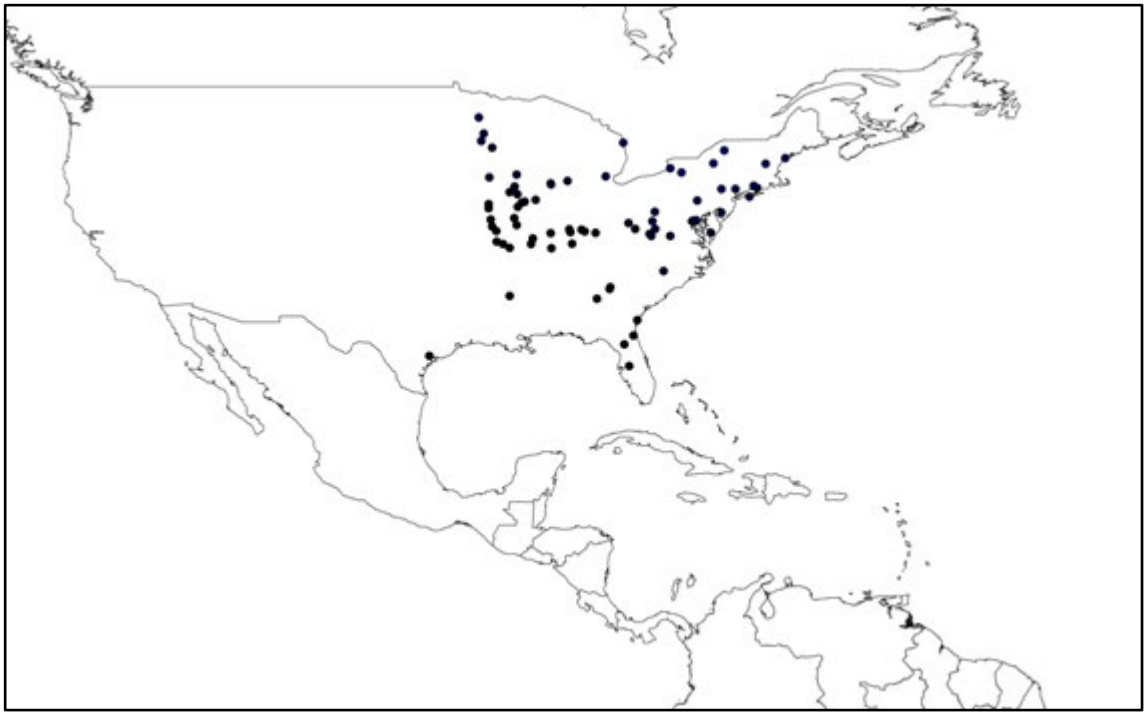

Figure 13: Spatial expression of natural unit of co-occurrence 12 (UC12).

Figure 14: Spatial expression of natural unit of co-occurrence 13 (UC13).

Figure 15: Spatial expression of natural unit of co-occurrence 14 (UC14).

Discussion

The 505Km limit inferred for ASCH matrix is usual in studies on a continental level. Although the analysis were conducted in a more strict way resulting only UCs that were formed into these criteria, there were found many candidates areas of endemism (14 UCs). The components composed of more than two nodes (species) will correspond to the UCs. Diads do not constitute UCs because the cohesiveness of their nodes is null.

After NAM analysis, the resulting UCs were plotted on Olson's ecoregions map. Ecoregions reflects the distribution of a broad range of fauna and flora across the planet. They are nested within the biomes and realms and together, these provide a framework for comparisons among units and the identification of representative habitats and species assemblages (Olson *et al.* 2001).

In NAM analysis resolution of patterns is notably increased due to a more accurate possibility of segregating spatially overlapped UCs (Dos Santos *et al.* 2011).The superposition could be observed on Neartic UCs 11 and 12, widely overlapping, while UC5 is partially overlapping to these two UCs. In the Neotropics, UC7 located on Peruvian Yungas, overlaps with UCs 2 and 14; UC8 situated on Sechura desert, overlaps with UCs 13 and 14. UC2 is superposed with UCs 7, 13 and 14. And UC 13 and 14 are partially superposed. In Brazil, UC 3 and 9 overlaps, this occurs also with UCs 10 and 6. UCs 9 and 10 overlaps in the ecoregion of Alto Parana Atlantic forests. The overlapping UCs are very noteworthy because can indicate a greater spatial and/or historical complexity in this regions. Endemism analysis (Szumik *et. al.* 2002; Szumik & Goloboff 2004) recovers overlapping endemism areas, but in this method, the species can be repeated and are not strictly endemic to each area.

Some of the UCs recognized by NAM agree (totaly or partially) with tradicional areas of endemism, or with biogeographic regionalization proposed by different authors for unlike taxa. For Miridae, although the number of works using phylogenetic analysis has increasing, there are few assumptions about the distribution patterns of the group. The related papers studies the relationships between areas of endemism, without using methodologies to identify these areas *a priori* (Ribes 1984; Schuh & Stonedahl 1986; Schuh 1991; Lu & Zheng 1998; Ferreira & Henry 2002; Schuh 2006; Forero & Schwartz 2009).

In the present paper, UC1 on Central America, is largely similar to Caribbean sub-region of Morrone (2001). And matches partially with the endemism area of Southern Mexico (Oaxaca - Chiapas) postulated by Schuh (2006) with American *Phymatopsallus* (Miridae) group. Schuh (2006) investigated areas of endemism in western north america and despite the Southern Mexico, no other endemism area corresponds to the UCs treated in the present work. UC1 also largely overlaps the area of endemism five (A5) of Ferrari *et al.* (2010) who worked with Neotropical Pentatomidae. And finaly, partialy overlaps with endemism areas 1 and 2 of Ippi & Flores (2001) in a study with neotropical turtles. The UC2, corresponds to provinces of Yungas and Puna in Andean and Neotropical regions identified by Morrone (2001). Comparing with endemism areas identified by Ferrari *et al*. (2010), is superimposed with A3, 10 and 11. UCs 4 and 8 exactly matches the province Desierto Peruano Costero in the Andean region and UC7 to Yungas province on Amazónica sub-region described by Morrone (2001). UCs 13 and 14 are at the edges of Andean and Neotropical regions of Morrone (2001).

The UC10 covers Argentina, Bolivia, Brazil and Paraguay in the sub-regions Chaqueña, Amazónica and Paranaense of Morrone (2001). In Ferrari *et al.* (2010) corresponds totally to A13 and partially to endemism area 5 of Ippi & Flores (2001).

In Brazil, the UC3 corresponds to Bosque Atlántico Brasileño and Bosque Paranaense, in Paranaense sub-region of Morrone (2001). UC6 matches Bosque de *Araucaria angustifolia* (sub-region Paranaense, Morrone 2001) and completely inserted on endemism area 5 of Ippi & Flores (2001). Ultimately UC9 is broadly congruent with sub-region Paranaense (Morrone 2001).

This paper was the first attempt to use Miridae in a qualitative method to identify areas of endemism. The areas of endemism identified here, in addition to other studies, can help to define and/or confirm areas for biological diversity conservation and contribute to studies that compare endemism areas.

Acknowledgments

We are grateful to Luiz Antônio Alves Costa, Museu Nacional of Rio de Janeiro, for providing very important mirid bibliography. We are also grateful to CNPq for providing funds to the first author to conduct post-graduate studies at the Universidade Federal de Viçosa.

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Appendix 1. 721 records of the 180 *Prepops* species. Coordinates at decimal format.

Species	Latitud	Longitud
Prepops accinctus	8.427777778	-82.43055556
Prepops adluteiceps	-15.75	-41.46666667
Prepops albomarginatus	-12.56666667	-76.31666667
Prepops albomarginatus	-5.634722222	-78.53055556
Prepops alienus	-12.56666667	-76.31666667
Prepops anasueliae	-25.25416667	-56.03333333
Prepops anasueliae	-25.27111111	-57.66666667
Prepops areatus	4.598055556	-74.07583333
Prepops atratus	15.06333333	-90.23944444
Prepops atripennis	32.61083333	-110.7708333
Prepops atripennis	32.22166667	-110.9263889
Prepops atripennis	36.01694444	-115.5041667
Prepops atripennis	37.3	-113.05
Prepops atripennis	36.18666667	-84.20277778
Prepops atripennis	20.24305556	-74.15611111
Prepops atripennis	20.36666667	-75.91666667
Prepops atroluteus	-22.89972222	-43.23305556
Prepops atroluteus	-20.96666667	-46.11666667
Prepops atroluteus	-22.78666667	-43.30833333
Prepops atroluteus	-22.51083333	-43.18444444
Prepops atroluteus	-25.36166667	-48.77666667
Prepops atroluteus	-25.36277778	-48.7775
Prepops atroluteus	-25.3075	-48.69916667
Prepops atroluteus	-20.75	-42.88305556
Prepops bachmanni	-31.75	-64.46666667
Prepops bachmanni	-31.73305556	-64.4
Prepops bachmanni	-32.35	-65.03305556
Prepops bachmanni	-25.56666667	-54.56666667
Prepops banosus	-2.226944444	-80.7025
Prepops barueriensis	-23.51666667	-46.88305556
Prepops bastensis	-23.66666667	-46.51666667
Prepops bechynei	0.983055556	-52.04972222
Prepops bechynei	-1.363333333	-48.24
Prepops bechynei	-9.289444444	-76.00888889
Prepops bechynei	-1.666666667	-78.63305556
Prepops beniensis	-14.23305556	-63.51666667
Prepops bicolor	17.03333333	-99.66666667
Prepops bicolor	29.20694444	-110.1330556
Prepops bicolor	20.65166667	-103.3713889
Prepops bicoloroides	17.55	-97.43305556
Prepops bivittatus	-22.89972222	-43.23305556
Prepops bivittis	48.56	-122.94
Prepops bivittis	40.59916667	-122.4919444
Prepops bivittis	37.80444444	-122.2708333

Species	Latitud	Longitud
Prepops bivittis	41.52861111	-109.4661111
Prepops bivittis	18.91138889	-96.77833333
Prepops bivittis	33.09333333	-116.6080556
Prepops bivittis	38.27694444	-112.6411111
Prepops bivittis	38.98333333	-114.3
Prepops bivittis	37.79	-117.63
Prepops bivittis	33.96555556	-118.0244444
Prepops bivittis	38.19833333	-120.0094444
Prepops bivittis	25.76666667	-108.9666667
Prepops bivittis	20.21666667	-96.78305556
Prepops bivittis	18.6	-98.84972222
Prepops bivittis	18.89972222	-96.76666667
Prepops bolivianus	-17.51666667	-63.65
Prepops bolivianus	-17.45888889	-63.65916667
Prepops bolivianus	-17.78222222	-63.19
Prepops bolivianus	-16.97388889	-65.41722222
Prepops borealis	44.2225	-74.83638889
Prepops borealis	44.46444444	-68.71111111
Prepops borealis	45.48	-84.5
Prepops borealis	47.91666667	-90.55
Prepops borealis	42.55194444	-76.29111111
Prepops borealis	47.14361111	-99.99472222
Prepops borealis	44.93638889	-72.205
Prepops borealis	53.54972222	-113.5
Prepops borealis	45.33305556	-80.03305556
Prepops borealis	47.69638889	-98.88722222
Prepops borealis	44.13388889	-74.92111111
Prepops borealis	42.64444444	-78.67833333
Prepops borealis	44.21666667	-74.61333333
Prepops borealis	45.98472222	-94.0525
Prepops caatinganus	-10.46583333	-40.18083333
Prepops cajuruensis	-21.28305556	-47.29972222
Prepops caliensis	3.800833333	-76.64138889
Prepops candelariensis	22.74388889	-82.95805556
Prepops candelariensis	22.41361111	-79.96555556
Prepops canelae	-15.43305556	-55.75
Prepops canelae	-22.78305556	-51.18305556
Prepops canelae	-20.16666667	-56.51666667
Prepops cangussuensis	-31.1	-52.86666667
Prepops caracensis	-20.13333333	-43.5
Prepops carioca	-22.89972222	-43.23305556
Prepops casualis	5.47	-74.6575
Prepops catamarcanus	-28.25833333	-66.04083333
Prepops catarinensis	-27.05	-52.4
Prepops chanchamaianus	-11.05583333	-75.32861111

Species	Latitud	Longitud
Prepops circumcinctus	36.61777778	-94.31555556
Prepops circumcinctus	37.88055556	-91.75388889
Prepops circumcinctus	44.13388889	-74.92111111
Prepops circumcinctus	39.14888889	-76.51333333
Prepops circumcinctus	38.92166667	-77.29111111
Prepops circumcinctus	38.99805556	-77.28833333
Prepops circumcinctus	39.4725	-87.77833333
Prepops circumcinctus	40.11611111	-87.77833333
Prepops circummaculatus	-20.96666667	-46.11666667
Prepops circummaculatus	5.823333333	-55.16777778
Prepops circummaculatus	-9.413888889	-40.50277778
Prepops circummaculatus	-22.26666667	-42.53305556
Prepops circummaculatus	-34.425	-58.57972222
Prepops circummaculatus	-34.1825	-58.24916667
Prepops circummaculatus	-34.82388889	-57.98583333
Prepops circummaculatus	-24.41666667	-59.06666667
Prepops circummaculatus	-39.26666667	-65.68305556
Prepops circummaculatus	-38.99333333	-64.09472222
Prepops circummaculatus	-38.68472222	-67.98416667
Prepops circummaculatus	-30.11111111	-51.31666667
Prepops circummaculatus	-25.25	-56.03333333
Prepops circummaculatus	-31.57972222	-55.92972222
Prepops circummaculatus	-25.56666667	-54.56666667
Prepops columbiensis	4.216388889	-73.81333333
Prepops columbiensis	4.153333333	-73.635
Prepops comarapanus	-17.91527778	-64.53166667
Prepops commissuralis	9.916666667	-84.31666667
Prepops concinnoides	-15.51666667	-40.89972222
Prepops concinnoides	-19.00888889	-40.1275
Prepops concinnoides	-16.01194444	-41.28861111
Prepops concinnus	-22.89972222	-43.23305556
Prepops concinnus	-20.75	-42.88305556
Prepops concinnus	-22.63305556	-44.58305556
Prepops concinnus	-23.94972222	-46.33305556
Prepops concinnus	-22.5	-44.56666667
Prepops concinnus	-22.43305556	-42.98305556
Prepops concisus	44.37666667	-103.7297222
Prepops confraternus	29.28583333	-81.05583333
Prepops confraternus	29.65166667	-82.32472222
Prepops cordobanus	-32.05	-65.05
Prepops cordobanus	-14.83305556	-64.9
Prepops cordobanus	-31.98333333	-64.56666667
Prepops cordobanus	-32.05	-65.05
Prepops correntinoides	-25.56666667	-54.56666667
Prepops costalis	-22.5	-44.56666667

Species	Latitud	Longitud
Prepops costalis	-19.00888889	-40.1275
Prepops costalis	-22.89972222	-43.23305556
Prepops crassicornis	-13.50361111	-70.895
Prepops cruciferoides	-27.05	-52.4
Prepops cruciferoides	-34.425	-58.57972222
Prepops cruciferus	5.823333333	-55.16777778
Prepops cruciferus	-15.91666667	-52.25
Prepops cruciferus	-6.223888889	-57.75388889
Prepops cruciferus	-20.96666667	-46.11666667
Prepops cruciferus	-12.98305556	-38.51666667
Prepops cruciferus	-22.5	-44.56666667
Prepops cruciferus	-22.89972222	-43.23305556
Prepops cruciferus	-27.05	-52.4
Prepops cruciferus	-21.98305556	-47.41666667
Prepops cruciferus	-25.56666667	-54.56666667
Prepops cruciferus	-27.44972222	-58.98305556
Prepops cruciferus	-34.33416667	-58.57694444
Prepops cruciferus	5.057777778	-75.49944444
Prepops cruciferus	-9.289444444	-76.00888889
Prepops cruciferus	12	-62
Prepops cruciferus	-3.101944444	-60.025
Prepops cruciferus	8.933055556	-81.79972222
Prepops cruciferus	-1.033055556	-79.45
Prepops cruciferus	-23.34277778	-57.05972222
Prepops cruciferus	27.63777778	-81.82555556
Prepops cruciferus	27.49611111	-81.79694444
Prepops cruciferus	27.74666667	-80.435
Prepops cruciferus	28.51	-81.32
Prepops cruciferus	-20.75	-42.88305556
Prepops cruciferus	-34.46666667	-58.51666667
Prepops cruciferus	-28.48305556	-59.61666667
Prepops cruciferus	-3.142777778	-58.44388889
Prepops cruciferus	-20.16666667	-56.51666667
Prepops cruciferus	-31.76666667	-52.33305556
Prepops cruciferus	-31.57972222	-55.92972222
Prepops cruciferus	-29.94277778	-51.71833333
Prepops cruciferus	-30.03305556	-51.2
Prepops cruciferus	-30.08305556	-51.03305556
Prepops cruciferus	-30.11111111	-51.31666667
Prepops cruciferus	-29.68305556	-51.13305556
Prepops cruciferus	23.13194444	-82.36416667
Prepops cruciferus	-25.25	-56.03333333
Prepops cruciferus	-27.25	-53.86666667
Prepops cruciferus	-19.26666667	-57.06666667
Prepops cruciferus	-22.65944444	-43.52944444

Species	Latitud	Longitud
Prepops cruciferus	-17.21666667	-46.86666667
Prepops cruxnigrum	0.081111111	-78.69361111
Prepops cubanus	23.13194444	-82.36416667
Prepops cuzcoensis	-13	-71.29972222
Prepops decoratus	-14.14388889	-75.6875
Prepops diamantinensis	-14.41666667	-56.45
Prepops diminutus	32.77972222	-106.1716667
Prepops dissociatus	-31.98333333	-64.56666667
Prepops dissociatus	-34.31666667	-57.21666667
Prepops englemani	9.283333333	-82.53333333
Prepops entrerianus	-31.39972222	-58.03305556
Prepops eremicola	44.51416667	-109.0702778
Prepops eremicola	44.46055556	-110.8277778
Prepops eremicola	37.4825	-106.7988889
Prepops eremicola	44.21666667	-114.9377778
Prepops eremicola	45.53888889	-111.1194444
Prepops eremicola	33.35555556	-105.6738889
Prepops eremicola	51.07555556	-115.1308333
Prepops eremicola	53.54361111	-113.4905556
Prepops erubescens	8.807777778	-82.54305556
Prepops erubescens	17.55	-99.5
Prepops erubescens	17.9275	-98.54583333
Prepops erubescens	8.483055556	-82.61666667
Prepops fernandopolis	-20.28333333	-50.24666667
Prepops fiuzai	-27.26666667	-55.53305556
Prepops fiuzai	-27.05	-52.4
Prepops flavicostus	-34.33416667	-58.57694444
Prepops flavicostus	-17.79722222	-50.9
Prepops flavicostus	-4.253333333	-69.93861111
Prepops flavicostus	-15.91666667	-52.25
Prepops flavicostus	-13.50361111	-70.895
Prepops flavicostus	-30.03305556	-51.2
Prepops flavicostus	-26.69972222	-65.45
Prepops flavicostus	-24.11972222	-65.40388889
Prepops flavoniger	-20.75	-42.88305556
Prepops flavoniger	-20.96666667	-46.11666667
Prepops flavoniger	-14.66666667	-52.35
Prepops flavoniger	-15.91666667	-52.25
Prepops flavoniger	-16.95416667	-51.81583333
Prepops flavoniger	-21.98305556	-47.41666667
Prepops flavoniger	-27.05	-52.4
Prepops flavoniger	-24.11972222	-65.40388889
Prepops flavoniger	-10.46666667	-50.51666667
Prepops flavoniger	9.05	-69.75
Prepops flavoniger	-27.1	-56.6

Species	Latitud	Longitud
Prepops flavoniger	-24.78305556	-65.41666667
Prepops flavoniger	-22.89972222	-43.23305556
Prepops flavoniger	-27.88305556	-55.13305556
Prepops flavoniger	-26.56666667	-54.78305556
Prepops flavoniger	-26.11666667	-65.28305556
Prepops flavoniger	-24.18305556	-65.31666667
Prepops flavoniger	-27.19972222	-65.29972222
Prepops flavoniger	-24.23305556	-64.86666667
Prepops flavoniger	-26.08305556	-65.96666667
Prepops flavoniger	-23.21666667	-64.09972222
Prepops flavoniger	-25.6	-55.96666667
Prepops flavoniger	-20.75	-42.88305556
Prepops flavovarius	-14.14388889	-75.6875
Prepops flavovarius	-11.05	-75.28333333
Prepops fragosoi	-15.75	-41.46666667
Prepops fraterculus	37.19	-89.34
Prepops fraterculus	33.29	-90.95
Prepops fraterculus	39.63	-80.05
Prepops fraterculus	42.27083333	-83.72638889
Prepops fraterculus	46.69861111	-93.275
Prepops fraterculus	38.29	-86.46
Prepops fraterculus	38.02	-87.86
Prepops fraterculus	45.5	-92.91
Prepops fraterculus	44.94416667	-93.08527778
Prepops fraterculus	38.96944444	-77.17638889
Prepops fraterculus	38.04	-75.83
Prepops fraternus	33.95555556	-83.38305556
Prepops fraternus	33.82333333	-83.44305556
Prepops fraternus	33.29	-90.95
Prepops fraternus	38.77	-82.02
Prepops fraternus	39.63	-80.05
Prepops fraternus	37.21	-86.25
Prepops fraternus	37.79388889	-80.30333333
Prepops fraternus	41.58027778	-72.62555556
Prepops fraternus	38.895	-77.03638889
Prepops fraternus	41.94	-86.59
Prepops fraternus	44.44944444	-92.26694444
Prepops fraternus	40.46333333	-76.8425
Prepops fraternus	41.94	-86.59
Prepops fraternus	43.22194444	-71.71388889
Prepops fraternus	41.33	-75.03
Prepops fraternus	38.895	-77.03638889
Prepops fraternus	39.56972222	-75.04777778
Prepops fraternus	37.79	-78.88
Prepops fraternus	35.17388889	-79.39222222

Species	Latitud	Longitud
Prepops fraternus	28.04111111	-81.95888889
Prepops fraternus	29.65166667	-82.32472222
Prepops fraternus	38.93916667	-76.93388889
Prepops fraternus	38.97027778	-77.17972222
Prepops fraternus	37.20305556	-91.44333333
Prepops fraternus	40.19944444	-92.53972222
Prepops fraternus	39.04694444	-92.38138889
Prepops fraternus	36.9075	-90.94388889
Prepops fraternus	38.50527778	-92.26305556
Prepops fraternus	39.87138889	-92.53972222
Prepops fraternus	38.17388889	-91.94888889
Prepops fraternus	38.61027778	-90.4125
Prepops fraternus	37.3675	-91.91
Prepops fraternus	41.33138889	-73.98666667
Prepops fraternus	38.98888889	-76.92888889
Prepops fraternus	38.96944444	-77.17638889
Prepops fraternus	38.8975	-77.10027778
Prepops fraternus	38.90861111	-77.24055556
Prepops fraternus	38.93916667	-76.93388889
Prepops fraternus	38.97027778	-77.17972222
Prepops fraternus	38.895	-77.03638889
Prepops fraternus	40.34583333	-89.87472222
Prepops fraternus	39.98777778	-90.34611111
Prepops fraternus	40.37	-89.8275
Prepops fraternus	39.15666667	-90.61777778
Prepops fraternus	40.29972222	-90.06111111
Prepops fraternus	41.09944444	-90.9425
Prepops fraternus	37.6175	-89.20888889
Prepops fraternus	40.51416667	-88.99055556
Prepops frontalis	10.5	-66.91666667
Prepops goianus	-13.79	-48.57083333
Prepops gracilis	-12.56666667	-76.31666667
Prepops guanduensis	-19.51666667	-41.01666667
Prepops guaranianus	-38.81666667	-62.66666667
Prepops guaranianus	-34.425	-58.57972222
Prepops guaranianus	-39.26666667	-65.68305556
Prepops guttaticeps	-13.50361111	-70.895
Prepops hambletoni	-9.289444444	-76.00888889
Prepops horvathi	-14.48305556	-71.03305556
Prepops howardi	9.233055556	-83.58305556
Prepops huanucanus	-9.355555556	-75.97805556
Prepops huascaraiensis	-13.27638889	-72.15444444
Prepops iconnicoffi	-14.14388889	-75.6875
Prepops iconnicoffi	-16.41444444	-71.51722222
Prepops iguazuensis	-25.56666667	-54.56666667

Species	Latitud	Longitud
Prepops imperatrizensis	-5.525555556	-47.44305556
Prepops insignis	33.79	-84.47
Prepops insignis	34.87694444	-83.40833333
Prepops insignis	38.7	-80.73
Prepops insignis	44.2225	-74.83638889
Prepops insignis	44.13388889	-74.92111111
Prepops insignis	40.87138889	-73.45666667
Prepops insignis	38.96944444	-77.17638889
Prepops insignis	41.67944444	-87.64194444
Prepops insignis	41.49888889	-72.90083333
Prepops insignis	41.98944444	-73.09583333
Prepops insignis	41.28888889	-72.68166667
Prepops insitivoides	-25.46666667	-48.81666667
Prepops insitivus	30.33222222	-81.65583333
Prepops insitivus	44.8	-82.4
Prepops insitivus	41.4	-72.35
Prepops insitivus	43.66138889	-70.25527778
Prepops insitivus	33.95555556	-83.38305556
Prepops insitivus	33.09	-84.39
Prepops insitivus	31.48	-81.37
Prepops insitivus	37.95	-80.45
Prepops insitivus	38.34	-81.53
Prepops insitivus	39.63	-80.05
Prepops insitivus	38.32	-80.01
Prepops insitivus	38.9	-80.23
Prepops insitivus	37.19	-89.34
Prepops insitivus	38.02972222	-84.49472222
Prepops insitivus	38.26527778	-85.5375
Prepops insitivus	38.15361111	-85.31277778
Prepops insitivus	36.86777778	-87.8175
Prepops insitivus	38.10277778	-86.38972222
Prepops insitivus	36.9075	-90.94388889
Prepops insitivus	44.2225	-74.83638889
Prepops insitivus	42.88638889	-78.87833333
Prepops insitivus	42.56972222	-78.04
Prepops insitivus	43.25861111	-75.63888889
Prepops insitivus	40.75694444	-72.93916667
Prepops insitivus	38.96944444	-77.17638889
Prepops insitivus	38.86166667	-77.12916667
Prepops insitivus	42.41666667	-90.42888889
Prepops insitivus	40.94777778	-90.37111111
Prepops insitivus	39.15666667	-90.61777778
Prepops insitivus	41.66722222	-87.83027778
Prepops insitivus	41.50944444	-90.57861111
Prepops insitivus	41.74083333	-87.86027778

Species	Latitud	Longitud
Prepops insitivus	42.19361111	-92.46555556
Prepops insitivus	28.8	-96.97
Prepops itatiaiensis	-22.5	-44.56666667
Prepops itatiaiensis	-22.26666667	-42.53305556
Prepops itatiaiensis	-22.43305556	-45.45
Prepops jamaicensis	9.189722222	-79.8875
Prepops jamaicensis	9.116666667	-79.7
Prepops jamaicensis	9.152222222	-79.84638889
Prepops koschevnikovi	-14.14388889	-75.6875
Prepops latipennis	18.89972222	-96.76666667
Prepops latipennis	18.85	-97.1
Prepops latipennis	17.54722222	-92.95194444
Prepops latipennis	18.83305556	-96.38305556
Prepops latipennis	18.78305556	-99.23305556
Prepops latipennis	21.51666667	-104.8830556
Prepops latipennis	15.06333333	-90.23944444
Prepops latipennis	22.20055556	-84.08388889
Prepops latipennis	22.88888889	-82.49888889
Prepops latipennis	22.97777778	-82.37777778
Prepops latipennis	21.68416667	-79.43805556
Prepops latipennis	21.38388889	-77.9075
Prepops latipennis	22.41361111	-79.96555556
Prepops latipennis	9.802222222	-84.04583333
Prepops latipennis	18.61666667	-99.18305556
Prepops latipennis	18.90222222	-98.43916667
Prepops latipennis	25.86111111	-97.50222222
Prepops liliae	-15.51666667	-40.89972222
Prepops limbicollis	-12.56666667	-76.31666667
Prepops lopesi	-27.05	-52.4
Prepops luteiceps	-22.73305556	-45.58305556
Prepops luteiceps	-21.22638889	-43.77416667
Prepops luteiceps	-29.35	-49.75
Prepops luteofasciatus	9.833055556	-83.79972222
Prepops maldonadoi	18.35472222	-66.0075
Prepops maldonadoi	18.38833333	-66.24833333
Prepops maldonadoi	21.68722222	-79.19027778
Prepops maldonadoi	22.41361111	-79.96555556
Prepops maldonadoi	22.01944444	-79.99166667
Prepops maldonadoi	21.52333333	-78.22222222
Prepops marginalis	-9.289444444	-76.00888889
Prepops marginalis	-12.56666667	-76.31666667
Prepops mariliensis	-22.21666667	-49.93305556
Prepops meinerti	10.49111111	-66.90194444
Prepops meinerti	-13.50361111	-70.895
Prepops mielkei	-25.41666667	-49.25

Species	Latitud	Longitud
Prepops mimosus	-25.75	-56.43305556
Prepops mimosus	-25.25	-56.03333333
Prepops minensis	-20.75	-42.88305556
Prepops minutulus	-22.74722222	-43.71694444
Prepops minutulus	-27.05	-52.4
Prepops minutulus	-25.75	-56.43305556
Prepops minutulus	-27.25	-53.86666667
Prepops montevidensis	-34.88361111	-56.18194444
Prepops montivagus	8.808055556	-82.54305556
Prepops nicaraguensis	12.97611111	-88.25694444
Prepops nigricollis	39.47	-79.67
Prepops nigricollis	37.20305556	-91.44333333
Prepops nigricollis	44.2225	-74.83638889
Prepops nigricollis	44.13388889	-74.92111111
Prepops nigricollis	43.04805556	-76.1475
Prepops nigricollis	42.81805556	-78.67555556
Prepops nigricollis	42.42166667	-76.49166667
Prepops nigricollis	42.55194444	-76.29111111
Prepops nigricollis	42.15916667	-74.15777778
Prepops nigricollis	42.21722222	-73.86444444
Prepops nigricollis	41.39138889	-73.95611111
Prepops nigricollis	40.75694444	-72.93916667
Prepops nigricollis	40.88611111	-73.25722222
Prepops nigricollis	38.96888889	-77.1425
Prepops nigricollis	38.96944444	-77.17638889
Prepops nigricollis	38.88222222	-77.17111111
Prepops nigricollis	42.47722222	-88.09555556
Prepops nigricollis	41.89666667	-89.41166667
Prepops nigricollis	41.84361111	-73.32916667
Prepops nigricollis	41.83166667	-73.225
Prepops nigricollis	41.49027778	-72.27527778
Prepops nigripennis	-22.52638889	-43.72777778
Prepops nigripennis	-22.89972222	-43.23305556
Prepops nigripennis	-22.51083333	-43.18444444
Prepops nigripennis	-22.89972222	-43.23305556
Prepops nigripilus	44.2225	-74.83638889
Prepops nigripilus	44.27111111	-71.30555556
Prepops nigripilus	55.27916667	-114.7677778
Prepops nigritus	-9.289444444	-76.00888889
Prepops nigroscutellatus	37.76361111	-83.67
Prepops nigroscutellatus	42.99805556	-78.1875
Prepops nigroscutellatus	40.15805556	-76.66027778
Prepops nigroscutellatus	38.64694444	-90.225
Prepops nigroscutellatus	42.99805556	-78.1875
Prepops nigroscutellatus	42.43583333	-76.63138889

Species	Latitud	Longitud
Prepops nigroscutellatus	42.90055556	-78.67027778
Prepops nigroscutellatus	42.42166667	-76.49166667
Prepops nigroscutellatus	40.31333333	-88.97361111
Prepops nigrus	-50.29972222	-72.78305556
Prepops nitidipennis	-16.95416667	-51.81583333
Prepops nitidipennis	-27.05	-52.4
Prepops nitidipennis	-14.83305556	-64.9
Prepops nitidipennis	-26.68305556	-65.26666667
Prepops nitidipennis	-25.56666667	-54.56666667
Prepops nitidipennis	-25.73305556	-64.98305556
Prepops nitidipennis	-27.36666667	-65.75
Prepops nitidipennis	-26.69972222	-65.45
Prepops nitidipennis	-26.11666667	-65.28305556
Prepops nitidipennis	-26.61666667	-65.2
Prepops nitidipennis	-25.26666667	-57.66666667
Prepops nitidipennis	-25.25	-56.03333333
Prepops nitidipennis	-25.26666667	-57.66666667
Prepops nobilis	-13.50361111	-70.895
Prepops notaticollis	-25.64972222	-54.58305556
Prepops nuevoleonensis	23.96666667	-99.76666667
Prepops oaxacaenus	16.58333333	-95.28333333
Prepops obscurans	8.483055556	-82.61666667
Prepops olmosensis	-5.984722222	-79.74527778
Prepops omphalophorus	-14.14388889	-75.6875
Prepops palatanganus	-1.9925	-78.96
Prepops paraguaiensis	-23.34277778	-57.05972222
Prepops paraguaiensis	-22.21666667	-49.93305556
Prepops paranaensis	-27.05	-52.4
Prepops paranaensis	-26.35	-50.88305556
Prepops paranaensis	-25.56666667	-54.56666667
Prepops paranaensis	-25.55	-56.66666667
Prepops paranaensis	-26.63305556	-54.13305556
Prepops paranaensis	-26.25	-53.64972222
Prepops paranaensis	-27.24694444	-53.96027778
Prepops paranaensis	-27.46666667	-51.88333333
Prepops paranaensis	-27.25	-53.86666667
Prepops patricius	-14.14388889	-75.6875
Prepops patricius	-11.05	-75.28333333
Prepops patricius	-12.56666667	-76.31666667
Prepops patricius	-13.50361111	-70.895
Prepops paulistanus	-22.73305556	-45.58305556
Prepops paulistanus	-22.43305556	-42.98305556
Prepops pauloi	-3.049722222	-79.66666667
Prepops pentheri	-7.049722222	-36.35
Prepops persignandus	14.73333333	-91.45

Species	Latitud	Longitud
Prepops persimilis	-27.05	-52.4
Prepops persimilis	-31.06666667	-64.29972222
Prepops persimilis	-14.83305556	-64.9
Prepops peruvianus	-13.50361111	-70.895
Prepops piraporanus	-17.35	-44.93305556
Prepops platensis	-31.98333333	-64.56666667
Prepops platensis	-34.60361111	-58.38166667
Prepops platensis	-33.79666667	-59.52083333
Prepops platensis	-14.83305556	-64.9
Prepops platensis	-26.68305556	-65.26666667
Prepops platensis	-26.5	-64.75
Prepops platensis	-17.78888889	-63.1975
Prepops platensis	-28.3	-65.36666667
Prepops platensis	-25.25	-56.03333333
Prepops plaumann	-27.05	-52.4
Prepops plaumann	-27.23583333	-53.97888889
Prepops plaumann	-29.39972222	-53.04972222
Prepops plaumann	-27.36666667	-53.75
Prepops plaumann	-29.50277778	-50.2425
Prepops plenus	21.14972222	-88.93305556
Prepops plenus	21.91666667	-105.5666667
Prepops prepopsoides	-15.51666667	-40.89972222
Prepops procorrentinus	-24.33305556	-67.01666667
Prepops procorrentinus	-28.56666667	-58.71666667
Prepops procorrentinus	-21.98305556	-41.88305556
Prepops procorrentinus	-22.74722222	-43.71694444
Prepops procorrentinus	-15.91666667	-52.25
Prepops procorrentinus	-17.21666667	-46.86666667
Prepops procorrentinus	-21.07333333	-46.20194444
Prepops procorrentinus	-19.62916667	-43.88972222
Prepops procorrentinus	-19.00888889	-40.1275
Prepops procorrentinus	-20.16666667	-56.51666667
Prepops procorrentinus	-34.33416667	-58.57694444
Prepops procorrentinus	-22.53305556	-63.81666667
Prepops procorrentinus	-30.75	-59.64972222
Prepops procorrentinus	-16.06666667	-57.68305556
Prepops procorrentinus	-22.88305556	-42.33305556
Prepops procorrentinus	-27.44972222	-58.98305556
Prepops procorrentinus	-25.56666667	-54.56666667
Prepops procorrentinus	-34.88805556	-58.38416667
Prepops procorrentinus	-24.23305556	-64.86666667
Prepops procorrentinus	-29.94972222	-51.08305556
Prepops procorrentinus	-20.96666667	-46.11666667
Prepops procorrentinus	-28.56666667	-58.71666667
Prepops procorrentinus	-34.33416667	-58.57694444

Species	Latitud	Longitud
Prepops procorrentinus	-19.53888889	-42.54583333
Prepops procorrentinus	-24.18305556	-65.31666667
Prepops procorrentinus	-22.89972222	-43.23305556
Prepops procorrentinus	-14.83444444	-56.43
Prepops quadriguttatus	-5.984722222	-79.74527778
Prepops riodocensis	-19.53888889	-42.54583333
Prepops rollei	4.920833333	-52.29027778
Prepops rondoniensis	-8.761944444	-63.90222222
Prepops roppai	-15.51666667	-40.89972222
Prepops rubellicollis	44.94444444	-93.09333333
Prepops rubellicollis	45.69972222	-69.73388889
Prepops rubellicollis	43.65694444	-70.19611111
Prepops rubellicollis	44.96944444	-93.19472222
Prepops rubroscutellatus	35.47305556	-108.5427778
Prepops rubroscutellatus	31.92972222	-109.3822222
Prepops rubroscutellatus	34.64638889	-112.4291667
Prepops rubroscutellatus	38.63111111	-106.3591667
Prepops rubroscutellatus	35.76888889	-106.6922222
Prepops rubrovittatus	30.78	-82.14
Prepops rubrovittatus	32.37	-91.24
Prepops rubrovittatus	33.29	-90.95
Prepops rubrovittatus	36.21972222	-90.03722222
Prepops rubrovittatus	36.86611111	-89.32277778
Prepops rubrovittatus	36.21944444	-89.81305556
Prepops rubrovittatus	37.20305556	-91.44333333
Prepops rubrovittatus	44.2225	-74.83638889
Prepops rubrovittatus	44.13388889	-74.92111111
Prepops rubrovittatus	40.75694444	-72.93916667
Prepops rubrovittatus	38.895	-77.03638889
Prepops rubrovittatus	37.55833333	-89.47
Prepops rubrovittatus	37.36722222	-88.48638889
Prepops rubrovittatus	37.62638889	-89.49777778
Prepops rubrovittatus	37.29361111	-88.97527778
Prepops rubrovittatus	40.11055556	-88.20722222
Prepops rubrovittatus	40.01472222	-74.31138889
Prepops rurrenabaquensis	-14.46666667	-67.56666667
Prepops saltensis	-26.38416667	-60.28166667
Prepops santiagoensis	22.97777778	-82.37777778
Prepops schaffneri	21.41666667	-99.59972222
Prepops semifemoratus	-13.79	-48.57083333
Prepops seminiger	-22.5	-44.56666667
Prepops seminiger	-23.54888889	-46.63888889
Prepops seminiger	-23.46666667	-46.63305556
Prepops seminiger	-25.41666667	-49.25
Prepops seminiger	-22.89972222	-43.23305556

Species	Latitud	Longitud
Prepops seminiger	-19.62916667	-43.88972222
Prepops seminiger	-27.23583333	-53.97888889
Prepops seminiger	-27.23555556	-53.9775
Prepops seminiger	-27.24222222	-53.96611111
Prepops seminiger	-29.50277778	-50.2425
Prepops seminiger	-25.66666667	-56.33333333
Prepops seminiger	-27.25	-53.86666667
Prepops seminiger	-21.85	-45.29972222
Prepops seminiger	-22.43305556	-42.98305556
Prepops serranus	-22.51083333	-43.18444444
Prepops setosipes	-27.05	-52.4
Prepops setosipes	-27.6	-55.31666667
Prepops setosipes	-27.44972222	-58.98305556
Prepops setosipes	-26.25	-53.64972222
Prepops setosipes	-25.61666667	-54.33333333
Prepops setosipes	-27.04305556	-55.22722222
Prepops setosipes	-27.25	-53.86666667
Prepops setosipes	-27.36666667	-53.75
Prepops setosipes	-27.23027778	-53.98277778
Prepops setosipes	-27.19944444	-53.84527778
Prepops setosipes	-27.2375	-53.97944444
Prepops setosipes	-27.22666667	-53.98638889
Prepops setosipes	-27.20944444	-53.855
Prepops setosipes	-27.21055556	-53.85416667
Prepops setosipes	-27.13944444	-53.88055556
Prepops setosipes	-27.23583333	-53.97888889
Prepops setosipes	-27.22388889	-53.85083333
Prepops setosipes	-27.22222222	-53.85166667
Prepops signifer	-12.56666667	-76.31666667
Prepops signifer	-14.28888889	-67.46916667
Prepops similaris	24.87111111	-103.6963889
Prepops similaris	24.78305556	-104.45
Prepops similaris	23.16666667	-102.8830556
Prepops subannulatus	-26.16666667	-51.56666667
Prepops subannulatus	-27.05	-52.4
Prepops subannulatus	10.49111111	-66.90194444
Prepops subannulatus	-22.89972222	-43.23305556
Prepops subannulatus	-27.23583333	-53.97833333
Prepops subannulatus	-27.21138889	-53.85472222
Prepops subsimilis	-22.43305556	-42.98305556
Prepops subsimilis	-26.42611111	-49.24333333
Prepops subsimilis	-22.43305556	-45.45
Prepops subsimilis	-20.75	-42.88305556
Prepops subsimilis	-16.66666667	-49.26666667
Prepops subsimilis	-22.63305556	-44.58305556

Species	Latitud	Longitud
Prepops subsimilis	-25.56666667	-54.56666667
Prepops subsimilis	-27.05	-52.4
Prepops subsimilis	-22.5	-44.56666667
Prepops subsimilis	-20.75	-42.88305556
Prepops teapensis	17.54722222	-92.95194444
Prepops teutonianus	-27.05	-52.4
Prepops teutonianus	-27.20944444	-53.855
Prepops teutoniensis	-27.05	-52.4
Prepops tingoensis	-9.289444444	-76.00888889
Prepops tingoensis	-9.299166667	-75.36666667
Prepops tiquiensis	-4.372222222	-70.1925
Prepops trilineatus	-11.18305556	-40.51666667
Prepops trilineatus	-19.26666667	-57.06666667
Prepops trilineatus	-8.761944444	-63.90222222
Prepops trilineatus	-15.51666667	-40.89972222
Prepops trivittatus	-28.21666667	-65.86666667
Prepops trujilloi	27.24277778	-110.0586111
Prepops tucumanensis	-24.33305556	-67.01666667
Prepops tucumanensis	-25.19972222	-64.91666667
Prepops tucumanensis	-17.79722222	-50.9
Prepops tucumanensis	-15.91666667	-52.25
Prepops tucumanensis	-20.16666667	-56.51666667
Prepops tucumanensis	-27.05	-52.4
Prepops tucumanensis	-23.21666667	-64.09972222
Prepops tucumanensis	-16.66666667	-49.26666667
Prepops tupianus	-23	-44.29972222
Prepops tupianus	-22.74722222	-43.71694444
Prepops tupianus	-22.5	-44.56666667
Prepops tupianus	-22.89972222	-43.23305556
Prepops tupianus	-10.46666667	-50.51666667
Prepops tupianus	-12.98305556	-38.51666667
Prepops tupianus	-23.34277778	-57.05972222
Prepops turrialbanus	9.9	-83.68305556
Prepops turvoensis	-27.22222222	-53.85166667
Prepops ubirajarai	-21.16666667	-47.79972222
Prepops univittatus	-28.48305556	-65.98305556
Prepops univittatus	-28.21666667	-65.86666667
Prepops univittatus	-26.08305556	-65.96666667
Prepops univittatus	-25.5875	-66.44055556
Prepops univittatus	-24.33305556	-67.01666667
Prepops univittatus	-26.86666667	-65.68305556
Prepops univittatus	-29.19972222	-65.36666667
Prepops variabilis	-27.91666667	-55.38305556
Prepops variabilis	-28.21666667	-65.86666667
Prepops variabilis	-27.13305556	-64.81666667

Species	Latitud	Longitud
Prepops variabilis	-26.78305556	-65.34972222
Prepops variabilis	-23.14972222	-50.54972222
Prepops vianai	-27.91666667	-55.38305556
Prepops vissosensis	-20.75	-42.88305556
Prepops vittatus	19.76666667	-89.84972222
Prepops vitticollis	-13.50361111	-70.895
Prepops vitticollis	-12.56666667	-76.31666667
Prepops vittifrons	10.16666667	-83.61666667
Prepops vittifrons	21.38305556	-98.88305556
Prepops vittifrons	23.18944444	-106.2136111
Prepops vittifrons	17.54722222	-92.95194444
Prepops wallersteini	-31.98333333	-64.56666667
Prepops wallersteini	-28.48305556	-59.61666667
Prepops wallersteini	-27.64972222	-64.41666667
Prepops wanderbilti	-22.5	-44.56666667
Prepops xavantinoides	11.00722222	-74.91638889
Prepops xavantinus	-15.91666667	-52.25
Prepops xavantinus	-14.66666667	-52.35
Prepops zetterstedti	-22.63305556	-44.58305556
Prepops zetterstedti	-22.43305556	-42.98305556
Prepops zetterstedti	-23	-44.29972222
Prepops zetterstedti	-15.91666667	-52.25
Prepops zetterstedti	-16.66666667	-49.26666667
Prepops zetterstedti	-27.05	-52.4
Prepops zetterstedti	-20.75	-42.88305556
Prepops zetterstedti	-16.97388889	-65.41722222
Prepops zetterstedti	-10.19972222	-40.21666667
Prepops zetterstedti	-20.75	-42.88305556
Prepops zetterstedti	-24.18305556	-65.31666667
Prepops zetterstedti	-23.21666667	-64.09972222
Prepops zetterstedti	-26.68305556	-65.26666667
Prepops zetterstedti	-24.71666667	-65.48305556
Prepops zetterstedti	-26.11666667	-65.28305556
Prepops zetterstedti	-25.56666667	-54.56666667
Prepops zetterstedti	-24.23305556	-64.86666667
Prepops zetterstedti	-22.89972222	-43.23305556
Prepops zetterstedti	-25.25	-56.03333333
Prepops zetterstedti	-22.5	-44.56666667
Prepops zetterstedti	-22.26666667	-42.53305556
Prepops zonatus	-10.44972222	-40.18305556
Prepops zonatus	45.02083333	-93.50944444
Prepops zonatus	47.25388889	-95.2125
Prepops zonatus	45.48	-84.5
Prepops zonatus	48.94194444	-100.0663889
Prepops zonatus	45.30694444	-92.36222222

Species	Latitud	Longitud
Prepops zonatus	49.70861111	-99.60277778
Prepops zonatus	42.47722222	-88.09555556

5. CONCLUSÕES GERAIS

Apesar de possuir 198 espécies, o gênero *Prepops* permanece pouco amostrado, pois a maioria das descrições é feita a partir de um número pequeno de espécimes, ou até mesmo exemplares únicos. A descrição de duas novas espécies e os novos registros de localidades reforçam a necessidade de trabalhos taxonômicos e ampliação das coletas, afim de que a riqueza e biologia do grupo seja melhor documentada. Somado a isto, a reunião de informações espalhadas por dezenas de trabalhos taxonômicos e chaves de identificação regionais são importantes para facilitar a identificação das espécies de *Prepops*.

O uso do gênero em uma análise biogeográfica é um avanço nos estudos de Miridae, que permanecem essencialmente taxonômicos. Progressos nos estudos filogenéticos e biogeográficos devem ser testados com a família que possui um grau de endemismo evidente e pode contribuir para a definição de prioridades para conservação de áreas com grande diversidade biológica.