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PROGRAMA DE PÓS-GRADUAÇÃO EM CIÊNCIAS BIOLÓGICAS

Revisão de *Toechorychus* Townes (Hymenoptera, Ichneumonidae, Cryptinae)

Anazélia Magda Tedesco

Vitória, ES
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Orientador: Alexandre Pires Aguiar

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SUMÁRIO

1 – LISTA DE TABELAS

2 – LISTA DE FIGURAS

3 – RESUMO

O gênero Neotropical *Toechorychus* Townes é revisado e cladisticamente definido; 302 espécimes de 14 coleções foram examinados; 40 espécies são reconhecidas, das quais 35 são descritas como novas: *T*. **sp**. **nov**. 1, *T*. **sp**. **nov**. 2, *T*. **sp**. **nov**. 3, *T*. **sp**. **nov**. 4, *T*. **sp**. **nov**. 5, *T*. **sp**. **nov**. 6, *T*. **sp**. **nov**. 7, *T*. **sp**. **nov**. 8, *T*. **sp**. **nov**. 9, *T*. **sp**. **nov**. 10, *T*. **sp**. **nov**. 11, *T*. **sp**. **nov**. 12, *T*. **sp**. **nov**. 13, *T*. **sp**. **nov**. 14, *T*. **sp**. **nov**. 15, *T*. **sp**. **nov**. 16, *T*. **sp**. **nov**. 17, *T*. **sp**. **nov**. 18, *T*. **sp**. **nov**. 19, *T*. **sp**. **nov**. 20, *T*. **sp**. **nov**. 21, *T*. **sp**. **nov**. 22, *T*. **sp**. **nov**. 23, *T*. **sp**. **nov**. 24, *T*. **sp**. **nov**. 25, *T*. **sp**. **nov**. 26, *T*. **sp**. **nov**. 27, *T*. **sp**. **nov**. 28, *T*. **sp**. **nov**. 29, *T*. **sp**. **nov**. 30, *T*. **sp**. **nov**. 31, *T*. **sp**. **nov**. 32, *T*. **sp**. **nov**. 33, *T*. **sp**. **nov**. 34, *T*. **sp**. **nov**. 35. As demais espécies válidas são: *T. abactus* (Cresson), *T. albimaculatus* (Taschenberg), *T. brevicaudis* (Szépligeti), *T. cassunungae* (Brauns), *T. stramineus* (Taschenberg). O gênero pode ser reconhecido pela carena epicnemial geralmente não alcançando mais do que 0.3 da distância até a proeminência subtegular; sulco apical em forma de V presente na valva dorsal do ovipositor, anteriormente aos dentes apicais da valva ventral; presença de uma compressão subapical no ovipositor; bainha do ovipositor cerca de 0.1 tão longa quanto a tíbia posterior; e margem dorsal do pronoto fortemente inchada. Uma chave de identificação para todas as espécies conhecidas de *Toechorychus*, descrições de todas as espécies válidas, e análises filogenéticas são fornecidas, bem como ilustrações, e informações de distribuição para cada espécie. Registros de hospedeiro publicados foram compilados e três registros novos são fornecidos: *T. albimaculatus* é parasitóide de *Mischocyttarus drewseni* (Saussure) (Vespidae, Polistinae) **novo registro**; *T. stramineus* é parasitóide de *M. basimacula* (Cameron) **novo registro**; e *T.* **sp**. **nov**. 25 é parasitóide de *M. collarellus* Richards **novo registro**. Um Neótipo é designado para *T. cassunungae*. O gênero é provavelmente mais proximamente relacionado a *Lymeon* Föster e *Acerastes* Cushman.

4 – ABSTRACT

The Neotropical *Toechorychus* Townes is revised, cladistically defined and diagnosed; a total of 302 specimens from 14 depositories were examined; 40 species are recognized, 35 of which are described as new: *T.* **sp**. **nov**. 1, *T.* **sp**. **nov**. 2, *T.* **sp**. **nov**. 3, *T.* **sp**. **nov**. 4, *T.* **sp**. **nov**. 5, *T.* **sp**. **nov**. 6, *T.* **sp**. **nov**. 7, *T.* **sp**. **nov**. 8, *T.* **sp**. **nov**. 9, *T.* **sp**. **nov**. 10, *T.* **sp**. **nov**. 11, *T.* **sp**. **nov**. 12, *T.* **sp**. **nov**. 13, *T.* **sp**. **nov**. 14, *T.* **sp**. **nov**. 15, *T.* **sp**. **nov**. 16, *T.* **sp**. **nov**. 17, *T.* **sp**. **nov**. 18, *T.* **sp**. **nov**. 19, *T.* **sp**. **nov**. 20, *T.* **sp**. **nov**. 21, *T.* **sp**. **nov**. 22, *T.* **sp**. **nov**. 23, *T.* **sp**. **nov**. 24, *T.* **sp**. **nov**. 25, *T.* **sp**. **nov**. 26, *T.* **sp**. **nov**. 27, *T.* **sp**. **nov**. 28, *T.* **sp**. **nov**. 29, *T.* **sp**. **nov**. 30, *T.* **sp**. **nov**. 31, *T.* **sp**. **nov**. 32, *T.* **sp**. **nov**. 33, *T.* **sp**. **nov**. 34, *T.* **sp**. **nov**. 35. The other valid species are: *T. abactus* (Cresson), *T. albimaculatus* (Taschenberg), *T. brevicaudis* (Szépligeti), *T. cassunungae* (Brauns), *T. stramineus* (Taschenberg). The genus can be recognized by epicnemial carina usually not reaching more than 0.3 of distance to subtegular ridge; apical V-shaped sulcus at dorsal valve of ovipositor, anteriorly to apical teeth of ventral valve; subapical compression at ovipositor anteriorly to apical teeth of ventral valve; ovipositor sheath about 0.1 as long as hind tibia; and dorsal margin of pronotum strongly swollen. A key and descriptions are provided to all valid species, and cladistic analysis is provided, as well as illustrations and distributions. Published host records were compiled, and three new records are provided, as follows: *T. albimaculatus* is a parasitoid of *Mischocyttarus drewseni* (Saussure) (Vespidae, Polistinae) **new record**; *T. stramineus* is a parasitoid of *M. basimacula* (Cameron) **new record**; and *T.* **sp**. **nov**. 25 is a parasitoid of *M. collarellus* Richards **new record**. A Neotype is designated for *T. cassunungae*. The genus is probably more closely related to *Lymeon* Förster and *Acerastes* Cushman.

5 – CAPÍTULO I

Resumo expandido: Revisão de *Toechorychus* Townes (Hymenoptera, Ichneumonidae, Cryptinae)

ANAZÉLIA M. TEDESCO

Introdução

Lymeonina é uma das 15 subtribos de Cryptini, compreendendo um grupo predominantemente Neotropical de vespas atualmente com 19 gêneros e 164 espécies válidas (Yu *et al.* 2005; Nogueira & Aguiar 2005; Kasparyan & Ruíz 2008; Tedesco & Aguiar 2009). A subtribe foi definida por Townes (1970) com base em caracteres como sulco transversal na base do propódeo com carenas longitudinais, margem posterior do metanoto e margem anterior do propódeo sem projeções dentiformes e ausência de dentes na base do primeiro tergito. Membros da subtribe são, em sua maioria, ectoparasitóides idiobiontes que atacam pupas e pré-pupas de Lepidoptera e Hymenoptera. As únicas exceções conhecidas são *Acerastes pertinax* (Cresson) e *Lymeon orbus* (Say), que atacam ovissaco de aranha (Pratt 1945; Townes & Townes 1962). A subtribe é o grupo mais tipicamente Neotropical de Cryptinae, com 18 dos seus 19 gêneros atualmente válidos ocorrendo primariamente ou exclusivamente nessa região (Wahl 1999; Kasparyan & Ruíz 2008; Tedesco & Aguiar 2009). Entretanto, embora amplamente distribuídos (Porter 1980), não há muitos registros sobre abundância, diversidade e distribuição, taxonomia e biologia desses gêneros.

Enquanto outras subtribes parecem exibir uma estrutura corporal altamente especializada de acordo com uma presa específica, como observado para Gabuniina (Townes & Townes 1962), Lymeonina não têm um padrão típico de estrutura corporal que possa ser associado com tipos específicos de parasitismo. A forma do corpo varia de robusta em *Priotomis* Townes a aproximadamente elongada e cilíndrica em *Mallochia* Viereck e *Strabotes* Townes; dente ventral da mandíbula ligeiramente mais longo que dente dorsal em *Strabotes* vs. dente ventral normalmente mais curto que o dente dorsal em *Toechorychus* Townes; tíbia anterior dilatada e

órgãos subgenuais alargados em algumas espécies de *Lymeon* Föster e *Mallochia* vs. tíbia anterior e órgãos subgenuais não-dilatados em *Acerastes* Cushman, *Bathyzonus* Townes e na maioria dos gêneros.

Até então, não há nenhuma análise cladística que tenha explorado a filogenia interna de Lymeonina, afora um estudo morfológico focado em Gabuniina, que contou com várias subtribos potencialmente relacionadas, incluindo Lymeonina, entre outros (Aguiar 2005a), e uma filogenia molecular ampla, incluindo todas as tribos de Cryptinae (Laurenne *et al*. 2006). Laurenne *et al*. (*op*. *cit*.) usaram dados moleculares para testar a monofilia de Cryptinae e a validade das suas tribos e subtribos. Nessa análise, apenas seis espécies de Lymeonina, representando cinco gêneros, foram avaliadas. Elas foram recuperadas num clado com entre três a seis representantes de Lymeonina *sensu* Townes, sempre agrupadas ao único representante de Baryceratina incluído na análise (*Baryceros* Gravenhorst), e com o Hemigasterini *Platymystax* Townes. Portanto, a monofilia da subtribo, bem como exata relação de parentesco da maioria dos seus gêneros, permanece incerto.

Toechorychus foi estabelecido por Townes (1946), com base na espécie *Mesostenus abactus* Cresson, do México. *Toechorychus* é um gênero Neotropical moderadamente grande, originalmente definido pela ausência da epomia, margem dorsal do pronoto fortemente inchada, final dorsal da carena epicnemial oposto ao 0.25 ventral da margem posterior do pronoto, areolete muito pequeno, bainha do ovipositor cerca de 0.1 tão longa quanto a tíbia posterior, e valva ventral do ovipositor sem dentes. A monofilia e as relações de parentesco do gênero nunca foram investigados. O gênero foi alocado por Townes em Lymeonina, mas o arranjo subtribal de Cryptini parece ser altamente artificial (Gauld 1984; Laurenne *et al.* 2006).

O tratamento taxonômico prévio de *Toechorychus* foi limitado a descrições individuais de espécies, a maioria delas antes de 1916. Yu *et al.* (2004) catalogaram cinco espécies: *Toechorychus abactus* (Cresson, 1874), *T. albimaculatus* (Taschenberg, 1876), *T. stramineus* (Taschenberg, 1876), *T. cassunungae* (Brauns, 1905), e *T. brevicaudis* (Szépligeti, 1916). Anteriormente a este trabalho, o gênero foi registrado para apenas sete países: Brasil, Guatemala, Guiana, México, Paraguai, Peru, e Venezuela.

As espécies de *Toechorychus* aparentemente são parasitóides em ninhos de *Mischocyttarus* Saussure (Vespidae, Polistinae) e pupas e pré-pupas de Lepidoptera, mas registros de hospedeiroestão disponíveis apenas para três espécies. *Toechorychus abactus* e *T.*

cassunungae são conhecido por atacar espécies de *Mischocyttarus* (Brauns 1905; Bertoni 1911; Costa-Lima 1962), e *T. brevicaudis* emergiu de um casulo de *Hypsipyla grandella* Zeller (Lepidoptera, Pyralidae) (Myers 1932).

Os objetivos deste trabalho são avaliar e redefinir o gênero, descrever todas as espécies válidas, incluindo todos os novos táxons, e documentar novos registros de hospedeiro, provendo uma revisão taxonômica e cladística completa de *Toechorychus*.

Material

Este trabalho é baseado em 302 espécimes de *Toechorychus* provenientes de 14 coleções, encontrados entre os quase 60,000 Cryptini processados durante o curso deste projeto. Acrônimos estão listados abaixo. Nomes dos curadores que forneceram os empréstimos estão entre parênteses.

AEIC - American Entomological Institute, USA (D. Wahl); **AMNH** - American Museum of Natural History, USA (J. Carpenter); **ANSP** - Academy of Natural Sciences of Philadelphia, USA (J. Weintraub); **BMNH** - The Natural History Museum, Inglaterra (G. Broad); **CNCI** - Canadian National Collection of Insects, Canadá (A. Bennett); **DZUP** - Coleção Entomológica Padre Jesus Santiago Moure, Universidade Federal do Paraná, Brasil (G. A. R. Melo); **FSCA** - Florida State Collection of Arthropods, USA (J. Wiley); **HNHM** - Hungarian Natural History Museum, Budapest, Hungria (S. Csõsz); **IBPR** - Instituto Biológico de Ribeirão Preto, Brasil (N.W. Perioto); **MLUH** - Martin-Luther-Universität, Halle-Wittenberg, Alemanha (K. Schneider); **NHRS** - Naturhistoriska Riksmuseet, Suécia (H. Vårdal); **RMNH** - Nationaal Naturhistorische Museum, formerly Rijksmuseum van Natuurlijke Historie, Holanda (R. de Vries); **UFES** - Universidade Federal do Espírito Santo, Brasil (C. O. Azevedo); **UJMF** - Universidade Estadual Paulista "Júlio de Mesquita Filho", Brasil (F. Noll); **USNM** - United States National Museum of Natural History, USA (R. Kula); **ZMHU** - Museum für Naturkunde der Humboldt Universität zu Berlin, Alemanha (F. Koch).

Métodos

Estrutura

Termos para nervação alar foram interpretados como em Sharkey e Wharton (1997). Superfície e orientação das pernas foram interpretadas como em Aguiar e Gibson (2010). Termos para esculturação seguem Harris (1979). Termos para estruturas seguem a seção "General Morphology", parte do Genera Ichneumonorum Nearcticae, de I. Gauld e D. Wahl (http://www.amentinst.org/GIN/).

Medidas

Medidas foram feitas usando um micrômetro ocular sobreposto a um estereomicroscópio Leica MZ12.5, com lentes oculares de 16x. Razões citadas com duas casas decimais indicam medidas diretas realizadas com o micrômetro ocular; medidas citadas com uma casa decimal – a maioria para descrições de cor – representam valores estimados.

Devido aos seus limites naturalmente indistintos, medidas de comprimento das nervuras foram tomadas exatamente a partir do meio da junção com a nervura adjacente. As porções espectrais ou nebulosas das nervuras também foram consideradas nas medidas. Para estruturas do mesossomo e do metassomo, a menos que esteja indicado abaixo, as medidas foram feitas em vista dorsal. Razões biométricas são nas descrições como a seguir:

Mandíbula, comprimento máximo / largura máxima; **Clípeo**, largura máxima / altura máxima; **Clípeo**, largura no ápice / largura na base; **Espaço malar**, largura máxima / largura basal da mandíbula; **Escutelo**, comprimento máximo / largura máxima; **Pós-escutelo**, comprimento máximo / largura máxima; **Mesossoma**, comprimento máximo / largura máxima; **Sulco transversal na base do propódeo**, largura lateral / comprimento máximo da porção anterior do propódeo; **Propódeo**, comprimento máximo / largura no meio; **Espiráculo do propódeo**, largura máxima / comprimento máximo (vista lateral do propódeo); **Célula da asa anterior 1+2Rs (areolete)**, altura / altura máxima pterostigma; **Nervura da asa anterior 2–Cu**, comprimento / 2cu–a, comprimento; **Nervura da asa anterior 4–Rs** comprimento / 4–M, comprimento;

Nervura da asa posterior 1–Cu comprimento / cu–a, comprimento; **Nervura da asa posterior 2–1A**, comprimento / distância da nervura cu–a até a margem posterior da asa; **Primeiro tergito metassomal**, comprimento máximo / fêmur posterior, comprimento máximo; **Espiráculo do primeiro tergito metassomal**, distância da base do tergito / Primeiro tergito metassomal, comprimento máximo (vista lateral); **Segundo tergito metassomal**, comprimento máximo / largura máxima; **Segundo tergito metassomal**, largura máxima / largura mínima.

Descrições

Descrições de morfologia geral foram preparadas usando o DELTA Editor (Dallwitz 1980; Dallwitz *et al*. 1999.). O conjunto de caracteres produzido para as descrições está no Apêndice. As outras seções das descrições foram preparadas manualmente. Algumas convenções são usadas para padronização e para reduzir o tamanho do item "Material examinado"; dados de etiqueta listados nesta seção foram formatados como a seguir. Local de coleta: **PAÍS**, *Estado* ou *Província*, Cidade. Data de coleta foi formatada como "00.XII.0000". Métodos de coleta: YPT, para "Yellow pan trap" (armadilha Möricke), e "Sweeping", para varredura de vegetação. Termos curtos (uma ou duas palavras) que não puderam ser lidos das etiquetas foram registradas como "[illegible]."

Ilustrações

Imagens digitais foram preparadas usando o equipamento de foco extendido do sistema EntoVision (GTVision, Hagerstown, Maryland). Imagens em série foram capturadas pela câmera digital JVC KY-75U 3-CCD acoplada às lentes Leica MZ16. O tempo de exposição variou de 0.4 a 1.2 segundos, de acordo com o zoom utilizado. As camadas de imagem foram produzidas automaticamente pelo Cartograph, e exportadas como arquivos jpg pelo programa Archimed. As imagens foram, então, combinadas usando o programa CombineZM (disponível gratuitamente em http://www.hadleyweb.pwp.blueyonder.co.uk/CZM/combinezm.htm). As ilustrações resultantes foram digitalmente tratadas por meio do programa GIMP 2.6 (http://www.gimp.org/), e posteriormente processadas com CorelDraw 12. As fórmulas RGB que seguem o nome das cores nas descrições foram obtidas usando Corel PHOTO-PAINT 12, como descrito por Aguiar

(2005b). Este procedimento foi utilizado quando a descrição da cor foi considerada potencialmente ambígua.

Distribuição

As coordenadas geográficas, quando não disponíveis nos dados de etiqueta, foram obtidas a partir do geoLoc (http://splink.cria.org.br/geoloc) e do Global Gazetteer Version 2.2 (http://www.fallingrain.com/world/). Os mapas de distribuição foram gerados por meio do programa ArcView 3.2. Nos itens "Distribution" e "Material Examined", os países foram listados de norte para sul, como padronizado por Zanella *et al.* (2000).

Análises Cladísticas

Análises cladísticas foram conduzidas para prover uma avaliação da monofilia e das relações de parentesco de *Toechorychus*, e têm este objetivo apenas. Os resultados não foram explorados para filogenia interna ao nível de subtribo, uma vez que isto está além do escopo deste trabalho. Vinte e quatro espécies de *Toechorychus* foram incluídas nas análises. O subconjunto selecionado a partir do grupo-interno é suficientemente representativo do gênero, compreendendo uma gama ampla de variação estrutural. Os táxons usados no grupo-externo incluem 38 espécies de 18 dos 19 gêneros reconhecidos para Lymeonina (Wahl 1999; Kasparyan & Ruíz 2008; Tedesco & Aguiar 2009), em que Townes (1970) alocou *Toechorychus*. Estas espécies incluem o tipo da subtribe, *Lymeon orbus* e o único representante da região Etiópica, *Savolia maculata* Seyrig. O gênero de Lymeonina não incluído é *Epicnemion* Kasparyan & Ruíz, conhecido para apena três exemplares de uma espécie mexicana. Os táxons restantes incluem 71 espécies de 61 gêneros em 11 outras subtribos de Cryptini (de 15 listadas por Wahl 1999). Todos os táxons foram codificados diretamente a partir dos espécimes. Fêmeas foram preferencialmente codificadas, por serem mais informativas e morfologicamente estáveis que os machos. Representantes de outras tribos de Cryptinae (=Gelinae of Townes), também foram incluídos: *Phygadeuon* sp. (Phygadeuontini), *Gelis* sp. (Phygadeuontini), *Echthrus* sp. (Hemigasterini), e *Platymystax* sp. (Hemigasterini). Os três últimos foram usados porque foram recuperados no mesmo clado de Toechorychus ou de gêneros de Lymeonina em análises moleculares (Laurenne *et al*. 2006). A

espécie de *Phygadeuon* foi utilizada para enraizar a árvore. Este número comparativamente grande de táxons (109 espécies) no grupo-externo teve de ser considerado como uma a resposta aos seguintes problemas. Primeiro, não há grupos-irmãos claramente definidos para *Toechorychus* ou Lymeonina e, ao mesmo tempo, o arranjo subtribal de Cryptini parece é altamente artificial; com isso, táxons do grupo-externo tiveram que ser selecionados a partir de várias espécies aparentemente ou supostamente relacionadas à Lymeonina. Segundo, testes extensivos com diferentes táxons ou grupos de táxons, durante as análises preliminares, mostraram que resultados razoavelmente estáveis puderam ser obtidos somente com um número maior de táxons do grupo-externo.

O conjunto de caracteres usado incorpora 100 caracteres de matrizes de Aguiar (2005a), Santos & Aguiar (2008), Tedesco & Aguiar (2009), e Santos *et al*. (2009), mais 62 novos caracteres, resultando em 162 caracteres informativos de estrutura externa. Os novos caracteres foram delimitados a partir de observações originais e derivados de características tradicionais utilizadas por Townes (1970). Os caracteres originais apresentados aqui têm, naturalmente, uma leve ênfase em características observadas durante a descrição de novos gêneros e espécies de Lymeonina (Tedesco & Aguiar 2009; Santos *et al*. 2009). Vários estados de caracteres são únicos para espécies de Lymeonina, como a porção dorsal mediana da carena occipital fraca ou ausente. Os estados foram codificados como "-" quando não-aplicável, e com "?" para dados ausentes. Isto tem por objetivo apenas facilitar a compreensão do leitor, uma vez que o TNT considera ambos da mesma maneira, sem adicionar passos à árvore. A delimitação dos caracteres e a codificação foi feita em conjunto com Bernardo F. Santos (UFES), que codificou cerca de 50% da matriz usada.

Os dados gerados foram analisados no TNT v1.1 (Willi Hennig Society edition, described in Goloboff *et al.* 2008). Buscas setoriais foram configuradas para fundir as árvores duas vezes; "ratchet" 3,000 interações a cada busca; "drift" com 50 ciclos; e "tree fusing" com cinco rodadas. Caracteres multiestado foram sempre tratados como não-ordenados. Ilustrações dos cladogramas foram produzidas com Winclada (Nixon 1999).

Resultados e Discussão

Revisão taxonômica

Três das cinco espécies previamente válidas de *Toechorychus* foram redescritas; trinta e cinco espécies novas foram definidas e descritas, o que representa aumento de 700% na biodiversidade conhecida para o gênero. Uma chave de identificação para machos e fêmeas das espécies do gênero foi elaborada. Foram descritos 131 caracteres estruturais, a partir dos quais foram geradas as descrições das espécies.

Padrões de cor do corpo, recorrentemente utilizados nas diagnoses e chaves de espécies de Cryptinae, mostraram-se menos eficientes para o reconhecimento das espécies de *Toechorychus*. As espécies do gênero são, ao contrário da maioria das espécies de Cryptinae, mais facilmente diferenciadas pela esculturação, especialmente pela presença e ausência de estruturas como carenas e outras elevações da cutícula. Os padrões de cor, porém, são de grande utilidade no reconhecimento do gênero sem auxílio de microscópio estereoscópico. Várias espécies compartilham padrões semelhantes de coloração na cabeça, mesoescudo, mesopleura e propódeo.

O aumento de 700% na biodiversidade conhecida de *Toechorychus* torna o gênero o segundo gênero de Lymeonina em número de espécies descritas (40), atrás apenas de *Lymeon* Förster (78).

Biologia

Jeanne (1979) cita uma espécie de *Toechorychus* como parasitóide de *Mischocyttarus* (Vespidae, Polistinae). Bueno e Fraga (1988) encontraram uma espécie não identificada de *Toechorychus* parasitando a pupa de *Eueides isabella dianasa* (Cramer) (Lepidoptera, Nymphalidae, Heliconiini) coletada em um maracujazeiro em Minas Gerais, Brasil. *Mischocyttarus cerberus* Ducke (Vespidae, Polistinae) foi registrado como um hospedeiro de *Toechorychus* sp. por Togni e Giannotti (2006). Em adição a estes, o presente trabalho faz os seguintes registros: *Toechorychus* como um parasitóide de *Mischocyttarus drewseni* (Saussure) **novo registro**, *M. basimacula* (Cameron) **novo registro**, e *M. collarellus* Richards (Vespidae, Polistinae) **novo registro**.

Soares *et al.* (2006) e Guimarães (2008) coletaram um suposto *Pachysomoides* Strand emergido de um *Mischocyttarus cassununga* (von Ihering), mas as ilustrações fornecidas por aqueles autores indicam que o parasitóide é, na verdade, uma espécie de *Toechorychus*. A seguinte combinação de características é clara nas respectivas figuras: T1 delgado, subretangular em vista dorsal (vs. T1 robusto, subtriangular em *Pachysomoides*), ovipositor muito curto, apenas alcançando o ápice do T8 ou um pouco além (vs. ovipositor de tamanho moderado, alcançando bem além da margem do T8), areolete pequeno, aproximadamente tão alto quanto a altura do pterostigma (vs. areolete de tamanho médio, mais alto que o pterostigma). Mais características diferenciais incluem padrões de cor, como mesoescudo com uma mancha longitudinal amarela no lobo central (vs. mesoscutum com manchas longitudinais nos lobos laterais). Espécimes testemunho do trabalho de Soares *et al.* (2006) estão depositados na Coleção de Insetos da Universidade Federal de São Carlos, São Carlos, São Paulo, mas não puderam ser examinados. Ambos registros foram feitos como parte de amplos estudos acerca do comportamento de *Mischocyttarus*.

Distribuição

Toechorychus é registrado para quase todos os países continentais da região Neotropical, exceto Belize, El Salvador, Chile, e Uruguai (Fig. 1). Ainda assim, espécimes de *Toechorychus* raramente são encontrados (ver *Raridade*).

Morfologia

Devido à excepcionalmente ampla gama variação na estrutura geral, vários caracteres geralmente adotados como caracteres genéricos entre os Cryptinae são bastante variáveis em *Toechorychus*. A presença/ausência da carena pleural, por exemplo, foi citada por Gupta e Gupta (1983) para sugerir que os gêneros de Gabuniina "parecem formar dois grupos distintos". A mesma carena entre as espécies de *Toechorychus*, entretanto, pode ser ausente, incompleta, ou completa e forte. Outra característica não-usual em Cryptinae e presente em *Toechorychus* é a grande diversidade de padrões de forma e esculturação do propódeo. A diversidade encontrada é extrema e mescla presença e ausência de estruturas comumente utilizadas para separação de gêneros. O gradiente

de variação vai desde carena posterior e anterior ausentes até carena anterior forte e posterior representada por apófises longas e fortes. Este mesmo padrão não-usual de variação se repete para as características listadas abaixo. A estrutura é citada seguida pelos estados que variam mais intensamente.

Epomia: presença/ausência, forma e conspicuidade; **Margem posterior do metanoto:** presença/ausência de dentes e carenas; **Sulco transversal na base do propódeo:** com carenas/liso, largura; **Porção anterior do propódeo:** estreita/larga; **Carena transversal anterior do propódeo:** presença/ausência; **Carena transversal posterior do propódeo:** presença/ausência; **Areolete:** presença/ausência, tamanho, e forma; **Nervuras 1Cu e 1cu-a da asa posterior:** tamanho relativo; **Primeiro tergito:** com/sem dentes na base; **Valva ventral do ovipositor:** presença/ausência de dentes apicais.

Estrutura atípica

Alguns dos caracteres listados acima são atípicos para Lymeonina, notadamente a presença de dentes na margem posterior do metanoto, na margem anterior do propódeo, e na base do primeiro tergito. De fato, embora haja outros gêneros de Lymeonina com morfologia atípica (e.g. *Polyphrix* Townes, *Priotomis*, e *Petila* Tedesco & Aguiar), o gênero com mais características discordantes da diagnose da subtribo é certamente *Toechorychus*. *Polyphrix*, por exemplo, embora atípico, é conhecido por ter uma estrutura altamente uniforme (Santos *et al*. 2009).

Várias espécies de *Toechorychus* compartilham com ao menos outras duas subtribos suas características diagnósticas (Tabela 1). A curta projeção de nervura que parte do encontro das nervuras 1m-cu e 1-Rs+M da asa anterior, que ocorre apenas em *Toechorychus* **sp**. **nov**. 17, também é característica para alguns gêneros de Cryptina, como *Anacis* Porter e *Caenopelte* Porter. A presença dos dentes laterais na base do primeiro tergito é um caráter diagnóstico para Goryphina, exceto para poucos gêneros como *Debilos* Townes e *Hylophasma* Townes. Outros caracteres presentes em *Toechorychus* e atípicos para Lymeonina incluem a célula 1+2Rs da asa anterior retangular ou trapezoidal, muito mais larga do que alta, sempre posteriormente aberta. Em *Toechorychus* **sp**. **nov**. 30, a célula 1+2Rs é representada na base pela nervura 2r-m muito curta, aproximadamente intersticial com a nervura 2m-cu. Essas características são típica de

gêneros de Ceratocryptina; a maioria deles ocorre nos trópicos do Velho Mundo, como *Ignambia* Cheesman, *Lorio* Cheesman e *Rambides* Seyrig, que tem areolete com formato muito similar a algumas espécies de *Toechorychus*.

Por outro lado, a porção dorsal da carena occipital muito inconspícua ou ausente em algumas espécies de *Toechorychus*, é conhecida apenas par ao gênero e outro representante de Lymeonina, *Priotomis*. O mesoescudo com um sulco ou uma carena longitudinal também é comum em Lymeonina, especialmente em *Dismodix* Townes, *Acerastes*, e *Polycyrtidea* Townes.

Portanto, assim como definido na literatura, ou como demonstrado na tabela e no presente trabalho (ver *Análises Cladísticas* abaixo), *Toechorychus*, de acordo com a atual definição das subtribos de Cryptini, é mais seguramente alocado em Lymeonina *sensu* Townes.

Raridade

Considerando o grande número de espécimes de Cryptinae examinados, é notável que poucos espécimes do gênero tenham sido encontrados. Isto pode indicar que *Toechorychus* é um táxon raro, embora seja claramente bem distribuído; o gênero é registrado do México à Argentina, abrangendo 46°40’ de latitude. A pouca quantidade de espécimes, entretanto, pode não ser devida exatamente à raridade, mas ao menos em parte a amostragem fragmentada e limitações implícitas dos métodos de amostragem. Isto pode ser observado a partir do fato de que vários estudos acerca do comportamento de *Mischocyttarus* têm encontrado espécies de *Toechorychus* como seus parasitóides, e um número comparativamente alto de espécimes geralmente é registrado. Guimarães (2008), por exemplo, verificou a presença de 34 espécimes de Toechorychus nos ninhos de *Mischocyttarus*.

Amostragem

Dentre os 302 espécimes avaliados no presente estudo, apenas quarto foram coletados por armadilhas Möricke. Embora este seja um fato aparentemente surpreendente, esta estatística é congruente com os resultados encontrados por Aguiar e Santos (2010), sugerindo que *Toechorychus* é geralmente mais coletado por armadilhas Malaise. Aguiar e Santos (*op. cit.*) mostraram que, ao menos para Cryptini Neotropicais, amostragem com armadilhas Möricke e

Malaise retorna diferentes capturas a nível genérico, com cerca da metade dos gêneros sendo capturado principalmente ou quase exclusivamente por armadilhas Malaise.

Caracteres de importância na definição das espécies

Os seguintes caracteres são particularmente relevantes para a definição das espécies de *Toechorychus*: (1) Presença/ausência de dentes na base do primeiro tergito. (2) Forma e diferenciação da carena posterior transversa do propódeo. (3) Padrão de cor do propódeo, que pode muitas vezes ser espécie-específico, como o padrão único de *T.* **sp**. **nov**. 4. (4) Presença/ausência de dentes na margem anterior do propódeo. (5) Presença/ausência de dentes na margem posterior do metanoto.

Análises Cladísticas

Resultados e discussão

Um total de 162 caracteres foram definidos e codificados, e uma matriz final de 22.092 células foi obtida (Tabela 2). Oito cladogramas mais parcimoniosos (para busca com pesos iguais e com *K*=1–6) foram encontrados. Buscas com pesos iguais resultaram em duas árvores igualmente parcimoniosas de CI 0.05, e RI 0.45. Cada valor de *K* testado resultou em apenas uma árvore mais parcimoniosa, CI 0.05, RI 0.45–0.43 (Tabela 3). Todos os cladogramas para cada uma dessas buscas preservaram clados de interesse para Lymeonina como um todo, bem como para *Toechorychus* (Figs 240–244).

De acordo com as análises, *Toechorychus* é sempre apoiado como um grupo monofilético por 7–17sinapomorfias, das quais as seguintes estão presentes em todas as árvores: 47:2, carena epicnemial alcançando no máximo 0.5 da distância até a proeminência subalar (Figs 99–104); esta característica também é observada em *Latibulus* Gistel e *Epicnemion*. 144:2, ovipositor moderadamente delgado (Fig. 37, 39); esta característica corresponde a um caráter altamente homoplásico (CI 0.05–0.15). 152:1, valva dorsal do ovipositor com um sulco em forma de V anteriormente aos dentes apicais da valva ventral do ovipositor (Fig. 45). 153:1, ovipositor com uma constrição subapical anterior aos dentes apicais da valva ventral (Figs 45, 240). Estas duas

últimas características são únicas e típicas para o gênero e foram observadas pela primeira vez no presente trabalho. Todas as espécies de *Toechorychus* com fêmea conhecida possuem o ovipositor com um sulco impresso na valva dorsal e uma constrição subapical no ovipositor.

A maior parte dos resultados (exceto *K*=1 and 2) sugere que *Toechorychus* é corretamente alocado em Lymeonina *sensu* Townes (1970), tal como definido na literatura ou como recuperado aqui. Na maioria das análises (Figs 241–244), o gênero foi recuperado como mais relacionado a *Lymeon* sp. (*K*=3–5, e pesos iguais), e *Acerastes* sp. (com *K*=3–6), ambos classificados in Lymeonina. Para as buscas com *K*=1 e 2, entretanto, *Toechorychus* foi recuperado como grupo irmão de um clado formado por gêneros de Lymeonina (*Bathyzonus* sp. e *Latosculum* sp.), Mesostenina (*Acorystus circumflexus* Scherrer & Santos, *Cryptanura quadrimaculata* Cushman, e *Diloa* sp.), Gabuniina (*Prosthoporus nigrifemur* Gupta), e Goryphina (*Friona* sp.) (Fig. 240). O clado é apoiado apenas por sinapomorfias que correspondem a caracteres homoplásicos que sofrem reversões ao longo do clado: contorno da área apical do clípeo convexo, sulco escuto-escutelar com distintas carenas, nervura 1-R1 da asa posterior não diferenciada. De acordo com os resultados, embora não definido um grupo-irmão exato para o gênero, *Toechorychus* pode ser seguramente alocado em Lymeonina *sensu* Townes.

Platymystax sp. (Hemigasterini) e *Gelis* sp. (Phygadeuontini), recuperados no mesmo clado de *Toechorychus* por Laurenne *et al*. (2006) em uma análise molecular, foram recuperados próximos a raiz do cladograma nas presentes análises. Para análises com *K*=1 e 2, estes gêneros foram recuperados como grupo-irmão de *Trihapsis* (Cryptina) e *Latibulus argiolus* (Sphecophagina), respectivamente. Para *K*=3–5, entretanto, o grupo-irmão foi constituído pelos gêneros de Lymeonina *Pachysomoides* e *Golbachiella* Townes. Em todas as topologias, *Toechorychus* foi sempre recuperado no ramo mais apical, ao contrário de *Platymystax* e *Gelis*, o que discorda dos resultados obtidos por Laurenne *et al*. (*op. cit.*).

6 – CAPÍTULO II

Revision of *Toechorychus* Townes (Hymenoptera, Ichneumonidae, Cryptinae)

ANAZÉLIA M. TEDESCO

Table of contents

Abstract. The Neotropical *Toechorychus* Townes is revised, cladistically defined, and diagnosed. A total of 40 species are recognized, 35 of which are described as new. The other valid species are *T. abactus* (Cresson), *T. albimaculatus* (Taschenberg), *T. brevicaudis* (Szépligeti), *T. cassunungae* (Brauns), and *T. stramineus* (Taschenberg). *Toechorychus* can be recognized by the epicnemial carina usually not reaching more than 0.3 of the distance to subtegular ridge; dorsal valve of ovipositor with a subapical V-shaped sulcus; ovipositor with a subapical constriction; ovipositor sheath about 0.1 as long as hind tibia; and dorsal margin of pronotum swollen. A key and descriptions, including photographic illustrations and distribution maps, are provided to all valid species; a cladistic analysis of the genus is also performed. Seventy three new characters are

proposed for the analysis of Cryptinae phylogeny. *Toechorychus* was recovered as a monophyletic group supported by 7–17 synapomorphies, closely related to *Lymeon* Förster and *Acerastes* Cushman. Two new synapomorphies are discovered for *Toechorychus*, a subapical V-shaped sulcus at the dorsal valve of the ovipositor, and a subapical constriction of the ovipositor present basad of the apical teeth of the ventral valve. Published host records were compiled and three new records are provided, as follows: *T. albimaculatus* is a parasitoid of *Mischocyttarus drewseni* (Saussure) (Vespidae, Polistinae) **new record**; *T. stramineus* is a parasitoid of *M. basimacula* (Cameron) **new record**; and *T.* **sp. nov. 25** is a parasitoid of *M. collarellus* Richards **new record**. A neotype is designated for *T. cassunungae*.

Key words: *Acerastes*, Cryptini, implied weighting, *Lymeon*, Lymeonina

Introduction

Lymeonina is one of the 15 subtribes of Cryptini (Wahl 1999), comprising a predominantly Neotropical group of wasps currently with 19 genera and 164 valid species (Yu *et al*. 2005; Kasparyan & Ruíz 2008; Tedesco & Aguiar 2009). It was proposed and delimited by Townes (1970) by the presence of features such as the transverse furrow at the base of propodeum corrugated, hind margin of metanotum and anterior margin of propodeum without opposing teeth-like projections, and the absence of teeth at the base of the first tergite. The subtribal arrangement of cryptine genera seems however to be highly artificial (Gauld 1984; Laurenne *et al*. 2006) and the monophyly of the Lymeonina, as proposed by Townes, remains uncertain.

Lymeonines are, as far as known, mostly idiobiont ectoparasitoids that attack pupae or prepupae of Lepidoptera and Hymenoptera. The only known exceptions are *Acerastes pertinax* (Cresson) and *Lymeon orbus* (Say), which attack spider egg sacs (Pratt 1945; Townes & Townes 1962). The subtribe is the most typically Neotropical group of Cryptinae, 18 of its 19 valid genera are exclusive to that region (compiled from Wahl 1999; Kasparyan & Ruíz 2008; Tedesco & Aguiar 2009). However, despite its wide distribution (Porter 1980) there are not many reports about abundance, diversity, taxonomy, or biology of its genera.

Toechorychus was established by Townes (1946), based on *Mesostenus abactus* Cresson, from Mexico. It is a moderately large Neotropical genus, originally defined by the lacking

epomia, dorsal margin of pronotum swollen, dorsal end of epicnemial carina opposite ventral 0.25 of hind margin of pronotum, areolet very small, ovipositor sheath about 0.1 as long as hind tibia, and ventral valve of ovipositor without distinct teeth. The monophyly and relationships of the genus have never been investigated, but it was placed in the Lymeonina by Townes (1970).

Previous taxonomic treatments of *Toechorychus* were mainly limited to isolated species descriptions, most of them produced before 1916. Yu *et al*. (2004) cataloged five species: *Toechorychus abactus* (Cresson, 1874), *T. albimaculatus* (Taschenberg 1876), *T. stramineus* (Taschenberg 1876), *T. cassunungae* (Brauns, 1905), and *T. brevicaudis* (Szépligeti 1916). The genus has been recorded in the literature from seven countries, Brazil, Guatemala, Guyana, Mexico, Paraguay, Peru, and Venezuela.

Toechorychus spp. are apparently parasitoids in nests of Vespidae and pupae of Lepidoptera, but host records were previously known only for three species: *T. abactus* and *T. cassunungae* are known to attack species of *Mischocyttarus* (Brauns 1905; Bertoni 1911; Costa-Lima 1962), and *T. brevicaudis* was reared from a cocoon of *Hypsipyla grandella* Zeller (Lepidoptera, Pyralidae) (Myers 1932).

The goals of this study are to revise and to refine the definition of the genus, to define and describe all valid species, and to document new host records, while providing a cladistic and taxonomic revision.

Material and Methods

This work is based upon 302 specimens of *Toechorychus*, sorted from almost 60,000 Cryptini specimens in 16 depositories. The four letter acronyms used for the depositories follow Arnett *et al*. (1993); the complete list is provided next. Names of curators who assisted with the loans are given in parentheses:

AEIC – American Entomological Institute, USA (D. Wahl); **AMNH** – American Museum of Natural History, USA (J. Carpenter); **ANSP** – Academy of Natural Sciences of Philadelphia, USA (J. Weintraub); **BMNH** – The Natural History Museum, England (G. Broad); **CNCI** – Canadian National Collection of Insects, Canada (A. Bennett); **DZUP** – *Coleção Entomológica Padre Jesus Santiago Moure*, *Universidade Federal do Paraná*, Brazil (G. Melo); **FSCA** – Florida State Collection of Arthropods, USA (J. Wiley); **HNHM** – Hungarian Natural History

Museum, Budapest, Hungary (S. Csõsz); **IBPR** – *Instituto Biológico de Ribeirão Preto*, Brazil (N. Perioto); **MLUH** – *Martin-Luther-Universität, Halle-Wittenberg*, Germany (K. Schneider); **NHRS** – *Naturhistoriska Riksmuseet*, Sweden (H. Vårdal); **RMNH** – *Nationaal Naturhistorische Museum*, The Netherlands (R. de Vries); **UFES** – *Universidade Federal do Espírito Santo*, Brazil (M. Tavares); **UJMF** – *Universidade Estadual Paulista "Júlio de Mesquita Filho"*, Brazil (F. Noll); **USNM** – United States National Museum of Natural History, USA (R. Kula); **ZMHU** – *Museum für Naturkunde der Humboldt Universität zu Berlin*, Germany (F. Koch).

The terminology used herein is fully illustrated in Santos and Aguiar (2011). Leg surfaces and orientation were interpreted as in Aguiar and Gibson (2010). Terms for sculpture follow Harris (1979). Terms of structures follow the section "General Morphology" of the Genera Ichneumonorum Nearcticae, by Ian Gauld and David Wahl (http://www.amentinst.org/GIN/). Terms not treated by these authors are listed and defined below.

Axillary carinae – the first axillary carina, between postscutellum and hind wing insertion, and the second axillary carina extending from hind margin of metanotum towards mesepimeron. In color descriptions, all carinae were collectively referred simply as *axillary carinae*; **Interocellar area** – the area delimited by the ocelli; **Metapleural triangle** – the triangular area between the upper and the lower division of metapleuron. In *Toechorychus* it is often slightly swollen; **Orbital band** – the yellow or whitish color stripe which occurs around the compound eye, sometimes completely encircling it (used as in Aguiar 2005 and Aguiar & Ramos 2011). It can be either complete (rare), or incomplete, when interrupted by surrounding colors; **Scutellar carina** – a longitudinal carina linking the lateral margin of mesoscutum to scutellum.

When the anterior transverse carina of propodeum is present, the propodeum is treated as divided into two regions: the **anterior portion of propodeum**, corresponding to the area between the transverse furrow at base of propodeum and anterior transverse carina of propodeum; and the **posterior portion of propodeum**, corresponding to the area between anterior transverse carina of propodeum and posterior margin of propodeum.

Measurements were taken using an ocular micrometer attached to a Leica MZ12.5 stereomicroscope, with a 16x ocular. Ratios cited to the nearest hundredth indicate direct measurements performed with the ocular micrometer; ratios cited to the nearest tenth represent

estimated values. Since all used ratios are quite similar between specimens of a given species, measurements are given only for the holotype. Measurements of veins length were taken as in Tedesco and Aguiar (2001). For mesosomal and metasomal structures measurements were taken in dorsal view, unless where indicated otherwise.

Biometric ratios used in descriptions are as follows:

Mandible – maximum length / maximum width; **Clypeus** – maximum width / maximum height; **Clypeus** – apex width / base width; **Malar space** – maximum width / basal width of mandible; **Scutellum** – maximum length / maximum width; **Post-scutellum** – maximum length / maximum width; **Mesosoma** – maximum length / maximum width; **Transverse furrow at base of propodeum** – lateral width / maximum length of anterior portion of propodeum; **Propodeum** – maximum length / mid-width; **Propodeal spiracle** (including borders) – maximum width / maximum length (lateral view of propodeum); **Fore wing cell 1+2Rs (areolet)** – height / pterostigma maximum height; **Fore wing vein 2Cu** – length / 2cu-a, length; **Fore wing vein 4Rs** – length / 4M, length; **Hind wing vein 1Cu** – length / cu-a, length; **Hind wing vein 2-1A** – length / distance from cu-a to posterior margin; **First metasomal tergite** – maximum length / hind femur, maximum length; **Spiracle at first metasomal tergite** – distance from base of tergite / First metasomal tergite, maximum length (lateral view); **Second metasomal tergite** – maximum length / maximum width; **Second metasomal tergite** – maximum width / minimum width.

Descriptions were prepared using DELTA (Dallwitz 1980; Dallwitz *et al*. 1999). The character set produced for the descriptions is given in the Appendix. The abbreviation YPT stands for Yellow pan trap (Moericke trap). Digital images were prepared using the extended-focus system EntoVision (GTVision, Hagerstown, Maryland). Serial pictures were taken using a JVC KY-75U 3-CCD digital video camera attached to a Leica MZ16 zoom lens. The exposure time ranged from 0.4 to 1.2 seconds, according to the zoom used. The stacks of pictures were produced in Cartograph®, and exported as jpg files through the Archimed® software. The images were then merged using the software CombineZM (http://www.hadleyweb.pwp.blueyonder.co.uk/). The resulting pictures were digitally rendered using GIMP 2.6 in order to enhance clarity, and further processed with CorelDraw12. The RGB formula that follows color names in the descriptions

were taken using Corel PHOTO-PAINT 12, according to the procedure described by Aguiar (2005b). This was used when color description was considered potentially ambiguous.

The specific epithet names for all new taxa were created from a free rearrangement of the name of the respective locality of the holotype or paratype, plus the suffix *-us* or *-ensis*, to Latinize and to match the gender of the new word with the masculine gender of the generic epithet.

The geographical coordinates, when not available from label data, were obtained from geoLoc (http://splink.cria.org.br/geoloc) and from the Global Gazetteer 2.2 (http://www.fallingrain.com/world/). Distribution maps were generated using ArcView 3.2. In the items Distribution and Material Examined, the countries are listed from north to south, as standardized by Zanella *et al*. (2000).

Cladistic Analyses

All analyses were performed to provide an evaluation of the monophyly and relationships of *Toechorychus*, and fit this aim only. Results were not explored for the internal phylogeny at subtribal level, which is beyond the scope of the present work. Twenty-four species of *Toechorychus* were included in the analyses, comprising an array of morphological variation which is nearly fully representative for the genus. The outgroup taxa used for the present study includes 38 species from 18 of the 19 valid genera recognized for Lymeonina (Wahl 1999; Kasparyan & Ruíz 2008; Tedesco & Aguiar 2009). The selected species included the type of the subtribe, *Lymeon orbus*, and the unique lymeonine representative from the Ethiopian region, *Savolia maculata* Seyrig. A representative of the Lymeonina *Epicnemion* Kasparyan *et* Ruíz, known only from three specimens of a Mexican species, could not be included in the analyses. Outgroup taxa comprise 71 species of 61 genera in 12 other Cryptini subtribes (of 15 listed by Wahl 1999). All taxa were coded directly from the specimens. Females were preferentially coded, because they are more informative and taxonomically characteristic than males. Representatives of other tribes of Cryptinae were also included: *Phygadeuon* sp. (Phygadeuontini), *Gelis* sp. (Phygadeuontini), *Echthrus* sp. (Hemigasterini), and *Platymystax* sp. (Hemigasterini). The latter three were used because they were recovered in the same clade of *Toechorychus*, or in clades of other typical Lymeonina, in a study with molecular analyses

(Laurenne *et al*. 2006). The *Phygadeuon* sp. was used to root the tree. Such comparatively large number of outgroup taxa (109 species) had to be considered as a response to the following problems. First, there is a lack of clearly defined sister-groups for *Toechorychus* or Lymeonina and, at the same time, the current subtribal arrangement for Cryptini is probably highly artificial; therefore, outgroup taxa had to be selected from numerous species apparently or supposedly related to Lymeonina. Second, extensive tests with different taxa or groups of taxa, during preliminary analyses, showed that reasonably stable results could only be obtained with a large number of outgroup taxa.

The character set used in the analyses (see Appendix) incorporates 100 characters from the matrices of Aguiar (2005a), Santos and Aguiar (2008), Tedesco and Aguiar (2009), and Santos *et al*. (2009) (see Table 1), plus 62 original characters of the external morphology. Many characters were delimited from taxonomic features used by Townes (1970); the new characters were delimited and coded collectively by the senior author and by Bernardo F. Santos, and are simultaneously published with Santos and Aguiar (2012).

Characters were scored with a hyphen ("-") when non-applicable, and with a question mark ("?") for missing data. This only aims to facilitate reader interpretation, since TNT treats both scores in the same way, adding no steps to the tree. Character delimitation and coding were made collectively by the senior author and by Bernardo F. Santos (UFES), each coding approximately half of the used matrix.

The data were analyzed using TNT v1.1 (Willi Hennig Society edition, described in Goloboff *et al*. 2008). For tree searching, the choice of number of sectors to run under random sectorial searches, number of initial replications to submit to fusing, and rounds of tree-drifting and ratchet was based on the consideration of how the data set behaved to changes in these parameters, through the evaluation of consecutive analyses. The best parameters defined by this procedure were used during the search with each tested value of K (1–6): sectorial searches set to fusing trees twice; ratchet with 3,000 iterations each run; drift set to 50 cycles; and tree fusing with five rounds. Multistate characters were always treated as unordered. Cladogram illustrations were produced with Winclada (Nixon 1999).

Taxonomy

Toechorychus Townes

(Figs 1 and 2)

Toechorychus: Townes, 1946, 5: 29–63. Type species: *Mesostenus abactus* Cresson.

Diagnosis. All *Toechorychus* can be recognized by epicnemial carina usually not reaching more than 0.3 of distance to subtegular ridge (Fig. 103); dorsal valve of ovipositor with subapical, V-shaped sulcus (Fig. 45); ovipositor with subapical constriction (Fig. 45); ovipositor sheath about 0.1 as long as hind tibia (Fig. 1); and dorsal margin of pronotum distinctly swollen (as in fig. 47).

Redescription. Female. Fore wing length 3.93–8.20 mm (n=36). Body usually shiny, moderately stout.

Head (Figs 55–84). Mandible 1.28–1.79 (n=38) as long as basal width, apex narrower than base, dorsal tooth distinctly longer than ventral tooth, usually basally wider than the base of ventral tooth. Palpi densely pilose. Malar space usually moderately large, 0.72–1.62 (n=38) length of basal width of mandible. Clypeus broad, 1.38–2.09 (n=38) as long as wide, in front view distinctly rectangular to almost triangular, apex usually entirely truncated to slightly but distinctly convex, dorsally often markedly convex; apicolateral corners not distinctly projected as triangular lobes; apical margin medially straight, concave, or slightly convex, without median teeth, usually sharp, lifted. Supraclypeal area sometimes with moderately stout, subrectangular medial protuberance; area between antennal foramens often with V- or U-shaped carinae. Antenna with 21–30 flagellomeres (n=38); flagellum usually slightly enlarged towards apex, sometimes markedly widened and flattened subapically; apical flagellomere often subcircular, sometimes flattened. Supra-antennal area ventrally slightly to distinctly concave, usually with faint median carina or with median elevation. Occipital carina ventrally always conspicuous, sharp, dorsally usually uniformly curved, sometimes dorsally very faint or completely absent, reaching hypostomal carina at, or far from mandible base. Occipital and hypostomal carinae ventrally from a regular carina to very wide.

Mesosoma (Figs 85–104). Dorsal margin of pronotum swollen; epomia from absent to stout, usually restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum always convex, subcircular to ovoid, always densely sculptured, usually corrugated at and laterally to impression of notaulus, lobes covered with fine to coarse punctures; notaulus long, reaching about 0.8 of mesoscutum length, moderately to deeply impressed, posterior apex always faintly impressed, usually U-shaped; sternaulus surface faintly to markedly corrugated. Epicnemial carina usually not reaching more than 0.3 distance to subtegular ridge, often curved backwards. Sternaulus intensely sinuous, often complete, but sometimes incomplete or medially shallow, sometimes interrupted, or faint at medial 0.5 to 0.9 (n=13), frequently entirely corrugated. Mesopleural groove always corrugated. Median portion of posterior transverse carina of mesothoracic venter short to moderately long, either straight or arched forwards or backwards, sometimes flanged. Hind margin of metanotum sometimes with teeth like projections. Transverse furrow at base of propodeum deep to very shallow, usually moderately narrow, but sometimes wide, width 0.05–1.45 (n=38) central length of anterior area of propodeum, surface smooth to markedly corrugated. Juxtacoxal carina absent to complete, usually represented only by very short ridges. Pleural carina absent to stout, occasionally irregular, fused to sculpture of propodeum and lower division of metapleuron. Fore tibia usually apparently apically compressed, partly because of faint medial swelling. Hind coxa generally globose. Hind tibia often with distinct, long bristles.

Propodeum (Figs 125–162). Moderately stout, 0.96–1.33 (n=38) medially as long as wide, almost always entirely sculptured. Anterior margin with or without two lateral teeth, which may be faint or blunt; medially concave, or with two conspicuous lateral concavities, as in *T. albimaculatus*. Spiracle usually rounded, sometimes slightly elliptic. Anterior transverse carina absent to complete, faint to stout, either straight or slightly arched forwards or backwards, sometimes medially interrupted or elevated. Posterior area of propodeum with varied sculpture, from smooth to markedly closely strigate. Posterior transverse carina either completely absent or distinct as a pair of apophyses, conical swellings, rounded tubercles, or still as faint to moderately stout sublateral crests. *Toechorychus* **sp**. **nov**. 7 (Fig. 135) with posterior transverse carina almost complete, centrally arched, laterally with low swelling.

Wings (Figs 105–124). Hyaline. Fore wing vein 1-Rs+M with bulla placed basally or medially; ramellus absent (except distinct in *T*. **sp**. **nov**. 17); crossvein 1cu-a arising far from or

near vein 1M+Rs; vein 2Cu distinctly longer than crossvein 2cu-a; bulla at crossvein 2m-cu moderately short, placed medially to posteriorly; cell 1+2Rs small to medium sized, rectangular to pentagonal, sometimes indistinct; crossvein 3r-m at least partly spectral or rarely not differentiated; when present, crossveins 2r-m and 3r-m parallel, subparallel, or markedly convergent, veins 2r-m shorter, longer, or about same size of 3r-m; vein 4Rs shorter, longer, or about same size of vein 4M. Hind wing vein M+Cu apically markedly convex; vein 1Cu shorter to longer than crossvein 1cu-a; crossvein 1r-m with bulla at ventral 0.3; veins 1-Rs and 2-Rs distinctly angled, cell R1 trapezoidal; apical 0.5 of vein Cub almost always distinctly convex; vein 2-1A reaching at least 0.50 of distance to wing margin.

Metasoma (Figs 163–199). T1 short to moderately long, apex distinctly wider than base, petiole from approximately cylindric to moderately compressed, with or without basolateral tooth, often with dorsal median depression posteriorly to spiracle, sometimes also with lateral and posterior median depressions; spiracle of T1 near midlength or slightly beyond, placed at apical 0.50–0.65 (n=43), in dorsal view slightly to distinctly prominent; median dorsal carina completely absent; dorsolateral carina absent, sometimes basally faint, apparently separating dorsal and lateral portions; ventrolateral carina usually completely absent. T2–8 usually coriarious. T2 usually short, often as long as wide, thyridium slightly to distinctly longer than wide, rarely about as wide as high; T7–8 usually slightly to distinctly shorter than T5–6. Ovipositor always short, reaching only apex of abdomen or nearly so, slender to moderately stout, almost always downcurved, rarely straight, sometimes scarcely punctate, basally cylindrical, subapically slightly to distinctly depressed, with subapical circular constriction, dorsal valve with subapical V-shaped sulcus; apex of ovipositor ending in long and narrow point, often without nodus or notch; dorsal valve without teeth; ventral valve apically with 4–8 faint to distinct teeth, or teeth absent.

Color. Orbital band generally complete and very large. Supra-antennal area almost always black or dark brown. Pronotum often with yellow marks laterally along collar and dorsal margin. Mesoscutum medially, on central lobe, often with subcircular to lanceolate yellow spot. Scutellum usually yellow, rarely concolorous with mesoscutum. Subalar ridge, hypoepimeron, scrobe, and sternaulus often marked in different colors than rest of mesopleuron. Mesosoma usually striped, rarely entirely brown or orange. Propodeum typically with two longitudinal yellow stripes, intercalated with black or dark brown.

Male. Very similar to female. Secondary sexual differences as typically observed for Cryptini: male body size almost always smaller than females; antenna with more flagellomeres than in female; propodeal apophyses, conical swellings, and sublateral crests, when present, usually fainter than in female, but always distinct nonetheless; propodeal sculpture significantly more confusedly arranged than in female. Male color patterns are usually also very similar to those of females, except white band of flagellum sometimes present only dorsally, and yellow marks at propodeum often smaller.

Variability. As can be easily noticed in the general description above, there is an unusually wide array of variation within *Toechorychus* (see also the item *Discussion*, below). Specimens of a given species, however, are generally quite similar and uniform, the major source of morphological variation being mostly limited to body color and few structural features highly variable, notably the sculpture of scuto-scutellar groove, varying from smooth to corrugated, and the extension of the scutellar carina. Species of *Toechorychus* can have also no considerable intraspecific variation in color patterns, even in spite of the sometimes moderately wide distribution range (e.g. *T. stramineus*). The major exception is *T. cassunungae*, with a moderately range of differences in tonality (from pale yellow to dark brown, for example), extension of spots, and presence/absence of dark marks. In this species, the lanceolate mark at the mesoscutum can be reduced or almost indistinct or is sometimes medially interrupted. These color variations, however, seem to be of little or no importance at the species level.

Biology. Jeanne (1979) cites a unidentified *Toechorychus* sp. as parasitoid of *Mischocyttarus* (Vespidae, Polistinae). Bueno and Fraga (1988) also report a unidentified *Toechorychus* sp. parasitizing the pupae of *Eueides isabella dianasa* (Cramer) (Lepidoptera, Nymphalidae, Heliconiini) collected in passion fruit (*Passiflora edulis* Sims, Passifloraceae) in Minas Gerais, Brazil. *Mischocyttarus cerberus* Ducke (Vespidae, Polistinae) was recorded as a host of a unidentified *Toechorychus* sp. by Togni and Giannotti (2006). In addition to these, the present study records three different *Toechorychus* spp. as a parasitoids of *Mischocyttarus drewseni* (Saussure) **new record**, *M. basimacula* (Cameron) **new record**, and *M. collarellus* Richards (Vespidae, Polistinae) **new record**.

Soares *et al*. (2006) and Guimarães (2008) reared a supposed *Pachysomoides* Strand from *Mischocyttarus cassununga* (von Ihering), but the pictures provided by those authors indicate that the parasitoid is actually a *Toechorychus* sp. The following combination of features, typical for

Toechorychus, is clear from the respective images: T1 slender, subrectangular in dorsal view (*vs*. T1 stout, subtriangular in *Pachysomoides*), ovipositor very short, only reaching T8 apex or nearly so (*vs*. ovipositor of moderate length, reaching well beyond metasoma apex), areolet small, approximately as high as pterostigma (*vs*. areolet medium sized to large, higher than pterostigma). More variable differential features include color patterns, as mesoscutum with yellow longitudinal mark at central lobe (*vs*. mesoscutum with yellow longitudinal marks at lateral lobes) and posterior transverse carina of propodeum absent between crests or apophyses (*vs*. conspicuous and arched forwards). Voucher specimens from Soares *et al*. (2006) are deposited in the insect collection of the Universidade Federal de São Carlos, São Carlos, São Paulo, but could not be examined.

Distribution. *Toechorychus* is recorded from most continental countries of the Neotropical region, except only Belize, El Salvador, Chile, and Uruguay (Fig. 1). Even so, specimens of *Toechorychus* are rarely encountered (see *Rarity*, in the item *Discussion*).

Discussion

Morphology. Due to an unusually wide array of variation in general structure, several characters which are usually taxonomically relevant at genus level in Cryptinae are rather inoperative for *Toechorychus*. The presence/absence of the pleural carina, for example, was cited by Gupta and Gupta (1983) to suggest that the genera of Gabuniina "appear to form two distinct groups". The same carina among species of *Toechorychus*, however, can be absent, incomplete, or complete and stout. A similarly unusual pattern of variation also occurs for the features listed below. The listed structure is followed by the respective character-states that vary most intensely.

Epomia – presence/absence, shape and stoutness; **Hind margin of metanotum** – presence/absence of teeth and carinae; **Transverse furrow at base of propodeum** – corrugated/smooth, width; **Anterior margin of propodeum** – presence/absence of teeth; **Anterior portion of propodeum** – narrow/wide; **Anterior transverse carina of propodeum** – presence/absence; **Posterior transverse carina of propodeum** – presence/absence; **Areolet** – presence/absence, size, and shape; **Hind wing veins 1Cu and 1cu-a** – relative length; **First**

tergite – with/without basolateral teeth; **Ventral valve of ovipositor** – presence/absence of apical teeth.

Characters of supra-generic importance. Some of the characters listed above are atypical for Lymeonina, notably the presence of teeth at the hind margin of metanotum, anterior margin of propodeum, and at the base of the first tergite. In fact, although there are other genera of Lymeonina with atypical morphology (e.g., *Polyphrix* Townes, *Priotomis* Townes, and *Petila* Tedesco *et* Aguiar), the genus with most discordant features from the diagnosis of the subtribe is certainly *Toechorychus*.

Several species of *Toechorychus* share with at least other two subtribes one or more of their diagnostic features (Table 2). The ramellus, a short vein projection arising at the meeting of fore wing veins 1m-cu and 1-Rs+M, which occur only in *Toechorychus* **sp**. **nov**. **17**, is also characteristic of some genera of Cryptina, such as *Anacis* Porter and *Caenopelte* Porter. The presence of the lateral teeth at base of first tergite is a diagnostic feature to Goryphina, except for a few genera, as *Debilos* Townes and *Hylophasma* Townes. Other features which occur in *Toechorychus* but are atypical of Lymeonina include the fore wing cell 1+2Rs rectangular or somewhat trapezoidal, much wider than high, and always posteriorly open. In *Toechorychus* **sp**. **nov**. **30**, cell 1+2Rs is basally represented by a very short crossvein 2r-m, approximately interstitial with crossvein 2m-cu. These features are characteristic to genera of Ceratocryptina; most of them occur in the Old Word tropics, as in *Ignambia* Cheesman, *Lorio* Cheesman, and *Rambides* Seyrig, which have the areolet shaped in a very similar way to that of some *Toechorychus* species.

However, the very inconspicuous or absent dorsal portion of occipital carina, as noted in some *Toechorychus* spp., is known only for this genus and another representative of Lymeonina, *Priotomis*. The mesoscutum with a longitudinal sulcus or carina is also common in the Lymeonina *Dismodix* Townes, *Acerastes*, and *Polycyrtidea* Townes. Still, most of the features of *Toechorychus* agree well with those which define the Lymeonina *sensu* Townes (see Table 2) (see also item *Cladistic analyses*, further below).

Characters of specific importance. The following characters are particularly relevant in defining species of *Toechorychus*: (1) Presence/absence of the basolateral teeth of first tergite; (2) Shape

and presence/absence of posterior transverse carina of propodeum; (3) Color pattern of propodeum, which can be species-specific sometimes, as with the unique pattern of *T*. **sp**. **nov**. 4; (4) Presence/absence of teeth at anterior margin of propodeum; (5) Presence/absence of teeth at hind margin of metanotum.

Rarity. Considering the large number of Cryptinae specimens sorted for *Toechorychus*, it seems worthy of note that only few specimens of the genus were found. That might indicate that *Toechorychus* is a rarely collected taxon, even though it is clearly widespread (the genus is recorded from Mexico to Argentina, ranging 46°40' in latitude. Such rarity of specimens may also be due, at least in part, to fragmented sampling effort, as well as implicit limitations of the sampling methods. This is suggested from the fact that several studies on *Mischocyttarus* behavior found *Toechorychus* species as parasitoids, and a comparatively high number of specimens are generally recorded. For example, Guimarães (2008) recorded 34 specimens of *Toechorychus* emerging from *Mischocyttarus* nests.

Sampling. Of 302 specimens examined in the present study, only four were collected by Moericke traps (= yellow pan traps). While perhaps a surprising fact, such statistics agrees with the findings of Aguiar and Santos (2010), which also suggested that *Toechorychus* seemed to be possibly more efficiently collected by Malaise traps. Aguiar and Santos (*op*. *cit*.) showed that, at least for Neotropical Cryptini, sampling with Moericke and Malaise traps yields intensely different genus-level assemblages, with about half of the genera being captured mostly or almost exclusively by Malaise traps.

Key to species of *Toechorychus* Townes

The present key is applicable to both females and males. The identity of *T*. *abactus* (Cresson, 1874) and *T*. *brevicaudis* (Szépligeti, 1916) could not be checked, and both these species are therefore not included in the key.

1. Hind margin of metanotum with two lateral teeth, even if faint, or with two short lateral carinae extending towards transverse furrow at base of propodeum (Fig. 49) ... 2

-. Hind margin of metanotum without teeth or carinae (Fig 48) ... 20

2(1). Occipital carina dorsally conspicuous (Fig. 52) ... 3
-. Occipital carina dorsally inconspicuous (Fig. 50) ... 11

3(2). Collar dorso-laterally rounded, distinctly swollen (Fig. 47) ... 4
-. Collar dorso-laterally carinated, not swollen (Fig. 46) ... 8

4(3). Anterior portion of propodeum medially with two longitudinal carinae (Fig. 129), even if faint (Fig. 144); transverse furrow at base of propodeum moderately deep to very deep (Figs 157–162); hind coxa patterned (Figs 187–199) ... 5
-. Anterior portion of propodeum medially without longitudinal carinae (Fig. 131); transverse furrow at base of propodeum shallow (Fig. 150); hind coxa uniformly coloured (Figs 175–178) ... 7

5(4). Anterior transverse carina of propodeum straight (Fig. 154); fore wing crossvein 1cu-a angle with vein M+Cu distinctly obtuse (Fig. 105); gaster mostly uniformly coloured (Fig. 171); transverse furrow at base of propodeum wide throughout its length (Fig. 154) ... ***Toechorychus albimaculatus*** **Taschenberg**
-. Anterior transverse carina of propodeum medially or entirely arched (Figs 125 and 135); fore wing vein 1cu-a angle with vein M+Cu about 90° (Fig. 118); gaster striped (Figs 175–195); transverse furrow at base of propodeum moderately to very narrow (Figs 157–162), even if medially wider ... 6

6(5). Anterior margin of propodeum with two lateral teeth (Fig. 142), even if faint; T1 with basolateral teeth (Fig. 53), even if faint; supraclypeal area with dark brown or black marks (Fig. 71); propodeal crests conspicuous (Figs 18 and 161) ... ***Toechorychus*** **sp. nov. 11, Tedesco**
-. Anterior margin of propodeum without teeth (Fig. 161); T1 without basolateral teeth (Fig. 54); supraclypeal area without dark brown or black marks; propodeal crests not developed (Figs 7 and 161) ... ***Toechorychus*** **sp. nov. 22, Tedesco**

7(4). Transverse furrow at base of propodeum entirely wide (Fig. 138); anterior transverse carina of propodeum medially slightly arched (Fig. 138); fore wing crossvein 1cu-a angle with vein M+Cu about 90° (Fig. 118); gaster mostly uniformly coloured (Fig. 172) ... ***Toechorychus* sp. nov. 29, Tedesco**

-. Transverse furrow at base of propodeum moderately to very narrow (Fig. 131), even medially wider; anterior transverse carina of propodeum straight (Fig. 131); fore wing crossvein 1cu-a angle with vein M+Cu distinctly obtuse (Fig. 117); gaster striped (Fig. 180) ... ***Toechorychus* sp. nov. 12, Tedesco**

8(3). Anterior portion of propodeum medially with two longitudinal carinae (Fig. 129), even if faint (Fig. 144); dorsal half of supra-antennal area medially with distinct sculpture; postscutellum mostly or entirely yellowish (Figs 137–144) ... 9

-. Anterior portion of propodeum medially without longitudinal carinae (Fig. 131); dorsal half of supra-antennal area medially polished; postscutellum without yellow (Figs 132–134) ... 10

9(8). Sternaulus incomplete (Fig. 43); transverse furrow at base of propodeum moderately deep to very deep; anterior margin of propodeum without teeth (Fig. 48); fore wing vein 1cu-a angle with vein M+Cu distinctly obtuse (Fig. 117) ... ***Toechorychus* sp. nov. 34, Tedesco**

-. Sternaulus complete (Fig. 44), even medially shallow; transverse furrow at base of propodeum shallow; anterior margin of propodeum with two lateral teeth (Fig. 51), even if faint; fore wing crossvein 1cu-a angle with vein M+Cu about 90° (Fig. 118) ... ***Toechorychus* sp. nov. 16, Tedesco**

10(8). Sternaulus incomplete (Fig. 43); transverse furrow at base of propodeum entirely wide; anterior transverse carina of propodeum straight; T1 with basolateral teeth (Fig. 53), even if faint ... ***Toechorychus* sp. nov. 10, Tedesco**

-. Sternaulus complete (Fig. 44), even if medially shallow; transverse furrow at base of propodeum moderately to very narrow, even if medially wider; anterior transverse carina of propodeum medially or entirely arched (Figs 125 and 135); T1 without basolateral teeth (Fig. 54) ... ***Toechorychus* sp. nov. 8, Tedesco**

11(2). Collar dorso-laterally rounded, distinctly swollen (Fig. 47) ... 12
-. Collar dorso-laterally carinated, not swollen (Fig. 46) ... 16

12(11). Anterior transverse carina of propodeum straight (Fig. 154) ... 13
-. Anterior transverse carina of propodeum medially or entirely arched (Figs 125 and 135) ... 15

13(12). Anterior margin of propodeum with two lateral teeth (Fig. 142), even if faint; ventral margin of mandible regularly shaped, not expanded as crest (Fig. 66); gaster mostly uniformly coloured (Fig. 168) ... ***Toechorychus*** **sp**. **nov**. **3, Tedesco**
-. Anterior margin of propodeum without teeth (Fig. 48); ventral margin of mandible basally expanded as crest (Figs 67 and 68), even if slightly; gaster striped (Figs 175–195) ... 14

14(13). Fore wing crossvein 1cu-a angle with vein M+Cu about 90° (Fig. 118); anterior transverse carina of propodeum complete (Fig. 140) ... ***Toechorychus*** **sp**. **nov**. **14, Tedesco**
-. Fore wing crossvein 1cu-a angle with vein M+Cu distinctly obtuse (Fig. 122); anterior transverse carina of propodeum incomplete, medially interrupted (Fig.160) ... ***Toechorychus*** **sp**. **nov**. **25, Tedesco**

15(12). Anterior margin of propodeum with two lateral teeth (Fig. 162), even if faint; postscutellum mostly or entirely yellowish (Fig. 162); central lobe of mesoscutum with a long lanceolate or rectangular yellow mark, nearly reaching anterior margin (Fig. 92); propodeal Apophysis or conical swelling not developed (Figs 30 and 162) ... ***Toechorychus*** **sp**. **nov**. **31, Tedesco**
-. Anterior margin of propodeum without teeth (Fig. 129); postscutellum without yellow (Fig. 129); central lobe of mesoscutum without yellow mark; propodeal Apophysis or conical swelling conspicuous, higher than wide, somewhat compressed (Figs 39 and 129) ... ***Toechorychus*** **sp**. **nov**. **17, Tedesco**

16(11). Anterior portion of propodeum medially with two longitudinal carinae (Fig. 129), even if faint; anterior margin of propodeum without teeth (Fig 48); fore wing crossvein 1cu-a angle with vein M+Cu distinctly obtuse (Fig. 117); central lobe of mesoscutum posteriorly with a short

lanceolate or rounded yellow mark, not nearly reaching anterior margin, sometimes without marks (Figs 97 and 98) ... 17

-. Anterior portion of propodeum medially without longitudinal carinae (Fig. 131); anterior margin of propodeum with two lateral teeth (Fig. 51), even if faint; fore wing crossvein 1cu-a angle with vein M+Cu about 90° (Fig. 118); central lobe of mesoscutum posteriorly with a long lanceolate or rectangular yellow mark, nearly reaching anterior margin, sometimes taking nearly the entire lobe (Figs 85–90) ... 18

17(16). Postpetiole apical margin with complete transversal yellowish stripe (Figs 180–186) ... ***Toechorychus* sp. nov. 21, Tedesco**

-. Postpetiole apical margin without complete transversal yellowish stripe (Figs 168 and 170) ... ***Toechorychus* sp. nov. 23, Tedesco**

18(16). Transverse furrow at base of propodeum moderately deep to very deep; transverse furrow at base of propodeum moderately narrow to very narrow (Fig. 131), even if medially widened; sternaulus complete (Fig. 44), even if medially shallow; propodeal crests not developed (Figs 130–132) ... 19

-. Transverse furrow at base of propodeum shallow; transverse furrow at base of propodeum entirely wide (Fig. 128); sternaulus incomplete (Fig. 43); propodeal crests conspicuous (Fig. 128) ... ***Toechorychus* sp. nov. 6, Tedesco**

19(18). Ventral margin of mandible basally expanded as crest (Fig. 80), even if slightly; lower division of metapleuron almost entirely yellow, or orange to fulvous (Fig. 27) ... ***Toechorychus* sp. nov. 33, Tedesco**

-. Ventral margin of mandible regularly shaped, not expanded as crest (Fig. 72); lower division of metapleuron black, orange or fulvous, with a large dorsal or central yellow spot (Fig. 31) ...***Toechorychus* sp. nov. 2, Tedesco**

20(1). Posterior transverse carina of propodeum laterally absent (Fig. 126) ... 21

-. Posterior transverse carina of propodeum present laterally to apophyses or crests (Fig. 129) ... 30

21(20). Collar dorso-laterally rounded, distinctly swollen (Fig. 47) ... 22
-. Collar dorso-laterally carinated, not swollen (Fig. 46) ... 26

22(21). Anterior margin of propodeum with two lateral teeth (Fig. 162), even if faint; central lobe of mesoscutum posteriorly with a long lanceolate or rectangular yellow mark, nearly reaching anterior margin, sometimes taking nearly the entire lobe (Figs 85–90) ... 23
-. Anterior margin of propodeum without teeth (Fig. 129); central lobe of mesoscutum posteriorly with a short lanceolate or rounded yellow mark, not nearly reaching anterior margin, sometimes without marks (Figs 97 and 98) ... 24

23(22). T1 without basolateral teeth (Fig. 54); postscutellum mostly or entirely yellowish (Fig. 155); gaster striped (Fig 182); supraclypeal area without dark brown or black marks ... ***Toechorychus* sp. nov. 9, Tedesco**
-. T1 with basolateral teeth (Fig. 53), even if faint; postscutellum without yellow (Fig. 157); gaster mostly uniformly coloured (Fig. 165); supraclypeal area with dark brown or black marks (Fig. 79) ... ***Toechorychus* sp. nov. 32, Tedesco**

24(22). Anterior transverse carina of propodeum straight (Fig. 147); lower division of metapleuron almost entirely yellow or orange to fulvous (Fig. 35) ... ***Toechorychus* sp. nov. 18, Tedesco**
-. Anterior transverse carina of propodeum medially or entirely arched (Figs 125 and 135); lower division of metapleuron black, orange or fulvous, with large dorsal or central yellow spot (Figs 16, 25 and 26) ... 25

25(24). T1 without basolateral teeth (Fig. 54); posterior transverse carina of propodeum differentiated as swellings; propodeal conical swellings conspicuous (Fig. 126) ... ***Toechorychus* sp. nov. 4, Tedesco**
-. T1 with basolateral teeth (Fig. 53), even if faint; posterior transverse carina of propodeum not differentiated as crests, swellings, or apophyses; propodeal conical swellings not developed (Fig. 146) ... ***Toechorychus* sp. nov. 27, Tedesco**

26(21). Occipital carina dorsally conspicuous ... 27
-. Occipital carina dorsally inconspicuous ... 29

27(26). Ventral margin of mandible basally expanded as crest (Fig. 80), even if slightly; anterior transverse carina of propodeum medially or entirely arched (Figs 125 and 135); anterior margin of propodeum without teeth (Fig. 48); T1 without basolateral teeth (Fig. 54) ... 28
-. Ventral margin of mandible regularly shaped, not expanded as crest (Fig. 70); anterior transverse carina of propodeum straight (Fig. 136); anterior margin of propodeum with two stout lateral teeth (Fig. 136); T1 with basolateral teeth (Fig. 195), even if faint ... ***Toechorychus* sp. nov. 15, Tedesco**

28(27). Transverse furrow at base of propodeum entirely wide; fore wing crossvein 1cu-a angle with vein M+Cu about 90° (Fig. 121); postscutellum mostly or entirely yellowish (Fig. 125); hind coxa uniformly coloured (Fig. 176) ... ***Toechorychus* sp. nov. 24, Tedesco**
-. Transverse furrow at base of propodeum moderately narrow to very narrow (Fig. 132), even if medially wider; fore wing crossvein 1cu-a angle with vein M+Cu distinctly obtuse (Fig. 117); postscutellum without yellow; hind coxa patterned (Fig. 194) ... ***Toechorychus* sp. nov. 19, Tedesco**

29(26). Ventral margin of mandible basally expanded as crest (Fig. 59), even if slightly; anterior transverse carina of propodeum medially or entirely arched (Figs 125 and 135); anterior portion of propodeum medially without longitudinal carinae (Fig. 139); postscutellum mostly or entirely yellowish (Fig. 139) ... ***Toechorychus* sp. nov. 5, Tedesco**
-. Ventral margin of mandible regularly shaped, not expanded as crest (Fig. 64); anterior transverse carina of propodeum straight (Fig. 151); anterior portion of propodeum medially with two longitudinal carinae, even if faint; postscutellum without yellow (Fig. 151) ... ***Toechorychus* sp. nov. 1, Tedesco**

30(20). Anterior portion of propodeum medially with two longitudinal carinae (Fig. 151), even if faint ... 31
-. Anterior portion of propodeum medially without longitudinal carinae (Fig. 158) ... 35

31(30). Fore wing crossvein 1cu-a angle with vein M+Cu about 90° (Fig. 118); propodeal Apophysis or conical swelling conspicuous, higher than wide, somewhat compressed; crests not developed (Fig. 148) ... 32
-. Fore wing crossvein 1cu-a angle with vein M+Cu distinctly obtuse (Fig. 117); propodeal Apophysis or conical swelling not developed; crests conspicuous (Figs 133–135) ... 34

32(31). Transverse furrow at base of propodeum moderately deep to very deep; T1 without basolateral teeth (Fig. 54); lower division of metapleuron almost entirely yellow, or orange to fulvous ... 33
-. Transverse furrow at base of propodeum shallow (Fig. 141); T1 with basolateral teeth (Fig. 141), even if faint; lower division of metapleuron black, orange or fulvous, with a large dorsal or central yellow spot (Fig. 20) ... ***Toechorychus* sp. nov. 30, Tedesco**

33(32). Anterior transverse carina of propodeum conspicuous (Fig. 148), even if medially interrupted; collar dorso-laterally rounded, distinctly swollen (Fig. 47); postscutellum mostly or entirely yellowish (Fig. 148) ... ***Toechorychus* sp. nov. 28, Tedesco**
-. Anterior transverse carina of propodeum absent (Fig. 127); collar dorso-laterally carinated, not swollen (Fig. 46); postscutellum without yellow (Fig. 127) ... ***Toechorychus* sp. nov. 26, Tedesco**

34(31). Anterior transverse carina of propodeum straight or only medially arched (Fig. 144); anterior margin of propodeum without teeth (Fig 144); T1 with basolateral teeth (Fig. 53), even if faint; postscutellum mostly or entirely yellowish (Fig. 144) ... ***Toechorychus stramineus* Taschenberg**
-. Anterior transverse carina of propodeum entirely arched (Fig. 135); anterior margin of propodeum with two lateral teeth, even if faint; T1 without basolateral teeth (Fig. 54); postscutellum without yellow (Fig. 135) ... ***Toechorychus* sp. nov. 7, Tedesco**

35(30). Fore wing crossvein 1cu-a angle with vein M+Cu about 90° (Fig. 118); central lobe of mesoscutum posteriorly with a long lanceolate or rectangular yellow mark, nearly reaching anterior margin, sometimes taking entire lobe (Figs 85–90) ... 36

-. Fore wing crossvein 1cu-a angle with vein M+Cu distinctly obtuse (Fig. 117); central lobe of mesoscutum posteriorly with a short lanceolate or rounded yellow mark, not nearly reaching anterior margin, sometimes without marks (Figs 97 and 98) ... 37

36(35). Transverse furrow at base of propodeum moderately deep to very deep (Fig. 143); occipital carina dorsally conspicuous (Fig. 52); postscutellum mostly or entirely yellowish (Fig. 143); supraclypeal area with dark brown or black marks (Fig. 83) ... ***Toechorychus* sp. nov. 20, Tedesco**

-. Transverse furrow at base of propodeum shallow (Fig. 134); occipital carina dorsally inconspicuous (Fig. 50); postscutellum without yellow (Fig. 134); supraclypeal area without dark brown or black marks (Fig. 60) ... ***Toechorychus* sp. nov. 35, Tedesco**

37(35). Ventral margin of mandible regularly shaped, not expanded as crest (Fig. 69); lower division of metapleuron black, orange or fulvous, with a large dorsal or central yellow spot (Fig. 16); sternaulus incomplete (Fig. 43) ... ***Toechorychus cassunungae* Brauns**

-. Ventral margin of mandible basally expanded as crest (Fig. 65), even if slightly; lower division of metapleuron almost entirely yellow or orange to fulvous (Fig. 8); sternaulus complete, even if medially shallow (Fig. 44) ... ***Toechorychus* sp. nov. 13, Tedesco**

Species descriptions

***Toechorychus abactus* (Cresson, 1874)**

(Not illustrated)

Mesostenus abactus Cresson, 1874: 151, 160 (Key, description).

Mesostenus abactus Cresson 1916: 13. Lectotype designation. Lectotype f# (ANSP, not examined), Type locality: Mexico, Mirador.

Toechorychus abactus: Townes 1946: 30, 49 (Host); Townes & Townes 1966: 96 (Synonymic list); Yu & Horstmann 1997: 290 (Listed); Kasparyan & Ruíz 2008 (Host); Yu *et al*. 2005 (Listed).

Original description. FEMALE. Black, with the following white marks: face, mouth, orbits, scape ventrally, broad annulus at flagellum, collar, tegula, median stripe at mesopleuron, scutellum, axillary carinae, subalar ridge, upper division of metapleuron, two lateral longitudinal marks at posterior portion of propodeum, mesopleuron except around hypoepimeron, all coxae, except hind coxa ventrally and dorsal stripe, anterior portion of T1, posterior margin of T1–8. Wings hyaline; legs pale honey-yellow; all t5 black. Opaque central lobe of mesoscutum finely transversally aciculated; propodeum rugose, tubercles transverse, very blunt; areolet very minute, open.

Male. Unknown.

Comments. The lectotype could not be examined, and none of the examined specimens seemed to fit convincingly the available characterization for this species (literature information). Since its identity could not be fully ascertained, *T. abactus* is here maintained as a valid species. The only known specimen for *T.* **sp**. **nov**. **25** was identified as *T. abactus* by Ian Gauld in 2001 (label data), but it can be safely differentiated from the new species by having transverse tubercles at the posterior portion of propodeum (*vs*. absent in *T.* **sp**. **nov**. **25**); mesopleuron without black marks except around hypoepimeron (*vs*. with rounded black spot just behind dorsal portion of epicnemial carina); sternaulus white (*vs*. posterior half black); legs entirely pale yellow, except for t5 of all legs black (*vs*. fore and mid tarsi dorsally brown); and anterior portion of T1 white (*vs*. dorsally black).

Distribution. Mexico and Guatemala. Recorded from four localities from Mexico (*Nuevo León*, *Tamaulipas*, *Jalisco*) (Kasparyan & Ruíz 2008) to Guatemala (*Guatalón*) (Townes 1946) (Fig. 200). These records comprise a range of 11°46' in latitude.

Biology. Townes (1946) cites a short series of *T. abactus* deposited in the USNM that was reared from *Mischocyttarus capixaba* (Vespidae, Polistinae) at Mocá, Guatalón, Guatemala (14°40'N 89°24'W). Some specimens also emerged from *Mischocyttarus pallidipectus* (Smith) at Jalisco, Mexico (20°34'N 103°40'W) acc. to Kasparyan and Ruíz (2008).

Toechorychus albimaculatus **(Taschenberg, 1876)**
(Figs 29, 68, 104, 109, 154, 171)

Mesostenus albimaculatus Taschenberg, 1876: 226, 455. Description. Holotype m# (MLUH; examined). Type locality: Rio de Janeiro.

Toechorychus albimaculatus: Townes & Townes 1966: 96 (Synonymic list); Jeanne 1979: 306 (Host); Yu & Horstmann 1997: 290 (Listed); Yu *et al*. 2005. (Listed).

Redescription. Holotype MALE. Fore wing length 7.03 mm.

Head. Mandible 1.47 as long as basal width, moderately pilose; ventral margin projected as crest. Clypeus 1.65 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.76 as long as base, truncate; apical margin sharp, medially slightly convex. Supraclypeal area entirely strigulate, also densely punctate, densely pilose, medially with oval prominent area; between antennal foramens with U-shaped carina; radicle punctate. Antenna with 26 flagellomeres; white band starting at flagellomere 7; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area smooth. Vertex rugulose around ocelli, at anterior third with short, longitudinal sulcus, posterior two-thirds smooth; gena and vertex behind ocelli smooth, glabrous; gena in lateral view uniformly wide; occipital carina stout, dorsally faint, uniformly arched, ventrally markedly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 0.72 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.07 as long as wide; in lateral view, mesosoma middle width 0.21 mm. Pronotum centrally smooth, latero-ventrally markedly rugose behind collar, margin near mesopleuron entirely corrugated; pronotal swelling with sparse coarse punctures; collar dorso-laterally carinated, not swollen, anteriorly with coarse punctures; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with sparse coarse punctures, central lobe without longitudinal sulcus or carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove smooth, polished; scutellum 0.99 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.26 as long as wide; hind margin of metanotum with two short lateral carinae extending towards transverse furrow at base of propodeum. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigate; mesopleural groove corrugated; epicnemial carina stout, dorsally straight; dorsal end of epicnemial carina reaching 0.1 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed, faint from anterior 0.5 to 0.7, not corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter coarsely punctate; median portion of posterior transverse carina of mesothoracic venter convex, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 1.45 as long as anterior portion of propodeum deep and very wide, very faintly corrugated, almost smooth, medially some carinae stouter; propodeum 1.05 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum strigate, medially with two posteriorly convergent longitudinal carinae; lateral longitudinal carina of propodeum represented by faint but distinct subcircular carina; posterior portion of propodeum markedly strigate, striation medially arched backwards, medially without distinctly stout longitudinal carina; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent; propodeal spiracle 1.67 as long as wide; pleural carina of propodeum present only posteriorly; lower division of metapleuron strigate, sparsely pilose, juxtacoxal carina absent.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.38 as long as vein 2cu-a; vein 4Rs 0.95 as long as vein

4M, slightly sinuous, almost straight; cell 1+2Rs 0.89 as high as pterostigma, rectangular; vein 2M distinctly longer than vein 3M; vein 3M indistinct. Hind wing*:* vein 1Cu 1.24 as long as vein cu-a; vein 2-1A reaching 0.80 of distance to posterior margin.

Legs. Tibia with dense short bristles; hind coxa elongate.

Metasoma. T1 0.48 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.62, prominent; postpetiole dorsally, at level of spiracles, faintly but distinctly concave; T2–8 minutely coriarious; almost glabrous; T2 1.20 as long as wide at apex; apex of T2 1.79 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve without teeth; notch absent.

Color. Head yellowish, mesosoma black and yellow; metasoma mostly ferruginous. Head: bright yellow (238,215,088); small spot at ventral half of malar space, mandible apex, lateral and apex of clypeus, supra–antennal area medially, vertex and occiput black; scape and pedicel dark brown; flagellum basally brownish, blackish towards apex, f7 partially white. Mesosoma: black, generally dorsally dark, ventrally brownish, with yellow marks (234,216,127); pronotum black, except for transverse spot at pronotal swelling, and collar laterally, yellow; longitudinal lanceolate mark at posterior 0.3 of central lobe of mesoscutum, axillary carina, scutellum, postscutellum, tegula, subalar ridge, circular spot at hypoepimeron, large mark extending from subalar ridge to dorsal margin of sternaulus, and lateral mark at mesothoracic venter, yellow; posterior portion of propodeum yellow, with three longitudinal black stripes, central one large, between crests, lateral ones along pleural carina. Legs: mostly orange; fore coxa pale brown, with anterior yellow spot; posterior basal spot at mid coxa, mid femur posteriorly, posterior apical spot at hind femur, brown; hind coxa posteriorly with basal yellow mark; t5 of all legs dark brown. Metasoma: ferruginous (195,092,042); postpetiole anteriorly brownish; anterior 0.1 of T1 dorsally yellow; T3–5 with lateral dark brown spot.

Variation. Scutoscutellar groove very faintly corrugated. Mesothoracic venter entirely black. Posterior basal spot at hind coxa very small, or faded. Longitudinal stripes at posterior portion of propodeum posteriorly brownish. The very large transverse furrow at base of propodeum in the type specimen seems to be an individual variation, not usual in the other specimens.

Comments. Similar to *T.* **sp**. **nov**. 33 especially due to the color pattern (Fig. 27), is readily differentiated from it by having pleural carina of propodeum present only posteriorly (*vs*.

absent in *T*. **sp**. **nov**. 33); juxtacoxal carina absent (*vs*. stout, medially interrupted); angle between fore wing veins 1cu-a and M+Cu distinctly obtuse (*vs*. about 90°); T1 without basolateral tooth (*vs*. with faint basolateral tooth). Also similar to *T*. **sp**. **nov**. 1 from which it can be distinguished by having clypeus apically and supraclypeal area ventrally, brown (*vs*. clypeus and supraclypeal area entirely yellow in *T*. **sp**. **nov**. 1, Fig. 64); posterior transverse carina of propodeum absent, carina not developed (Fig. 154) (*vs*. represented by crests, present laterally as carina); posterior portion of propodeum medially without distinct longitudinal carina (*vs*. with distinct and stout carina); postscutellum yellow (*vs*. black); T1 orange with apical 0.1 yellow (Fig. 171) (*vs*. T1 entirely orange); sternaulus medially yellowish (Fig. 104) (*vs*. with brown mark extending from dorsal end of epicnemial carina anteriorly to mesothoracic venter posteriorly); lower division of metapleuron entirely bright yellow (*vs*. ventral half of lower division of metapleuron orange to dark brown); hind coxa dorsally with basal yellow spot (*vs*. entirely orange).

Female. Very similar to male, but differs from it by the longitudinal lanceolate yellow mark at mesoscutum reaching close to anterior margin. Although distinct on some males, the anterior basal spot at the hind coxa is faint on all examined females.

Distribution. Venezuela, Suriname, and Brazil. Recorded from 16 localities from Venezuela to southeastern Brazil (Fig. 201). The type locality is Rio de Janeiro (22°53'S 43°13'W); the present study adds records from *Caripe*, Venezuela, Suriname and 11 localities from Brazil: Ubaitaba, Uruçuca, Coaraci, Buerarema and Firmino Alves (*Bahia*); Chapada dos Veadeiros and Barro Alto (*Goiás*); Parque Estadual do Rio Doce (*Minas Gerais*); Itatiaia (*Rio de Janeiro*); Luís Antônio and Descalvado (*São Paulo*). These records comprise a range of 34º21' in latitude.

Biology. Solitary parasitoids of *Polistes canadensis canadensis* (L.) (Jeanne 1979). Parasitoid of *Mischocyttarus drewseni* (Saussure) (Vespidae, Polistinae), **new record**.

Material examined. 47 females and 5 males, 6 unknown. Holotype m#, **BRAZIL**: from *Rio de Janeiro,* WB Zoologie (MLUH). Antennae apical half missing, mesoscutum somewhat damaged by pin; otherwise in good shape. Paratypes: **VENEZUELA**: 1 f# from *Caripe*, Conuco, El Mirador, Malaise trap, 19.V.1973 (CNCI). **SURINAME**: 1 f# from Maratakka River, Awara Sabana, 26.II–3.III.1971, Malaise trap, D.C.Geijskes *leg*. (RMNH). **BRAZIL**: 1 f# from *Bahia*, Ubaitaba, Fazenda Casa de Pedra, 14°18'S 39°19'47"W, 09.VI.2003, Malaise trap, L 15, J.Cardoso, J.Maia *et al*. *leg*. 1 f#, same data, except pt. 04, 13.XII.2003. 1 f#, from *Bahia*,

Uruçuca, Fazenda Bom Jardim, 14°34’S 39°17’W, 23.XI.2002, Malaise trap, pt. 06, J.Cardoso, J.Maia *et al*. *leg*. 1 f# from *Bahia*, Coaraci, Fazenda Restauração, 14°38’29”S 39°33’40”W, 26.XI.2002, Malaise trap, pt. 04, J.Cardoso, J.Maia *et al*. *leg*. 1 f# from *Bahia*, Buerarema, Fazenda Sempre Viva, 14°56’S 39°18’W, 28.X.2002, Malaise trap, pt. 03, J.Cardoso, J.Maia *et al*. *leg*. 1 f#, same data, except pt. 01; 1 f#, same data, except Fazenda Boa Sorte, 29.XII.2002, pt. 01. 1 f# from *Bahia*, Firmino Alves, Fazenda Santo Antônio, 14°59’51”S 39°55’56”W, 24.XI.2002 Malaise trap, pt. 05, J.Cardoso, J.Maia *et al*. *leg*. 1 f# from *Bahia,* Firmino Alves, Fazenda Bela Vista, 14°59’51”S 39°55’56”W, 17.VIII.2002, pt. 08, J.Cardoso, J.Maia *et al*. *leg*. 1 f# from *Goiás*, Parque Nacional Chapada dos Veadeiros, 12–24.IX.2005, Malaise trap, pt. 27, A.P.Aguiar *et al*. *leg*. 1 f# from *Goiás,* Barro Alto, Go–080, vereda, 15º4’38.5”S 48º54’44.3”W, Malaise trap, XI.2009, M.I.Pimenta & L.L.Bergamini *leg*. (UFES). 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha da Lagoa Bonita 3, mata secundária baixa, 16.XI.2000, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha do Vinhático 3, mata secundária alta, 07.XI.2002, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha do Gambá 1, mata secundária baixa, 18–25.XI.2007, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha do Gambá 2, Mata secundária baixa, 07.XI.2002, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f#, same data, except 26.X-02.XI.2003; 1 f#, same data, except 04–11.XI.2007. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha do Gambá 3, mata secundária baixa, 24.X.2002, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Área da Tereza 2, Mata primária, 14.XI.2002, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f#, same data, except 27.X–02.XI.2004. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Área da Tereza 3, Mata primária, 24–31.X.2002, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 2 f#f#, same data, except 14.XI.2002; 1 f#, same data except 26.X–2.XI.2003; 1 f#, same data, except 27.X–02.XI.2004 (UFES). 3 f#f#, 1 m#, 1 [unknown sex] *Rio de Janeiro*, Mt. Itatiaia, 700 m, 3/533, J.F.Zikán *leg*.; 4 f#f#, 2 m#m#, 3 [unknown sex] same data, except 15/433. 3 f#f#, 1 m# from *Rio de Janeiro*, Mt. Itatiaia, E.L.Ban, 26.III.1933, v: *Mischocyttarus drewseni*, 700 m, J.F.Zikán *leg*. 1 [unknown sex], from *Rio de Janeiro*, Mt. Itatiaia, [illegible], v: *Mischocyttarus drewseni*, 03.III.1933. (NHRS). 1 f# from *São Paulo*, Luiz Antônio, Estação Ecológica Jataí, Cerradão, Malaise trap 2, 13.V.2009, N.W.Perioto *et al*. *leg*.; 1 f#, same data, except Malaise trap 1, 19.VII.2007; 1 f#, same data, except Malaise trap 1,

30.IX.2009; 1 f#, same data, except Ichneumonidae 2/3, 24.X.2007. 1 [unknown sex] from *São Paulo*, Descalvado, Malaise trap B2, 23.IV.2006 N.W.Perioto *et al*. *leg*.; 1 f#, same data, except Cerrado, 21.VI.2006 (IBRP).

***Toechorychus brevicaudis* (Szépligeti, 1916)**

(Not illustrated)

Stenarella brevicaudis Szépligeti, 1916: 14, 225–380 (Description). Holotype f# (HNHM, not examined). Type locality: Peru.

Stenarella brevicaudis: Myers 1932 (Host).

Toechorychus brevicaudis: Townes & Townes 1966: 96 (Synonymic list); Yu & Horstmann 1997: 290 (Listed); Yu *et al*. 2005 (Listed).

Comments. The identity of this species could not be checked. The original description is insufficient for its recognition, and the authors have not seen any specimen determined as *T. brevicaudis*. The holotype could not be examined.

Male. Unknown.

Distribution. Guyana and Peru (Fig. 202).

Biology. Myers (1932) listed *T. brevicaudis* as a parasitoid of *Hypsipyla grandella* Zeller (Lepidoptera, Pyralidae, Phycitinae). This record is based on one male specimen which emerged from a cocoon of the moth. The specimen of *Hypsipyla grandella* was found in a fallen fruit of the Meliaceous tree *Carapa guianensis*, at Mabaruma, Guyana.

***Toechorychus cassunungae* (Brauns, 1905)**

(Figs 16, 69, 106, 133, 174)

Mesostenus cassunungae Brauns, 1905: 5, 129–131. Description. Neotype f# (here designed). Type locality: Brazil.

Mesostenus cassunungae Bertoni 1911: 101 (Host).

Toechorychus cassunungae: Costa-Lima 1962 (Host); Townes & Townes 1966: 96 (Synonymic list); Yu & Horstmann 1997: 290 (Listed); Yu *et al*. 2005 (Listed).

Redescription. Neotype f#, present designation. Fore wing length 6.64 mm.

Head. Mandible 1.34 as long as basal width, densely pilose; ventral margin slightly projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.57 as wide as high, subrectangular, finely punctate; apex 1.26 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely densely punctate, dorsally also strigulate, densely pilose, medially with oval prominent area; between antennal foramens without V-shaped carina; radicle foveolate. Antenna with 23 flagellomeres; white band starting at flagellomere 6, reaching flagellomere 11; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially strigulate. Paraocular area finely punctulate. Vertex rugulose around ocelli, at anterior two-thirds with long shallow sulcus, posterior third smooth, regularly shaped; gena and vertex behind ocelli minutely strigulate, densely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally faint, V-shaped, ventrally markedly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 0.93 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.02 as long as wide; in lateral view, mesosoma middle width 0.17 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly punctulate; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe without longitudinal sulcus or carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove smooth, polished; scutellum 0.98 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.34 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus incomplete, not reaching base of mid coxa, almost straight, deeply impressed, faint from anterior 0.7 to 0.8, not corrugated; scrobe deeply impressed, forming pit. Mesothoracic

venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter convex, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.13 as long as anterior portion of propodeum, moderately deep and narrow, medially wide, uniformly corrugated; anterior margin of propodeum without teeth; propodeum 1.28 as long as wide medially; anterior portion of propodeum finely strigulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum faintly strigate, medially without distinctly stout longitudinal carina; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina represented by crests, present laterally as carina; propodeal spiracle 2.67 as long as wide; pleural carina of propodeum absent; lower division of metapleuron strigulate, sparsely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs entirely irregular; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.48 as long as vein 2cu-a; vein 4Rs 0.87 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.72 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 1.20 as long as vein 2M. Hind wing*:* vein 1Cu 1.41 as long as vein cu-a; vein 2-1A reaching 0.78 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa globose.

Metasoma. T1 0.52 as long as hind femur, without basolateral tooth; minutely coriarious; spiracle at anterior 0.55, slightly prominent; postpetiole dorso-anteriorly flat; T2–8 minutely coriarious; almost glabrous; T2 0.96 as long as wide at apex; apex of T2 1.8 as wide as base. Dorsal valve of ovipositor with nodus faint; apex of lower valve without teeth; notch present.

Color. Head pale yellow and black, mesosoma and metasoma brown with pale yellow marks. Head: pale yellow (244,208,105); mandible, supraclypeal area just behind clypeus, and ventral half of malar space, brownish (140,066,030) supra–antennal medially, vertex and occiput, black; scape anteriorly bright yellow, dorsally dark brown; pedicel brownish; flagellum brownish, f6–10 white, ventrally pale brown. Mesosoma: light brown (222,132,049), except for the following pale yellow marks: collar laterally, pronotal swelling, longitudinal lanceolate mark at posterior 0.2 of central lobe of mesoscutum, axillary carina, scutellum, tegula, upper division of metapleuron laterally and medially, two lateral longitudinal marks at posterior portion of propodeum, dorsal half of lower division of metapleuron, and three marks at mesopleuron, dorsal

one extending from subalar ridge to dorsal end of epicnemial carina, other ones dorsal and ventral to scrobe, respectively; mesothoracic venter dark yellow. Legs: bright yellow; fore coxa anteriorly, and hind coxa posteriorly, with basal pale yellow spot; all t5 dark brown. Metasoma: brown and pale orange; T1 bright yellow, dorsally with medial 0.7–0.8 pale orange, posterior 0.2 dark brown; T2–5 brown, laterally and dorsally at medial 0.7–0.8 pale orange, posterior 0.2 dark brown; T6–8 pale orange; S2–8 anteriorly bright yellow, posteriorly pale orange.

Variation. The greatest intraspecific variation observed for *Toechorychus* was within *T. cassunungae* specimens. The variation of tonality and color patterns is very high, particularly on the mesopleuron and propodeum dorsally. The specimens examined showed mesopleuron color pattern from brown stripes at posterior potion of propodeum concolorous with anterior portion to anterior portion of propodeum brownish and stripes at posterior portion black.

Other typical variations are: clypeus usually with small brown marks at median apex, lateral corners and median base (sometimes some of those absent). Pronotum sometimes entirely orange (except collar laterally and pronotal swelling), or variously marked with blackish, sometimes entirely blackish (except collar laterally and pronotal swelling). Cell 1+2 Rs either distinct, pentagonal (though open) or almost disappearing as veins get closer (and then wider than high); T2–8 usually orange in same tone of body, sometimes anterior part of tergites fuscous or brown, often only at T2–3; mark at mesopleuron from subtegular ridge to epicnecium frequently separated from mark dorsal to posterior margin of sternaulus. Propodeal crests sometimes faint (in Mangaratiba specimen). All observed variations do not appear to be correlated with geographical distribution in any degree.

Comments. The Holotype designated by Brauns (1905) was reported by Townes and Townes (1966) and Yu *et al*. (2005) as lost. The lack of a type can generate serious problems in the near future, since there is a large intraspecific variation for the species. In order to clarify the taxonomic status and to preserve the stability of the species, and considering that the original description is limited, the specimen indicated in "Material examined" is herein designated as the Neotype for *T. cassunungae*. There are no original paratypes or paralectotypes; efforts were made to select a specimen which most resembled the original description. The original type locality refers only to "Brazil," from where the Neotype was also collected.

Color pattern very similar to some *T.* **sp**. **nov**. 7, from which it can be distinguished by having juxtacoxal carina of mesopleuron short (*vs*. long in *T.* **sp**. **nov**. 7); pale yellow marks

dorsally and ventrally to scrobe variously connected to other marks at mesopleuron (*vs*. always separated from other marks at mesopleuron; Fig. 1); hind femur uniformly colored, generally dark yellow (*vs*. dorsally dark; Fig. 1); T1 variously colored (*vs*. always laterally pale yellow, except around spiracle); mesoscutum sometimes not concolorous with anterior portion of propodeum (*vs*. always concolorous; Fig. 2).

Male. The only known male specimen is very similar to female, except as follows. Clypeus brown, except for two lateral yellow marks. Posterior 0.2 of scutellum brownish. Propodeal sculpturing behind posterior transverse carina faint and irregular; propodeal crests smaller than in females. Yellow marks at propodeum restricted to the crests; not reaching posterior margin of propodeum. Posterior 0.2 of hind femur and tibia blackish. Yellow mark at posterior 0.1 of T1 narrow. Apex of T2 medially black, laterally yellow.

Distribution. Brazil, Paraguay, and Argentina. Recorded from 11 localities from Brazil to Argentina (Fig. 203). The type locality is Brazil; the present work adds records from eight localities from Brazil: ES; Itatiaia and Mangaratiba (RJ); Palestina, Barretos, Itatiba, and São Paulo (SP); Nova Teutônia (SC). Other new records are Pirapó, *Itapúa* (Paraguay), Tartagal, and Aguas Blancas, *Salta* (Argentina). These records comprise a range of 9°0.1’ in latitude.

Biology. Parasitoid of *Mischocyttarus indeterminabilis* (Bertoni 1911, Costa-Lima 1962) and *Mischocyttarus cassununga* (Ihering) (Brauns 1905).

Material examined. 64 females and 1 male. Neotype f#, here designed, **BRAZIL**, *Santa Catarina*, Nova Teutônia, IX.1966, 27°11’S 52°23’W , 300–500 m, Fritz Plaumann *leg*. *Toechorychus* Townes, det. Aguiar 2008. (CNCI). Head and right hind leg beyond first trochanter broken but attached to specimen; otherwise in good shape. **BRAZIL**: 1 f# from *Espírito Santo*, (Staudinger) (ZMHU). 1 f# from *Rio de Janeiro*, Mt. Itatiaia, 700 m, J.F.Zikán, 33, e. l. Ban. *Mischocyttarus cassununga*, 20.V.1954; 1 f#, same data, except 38; 1 f#, same data, except 63, 04.X.1930; 1 f#, same data, except 14.II.1932; 1 f#, same data, except 63, 16.II.1912; 1 f#, same data, except 04.VIII.1930, 6B; 1 f#, same data, except 63, 17.II.1932, *ex*. *Mischocyttarus* Saussure. (NHRS). 1f# from *Rio de Janeiro*, Mangaratiba, Muriqui, VII.1969, M.Alvarenga *leg* (AEIC). 1 f# from *São Paulo*, Palestina, 05.XII.2008, black Malaise trap p1, F.Noll *et al*. *leg*. 2 f#f# from *São Paulo*, Barretos, 50 m, 23.X.2008, Malaise trap p7, F.Noll *et al*. *leg*. (NOLL). 1 f# from *São Paulo*, Itatiba, II.1902, Lima *leg*. (DZUP). 1 m# from *São Paulo*, São Paulo, Aclimação, 10.VII.1923, H.B.Colt (B.M.), nest 412, *Mesostenus cassunungae* Br. *m*#,

Toechorychus cassunungae Brauns, JDPerkins, 1957 (BMNH). 3 f#f# from *Santa Catarina*, Nova Teutônia, 13.I.1953, Fritz Plaumann *leg*.; 1 f#, same data, except 18.II.1954; 1 f#, same data, except 1.XII.1953; 15 f#f#, same data, except I.1968; 4 f#f#, same data, except II.1968; 1 f#, same data, except X.1970; 1 f#, same data, except I.1971; 1 f#, same data, except III.1968; 1 f#, same data, 25.XI.1952; 1 f#, same data, except I.1970 (AEIC). 1 f# from *Santa Catarina*, Nova Teutônia, 27°11'S 52°23'W, 300–500 m, I.1966, Fritz Plaumann *leg*. 4 f#f#, same data, except I.1968; 1 f#, same data, except XI.1968; 1 f#, same data, except XII.1967; 1 f#, same data, except IX.1961 (CNCI). 7 f#f# from *Santa Catarina*, Nova Teutônia, 27°11'S 52°23'W, II.1968, Malaise trap, Fritz Plaumann *leg*.; 1 f#, same data, except 29.I.1968; 1 f#, same data, except III.1969; 1 f#, same data, except 08.II.1968 (CNCI). 1 f# from *Santa Catarina*, Nova Teutônia, 27˚11'S 52˚23'W, 29.III.1938, Fritz Plaumann, B.M.1938. –458 (BMNH). **PARAGUAY**: 1 f# from *Itapúa*, Pirapó, 29.XII.1971, L.Peña *leg*. (AEIC). **ARGENTINA**: 1 f# from *Salta*, Tartagal, 11–18 .V.1973, C.Porter *leg*. 1 f# from *Salta*, Campamento Jakúlica, 40 Km W. Aguas Blancas, VII–IX.1970, Malaise trap, C.Porter *leg*., *Toechorychus* sp. 1 (FSCA).

Toechorychus stramineus **(Taschenberg, 1876)**

(Figs 4, 62, 107, 144, 196)

Mesostenus stramineus Taschenberg, 1876: 48, 61–104. Description. Holotype f# (MLUH; examined). Type locality: Venezuela.

Toechorychus stramineus: Townes & Townes 1966: 96 (Synonymic list); Yu & Horstmann 1997: 290 (Listed); Yu *et al*. 2005 (Listed).

Redescription. Holotype FEMALE. Fore wing length 5.00 mm.

Head. Mandible 1.48 as long as basal width, moderately pilose; ventral margin slightly projected as crest. Clypeus 1.69 as wide as high, subrectangular, finely punctate; apex 1.44 as long as base, truncate; apical margin sharp, medially slightly convex. Supraclypeal area entirely densely punctate, densely pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with U-shaped carina, medially widely interrupted; radicle punctate. Antenna with 24 flagellomeres; white band starting at flagellomere 4, reaching flagellomere 12; flagellum somewhat stout. Supra-antennal area with very faint but distinct median longitudinal

carina, medially with well developed longitudinal elevation, near antennal sockets striolate; dorsal half medially punctulate. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli punctulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally faint, V-shaped, ventrally slightly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 0.93 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.35 as long as wide; in lateral view, mesosoma middle width 0.15 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling strigulate; lateral portion of collar rounded, distinctly swollen, anteriorly punctulate; stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe without longitudinal sulcus or carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove faintly corrugated; scutellum 0.96 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.34 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, deeply impressed; faintly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.18 as long as anterior portion of propodeum deep and narrow, medially wide, closely corrugated, medially some carinae distinctly stouter; anterior margin of propodeum without teeth; propodeum 1.11 as long as wide medially; anterior portion of propodeum strigulate, medially with two posteriorly convergent longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum before posterior transverse carina medially confused-rugose and laterally punctulate, behind strigate-rugose, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout or laterally faint, straight; posterior transverse carina represented by

crests; propodeal spiracle 1.38 as long as wide; pleural carina of propodeum irregular, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigulate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs slightly uniform curved; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.60 as long as vein 2cu-a; vein 4Rs 0.86 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.90 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.50 as long as vein 2M. Hind wing*:* vein 1Cu 1.67 as long as vein cu-a; vein 2-1A reaching 0.61 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa elongate.

Metasoma. T1 0.57 as long as hind femur, with faint basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.58, not prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; sparsely pilose; T2 0.99 as long as wide at apex; apex of T2 1.83 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma bright yellow (246,230,111) with black marks. Head: yellow; mandible apex, supra–antennal area medially, interocellar area, large dorsal band at vertex, and occiput, blackish; scape ventrally pale yellow, dorsally dark brown; pedicel brownish; flagellum basally brownish, blackish towards apex, f5 entirely white, f6–12 partially white. Mesosoma: mostly yellow; pronotum black except collar laterally and pronotal swelling, bright yellow; mesoscutum black, except longitudinal lanceolate mark at posterior 0.9 of central lobe; both axillary trough of mesonotum and metanotum, central mark at mesopleuron around hypoepimeron, carinal triangle, and anterior portion of propodeum, black; posterior portion of propodeum yellow, with three longitudinal black stripes, central one between crests, lateral ones along pleural carina. Legs: bright yellow, except for the following black marks: apical mark dorsally at mid coxa, hind coxa dorsally, hind coxa ventrally at basal 0.6, fore and mid t5. Metasoma: black and yellow; T1 bright yellow, dorsally with medial 0.6–0.7 black, ventrally dark brown; T2–5 and posterior 0.4 of T7–8 and thin lateral marks, bright yellow; T6 bright yellow; S2–8 bright yellow.

Variation. Specimens very similar, except by the following slight variations: apical margin of clypeus sometimes medially straight; U-shaped carina between antennal foramens

inconspicuous; mesopleuron sometimes with small rounded black spot above sternaulus and just behind epicnemial carina; surface over sternaulus sometimes entirely yellow except for small point just before mid coxa; median longitudinal carinae at anterior portion of propodeum sometimes faint; lateral longitudinal carina of propodeum straight; juxtacoxal carina faint; first hind trochanter sometimes dorsally fulvous or blackish. Antenna of one specimen from Honduras with 23 flagellomeres; white band starting at flagellomere 5. Differences in tonality include variations from bright yellow (246,230,111) to pale orange (226,175,085), including pale yellow (216,179,109).

Comments. This is the only known species with a well developed median longitudinal elevation at supra-antennal area. Other four species have this elevation as a very slight swelling: *T*. **sp**. **nov**. 11, *T*. **sp**. **nov**. 23 and *T*. **sp**. **nov**. 30, from which it can be readily differentiated by epicnecium and mesothoracic venter yellowish (*vs*. black in, *T*. **sp**. **nov**. 11, *T*. **sp**. **nov**. 23 and *T*. **sp**. **nov**. 30; Figs. 18, 24, and 20), and *T*. **sp**. **nov**. 25, from which it differs in having the mandible base, clypeus and supraclypeal area entirely yellowish (*vs*. mandible base, clypeal apex centrally, and supraclypeal area just around clypeus, black; Fig. 75), scutellar carina restricted approximately to anterior 0.3 (*vs*. reaching anterior 0.6; Fig. 160), hind margin of metanotum without teeth or carinae (*vs*. with two short lateral carinae extending towards transverse furrow at base of propodeum).

Male. Very similar to female, except as follows. Propodeum sometimes medially longitudinally swollen, as in *T*. **sp**. **nov**. 25; one male from Yucatán, Mexico with orange instead of yellow marks.

Distribution. Mexico, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, and Venezuela. Recorded from 11 localities from Mexico to Venezuela (Fig. 204). The type locality is Venezuela; the present work adds records from ten localities: *Vera Cruz*, *Yucatán* (Mexico); *Guatalón*, *Sololá* (Guatemala), *Atlántida* (Honduras); *Rivas* (Nicaragua); *Guanacaste*, *San José*, *Cartago* (Costa Rica); *Chiriqui* (Panama). These records comprise a range of 31°54’ in latitude.

Biology. Parasitoid of *Mischocyttarus basimacula* (Cameron) (Vespidae, Polistinae), **new record**, in Guatalón, Guatemala (14°40’N 89°24’W). This record is based on one female reared between March and April of 1931, by J. Bequaert, but without specific determination. One male with same label data was reared from *Mischocyttarus indeterminabilis* (Vespidae, Polistinae), **new record**.

Material examined. 14 females and 4 males. Holotype f#, **VENEZUELA**, WB Zoologie (MLUH). Other specimens: **MEXICO**: 1 m# from *Veracruz*, Fortín de las Flores – Sumidero, Planta de la Cerveceria, Ing. Daniel Rabago Res. Elev. 2500–3000 FT. H.V.Weens, Jr. 27–28.IV.1965, Black light trap. *Toechorychus* sp. 1, det. C.C.Porter, 1973 (FSCA). 1 m# from *Yucatán*, Chichen-itza, 15.IX.1952, J. & D.Pallister, C.R.Vose Fund, Explorers Club, AMNH Exped. (AMNH). 1 f# from *Yucatán*, Chichen-itza, E.C.Welling *leg*., 25.II.1956, *Toechorychus* sp. 5, Townes, 1964 (AEIC). **GUATEMALA**: 1 f# from *Guatalón*, Mocá, 1000 m, March to April–1931, J.Bequaert, *Mesostenus abactus* Cress. C.W.T.Muesebeck. Host: *Mischocyttarus basimacula* (Cameron) (USNM). 1 m# from *Guatalon*, Moca, 1000 m, III–IV.1931, J.Bequaert, *Toechorychus abactus* (Cresson) Host: *Mischocyttarus indeterminabilis* (USNM). 1 f# from *Sololá*, Finca, Santa Cruz, Quixaya nr. Border W/Suchitepequez, 02.XI.1978, 840 m, C. & J.Porter. **HONDURAS**: 1 f# from *Atlántida*, Tela, Lancetilla, 05.VII.1990, R.Cave *leg*. (FSCA). **NICARAGUA**: 1 f# from *Rivas*, San Juan del Sur, a. l., 29.XII.1968, J.Geijskes, Museum Leidem. (RMNH). **COSTA RICA**: 1 f# from *Guanacaste*, Santa Rosa National Park, 8.XI.1977, D.H.Janzen, Riparian. 1 f#, same data, except 24.IX.1977; 1 f#, same data, except 24.VIII.1977; 1 f#, same data, except 31.X.1977; 1 f#, same data, except 18.X.1977. 1 f# from *Guanacaste*, Santa Rosa National Park, Dry Hill, 3.VII.1977, D.H.Janzen (AEIC). 1 m# from *San José*, Escazú, 21.V.1987, H. & M.Townes *leg*. (AEIC). 1 f# from *Cartago*, Pacayas, C.Werckele. (AMNH). **PANAMA**: 1 f# from *Chiriqui*, 15 km W Hato del Volcán, 24–31.V.1977, Malaise trap (AEIC).

***Toechorychus* sp. nov. 1, Tedesco**

(Figs 28, 64, 108, 151, 169)

Description. Holotype MALE. Fore wing length 6.64 mm.

Head. Mandible 1.56 as long as basal width, densely pilose; ventral margin slightly projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.73 as wide as high, rectangular, finely punctate; apex 1.22 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely densely punctate, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens without V-shaped carina; radicle foveolate. Antenna with 29 flagellomeres; white band starting at flagellomere 7, reaching

flagellomere 13; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially punctulate, or rugulose. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli punctulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina projected as crest; malar space 1.06 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.70 as long as wide; in lateral view, mesosoma middle width 0.21 mm. Pronotum centrally smooth, latero-ventrally markedly strigate behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling strigulate; collar dorso-laterally carinated, not swollen, anteriorly punctulate; epomia very faint, almost indistinct. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe with faint longitudinal carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 0.83 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.45 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat rounded; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina faint, dorsally straight; dorsal end of epicnemial carina not reaching ventral margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, moderately impressed, faint from anterior 0.5 to 0.8, faintly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter punctate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.65 as long as anterior portion of propodeum, moderately deep and very wide, markedly corrugated; anterior margin of propodeum without teeth; propodeum 0.96 as long as wide medially; anterior portion of propodeum with sparse coarse punctures, medially with two posteriorly convergent faint longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum confused-rugose, medially with distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina represented by crests, present

laterally as carina; propodeal spiracle 1.82 as long as wide; pleural carina of propodeum present only posteriorly; lower division of metapleuron strigate, densely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a posteriorly markedly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.62 as long as vein 2cu-a; vein 4Rs 0.86 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.89 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 1.43 as long as vein 2M. Hind wing*:* vein 1Cu 1.88 as long as vein cu-a; vein 2-1A reaching 0.76 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.53 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.55, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 1.01 as long as wide at apex; apex of T2 1.51 as wide as base.

Color. Head and mesosoma black and yellow, metasoma dark orange. Head: light yellow (239,223,151); mouthparts, mandible, apical margin of clypeus, supra–antennal medially, vertex and occiput, blackish; scape anteriorly bright yellow, dorsally black; pedicel and flagellomeres black, brownish towards apex; f9–11 entirely white, f8 and f12 mostly white. Mesosoma: black, except for the following bright yellow marks: propleuron ventrally, collar and pronotal swelling, longitudinal lanceolate mark at posterior 0.4 of central lobe of mesoscutum, axillary carina, scutellum, tegula, mesothoracic venter, upper division of metapleuron, and dorsal half of lower division of metapleuron, bright yellow; mesopleuron with three light yellow spots: from anterior margin of mesopleuron to posterior margin of sternaulus, at subalar ridge, and at hypoepimeron; large longitudinal brown (096,053,037) stripe covering sternaulus; ventral half of lower division of metapleuron anteriorly dark brown, posteriorly pale orange (206,124,058); posterior portion of propodeum black with two lateral longitudinal yellow marks. Legs: mostly orange (217,100,036); all t5 blackish, fore and mid t4 brownish; fore coxa yellow, posteriorly brown; trochanters yellowish towards apex. Metasoma: entirely dark orange.

Variation. Mandible ventrally yellow. Ventral yellow mark at mesopleuron medially narrow, black areas almost joining.

Comments. Similar to *T. albimaculatus* from which it can be distinguished by having clypeus and supraclypeal area entirely yellow (*vs*. clypeus apically and supraclypeal area ventrally, brown in *T. albimaculatus; Fig*. 68); posterior transverse carina of propodeum represented by crests, present laterally as carina (*vs*. crests absent, or carina not developed; Fig. 154); posterior portion of propodeum medially with distinct and stout carina (*vs*. without distinct longitudinal carina); postscutellum black (*vs*. yellow; Fig. 154); T1 entirely orange (*vs*. T1 orange with apical 0.1 yellow; Fig. 161); sternaulus with brown mark extending from dorsal end of epicnemial carina anteriorly to mesothoracic venter posteriorly (*vs*. sternaulus medially yellowish; Fig. 104); ventral half of lower division of metapleuron orange to dark brown (*vs*. lower division of metapleuron entirely bright yellow); hind coxa entirely orange (*vs*. dorsally with basal yellow spot).

Female. Unknown.

Distribution. Brazil. Recorded from *Minas Gerais* and *São Paulo* (Fig. 205). The type locality is Varginha, *Minas Gerais* (21°33'S, 45°25'W). These records comprise a range of 1°56' in latitude.

Biology. Unknown.

Material examined. 2 males. Holotype m#, **BRAZIL**: *Minas Gerais*, Varginha, I.1960, Seabra & Alvarenga *leg*. (DZUP). Antennae tip missing, mesoscutum somewhat damaged by pin; otherwise in good shape. Paratype: **BRAZIL**: 1 m# from *São Paulo*, Onda Verde, Fazenda São João, I.1946, F.Lane *leg*., *Toechorychus* A.P.Aguiar det. (DZUP).

***Toechorychus* sp. nov. 2, Tedesco**

(Figs 31, 53, 72, 96, 110, 158, 198)

Description. Holotype FEMALE. Fore wing length 6.71 mm.

Head. Mandible 1.79 as long as basal width, moderately pilose; ventral margin slightly projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.57 as wide as high, subtriangular, minutely strigulate, apically smooth; apex 1.35 as long as base, slightly but distinctly convex; apical margin sharp, medially slightly concave. Supraclypeal area entirely strigate, with scarce punctures, moderately pilose, medially slightly prominent; between antennal foramens with three, complete, U-shaped carinae; radicle foveolate. Antenna with 26

flagellomeres; white band starting at flagellomere 5, reaching flagellomere 10; flagellum somewhat stout; subapical flagellomeres slightly flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially strigulate. Paraocular area smooth. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli smooth, glabrous; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina stout, dorsally absent, ventrally slightly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 1.15 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.23 as long as wide; in lateral view, mesosoma middle width 0.21 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling smooth; collar dorso-laterally carinated, not swollen, anteriorly smooth; epomia absent. Mesoscutum densely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe without longitudinal sulcus or carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove faintly corrugated; scutellum 1.2 as long as wide, smooth; scutellar carina complete, posteriorly closing; postscutellum 0.29 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally smooth; mesopleural groove corrugated; epicnemial carina stout, dorsally curving forwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, moderately sinuate, moderately impressed, faint from anterior 0.6 to 0.9, faintly corrugated; scrobe moderately deep, forming pit with sulcus. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.08 as long as anterior portion of propodeum deep and narrow, very faintly corrugated, almost smooth; anterior margin of propodeum with two faint lateral teeth; propodeum 1.24 as long as wide medially; anterior portion of propodeum finely strigulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum strigate, progressively coarse toward posterior margin, medially with longitudinal carina until mid-length; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent; propodeal spiracle 2.00 as long as

wide; pleural carina of propodeum absent, apparently present because of sculpture patterns of lower division of metapleuron and propodeum; lower division of metapleuron very faintly strigulate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs entirely irregular; vein 1cu-a straight, arising near vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.76 as long as vein 2cu-a; vein 4Rs 0.92 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.96 as high as pterostigma, rectangular; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.35 as long as vein 2M. Hind wing*:* vein 1Cu 1.37 as long as vein cu-a; vein 2-1A reaching 0.89 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.53 as long as hind femur, with basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.55, prominent; postpetiole dorsally, behind spiracles, markedly concave, deeply depressed; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 0.87 as long as wide at apex; apex of T2 2.07 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch absent.

Color. Head and mesosoma yellow and dark brown, metasoma orange. Head: bright yellow (243,227,126); 0.8 of mandible, ventral half of malar space, apical half of clypeus, supraclypeal area ventrally, supra–antennal area, interocellar area, vertex and gena, except complete large orbital band, and occiput, dark brown (124,082,058); scape, pedicel, and flagellum brown, blackish toward apex; f6–9 entirely white, f10 almost entirely white, f5 partially white. Mesosoma: brown with whitish marks (244,231,204); propleuron brown; pronotum dark brown except collar laterally and pronotal swelling, pale yellow; mesoscutum black except longitudinal pale yellow lanceolate mark at posterior 0.5 of central lobe; remainder of mesosoma dark brown, except for the following pale yellow marks: axillary carina, tegula apically, scutellum, postscutellum, large mark extending from subalar ridge to entire dorsal margin of sternaulus except around hypoepimeron, dorsal half of hypoepimeron, upper division of metapleuron, 0.5 dorsal of lower division of metapleuron, and two lateral longitudinal marks at posterior portion of propodeum, pale yellow. Legs: mostly brown; fore and mid coxae with large dorsal pale yellow spot; fore and mid trochanters pale yellow, posteriorly brown; fore and mid femora posteriorly with brown stripe; all tibia, and all t1–t4, yellow; hind coxa dark brown with two pale yellow marks, anterior one narrow, at basal 0.7, posterior one large and dorsal, almost

reaching apex of coxa, basally wide; hind first trochanter mostly brownish, posteriorly yellow. Metasoma: mostly orange (221, 126,036); T1 ferruginous (183,095,052), posterior 0.2 pale yellow; T2–8 and S2–8 uniformly orange. 0.7 dorsal of lower division of metapleuron yellow.

Variation. Brown mark at supraclypeal area laterally reaching antennal foramens. Epicnemial carina dorsally yellowish. Fore and mid femora posteriorly with pale brown stripe. Posterior 0.2 of T1 bright yellow.

Comments. Similar to *T*. **sp**. **nov**. 32, from which can be separated by having ventral half of gena posteriorly brown (*vs*. yellow in *T*. **sp**. **nov**. 32; Fig. 79); propleuron completely dark brown (*vs*. dorsally black and ventrally pale yellow); collar dorso-laterally carinated, not swollen, as in Fig. 46 (*vs*. rounded, distinctly swollen, as in Fig. 47); mesothoracic venter completely dark brown (*vs*. black with yellow longitudinal stripes); lower division of metapleuron almost smooth, very faintly strigulate (*vs*. punctate and strigulate); fore and mid femora ventrally brownish (*vs*. entirely orange); mid coxa brown with dorsal large yellow mark (*vs*. yellow, with dorsal black mark at apical 0.7); hind coxa dark brown with two yellow stripes (*vs*. yellow with three black marks); spiracle of T1 prominent (*vs*. slightly prominent); posterior 0.2 of T1 pale yellow (*vs*. T1 medially orange and laterally pale yellow; Fig. 165).

Male. Unknown.

Distribution. Venezuela and Brazil. Recorded from two localities (Fig. 206). The type locality is Caxiuanã, *Pará*, Brazil (2°4’54”S 51°51’5”W). These records comprise a range of 7°15’ in latitude.

Biology. Unknown.

Material examined. 2 females. Holotype f#, **BRAZIL**: *Pará*, Melgaço, Floresta Nacional de Caxiuanã, Trilha Igarapé Tijucaquara, 24–27.XI.2003, YPT, A.P.Aguiar & J.Dias *leg*., P05199 [field point] (UFES). Right fore leg beyond coxa missing, otherwise in good shape. Paratype: **VENEZUELA:** 1 f# from *Zulia*, Tucuco, 23.IV.1981, H.K.Townes *leg*. (AEIC).

***Toechorychus* sp. nov. 3, Tedesco**

(Figs 13, 50, 66, 103, 137, 168)

Description. Holotype FEMALE. Fore wing length 6.00 mm.

Head. Mandible 1.31 as long as basal width, moderately pilose; ventral margin slightly projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.71 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.54 as long as base, truncate; apical margin sharp, medially slightly concave. Supraclypeal area medially strigate, laterally finely punctate, densely pilose, medially slightly prominent; between antennal foramens with U-shaped carina, medially widely interrupted; radicle foveolate. Antenna with 25 flagellomeres; white band starting at flagellomere 4, reaching flagellomere 11; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with stout, median, longitudinal carina or with stout, median, transversally arched carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially punctulate, or rugulose. Paraocular area finely punctulate. Vertex with very coarse punctures around ocelli, at anterior third with short, longitudinal sulcus, posterior two-thirds smooth; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina stout, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 1.06 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.02 as long as wide; in lateral view, mesosoma middle width 0.18 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling dorsally smooth, ventrally strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly smooth; epomia absent. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with faint longitudinal carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 0.87 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.6; postscutellum 0.30 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina

reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area, but distinctly markedly strigate; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed, faint from anterior 0.7 to 0.8, faintly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.10 as long as anterior portion of propodeum deep and narrow, very faintly corrugated, almost smooth; propodeum 1.12 as long as wide medially; anterior margin of propodeum with two lateral teeth; anterior portion of propodeum finely strigulate or with sparse coarse punctures, medially with two posteriorly convergent longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum entirely markedly strigate, medially without distinctly stout longitudinal carina; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent; propodeal spiracle 1.55 as long as wide; pleural carina of propodeum irregular and faint, obsolescent posteriorly, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron faintly strigulate, sparsely pilose, juxtacoxal carina represented by very short ridges.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.71 as long as vein 2cu-a; vein 4Rs 0.89 as long as vein 4M, uniformly slightly convex; cell 1+2Rs 0.71 as high as pterostigma, rectangular; vein 2M approximately as long as vein 3M; vein 3M distinct, 1.20 as long as vein 2M. Hind wing*:* vein 1Cu 1.39 as long as vein cu-a; vein 2-1A reaching 0.96 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.51 as long as hind femur, with basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.54, slightly prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 1.15 as long as wide at apex; apex of T2 1.78 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch absent.

Color. Head yellow with black marks, mesosoma black and yellow and metasoma mostly orange (212,115,049). Head: yellow; mandible apex, clypeal apex, two lateral longitudinal stripes at supraclypeal area, supra–antennal area, interocellar area, vertex and gena, except complete

large orbital band, and occiput, black; scape ventrally yellow, dorsally dark brown; flagellum ventrally entirely brown, dorsally whitish at f5–13. Mesosoma: mostly bright yellow (240,219,117); propleuron bright yellow, dorsally black; pronotum black except collar laterally and pronotal swelling, bright yellow; mesoscutum black, except longitudinal lanceolate mark at posterior 0.9 of central lobe; mesopleuron bright yellow with four black marks: anteriorly around hypoepimeron, entire mesopleural groove, rounded spot just behind epicnemial carina, and along posterior half of sternaulus; remainder of mesosoma black, except for the following bright yellow marks: axillary carina, scutellum, postscutellum, both upper and lower division of metapleuron, and two lateral longitudinal marks at posterior portion of propodeum. Legs: mostly orange; fore coxa, mid and hind coxae basally, bright yellow; fore coxa ventrally, mid and hind coxae dorsally with basal dark brown mark; hind coxa posteriorly with black spot; mid t5 dark brown. Metasoma: mostly orange; T1 laterally bright yellow, dorsally black with posterior 0.2 bright yellow; T2–8 orange; S2–8 bright yellow, laterally orange.

Variation. Scutoscutellar groove faintly corrugated. Rounded spot just behind epicnemial carina joining posterior black mark at sternaulus. Anterior portion of propodeum brownish around spiracle. Longitudinal stripes at posterior portion of propodeum brownish towards apex. Posterior black spot at hind coxa absent. Mid coxa dorsally entirely yellowish. T1 dorsally orange.

Comments. Very similar to *T*. **sp**. **nov**. 29, from which it can be separated by having supraclypeal area with two lateral longitudinal stripes (Fig. 66) (*vs*. entirely yellow in *T*. **sp**. **nov**. 29); supra-antennal area with distinct median longitudinal carina (*vs*. without distinct median carina); supra-antennal area medially without elevation (*vs*. with small rounded elevation); occipital carina dorsally absent (Fig. 50) (*vs*. conspicuous and uniformly arched, as in Fig. 52); mesopleuron ventrally and sternaulus, yellow (*vs*. with rounded black spot just behind epicnemial carina, and along posterior half of sternaulus; Fig. 99); hind coxa dorsally yellow (*vs*. entirely orange; Fig. 172); T1 with basolateral tooth, as in Fig. 53 (*vs*. without, as in Fig. 54). Also similar to *T*. **sp**. **nov**. 31, from which it can be differentiated by having supraclypeal area with two lateral longitudinal black stripes (*vs*. ventrally with M-shaped mark in *T*. **sp**. **nov**. 31; Fig. 78); lateral black stripes at supraclypeal area not reaching antennal foramens (*vs*. reaching antennal foramens, even medially interrupted); malar space completely yellow (*vs*. ventrally black); occipital carina near mandible bright yellow (*vs*. black); juxtacoxal carina of mesopleuron faint

and short (*vs*. stout and long); scrobe very shallow, forming a sulcus (*vs*. deeply impressed, forming a pit); lower division of metapleuron entirely yellow (*vs*. with ventral rounded black spot; Fig. 30); mid and hind coxae mostly yellow to orange (*vs*. with conspicuous black marks).

Male. Unknown.

Distribution. Brazil. Recorded from *Mato Grosso* and *Amapá* (Fig. 207). The type locality is Sinop, *Mato Grosso* (12°31'S 55°37'W). These records comprise a range of 13°21' in latitude.

Biology. Unknown.

Material examined. 2 females. Holotype f#, **BRAZIL**: *Amapá*, Serra do Navio, X.1957, K.Lenko *et al*. *leg*. (DZUP). Antennae apical half and left fore leg beyond tibia missing, mesoscutum somewhat damaged by pin; otherwise in good shape. Paratype: **BRAZIL**: 1 f# from *Mato Grosso*, Sinop, 12°31'S 55°37'W, October, 1976, M.Alvarenga, *Toechorychus*, S.Gupta, 1980 (FSCA).

***Toechorychus* sp**. **nov**. **4, Tedesco**

(Figs 21, 73, 111, 126, 183)

Description. Holotype FEMALE. [Fore wing damaged].

Head. Mandible 1.69 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.82 as wide as high, rectangular, finely punctate; apex 1.33 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely strigulate, also densely punctate, moderately pilose, medially with oval prominent area; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Antenna with 22 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 11; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially punctulate. Paraocular area finely punctulate. Vertex punctate around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina faint, dorsally absent, ventrally regularly shaped, not projected, reaching hypostomal carina at

mandible base or nearly so; hypostomal carina regularly shaped, not projected; malar space 1.62 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.05 as long as wide; in lateral view, mesosoma middle width 0.17 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly rugulose; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, densely punctulate, covered with sparse coarse punctures, impression of notaulus corrugated, central lobe with longitudinal sulcus; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove smooth, polished; scutellum 0.82 as long as wide, densely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.45 as long as wide; hind margin of metanotum without teeth or carinae. Mesopleuron entirely markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina faint, dorsally straight; dorsal end of epicnemial carina reaching 0.1 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed; not corrugated; scrobe moderately deep, forming pit with sulcus. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.23 as long as anterior portion of propodeum, moderately deep and moderately narrow, medially wide, closely corrugated, medially some carinae distinctly stouter; propodeum 1.11 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum finely strigulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum mostly smooth, with widely spaced carinae, medially with two stout longitudinal carina; behind posterior transverse carina with two stout parallel longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially markedly arched forwards; posterior transverse carina represented by high conical apophyses; apophysis 1.00 as high as wide; propodeal spiracle 1.50 as long as wide; pleural carina of propodeum complete, moderately stout; lower division of metapleuron faintly strigulate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with

vein M+Cu about 90°; vein 2Cu 0.73 as long as vein 2cu-a. Hind wing*:* vein 1Cu 1.4 as long as vein cu-a; vein 2-1A reaching 0.66 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.53 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.54, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 0.96 as long as wide at apex; apex of T2 2.18 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head and mesosoma black and pale yellow; metasoma brownish (080,045,027) and pale yellow. Head: pale yellow, except for the following black marks: mandible except rounded basal spot, malar space, clypeal apex, supraclypeal area around clypeus, supra–antennal area medially, interocellar area, vertex and gena except large complete orbital band, and occiput, black; scape, pedicel, and flagellum, dark brown (070,047,030); flagellum at f6–9 dorsally whitish, partially at f5. Mesosoma: black, except for the following pale yellow marks (225,187, 105): propleuron medially, collar laterally, pronotal swelling, longitudinal lanceolate mark at posterior 0.3 of central lobe of mesoscutum, axillary carina, scutellum, postscutellum, tegula basally, subalar ridge, dorsal 0.8 of hypoepimeron, large triangular mark ventral to scrobe, small triangular mark dorsal to epicnemial carina, longitudinal stripe at mesothoracic venter ventrally to anterior 0.6 of sternaulus, upper division of metapleuron, hind margin of metanotum medially, dorsal 0.6 of lower half of metanotum, and conical apophysis, yellow. Legs: mostly dark yellow (219,156,090); fore and mid coxae brown (086,059,045), dorsally yellow at apical 0.9 and 0.7, respectively; hind coxa and hind trochanter, black; hind coxa with two longitudinal marks at basal 0.9, anterior mark narrow, posterior mark large; hind second trochanter, fore and mid tarsi, apical 0.3 of hind tibia ventrally, hind tarsus ventrally, brown. Metasoma: mostly brown; T1 black, posterior 0.1 pale yellow; T2–8 pale yellow at posterior 0.2; S2–5 medially orange.

Comments. This species has the most different color pattern among the species of the genus, and is easily recognizable by the propodeum completely black, only with pale yellow over the high conical apophyses (Fig. 126), whereas other species have a slightly varied pattern of longitudinal stripes at posterior portion of propodeum. The sculpturing of posterior portion of propodeum is also unique and characteristic for the species, only similar to *T*. **sp**. **nov**. 20 (Fig. 143) from which it can be readily separated by having supra-antennal area without transverse

carina (*vs*. with stout, median, arched transverse carina in *T*. **sp**. **nov**. 20); central lobe of mesoscutum with longitudinal sulcus (*vs*. without sulcus or carina); T1 black, except 0.2 posterior, pale yellow (*vs*. yellow, except dorsally to spiracle, black; Fig. 190).

Male. Unknown.

Distribution. Known only from Peru (Fig. 208).

Biology. Unknown.

Material examined. Holotype f#, **PERU**: *Amazonas*, 6°53'S 77°40'W, 12.II.1973, 2000 m, J.Helava *leg*. (AEIC). Fore wings apex missing, mesoscutum somewhat damaged by pin; otherwise in good shape.

***Toechorychus* sp**. **nov**. **5, Tedesco**

(Figs 33, 59, 94, 112, 139, 189)

Description. Holotype FEMALE. Fore wing length 7.03 mm.

Head. Mandible 1.55 as long as basal width, densely pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.79 as wide as high, rectangular, minutely strigulate, apically smooth; apex 1.26 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely strigate, with scarce punctures, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with U-shaped carina, medially widely interrupted; radicle foveolate. Antenna with 28 flagellomeres; white band starting at flagellomere 6, reaching flagellomere 11; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli smooth, densely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina stout, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina projected as crest; malar space 0.95 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.23 as long as wide; in lateral view, mesosoma middle width 0.20 mm. Pronotum centrally smooth, latero-ventrally markedly strigate behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling dorsally smooth,

ventrally strigulate; collar dorso-laterally carinated, not swollen, anteriorly smooth; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe with faint longitudinal carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 1.00 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.36 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat rounded; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving forwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, posteriorly almost faint; not corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter coarsely punctate; median portion of posterior transverse carina of mesothoracic venter long and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.28 as long as anterior portion of propodeum, deep and narrow, uniformly corrugated; anterior margin of propodeum without teeth; propodeum 1.17 as long as wide medially; anterior portion of propodeum posteriorly strigate, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum faintly strigate, medially with longitudinal carina; behind posterior transverse carina without distinct longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially slightly arched forwards; posterior transverse carina absent; propodeal spiracle 1.50 as long as wide; pleural carina of propodeum present only posteriorly; lower division of metapleuron strigate, densely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.50 as long as vein 2cu-a; vein 4Rs 0.96 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.82 as high as pterostigma, almost indistinct; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.38 as long as vein 2M. Hind wing*:* vein 1Cu 2.13 as long as vein cu-a; vein 2-1A reaching 0.82 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa elongate.

Metasoma. T1 0.47 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.50, prominent; postpetiole dorso-anteriorly flat; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 0.94 as long as wide at apex; apex of T2 2.07 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma black and yellow (225,204,101). Head: yellow; mandible apex, malar space, clypeal apex centrally, supra–antennal area medially, interocellar area, vertex and gena, except complete large orbital band, and occiput, black; scape ventrally yellow, dorsally brown; flagellum ventrally entirely brown, dorsally whitish at f9–10. Mesosoma: propleuron light yellow, dorsally black; pronotum black except lateral rounded spots at collar and pronotal swelling, bright yellow; mesoscutum black, except longitudinal lanceolate mark at posterior 0.9 of central lobe; mesopleuron with two large marks: anterior one extending from subalar ridge to entire dorsal margin of sternaulus except around hypoepimeron and just behind epicnemial carina, posterior one at 0.7 dorsal of hypoepimeron; mesothoracic venter with lateral yellow stripe ventrally to sternaulus; remainder of mesosoma black, except for the following bright yellow marks: axillary carina, scutellum, postscutellum, both upper and lower division of metapleuron, and two lateral longitudinal marks at posterior portion of propodeum. Legs: mostly yellow; fore and mid coxae ventrally, and fore and mid femora dorsally and ventrally, brown; all t5 dark brown; hind coxa black with two basally connected yellow marks: anterior mark narrow, posterior mark large, both reaching 0.9 of length of coxa; hind first trochanter and hind femur dark brown, dorsally with narrow yellow stripe. Metasoma: black and yellow; T1 laterally bright yellow, dorsally black with posterior 0.2 bright yellow; T2–8 black with posterior 0.4 bright yellow; S2–8 bright yellow, laterally black.

Variation. Antenna with 27–29 flagellomeres, white band at f5–12. Yellow spot at ventral side of scape from distinct to very small, almost fading. Scutoscutellar groove faintly corrugated. Dark mark at mid mesopleuron just behind epicnemial carina sometimes separated from dark mark at epicnecium, sometimes connected. One specimen with mesopleuron just behind epicnemial carina yellow, coloration continuous with large mark extending from subalar ridge to dorsal margin of sternaulus. Surface over sternaulus sometimes partially yellow (sometimes medially, or posteriorly). Mesothoracic venter sometimes completely black, or variously marked with yellowish. Hind coxa ventrally with apical yellow stripe. Hind femur

ventrally with basal yellow mark; apical 0.1 yellow. Cell 1+2Rs sometimes distinct, pentagonal; often higher apically. T1 around spiracle black. T2 sometimes basally orange, turning to blackish before yellow stripe. Dark marks at epicnecium, mesothoracic venter and legs sometimes dark brown (079,037,018) instead of black.

Comments. Very similar to *T*. **sp**. **nov**. 9, from which it is isolated by having collar dorso-laterally carinated, not swollen, as in Fig. 46 (*vs*. rounded, distinctly swollen in *T*. **sp**. **nov**. 9, as in Fig. 47); epomia stout (*vs*. absent); mesopleuron markedly strigate only anteriorly around hypoepimeron (*vs*. entirely markedly strigate; Fig. 102); sternaulus smooth (*vs*. corrugated; Fig. 102); hind tibia entirely bright yellow (*vs*. with apical 0.3 brownish); hind t1 entirely whitish (*vs*. with basal 0.2 brownish).

Male. Similar to female, except as follows. Supraclypeal area with two lateral black stripes reaching antennal foramens; dorsally to clypeus blackish. Antenna with 28 flagellomeres; flagellum completely white at f8–15, partially at f7 and f16. Orbital band sometimes very thin at lower gena, black part of gena almost connected to black malar space. Longitudinal lanceolate yellow mark at central lobe of mesoscutum restricted to posterior 0.3. Mesopleuron just behind epicnemial carina yellowish. Sternaulus entirely black; posterior portion sometimes yellow. Yellow marks at mesothoracic venter narrow. Propodeal sculpturing behind anterior transverse carina stout. Mid femur entirely yellowish. Yellow stripes at hind coxa narrow, sometimes straight, restricted to basal 0.6. Posterior yellow mark at T3–T8 present only laterally. T2 sometimes fuscous, lighter than other tergites. T1–8 sometimes dark brown instead of black.

Distribution. Brazil and Paraguay. Recorded from two localities (Fig. 209). The type locality is Nova Teutônia (27°09’49”S 52°25’27”W), *Santa Catarina*. These records comprise a range of 0°10’ in latitude.

Biology. Unknown.

Material examined. 22 females and 14 males. Holotype f#, **BRAZIL**: *Santa Catarina*, Nova Teutônia, XII.1967, Fritz Plaumann *leg*. (DZUP). Left antenna beyond flagellomere 5 and right hind leg beyond tibia missing, axillary trough of metanotum somewhat damaged by pin; otherwise in good shape. Paratypes: **BRAZIL**: 1 f#, 1 m# from *Santa Catarina*, Nova Teutônia, I.1968, Fritz Plaumann *leg*. (AEIC). 2 f#f#, 4 m#m# from *Santa Catarina*, Nova Teutônia, I.1968, 300–500 m, 27°11’S 52°23’W, Fritz Plaumann *leg*.; 1 f#, 1 m#, same data, except XI.1968; 1 f#, same data, except II.1965; 1 f#, same data, except XII.1968; 2 f#f#, same data,

except 29.I.1968; 1 f#, same data, except XII.1967. 2 f#f# from *Santa Catarina*, Nova Teutônia, 300–500 m, 27°11'S 52°23'W, Fritz Plaumann *leg*. (CNCI). Other specimens: **BRAZIL**: 2 f#f#, 2 m#m# from *Santa Catarina*, Nova Teutônia, II.1968, Fritz Plaumann *leg*., *Toechorychus*, Townes; 8 f#f#, 5 m#m# same data, except I.1968; 1 m#, same data, except X.1968 (AEIC). **PARAGUAY**: 1 m# from *Itapúa*, Pirapó, 01–03.I.1972, L.Peña *leg*. (AEIC).

***Toechorychus* sp. nov. 6, Tedesco**

(Figs 38, 51, 74, 89, 113, 128, 175)

Description. Holotype FEMALE. Fore wing length 8.20 mm.

Head. Mandible 1.64 as long as basal width, densely pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.38 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.13 as long as base, truncate; apical margin sharp, medially slightly concave. Supraclypeal area medially strigate, laterally and medially finely punctate, densely pilose, medially with oval prominent area; between antennal foramens with V-shaped carina; radicle foveolate. Antenna with 27 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 11; flagellum slender; subapical flagellomeres as wide as basal flagellomeres, not flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially with small rounded elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area smooth. Vertex rugulose around ocelli or with very coarse punctures around ocelli, without sulcus; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally absent, ventrally slightly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 1.00 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.01 as long as wide; in lateral view, mesosoma middle width 0.25 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling strigulate; collar dorso-laterally carinated, not swollen, anteriorly punctate; epomia very faint, almost indistinct. Mesoscutum densely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with dense coarse punctures, central lobe without longitudinal sulcus or carina; notaulus moderately impressed, posteriorly convergent. Scutoscutellar groove smooth, polished; scutellum 0.99 as

long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.28 as long as wide; hind margin of metanotum with two short lateral carinae extending towards transverse furrow at base of propodeum. Subalar ridge somewhat elongate; mesopleuron entirely densely punctate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus incomplete, not reaching base of mid coxa, moderately sinuate, moderately impressed, faint from anterior 0.6 to 0.9, faintly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.12 as long as anterior portion of propodeum, shallow and very wide, closely corrugated, medially some carinae distinctly stouter; propodeum 1.18 as long as wide medially; anterior margin of propodeum with two lateral teeth; anterior portion of propodeum posteriorly strigate, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum confused-rugose, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina complete, medially arched, laterally with low swelling; propodeal spiracle 2.57 as long as wide; pleural carina of propodeum present only posteriorly; lower division of metapleuron strigate, densely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs uniformly curved; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.57 as long as vein 2cu-a; vein 4Rs 0.98 as long as vein 4M, sinuous; cell 1+2Rs 1.3 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.78 as long as vein 2M. Hind wing*:* vein 1Cu 1.34 as long as vein cu-a; vein 2-1A reaching 0.94 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa globose.

Metasoma. T1 0.51 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.55, prominent; postpetiole dorso-laterally, behind spiracles, markedly concave, deeply depressed; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 1.08 as long as wide at apex; apex of T2 1.98 as wide as base.

Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch absent.

Color. Head black and yellow, mesosoma mostly orange and metasoma black with yellow marks. Head: yellow; mandible apex, clypeus apex, median longitudinal stripe at dorsal half of supraclypeal area, supra–antennal area, interocellar area, vertex except large incomplete orbital band, entire gena, and occiput, black. Mesosoma: orange (222,111,048); pronotum bright brown (087,054,036) except for pronotal swelling, yellow; mesoscutum black, except longitudinal rectangular mark at entire length of central lobe; remainder of mesosoma orange, except for the following yellow marks: axillary carina, scutellum, postscutellum, tegula, crests of propodeum, and large mark extending along epicnecium from subalar ridge to posterior end of epicnemial carina. Legs: orange (224,126,052), yellowish towards apex; all t5 dark brown. Metasoma: black and yellow; T1 bright brown, postpetiole anteriorly brown, posteriorly yellow; T2–8 black with posterior 0.1 pale yellow; S2–8 yellow, laterally black.

Variation. No variation observed.

Comments. Color pattern very similar to *T*. **sp**. **nov**. 12, from which it can be distinguished by having dorsal half of supraclypeal area with median longitudinal stripe (Fig. 74) (*vs*. supraclypeal area entirely pale yellow); collar dark brown (*vs*. pale yellow; Fig. 36); gena ventrally and malar space, black (*vs*. pale yellow); mesopleuron orange, except for subalar ridge and epicnecium, pale yellow (*vs*. with black mark anteriorly around hypoepimeron; Fig. 42); posterior transverse carina of propodeum complete, laterally with crest (*vs*. absent); pleural carina of propodeum present only posteriorly (*vs*. absent).

Male. Unknown.

Distribution. Suriname and Brazil. Recorded from two localities (Fig. 210). The type locality is Vilhena, *Rondônia* (12°44’26”S 60°8’45” W). These records comprise a range of 17°54’ in latitude.

Biology. Unknown.

Material examined. 2 females. Holotype f#, **BRAZIL**: *Rondônia*, Vilhena, 27.XI.1986, Pólo Noroeste, C.Elias *leg*. (DZUP). Right antennae beyond with band and right fore leg beyond coxa missing, mesoscutum somewhat damaged by pin; otherwise in good shape. Other specimen: **SURINAME**: 1 f# from 45 Km S Paramaribo, 13.X.1963, D.C.Geijskes *leg*. (AEIC).

***Toechorychus* sp. nov. 7, Tedesco**

(Figs 1, 2, 58, 97, 114, 139, 179)

Description. Holotype FEMALE. Fore wing length 6.79 mm.

Head. Mandible 1.63 as long as basal width, densely pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.65 as wide as high, subrectangular, finely punctate; apex 1.43 as long as base, truncate; apical margin sharp, medially slightly concave. Supraclypeal area entirely densely punctate, densely pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Antenna with 23 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 11; flagellum somewhat stout; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate, densely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally V-shaped, ventrally slightly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 0.91 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.98 as long as wide; in lateral view, mesosoma middle width 0.18 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly punctulate; epomia stout, ending at pronotal swelling. Mesoscutum sparsely pilose, densely punctulate, covered with sparse coarse punctures, impression of notaulus corrugated, central lobe without longitudinal sulcus or carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 1.11 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.6; postscutellum 0.31 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron dorsally strigate, ventrally rugulose; mesopleural groove corrugated; epicnemial carina faint, dorsally straight; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind

epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, deeply impressed; faintly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.16 as long as anterior portion of propodeum deep and moderately narrow, medially wide, closely corrugated, medially some carinae distinctly stouter; propodeum 1.09 as long as wide medially; anterior margin of propodeum with two faint lateral teeth; anterior portion of propodeum finely strigulate, medially with two posteriorly convergent faint longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum before posterior transverse carina medially confused-rugose and laterally punctulate, behind strigate-rugose, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially slightly arched forwards; posterior transverse carina complete, medially arched, laterally with low swelling; propodeal spiracle 1.45 as long as wide; pleural carina of propodeum absent, apparently present because of sculpture patterns of lower division of metapleuron and propodeum; lower division of metapleuron strigulate, densely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs slightly sinuous; ramellus absent; vein 1M+Rs uniformly curved; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.68 as long as vein 2cu-a; vein 4Rs 0.90 as long as vein 4M, straight; cell 1+2Rs 0.80 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M indistinct. Hind wing*:* vein 1Cu 2.2 as long as vein cu-a; vein 2-1A reaching 0.80 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.55 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.58, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 0.98 as long as wide at apex; apex of T2 2.08 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma whitish, fulvous and black, with yellow marks. Head: whitish; mouthparts, mandible, clypeal apex, supraclypeal area laterally just posteriorly to

clypeus, supra–antennal area only posteriorly to scape, interocellar area, vertex and gena, except complete large orbital band, and occiput, brown (090,057,027); scape yellow (195,136,093); pedicel light brown; flagellum ventrally entirely brown, dorsally completely whitish at f6–9, partially at f5 and f10. Mesosoma: mostly fulvous (166,099,055); propleuron yellow; pronotum fulvous except collar laterally and pronotal swelling, pale yellow, and posterior 0.1 of collar, black; mesoscutum fulvous, except longitudinal lanceolate mark at posterior 0.2 of central lobe; mesopleuron fulvous with three pale yellow marks: along epicnecium from subalar ridge to dorsal end of epicnemial carina, and dorsally and ventrally to scrobe, respectively; mesothoracic venter fulvous with lateral light brown (136,076,030) stripe ventrally to sternaulus; axillary carina, scutellum, upper division of metapleuron, dorsal half of lower division of metapleuron, pale yellow; anterior portion of propodeum fulvous, except for first pleural area, black; posterior portion of propodeum black, with two lateral longitudinal marks from crests to posterior margin of propodeum. Legs: fore and mid legs dark yellow (213,154,072); all coxae with dorsal subcircular pale yellow spot, all t5 black; hind coxa and femur ferruginous (145,085,049), hind femur dorsally brownish; hind tibia dark yellow; hind t1–4 light yellow, whitish towards apex. Metasoma: black, white and ferruginous; T1–2 black, with lateral and posterior 0.2 whitish; T3–8 fulvous, with posterior 0.5 whitish; S2–8 pale brown, with posterior 0.4 white.

Variation. Antenna with 24 flagellomeres; flagellum dorsally whitish at f5–9, sometimes reaching flagellomere 10 or 11. Mandible sometimes completely brown, sometimes mostly yellow with brown base and apex. Supraclypeal area often entirely yellowish, or medially black, except for two small spots ventrally to antennal foramens. Area at and around scrobe sometimes blackish, sometimes brown (as remainder of mesopleuron). Apical yellow stripe at T1 sometimes medially narrow. Anterior portion of propodeum blackish around spiracle. Dorsal yellow spot at hind coxa lighter. Differences in tonality include variations from whitish to pale yellow, and from fulvous (166,099,055) to dark brown (083,051,029). One specimen from Parque Estadual do Rio Doce with anterior portion of propodeum entirely black and apical yellow stripe of T1 centrally interrupted.

Comments. Color pattern very similar to some *T. cassunungae* specimens, from which it can be distinguished by having juxtacoxal carina of mesopleuron long (*vs*. short in *T. cassunungae*); pale yellow marks dorsally and ventrally to scrobe always separated from other marks at mesopleuron (*vs*. variously connected to other marks); hind femur dorsally dark (*vs*.

uniformly colored, generally dark yellow); T1 always laterally pale yellow, except around spiracle (Figs. 1 and 179) (*vs*. variously colored; Fig. 16); mesoscutum always concolorous with anterior portion of propodeum (*vs*. sometimes not concolorous).

Male. Unknown.

Distribution. Brazil. Recorded from seven localities from *Goiás* to *Paraná* (Fig. 211). The type locality is Domingos Martins, *Espírito Santo* (20°22'17"S 40°39'29"W). These records comprise a range of 11°23' in latitude.

Biology. Unknown.

Material examined. 21 females. Holotype f#, **BRAZIL**: *Espírito Santo*, Domingos Martins, Mata Pico do Eldorado, 20°22'17"S 40°39'29"W, 26.XI–03.XII.2004, Malaise trap T4, M.T.Tavares *et al*. *leg*. (UFES). Complete, in good shape. Paratypes: **BRAZIL**: 2 f#f# from *Goiás*, Parque Nacional Chapada dos Veadeiros, 15–25.IX.2005, Malaise trap, pt. 4, A.P.Aguiar *et al*. *leg*.; 1 f#, same data, except 07–23.IX.2005, pt. 18. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha do Vinhático 2, mata secundária alta, 10–17.XI.2004, Malaise trap, J.C.R.Fontenelle *leg*. 3 f#f# from *Espírito Santo*, Domingos Martins, Mata Pico do Eldorado, 20°22'17"S 40°39'29"W, 26.XI–03.XII.2004, Malaise trap T1, M.T.Tavares *et al*. *leg*.; 1 f#, same data, except Malaise trap T2; 1 f#, same data, except Malaise trap T3; 1 f#, same data, except Malaise trap B3; 1 f#, same data, except Malaise trap B7. 1 f# from *Espírito Santo*, Cariacica, Reserva Biológica Duas Bocas, Pau Amarelo, 20–28.X.2005, Malaise trap, pt. 9, A.P.Aguiar *et al*. *leg*. 1 f# from *São Paulo*, Rio Claro, Floresta Estadual Edmundo Navarro de Andrade, 11.IX–01.X.2005, J.T.Dias *et al*. *leg*. (UFES). 1 f# from *São Paulo*, Descalvado, Fazenda Itaúnas, 13.XI.2006, Malaise trap A1, N.W.Perioto *et al*. *leg*.; 1 f#, same data, except Malaise trap B1. 1 f# from *São Paulo*, Descalvado, Fazenda Itaúnas, 01.XII.2005, Malaise trap B1, N.W.Perioto *et al*. *leg*.; 1 f#, same data, except 15.XII.2005 (IBRP). 1 f# from *Paraná*, Guarapuava, Estação Águas Santa Clara, Levantamento Entomológico Profaupar, 13.X.1986, Malaise trap (DZUP). Other specimens: **BRAZIL**: 1 f# from *Rio de Janeiro*, Represa Rio Grande, IX.1969, M.Alvarenga *leg*.; 1 f#, same data, X.1967 (AEIC).

***Toechorychus* sp. nov. 8, Tedesco**

(Figs 37, 52, 61, 98, 115, 130, 178)

Description. Holotype FEMALE. Fore wing length 6.32 mm.

Head. Mandible 1.39 as long as basal width, densely pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.71 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.37 as long as base, truncate; apical margin blunt, medially straight. Supraclypeal area entirely densely punctate, densely pilose, medially slightly prominent; between antennal foramens with U-shaped carina; radicle punctate. Antenna with 24 flagellomeres; white band starting at flagellomere 4, reaching flagellomere 12; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially smooth. Paraocular area smooth. Vertex strigulate between ocelli, without sulcus; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally uniformly arched, ventrally slightly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 1.03 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.12 as long as wide; in lateral view, mesosoma middle width 0.19 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling strigulate; collar dorso-laterally carinated, not swollen, anteriorly punctulate; epomia absent. Mesoscutum sparsely pilose, densely punctate, impression of notaulus corrugated, central lobe without longitudinal sulcus or carina; notauli faintly impressed, posteriorly parallel throughout. Scutoscutellar groove smooth, polished; scutellum 1.3 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.6; postscutellum 0.34 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat rounded; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving forwards; dorsal end of epicnemial carina reaching 0.1 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed, faint from anterior 0.5 to 0.7, not corrugated; scrobe moderately deep, forming pit with sulcus.

Mesothoracic venter punctate; median portion of posterior transverse carina of mesothoracic venter V-shaped, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.09 as long as anterior portion of propodeum, shallow and narrow, medially wide, uniformly corrugated; propodeum 1.33 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum strigulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum strigate, progressively coarse toward posterior margin, medially without distinctly stout longitudinal carina; anterior transverse carina of propodeum complete, stout, medially slightly arched forwards; posterior transverse carina absent; propodeal spiracle 1.71 as long as wide; pleural carina of propodeum absent; lower division of metapleuron strigulate, densely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.48 as long as vein 2cu-a; vein 4Rs 0.99 as long as vein 4M, straight; cell 1+2Rs 0.74 as high as pterostigma, pentagonal; vein 2M distinctly shorter than vein 3M; vein 3M indistinct. Hind wing*:* vein 1Cu 1.44 as long as vein cu-a; vein 2-1A reaching 0.8 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa elongate.

Metasoma. T1 0.47 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.53, not prominent; postpetiole dorsally, at level of spiracles, faintly but distinctly concave; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 1.09 as long as wide at apex; apex of T2 2.37 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head and metasoma mostly white and black, mesosoma orange. Head: whitish; mandible teeth, supra–antennal area only behind scape, interocellar area, vertex and gena, except complete large orbital band, and occiput, dark brown, blackish posteriorly; scape ventrally yellow, scape dorsally, pedicel, and flagellum ventrally, brown; flagellum dorsally completely whitish at f4–10, f3 and f11 partially white. Mesosoma: orange (207,091,021); propleuron, subalar ridge, epicnecium, mesothoracic venter, mesepimeron, and apex of juxtacoxal area, whitish (222,176,094). Legs: orange (207,091,021), yellowish towards apex; all t5 dark brown. Metasoma: T1 orange, both basal and apical 0.1 white; T2 basally orange, blackish toward apex,

posterior 0.3 white; T2 basally black, posterior 0.4 white; T3–8 basally black, lateral and posterior 0.4 white; S2–8 white, with lateral brown mark.

Variation. Fore wing of same length on both females. Antenna with 23 flagellomeres. Supra-antennal area medially orange; around ocelli lighter. T2 orange only at anterior 0.1. Scutoscutellar groove faintly corrugated.

Comments. This is the only known species with mesosoma and legs almost entirely orange, except by small white areas (Fig. 37). Very similar to *T*. **sp**. **nov**. 12 from which it can be separated by having mesosoma completely orange (*vs*. pronotum, mesoscutum and mesopleuron marked with black areas in *T*. **sp**. **nov**. 12); lateral portion of collar carinated, not swollen, as in Fig. 46 (*vs*. dorsally rounded, distinctly swollen, as in Fig. 47); pleural carina of propodeum present only posteriorly (*vs*. absent, as in Fig. 42).

Male. Unknown.

Distribution. Brazil. Known only from the Floresta Nacional de Caxiuanã (2°4’54”S 51°51’5”W), *Pará*, from two close localities (Fig. 212).

Biology. Unknown.

Material examined. 2 females. Holotype f#, **BRAZIL**: *Pará*, Melgaço, Floresta Nacional de Caxiuanã, Trilha do Igarapé Curua, 14–17.XI.2003, YPT, A.P.Aguiar & J.Dias *leg*., P05020 [field point] (UFES). Complete, in good shape. Paratype: **BRAZIL**: 1 f# from *Pará*, Melgaço, Floresta Nacional de Caxiuanã, Trilha do Igarapé Tijucaquara, 15–18.XI.2003, YPT, A.P.Aguiar & J.Dias *leg*., P05038 [field point] (UFES).

***Toechorychus* sp**. **nov**. **9, Tedesco**

(Figs 34, 57, 93, 102, 116, 155, 182)

Description. Holotype FEMALE. Fore wing length 5.93 mm.

Head. Mandible 1.67 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.45 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.62 as long as base, slightly but distinctly convex; apical margin sharp, medially slightly convex. Supraclypeal area entirely strigulate, also densely punctate, densely pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with U-shaped carina; radicle foveolate. Antenna

with 26 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 14; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with stout, median, transversally arched carina, medially interrupted, without median longitudinal elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area finely strigulate. Vertex rugulose between ocelli, without sulcus; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina projected as crest; malar space 1.07 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.04 as long as wide; in lateral view, mesosoma middle width 0.19 mm. Pronotum centrally smooth, latero-ventrally markedly strigate behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly punctulate; epomia absent. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe without longitudinal sulcus or carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 0.92 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.29 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron entirely markedly strigate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, moderately impressed, faint from anterior 0.7 to 0.8, markedly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter convex, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.11 as long as anterior portion of propodeum, moderately deep and narrow, very faintly corrugated, almost smooth, medially some carinae stouter; propodeum 1.14 as long as wide medially; anterior margin of propodeum with two faint lateral teeth; anterior portion of propodeum strigulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum entirely markedly strigate, medially without distinctly stout longitudinal carina; anterior transverse carina of propodeum complete, stout, medially markedly arched forwards; posterior transverse carina absent; propodeal spiracle

1.67 as long as wide; pleural carina of propodeum present only posteriorly; lower division of metapleuron strigate, sparsely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.57 as long as vein 2cu-a; vein 4Rs 0.88 as long as vein 4M, uniformly slightly convex; cell 1+2Rs 0.75 as high as pterostigma, rectangular; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.75 as long as vein 2M. Hind wing*:* vein 1Cu 1.48 as long as vein cu-a; vein 2-1A reaching 0.82 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.45 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.55, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 1.00 as long as wide at apex; apex of T2 2.13 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve without teeth; notch present.

Color. Head, mesosoma and metasoma black and pale yellow (230,191,109). Head: pale yellow; mandible teeth, clypeal apex, supra–antennal area, interocellar area, vertex and gena, except complete large orbital band, and occiput, black; scape ventrally yellow, dorsally brown; flagellum ventrally entirely brown, dorsally totally whitish at f6–15, partially at f5 and f14. Mesosoma: propleuron pale yellow; pronotum black except lateral rounded spots at collar and pronotal swelling, pale yellow; mesoscutum black, except pale yellow longitudinal lanceolate mark at posterior 0.9 of central lobe; mesopleuron pale yellow with three black marks: extending anteriorly around hypoepimeron, at mesopleural groove, and over sternaulus; mesothoracic venter between epicnemial carina and posterior transverse carina of mesothoracic venter, pale yellow; remainder of mesosoma black, except the following pale yellow marks: scutellar carina, scutellum, postscutellum, both upper and lower division of metapleuron, and two lateral longitudinal marks at posterior portion of propodeum. Legs: fore and mid legs pale yellow; all femora anteriorly and posteriorly brown striped; all t5 dark brown; mid coxa dorsally with apical small brown spot; hind coxa with two longitudinal black marks, ventral one extending at basal 0.4, dorsal one anchor–shaped, reaching apex of coxa; hind tibia yellow at basal 0.8, apical 0.2 dark brown (128,090,065); hind t1 black at basal 0.2, apically white; t2–4 white. Metasoma:

black and yellow; T1 black, at posterior 0.2 and laterally, yellow (except basally and at spiracle); T2–8 black with posterior 0.4 pale yellow; S1 black; S2–8 pale yellow, laterally black.

Variation. Antenna with 26–27 flagellomeres. Scutoscutellar groove smooth, larger. Black mark over sternaulus medially or anteriorly interrupted. Transverse furrow at base of propodeum medially with some stouter carinae. Anterior transverse carina of propodeum medially straight. Dorsal stripe at fore and mid femora lighter. Dorsal stripe at mid coxa sometimes absent. Dorsal stripe at hind coxa brownish; apically narrower. Basal 0.2 of hind t1 brownish. T1 brownish at anterior 0.1. Differences in tonality include variations from whitish (230,191,109) to pale yellow, and from dark brown (128,090,065) to black.

Comments. Very similar to *T*. **sp**. **nov**. 5, from which it is isolated by having collar dorso-laterally rounded, distinctly swollen (*vs*. carinated, not swollen in *T*. **sp**. **nov**. 5, as in Fig. 46); epomia absent (*vs*. stout); mesopleuron entirely markedly strigate (Fig. 102) (*vs*. markedly strigate only anteriorly around hypoepimeron); sternaulus corrugated (*vs*. smooth); hind tibia with apical 0.3 brownish (*vs*. entirely bright yellow); hind t1 with basal 0.2 brownish (*vs*. entirely whitish).

Male. Similar to female, except as follows. Supraclypeal area laterally with two brown marks. Scuto-scutellar groove very faintly corrugated. Sternaulus yellow, medially with a rounded black spot. Anterior portion of propodeum medially with longitudinal depression between median longitudinal carinae. Dorsal stripe at mid coxa occupying apical 0.7. Dorsal stripe at hind coxa rectangular, not anchor-shaped. Hind femur entirely brown, darker towards apex.

Distribution. Suriname and Brazil. Recorded from six localities (Fig. 213). The type locality is Coaraci, *Bahia* (14°38’29”S 39°33’40”W). These records comprise a range of 14°15’ in latitude.

Biology. Unknown.

Material examined. 7 females and 1 male. Holotype f#, **BRAZIL**: *Bahia*, Coaraci, Fazenda Restauração, Pt. 03, 14°38'29"S 39°33'40"W, 26.XI.2002, Malaise trap, J.Cardoso & J.Maia *leg*. (UFES). Left hind leg beyond femur missing, otherwise in good shape. Paratypes: **SURIMAME**: 1 f# from Wilhelminagbergte, linken Coppename [Left Coppename River], 17.VIII.1943, Geiskes, *Toechorychus*, det. Townes 1965. 1 f#, 09.V.1963, J.V.D.Vecht [illegible] (RMNH). **BRAZIL**: 1 f# from *Amazonas*, Reserva Florestal Adolpho Ducke, 9–6.X.2005, Malaise trap, A.P.Aguiar & *et al*. *leg*. Pt. 20. 1 f# from *Pará,* Melgaço, Floresta Nacional de Caxiuanã, Estação Científica Ferreira Pena, 22–25.XI.2003, Malaise trap, A.P.Aguiar & J.Dias *leg*., P05124 [field point]. 1 f# from *Bahia*, Camamu, Fazenda Nova Sorte, pt. 02, 14°57'59"S 39°09'37"W, 12.XI.2003, Malaise trap, J.Cardoso & J.Maia. *leg*. 1 m# from *Bahia,* Itacaré, Fazenda Muchirão, pt. 03, 14°20'48"S 39°18'38"W, 12.XI.2003, Malaise trap, J.Cardoso & J.Maia. *leg*. 1 f# from *Bahia*, Coaraci, Fazenda Restauração, pt. 03, 14°38'29"S 39°33'40"W, 26.XI.2002, Malaise trap, J.Cardoso & J.Maia. *leg*. (UFES).

***Toechorychus* sp. nov. 10, Tedesco**

(Figs 10, 46, 85, 150, 181)

Description. Holotype FEMALE. Fore wing length 5.87 mm.

Head. Mandible 1.52 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 2.08 as wide as high, subrectangular, finely punctate; apex 1.88 as long as base, truncate; apical margin sharp, medially slightly concave. Supraclypeal area entirely densely punctate, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with three U-shaped, concentric carinae, medially interrupted; radicle foveolate. Antenna with 23 flagellomeres; white band starting at flagellomere 6, reaching flagellomere 17; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially smooth. Paraocular area smooth. Vertex smooth, without sulcus; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally uniformly arched, ventrally markedly projected as crest, reaching hypostomal carina far

from mandible base; hypostomal carina projected as crest; malar space 1.07 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.07 as long as wide; in lateral view, mesosoma middle width 0.18 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron not corrugated; pronotal swelling finely rugulose; collar dorso-laterally carinated, not swollen, anteriorly punctulate; epomia very faint, almost indistinct. Mesoscutum densely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe with faint longitudinal carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 1.23 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.28 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus incomplete, not reaching base of mid coxa, moderately sinuate, posteriorly almost faint, faint from anterior 0.6 to 0.8, not corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter punctate; median portion of posterior transverse carina of mesothoracic venter V-shaped, expanded as two deltaic perpendicular projections. Transverse furrow at base of propodeum laterally 0.49 as long as anterior portion of propodeum, shallow and very wide, markedly corrugated; propodeum 1.23 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum with sparse coarse punctures, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by faint but distinct subcircular carina; posterior portion of propodeum entirely markedly strigate, medially with swollen longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent; propodeal spiracle 1.50 as long as wide; pleural carina of propodeum irregular and faint, obsolescent posteriorly, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigate, densely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs almost straight, apically slightly curved; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs

base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.25 as long as vein 2cu-a; vein 4Rs 0.92 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 1.00 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.46 as long as vein 2M. Hind wing*:* vein 1Cu 4 as long as vein cu-a; vein 2-1A reaching 0.86 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa globose.

Metasoma. T1 0.57 as long as hind femur, with faint basolateral tooth; minutely coriarious; spiracle at anterior 0.52, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 1.00 as long as wide at apex; apex of T2 2.23 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma pale yellow (224,193,112) with black marks. Head: yellow; mouthparts, mandible teeth, interocellar area, vertex and gena, except complete large orbital band and stripe between ocelli and vertex, and occiput, black; scape ventrally yellow, dorsally brown; flagellum brown, except for f6–15, completely white and f16, partially whitish. Mesosoma: mostly light yellow, except for the following black marks: pronotum only centrally, center of posterior margin of pronotum, inner half of lateral lobes of mesoscutum, scutoscutellar groove, base of postscutellum, both axillary trough of mesonotum and metanotum, transverse mark anteriorly around hypoepimeron, carinal triangle, anterior portion of propodeum, apex of juxtacoxal area, and three longitudinal narrow stripes at propodeum, central one along median longitudinal carina, lateral ones along pleural carina. Legs: mostly yellow; all t5 black; fore and mid coxae dorsally with brown mark at apical 0.1; hind coxa with two black marks: dorsally at entire length, and ventrally at basal 0.2; hind second trochanter apically brown; tarsomeres whitish towards apex. Metasoma: black and light yellow; T1 light yellow, medially, at spiracle level, black; T2–8 black with posterior 0.6 bright yellow; S2–8 bright yellow, laterally black.

Variation. Flagellum brown, except for f6–14, completely white, and f5 and f15, partially whitish. Black mark at ocellar triangle sometimes reaching black mark at vertex. Posterior margin of pronotum sometimes black, either connected or not with median brown mark dorsal to collar. Yellow mark at outer half of lateral lobe of mesoscutum often reaching axillary carina. Dark mark anteriorly around hypoepimeron sometimes medially interrupted, or complete. Median

carinae at transverse furrow at base of propodeum sometimes almost reaching anterior transverse carina of propodeum. Basal portion of propodeum sometimes with two central yellowish marks. Anterior half of posterior portion of propodeum sometimes faintly sculptured; posterior half markedly strigate. Median longitudinal stripe at posterior portion of propodeum sometimes medially interrupted, or posteriorly absent. Lateral longitudinal stripes often posteriorly absent. Vein 2-1A short, reaching only about 0.5 of distance to posterior margin. T1 dorsally to spiracle yellowish. Differences in tonality include variations from pale yellow (224,193,112) on most specimens to bright yellow (242,231,125) on one specimen from Aracruz (*Espírito Santo*).

Comments. Very similar to *T*. **sp**. **nov**. 16, from which it differs by having central lobe of mesoscutum with faint longitudinal carina (*vs*. without sulcus or carina in *T*. **sp**. **nov**. 16); posterior portion of propodeum medially with swollen longitudinal carina (*vs*. without distinctly stout longitudinal carina; Fig. 149); yellow mark at lateral lobe of mesoscutum reaching well beyond tegula (*vs*. restricted to 0.2 anterior of lateral lobe; Fig. 88); pleural carina irregular and faint, obsolescent posteriorly, fused with sculpture of propodeum and lower division of metapleuron (*vs*. complete, moderately stout, as in Fig. 41); transverse furrow at base of propodeum laterally wide (*vs*. narrow); T1 light yellow, with black mark restricted to spiracle level (*vs*. T1 almost entirely black, except for anterior and posterior 0.1, bright yellow).

Male. Unknown.

Distribution. Brazil. Recorded from ten localities from *Bahia* to *São Paulo* (Fig. 214). The type locality is Parque Estadual do Rio Doce, *Minas Gerais* (19°32’20”S 42°32’45”W). These records comprise a range of 9°59’ in latitude.

Biology. Unknown.

Material examined. 37 females. Holotype f#, **BRAZIL**: from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha do Vinhático 1, mata secundária alta, 1–17.XII.2002, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. (UFES). Right antenna beyond white band missing, otherwise in good shape. Paratypes: **BRAZIL**: 1 f# from *Bahia*, Uruçuca, Fazenda Guarani, 14°34’30”S 39°20’02”W, 12.XII.2003, Malaise trap, pt. 04, J.Cardoso & J.Maia *leg*. 2 f#f# from *Bahia*, Iguaí, Fazenda Veneza, Malaise trap, pt. 08, 14°41’S 40°03’W, 28.XI.2002, J.Cardoso & J.Maia *et al*. *leg*. 1 f# from *Bahia*, Ilhéus, Fazenda São José, 14°43’29”S 39°11’33”W, 26.XI.2002, Malaise trap, pt. 02, J.Cardoso & J.Maia *leg*. 1 f# from *Bahia,* Una, Fazenda Cachoeira, seringueira nativa, Malaise trap, 10.III–08.XII.2001, J.Cardoso & J.Maia *leg*. 1 f# from *Minas*

Gerais, Ipaba, Fazenda Macedônia, 22–29.2005, Malaise trap, pt. 01, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais,* Parque Estadual do Rio Doce, Área da Tereza, mata primária, 24.X.2002, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais,* Parque Estadual do Rio Doce, 19°42'S 42°33'W, Área da Tereza 1, mata primária, 2–9.X.2003, Malaise trap, J.C.R.Fontanele *et al*. *leg*.; 1 f#, same data, except, 27.X–02.XI.2004. 2 f#f# from *Minas Gerais,* Parque Estadual do Rio Doce, Área da Tereza 2, 19°42'S 42°33'W, mata primária, 24–31.VII.2002, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais,* Parque Estadual do Rio Doce, Área da Tereza 3, mata primária, 26.X–2.XI.2003, Malaise trap, J.C.R.Fontenelle *et al*. *leg*.; 1 f# same data, except 20–27.X.2004; 1 f#, same data, except 14.XI.2002; 1 f#, same data, except 2002. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha do Vinhático 1, mata secundária alta, 24–31.VII.2001, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 3 f#f# from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha do Vinhático 2, mata secundária alta, 24.X.2002, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais,* Parque Estadual do Rio Doce, Trilha do Vinhático 3, mata secundária alta, 22–29.X.2005, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Fazenda Morro do Gavião, mata primária, 15–22.X.2005, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Fazenda Morro do Gavião 3, mata primária, 22–29.X.2006, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, Trilha da Lagoa do Gambá 1, mata secundária baixa, 05–12.XI.2005, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 1 f#, same data, except 28.X–04.XI.2007. 1 f# from *Minas Gerais*, Parque Estadual do Rio Doce, 19°42'S 42°33'W, Campolina 2, mata primária com helicônias, 3–10.VII.2003, Malaise trap, J.C.R.Fontenelle *et al*. *leg*. 2 f#f# from *Minas Gerais,* Parque Estadual do Rio Doce, Fazenda Sacramento, mata secundária, 19°51'30"S 47°27'09"W, 22–29.X.2005, Malaise trap, pt. 2, J.C.R.Fontenelle *et al*. *leg*. 1 f#, same data, except 05–12.XI.2005. 1 f# from *Minas Gerais,* Parque Estadual do Rio Doce, Porco Capim 1, 12–19.XI.2005, Malaise trap, J.C.R.Fontenelle *et al*. *leg*.; 1 f#, same data, except Porco Capim 2, 21–28.VIII.2005. 1 f# from *Espírito Santo*, Aracruz, Fazenda São José, 6–13.X.2007, Malaise trap, pt. 04, F.G.Rampinelli *et al*. *leg*. 1 f# from *Espírito Santo,* Cariacica, Reserva Biológica Duas Bocas, 26.VII.1996, sweeping, C.O.Azevedo *leg*. 1 f# from *São Paulo*, Luiz Antônio, Estação Ecológica Jataí, Mata Ciliar, M1, 26.XI.2008 (UFES). Other specimens: BRAZIL: 1 f# from *Rio de Janeiro*, Represa

Rio Grande, VI.1967, M.Alvarenga *leg*.; 1 f#, same data, except VII.1972; 1 f#, same data, except X.1967 (AEIC).

***Toechorychus* sp. nov. 11, Tedesco**

(Figs 18, 47, 71, 103, 142, 188)

Description. Holotype FEMALE. Fore wing length 6.18 mm.

Head. Mandible 1.55 as long as basal width, densely pilose; ventral margin slightly projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 2.09 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.43 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area medially strigate, laterally finely punctate, densely pilose, medially slightly prominent; between antennal foramens without V-shaped carina; radicle foveolate. Antenna with 21 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 10; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with stout, median, arched, transverse carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate or with scarce punctures, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina stout, dorsally V-shaped, ventrally slightly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina slightly projected as crest; malar space 0.94 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.86 as long as wide; in lateral view, mesosoma middle width 0.16 mm. Pronotum centrally corrugated, latero-ventrally markedly strigate behind collar, margin near mesopleuron entirely corrugated; pronotal swelling finely rugulose; collar dorso-laterally rounded, distinctly swollen, anteriorly rugulose; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with sparse coarse punctures, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 0.96 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.34 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat

elongate; mesopleuron entirely markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina with rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed; faintly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.22 as long as anterior portion of propodeum, moderately deep and narrow, medially wide, uniformly corrugated; propodeum 1.16 as long as wide medially; anterior margin of propodeum with two faint lateral teeth; anterior portion of propodeum finely strigulate or with sparse coarse punctures, medially with two posteriorly convergent faint longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum confused-rugose, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, entirely slightly arched forwards; posterior transverse carina represented by crests, present laterally as carina; propodeal spiracle 1.50 as long as wide; pleural carina of propodeum irregular and faint, obsolescent posteriorly, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigulate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs entirely slightly sinuous; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.69 as long as vein 2cu-a; vein 4Rs 0.85 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.9 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.50 as long as vein 2M. Hind wing*:* vein 1Cu 1.43 as long as vein cu-a; vein 2-1A reaching 0.76 of distance to posterior margin.

Legs. Tibia with dense short bristles; hind coxa globose.

Metasoma. T1 0.59 as long as hind femur, with basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.54, prominent; postpetiole dorso-anteriorly flat; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 0.92 as long as wide at apex; apex of T2 1.93 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma black and yellow (234,216,097). Head: yellow; mandible teeth dorsally, M–shaped mark at ventral half of supraclypeal area, supra–antennal area medially, interocellar area, vertex centrally, and occiput, black; scape ventrally yellow, dorsally dark brown; pedicel and flagellum brown, except for f6–9 dorsally, completely white, and f5 and f10, partially whitish. Mesosoma: black, except for the following bright yellow marks: propleuron, collar laterally, pronotal swelling, longitudinal lanceolate mark at posterior 0.9 of central lobe of mesoscutum, axillary carina, scutellum, postscutellum, both upper and lower division of metapleuron, hind margin of metanotum, two lateral longitudinal marks at propodeum, mesothoracic venter, and two large marks at mesopleuron: anteriorly extending from subalar ridge to entire dorsal margin of sternaulus except around hypoepimeron and just behind epicnemial carina, and at entire length of hypoepimeron, not connected. Legs: mostly orange; all coxae bright yellow with dark brown or black spots; fore coxa anteriorly with apical black spot, posteriorly brownish (114,067,036); mid coxa dorsally with apical dark brown spot; hind coxa with two longitudinal black marks, not basally connected, dorsal one anchor–shaped, reaching apex of coxa, ventral one at basal 0.7; all t5 dark brown. Metasoma: black and yellow; T1 dorsally black, laterally and at posterior 0.2, yellow, with black rounded spot opposite to spiracle; T2–8 black with posterior 0.4 bright yellow; T2 basally with lateral narrow stripe anteriorly to spiracle; S1 black; S2–8 bright yellow, laterally black.

Variation. White band at antenna starting at flagellomere 3. Malar space only ventrally black. Clypeus entirely bright yellow. Orbital band complete, not interrupted at ventral gena. Longitudinal lanceolate mark at central lobe of mesoscutum narrow. Black marks at mesopleuron at hypoepimeron and confused-rugulose area connected. Black mark at confused rugulose area connected with black mark over sternaulus. Longitudinal marks ventrally to sternaulus and laterally to suture of mesothoracic venter large, occupying 0.8 of mesothoracic venter area. Hind coxa ventrally black only at basal 0.8.

Comments. Similar to *T*. **sp**. **nov**. 28, from which it is isolated by having central lobe of mesoscutum without sulcus or carina (*vs*. with longitudinal sulcus in *T*. **sp**. **nov**. 28); mesopleuron with one black mark extending anteriorly around hypoepimeron and at confused-rugulose area just behind dorsal end of epicnemial carina (*vs*. with two black marks not connected, dorsally around hypoepimeron, and ventrally at confused-rugulose area; Fig. 19); sternaulus with wide brown mark (*vs*. brown mark at sternaulus very narrow, centrally

interrupted); pleural carina of propodeum irregular and faint, obsolescent posteriorly, fused with sculpture of propodeum and lower division of metapleuron (*vs*. complete, moderately stout, as in Fig. 41); hind leg, except coxa and t5, yellowish (*vs*. blackish at first trochanter, 0.2 apical of tibia, and 0.5 basal of t1); hind wing vein 1Cu about 1.5 as long as vein cu-a (*vs*. almost 2 as long as vein cu-a); T1 with faint but distinct basolateral tooth (*vs*. without basolateral tooth, as in Fig. 54).

Male. Unknown.

Distribution. Mexico and Colombia. Recorded from four localities (Fig. 215). The type locality is Cali, *Valle del Cauca* (3°25'14"N 76°31'20"W). These records comprise a range of 15°31' in latitude.

Biology. Unknown.

Material examined. 4 females. Holotype f#, **COLOMBIA**: *Valle del Cauca*, Cali, X.1971, W.Eberhard *leg*., *Toechorychus,* Townes det. (AEIC). Complete, in good shape. Paratypes: **MEXICO**: 1 f# from *Chiapas*, San Cristóbal de las Casas, 7087', 12.VI.1969, B.V.Peterson (CNCI). 1 f# from *Morelos*, Cuernavaca, June H.H.S., Godman-Salvin *leg*. 1904.–1. (BMNH). **COLOMBIA**: 1 f# from *Valle del Cauca*, Peñas Brancas, 1750 m, 10 Km W Cali, very wet premontane forest, 31.I.1975, Malaise trap, R.C.Wilkerson *leg*. (FSCA).

***Toechorychus* sp**. **nov**. **12, Tedesco**

(Figs 36, 42, 91, 117, 131, 180)

Description. Holotype FEMALE. Fore wing length 5.78 mm.

Head. Mandible 1.38 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.70 as wide as high, subtriangular, minutely strigulate, apically smooth; apex 1.45 as long as base, truncate; apical margin sharp, medially slightly convex. Supraclypeal area entirely strigate, with scarce punctures, densely pilose, medially slightly prominent; between antennal foramens with V-shaped carina; radicle foveolate. Antenna with 25 flagellomeres; white band starting at flagellomere 4, reaching flagellomere 12; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area smooth.

Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally uniformly arched, ventrally slightly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 0.79 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.08 as long as wide; in lateral view, mesosoma middle width 0.17 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly punctulate; epomia absent. Mesoscutum densely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly parallel throughout. Scutoscutellar groove smooth, polished; scutellum 1.04 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.6; postscutellum 0.27 as long as wide; hind margin of metanotum with two short lateral carinae extending towards transverse furrow at base of propodeum. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina faint, dorsally straight; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, posteriorly almost faint, faint from anterior 0.6 to 0.8, not corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.05 as long as anterior portion of propodeum, shallow and narrow, very faintly corrugated, almost smooth, medially some carinae stouter; propodeum 1.21 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum finely strigulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum punctate and strigate, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent, only with lateral slight swellings; propodeal spiracle 1.33 as long as wide; pleural carina of propodeum absent; lower division of metapleuron strigulate, densely pilose, juxtacoxal carina absent.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs uniformly curved; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.63 as long as vein 2cu-a; vein 4Rs 0.91 as long as vein 4M, straight; cell 1+2Rs 0.81 as high as pterostigma, rectangular; vein 2M distinctly longer than vein 3M; vein 3M distinct, 1.00 as long as vein 2M. Hind wing*:* vein 1Cu 1.30 as long as vein cu-a; vein 2-1A reaching 0.80 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa globose.

Metasoma. T1 0.53 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.54, slightly prominent; postpetiole dorsally, at level of spiracles, faintly but distinctly concave; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 1.14 as long as wide at apex; apex of T2 2.06 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch absent.

Color. Head and metasoma mostly black and white, mesosoma mostly orange (154,060,018). Head: pale yellow (226,200,132); mandible teeth, supra–antennal area medially, interocellar area, vertex and gena, except complete large orbital band, and occiput, black; scape ventrally yellow, dorsally brown; flagellum ventrally entirely brown or orange, dorsally entirely whitish at f5–10, partially at f4 and f11. Mesosoma: propleuron pale yellow; pronotum black except entire collar and pronotal swelling, pale yellow; mesoscutum black, except longitudinal lanceolate mark at entire length of central lobe; mesopleuron ventrally orange, dorsally pale yellow, except medially, around hypoepimeron, dark brown (062,029,012); remaining of mesosoma orange, except for the following pale yellow marks: axillary carina, scutellum, postscutellum, tegula basally, upper division of metapleuron centrally. Legs: orange (178,064,013), yellowish towards apex; all t5 dark brown.. Metasoma: T1–2 orange, brownish towards apex, with posterior 0.2 white; T3–8 anteriorly dark brown, laterally and at posterior 0.3, white; S1 orange; S2–5 white with lateral brown spot; bright yellow, laterally black; S6–8 white.

Variation. Flagellomeres dorsally entirely whitish at f5–11, partially at f4 and f12. T1 medially and t2 basally, black. Scutoscutellar groove faintly corrugated. Postscutellum sometimes orange. Dark brown mark around hypoepimeron ventrally lighter, or faded. Black portions of mesoscutum, pronotum and mesopleuron dark brown in one specimen. T2 in one specimen basally orange (same tone of body, except blackish over thyridium). Differences in tonality

include variations from whitish (246,238,222) to bright yellow (240,214,097), including pale yellow (226,200,132).

Comments. Very similar to *T*. **sp**. **nov**. 8, from which it can be readily differentiated by having pronotum, mesoscutum and mesopleuron marked with black areas (*vs*. completely orange in *T*. **sp**. **nov**. 8; Fig. 37); collar dorso-laterally rounded, distinctly swollen, as in Fig. 47 (*vs*. carinated, not swollen, as in Fig. 46); pleural carina of propodeum absent (*vs*. present only posteriorly). Color pattern very similar to *T*. **sp**. **nov**. 6, from which it can be distinguished by having supraclypeal area entirely pale yellow (*vs*. dorsal half of supraclypeal area with median longitudinal stripe; Fig. 74); collar laterally pale yellow (*vs*. dark brown; Fig. 38); gena and malar space pale yellow (*vs*. gena ventrally and malar space, black; Fig. 74); mesopleuron with black mark anteriorly around hypoepimeron (*vs*. orange, except for subalar ridge and epicnecium, pale yellow; Fig. 38); posterior transverse carina of propodeum absent (*vs*. complete, laterally with crest); pleural carina of propodeum absent (*vs*. present only posteriorly).

Male. Unknown.

Distribution. Suriname, Brazil, and Peru. Recorded from five localities from Suriname to Peru (Fig. 216). The type locality is the Floresta Nacional de Caxiuanã, *Pará* (2°4’54”S 51°51’5”W). These records comprise a range of 26°09’ in latitude.

Biology. Unknown.

Material examined. 8 females. Holotype f#, **BRAZIL**: *Pará*, Melgaço, Floresta Nacional de Caxiuanã, Estação Científica Ferreira Pena, 22–25.XI.2003, Malaise trap M5, A.P.Aguiar & J.Dias *leg*. P05144 [field point] (UFES). Right hind leg beyond femur missing; otherwise in good shape. Paratypes: **BRAZIL**: 1 f# from *Amazonas*, Manaus, INPA, Reserva Florestal Adolpho Ducke, 08–14.X.2005, Malaise trap, pt. 10, A.P.Aguiar *et al*. *leg*. 1 f# from *Pará*, Melgaço, Floresta Nacional de Caxiuanã, Trilha Igarapé Tijucaquara, 18–24.XI.2003, Malaise trap M11, A.P.Aguiar & J.Dias *leg*., P05128 [field point]. 1 f# from *Espírito Santo,* Cariacica, Reserva Biológica de Duas Bocas, 27.V.1997, sweeping, C.O.Azevedo *leg*. (UFES). Other specimens: **SURINAME**: 1 f# from 45 km S Paramaribo, 29.IX.1963, D.C.Geijskes *leg*.; 1 f#, same data, except 29.IX–03.X.1963; 1 f#, same data, except 26.X–01.XI.1963 (AEIC). **PERU**: 1 f# from *Avispa*, nr. Marcapata, 01–15.X.1962, 30 m, L.Peña *leg*. (AEIC).

***Toechorychus* sp. nov. 13, Tedesco**

(Figs 8, 48, 65, 152, 187)

Description. Holotype MALE. Fore wing length 5.62 mm.

Head. Mandible 1.46 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.79 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.33 as long as base, slightly but distinctly convex; apical margin blunt, medially straight. Supraclypeal area entirely strigulate, also densely punctate, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Antenna with 28 flagellomeres; white band starting at flagellomere 8, reaching flagellomere 14; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area finely strigulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally faint, V-shaped, ventrally slightly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina slightly projected as crest; malar space 1.11 as long as basal width of mandible.

Mesosoma. . Mesosoma in dorsal view 1.89 as long as wide; in lateral view, mesosoma middle width 0.18 mm. Pronotum centrally smooth, latero-ventrally markedly rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling finely rugulose; collar dorso-laterally rounded, distinctly swollen, anteriorly smooth; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, densely punctulate, covered with sparse coarse punctures, impression of notaulus corrugated, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly convergent. Scutoscutellar groove markedly corrugated; scutellum 0.93 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.6; postscutellum 0.39 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally straight; dorsal end of epicnemial carina not

reaching ventral margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed; not corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter V-shaped, expanded as two deltaic perpendicular projections. Transverse furrow at base of propodeum laterally 0.12 as long as anterior portion of propodeum, moderately deep and narrow, medially wide, very faintly corrugated, almost smooth, medially some carinae stouter; propodeum 1.09 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum punctulate or with sparse coarse punctures, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum punctate and strigate, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially slightly arched forwards; posterior transverse carina incomplete, medially interrupted, laterally with low swelling; propodeal spiracle 1.67 as long as wide; pleural carina of propodeum present only posteriorly; lower division of metapleuron strigate, sparsely pilose, juxtacoxal carina reaching base of hind coxa.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.65 as long as vein 2cu-a; vein 4Rs 0.90 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.82 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct. Hind wing*:* vein 1Cu 5 as long as vein cu-a; vein 2-1A reaching 0.78 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.51 as long as hind femur, without basolateral tooth; minutely coriarious; spiracle at anterior 0.55, slightly prominent; postpetiole dorso-anteriorly flat; T2–8 minutely coriarious; sparsely pilose; T2 1.04 as long as wide at apex; apex of T2 1.92 as wide as base.

Color. Head, mesosoma and metasoma black with bright yellow (244,235,142) marks. Head: yellow; mandible teeth, anterior tentorial pits, small spot at clypeal base, supra–antennal area medially, interocellar area, vertex centrally, and occiput, black; scape ventrally yellow; scape dorsally, pedicel and flagellum, brown; flagellum completely whitish at f8–12, partially at f7 and f13–14. Mesosoma: black except for the following yellow marks: collar laterally, pronotal

swelling, longitudinal rounded mark at posterior 0.3 of central lobe of mesoscutum, axillary carina, scutellum, tegula basally, large mark extending from subalar ridge along epicnecium and mesopleuron to mesothoracic venter, except around hypoepimeron, mesothoracic venter, upper division of metapleuron, dorsal half of lower division of metapleuron, and two lateral longitudinal marks at posterior portion of propodeum; ventral half of lower division of metapleuron pale orange. Legs: mostly orange (215,100,028); fore and mid coxae yellow with dorsal spot at apical 0.3; hind coxa orange with dorsal yellow mark at basal 0.5; apical 0.2 of hind tibia, and all t5, dark brown; tarsi whitish towards apex. Metasoma: black with the following yellow marks: T1 laterally and at posterior 0.1, posterior 0.2 of T2–8, S1, S2–8 centrally.

Comments. Very similar to *T*. **sp**. **nov**. 29, from which it can be readily differentiated by having epomia very stout, restricted to space between posterior margin of collar and pronotal swelling (*vs*. absent); hind coxa dorsally with basal yellow spot (*vs*. entirely orange; Fig. 172); hind tibia dorsally brownish at 0.1 apical (*vs*. uniformly orange); metasoma striped (*vs*. entirely orange; Fig. 172).

Female. Unknown.

Distribution. Known only from southeastern Brazil (Fig. 217).

Biology. Unknown.

Material examined. Holotype m#, **BRAZIL**, *Rio de Janeiro* (22°57'S 43°14'W), Represa Rio Grande, IX.1969, M.Alvarenga *leg*., *Toechorychus,* Townes det. (AEIC). Mesoscutum somewhat damaged by pin; otherwise in good shape.

***Toechorychus* sp**. **nov**. **14, Tedesco**

(Figs 6, 67, 118, 140, 191)

Description. Holotype. m#. Fore wing length 6.40 mm.

Head. Mandible 1.47 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.57 as wide as high, subrectangular, finely punctate; apex 1.60 as long as base, truncate; apical margin sharp, medially slightly concave. Supraclypeal area entirely strigate, with scarce punctures, densely pilose, medially with longitudinal subrectangular prominent area; between antennal foramens without V-shaped carina; radicle foveolate. White band starting at flagellomere 8, reaching flagellomere 19;

flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with stout, median, longitudinal carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially punctulate, or rugulose. Paraocular area finely punctulate. Vertex rugulose around ocelli or with very coarse punctures around ocelli, without sulcus; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina stout, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 1.03 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.05 as long as wide; in lateral view, mesosoma middle width 0.20 mm. Pronotum centrally smooth, latero-ventrally markedly strigate behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling striate; collar dorso-laterally rounded, distinctly swollen, anteriorly punctate; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with faint longitudinal carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove smooth, polished; scutellum 1.04 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.6; postscutellum 0.35 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat rounded; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina faint, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, moderately impressed; faintly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.16 as long as anterior portion of propodeum deep and narrow, very faintly corrugated, almost smooth, medially some carinae stouter; propodeum 1.11 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum finely strigulate or with sparse coarse punctures, medially with two parallel longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum entirely markedly strigate, medially with swollen longitudinal carina; anterior transverse carina of propodeum complete, stout, straight; posterior

transverse carina absent; propodeal spiracle 2.00 as long as wide; pleural carina of propodeum irregular, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigulate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs almost straight, apically slightly curved; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.74 as long as vein 2cu-a; vein 4Rs 0.93 as long as vein 4M, uniformly slightly convex; cell 1+2Rs 0.81 as high as pterostigma, rectangular; vein 2M distinctly longer than vein 3M; vein 3M indistinct. Hind wing*:* vein 1Cu 1.18 as long as vein cu-a; vein 2-1A reaching 0.77 of distance to posterior margin.

Legs. Tibia with dense short bristles; hind coxa globose.

Metasoma. T1 0.51 as long as hind femur, with basolateral tooth; minutely coriarious; spiracle at anterior 0.53, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 1.29 as long as wide at apex; apex of T2 2.00 as wide as base.

Color. Head, mesosoma and metasoma black and bright yellow (243,233,146). Head: yellow; mandible apex, clypeal apex centrally, two longitudinal marks extending from anterior tentorial pit to supraclypeal area around medial rectangular swelling, supra–antennal area, interocellar area, vertex and gena, except complete large orbital band, and occiput dorsally, black; scape ventrally yellow, dorsally brown; pedicel and flagellum, brown; flagellum completely whitish at f11–16, partially at f8–10 and f17–19. Mesosoma: mostly bright yellow; pronotum black except collar laterally and pronotal swelling, bright yellow; mesoscutum black, except longitudinal lanceolate mark at posterior 0.9 of central lobe; mesopleuron with three black marks: anteriorly around hypoepimeron, rounded spot just behind epicnemial carina, and at mesopleural groove; remainder of mesosoma bright yellow, except for the following black areas: both axillary trough of mesonotum and metanotum, carinal triangle, anterior portion of propodeum, and three lateral longitudinal marks at propodeum: medially and along pleural carinae. Legs: bright yellow; all t5 dark brown; all femora and hind trochanters, anteriorly and posteriorly, hind tibia, and basal 0.1 of hind t1, brown (124,078,049); fore and mid t1–4 pale brown; mid coxa dorsally with apical lanceolate brown mark; hind coxa with two black marks: posteriorly, reaching basal 0.6, and dorsally, slightly anchor–shaped, reaching apex. Metasoma: black and yellow; T1 laterally bright

yellow, dorsally black with posterior 0.2 bright yellow; T2 with lateral and posterior 0.3 bright yellow; T3–8 black with posterior 0.4 bright yellow; S1 bright yellow; S2–8 brownish.

Comments. Color pattern similar to *T*. **sp**. **nov**. 9 from which it can be readily separated by having anterior transverse carina of propodeum straight (*vs*. medially markedly arched forwards in *T*. **sp**. **nov**. 9, Fig. 155); hind femur entirely brown (*vs*. yellowish with 0.2 apical black); T1 with basolateral tooth, as in Fig. 53 (*vs*. without basolateral tooth, as in Fig. 54).

Female. Unknown.

Distribution. Known only from Guyana (Fig. 218).

Biology. Unknown.

Material examined. Holotype m#, **GUYANA**: *Bartica*, Kartabo, 5.XI.1920, Tropical Research Station, New York Zoological Society, no. 20972 (AMNH). Antennae tip missing, mesoscutum somewhat damaged by pin; otherwise in good shape.

***Toechorychus* sp**. **nov**. **15, Tedesco**

(Figs 14, 70, 95, 119, 136, 195)

Description. Holotype FEMALE. Fore wing length 6.25 mm.

Head. Mandible 1.62 as long as basal width, densely pilose; ventral margin regularly shaped, not projected; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.81 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.62 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area medially strigate, laterally finely punctate, densely pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with U-shaped carina; radicle foveolate. Antenna with 26 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 10; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with stout, median, arched, transverse carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially rugose. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally uniformly arched, ventrally markedly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 1.00 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.00 as long as wide; in lateral view, mesosoma middle width 0.19 mm. Pronotum centrally smooth, latero-ventrally rugulose behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling finely rugulose; collar dorso-laterally carinated, not swollen, anteriorly punctate; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove faintly corrugated; scutellum 1.04 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.46 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat rounded; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed, faint from anterior 0.6 to 0.8, faintly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.16 as long as anterior portion of propodeum, moderately deep and narrow, uniformly corrugated; propodeum 1.14 as long as wide medially; anterior margin of propodeum with two lateral teeth; anterior portion of propodeum finely strigulate or punctulate or with sparse coarse punctures, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum entirely markedly strigate, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent; propodeal spiracle 2.00 as long as wide; pleural carina of propodeum irregular, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigulate, densely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs entirely irregular; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.57 as long as vein 2cu-a; vein 4Rs 0.94 as long as vein

4M, straight; cell 1+2Rs 0.83 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 1.00 as long as vein 2M. Hind wing*:* vein 1Cu 1.64 as long as vein cu-a; vein 2-1A reaching 0.89 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.52 as long as hind femur, with basolateral tooth; minutely coriarious; spiracle at anterior 0.51, prominent; postpetiole dorso-laterally, behind spiracles, markedly concave, deeply depressed; T2–8 minutely coriarious; almost glabrous; T2 1.16 as long as wide at apex; apex of T2 1.74 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve without teeth; notch present.

Color. Head, mesosoma and metasoma brown and pale yellow (216,155,084). Head: pale yellow; malar space ventrally, mandible apex, clypeal apex, supraclypeal area ventrally, supra–antennal area medially, interocellar area, vertex and gena, except complete large orbital band, and occiput, pale brown (184,125,077); scape ventrally yellow, dorsally brown; pedicel and flagellum ventrally, brown; flagellum dorsally whitish at f6–8, partially at f5 and f9. Mesosoma: propleuron pale yellow, dorsally black; pronotum pale brown except lateral rounded spot at collar and pronotal swelling, pale yellow; mesoscutum pale brown, except longitudinal lanceolate mark at posterior 0.8 of central lobe; mesopleuron pale yellow with four pale brown marks: anteriorly around hypoepimeron, at mesopleural groove, rounded spot just behind epicnemial carina, and over posterior 0.6 of sternaulus; remainder of mesosoma pale yellow, except for the following brown (111,070,048) marks: both axillary trough of mesonotum and metanotum, carinal triangle, anterior portion of propodeum, and three lateral longitudinal marks at propodeum: medially, and along pleural carinae. Legs: yellow; all t5 dark brown; mid coxa dorsally with small apical brown spot; hind coxa with two basally not connected brown marks: dorsally anchor–shaped stripe reaching apex, and ventrally rounded large mark reaching basal 0.6. Metasoma: brown and pale yellow; T1 brown, both anterior and posterior 0.1 pale yellow; T2–8 brown with posterior 0.4 pale yellow; S1 brown; S2–8 pale yellow, laterally black.

Variation. Median longitudinal brown stripe at posterior portion of propodeum large. Hind femur anteriorly and posteriorly brownish. T1 laterally pale yellow at anterior 0.4. Differences in tonality include variations from light brown (111,070,048) to black, and from whitish (230,206,126) to pale yellow (216,155,084).

Comments. Similar to *T*. **sp**. **nov**. 19, from which it is isolated by having transverse furrow at base of propodeum uniformly corrugated (*vs*. very faintly corrugated, almost smooth in *T*. **sp**. **nov**. 19; Fig. 132); anterior margin of propodeum with two lateral teeth, as in Fig. 51 (*vs*. without, as in Fig. 48); lateral longitudinal carina of propodeum represented by short curved carina (*vs*. indistinct); anterior transverse carina of propodeum straight (*vs*. medially slightly arched forwards); pleural carina of propodeum irregular but complete, fused with sculpture of propodeum and lower division of metapleuron (*vs*. present only posteriorly); T1 with basolateral tooth, as in Fig. 53 (*vs*. without, as in Fig 54).

Male. Unknown.

Distribution. Known only from Brazil (Fig. 219).

Biology. Unknown.

Material examined. 5 females. Holotype f#, **BRAZIL**: *Espírito Santo*, Domingos Martins, Mata Pico do Eldorado, 20°22'17"S 40°39'29"W, 03–10.XII.2004, Malaise trap T5, M.T.Tavares *et al*. *leg*. (UFES). Right antenna missing; otherwise in good shape. Paratypes: **BRAZIL**: 1 f# from *Espírito Santo*, Domingos Martins, Mata Pico do Eldorado, 20°22'17"S 40°39'29"W, 03–10.XII.2004, Malaise trap T3, M.T.Tavares *et al*. *leg*.; 1 f#, same data, except Malaise trap T4; 1 f#, same data, except Malaise trap B1; 1 f#, same data, except Malaise trap T8 (UFES).

***Toechorychus* sp**. **nov**. **16, Tedesco**

(Figs 5, 63, 88, 149, 192)

Description. Holotype FEMALE. Fore wing length 3.93 mm.

Head. Mandible 1.54 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.44 as wide as high, subtriangular, finely punctate; apex 1.67 as long as base, truncate; apical margin sharp, medially slightly concave. Supraclypeal area medially strigate, laterally finely punctate, densely pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with U-shaped carina; radicle foveolate. Antenna with 22 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 18; flagellum slender. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal

half medially rugulose. Paraocular area smooth. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally uniformly arched, ventrally markedly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 1.07 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.08 as long as wide; in lateral view, mesosoma middle width 0.16 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron not corrugated; pronotal swelling strigulate; collar dorso-laterally carinated, not swollen, anteriorly smooth; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, densely punctulate, covered with sparse coarse punctures, impression of notaulus corrugated, central lobe without longitudinal sulcus or carina; notaulus moderately impressed, posteriorly parallel throughout. Scutoscutellar groove smooth, polished; scutellum 0.96 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.44 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.1 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, deeply impressed, faint from anterior 0.7 to 0.8, faintly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter convex, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.21 as long as anterior portion of propodeum, shallow and narrow, medially wide, uniformly corrugated; propodeum 1.27 as long as wide medially; anterior margin of propodeum with two faint lateral teeth; anterior portion of propodeum strigulate or with sparse coarse punctures, medially with two parallel longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum strigate, progressively coarse toward posterior margin, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially markedly arched forwards; posterior transverse carina absent, only with lateral slight swellings; propodeal spiracle 1.33 as long as wide; pleural carina

of propodeum complete, moderately stout; lower division of metapleuron strigulate, densely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.44 as long as vein 2cu-a; vein 4Rs 0.94 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.73 as high as pterostigma, rectangular; vein 2M approximately as long as vein 3M; vein 3M distinct, 1.00 as long as vein 2M. Hind wing*:* vein 1Cu 1.41 as long as vein cu-a; vein 2-1A reaching 0.75 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa globose.

Metasoma. T1 0.65 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.51, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 1.12 as long as wide at apex; apex of T2 2.28 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve without teeth; notch absent.

Color. Head, mesosoma and metasoma black, dark brown and bright yellow. Head: bright yellow (235,197,081); interocellar area, vertex and gena, except complete large orbital band, and occiput, dark brown (105,042,016); scape and pedicel, bright yellow. Mesosoma: propleuron bright yellow; pronotum bright yellow, with transverse central dark brown stripe; mesoscutum black, except almost entire central lobe and anterolateral rounded spot at lateral lobe, bright yellow; mesopleuron bright yellow with dark brown mark anteriorly around hypoepimeron; remainder of mesosoma bright yellow, except for the following black marks: both axillary trough of mesonotum and metanotum, carinal triangle, anterior portion of propodeum, and three lateral longitudinal marks at propodeum: medially and along pleural carinae. Legs: yellow; all t5 dark brown; mid coxa dorsally with small apical brown spot; hind coxa dorsally with anchor-shaped mark at entire length. Metasoma: brown and bright yellow; T1 and S1 brown, anterior and posterior 0.1 bright yellow; T2–8 brown with posterior 0.4 yellow; S2–8 bright yellow.

Comments. Very similar to *T*. **sp**. **nov**. 10, from which it differs by having central lobe of mesoscutum without sulcus or carina (*vs*. with faint longitudinal carina in *T*. **sp**. **nov**. 10); posterior portion of propodeum without distinctly stout longitudinal carina (*vs*. medially with swollen longitudinal carina; Fig. 150); yellow mark at lateral lobe of restricted to 0.2 anterior (*vs*. mesoscutum reaching well beyond tegula; Fig. 85); pleural carina complete, moderately stout, as

in Fig. 41 (*vs*. irregular and faint, obsolescent posteriorly, fused with sculpture of propodeum and lower division of metapleuron); transverse furrow at base of propodeum laterally narrow (*vs*. wide; Fig. 150); T1 almost entirely black, except for anterior and posterior 0.1, bright yellow (*vs*. T1 light yellow, with black mark restricted to spiracle level; Fig. 181).

Male. Unknown.

Distribution. Mexico. The type locality "Tumazula" refers to Tumazula, *Durango*, in Mexico (24°56'N 104°54'W) (Fig. 220).

Biology. Unknown.

Material examined. Holotype f#, Tumazula, 13–16.VIII.1913 (AMNH). Antennae beyond scape, right fore and hind legs beyond coxa, left mid leg, and right hind leg beyond tibia, missing; left wings ripped; axillary trough of mesonotum somewhat damaged by pin.

***Toechorychus* sp. nov. 17, Tedesco**

(Figs 39, 45, 56, 120, 129, 177)

Description. Holotype FEMALE. Fore wing length 7.10 mm.

Head. Mandible 1.53 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.60 as wide as high, subtriangular, finely punctate; apex 2.03 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely strigate, with scarce punctures, densely pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with V-shaped carina; radicle punctate. Antenna with 23 flagellomeres; white band starting at flagellomere 8, reaching flagellomere 9; flagellum slender; subapical flagellomeres as wide as basal flagellomeres, not flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially scarcely punctulate, or strigulate. Paraocular area finely punctulate. Vertex punctate around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina projected as crest; malar space 1.13 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.09 as long as wide; in lateral view, mesosoma middle width 0.20 mm. Pronotum centrally smooth, latero-ventrally rugulose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling finely rugulose; collar dorso-laterally rounded, distinctly swollen, anteriorly punctulate; epomia absent. Mesoscutum sparsely pilose, densely punctulate, covered with sparse coarse punctures, impression of notaulus corrugated, central lobe without longitudinal sulcus or carina; notaulus moderately impressed, posteriorly convergent. Scutoscutellar groove smooth, polished; scutellum 1.16 as long as wide, densely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.36 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat elongate; mesopleuron dorsally strigate, include over hypoepimeron, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving forwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, moderately impressed; markedly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter convex, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.28 as long as anterior portion of propodeum deep and wide, very markedly corrugated; propodeum 1.23 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum strigate, medially with two posteriorly convergent longitudinal carinae; lateral longitudinal carina of propodeum represented by faint but distinct subcircular carina; posterior portion of propodeum confused-rugose, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially markedly arched forwards; posterior transverse carina represented by pair of high spine-like apophysis, posteriorly curved; apophysis 1.28 as high as wide; propodeal spiracle 1.36 as long as wide; pleural carina of propodeum irregular, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigate, densely pilose, juxtacoxal carina long and stout.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus present, almost indistinct; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.77 as long as vein 2cu-a; vein 4Rs 0.87 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.73 as high as pterostigma,

pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.67 as long as vein 2M. Hind wing*:* vein 1Cu 1.00 as long as vein cu-a; vein 2-1A reaching 0.90 of distance to posterior margin.

Legs. Tibia with dense short bristles; hind coxa globose.

Metasoma. T1 0.5 as long as hind femur, with faint basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.57, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 1.17 as long as wide at apex; apex of T2 1.82 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch absent.

Color. Head and mesosoma orange (216,091,024), metasoma pale yellow and dark brown (073,052,039). Head: orange; mandible teeth dark brown; clypeus and faint orbital band, yellowish; f8 and f9 ventrally partially white. Mesosoma: orange. Legs: mostly orange; all t5 black; hind femur, hind tibia, and basal 0.9 of t1, dark brown; apical 0.1 of t1 and t2–4, white. Metasoma: orange, brown and pale yellow; T1 brown, anterior and posterior 0.1 pale yellow; T2–8 brown with posterior 0.4 pale yellow; S1 brown; S2–8 pale yellow, laterally black.

Comments. Readily differentiated from other species of the genus by the mostly orange head and mesosoma, except for clypeus and faint orbital band, yellowish (Fig. 39). The color pattern of mesoscutum, without yellow marks, resembles *T*. **sp**. **nov**. 8, and *T*. **sp**. **nov**. 26, from which it is differentiated by having supra-antennal area completely orange (*vs*. medially black in *T*. **sp**. **nov**. 8 and *T*. **sp**. **nov**. 25); collar dorso-laterally rounded, distinctly swollen, as in Fig. 47 (*vs*. carinated, not swollen, as in Fig. 46); juxtacoxal carina long (*vs*. short).

Male. Unknown.

Distribution. Known only from Peru (Fig. 221).

Biology. Unknown.

Material examined. Holotype f#, **PERU**: Callanga (12°34’S 76°19’W) (Staudinger) (ZMHU). Right antenna, and right mid and hind legs beyond tibia, missing; otherwise in good shape.

***Toechorychus* sp. nov. 18, Tedesco**

(Figs 35, 147, 184)

Description. Holotype FEMALE. Fore wing length 5.31 mm.

Head. Mandible 1.28 as long as basal width, densely pilose; ventral margin slightly projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 2.00 as wide as high, rectangular, minutely strigulate, apically smooth; apex 1.47 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely strigulate, also densely punctate, moderately pilose, medially slightly prominent; between antennal foramens without V-shaped carina; radicle foveolate. Antenna with 24 flagellomeres; white band starting at flagellomere 8, reaching flagellomere 15; flagellum slender; subapical flagellomeres as wide as basal flagellomeres, not flattened. Supra-antennal area with stout, median, arched, transverse carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally absent, ventrally markedly projected as crest; hypostomal carina projected as crest; malar space 0.97 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.02 as long as wide; in lateral view, mesosoma middle width 0.15 mm. Pronotum centrally corrugated, latero-ventrally markedly rugose behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling smooth; collar dorso-laterally rounded, distinctly swollen, anteriorly smooth; epomia very faint, almost indistinct. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly convergent. Scutoscutellar groove markedly corrugated; scutellum 0.72 as long as wide; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.29 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat rounded; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina faint, dorsally curving forwards; dorsal end of epicnemial carina reaching 0.10 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, moderately impressed; faintly corrugated; scrobe deeply impressed,

forming pit. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter convex, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.20 as long as anterior portion of propodeum, moderately deep and narrow, medially wide, uniformly corrugated; propodeum 1.15 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum punctulate or with sparse coarse punctures, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum markedly strigate, striation medially arched backwards, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent, only with lateral slight swellings; propodeal spiracle 1.20 as long as wide; pleural carina of propodeum irregular and faint, obsolescent posteriorly, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigulate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs entirely slightly sinuous; vein 1cu-a straight, arising near vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.48 as long as vein 2cu-a; vein 4Rs 0.94 as long as vein 4M, straight; cell 1+2Rs 0.60 as high as pterostigma, almost indistinct; vein 2M indistinct; vein 3M distinct. Hind wing*:* vein 1Cu 1.70 as long as vein cu-a; vein 2-1A reaching 0.75 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa elongate.

Metasoma. T1 0.50 as long as hind femur, without basolateral tooth; minutely coriarious; spiracle at anterior 0.53, prominent; postpetiole dorsally, behind spiracles, markedly concave, deeply depressed; T2–8 minutely coriarious; almost glabrous; T2 1.43 as long as wide at apex; apex of T2 1.63 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma black and yellow (237,221,110). Head: yellow; mandible teeth, clypeal apex medially, M–shaped mark at ventral half of supraclypeal area, supra–antennal area medially, interocellar area, vertex centrally, and occiput, black; scape, pedicel, and flagellum, brown; f9–14 completely, and f8, f15–16 dorsally, white. Mesosoma: black, except for the following bright yellow marks: propleuron, collar laterally, pronotal swelling, rounded mark at posterior 0.3 of central lobe of mesoscutum, axillary carina, scutellum, postscutellum laterally, upper division of metapleuron, dorsal 0.9 of lower division of

metapleuron, hind margin of metanotum, large mark extending from subalar ridge to posterior 0.6 of dorsal margin of sternaulus except around hypoepimeron and just behind epicnemial carina, hypoepimeron, mesothoracic venter, and two lateral longitudinal marks at posterior portion of propodeum. Legs: orange, yellowish posteriorly; fore, mid, and hind coxae dorsally with brown mark at apical 0.1, 0.3 and 0.7, respectively; hind coxa ventrally and dorsally, fore and mid first trochanters basally, both hind first and second trochanters, mid femur posteriorly and ventrally at apical 0.6, hind femur anteriorly and posteriorly, hind tibia except dorsally at basal 0.2, t1 at basal 0.1, and all t5, brown; hind first trochanter, and femur at basal 0.1, dark orange. Metasoma: black and yellow; T1–7 black with posterior 0.2 bright yellow; T8, S1, and S8 brown; S2–4 bright yellow, laterally brown; S5–6 brown, posteriorly bright yellow.

Comments. Similar to *T*. **sp**. **nov**. 9, from which it is isolated by having supraclypeal area with M-shaped black mark (*vs*. completely yellow in *T*. **sp**. **nov**. 9; Fig. 57); mesothoracic venter posteriorly black (*vs*. ventrally entirely yellow); anterior margin of propodeum without lateral teeth (*vs*. with two faint but distinct lateral teeth, as in Fig.51); anterior carina of propodeum medially straight (*vs*. markedly arched forwards; Fig. 155); fore wing vein 1M+Rs arising near vein 1M+Rs base (*vs*. far from vein 1M+Rs base); angle between 1M+Rs and M+Cu about 90º (*vs*. distinctly obtuse; Fig. 116); cell 1+2Rs almost indistinct (*vs*. present and rectangular; Fig. 116); hind tibia brown except dorsally at basal 0.2, yellow (*vs*. black, except at apical 0.2, yellow).

Male. Unknown.

Distribution. Known only from Brazil (Fig. 222).

Biology. Unknown.

Material examined. Holotype f#, **BRAZIL**: *Mato Grosso*, Sinop, 12°31'S 55°37'W, X.1975, M.Alvarenga *leg*. (AEIC). Complete, in good shape.

***Toechorychus* sp**. **nov**. **19, Tedesco**

(Figs 15, 101, 132, 194)

Description. Holotype FEMALE. Fore wing length 5.75 mm.

Head. Mandible 1.39 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.61 as wide as high,

subrectangular, minutely strigulate, apically smooth; apex 1.50 as long as base, slightly but distinctly convex; apical margin sharp, medially slightly convex. Supraclypeal area entirely strigulate, also densely punctate, moderately pilose, medially slightly prominent; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Antenna with 24 flagellomeres; white band starting at flagellomere 6, reaching flagellomere 12; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially scarcely punctulate. Paraocular area smooth. Vertex with very coarse punctures around ocelli, without sulcus; gena and vertex behind ocelli punctulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally V-shaped, ventrally markedly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 0.97 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.14 as long as wide; in lateral view, mesosoma middle width 0.17 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling finely rugulose; collar dorso-laterally carinated, not swollen, anteriorly punctulate; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, densely punctulate, covered with sparse coarse punctures, impression of notaulus corrugated, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly parallel throughout. Scutoscutellar groove markedly corrugated; scutellum 0.98 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.39 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron dorsally strigate, ventrally strigate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina with rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, moderately impressed; faintly corrugated; scrobe moderately deep, forming pit with sulcus. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.08 as long as anterior portion of propodeum deep and narrow, medially wide, very faintly corrugated, almost smooth, medially some carinae stouter; propodeum 1.31 as long as wide medially; anterior

margin of propodeum without teeth; anterior portion of propodeum finely strigulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum entirely markedly strigate, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially slightly arched forwards; posterior transverse carina absent; propodeal spiracle 1.83 as long as wide; pleural carina of propodeum present only posteriorly; lower division of metapleuron strigulate, densely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.64 as long as vein 2cu-a; vein 4Rs 0.98 as long as vein 4M, straight; cell 1+2Rs 0.81 as high as pterostigma, pentagonal; vein 2M approximately as long as vein 3M; vein 3M distinct, 0.57 as long as vein 2M. Hind wing*:* vein 1Cu 2.05 as long as vein cu-a; vein 2-1A reaching 0.92 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa globose.

Metasoma. T1 0.52 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.55, prominent; postpetiole dorsally, at level of spiracles, faintly but distinctly concave; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 0.93 as long as wide at apex; apex of T2 2.28 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve without teeth; notch present.

Color. Head, mesosoma and metasoma brown and pale yellow (223,205,146). Head: pale yellow; mandible teeth, supra–antennal area medially, interocellar area, vertex and gena, except complete large orbital band, and occiput, pale brown (182,074,039); scape ventrally yellow; scape dorsally, pedicel and flagellum, brown; flagellum dorsally whitish at f6–14, partially at f15. Mesosoma: propleuron pale yellow, posteriorly pale brown; pronotum pale brown except lateral stripe at collar and pronotal swelling, pale yellow; mesoscutum pale brown, except longitudinal lanceolate mark at posterior 0.8 of central lobe; mesopleuron pale yellow with four pale brown marks: anteriorly around hypoepimeron, at mesopleural groove, rounded spot just behind epicnemial carina, and along entire length of sternaulus; remainder of mesosoma pale yellow, except for the following pale brown marks: both axillary trough of mesonotum and metanotum, carinal triangle, upper division of metapleuron centrally, anterior portion of propodeum, and three

lateral longitudinal marks at propodeum: medially, and laterally along pleural carinae. Legs: bright yellow; all t5 dark brown; fore and mid t1–t4 dorsally pale brown; hind coxa with two basally not connected brown marks: dorsal mark somewhat anchor–shaped reaching apex, and ventral mark large, at basal 0.6. Metasoma: brown and pale yellow; T1 brown, anterior and lateral 0.3 bright yellow; posterior 0.1 of T1 pale yellow; T2 orange at anterior 0.6, brown at medial 0.7, and pale yellow at posterior 0.3; T3–8 brown with posterior 0.4 pale yellow; S1 bright yellow; S2–8 pale yellow, laterally brown.

Variation. Confused-rugulose area faint. Rounded spot just behind epicnemial carina brown, smaller than in the holotype. Differences in tonality include variations from orange (210,122,052) to dark brown (141,059,033).

Comments. Similar to *T*. **sp**. **nov**. 15, from which it is separated by having transverse furrow at base of propodeum very faintly corrugated, almost smooth (*vs*. uniformly corrugated in *T*. **sp**. **nov**. 15; Fig. 136); anterior margin of propodeum without tooth (*vs*. with two lateral teeth, as in Fig. 51); lateral longitudinal carina of propodeum indistinct (*vs*. represented by short curved carina); anterior transverse carina of propodeum medially slightly arched forwards (*vs*. straight; Fig. 136); pleural carina of propodeum present only posteriorly (*vs*. irregular but complete, fused with sculpture of propodeum and lower division of metapleuron); T1 without basolateral tooth, as in Fig. 54 (*vs*. with two basolateral teeth, as in Fig. 53).

Male. Unknown.

Distribution. Brazil. Recorded from two localities from *Santa Catarina* (Fig. 223). The type locality is Nova Teutônia (27°11’S 52°23’W); the other locality probably refers to the municipality of Águas Mornas, formerly “Teresópolis.” These records comprise a range of 0°30’ in latitude.

Biology. Unknown.

Material examined. 2 females. Holotype f#, **BRAZIL**: *Santa Catarina*, Nova Teutônia, 27°11’S 52°23’W, 300–500 m, 22.XII.1962, Fritz Plaumann *leg*. (CNCI). Left hind leg beyond femur and right hind leg beyond tibia, missing; mesoscutum somewhat damaged by pin; otherwise in good shape. Paratype: **BRAZIL**: 1 f# from *Santa Catarina*, Theresopolis [Águas Mornas], S.Michaelis *leg*. (ZMHU).

***Toechorychus* sp. nov. 20, Tedesco**

(Figs 22, 83, 143, 190)

Description. Holotype FEMALE. Fore wing length 5.93 mm.

Head. Mandible 1.39 as long as basal width, moderately pilose; ventral margin slightly projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.88 as wide as high, subtriangular, minutely strigulate, apically smooth; apex 1.83 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area medially strigate, laterally and medially finely punctate, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens without V-shaped carina; radicle foveolate. White band starting at flagellomere 6, reaching flagellomere 9; flagellum somewhat stout; subapical flagellomeres slightly flattened. Supra-antennal area with stout, median, arched, transverse carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area finely strigulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina stout, dorsally faint, V-shaped, ventrally slightly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 1.03 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.11 as long as wide; in lateral view, mesosoma middle width 0.2 mm. Pronotum centrally corrugated, latero-ventrally markedly rugose behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly punctulate; epomia stout, ending at pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 0.93 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.44 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial

carina with rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, deeply impressed; markedly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.14 as long as anterior portion of propodeum, moderately deep and narrow, medially wide, closely corrugated, medially some carinae distinctly stouter; propodeum 1.10 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum finely strigulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum confused-rugose, medially with two stout longitudinal carina; anterior transverse carina of propodeum complete, stout, entirely slightly arched forwards; posterior transverse carina represented by pair of high conical apophysis; apophysis 1.10 as high as wide; propodeal spiracle 1.63 as long as wide; pleural carina of propodeum irregular, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigulate, densely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs uniformly curved; vein 1cu-a straight, arising near vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.80 as long as vein 2cu-a; vein 4Rs 0.82 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.76 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 1.08 as long as vein 2M. Hind wing*:* vein 1Cu 4.33 as long as vein cu-a; vein 2-1A reaching 0.80 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.57 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.52, prominent; postpetiole dorso-laterally, behind spiracles, markedly concave, deeply depressed; T2–8 punctate, posteriorly coriarious; centrally almost glabrous, laterally pilose; T2 0.93 as long as wide at apex; apex of T2 1.87 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma black with yellow (245,231,127) marks. Head: black; labrum, clypeus apicolaterally, radicle dorsally, ventral stripe at scape, large orbital band, interrupted only at malar space, yellow; flagellum dorsally totally whitish at f6–10, partially at f5.

Mesosoma: black, except for the following yellow marks: propleuron ventrally, collar laterally, pronotal swelling, large longitudinal lanceolate mark at posterior 0.8 of central lobe of mesoscutum, axillary carina, scutellum, postscutellum, upper division of metapleuron, lower division of metapleuron centrally, two lateral longitudinal marks at propodeum, and four marks at mesopleuron: subalar ridge, ventral half of epicnecium, hypoepimeron, and elongate spot ventrally to scrobe. Legs: mostly orange; all t5 black; fore and mid coxae black, anteriorly with large basal spot; hind coxa yellow with two longitudinal black marks: dorsal mark anchor-shaped, apically connected with ventral large mark, both at entire length of coxa; hind first trochanter blackish. Metasoma: black and yellow; T1 yellow, except for rounded spot opposite to spiracle; T2–8 black with posterior 0.4 yellow; S1 black; S2–8 pale yellow, laterally black.

Comments. Similar to *T*. **sp**. **nov**. 4, mainly due to the mesopleuron color pattern, from which it can be isolated by having supra-antennal area with stout, median, arched, transverse carina (*vs*. without transverse carina in *T*. **sp**. **nov**. 4); posterior portion of propodeum with two longitudinal yellow stripes (Fig. 143) (*vs*. black, only marked with yellow on conical swellings; Fig. 126) central lobe of mesoscutum without sulcus or carina (*vs*. with longitudinal sulcus); lower division of metapleuron centrally yellow (*vs*. with ventral half black); T1 yellow, except dorsally to spiracle, black (*vs*. black, except 0.2 posterior, pale yellow).

Male. Unknown.

Distribution. Known only from Colombia (Fig. 224).

Biology. Unknown.

Material examined. Holotype f#, **COLOMBIA**: *Valle Del Cauca* (3°25’14”N 76°31’20”W), Cali, Tropical Wet Forest, Malaise trap, 19.VIII.1975, R.C.Wilkerson *leg*. (FSCA). Right antenna beyond flagellomere 1, left antenna beyond white band, and right fore wing, missing; mesoscutum somewhat damaged by pin; otherwise in good shape.

***Toechorychus* sp**. **nov**. **21, Tedesco**

(Figs 23, 81, 100, 159, 166)

Description. Holotype FEMALE. Fore wing length 7.34 mm.

Head. Mandible 1.53 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.76 as wide as high,

subrectangular, finely punctate, apically smooth; apex 1.76 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely strigate, with scarce punctures, moderately pilose; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Antenna with 28 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 11; flagellum slender; subapical flagellomeres as wide as basal flagellomeres, not flattened. Supra-antennal area with very faint but distinct median longitudinal carina or with stout, median, transversally arched, medially interrupted carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli with scarce punctures, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina faint, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina regularly shaped, not projected; malar space 1.06 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.73 as long as wide; in lateral view, mesosoma middle width 0.22 mm. Pronotum centrally smooth, latero-ventrally markedly rugose behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling smooth; collar dorso-laterally carinated, not swollen, anteriorly punctulate; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with dense coarse punctures, central lobe with faint longitudinal carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 0.94 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.35 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat rounded; mesopleuron entirely markedly strigate; mesopleural groove corrugated; epicnemial carina stout, dorsally straight; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed; faintly corrugated; scrobe moderately deep, forming pit with sulcus. Mesothoracic venter coarsely punctate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.12 as long as anterior portion of propodeum, moderately deep and narrow, medially wide, closely

corrugated, medially some carinae distinctly stouter; propodeum 1.17 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum strigate, medially with two posteriorly convergent longitudinal carinae; lateral longitudinal carina of propodeum represented by subcircular carina; posterior portion of propodeum entirely markedly strigate, medially with longitudinal carina; behind posterior transverse carina with two stout parallel longitudinal carinae; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent; propodeal spiracle 1.50 as long as wide; pleural carina of propodeum irregular, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron minutely strigate or sparsely punctate, densely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs entirely slightly sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.67 as long as vein 2cu-a; vein 4Rs 0.95 as long as vein 4M, sinuous; cell 1+2Rs 1.00 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M indistinct. Hind wing*:* vein 1Cu 1.52 as long as vein cu-a; vein 2-1A reaching 0.74 of distance to posterior margin.

Legs. Tibia with dense short bristles; hind coxa globose.

Metasoma. T1 0.49 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.57, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 0.98 as long as wide at apex; apex of T2 2.02 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head and mesosoma black and yellow, metasoma ferruginous. Head: black; mouthparts, base of clypeus, supraclypeal area laterodorsally, large complete orbital band, and malar space, dark yellow (232,188,108); clypeus apically, and mandible base and apex, dark brown (109,079,062); scape ventrally dark brown; flagellum brownish towards apex; f5–12 ventrally whitish. Mesosoma: black; lateral small mark at collar, pronotal swelling, longitudinal lanceolate mark at posterior 0.3 of central lobe of mesoscutum , axillary carina, scutellum, postscutellum, base of tegula, upper division of metapleuron, dorsal half of lower division of metapleuron, and hind margin of metanotum, bright yellow; mesopleuron with four small bright yellow spots: at subalar ridge, dorsal half of hypoepimeron, dorsally to epicnemial carina, and

ventrally opposite to mesepimeron; posterior portion of propodeum with two lateral longitudinal large yellow stripes. Legs: all coxae black with yellow (229,212,139) spots; fore and mid coxae with large dorsal yellow spot; hind coxa with two yellow spots: dorsal mark large, at basal 0.7, anterior mark small, at basal 0.2; all femora dark yellow (229,167,056), ventrally brown (101,047,022); second trochanter of all legs basally yellow; all tibiae and tarsi yellow, whitish towards apex, except for all t5, dark brown. Metasoma: ferruginous; T1 dorsally to spiracles, black; posterior 0.1 of T1 yellow.

Comments. Albeit stated by Townes as near *albimaculatus* (label data), it can be more easily confused with *T*. **sp**. **nov**. 23, from which it is differentiated by having mesopleuron with four yellow spots (*vs*. with three in *T*. **sp**. **nov**. 23; Fig. 24); hind margin of metanotum with two lateral teeth (*vs*. with two short lateral carinae extending towards transverse furrow at base of propodeum); posterior portion of propodeum medially with distinct longitudinal carina; (*vs*. without; Fig. 145); hind femur orange, ventrally brown (*vs*. black); metasoma mostly ferruginous (*vs*. mostly black; Fig. 164).

Male. Unknown.

Distribution. Known only from Brazil (Fig. 225).

Biology. Unknown.

Material examined. Holotype f#, **BRAZIL**: *Pará*, Santarém, Taperinha, 2°54'S 54°20'W, 07.VIII.1977, R.L.Jeanne *leg*., *Toechorychus* nr. *albimaculatus* Townes (AEIC). Right antenna tip, and right mid leg beyond tibia, missing; mesoscutum somewhat damaged by pin; otherwise in good shape.

***Toechorychus* sp**. **nov**. **22, Tedesco**

(Figs 7, 87, 161, 186)

Description. Holotype FEMALE. Fore wing length 4.70 mm.

Head. Mandible 1.65 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.72 as wide as high, subquadrate, minutely strigulate, apically smooth; apex 1.48 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely densely punctate, dorsally also strigulate, moderately pilose, medially with oval prominent area; between antennal foramens with

three U-shaped, concentric carinae, medially interrupted; radicle punctate. Antenna with 21 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 15; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area finely strigulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli punctulate or minutely strigulate, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina faint, dorsally faint, V-shaped, ventrally slightly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina slightly projected as crest; malar space 1.35 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.15 as long as wide; in lateral view, mesosoma middle width 0.13 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly punctate; epomia very faint, almost indistinct. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with sparse coarse punctures, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove faintly corrugated; scutellum 0.75 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.26 as long as wide; hind margin of metanotum with two short lateral carinae extending towards transverse furrow at base of propodeum. Subalar ridge somewhat elongate; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina faint, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.1 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed; faintly corrugated; scrobe moderately deep, forming pit with sulcus. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter long and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.23 as long as anterior portion of propodeum, moderately deep and narrow, medially wide, uniformly corrugated; anterior margin of propodeum without teeth; propodeum 1.27 as long as wide medially; anterior portion of propodeum finely strigulate or confused-rugose, medially with two posteriorly convergent faint

longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum laterally strigate, medially confused-rugose, medially with two stout longitudinal carina; behind posterior transverse carina with two stout parallel longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially slightly arched forwards; posterior transverse carina absent, only with lateral slight swellings; propodeal spiracle 1.50 as long as wide; pleural carina of propodeum complete, moderately stout; lower division of metapleuron faintly strigulate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs entirely irregular; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.55 as long as vein 2cu-a; vein 4Rs 0.81 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.9 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.58 as long as vein 2M. Hind wing*:* vein 1Cu 1.33 as long as vein cu-a; vein 2-1A reaching 0.80 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa elongate.

Metasoma. T1 0.55 as long as hind femur, without basolateral tooth; minutely coriarious; spiracle at anterior 0.54, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; centrally almost glabrous, laterally pilose; T2 1.17 as long as wide at apex; apex of T2 2.11 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma pale yellow (239,220,173) with black marks. Head: pale yellow; mandible teeth, supra–antennal area posteriorly, interocellar area, vertex centrally, and occiput, black; scape ventrally, pedicel ventrally and flagellum ventrally, entirely pale yellow, whitish towards apex; flagellum completely whitish at f6–13, apically at f5, and dorsally at f14–16. Mesosoma: mostly pale yellow, except for the following black marks: pronotum centrally, margin of central lobe of mesoscutum, lateral lobes of mesoscutum posteriorly, scutoscutellar groove, both axillary trough of mesonotum and metanotum, small mark between subalar ridge and hypoepimeron, scrobe, carinal triangle, anterior portion of propodeum, posterior portion of propodeum medially, and along pleural carina. Legs: yellow with brown (100,050,030) stripes; all t5 brown; all legs dorsally with longitudinal brown stripes at entire length, except for hind tarsus, whitish. Metasoma: pale yellow with black marks; T1 black at medial 0.2–0.8; T2–8 black at anterior 0.4; S2–4 laterally light brown.

Comments. Very similar to *T*. **sp**. **nov**. 34, from which it is differentiated by having epomia very faint, almost indistinct (*vs*. stout, restricted to space between posterior margin of collar and pronotal swelling in *T*. **sp**. **nov**. 34); sternaulus reaching base of mid coxa, as in Fig. 44 (*vs*. not reaching, as in Fig. 43); pleural carina of propodeum complete, moderately stout (*vs*. irregular, fused with sculpture of propodeum and lower division of metapleuron); all legs dorsally with brown stripe (*vs*. yellowish, except coxae and hind trochanters); T4–8 black at anterior 0.4 (*vs*. T4–8 only medially black at anterior 0.1).

Male. Unknown.

Distribution. Known only from Ecuador (Fig. 226).

Biology. Unknown.

Material examined. Holotype f#, **ECUADOR**: *Zamora Chinchipe*, Río Bombuscaro, 4.12°S 78.98°W, 26–30.VI.1996, 970 m, Malaise trap, P.Hibbs *leg*. (AEIC). Complete, in good shape.

***Toechorychus* sp**. **nov**. **23, Tedesco**

(Figs 24, 82, 145, 164)

Description. Holotype FEMALE. Fore wing length 7.42 mm.

Head. Mandible 1.49 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.88 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.80 as long as base, truncate; apical margin sharp, medially slightly convex. Supraclypeal area entirely strigate, with scarce punctures, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with U-shaped carina; radicle foveolate. Antenna with 21 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 12; flagellum slender; subapical flagellomeres as wide as basal flagellomeres, not flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli with scarce punctures, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina faint, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina at

mandible base or nearly so; hypostomal carina projected as crest; malar space 1.00 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.98 as long as wide; in lateral view, mesosoma middle width 0.23 mm. Pronotum centrally corrugated, latero-ventrally markedly rugose behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling finely rugulose; collar dorso-laterally carinated, not swollen, anteriorly punctate; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum densely pilose, lobes dorsally rugulose, impression of notaulus markedly corrugated, central lobe with sparse coarse punctures, central lobe with faint longitudinal carina; notauli deeply impressed, posteriorly convergent. Scutoscutellar groove faintly corrugated; scutellum 0.78 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.33 as long as wide; hind margin of metanotum with two short lateral carinae extending towards transverse furrow at base of propodeum. Subalar ridge somewhat elongate; mesopleuron entirely markedly strigate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, deeply impressed; faintly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter coarsely punctate, or strigulate; median portion of posterior transverse carina of mesothoracic venter long and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.10 as long as anterior portion of propodeum, moderately deep and moderately narrow, medially wide, markedly corrugated; propodeum 1.07 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum strigate, medially with two posteriorly convergent faint longitudinal carinae; lateral longitudinal carina of propodeum represented by faint but distinct subcircular carina; posterior portion of propodeum markedly strigate, striation medially arched backwards, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent; propodeal spiracle 1.60 as long as wide; pleural carina of propodeum irregular and faint, obsolescent posteriorly, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron minutely strigate or sparsely punctate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs almost straight, apically slightly curved; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.65 as long as vein 2cu-a; vein 4Rs 1.11 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.76 as high as pterostigma, rectangular; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.50 as long as vein 2M. Hind wing*:* vein 1Cu 2.25 as long as vein cu-a; vein 2-1A reaching 0.79 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.52 as long as hind femur, without basolateral tooth; minutely coriarious; spiracle at anterior 0.52, prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 0.98 as long as wide at apex; apex of T2 1.98 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma black with yellow marks. Head: black; mouthparts, mandible centrally, clypeus basally, supraclypeal area latero–dorsally, large but incomplete orbital band, dark yellow (207,148,077); clypeus apically, and mandible base and apex, dark brown (077,044,025); scape ventrally dark brown; flagellum ventrally entirely brown, dorsally whitish at f5–12. Mesosoma: black; lateral small mark at collar, pronotal swelling, longitudinal lanceolate mark at posterior 0.3 of central lobe of mesoscutum, axillary carina, scutellum, postscutellum, tegula, upper division of metapleuron, large mark at dorsal half of lower division of metapleuron, and hind margin of metanotum centrally, bright yellow; mesopleuron with four small bright yellow spots: at subalar ridge, dorsal half of hypoepimeron, dorsally to epicnemial carina, and opposite to mesepimeron; posterior portion of propodeum with two lateral longitudinal large yellow stripes. Legs: all coxae black with yellow (202,147,068) spots; fore and mid coxae with large dorsal yellow spot; hind coxa with two yellow spots: dorsal spot large, at basal 0.7, lateral spot small, at basal 0.2; first trochanter of all legs apically yellow; fore and mid femora dark yellow (204,133,069), ventrally brown (101,082,060); hind femur dark brown, apical 0.1 yellow; all tibiae and tarsi yellow, except for all t5, dark brown. Metasoma: black; T1 and T2 yellowish at posterior 0.1.

Comments. Similar to *T*. **sp**. **nov**. 21, from which it is differentiated by having mesopleuron with three yellow spots (*vs*. with four in *T*. **sp**. **nov**. 21; Fig. 100); hind margin of

metanotum with two short lateral carinae extending towards transverse furrow at base of propodeum (*vs*. with two lateral distinct teeth); posterior portion of propodeum medially without longitudinal carina; (*vs*. with distinct longitudinal carina; Fig. 159); hind femur black (*vs*. orange, ventrally brown); metasoma mostly black (*vs*. mostly ferruginous).

Male. Unknown.

Distribution. Known only from Brazil (Fig. 227).

Biology. Unknown.

Material examined. Holotype f#, **BRAZIL**: *Santa Catarina*, Nova Teutônia, II.1953, Fritz Plaumann *leg*. (AEIC). Left antenna beyond scape, and right hind leg beyond tibia, missing; mesoscutum somewhat damaged by pin; otherwise in good shape.

***Toechorychus* sp. nov. 24, Tedesco**

(Figs 9, 41, 54, 90, 121, 125, 176)

Description. Holotype FEMALE. Fore wing length 5.62 mm.

Head. Mandible 1.53 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 2.09 as wide as high, subtriangular, minutely strigulate, apically smooth; apex 1.63 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely strigate, with scarce punctures, moderately pilose, medially slightly prominent; between antennal foramens with U-shaped carina, medially widely interrupted; radicle punctate. Antenna with 22 flagellomeres; white band starting at flagellomere 4, reaching flagellomere 13; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets striolate; dorsal half medially rugulose. Paraocular area smooth. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina wide, ventrally narrow; occipital carina stout, dorsally faint, uniformly arched, ventrally slightly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 0.97 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.05 as long as wide; in lateral view, mesosoma middle width 0.18 mm. Pronotum centrally smooth, latero-ventrally rugose behind collar, margin

near mesopleuron not corrugated; pronotal swelling strigulate; collar dorso-laterally carinated, not swollen, anteriorly punctulate; epomia absent. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove smooth, polished; scutellum 1.21 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.46 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat rounded; mesopleuron dorsally strigate only before hypoepimeron, centrally polished, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally straight; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, moderately impressed, faint at posterior 0.5; faintly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter V-shaped, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.24 as long as anterior portion of propodeum deep and wide, uniformly corrugated; propodeum 1.21 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum finely strigulate or with sparse coarse punctures, medially without longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum markedly strigate, striation medially arched backwards, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially slightly arched forwards; posterior transverse carina absent, only with a lateral slight swellings; propodeal spiracle 1.25 as long as wide; pleural carina of propodeum complete, moderately stout; lower division of metapleuron faintly strigulate, sparsely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs uniformly curved; vein 1cu-a straight, arising at vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.62 as long as vein 2cu-a; vein 4Rs 0.95 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.74 as high as pterostigma, pentagonal; vein 2M approximately as long as vein 3M; vein 3M distinct, 0.89 as long as vein 2M. Hind wing*:* vein 1Cu 1.75 as long as vein cu-a; vein 2-1A reaching 0.8 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.56 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.51, prominent; postpetiole dorso-anteriorly flat; T2–8 minutely coriarious; almost glabrous; T2 1.04 as long as wide at apex; apex of T2 1.74 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch absent.

Color. Head, mesosoma and metasoma pale yellow (218,182,108) with black marks. Head: pale yellow; mandible teeth, supra–antennal area between antennal foramen, interocellar area, vertex and gena, except complete large orbital band, and occiput, black; scape ventrally yellow; scape dorsally, pedicel and flagellum, brown; flagellum completely whitish at f4–8, apically at f3, and dorsally at f9–10. Mesosoma: propleuron pale yellow, dorsally with small black spot; pronotum black except lateral rounded spot at collar and pronotal swelling, pale yellow; mesoscutum black, except longitudinal rectangular mark at posterior 0.9 of central lobe; mesopleuron pale yellow with three black marks: anteriorly around hypoepimeron, at mesopleural groove, and ventrally almost faint, along sternaulus; remainder of mesosoma black, except for the following bright yellow marks: axillary carina, scutellum, postscutellum, both upper and lower division of metapleuron, mesothoracic venter and two lateral longitudinal marks at posterior portion of propodeum, over propodeal swelling. Legs: mostly yellow; all t5 brown; fore coxa, fore trochanter, dorsal spot at mid coxa, and hind tarsomeres, white. Metasoma: black, brown and whitish (239,224,189); T1 black, laterally and at posterior 0.2, whitish; T2–8 black with lateral and posterior 0.4 whitish; S1 white; S2–8 whitish, laterally with brown spots.

Variation. Posterior portion of propodeum with two lateral slight rounded swellings. Pleural carina stouter than in the holotype. T1 anteriorly white, medially orange. Differences in tonality include variations from whitish (239,224,189) to pale yellow (218,182,108).

Comments. Similar to *T*. **sp**. **nov**. 34, from which it is isolated by having epomia absent (*vs*. stout, restricted to space between posterior margin of collar and pronotal swelling in *T*. **sp**. **nov**. 34); lateral lobes of mesoscutum entirely black (*vs*. anteriorly with yellow marks; Fig. 86); hind margin of metanotum without teeth or carinae, as in Fig. 48 (*vs*. with two short lateral carinae extending towards transverse furrow at base of propodeum, as in Fig. 49); scrobe very shallow, forming a sulcus (*vs*. deeply impressed, forming a pit); posterior portion of propodeum medially without distinctly stout longitudinal carina (*vs*. with two stout longitudinal carina; Fig. 156); hind coxa entirely orange (*vs*. yellow with dorsal black stripe).

Male. Unknown.

Distribution. French Guiana and Brazil. Recorded from two localities (Fig. 228). The type locality is Floresta Nacional de Caxiuanã, *Pará* (2°4'54"S 51°51'5"W). These records comprise a range of 0°50' in latitude.

Biology. Unknown.

Material examined. 2 females. Holotype f#, **BRAZIL**: *Pará*, Melgaço, Floresta Nacional de Caxiuanã, Trilha Igarapé Tijucaquara, 24–27.XI.2003, YPT, A.P.Aguiar & J.Dias *leg*., P05197 [field point] (UFES). Complete, in good shape. Paratype: **FRENCH GUIANA**: 1 f# from *Nourages*, Pararé, 22.IX.2009, Rec: Société Entomologique Antilles Guyane, 2009 (UFES).

***Toechorychus* sp. nov. 25, Tedesco**

(Figs 32, 75, 122, 160)

Description. Holotype MALE. Fore wing length 5.56 mm.

Head. Mandible 1.56 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.62 as wide as high, subquadrate, entirely finely strigulate; apex 1.62 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area medially strigate, laterally finely punctate, moderately pilose, medially slightly prominent; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Flagellum slender. Supra-antennal area with very faint but distinct median longitudinal carina, medially with slightly longitudinal elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area smooth. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina stout, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 1.06 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.04 as long as wide; in lateral view, mesosoma middle width 0.19 mm. Pronotum centrally smooth, latero-ventrally smooth, margin near mesopleuron entirely corrugated; pronotal swelling dorsally smooth, ventrally strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly smooth; epomia absent. Mesoscutum sparsely pilose, central lobe dorsally punctate, impression of notaulus markedly corrugated,

laterals lobes dorsally striate, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove smooth, polished; scutellum 0.92 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.6; postscutellum 0.29 as long as wide; hind margin of metanotum with two short lateral carinae extending towards transverse furrow at base of propodeum. Subalar ridge somewhat elongate; mesopleuron dorsally medially strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally straight; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum; sternaulus complete, reaching base of mid coxa, markedly sinuate, moderately impressed; faintly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.17 as long as anterior portion of propodeum deep and narrow, uniformly corrugated; propodeum 1.18 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum finely strigulate or with sparse coarse punctures, medially with two parallel longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum entirely markedly strigate, medially longitudinally swollen; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum medially interrupted, faint, straight; posterior transverse carina absent; propodeal spiracle 1.70 as long as wide; pleural carina of propodeum complete, moderately stout; lower division of metapleuron strigulate, sparsely pilose, juxtacoxal carina long and stout.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.50 as long as vein 2cu-a; slightly sinuous, almost straight; cell 1+2Rs 1.07 as high as pterostigma, rectangular; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.64 as long as vein 2M. Hind wing*:* vein 1Cu 2.63 as long as vein cu-a; vein 2-1A reaching 0.90 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa elongate.

Metasoma. T1 0.48 as long as hind femur, with faint basolateral tooth; minutely coriarious; spiracle at anterior 0.54, prominent; postpetiole dorso-anteriorly convex; T2–8

minutely coriarious; almost glabrous; T2 1.30 as long as wide at apex; apex of T2 2.00 as wide as base.

Color. Head, mesosoma and metasoma black and yellow. Head: pale yellow (229,213,152); mandible base, mandible apex, clypeal apex centrally, supraclypeal area just around clypeus, supra–antennal area medially, interocellar area, vertex and gena, except complete large orbital band, and occiput, black; scape ventrally pale yellow; scape dorsally, pedicel and flagellum, brown. Mesosoma: propleuron pale yellow, dorsal half black; pronotum black, except lateral marks at collar and pronotal swelling, pale yellow; mesoscutum black, except longitudinal rectangular mark at posterior 0.7 of central lobe, centrally interrupted; mesopleuron pale yellow with four black marks: anteriorly around hypoepimeron, at mesopleural groove, rounded spot just behind dorsal end of epicnemial carina, and along posterior 0.6 of sternaulus; remainder of mesosoma pale yellow, except for the following black marks: both axillary trough of mesonotum and metanotum, carinal triangle, anterior portion of propodeum, and three longitudinal marks at propodeum: medially, and laterally along pleural carinae, all marks posteriorly narrow. Legs: mostly pale yellow; fore and mid coxae dorsally with small apical black spot; hind coxa with two basally not connected black marks: ventral mark reaching basal 0.6, dorsal mark reaching apex; all trochanters pale yellow, dorsally with brown basal spot; all femora and tibiae bright yellow; fore and mid t1–5 brownish. Metasoma: black and bright yellow (216,176,075); T1 black, lateral and posterior 0.2 pale yellow; T2–8 black with posterior 0.4 bright yellow; S1 pale yellow; S2–8 yellowish.

Comments. Dorsal color pattern of propodeum is unique and characteristic for the species (Fig. 160). The only known *T*. **sp**. **nov**. 25 specimen was identified by I. Gauld as *T. abactus* in 2001 (label data), but it differs from the original description as follows. Tubercles at posterior portion of propodeum absent (*vs*. with transverse tubercles in *T. abactus*); mesopleuron with rounded black spot just behind dorsal portion of epicnemial carina (Fig. 32) (*vs*. mesopleuron without black marks except around hypoepimeron); posterior half of sternaulus black (*vs*. sternaulus white); fore and mid tarsi dorsally brown (*vs*. legs entirely pale yellow, except for all t5 black); T1 dorsally anteriorly black (*vs*. anterior portion of T1 white).

Female. Unknown.

Distribution. Known only from Costa Rica (Fig. 229).

Biology. Parasitoid of *Mischocyttarus collarellus* Richards (Vespidae, Polistinae), **new record**, in La Selva Biological Station, Costa Rica. Collected and reared by E. F. Smith.

Material examined. Holotype m#, **COSTA RICA**: *Heredia*, La Selva Biological Station, 11.VII.1999, E.F.Smith, *Toechorychus abactus* det. I. Gauld, 2001, ex. *Mischocyttarus collarellus* nest (BMNH). Antennae apical half and right hind leg beyond tibia, missing; mesoscutum somewhat damaged by pin; otherwise in good shape.

***Toechorychus* sp. nov. 26, Tedesco**

(Figs 40, 55, 127, 163)

Description. Holotype FEMALE. Fore wing length 6.87 mm.

Head. Mandible 1.63 as long as basal width, densely pilose; ventral margin regularly shaped, not projected; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.59 as wide as high, subtriangular, finely punctate; apex 1.55 as long as base, truncate; apical margin blunt, medially straight. Supraclypeal area entirely strigulate, also densely punctate, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. White band starting at flagellomere 4, reaching flagellomere 11; flagellum somewhat stout; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets not striate; dorsal half medially punctulate, or strigulate. Paraocular area finely punctulate. Vertex punctate around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally uniformly arched, ventrally regularly shaped, not projected, reaching hypostomal carina at mandible base or nearly so; hypostomal carina projected as crest; malar space 1.03 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.96 as long as wide; in lateral view, mesosoma middle width 0.19 mm. Pronotum centrally corrugated, latero-ventrally rugose behind collar, margin near mesopleuron not corrugated; pronotal swelling finely rugulose; collar dorso-laterally carinated, not swollen, anteriorly rugulose; epomia very faint, almost indistinct. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped.

Scutoscutellar groove faintly corrugated; scutellum 2.14 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.47 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron dorsally strigate, include over hypoepimeron, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving forwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, moderately impressed; faintly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter V-shaped, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.21 as long as anterior portion of propodeum deep and wide, very markedly corrugated; propodeum 1.14 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum strigulate, medially with two faint parallel longitudinal carinae; lateral longitudinal carina of propodeum indistinct; posterior portion of propodeum confused-rugose, medially without distinctly stout longitudinal carina; anterior transverse carina of propodeum absent; posterior transverse carina represented by pair of high spine-like apophysis, posteriorly curved; apophysis 0.62 as high as wide; propodeal spiracle 1.75 as long as wide; pleural carina of propodeum complete, moderately stout; lower division of metapleuron strigulate, densely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a almost indistinctly curved, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.86 as long as vein 2cu-a; vein 4Rs 0.89 as long as vein 4M, straight; cell 1+2Rs 0.88 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.55 as long as vein 2M. Hind wing*:* vein 1Cu 1.59 as long as vein cu-a; vein 2-1A reaching 0.95 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa elongate.

Metasoma. T1 0.56 as long as hind femur, without basolateral tooth; minutely coriarious; spiracle at anterior 0.56, slightly prominent; postpetiole dorso-anteriorly flat; T2–8 minutely coriarious; almost glabrous; T2 1.10 as long as wide at apex; apex of T2 2.39 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head black and whitish, mesosoma fulvous (153,072,037) and metasoma dark brown (081,063,048) with white marks. Head: black; mandible centrally, clypeus and supraclypeal area laterally, ventral half of supra–antennal area laterally, large orbital band interrupted before malar space, whitish (230,211,146); mouthparts, mandible base and apex, clypeus apically, and scape ventrally, light brown (179,106,066); flagellum ventrally entirely brown, dorsally entirely whitish at f5–11, partially at f4. Mesosoma: almost completely fulvous; pronotal swelling, axillary carina, tegula, subalar ridge, spot dorsally to epicnemial carina, and apex of apophysis, whitish. Legs: fore leg fulvous, except for tarsus, brown; mid leg brown, with two stripes: the dorsal one yellow, the lateral one whitish; hind leg black, except for the following marks: dorsal spot at coxa, and t1–t5 ventrally, whitish; hind coxa basally with ventral fulvous spot. Metasoma: black; T1 fulvous at anterior 0.1; T2–8 laterally whitish at posterior 0.1.

Comments. Readily differentiated from other species of the genus by the almost completely fulvous mesosoma (Fig. 40), and by lacking anterior transverse carina of propodeum (Fig. 127). Similar to *T*. **sp**. **nov**. 17, from which it is differentiated by having supra-antennal area medially black (*vs*. completely orange in *T*. **sp**. **nov**. 17); collar dorso-laterally carinated, not swollen, as in Fig. 46 (*vs*. rounded, distinctly swollen, as in Fig. 47); juxtacoxal carina short (*vs*. long).

Male. Unknown.

Distribution. Known only from Ecuador (Fig. 230).

Biology. Unknown.

Material examined. Holotype f#, **ECUADOR**: *Napo*, Baeza, 13.II.1983, Lars Huggert *leg*., *Toechorychus,* Townes det. 1957 (AEIC). Complete, in good shape, except for mesoscutum somewhat damaged by pin.

***Toechorychus* sp**. **nov**. **27, Tedesco**

(Figs 25, 43, 84, 146, 185)

Description. Holotype FEMALE. Fore wing length 7.10 mm.

Head. Mandible 1.45 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.76 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.76 as long as base, truncate; apical

margin blunt, medially straight. Supraclypeal area medially strigate, laterally finely punctate, moderately pilose, medially slightly prominent; between antennal foramens without V-shaped carina; radicle foveolate. Antenna with 28 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 15; flagellum slender; subapical flagellomeres as wide as basal flagellomeres, not flattened. Supra-antennal area with stout, median, transversally arched, medially interrupted carina, medially with slightly longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area finely strigulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli with scarce punctures, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina faint, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina projected as crest; malar space 0.81 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.00 as long as wide; in lateral view, mesosoma middle width 0.23 mm. Pronotum centrally corrugated, latero-ventrally markedly strigate behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling strigulate; collar dorso-laterally rounded, distinctly swollen, anteriorly punctate; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with sparse coarse punctures, central lobe with faint longitudinal carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove faintly corrugated; scutellum 1.03 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.28 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron entirely markedly strigate; mesopleural groove corrugated; epicnemial carina stout, dorsally straight; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, reaching base of mid coxa, markedly sinuate, deeply impressed; faintly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter coarsely punctate; median portion of posterior transverse carina of mesothoracic venter long and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.15 as long as anterior portion of propodeum deep and narrow, medially wide, closely corrugated, medially some carinae distinctly stouter; propodeum 1.14 as

long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum strigate or with sparse coarse punctures, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by subcircular carina; posterior portion of propodeum confused-rugose, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially arched backwards; posterior transverse carina absent; propodeal spiracle 1.89 as long as wide; pleural carina of propodeum irregular, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigate or sparsely punctate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs uniformly curved; vein 1cu-a posteriorly slightly curved, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.64 as long as vein 2cu-a; vein 4Rs 1.02 as long as vein 4M, uniformly slightly convex; cell 1+2Rs 0.96 as high as pterostigma, rectangular; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.67 as long as vein 2M. Hind wing*:* vein 1Cu 1.85 as long as vein cu-a; vein 2-1A reaching 0.85 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa globose.

Metasoma. T1 0.47 as long as hind femur, with faint basolateral tooth; minutely coriarious; spiracle at anterior 0.56, slightly prominent; postpetiole dorso-anteriorly flat; T2–8 minutely coriarious; almost glabrous; T2 1.02 as long as wide at apex; apex of T2 1.89 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma black with yellow marks (244,223,107). Head: black; mouthparts, malar space dorsally, clypeus laterally, supraclypeal area laterally, paraocular area interrupted centrally, and genal orbit dorsally, bright yellow (240,222,135); mandible, clypeus apically, scape, pedicel and flagellum, dark brown (097,055,030); flagellum dorsally entirely whitish at f5–11, partially at f12–14. Mesosoma: black; lateral small mark at collar, pronotal swelling, longitudinal lanceolate mark at posterior 0.3 of central lobe of mesoscutum, axillary carina, scutellum, postscutellum, tegula basally, upper division of metapleuron, large mark at dorsal half of lower division of metapleuron, and hind margin of metanotum, bright yellow; mesopleuron with three small bright yellow spots: at subalar ridge, dorsal half of hypoepimeron, and dorsally to epicnemial carina; posterior portion of propodeum with two lateral

longitudinal large yellow stripes. Legs: all coxae dark brown with yellow (225,165,099) spots; fore and mid coxae with small dorsal yellow spot; hind coxa with two yellow spots, the large one dorsal, at basal 0.7, the small one lateral, at basal 0.2; first trochanter of all legs apically yellow; fore and mid femora dark yellow, ventrally brown (118,093,074); hind femur dark brown, with dorsal narrow yellow stripe; all tibiae and tarsi yellow, except for all t5, apical 0.3 of hind tibia, and basal 0.3 of t1, dark brown. Metasoma: black; T1–T8 bright yellow at posterior 0.2.

Comments. Very similar to *T*. **sp**. **nov**. 23, from which it is isolated by having sternaulus medially shallow, interrupted (*vs*. complete in *T*. **sp**. **nov**. 23); anterior transverse carina of propodeum medially arched backwards (*vs*. straight; Fig. 145); hind femur dorsally with narrow yellow stripe (*vs*. entirely black); apical 0.3 of hind tibia dark brown (*vs*. hind tibia entirely yellow); metasoma striped (*vs*. entirely black).

Male. Unknown.

Distribution. Known only from Suriname (Fig. 231).

Biology. Unknown.

Material examined. Holotype f#, **SURINAME**: 45 Km S Paramaribo, 29.IX.1963, D.C. Geijskes *leg*. (AEIC). Left antenna tip, and right fore leg beyond coxa, missing; mesoscutum somewhat damaged by pin; otherwise in good shape.

***Toechorychus* sp**. **nov**. **28, Tedesco**

(Figs 28, 76, 148, 193)

Description. Holotype MALE. Fore wing length 5.93 mm.

Head. Mandible 1.36 as long as basal width, densely pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.81 as wide as high, subtriangular, minutely strigulate, apically smooth; apex 1.56 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area medially strigate, laterally and medially finely punctate, moderately pilose, medially with oval prominent area; between antennal foramens with three U-shaped, concentric carinae, medially interrupted; radicle foveolate. White band starting at flagellomere 8, reaching flagellomere 12; flagellum slender; subapical flagellomeres as wide as basal flagellomeres, not flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially without longitudinal elevation, near antennal sockets striate; dorsal

half medially rugulose. Vertex rugulose around ocelli, with very coarse punctures, without sulcus; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina stout, dorsally uniformly arched, ventrally slightly projected as crest, reaching hypostomal carina far from mandible base; hypostomal carina projected as crest; malar space 0.85 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.11 as long as wide; in lateral view, mesosoma middle width 0.18 mm. Pronotum centrally corrugated, latero-ventrally markedly rugose behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling finely rugulose; collar dorso-laterally rounded, distinctly swollen, anteriorly smooth; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe with longitudinal sulcus; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove smooth, polished; scutellum 0.9 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.28 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat rounded; mesopleuron dorsally medially markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina with rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, deeply impressed; markedly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter V-shaped, expanded as two deltaic perpendicular projections. Transverse furrow at base of propodeum laterally 0.37 as long as anterior portion of propodeum deep and moderately narrow, medially wide, markedly corrugated; anterior margin of propodeum without teeth; propodeum 1.22 as long as wide medially; anterior portion of propodeum with sparse coarse punctures, medially with two posteriorly convergent longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum confused-rugose, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two stout parallel longitudinal carinae; anterior transverse carina of propodeum complete, stout, entirely slightly arched forwards; posterior transverse carina represented by apophysis, present laterally as carina; apophysis 0.83 as high as wide; propodeal spiracle 1.40 as long as wide;

pleural carina of propodeum complete, moderately stout; lower division of metapleuron punctate, sparsely pilose, juxtacoxal carina short and stout.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs entirely slightly sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.75 as long as vein 2cu-a; vein 4Rs 0.80 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.78 as high as pterostigma, pentagonal; vein 2M distinctly longer than vein 3M; vein 3M indistinct. Hind wing: vein 1Cu 1.92 as long as vein cu-a; vein 2-1A reaching 0.83 of distance to posterior margin.

Legs. Tibia with dense short bristles; hind coxa globose.

Metasoma. T1 0.56 as long as hind femur, without basolateral tooth; minutely coriarious; spiracle at anterior 0.60, prominent; postpetiole dorso-anteriorly flat; T2–8 minutely coriarious; almost glabrous; T2 1.17 as long as wide at apex; apex of T2 1.61 as wide as base.

Color. Head, mesosoma and metasoma black with bright yellow (232,217,141) marks. Head: yellow; mandible brownish; two longitudinal marks extending from anterior tentorial pit to base of clypeus, supra–antennal area medially, interocellar area, vertex centrally, and occiput, black; scape ventrally yellow; scape dorsally, pedicel and flagellum, brown; flagellum completely whitish at f9–12, partially at f8 and f13. Mesosoma: black except for the following yellow marks: collar laterally, pronotal swelling, longitudinal lanceolate mark at posterior 0.9 of central lobe of mesoscutum, axillary carina, scutellum, postscutellum, tegula, large mark extending from subalar ridge along epicnecium and mesopleuron to entire dorsal margin of sternaulus, except over rounded confused–rugulose area behind epicnemial carina, hypoepimeron, mesothoracic venter, both upper and lower division of metapleuron, hind margin of metanotum, and two lateral longitudinal marks at posterior portion of propodeum. Legs: mostly orange; fore and mid coxae yellow with dorsal black spot at apical 0.3; hind coxae yellow with two longitudinal black marks, ventral one at basal 0.6, dorsal one at entire length, anchor–shaped; all first trochanters, apical 0.2 of hind tibia, basal 0.5 of t1, and all t5, dark brown; tarsi whitish towards apex. Metasoma: black except for the following yellow marks: T1 basolaterally and at posterior 0.1, posterior 0.2 of T2–8, S1, and S2–8 laterally.

Comments. Similar to *T*. **sp**. **nov**. 11, from which it is differentiated by having central lobe of mesoscutum with longitudinal sulcus (*vs*. without sulcus or carina in *T*. **sp**. **nov**. 11); mesopleuron with two black marks not connected, dorsally around hypoepimeron, and ventrally

at confused-rugulose area just behind dorsal end of epicnemial carina (*vs*. with one black mark extending anteriorly around hypoepimeron and at confused-rugulose area; Fig. 103); sternaulus with a very narrow brown mark, centrally interrupted (*vs*. with complete and wide brown mark; Fig. 13); pleural carina of propodeum complete, moderately stout, as in Fig. 41 (*vs*. irregular and faint, obsolescent posteriorly, fused with sculpture of propodeum and lower division of metapleuron); hind leg blackish at first trochanter, 0.2 apical of tibia, and 0.5 basal of t1 (*vs*. yellowish, except coxa and t5); hind wing vein 1Cu almost 2 as long as vein cu-a (*vs*. about 1.5 as long as vein cu-a); T1 without basolateral tooth, as in Fig. 54 (*vs*. with faint but distinct basolateral tooth).

Female. Unknown.

Distribution. Known only from Mexico (Fig. 232).

Biology. Unknown.

Material examined. Holotype m#, **MEXICO**: *Nuevo León*, San Pedro Iturbides, ~32 Km W Linares, 06.X.1962, *Toechorychus,* Townes det. 1964, H. & M.Townes *leg*. (AEIC). Antennae tip missing; mesoscutum somewhat damaged by pin; otherwise in good shape.

***Toechorychus* sp. nov. 29, Tedesco**

(Figs 12, 99, 138, 172)

Description. Holotype FEMALE. Fore wing length 6.79 mm.

Head. Mandible 1.46 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.67 as wide as high, subquadrate, entirely finely strigulate; apex 1.41 as long as base, truncate; apical margin sharp, medially slightly concave. Supraclypeal area entirely strigulate, also densely punctate, moderately pilose, medially slightly prominent; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Antenna with 25 flagellomeres; white band starting at flagellomere 4, reaching flagellomere 12; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially with small rounded elevation, near antennal sockets striolate; dorsal half medially strigulate. Paraocular area smooth. Vertex with very coarse punctures around ocelli, without sulcus; gena and vertex behind ocelli smooth, densely pilose; gena in lateral view at level of dorsal portion of occipital carina

narrow, ventrally wide; occipital carina faint, dorsally uniformly arched, ventrally slightly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina slightly projected as crest; malar space 1.14 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.04 as long as wide; in lateral view, mesosoma middle width 0.19 mm. Pronotum centrally smooth, latero-ventrally rugulose behind collar, margin near mesopleuron not corrugated; pronotal swelling finely rugulose; collar dorso-laterally rounded, distinctly swollen, anteriorly punctulate; epomia absent. Lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures; notauli faintly impressed, posteriorly parallel throughout. Scutoscutellar groove faintly corrugated; scutellum 1.00 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.32 as long as wide; hind margin of metanotum with two short lateral carinae extending towards transverse furrow at base of propodeum. Subalar ridge somewhat rounded; mesopleuron dorsally strigate, include over hypoepimeron, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally straight; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, moderately sinuate, posteriorly almost faint; faintly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter convex, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.09 as long as anterior portion of propodeum, shallow and wide, uniformly corrugated; propodeum 1.31 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum finely strigulate or punctulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum entirely markedly strigate, medially without distinctly stout longitudinal carina; anterior transverse carina of propodeum complete, faint, medially slightly arched forwards; posterior transverse carina absent; propodeal spiracle 1.36 as long as wide; pleural carina of propodeum absent, apparently present because of sculpture patterns of lower division of metapleuron and propodeum; lower division of metapleuron faintly strigulate, densely pilose, juxtacoxal carina absent.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs entirely sinuous; vein 1cu-a posteriorly markedly curved, arising far from vein 1M+Rs base, angle with

vein M+Cu about 90°; vein 2Cu 0.73 as long as vein 2cu-a; vein 4Rs 1.10 as long as vein 4M, straight; cell 1+2Rs 0.80 as high as pterostigma, rectangular; vein 2M approximately as long as vein 3M; vein 3M distinct, 0.50 as long as vein 2M. Hind wing*:* vein 1Cu 1.09 as long as vein cu-a; vein 2-1A reaching 0.79 of distance to posterior margin.

Legs. Tibia with very sparse short bristles; hind coxa globose.

Metasoma. T1 0.52 as long as hind femur, without basolateral tooth; minutely coriarious; spiracle at anterior 0.54, slightly prominent; postpetiole dorso-anteriorly flat; T2–8 minutely coriarious; sparsely pilose; T2 1.25 as long as wide at apex; apex of T2 1.92 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch absent.

Color. Head and mesosoma pale yellow with black marks, metasoma orange (206,091,028). Head: pale yellow (238,221,131); mandible teeth, supra–antennal area medially, interocellar area, vertex, and occiput, black; scape ventrally yellow, dorsally brown; flagellum ventrally brown, dorsally entirely whitish at f5–7, partially at f4 and f8–9. Mesosoma: mostly pale yellow; pronotum black, except for lateral of collar and pronotal swelling, pale yellow; mesoscutum black, except longitudinal lanceolate mark at entire length of central lobe; mesopleuron pale yellow with two black marks: anteriorly around hypoepimeron, and ventral half of epicnecium; remaining of mesosoma pale yellow, except for the following black marks: scutoscutellar groove, both axillary trough of mesonotum and metanotum, tegula apically, carinal triangle, and anterior portion of propodeum; posterior portion of propodeum with three longitudinal stripes, basally black, apically orange. Legs: all legs entirely orange (211,089,024), yellowish towards apex, except for all t5, dark brown (086,067,053). Metasoma: orange; S2–8 medially white.

Comments. Very similar to *T*. **sp**. **nov**. 13, from which it can be readily differentiated by lacking epomia (*vs*. with very stout epomia, restricted to space between posterior margin of collar and pronotal swelling); and metasoma entirely orange (*vs*. striped; Fig. 187). Also similar to *T*. **sp**. **nov**. 3, from which it can be separated by having mesopleuron ventrally and sternaulus, yellow (*vs*. with rounded black spot just behind epicnemial carina, and along posterior half of sternaulus; Fig. 13); hind coxa dorsally yellow (*vs*. entirely orange; Fig. 168); T1 with basolateral tooth, as in Fig. 53 (*vs*. without, as in Fig. 54).

Male. Unknown.

Distribution. Known only from Brazil (Fig. 233).

Biology. Unknown.

Material examined. Holotype f#, **BRAZIL**: *Rondônia*, Vilhena, XI.1973, M.Alvarenga leg., *Toechorychus* ,Townes det. (AEIC). Complete, in good shape, except for mesoscutum somewhat damaged by pin.

***Toechorychus* sp. nov. 30, Tedesco**

(Figs 20, 77, 123, 141, 199)

Description. Holotype FEMALE. Fore wing length 6.32 mm.

Head. Mandible 1.63 as long as basal width, almost glabrous; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.95 as wide as high, rectangular, finely punctate, apically smooth; apex 1.54 as long as base, truncate; apical margin sharp, medially slightly concave. Supraclypeal area entirely strigulate, also densely punctate, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Antenna with 25 flagellomeres; white band starting at flagellomere 3, reaching flagellomere 19; flagellum slender; subapical flagellomeres as wide as basal flagellomeres, not flattened. Supra-antennal area with stout, median, longitudinal carina, medially with slightly longitudinal elevation, near antennal sockets not striate; dorsal half medially rugulose. Paraocular area finely punctulate. Vertex rugulose between ocelli, at anterior third with short, longitudinal sulcus, posterior two-thirds smooth; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view uniformly narrow; occipital carina stout, dorsally V-shaped, ventrally markedly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina projected as crest; malar space 0.97 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.89 as long as wide; in lateral view, mesosoma middle width 0.22 mm. Pronotum centrally smooth, latero-ventrally smooth, margin near mesopleuron entirely corrugated; pronotal swelling smooth; collar dorso-laterally rounded, distinctly swollen, anteriorly smooth; epomia very faint, almost indistinct. Mesoscutum sparsely pilose, densely punctate, impression of notaulus corrugated, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar

groove markedly corrugated; scutellum 0.88 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.30; postscutellum 0.26 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat rounded; mesopleuron dorsally medially strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally straight; dorsal end of epicnemial carina reaching 0.10 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, deeply impressed; markedly corrugated; scrobe moderately deep, forming pit with sulcus. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter V-shaped, expanded as two deltaic perpendicular projections. Transverse furrow at base of propodeum laterally 0.27 as long as anterior portion of propodeum, shallow and wide, markedly corrugated; propodeum 1.01 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum strigate, medially with two parallel longitudinal carinae; lateral longitudinal carina of propodeum represented by subcircular carina; posterior portion of propodeum confused-rugose, medially with two stout longitudinal carina; behind posterior transverse carina with two stout parallel longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially markedly arched forwards; posterior transverse carina represented by blunt apophysis, present laterally as carina; propodeal spiracle 1.47 as long as wide; pleural carina of propodeum irregular, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigate or sparsely punctate, densely pilose, juxtacoxal carina long and stout.

Wings. Fore wing: vein 2+3Rs slightly sinuous; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a posteriorly markedly curved, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.69 as long as vein 2cu-a; vein 4Rs 0.94 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.80 as high as pterostigma, rectangular; vein 2M distinctly shorter than vein 3M; vein 3M distinct, 1.50 as long as vein 2M. Hind wing*:* vein 1Cu 1.67 as long as vein cu-a; vein 2-1A reaching 0.86 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.55 as long as hind femur, with faint basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.63, slightly prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 0.90 as long as wide at apex; apex of T2

1.69 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma black and yellow (232,212,089). Head: light yellow; clypeus apically, supraclypeal area ventrally, supra–antennal area medially, vertex and gena, except genal orbit, and occiput, black; mouthparts, mandible apex, scape, pedicel and flagellum, brown; flagellum entirely whitish at f5–12, partially at f4. Mesosoma: black, except for the following bright yellow marks: propleuron ventrally, collar laterally, pronotal swelling, large longitudinal mark at almost entire length of central lobe of mesoscutum, axillary carina, scutellum, postscutellum, upper division of metapleuron, 0.6 dorsal of lower division of metapleuron, posterior portion of propodeum except medio anteriorly, mesothoracic venter centrally, and three large marks at mesopleuron: subalar ridge, ventral half of mesopleuron, and 0.7 dorsal of hypoepimeron. Legs: mostly orange (206,097,026); all t5 black; fore and mid coxae ventrally fulvous, dorsally yellow; hind coxa yellow with two not connected fulvous marks: dorsal anchor-shaped spot at apical 0.6, ventral large spot reaching basal 0.7. Metasoma: black, fulvous, and yellow; T1 black with medial 0.6–0.8 fulvous, posterior 0.2 yellow; T2 fulvous with posterior 0.2 laterally dark yellow (194,129,057); T3–8 fulvous, blackish towards apex, with posterior 0.4 yellow; S1 black; S2–5 pale yellow, laterally black; S6–8 black, posterior 0.1 yellow.

Comments. The propodeal and metasomal color patterns, and the blunt apophysis are unique and characteristic for the species (Figs 20, 141, 199).

Male. Unknown.

Distribution. Known only from Suriname (Fig. 234).

Biology. Unknown.

Material examined. Holotype f#, **SURINAME**: *Marowijne*, R. Bigistron, 09.IX.1963, D.C.Geijskes *leg*. (AEIC). Complete, in good shape, except for mesoscutum somewhat damaged by pin.

***Toechorychus* sp. nov. 31, Tedesco**

(Figs 30, 78, 92, 162, 167)

Description. Holotype FEMALE. Fore wing length 6.06 mm.

Head. Mandible 1.38 as long as basal width, densely pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.51 as wide as high, subquadrate, entirely finely strigulate; apex 1.45 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely strigulate, also densely punctate, moderately pilose, medially slightly prominent; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Antenna with 25 flagellomeres; white band starting at flagellomere 4, reaching flagellomere 11; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area with very faint but distinct median longitudinal carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area smooth. Vertex rugulose between ocelli, at anterior third with short, longitudinal sulcus, posterior two-thirds smooth; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina faint, dorsally absent, ventrally slightly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina slightly projected as crest; malar space 1.06 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.80 as long as wide; in lateral view, mesosoma middle width 0.20 mm. Pronotum centrally smooth, latero-ventrally smooth, margin near mesopleuron ventrally corrugated; pronotal swelling finely rugulose; collar dorso-laterally rounded, distinctly swollen, anteriorly smooth; epomia absent. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with dense coarse punctures, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove smooth, polished; scutellum 0.98 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.6; postscutellum 0.30 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat elongate; mesopleuron entirely markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving forwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina with

rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, markedly sinuate, deeply impressed; markedly corrugated; juxtacoxal carina of mesopleuron stout and long; scrobe deeply impressed, forming pit. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter V-shaped, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.09 as long as anterior portion of propodeum, moderately deep and narrow, medially wide, very faintly corrugated, almost smooth; propodeum 1.16 as long as wide medially; anterior margin of propodeum with two faint lateral teeth; anterior portion of propodeum punctulate or with sparse coarse punctures, medially with two posteriorly convergent faint longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum entirely markedly strigate, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially slightly arched forwards; posterior transverse carina absent, only with lateral slight swellings; propodeal spiracle 1.45 as long as wide; pleural carina of propodeum irregular and faint, obsolescent posteriorly, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron strigulate or sparsely punctate, sparsely pilose, juxtacoxal carina long and stout.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base; vein 2Cu 0.46 as long as vein 2cu-a; vein 4Rs 0.93 as long as vein 4M, uniformly slightly convex; cell 1+2Rs 0.72 as high as pterostigma, rectangular; vein 2M approximately as long as vein 3M; vein 3M distinct, 0.64 as long as vein 2M. Hind wing*:* vein 1Cu 1.33 as long as vein cu-a; vein 2-1A reaching 0.83 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.52 as long as hind femur, with basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.54, slightly prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 1.09 as long as wide at apex; apex of T2 1.93 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head and mesosoma yellow and black, metasoma mostly orange. Head: pale yellow (208,133,077); mandible, ventral half of malar space, apex of clypeus, M–shaped mark at

ventral half of supraclypeal area, supra–antennal area medially, vertex, and occiput, black; scape ventrally pale yellow; pedicel, and flagellum brown; flagellum dorsally entirely white at f5–10 entirely, partially at f4 and f11. Mesosoma: black, except for the following pale yellow marks: propleuron centrally, collar laterally, pronotal swelling, longitudinal narrow mark at posterior 0.9 of central lobe of mesoscutum, tegula, axillary carina, scutellum, postscutellum, large mark extending from subalar ridge to posterior ventral margin of mesopleuron and over epicnecium, dorsal 0.8 of hypoepimeron, mesothoracic venter, upper division of metapleuron, lower division of metapleuron except ventral rounded spot, hind margin of metanotum, and two lateral longitudinal marks at posterior portion of propodeum. Legs: mostly orange (212,147,043); fore coxa pale yellow, posteriorly fulvous; mid coxa pale yellow, laterally with black strip reaching first trochanter; hind coxa pale yellow with lateral black stripes at entire length. Metasoma: mostly orange; T1 dorsally black, laterally and at posterior 0.2, pale yellow, brownish around spiracle; T2–8 yellowish towards apex; S2–3 laterally dark brown (108,062,031).

Variation. Mandible basally white. Occipital carina dorsally widely interrupted, completely absent. Mid coxa dorsally black only at apical 0.4. Hind coxa laterally with small black spot. T1 black around spiracle.

Comments. Very similar to *T*. **sp**. **nov**. 3, from which it can be isolated by having supraclypeal area ventrally with M–shaped mark (*vs*. with two lateral longitudinal black stripes in *T*. **sp**. **nov**. 3 – Fig. 66); lateral black stripes at supraclypeal area reaching antennal foramens, even if medially interrupted (*vs*. not reaching antennal foramens); malar space ventrally black (*vs*. completely yellow); occipital carina near mandible black (*vs*. bright yellow); juxtacoxal carina of mesopleuron stout and long (*vs*. faint and short); scrobe deeply impressed, forming a pit (*vs*. very shallow, forming a sulcus); lower division of metapleuron with ventral rounded black spot (*vs*. entirely yellow; Fig. 13).

Male. Unknown.

Distribution. Costa Rica and Panama. Record from *Heredia* and *Darién*. The type locality is Darién National Park, *Darién* (7°44’10”N 77°32’50”W) (Fig. 235). These records comprise a range of 3°42’ in latitude.

Biology. Collected near *Mischocyttarus collarellus* Richards (Vespidae, Polistinae) nest, in La Selva Biological Station, Costa Rica.

Material examined. Holotype f#, **PANAMA**: *Darién*, Darién National Park, Pirre, Est. Rancho Frio, 17.I.2000, 80 m, R.Cambra & A.Santos *leg*., *Toechorychus,* Townes det. (AEIC). Complete, in good shape, except for mesoscutum somewhat damaged by pin. Paratype f# from **COSTA RICA**: *Heredia*, La Selva Biological Station, 8.VI.1999, E.F.Smith *Toechorychus abactus*, det. I. Gauld 2001, flying near *Mischocyttarus collarellus* nest, Nest P. 03B (BMNH).

***Toechorychus* sp**. **nov**. 32 **, Tedesco**.
(Figs 26, 44, 79, 157, 165)

Description. Holotype FEMALE. Fore wing length 6.18 mm.

Head. Mandible 1.28 as long as basal width, densely pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.93 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.39 as long as base, truncate; apical margin sharp, medially straight. Supraclypeal area entirely strigate, with scarce punctures, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with V-shaped carina, medially interrupted; radicle foveolate. Antenna with 24 flagellomeres; white band starting at flagellomere 5, reaching flagellomere 11; flagellum somewhat stout; subapical flagellomeres slightly flattened. Supra-antennal area with stout, median, longitudinal carina or with stout, median, transversally arched, medially interrupted carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area smooth. Vertex rugulose around ocelli, at anterior third with short, longitudinal sulcus, posterior two-thirds smooth; gena and vertex behind ocelli smooth, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina faint, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina slightly projected as crest; malar space 0.97 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.96 as long as wide; in lateral view, mesosoma middle width 0.20 mm. Pronotum centrally smooth, latero-ventrally smooth, margin near mesopleuron ventrally markedly corrugated; pronotal swelling smooth; collar dorso-laterally rounded, distinctly swollen, anteriorly smooth; epomia very faint, almost indistinct. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated, central lobe with dense

coarse punctures, central lobe with faint longitudinal carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove faintly corrugated; scutellum 1.16 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.41 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat elongate; mesopleuron entirely markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.1 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, moderately sinuate, moderately impressed; faintly corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter punctate and strigulate; median portion of posterior transverse carina of mesothoracic venter long and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.18 as long as anterior portion of propodeum deep and narrow, medially wide, very faintly corrugated, almost smooth; propodeum 1.18 as long as wide medially; anterior margin of propodeum with two lateral teeth; anterior portion of propodeum strigate or strigulate or with sparse coarse punctures, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum entirely markedly strigate, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially slightly arched forwards; posterior transverse carina absent; propodeal spiracle 1.80 as long as wide; pleural carina of propodeum absent, apparently present because of sculpture patterns of lower division of metapleuron and propodeum; lower division of metapleuron punctate and strigulate, sparsely pilose, juxtacoxal carina short and faint.

Wings. Fore wing: vein 2+3Rs almost straight, apically slightly curved; ramellus absent; vein 1M+Rs uniformly curved; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.67 as long as vein 2cu-a; vein 4Rs 0.99 as long as vein 4M, sinuous; cell 1+2Rs 1.00 as high as pterostigma, almost indistinct; vein 2M distinctly longer than vein 3M; vein 3M indistinct. Hind wing*:* vein 1Cu 2.05 as long as vein cu-a; vein 2-1A reaching 0.80 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.53 as long as hind femur, with faint basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.55, slightly prominent; postpetiole dorsally, at level of spiracles, faintly but distinctly concave; T2–8 minutely coriarious; almost glabrous; T2 0.99 as long as wide at apex; apex of T2 2.02 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth.

Color. Head and mesosoma yellow and black, metasoma mostly orange. Head: bright yellow (240,217,115); mandible, ventral half of malar space, apex of clypeus, M–shaped mark at ventral half of supraclypeal area, supra–antennal area medially, vertex, and occiput, black; scape, pedicel, and flagellum brown; flagellum dorsally entirely white at f6–9 entirely, partially at f5 and f10–11. Mesosoma: black, except for the following bright yellow marks: propleuron ventrally, collar laterally, pronotal swelling, longitudinal narrow mark at posterior 0.8 of central lobe of mesoscutum, tegula basally, axillary carina, scutellum, postscutellum, large mark extending from subalar ridge to posterior dorsal margin of sternaulus except dorsally to epicnemial carina, dorsal 0.8 of hypoepimeron, mesothoracic venter laterally and centrally, upper division of metapleuron, dorsal 0.9 of lower division of metapleuron, hind margin of metanotum centrally, and two lateral longitudinal marks at posterior portion of propodeum. Legs: mostly orange (220,117,056); fore coxa bright yellow, posteriorly fulvous, laterally with light brown spot; mid coxa bright yellow, laterally with dark brown strip at posterior 0.7; hind coxa yellow with three brown spots: anteriorly at basal 0.3, laterally at medial 0.5–0.6, dorsally at entire length; all t5 dark brown. Metasoma: mostly orange (206,097,050); T1 dorsally, and laterally at spiracles, black; laterally, anterior 0.4, and at posterior 0.2, bright yellow; medially, at posterior 0.2, orange.

Variation. Antenna with 26 flagellomeres, dorsally entirely white at f5–f11. Dark mark at mid mesopleuron just behind epicnemial carina sometimes separated from dark mark at epicnecium, sometimes connected. Surface over sternaulus sometimes partially yellow medially. Mesothoracic venter either completely yellow or marked with blackish medially and near mesopleuron, forming M-shaped mark, or only medially blackish.

Comments. Similar to *T*. **sp**. **nov**. 2 from which can be distinguished by having ventral half of gena yellow (*vs*. posteriorly brown in *T*. **sp**. **nov**. 2; Fig. 72); propleuron dorsally black and ventrally pale yellow (*vs*. completely dark brown); collar dorso-laterally rounded, distinctly swollen, as in Fig. 47 (*vs*. carinated, not swollen; Fig. 46); mesothoracic venter black with yellow

longitudinal stripes (*vs*. completely dark brown); lower division of metapleuron punctate and strigulate (*vs*. almost smooth, very faintly strigulate); fore and mid femora entirely orange (*vs*. ventrally brownish); mid coxa yellow, with dorsal black mark at apical 0.7 (*vs*. brown with dorsal large yellow mark); hind coxa yellow with three black marks (*vs*. dark brown with two yellow stripes); spiracle of T1 slightly prominent (*vs*. prominent); posterior 0.2 of T1 medially orange and laterally pale yellow (*vs*. pale yellow).

Male. Unknown.

Distribution. French Guiana and Brazil. Recorded from Mount Kaw, and *Amazonas* (Fig. 236). The type locality is *Amazonas* at (4º33'S 71º38'W). These records comprise a range of 7°06' in latitude.

Biology. Unknown.

Material examined. 2 females. Holotype f#, **BRAZIL**: *Amazonas*, 4°33'S 71°38'W, IX.1979, M.Alvarenga *leg*., *Toechorychus,* Townes det. (AEIC). Left antenna beyond white band missing; mesoscutum somewhat damaged by pin; otherwise in good shape. Other specimens: **FRENCH GUIANA**: 1 f# from Mt. Kaw, PK 42, IX–X.1997, Malaise trap, J.A.Cerda *leg*. (AEIC).

***Toechorychus* sp. nov. 33, Tedesco**

(Figs 27, 49, 80, 124, 153, 170)

Description. Holotype FEMALE. Fore wing length 7.50 mm.

Head. Mandible 1.4 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.78 as wide as high, rectangular, minutely strigulate, apically smooth; apex 1.35 as long as base, truncate; apical margin sharp, medially slightly concave. Supraclypeal area medially strigate, laterally finely punctate, moderately pilose, medially with longitudinal subrectangular prominent area; between antennal foramens with U-shaped carina, medially widely interrupted; radicle foveolate. Antenna with 30 flagellomeres; white band starting at flagellomere 6, reaching flagellomere 11; flagellum somewhat stout; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina or with stout, median, transversally arched, medially interrupted carina, medially with small rounded elevation, near antennal sockets not striate; dorsal half medially rugulose.

Paraocular area finely strigulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli with scarce punctures, sparsely pilose; gena in lateral view at level of dorsal portion of occipital carina narrow, ventrally wide; occipital carina stout, dorsally absent, ventrally markedly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina projected as crest; malar space 0.82 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.82 as long as wide; in lateral view, mesosoma middle width 0.24 mm. Pronotum centrally smooth, latero-ventrally markedly strigate behind collar, margin near mesopleuron ventrally markedly corrugated; pronotal swelling smooth; collar dorso-laterally carinated, not swollen, anteriorly punctate; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe with faint longitudinal carina; notaulus moderately impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove markedly corrugated; scutellum 0.8 as long as wide, densely punctate; scutellar carina incomplete, restricted approximately to anterior 0.6; postscutellum 0.33 as long as wide; hind margin of metanotum with two lateral teeth. Subalar ridge somewhat rounded; mesopleuron entirely markedly strigate; mesopleural groove corrugated; epicnemial carina stout, dorsally straight; dorsal end of epicnemial carina not reaching ventral margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus complete, reaching base of mid coxa, almost straight, moderately impressed; faintly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter punctate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.30 as long as anterior portion of propodeum, moderately deep and narrow, medially wide, markedly corrugated; propodeum 0.98 as long as wide medially; anterior margin of propodeum with two faint lateral teeth; anterior portion of propodeum confused-rugose, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by subcircular carina; posterior portion of propodeum entirely markedly strigate, medially longitudinally swollen; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, straight; posterior transverse carina absent; propodeal spiracle 1.4 as long as wide; pleural carina of propodeum absent; lower division of metapleuron strigate, sparsely pilose, juxtacoxal carina stout, medially interrupted.

Wings. Fore wing: vein 2+3Rs slightly concave; ramellus absent; vein 1M+Rs posteriorly faintly sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.69 as long as vein 2cu-a; vein 4Rs 1.03 as long as vein 4M, slightly sinuous, almost straight; cell 1+2Rs 0.86 as high as pterostigma, almost indistinct; vein 2M distinctly longer than vein 3M; vein 3M distinct, 0.38 as long as vein 2M. Hind wing*:* vein 1Cu 1.19 as long as vein cu-a; vein 2-1A reaching 0.77 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.56 as long as hind femur, with faint basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.56, prominent; postpetiole dorso-laterally, behind spiracles, markedly concave, deeply depressed; T2–8 minutely coriarious; almost glabrous; T2 0.75 as long as wide at apex; apex of T2 2.09 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch absent.

Color. Head and mesosoma black and yellow; metasoma mostly orange. Head: bright yellow (231,208,111); mandible apex, clypeal apex, two longitudinal marks extending from anterior tentorial pit to supraclypeal area around medial rectangular swelling, supraclypeal area ventrally, supra–antennal medially, vertex centrally, and occiput, black; scape, pedicel, and flagellum, dark brown (098,066,048); flagellum at f5–7 dorsally partially whitish. Mesosoma: black, except for the following yellow marks (226,206,111): propleuron ventrally, collar laterally, pronotal swelling, longitudinal lanceolate mark at posterior 0.5 of central lobe of mesoscutum, axillary carina, scutellum, postscutellum, tegula, large mark extending from subalar ridge to posterior 0.7 of dorsal margin of sternaulus, subcircular spot dorsally at hypoepimeron, mesothoracic venter centrally, both upper and lower division of metapleuron, hind margin of metanotum, and two large lateral longitudinal marks at posterior portion of propodeum, yellow. Legs: mostly orange; fore and mid coxae dorsally yellow at basal 0.7 and 0.5, respectively; hind coxa with two not connected yellow marks, the dorsal one at basal 0.5, the anterior one at basal 0.1; all t5 dark brown. Metasoma: dark orange (182,079,031); posterior 0.1 of T1 yellow.

Variation. Face with only faint, oblique black marks. Mesothoracic venter black. General tones of yellow “cream”. One specimen from Jataí, Goiás, with sculpturing and rugulosities at pronotum and mesopleuron fainter than in the holotype.

Comments. Similar to *T. albimaculatus*, especially due to the color pattern, and is readily differentiated from it by having pleural carina of propodeum absent, as in Fig. 42 (*vs*. present

only posteriorly in *T. albimaculatus*); juxtacoxal carina stout, medially interrupted (*vs*. absent); angle between fore wing veins 1cu-a and M+Cu about 90° (*vs*. distinctly obtuse; Fig. 105); T1 with faint basolateral tooth (Fig. 53) (*vs*. without; Fig. 54).

Male. Very similar to female.

Distribution. Brazil. Recorded from *Pará* and *Goiás* (Fig. 237). The type locality is Santarém, *Pará* (2°54'S 54°20'W). These records comprise a range of 14°58' in latitude.

Biology. Unknown.

Material examined. 4 females and 2 males. Holotype f#, **BRAZIL**: *Pará*, Santarém, Taperinha, 2°54'S 54°20'W, 15.VIII.1977, 77086, *Toechorychus albimaculatus* Townes, 1977 (AEIC). Right antenna missing; mesoscutum somewhat damaged by pin; otherwise in good shape. Other specimens: **BRAZIL**: 1 m# from *Pará*, Santarém, Taperinha, 2º54'S 54º20'W, 07.VIII.1977, *Toechorychus albimaculatus* Townes, 1977; 1 f#, same data, except 05.VIII.1977; 1 f#, same data, except 15.VIII.1977; 1 f#, same data, except 04.VIII.1977. 1 m# from *Goiás*, Jataí, jan.1977, *Toechorychus albimaculatus* Gupta (AEIC).

***Toechorychus* sp. nov. 34, Tedesco**

(Figs 11, 86, 156, 197)

Description. Holotype FEMALE. Fore wing length 5.18 mm.

Head. Mandible 1.52 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 1.56 as wide as high, subrectangular, finely punctate; apex 1.56 as long as base, truncate; apical margin sharp, medially slightly convex. Supraclypeal area entirely densely punctate, dorsally also strigulate, moderately pilose, medially slightly prominent; between antennal foramens without V-shaped carina; radicle foveolate. Antenna with 21 flagellomeres; white band starting at flagellomere 1, reaching flagellomere 15; flagellum slender; subapical flagellomeres as wide as basal flagellomeres, not flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area smooth. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli punctulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina faint, dorsally uniformly arched,

ventrally slightly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina projected as crest; malar space 1.03 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 2.05 as long as wide; in lateral view, mesosoma middle width 0.17 mm. Pronotum centrally corrugated, latero-ventrally rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling finely rugulose; collar dorso-laterally carinated, not swollen, anteriorly rugulose; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove smooth, polished; scutellum 0.82 as long as wide, smooth; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.33 as long as wide; hind margin of metanotum with two short lateral carinae extending towards transverse furrow at base of propodeum. Subalar ridge somewhat elongate; mesopleuron entirely markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina stout, dorsally curving backwards; dorsal end of epicnemial carina reaching 0.2 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus incomplete, not reaching base of mid coxa, markedly sinuate, moderately impressed; faintly corrugated; scrobe deeply impressed, forming pit. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter V-shaped, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.33 as long as anterior portion of propodeum, moderately deep and moderately narrow, medially wide, markedly corrugated; propodeum 1.19 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum finely strigulate or with sparse coarse punctures, medially with two posteriorly convergent longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum markedly strigate, striation medially arched backwards, medially with two stout longitudinal carina or longitudinally swollen; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially markedly arched forwards; posterior transverse carina absent, only with lateral slight swellings; propodeal spiracle 1.75 as long as wide; pleural carina of propodeum irregular, fused with sculpture of lower division of metapleuron and propodeum; lower division of metapleuron faintly strigulate, sparsely pilose, juxtacoxal carina absent.

Wings. Fore wing: vein 2+3Rs almost straight, apically slightly curved; ramellus absent; vein 1M+Rs anteriorly faintly sinuous; vein 1cu-a straight, arising far from vein 1M+Rs base, angle with vein M+Cu distinctly obtuse; vein 2Cu 0.56 as long as vein 2cu-a; vein 4Rs 0.93 as long as vein 4M, sinuous; cell 1+2Rs 0.81 as high as pterostigma, pentagonal; vein 2M approximately as long as vein 3M; vein 3M distinct, 0.55 as long as vein 2M. Hind wing*:* vein 1Cu 1.59 as long as vein cu-a; vein 2-1A reaching 0.93 of distance to posterior margin.

Legs. Tibia with sparse short bristles; hind coxa globose.

Metasoma. T1 0.56 as long as hind femur, without basolateral tooth; anteriorly smooth, posteriorly coriarious; spiracle at anterior 0.51, prominent; postpetiole dorso-laterally, behind spiracles, markedly concave, deeply depressed; T2–8 minutely coriarious; almost glabrous; T2 0.97 as long as wide at apex; apex of T2 2.30 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve with series of teeth; notch present.

Color. Head, mesosoma and metasoma pale yellow (221,186,119) with black marks. Head: pale yellow; mandible teeth, interocellar area, vertex centrally, and occiput, black; scape ventrally, pedicel ventrally and flagellum ventrally, entirely pale yellow, whitish towards apex; flagellum completely whitish at f5–14, apically at f4, and dorsally at f15–16. Mesosoma: mostly pale yellow, except for the following black marks: ventral 0.1 of propleuron, pronotum centrally, margin of central lobe of mesoscutum, lateral lobes of mesoscutum posteriorly, scutoscutellar groove, both axillary trough of mesonotum and metanotum, small mark between subalar ridge and hypoepimeron, scrobe, carinal triangle, anterior portion of propodeum, posterior portion of propodeum medially, and along pleural carina. Legs: mostly yellow (221,139,044); all t5 brown; fore and mid coxae dorsally with apical brown mark; hind coxa dorsally with longitudinal black stripe at entire length; hind second trochanter ventrally brown. Metasoma: pale yellow with black marks; T1 dorsally black opposite to spiracles; T2–3 black at anterior 0.5; T4–8 blackish medially at anterior 0.1–0.2.

Comments. Very similar to *T.* **sp**. **nov**. 22, from which it is differentiated by having epomia stout, restricted to space between posterior margin of collar and pronotal swelling (*vs*. very faint, almost indistinct in *T.* **sp**. **nov**. 22); sternaulus not reaching base of mid coxa, as in Fig. 43 (*vs*. reaching base of mid coxa, as in Fig. 44); pleural carina of propodeum irregular, fused with sculpture of propodeum and lower division of metapleuron (*vs*. complete, moderately

stout, as in Fig. 41); all legs yellowish, except coxae and hind trochanters (*vs*. dorsally with brown stripe); T4–8 only medially black at anterior 0.1 (*vs*. black at anterior 0.4).

Male. Unknown.

Distribution. Known only from Panama (Fig. 238).

Biology. Unknown.

Material examined. Holotype f#, **PANAMA**: *Darién*, Darién National Park, Pirre, Est. Rancho Frio, 21.III–04.IV.2000, 230 m, Cambra, Santos, Bermudez *leg*. (AEIC). Complete, in good shape.

***Toechorychus* sp. nov. 35, Tedesco**

(Figs 17, 60, 134, 173)

Description. Holotype f#. Fore wing length 5.18 mm.

Head. Mandible 1.37 as long as basal width, moderately pilose; ventral margin projected as crest; dorsal tooth distinctly longer than ventral tooth. Clypeus 2.01 as wide as high, subrectangular, minutely strigulate, apically smooth; apex 1.43 as long as base, truncate; apical margin blunt, medially straight. Supraclypeal area entirely strigulate, also densely punctate, moderately pilose, medially slightly prominent; between antennal foramens without V-shaped carina; radicle foveolate. Antenna with 24 flagellomeres; white band starting at flagellomere 4, reaching flagellomere 11; flagellum slender; subapical flagellomeres slightly flattened. Supra-antennal area without distinct median carina, medially without longitudinal elevation, near antennal sockets striate; dorsal half medially rugulose. Paraocular area finely punctulate. Vertex rugulose around ocelli, without sulcus; gena and vertex behind ocelli minutely strigulate, sparsely pilose; gena in lateral view uniformly wide; occipital carina faint, dorsally absent, ventrally slightly projected as crest, reaching hypostomal carina at mandible base or nearly so; hypostomal carina slightly projected as crest; malar space 0.77 as long as basal width of mandible.

Mesosoma. Mesosoma in dorsal view 1.76 as long as wide; in lateral view, mesosoma middle width 0.16 mm. Pronotum centrally smooth, latero-ventrally markedly rugose behind collar, margin near mesopleuron ventrally corrugated; pronotal swelling finely rugulose; collar dorso-laterally rounded, distinctly swollen, anteriorly punctate; epomia stout, restricted to space between posterior margin of collar and pronotal swelling. Mesoscutum sparsely pilose, lobes

dorsally punctulate, laterally markedly corrugated or covered with sparse coarse punctures, central lobe without longitudinal sulcus or carina; notauli deeply impressed, posteriorly abruptly curved, U-shaped. Scutoscutellar groove faintly corrugated; scutellum 0.89 as long as wide, scarcely punctate; scutellar carina incomplete, restricted approximately to anterior 0.3; postscutellum 0.29 as long as wide; hind margin of metanotum without teeth or carinae. Subalar ridge somewhat rounded; mesopleuron entirely markedly strigate, ventrally strigulate; mesopleural groove corrugated; epicnemial carina faint, dorsally straight; dorsal end of epicnemial carina reaching 0.1 of posterior margin of pronotum, behind epicnemial carina without rounded confused-rugulose area; sternaulus medially shallow, interrupted, not reaching base of mid coxa, moderately sinuate, posteriorly almost faint; not corrugated; scrobe very shallow, forming sulcus. Mesothoracic venter strigulate; median portion of posterior transverse carina of mesothoracic venter short and straight, regularly shaped, without projections. Transverse furrow at base of propodeum laterally 0.30 as long as anterior portion of propodeum, shallow and narrow, medially wide, very faintly corrugated, almost smooth, medially some carinae stouter; propodeum 1.25 as long as wide medially; anterior margin of propodeum without teeth; anterior portion of propodeum finely strigulate, medially without longitudinal carinae; lateral longitudinal carina of propodeum represented by short curved carina; posterior portion of propodeum confused-rugose, medially without distinctly stout longitudinal carina; behind posterior transverse carina with two divergent longitudinal carinae; anterior transverse carina of propodeum complete, stout, medially markedly arched forwards; posterior transverse carina represented by crests, present laterally as carina; propodeal spiracle 1.88 as long as wide; pleural carina of propodeum absent; lower division of metapleuron strigulate, sparsely pilose, juxtacoxal carina represented by very short ridges.

Wings. Fore wing: vein 2+3Rs almost straight; ramellus absent; vein 1M+Rs uniformly curved; vein 1cu-a entirely markedly curved, arising near vein 1M+Rs base, angle with vein M+Cu about 90°; vein 2Cu 0.49 as long as vein 2cu-a; vein 4Rs 0.87 as long as vein 4M, straight; cell 1+2Rs 0.9 as high as pterostigma, pentagonal; vein 2M approximately as long as vein 3M; vein 3M distinct, 0.80 as long as vein 2M. Hind wing*:* vein 1Cu 1.50 as long as vein cu-a; vein 2-1A reaching 0.89 of distance to posterior margin.

Legs. Tibia with dense short bristles; hind coxa globose.

Metasoma. T1 0.52 as long as hind femur, without basolateral tooth; minutely coriarious; spiracle at anterior 0.57, slightly prominent; postpetiole dorso-anteriorly convex; T2–8 minutely coriarious; almost glabrous; T2 0.93 as long as wide at apex; apex of T2 2.16 as wide as base. Dorsal valve of ovipositor with nodus indistinct; apex of lower valve without teeth; notch absent.

Color. Head yellow with black marks, mesosoma orange with black and yellow marks, metasoma mostly orange (206,107,052). Head: pale yellow (238,208,105); mandible teeth, clypeal apex centrally, supra–antennal area medially, interocellar area, vertex, and occiput, black; scape ventrally yellow, dorsally brown; flagellum brown, whitish at f5–7, partially at f4 and f8–10. Mesosoma: orange (229,126,037) with black and yellow (233,207,090) marks; pronotum centrally black, collar laterally and pronotal swelling, pale yellow; mesoscutum black, except longitudinal large mark at entire length of central lobe, anteriorly orange, posteriorly yellow; mesopleuron orange, black between subalar ridge and hypoepimeron, except for the following yellow marks: subalar ridge and epicnecium, dorsal 0.8 of hypoepimeron, and large spot dorsally to 0.6 posterior of sternaulus; axillary trough of mesonotum, black; remaining of mesosoma orange, except for the following yellow marks: axillary carina, scutellum, postscutellum, upper division of metapleuron, central spot at lower division of metapleuron, hind margin of metanotum, and two lateral longitudinal marks at posterior portion of propodeum. Legs: mostly orange; all coxae with dorsal spot at basal 0.2; all t5 dark brown. Metasoma: orange; S1–8 yellow at posterior 0.2; T2 blackish at posterior 0.1.

Comments. Similar to *T*. **sp**. **nov**. 11, from which it is differentiated by having mandible yellow (*vs*. black in *T*. **sp**. **nov**. 11; Fig. 71); supraclypeal area entirely yellow (*vs*. with M-shaped black mark); mark around hypoepimeron reaching mark over sternaulus (*vs*. not reaching; Fig. 18); sternaulus not reaching base of mid coxa (*vs*. reaching base of mid coxa, even if medially raise); hind coxa orange with dorsal yellow mark at basal 0.1 (*vs*. yellow with two large black marks; Figs 18 and 188).

Male. Unknown.

Distribution. Known only from Bolivia (Fig. 239).

Biology. Unknown.

Material examined. Holotype f#, **BOLIVIA**: *Beni*, Rurrenabaque, X.1956, 175 m, L.Peña *leg*., *Toechorychus,* Townes det. 1964 (AEIC). Right hind leg beyond tibia missing; otherwise in good shape.

Cladistic Analyses

Results and discussion

A total of 162 informative characters were coded, generating a final character-state matrix of 22.092 cells (Table 3). Eight most parsimonious cladograms were found. Equal weights searches found two most parsimonious trees of 3394 steps, CI 0.05, and RI 0.45. For each tested *K* value only one most parsimonious tree was found, with CI 0.05 and RI 0.43–0.45 (Table 4). All cladograms for each of these searches preserved clades of interest for Lymeonina as a whole, and for *Toechorychus* as well (Figs 240–244).

According to the analyses, *Toechorychus* is always supported as a monophyletic group by 7–17 synapomorphies, of which the following are present in all trees: 47:2, epicnemial carina reaching at most 0.5 of distance to subalar ridge (Figs 99–104) – this feature is also found in *Latibulus* Gistel and *Epicnemion*; 144:2, ovipositor moderately slender (Figs 37, 39) – this feature corresponds to a highly homoplasious character (CI 0.05–0.15); 152:1, subapical V-shaped sulcus at dorsal valve of ovipositor (Fig. 45); 153:1, subapical constriction at ovipositor present before apical teeth of ventral valve of ovipositor (Figs 45, 240). The latter two features are newly discovered characters, and are proposed here for the first time as new synapomorphies of the genus. They were observed in all species of *Toechorychus* for which females are known. .

The results suggest that *Toechorychus* is correctly assigned to Lymeonina *sensu* Townes (1970), either as defined in the literature or as recovered here in all analyses except for *K*=1 and 2. In most analyses (Figs 241–244), the genus was recovered as closely related to *Lymeon* sp. (*K*=3–5, and equal weights), and *Acerastes* sp. (with *K*=3–6), both classified in Lymeonina. On searches with *K*=1 and 2, however, *Toechorychus* appears related to a sister group consisting of some Lymeonina (*Bathyzonus* sp. and *Latosculum* sp.), Mesostenina (*Acorystus circumflexus* Scherrer *et* Santos, *Cryptanura quadrimaculata* Cushman, and *Diloa* sp.), Gabuniina (*Prosthoporus nigrifemur* Gupta), and Goryphina (*Friona* sp.) (Fig. 240). The clade is supported only by synapomorphies that correspond to homoplasious characters which suffer reversions within the clade: outline of apical area of clypeus convex, surface sculpturing of scuto-scutellar groove distinctly corrugated, hind wing vein 1-R1 not differentiated. According to these results,

even though *Toechorychus* could not be clearly related with any particular species or a clearly defined sister group, it can at least be surely assigned to Lymeonina *sensu* Townes.

Platymystax sp. (Hemigasterini) and *Gelis* sp. (Phygadeuontini) were recovered in the same clade of *Toechorychus* by Laurenne *et al*. (2006), in a molecular analysis, but they were always placed close to the tree root in the present analyses. For analyses with *K*=1 and 2, these two genera were recovered as sister groups of *Trihapsis* sp. (Cryptina) and *Latibulus argiolus* (Rossi) (Sphecophagina), respectively. For *K*=3–5, however, the sister groups were the Lymeonina *Pachysomoides* and *Golbachiella* Townes. Nevertheless, in all topologies, *Toechorychus* was always recovered in the most apical branch, unlike *Platymystax* and *Gelis*, disagreeing from the results recovered by Laurenne *et al*. (*op*. *cit*.).

The full character set used for the first analysis is presented below, listed approximately from the anterior to the posterior region of the body. The abbreviation [n/a] is used for non-applicable states.

Wings: The following veins are interpreted differently from Aguiar (2005): 1-Rs+M as Rs&1M; 2+3Rs as (Rs+M)b; 4-Rs as 2Rsb; 4M as 3M. Areolet: 2r-m as 1Rs; 3r-m as r-m; 2M as 2Ma; 3M as 2Mb. This interpretation, however, may change depending on ongoing studies (Aguiar & Sharkey in prep.)

1. **Body surface shine**: [0] matt to shiny, but never metallic; [1] with distinct metallic luster.

2. **Clypeus overall shape**: [0] approximately triangular, base much narrower than apex; [1] rectangular or slightly trapezoidal; base wide, at least 0.6 × width of apex.

3. **Structure of apical portion of clypeus**: [0] truncate; flattened or slightly concave; [1] convex.

4. **Shape of clypeal margin medially**: [0] straight; [1] convex; [1] concave.

5.**Number of teeth on clypeal margin**: [0] 0; [1] 1; [2] 2, even if very small.

6. **Lateral projections on clypeal margin**: [0]absent; [1] present.

7. **Mandible length**: [0] short to medium, total length less than 1.8× basal width; [1] very long, total length over 4.0 × basal width.

8. **Width of mandible apex**: [0] wide, more than 0.5 × as wide as base; [1] narrow, less than 0.5 × as wide as base.

9. **Projection of ventral margin of mandible**: [0] normal, not projected as a flange or crest; [1] projected as a flange or crest.

10. **Relative length of mandible teeth**: [0] ventral tooth longer than dorsal tooth; [1] teeth of equal length; [2] ventral tooth shorter than dorsal tooth, or ventral tooth indistinct.

11. **Shape of ventral tooth of mandible in frontal view**: [0] triangular or almost so, more or less uniformly tapered; [1] trapezoidal or lanceolate; [2] subquadrate; [-] n/a(ventral tooth indistinct).

12. **Differentiation of white band on flagellum of female**: [0] present; [1] absent.

13. **Extension of white on flagellomeres**: [0] covering entirely at least one flagellomere, both dorsally and ventrally; [1] covering only the dorsal face of flagellomeres along their entire length; [-] n/a (white band absent).

14. **Width of female flagellum subapically**: [0] regular, more or less uniform; [1] distinctly greater than rest of flagellum, even if not flattened.

15. **Shape of apex of apical flagellomere**: [0] regular, rounded or pointed;[1] distinctly flattened, cross section oval or subquadratic.

16. **Sculpturing of supra-antennal area medially**: [0] same as remainder of supra-antennal area; [1] with a smoother median longitudinal narrow stripe; [2] with a low, not continuous, median transversal suture-like structure; [3] with a weak to distinct median longitudinal carina.

17. **Presence of oval impression laterad tentorial pit on supra-antennal area**: [0] absent; [1] present.

18. **Presence of median horn or tubercle on supra-antennal area**: [0] absent; [1] present.

19. **Bifurcation of supra-antennal horn**: [0] not divided, either conical or compressed; [1] divided in two horns arising from a common base; [-] n/a (horns absent).

20. **Compression of supra-antennal horn**: [0] not compressed, base about as wide as long; [1] distinctly compressed, base longer than wide; [-] n/a (horns absent).

21. **Shape of apex of supra-antennal horn**: [0] pointed; [1] globose, not pointed.

22. **Profile of supra-antennal horn**: [0] straight; [1] distinctly curved forwards, posteriorly convex; [-] n/a (horns absent).

23. **Width of gena**: [0] ventrallyabout as wide as at eye midlength; [1] distinctly wider ventrally than at eye midlength.

24. **Projection of occipital carina**: [0] low; [1] expanded, wide, forming a distinct flange.

25. **Shape of occipital carina (lateral view)**: [0] more or less straight, not distinctly concave; [1] concave.

26. **Extension of occipital carina ventrally**: [0] complete, reaching hypostomal carina, even if apically faint; [1] incomplete, not reaching hypostomal carina.

27. **Apical shape of occipital carina**: [0] meeting hypostomal carina far beyong base of mandible; [1] meeting hypostomal carina at or very close to base of mandible; [-] n/a (occipital carina not reaching hypostomal carina).

28. **Dorsomedial differentiation of occipital carina**: [0] present and conspicuous; [1] very narrow or vestigial [2] absent.

29. **Dorsomedial shape of occipital carina**: [0] uniformly arched; [1] distinctly pointed or acuminate; [2] distinctly bent at ventral direction; [-] n/a (carina dorsomedially absent).

30. **Dorsolateral shape of occipital carina**: [0] uniformly curved; [1] angled or sinuous.

31. **Ventral shape of occipital carina**: [0] uniformly curved with dorsal portion; [1] irregular, more markedly arched than ventral portion.

32. **Projection of hypostomal carina**: [0] normal, not projected; [1] expanded, forming a flange or crest.

33. **Shape of vertex dorsomedially**: [0] without sulcus; [1] with a deep longitudinal sulcus between ocellar triangle and occipital carina.

34. **Mesoscutum sculpturing**: [0] shiny; [1] matt.

35. **Shape of dorsal margin of pronotum**: [0] regular, not or only slightly swollen; [1] markedly swollen, often forming a tubercle near dorsal end of epomia.

36. **Epomia length**: [0] short, ending far from dorsal margin of pronotum; [1] long, reaching dorsal margin of pronotum or nearly so; [2] absent.

37. **Shape of median portion of pronotum (lateral view)**: [0] regular, more or less flat, without a transverse depression; [1] weakly to strongly concave.

38. **Notaulus length**: [0] very short to short, not reaching middle of mesoscutum; [1] long, reaching past middle of mesoscutum; [2] completely absent.

39. **Notaulus differentiation**: [0] absent or very weak, not distinctly dividing mesoscutum; [1] moderate, narrow and slightly dividing mesoscutum; [2] deep,wide, distinctly dividing mesoscutum into three lobes.

40. **Surface sculpturing inside the notaulus**: [0] uniformly smooth or punctate with mesoscutum; [1] with distinct longitudinal wrinkles; [-] n/a (notaulus absent).

41. **Degree of convergence of notauli at middle portion**: [0] parallel or subparallel; [1] distinctly convergent posteriorly; [-] n/a (notaulus absent).

42. **Curvature of anterior apex of notaulus**: [0] slight or indistinct, anterior apex straight or almost so; [1] strong, anterior apex distinctly curved in lateral direction; [-] n/a (notaulus absent).

43. **Shape of posterior end of notaulus**: [0] straight, either parallel or convergent; [1] abruptly curved mesad, both notauli meeting posteriorly in U-shape; [-] n/a (notaulus absent).

44. **Mid-longitudinal groove on posterior portion of central lobe of mesoscutum**: [0] absent; [1] present, even if weak.

45. **Surface sculpturing of scuto-scutellar groove**: [0] crenulated; [1] smooth.

46. **Surface sculpturing of mesopleuron dorsad hypoepimeron**: [0] distinctly striate; [1] smooth.

47. **Extension of epicnemial carina**: [0] complete, reaching subalar ridge or almost so; [1] reaching only 0.6–0.85 of distance to subalar ridge; [2] reaching at most 0.5 of distance to subalar ridge.

48. **Projection of epicnemial carina**: [0] without projections or flanges; [1] medially with two triangular, perpendicular projections on each side of mesoscutum.

49. **Differentiation of sternaulus**: [0] complete but faint at least at posterior third; [1] complete and distinct throughout; [2] faint and incomplete, reaching 0.45–0.65 of the distance to mid coxa.

50. **Position of of sternaulus**: [0] placed laterally along its entire length; [1] anteriorly placed somewhat ventrally on mesothorax, posteriorly changing to occupy lateral position.

51. **Sculpturing of sternaulus**: [0] uniformly smooth or punctate with mesopleuron; [1] crenulate.

52. **Differentiation of median portion of posterior transverse carina of the mesothoracic venter**: [0] absent; [1] present, even if vestigial.

53. **Shape of median portion of posterior transverse carina of the mesothoracic venter**: [0] straight; [1] arched forwards, somewhat v-shaped [2] distinctly arched backwards; [-] n/a (median portion absent).

54. **Projection of median ventral portion of posterior transverse carina of the mesothoracic venter**: [0] without projections or flanges; [1] with two triangular projections at each side of mesosternum; [-] n/a (median portion absent).

55. **Differentiation of metapleural triangle**: [0] distinct, not impressed (e.g. Fig. 278); [1] small, impressed, sometimes almost indistinct.

56. **Presence of teeth-like projections at hind margin of metanotum**: [0] present; [1] absent (Figs. 162–206).

57. **Differentiation of dorsal division of metapleuron at median portion**: [0] not differentiated, metanotum and propodeum separated only by the transverse furrow (see Morphology section) ; [1] expanded, along with the transverse furrow forming the transverse sulcus (see Morphology section).

58. **Length of transverse furrow at base of propodeum**: [0] short, sometimes almost indistinct,; [1] , at least 0.25 as long as anterior area of propodeum .

Comment: note that the transverse furrow can be connected to the median portion of the dorsal division of metapleuron, forming a long area termed *transverse sulcus* (see character 57 and Morphology section). This character refers only to the length of the transverse furrow.**59**. **Depth of transverse furrow at base of propodeum**: [0] very deep to moderately shallow; [1] very shallow, sometimes inconspicuous.

60. **Surface sculpturing of transverse furrow at base of propodeum**: [0] smooth; [1] crenulate.

61. **Infuscation of fore wing**: [0] hyaline, even if with one to three dark marks; [1] weakly and uniformly infuscate, partially transparent; [1] strongly infuscate, entirely black or dark brown.

62. **Shape of fore wing vein Rs&1M**: [0] straight or slightly convex; [1] concave or sinuous, even if slightly.

63. **Length of fore wing crossvein 1m-cu**: [0] about as long as vein (Rs+M)b; distinctly shorter than vein (Rs+M)b [1]; distinctly longer than vein (Rs+M)b [2]; [-] n/a (limit between veins indistinct). Note: (Rs+M)b incorrectly referred as "1-Rs+M" in Aguiar 2005.

64. **Presence of bulla on fore wing vein (Rs+M)b**: [0] absent; [1] present

65. **Position of bulla on fore wing vein (Rs+M)b**: [0] central; [1] apical, reaching cell 1+2Rs or nearly so; [2] bulla absent.

66. **Shape of fore wing crossvein 1m-cu**: [0] straight or uniformly curved; [1] sinuous or somewhat irregular.

67. **Presence of short vein projection (ramellus) arising at junction of fore wing veins 1m-cu and (Rs+M)b**: [0] absent; [1] present. [Same comments for character 63 apply]

68. **Distinctness of limit between fore wing veins 1m-cu and (Rs+M)b**: [0] distinct; [1] indistinct, veins perfectly continuous. [Same comments for character 63 apply]

69. **Shape of fore wing vein (Rs+M)b**: [0] weakly and uniformly curved, or straight; [1] slightly sinuous to weakly irregular.

70. **Cell 2Cu (first subdiscal) shape**: [0] approximately rectangular, about as long basally as apically; [1] approximately trapezoidal, distinctly longer apically than basally.

71. **Position of fore wing crossvein 1cu-a**: [0] distinctly not opposite to base of Rs&1M; [1] opposite to to base of Rs&1M or almost so.

72. **Angle between fore wing crossvein 1cu-a and vein M+Cu**: [0] approximately 90 degrees; [1] distinctly obtuse; [2] distinctly acute.

73. **Shape of fore wing crossvein 1cu-a**: [0] straight; [1] convex, or at least posterior half slightly curved; [2] concave.

74. **Relative length of fore wing vein 2Cua**: [0] distinctly longer than crossvein 2cu-a; [1] nearly of the same length of 2cu-a, or 2cu-a slightly longer; [2] much shorter than crossvein 2cu-a; [3] 2Cua entirely absent.

75. **Relative position of fore wing veins 2Cua and 2cu-a**: [0] aligned; [1] angled, even if slightly; [-] n/a (2Cua entirely absent).

76. **Shape of fore wing vein 2Rsb**: [0] uniformly curved; [1] sinuous or irregular.

77. **Relative position of fore wing veins 2Rsb and 3M**: [0] basally aligned, starting at the same level of the wing length; [1] basally misaligned, starting at different levels of the wing length.

78. **Shape of fore wing vein 2m-cu**: [0] convex; [1] straight; [2] concave, even if slightly; [3] sinuous or irregular.

79. **Position of bulla of fore wing crossvein 2m-cu**: [0] mostly central to mostly ventral; [1] placed entirely or mostly on anterior 0.5; [2] nearly reaching or reaching cell 1+2Rs (areolet).

80. **Size of cell 1+2Rs (areolet)**: [0] small; [1] large, about as high as width of pterostigma; [-] n/a (cell 1+2Rs not differentiated).

81. **Relative position of fore wing veins 1Rs and r-m**: [0] parallel or nearly so; [1] distinctly but slightly or moderately convergent towards anterior margin of wing; [2] markedly convergent, anterior portion or cell 1+2Rs less than 0.7 its maximum width; [-] n/a (cell 1+2Rs open or not differentiated).

82. **Relative length of fore wing veins 1Rs and r-m**: [0] both veins with approximately the same length; [1] 1Rs distinctly longer than r-m; [2] 1Rs distinctly shorter than r-m; [-] n/a (cell 1+2Rs open: apical vein absent).

83. **Structure of fore wing vein 2Ma**: [0] entirely tubular or nebulous; [1] entirely or partly spectral.

84. **Length of fore wing vein 2Ma**: [0] approximately the same length of 2Mb, or one slightly shorter than the other; [1] distinctly shorter than 2Mb; [2] distinctly longer than 2Mb; [-] n/a (cell 1+2Rs not differentiated).

85. **Structure of fore wing vein r-m**: [0] tubular or nebulous; [1] entirely or partly spectral, including "with bulla"; [2] not differentiated, cell 1+2Rs open; [-] n/a (cell 1+2Rs not differentiated).

86. **Shape of cell 1+2Rs (areolet)**: [0] pentagonal, or nearly square or circular, even if slightly taller than wide or if open; [1] transversally elongated, distinctly wider than high ; [-] n/a (cell 1+2Rs not differentiated).

87. **Structure of fore wing vein 2Mb**: [0] tubular or nebulous [1] mostly or entirely spectral.

88. **Structure of fore wing 3M**: [0] tubular or nebulous, distinct until wing margin or nearly so; [1] mostly or entirely spectral, sometimes apically indistinct.

89. **Relative length of fore wing vein 3M**: [0] slightly to distinctly longer than vein 2Rsb; [1] nearly as long as, or shorter, than 2Rsb; [-] n/a (3M nebulous or spectral on apical half or more).

90. **Shape of hind wing vein M+Cu sub-apically**: [0] uniformly and weakly convex, or straight; [1] strongly convex; [2] concave.

91. **Length of hind wing vein Cua**: [0] nearly × as long as crossvein cu-a; [1] 1-Cu distinctly longer; [2] Cua distinctly shorter.

92. **Shape of hind wing vein Cua**: [0] straight; [1] slightly convex or sinuous; [2] concave.

93. **Structure of hind wing vein 2Rs**: [0] entirely tubular; [1] apical half or more nebulous or spectral.

94. **Shape of hind wing cell R1 basally**: [0] somewhat trapezoidal, hind wing veins 1-Rs and 2-Rs forming a distinct angle; [1] pointed or lanceolate, hind wing veins 1-Rs and 2-Rs continuous or nearly so.

95. **Angle between hind wing veins Cua and 1M**: [0] about 90º; [1] distinctly acute; [2] distinctly obtuse.

96. **Differentiation of hind wing vein 1R1** (the short basal section of R1 detached from wing margin): [0] distinct; [1] not differentiated.

97. **Differentiation of hind wing vein Cub**: [0] present and tubular; [1] absent or spectral only.

98. **Shape of hind wing vein Cub apical half**: [0] concave, straight or only very slightly convex; [1] distinctly convex, even if sinuous; [-] n/a (vein Cub not differenciated).

99. **Length of hind wing vein 2-1A**: [0] short, reaching less than 0.3 of the way to wing margin, or absent; [1] complete or reaching more than 0.5 of the way to wing margin.

100. **Aspect of fore tibia of female**: [0] normal, not swollen or basally constricted; [1] swollen, basally constricted.

101. **Region of greatest swelling on fore tibia**: [0] at median portion, tibia of oval or fusiform aspect; [1] subapical or continuous, tibia somewhat conic; [-] n/a (tibia not swollen).

102. **Shape of hind coxa**: [0] globose, about as long as its maximum diameter; [1] distinctly elongate, much longer than wide.

103. **Shape of fourth tarsomeres of females (all legs)**: [0] distinctly bilobed; [1] not distinctly bilobed.

104. **Relative length of lobes of female fourth tarsomeres (all legs)**: [0] approximately of equal length [1] unequal, mesal lobe at least 1.5 × as long as lateral lobe; [-] n/a (tarsomeres not bilobed).

105. **Differentiation of juxtacoxal carina**: [0] present, even if incomplete; [1] completely absent.

106. **Differentiation of pleural carina**: [0] absent; [1] distinct and complete; [2] distinct but weak and incomplete.

107. **Presence of tooth like sublateral projections at anterior margin of propodeum,** : [0] absent; [1] present.

108. **Median outline of anterior margin of propodeum**: [0] straight; [1] convex; [2] concave.

109. **Elevation of anterior area of propodeum**: [0] not inflated, in lateral view at the same level as the rest of propodeum; [1] somewhat inflated, in lateral view distinctly elevated compared to the rest of propodeum.

110. **Shape of propodeal spiracle**: [0] rounded or almost so; [1] distinctly elliptic, about 2.0 × width; [2] elongate, length distinctly over 2.5 × width.

111. **Length of anterior area of propodeum**: [0] approximately as long as distance between anterior and posterior transverse carinae, or just slightly shorter; [1] much shorter than distance between anterior and posterior transverse carinae; [2] longer than distance between anterior and posterior transverse carinae; [-] n/a (posterior or anterior carina absent).

112. **Differentiation of anterior transverse carina of propodeum**: [0] present, distinct; [1] absent.

113. **Shape of anterior transverse carina of propodeum**: [0] straight or weakly and uniformly curved; [1] strongly curved at median portion; [2] fused with posterior transverse carina; [-] n/a (anterior carina absent).

114. **Sculpturing over anterior surface of anterior transverse carina of propodeum**: [0] without longitudinal wrinkles [1] with distinct longitudinal wrinkles; [-] n/a (anterior carina absent).

115. **Posterior sculpturing over anterior transverse carina of propodeum**: [0] uniformly sculptured with propodeum; [1] with distinct longitudinal wrinkles; [-] n/a (anterior carina absent).

116. **Sculpturing of posterior area of propodeum**: [0] smooth or variously sculptured, not transversally wrinkled; [1] with distinct transverse wrinkles, either closely or widely spaced, straight or curved.

117. **Shape of transverse wrinkles of posterior area of propodeum**: [0] slightly to distinctly curved or sinuous; [1] straight.

118. **Presence of longitudinal medial carina on propodeum**: [0] absent; [1] interrupted medially; [2] complete from anterior carina until base of T1.

119. **Shape of posterior transverse carina of propodeum**: [0] uniformly convex, weakly or strongly, even if briefly interrupted centrally; [1] strongly bell-shaped or trapezoidal; [-] n/a (posterior transverse carina present only as sublateral crests or absent).

120. **Differentiation of posterior transverse carina of propodeum**: [0] complete, either with or without sublateral crests; [1] interrupted medially, between sublateral crests or apophyses; [2] absent except for crests or apophyses; [3] completely absent.

121. **Shape of sublateral portions of posterior transverse carina of propodeum**: [0] not forming crests or flanges; [1] forming distinct crests or flanges; [n/a], posterior transverse carina absent.

122. **Structure of sublateral swelling at posterior area of propodeum**: [0] rhombic, its apex rounded; [1] pointed, spine-like; [-] n/a (sublateral portion not swollen).

123. **Outline of sublateral portion of posterior transverse carina**: [0] regular, not expanded or forming distinct crests or flanges; [1] expanded into distinct crests or flanges; [-] n/a (posterior transverse carina absent).

124. **Presence of longitudinal carina between anterior margin of propodeum and anterior transverse carina**: [0] complete; [1] absent; [2] vestigial or partially developed.

125. **Presence of longitudinal carina between anterior and posterior transverse carinae of propodeum**: [0] complete; [1] absent; [2] vestigial or partially developed.

126. **Presence of longitudinal carina posterior to posterior transverse carina of propodeum**: [0] complete, reaching petiolar foramen; [1] absent; [2] vestigial or partially developed.

127. **Presence of longitudinal carina near dorsal surface of propodeal spiracle (lateral view)**: [0] absent; [1] present.

128. **Presence of a longitudinal carina between anterior transverse carina and crests or apophyses of propodeum**: [0] entirely absent; [1] present, even if weak.

129. **Shape of first metasomal tergite**: [0] short and triangular, length/(maximum width - minimum width) less than 4.0; [1] regular, somewhat elongate, lg/(w_{max}-w_{min}) 4.0–6.0; [2] long and slender, lg/(w_{max}-w_{min}) over 6.0.

130. **Ventrolateral outline of of first metasomal segment**: [0] somewhat angled, giving petiole ventrally a somewhat prismatic shape; [1] approximately rounded, giving petiole ventrally a somewhat cylindrical shape.

131. **Angle between petiole and postpetiole**: [0] posteptiole distinctly bent in ventral direction, strongly angled with petiole; [1] postpetiole not distinctly bent, at most forming very slight angle with petiole.

132. **Presence of median depression on T1**: [0] absent; [1] present.

133. **Presence of median posterior depression on T1**: [0] absent; [1] present.

134. **Presence of anterolateral tooth at first metasomal tergite**: [0] absent; [1] present, even if vestigial.

135. **Position of spiracle of first metasomal tergite**: [0] beyond middle; [1] at middle or nearly so.

136. **Projection of spiracle of first metasomal tergite in dorsal view**: [0] not prominent; [1] prominent.

137. **Differentiation of dorsolateral carina of first metasomal tergite**: [0] complete, even if much weaker on basal portion; [1] very weak or distinct only near base or above the spiracle; [2] completely absent.

138. **Differentiation of median dorsal carina of first metasomal tergite**: [0] distinct until the spiracle; [1] represented only by weak, often incomplete longitudinal ridge; [2] completely absent.

139. **Differentiation of ventrolateral carina of first metasomal tergite**: [0] complete, even if basal portion much weaker than apical one; [1] very weak or distinct only near base; [1] completely absent

140. **Shape of apical portion of T1 in dorsal view**: [0] narrowing towards apex, or margins parallel; [1] subapically distinctly wider than posterior margin, somewhat inflated.

141. **Shape of thyridium**: [0] subcircular; [1] distinctly longer than wide; [2] distinctly wider than long.

142. **T7-8 length in lateral view**: [0] of similar size or shorter than, respectively, T5-6; [1] distinctly longer than, respectively, T5-6.

143. **Differentiation of intersegmental membrane between T7–8**: [0] indistinct or if distinct, very short and hardly distinguishable; [1] distinct and long, making limit between the borders of T7–8 hardly distinguishable (see Fig. 11).

144. **Ovipositor thickness in profile**: [0] thick, stout; [1] moderately slender; [2] very slender, hair-like, usually long and contorted.

145. **Ovipositor shape in lateral view**: [0] straight or nearly so; [1] distinctly downcurved; [2] distinctly upcurved.

146. **Ovipositor compression**: [0] conspicuously compressed; [1] approximately cylindrical

147. **Conspicuousnessbetween first gonapophyses**: [0] distinct, both gonapophyses apparently somewhat fused, tubular; [1] indistinct, gonapophyses distinctly individualized and often separated in dried specimens.

148. **Shape of ovipositor tip**: [0] cylindrical or compressed in the same way of basal portion; [1] distinctly depressed; remainder of ovipositor cylindrical. See also characteer 154.**149**. **Presence of tiny punctures throughout ovipositor dorsal valve**: [0] absent; [1] present.

150. **Differentiation of nodus of ovipositor dorsal valve**: [0] tall, giving triangular shape to apex; [1] nodus weak or not evident, apex not triangular.

151. **Presence of notch of ovipositor dorsal valve**: [0] present; [1] absent.

152. **Presence of apical v-shaped sulcus at ovipositor dorsal valve**: [0] absent; [1] present before apical teeth of ovipositor ventral valve (Fig. 45 in Tedesco & Aguiar 2012).

153. **Presence of subapical compression on ovipositor ventral valve**: [0] absent; [1] present before apical teeth (Fig. 45 in Tedesco & Aguiar 2012).

154. **Pointing of ovipositor tip**: [0] blunt or only moderately pointed; [1] ending in a long and narrow point. See also character 148.

155. **Presence of apical rounded foldings at ovipositor dorsal valve**: [0] absent; [1] present (as in *Baryceros* Gravenhorst; see Fig. 183 in Townes 1970).

156. **Presence of notch-like marks at apex of ovipositor dorsal valve**: [0] absent; [1] present (as in *Lamprocryptus* Schmiedeknecht; see Fig. 203 in Townes 1970).

157. **Presence of apical ridges at ovipositor dorsal valve**: [0] absent, even if serrations or noth marks present (Figs 279–281); [1] with 3–5 distinct blunt ridges (as in many species of *Messatoporus*; see Figs 282–288); [2] with distinct pointed ridges (as in *Stenarella* Szépligeti; see Fig. 279 in Townes 1970)..

158. **Prominence of ventral valve subapically**: [0] with a distinct swelling; [1] without a distinct swelling.

159. **Differentiation of apical lobe of ovipositor ventral valve**: [0] absent, ventral valve apically not projected dorsally; [1] present, ventral valve apically projected dorsally, partially overlapping dorsal valve; [2] ventral valve apically expanded to cover entire tip as a sheath.

160. **Differentiation of teeth of ventral valve tip**: [0] present along entire tip; [1] weak and restricted to the very tip, or serrations absent.

161. **Orientation of apical teeth on ovipositor ventral valve**: [0] distinctly inclivous; [1] approximately vertical; [2] distinctly reclivous.

162. **Shape of individual teeth (=parallel carinae) on apex of ventral valve**: [0] uniformly arched; [1] conspicuously arched or bent towards base, forming a dentiform, triangular structure.

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7 – CONCLUSÃO

As seguintes principais conclusões são derivadas do presente trabalho:

- *Toechorychus* é um grupo monofilético, definido principalmente pelas seguintes sinapomorfias não-homoplásicas: presença de um sulco subapical em forma de V na valva dorsal do ovipositor; presença de uma compressão subapical no ovipositor.

- O gênero é de fácil reconhecimento, sendo diagnosticado pelos seguintes caracteres: carena epicnemial geralmente não alcançando mais do que 0.3 da distância até a proeminência subtegular; sulco apical em forma de V presente na valva dorsal do ovipositor, anteriormente aos dentes apicais da valva ventral; presença de uma compressão subapical no ovipositor; bainha do ovipositor cerca de 0.1 tão longa quanto a tíbia posterior; e margem dorsal do pronoto fortemente inchada.

- Apesar de seguramente alocado em Lymeonina *sensu* Townes, tanto nas análises cladísticas quanto no estudo morfológico, e aparentemente relacionado aos gêneros *Lymeon* e *Acerastes*, não há grupo-irmão estritamente definido para o gênero. O grupo-irmão, ao contrário, mostrou-se muito instável nas buscas realizadas.

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9 – APÊNDICE A

Appendix. Character-state set formatted as a DELTA file.

#1. Fore wing <length>/
    mm/
#2. Mandible <length>/
    as long as basal width/
#3. <Mandible pilosity>/
    1. almost glabrous/
    2. moderately pilose/
    3. densely pilose/
#4. <Mandible> ventral margin/
    1. projected as crest/
    2. regularly shaped, not projected/
    3. slightly projected as crest/
#5. Dorsal tooth/
    1. distinctly longer than ventral tooth/
    2. distinctly shorter than ventral tooth/
#6. Clypeus <proportion>/
    as wide as high/
#7. <Clypeus, shape>/
    1. rectangular/
    2. subrectangular/
    3. subtriangular/
    4. subquadrate/
#8. <Clypeus sculpture>/
    1. entirely smooth, with scarce punctures/
    2. finely punctate/
    3. finely punctate, apically smooth/
    4. minutely strigulate, apically smooth/

5. entirely finely strigulate/

#9. Apex <ratio>/

as long as base/

#10. <Clypeus, apex shape>/

1. truncate/

2. slightly but distinctly convex/

#11. <Clypeus> apical margin/

1. sharp/

2. blunt/

#12. <Clypeus, apical margin> medially/

1. straight/

2. slightly convex/

3. slightly concave/

#13. Supraclypeal area <sculpture>/

1. medially strigate, laterally finely punctate/

2. medially strigate, laterally and medially finely punctate/

3. entirely densely punctate/

4. entirely densely punctate, dorsally also strigulate/

5. entirely strigate, with scarce punctures/

6. entirely strigulate and densely punctate/

#14. <Supraclypeal area, pilosity>/

1. almost glabrous/

2. moderately pilose/

3. densely pilose/

#15. <Supraclypeal area> medially <shape>/

1. slightly prominent/

2. with longitudinal subrectangular prominent area/

3. with oval prominent area/

#16. <Supraclypeal area> between antennal foramens <protuberance>/

1. without carina/

2. with V-shaped carina, medially interrupted/

3. with V-shaped carina/

4. with U-shaped carina/

5. with U-shaped carina medially widely interrupted/

6. with three U-shaped, concentric carinae, all medially interrupted/

7. with three, complete, U-shaped carinae/

#17. Radicle <sculpture>/

1. foveolate/

2. punctate/

#18. Antenna with <number of flagellomeres>/

flagellomeres/

#19. White band starting at flagellomere <number>/

#20. Reaching flagellomere <number>/

#21. Flagellum <shape>/

1. somewhat stout/

2. slender/

#22. Subapical flagellomeres/

1. as wide as basal ones, not flattened/

2. slightly flattened/

#23. Supra-antennal area <median carinae>/

1. without distinct median carina/

2. with faint but distinct median longitudinal carina/

3. with stout, median, longitudinal carina/

4. with stout, median, arched, transverse carina/

5. with stout, median, transversally arched, medially interrupted carina/

#24. <Supra-antennal area, median elevation> medially/

1. without longitudinal elevation/

2. with slightly longitudinal elevation/

3. with moderate longitudinal elevation/

4. with small rounded elevation/

#24. Median logitudinal elevation <Supra-antennal area>/

1. absent/

2. faint/

3. short, rounded/

4. moderately developed/

#25. <Supra-antennal area, sculpture> near antennal sockets/

1. not striate/

2. striate/

3. striolate/

#26. <Supra-antennal area, sculpture> dorsal half medially/

1. smooth/

2. scarcely punctulate/

3. punctulate/

4. rugulose/

5. rugose/

6. strigulate/

#27. Paraocular area <sculpture>/

1. smooth/

2. finely punctulate/

3. finely strigulate/

#28. Vertex <sculpture near ocelli>/

1. smooth/

2. strigulate between ocelli/

3. rugulose between ocelli/

4. rugulose around ocelli/

5. punctate around ocelli/

6. with very coarse punctures around ocelli/

#29. <Vertex, presence of sulcus>/

1. without sulcus/

2. at anterior third with short, longitudinal sulcus, posterior two-thirds smooth/

3. at anterior two-thirds with long, shallow sulcus, posterior third smooth/

#30. Gena, and vertex near ocelli <sculpture>/

1. smooth/

2. punctulate/

3. minutely strigulate/

4. with scarce punctures/

#31. <Gena and vertex near ocelli, pilosity>/

1. glabrous/

2. sparsely pilose/

3. densely pilose/

#32. <Gena, length> gena in lateral view/

1. uniformly narrow/

2. uniformly wide/

3. at level of dorsal portion of occipital carina narrow, ventrally wide/

4. at level of dorsal portion of occipital carina wide, ventrally narrow/

#33. Occipital carina/

1. faint/

2. stout, dorsally faint/

3. stout/

#34. <Occipital carina> dorsally/

1. absent/

2. straight/

3. uniformly arched/

4. V-shaped/

#35. <Occipital carina, projection> ventrally/

1. regularly shaped, not projected/

2. slightly projected as crest/

3. distinctly projected as crest/

#36. <Occipital carina>/

1. reaching hypostomal carina at mandible base or nearly so/

2. reaching hypostomal carina far from mandible base/

#37. Hypostomal carina <projection>/

1. slightly projected as crest/

2. regularly shaped, not projected/

3. projected as crest/

#38. Malar space <ratio>/

as long as basal width of mandible/

#39. Pronotum centrally <sculpture>/

1. smooth/
2. corrugated/

#40. <Pronotum, general sculpture> latero-ventrally/

1. smooth/
2. strigate behind collar/
3. markedly strigate behind collar/
4. rugulose behind collar/
5. rugose behind collar/
6. markedly rugose behind collar/

#41. Margin near mesopleuron/

1. not corrugated/
2. ventrally corrugated/
3. ventrally distinctly corrugated/
4. entirely corrugated/

#42. Pronotal swelling <sculpture>/

1. smooth/
2. dorsally smooth, ventrally strigulate/
3. finely rugulose/
4. strigulate/
5. striate/
6. with sparse coarse punctures/

#43. Collar dorso-laterally <swelling>/

1. rounded, distinctly swollen/
2. carinated, not swollen/

#44. <Pronotum, collar> anteriorly/

1. smooth/
2. punctulate/

3. punctate/
4. with coarse punctures/
5. rugulose/

#45. Epomia/

1. absent/
2. very faint, almost indistinct/
3. stout, restricted to space between posterior margin of collar and pronotal swelling/
4. stout, ending at pronotal swelling/

#46. Mesoscutum <pilosity>/

1. glabrous/
2. sparsely pilose/
3. densely pilose/

#47. <Mesoscutum sculpture>/

1. smooth/
2. densely punctate/
3. dorsally punctulate, laterally markedly corrugated/
4. densely punctate, impression of notaulus corrugated/
5. covered with sparse coarse punctures/
6. dorsally punctulate, laterally markedly corrugated, central lobe with sparse coarse punctures/
7. dorsally punctulate, laterally markedly corrugated, central lobe with dense coarse punctures/
8. densely punctulate, covered with sparse coarse punctures, impression of notaulus corrugated/
9. dorsally rugulose, impression of notaulus markedly corrugated, central lobe with sparse coarse punctures/

#48. Central lobe <Mesoscutum, presence of sulcus>/

1. with longitudinal sulcus/
2. with faint longitudinal carina/
3. without longitudinal sulcus or carina/

#49. Notauli <impression>/

1. faintly impressed/
2. moderately impressed/
3. deeply impressed/

#50. <Notauli, posterior margin>/

1. posteriorly convergent/
2. posteriorly abruptly curved, U-shaped/
3. parallel throughout/

#51. Scuto-scutellar groove/

1. smooth, polished/
2. faintly corrugated/
3. markedly corrugated/

#52. Scutellum/

as long as wide/

#53. <Scutellum, sculpture>/

1. smooth/
2. scarcely punctate/
3. densely punctate/

#54. Scutellar carina/

1. incomplete, restricted approximately to anterior 0.3/
2. incomplete, restricted approximately to anterior 0.6/
3. complete, posteriorly closing/

#55. Postscutellum/

as long as wide/

#56. Hind margin of metanotum <presence of teeth>/

1. with two lateral teeth/
2. with two short lateral carinae extending towards transverse furrow at base of propodeum/
3. without teeth or carinae/

#57. Subalar ridge/

1. somewhat elongate/
2. somewhat rounded/

#58. Mesopleuron/

1. dorsally medially strigate/
2. dorsally medially markedly strigate/
3. dorsally strigate/
4. dorsally strigate only before hypoepimeron, centrally polished/
5. dorsally strigate, include over hypoepimeron/
6. entirely markedly strigate/
7. entirely densely punctate/

#59. Ventrally/

1. strigate/
2. strigulate/
3. smooth/
4. rugulose/

#60. Mesopleural groove/

1. corrugated/
2. not corrugated/

#61. Epicnemial carina/

1. stout/
2. faint/

#62. <Epicnemial carina>/

1. dorsally straight/
2. dorsally curving forwards/
3. dorsally curving backwards/

#63. Dorsal end of epicnemial carina/

1. not reaching ventral margin of pronotum/
2. reaching 0.1 of posterior margin of pronotum/
3. reaching 0.2 of posterior margin of pronotum/

#64. <Sculpture behind epicnemial carina> behind epicnemial carina/

1. with rounded confused-rugulose area/
2. without rounded confused-rugulose area/

#65. Sternaulus <length>/

1. complete/

2. incomplete/

3. medially shallow, interrupted/

#66. <Sternaulus, meeting with coxa>/

1. not reaching base of mid coxa/

2. reaching base of mid coxa/

#67. <Sternaulus, shape>/

1. almost straight/

2. moderately sinuate/

3. markedly sinuate/

#68. <Sternaulus, impression>/

1. deeply impressed/

2. moderately impressed/

3. posteriorly almost faint/

#69. <Sternaulus, posteriorly> faint at posterior/

#70. Faint from anterior/

#71. <Continued> to/

#72. <Sternaulus, sculpture>/

1. not corrugated/

2. faintly corrugated/

3. markedly corrugated/

#73. Scrobe/

1. very shallow, forming sulcus/

2. moderately deep, forming pit with sulcus/

3. deeply impressed, forming pit/

#74. Mesothoracic venter <sculpture>/

1. coarsely punctate/

2. punctate and strigulate/

3. punctate/

4. strigulate/

5. smooth/

#75. Median portion of posterior transverse carina of mesothoracic venter/

1. short and straight/
2. long and straight/
3. convex/
4. V-shaped/

#76. <Median portion of posterior transverse carina of mesothoracic venter>/
1. expanded as two deltaic perpendicular projections/
2. regularly shaped, without projections/

#77. Mesosoma in dorsal view/
as long as wide/

#78. In lateral view, mesosoma width/
mm/

#79. Transverse furrow at base of propodeum laterally/
as long as anterior portion of propodeum/

#80. <Transverse furrow at base of propodeum, depth>/
1. shallow/
2. moderately deep/
3. deep/

#81. <Transverse furrow at base of propodeum, width> and/
1. narrow/
2. narrow, medially wide/
3. moderately narrow, medially wide/
4. wide/
5. very wide/

#82. <Transverse furrow at base of propodeum, sculpture>/
1. very faintly corrugated, almost smooth/
2. very faintly corrugated, almost smooth, medially some carinae stouter/
3. uniformly corrugated/
4. markedly corrugated/
5. very markedly corrugated/
6. closely corrugated, medially some carinae distinctly stouter/

#83. Propodeum <proportion>/

as long as wide medially/

#84. Anterior margin of propodeum <presence of teeth>/

1. without teeth/
2. with two vestigial lateral teeth/
3. with two lateral teeth/

#85. Anterior portion of propodeum <sculpture>/

1. with sparse coarse punctures/
2. finely strigulate/
3. strigulate/
4. posteriorly strigate/
5. strigate/
6. punctulate/
7. confused-rugose/

#86. <Anterior portion of propodeum, presence of carinae> medially/

1. without longitudinal carinae/
2. with two faint parallel longitudinal carinae/
3. with two parallel longitudinal carinae/
4. with two posteriorly convergent faint longitudinal carinae/
5. with two posteriorly convergent longitudinal carinae/

#87. <Anterior portion of propodeum, presence of carinae> lateral longitudinal carina of propodeum/

1. indistinct/
2. represented by faint but distinct subcircular carina/
3. represented by subcircular carina/
4. represented by short curved carina/

#88. Posterior portion of propodeum <sculpture>/

1. mostly smooth, with widely spaced wrinkles/
2. faintly strigate/
3. confused-rugose/
4. before posterior transverse carina medially confused-rugose and laterally punctulate, behind strigate-rugose/

5. laterally strigate, medially confused-rugose/
6. strigate, progressively coarse toward posterior margin/
7. punctate and strigate/
8. markedly strigate, striation medially arched backwardss/
9. entirely markedly strigate/

#89. <Posterior portion of propodeum, presence of longitudinal carina> medially/

1. without distinctly stout longitudinal carina/
2. with swollen longitudinal carina/
3. with longitudinal carina until mid-length/
4. with two stout longitudinal carina/
5. longitudinally swollen/
6. with distinct longitudinal carina/

#90. Behind posterior transverse carina/

1. without distinct longitudinal carinae/
2. with two divergent longitudinal carinae/
3. with two stout parallel longitudinal carinae/

#91. Anterior transverse carina of propodeum/

1. absent/
2. medially interrupted/
3. complete/

#92. <Anterior transverse carina of propodeum>/

1. faint/
2. laterally faint/
3. stout/

#93. <Anterior transverse carina of propodeum>/

1. straight/
2. medially slightly arched forwards/
3. medially markedly arched forwards/
4. entirely slightly arched forwards/
5. medially arched backwards/

#94. Posterior transverse carina/

1. absent/
2. only indicated by lateral, slight swellings, otherwise absent/
3. represented by lateral crests, otherwise absent/
4. represented by crests, then developed laterally as typical carina/
5. represented by long, spine-like apophyses, curved towards apex of metasoma/
6. represented by long, conical apophyses/
7. represented only by low, rounded tubercles, otherwise absent/
8. incomplete, medially interrupted, laterally with low swelling/
9. complete, medially arched, laterally with low swelling/

#95. Apophysis or conical swelling <size>/

as high as wide/

#96. Propodeal spiracle/

as long as wide/

#97. Pleural carina of propodeum/

1. absent/
2. absent, but apparently present because of sculpture patterns of lower division of metapleuron and propodeum/
3. developed only posteriorly/
4. irregular, fused with sculpture of with lower division of metapleuron and propodeum/
5. irregular, obsolescent posteriorly, fused with sculpture of with lower division of metapleuron and propodeum /
6. complete, posteriorly faint/
7. complete, moderately stout/

#98. Lower division of metapleuron <sculpture>/

1. smooth/
2. strigulate/
3. faintly strigulate/
4. minutely strigate/
5. strigate/
6. sparsely punctate/
7. punctate/

#99. <Lower division of metapleuron, pilosity>/

1. sparsely pilose/
2. densely pilose/

#100. Juxtacoxal carina/

1. absent/
2. short and faint/
3. short and stout/
4. represented by very short ridges/
5. stout, medially interrupted/
6. long and stout/
7. reaching base of hind coxa/

#101. Fore wing: vein 2+3Rs/

1. almost straight/
2. almost straight, apically slightly curved/
3. slightly sinuous/
4. slightly and uniformly convex/
5. slightly concave/

#102. Ramellus/

1. absent/
2. present, almost indistinct/

#103. Vein 1M+Rs/

1. anteriorly faintly sinuous/
2. posteriorly faintly sinuous/
3. entirely sinuous/
4. uniformly curved/
5. entirely slightly sinuous/
6. entirely irregular/

#104. Crossvein 1cu-a/

1. straight/
2. almost indistinctly curved/
3. posteriorly slightly curved/

4. posteriorly markedly curved/

5. entirely markedly curved/

#105. <Vein 1cu-a> arising/

1. at vein 1M+Rs base/

2. far from vein 1M+Rs base/

3. near vein 1M+Rs base/

#106. Angle/

1. with vein M+Cu about 90 degrees/

2. with vein M+Cu distinctly obtuse/

#107. Vein 2Cu/

as long as crossvein 2cu-a/

#108. Vein 4Rs/

as long as vein 4M/

#109. <Vein 4Rs>/

1. straight/

2. uniformly and slightly convex/

3. slightly sinuous, almost straight/

4. sinuous/

#110. Cell 1+2Rs/

as high as pterostigma/

#111. <Areolet>/

1. almost indistinct/

2. rectangular/

3. pentagonal/

#112. Vein 2M/

1. indistinct/

2. approximately as long as vein 3M/

3. distinctly longer than vein 3M/

4. distinctly shorter than vein 3M/

#113. Vein 3M/

1. distinct/

2. indistinct/

#114. <Vein 3M>/

as long as vein 2M/

#115. Hind wing: vein 1Cu/

as long as crossvein cu-a/

#116. Vein 2-1A reaching/

of distance to posterior margin/

#117. Tibia/

3. with very sparse short bristles/

1. with sparse short bristles/

2. with dense short bristles/

#118. Hind coxa/

1. elongate/

2. globose/

#119. T1/

as long as hind femur/

#120. <T1>/

1. without basolateral tooth/

3. with vestigial basolateral tooth/

2. with distinct basolateral tooth/

#121. <T1, sculpture>/

1. anteriorly smooth, posteriorly coriarious/

2. minutely coriarious/

#122. Spiracle at anterior/

#123. <Spiracle>/

1. not prominent /

2. slightly prominent/

3. prominent/

#124. Postpetiole/

1. dorso-anteriorly convex/

2. dorsally, at level of spiracles, faintly but distinctly concave/

3. dorso-anteriorly flat/

4. dorsally, behind spiracles, markedly concave /

5. dorso-laterally, behind spiracles, markedly concave /

#125. T2–8 <sculpture>/

1. minutely coriarious/

2. punctate, posteriorly coriarious/

#126. <T2–8, pilosity>/

1. almost glabrous/

2. sparsely pilose/

3. moderately pilose/

4. centrally almost glabrous, laterally pilose/

#127. T2/

as long as wide at apex/

#128. Apex of T2/

as wide as base/

#129. Dorsal valve of ovipositor with nodus/

1. small but distinct/

2. indistinct/

#130. Apex of lower valve < presence of teeth>/

1. with series of teeth/

2. without teeth/

#131. Notch/

1. present/

2. absent/

10 – APÊNDICE B

Tabelas

Table 1. Characters for Cryptini subtribes with genera that most resemble *Toechorychus*. Credits: Tw= Townes 1970, *= original data.

Character	Lymeonina	Goryphina	Cryptina	*Toechorychus*
Surface sculpture of supra-antennal area (Tw)	commonly with carina or elevation	generally without carina or elevation	generally without carina or elevation	=Lymeonina
Teeth at hind margin of metanotum, presence (Tw)	always absent (Fig. 48)	present as small triangular or crescent lobe (Fig. 49)	usually with a small rounded or angular widening	=Goryphina
Mesoscutal median sulcus or Carina, presence (*)	frequently present	absent	absent	=Lymeonina
Lateral teeth at base of T1, presence (Tw)	always absent (except in *Savolia maculata* Seyrig) (Fig. 54)	often present (Fig. 53)	present or absent	=Goryphina/Cryptina
Surface sculpture of transverse furrow at base of propodeum (Tw)	always corrugated (Fig. 151)	not corrugated (Fig. 137)	not corrugated	=Goryphina/Cryptina / Lymeonina
Ramellus, presence (Tw)	always absent	always absent	often present	=Cryptina
Dorsal portion of occipital carina, presence (*)	frequently inconspicuous or absent (Fig. 50)	conspicuous (Fig. 52)	conspicuous	=Lymeonina

Table 2. Character state matrix for *Toechorychus* species and outgroup taxa. Characters 1–85. *Subt*, subtribes of Cryptini. *Agrt*, Agrothereutina. *Barc*, Baryceratina. *Cert*, Ceratocryptina. *Cryp*, Cryptina. *Gabn*, Gabuniina. *Glod*, Glodianina. *Gory*, Goryphina. *Lymn*, Lymeonina. *Meln*, Melanocryptina. *Mest*, Mesostenina. *Ospr*, Osprynchotina. *Sphe*, Sphecophagina. Polymorphisms were expressed as follows: a, 01; b, 02. Species of *Toechorychus* in boldface.

Subt		**0000000001 1111111112 2222222223 3333333334 4444444445 5555555556 6666666667 7777777778 88888**
	Species	**1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 12345**
Agrt	*Agrothereutes* sp.	0001010001 00?0?010?? ??00000000 1000010011 0010110021 1100010000 1110a00010 1000101321 01100
Agrt	*Trychosis* sp.	0101000112 10100000?? ??01100000 0100011?1? 0010111021 1101110000 1000111010 1001011321 01000
Barc	*Baryceros* sp.	0100000112 20110300?? ??00000001 1100111111 0000010021 10?0100001 0110000000 0112010000 ??121
Barc	*Chlorocryptus* sp.	100100010? 2010?300?? ??00000001 0000010000 0000000001 1110110000 0101010010 0211011011 00120
Barc	*Whymperia* sp.	0100000112 20110300?? ??01100010 010103120? ??10111020 00?0000000 0020010010 1001001011 01110
Cert	*Lorio* sp.	0010000000 00000310?? ??10100000 0000030111 1000111020 11000101?1 0111010010 1002110000 ?????
Cert	*Nematocryptus* sp.	0111010112 1????310?? ??01001001 0100111121 0001011001 1100111101 00?0000110 0002110100 ??121
Cryp	*Anacis apoeca*	0011210011 10?01100?? ??10000000 0000001111 0100000021 10?000101a 0111111000 1111111311 20120
Cryp	*Anacis festiva*	0111000112 00?0?310?? ??00000000 0001001010 0110100000 0110010000 0101?11000 1111001011 10010
Cryp	*Buarthra laborator*	0001010001 11?00200?? ??10000000 0000011111 1000001001 1110100000 1001111011 0000011011 10100
Cryp	*Camera* sp.	0111000112 20000100?? ??00100000 1100000011 0[01]10100 0010100000 0000120000 0001011000 00010
Cryp	*Compsocryptus callipterus*	0100000002 00110010?? ??00000000 0100000200 1000001021 00?0100000 1121010000 0212111301 20100
Cryp	*Diplohimas* sp.	0100000012 10110010?? ??00101000 000103000? ???0?11020 0110110111 00?0000110 1001101021 10010
Cryp	*Dotocryptus* sp.	0001001000 10?0?200?? ??10000001 1101010111 0100010011 1??0111000 1111?00011 0100011011 11120
Cryp	*Enclisis* sp.	0101010012 101??000?? ??10000000 0100010111 00?0?00000 1110000000 00?0100111 1110011311 10010
Cryp	*Ischnus* sp.	0101000011 10110010?? ??00000000 0101011111 00?0?10010 10?0001000 0110111010 1201001021 20000
Cryp	*Joppidium moerens*	0101000112 20010010?? ??00100001 0000000111 0000002020 00?0101000 21?0110100 1?10101001 0?100
Cryp	*Meringopus* sp.	0001010002 01?00000?? ??10000000 0100010101 0000001001 1120100001 1111111010 0010211011 11100
Cryp	*Monothela* sp.	0001100102 20110300?? ??10101?0? 0000031200 ???0000021 1100000001 0021000000 0011111011 20110
Cryp	*Neodontocryptus* sp.	1001000102 01?00000?? ??10000000 000011020? ???0010020 0100110000 1121000010 0110211001 12120
Cryp	*Trachysphyrus* sp.	0100010111 00101310?? ??10000000 1100011111 0010111001 1100100000 1020111000 0110011011 10110
Cryp	*Tricentrum* sp.	0001100100 00010200?? ??00100010 0100031000 0000010000 1110000001 0001000010 0210111001 20110
Cryp	*Trihapsis* sp.	0010011001 00110000?? ??00001000 100003020? ??00000000 00?0000000 00?0000110 1000111011 1?000
Gabn	*Agonocryptus varus*	0002100100 20001010?? ??1001?010 1000001010 0010110000 0100010000 0110010010 0001a11101 0?000
Gabn	*Cestrus calidus*	0102100110 10001010?? ??10000000 0000010110 1010000011 10?0011000 01?1000101 0010011311 20100
Gabn	*Digonocryptus crassipes*	0101210010 10001210?? ??10100000 0100000010 1110110021 10?0110000 00?0000110 1011100011 00100
Gabn	*Distictus tibialis*	01001a0111 00001210?? ??00000100 0100001011 0000010001 10?1110000 00?0000110 0111011111 10100
Gabn	*Eurycryptus* sp.	0100000100 00001010?? ??00001020 0110001121 1010001001 10?0011010 0101010010 0000110100 10000
Gabn	*Lagarosoma assitum*	0002000112 00101010?? ??00100010 1001031110 0110111011 00?0011011 0010000001 1002111301 12020
Gabn	*Prosthoporus nigrifemur*	0002000012 1010?110?? ??0011?000 0001001111 1000001020 00?0010110 0000000011 1002111011 02000
Gabn	*Xantocryptus* sp.	0100100100 20?0?300?? ??10000001 1001030010 0010111020 0100010000 01?0000110 0101010000 ??021
Gabn	*Xoridesopus* sp.	0000100100 0000?310?? ??00000000 0001001011 1000010011 1110010?1 0101000010 0002110000 10010
Glod	*Glodianus* sp.	0000000002 1011001101 0?01100010 0101010101 0??0?11010 1101000000 0100010000 1001110101 00020

Table 2. Continued.

		0000000001 1111111112 2222222223 3333333334 4444444445 5555555556 6666666667 7777777778 88888
Subt	**Species**	**1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 12345**
Glod	*Lamprocryptus* sp.	0002000002 00110310?? ??00100010 0100011100 0000011011 1100000000 0100010010 1001111101 31020
Gory	*Baltazaria* sp.	0000010012 00101300?? ??01100000 0100011111 0010110010 1101100000 0110010010 1111210000 ??101
Gory	*Bozakites* sp.	0110000012 1010?300?? ??10100010 1100111111 1000010001 1100100000 0111000010 0011110000 01120
Gory	*Buodias* sp.	0010110112 10???310?? ??11000001 1100011111 0010111001 1100000000 01?0000110 0101010301 01000
Gory	*Debilos* sp.	0000000002 10110100?? ??00100000 0001001010 0000011011 1110101000 0100000000 1111110000 ??001
Gory	*Diapetimorpha* sp.	0100000102 10100300?? ??10100001 0100011010 0010110011 1110100000 0000000000 1001010000 ??111
Gory	*Friona* sp.	0101000012 10000300?? ??11100011 1100111120 1000011001 1110101100 0101010010 1011111001 00120
Gory	*Goryphus* sp. 1	0001010012 10?01010?? ??01000000 0100010011 0010110000 0100101000 0000000010 0212010000 01100
Gory	*Goryphus* sp. 2	0101010012 10101210?? ??01000110 1100010111 0010110011 1100100000 0010000010 0111010000 1?000
Gory	*Larpelites* sp.	0100000001 1010130100 0210000010 1100010111 1000002020 1101100001 0111010010 0111210301 22020
Gory	*Loxopus australis*	0011010102 10110110?? ??00000000 0001001010 1010111001 1100100001 00?00a0100 11a1200000 ??011
Gory	*Necolia* sp.	0111000012 101??300?? ??11100000 1101011111 1000011001 1100000000 0001110010 1010110111 11100
Lymn	*Acerastes pertinax*	0100010012 0000?310?? ??01100000 0110111121 1001010000 1110010001 0111000010 0013?10001 ??111
Lymn	*Acerastes* sp. 1	0000010112 10?0?210?? ??01100011 1100110121 0111110001 0100111011 0100000010 00a2100010 ??021
Lymn	*Acerastes* sp. 2	0102000112 10100110?? ??01100010 1110101111 0111110001 0100011101 01?0000110 0002110000 ??001
Lymn	*Acerastes* sp. 3	0000010012 10100010?? ??01100000 1100111120 1111110001 0100011001 00?0000101 0202110000 ??111
Lymn	*Acerastes* sp. 4	0010000012 10100110?? ??00100010 0100111120 0a10110010 1110011101 0110000011 0012110010 ??001
Lymn	*Acerastes* sp. 5	0000010112 00100210?? ??01100000 0100101111 0111110011 1100011101 01?0000111 0003?01011 ??121
Lymn	*Basileucus* sp.	0010000102 1010?300?? ??01100010 0101001000 1110110001 0100011001 0020010001 0111011001 1?110
Lymn	*Bathyzonus* sp.	0001010111 10000010?? ??01100020 1110010121 0a00010010 1100011111 0100000011 12b2?00011 0?021
Lymn	*Bicryptella* sp.	0101000002 20110300?? ??00100001 1101011011 1010110011 1110110001 0120000010 0111111000 1?000
Lymn	*Dismodix* sp. 1	0110000012 10100110?? ??01100000 0110100121 0111100011 0101110011 0110000011 0012110000 ??101
Lymn	*Dismodix* sp. 2	0000010012 10100010?? ??01000010 0110111121 0111100011 0100011001 0110000011 10a2110000 ??001
Lymn	*Dismodix* sp. 3	0000000012 10100010?? ??01100000 0110100121 0111100001 0100111101 00?0010101 0002100010 ??001
Lymn	*Golbachiella* sp. 1	0111000102 01?0?100?? ??000012?0 0001030001 0000010021 00?0111011 0000000010 2011101010 1?001
Lymn	*Golbachiella* sp. 2	0001000112 01?00000?? ??00000201 1010000011 1010110021 0110111000 0010000000 1011001001 1?000
Lymn	*Latosculum* sp. 1	0000000002 00000000?? ??00000000 0001030011 0000011020 10?0010000 0100000000 00a1010301 00100
Lymn	*Latosculum* sp. 2	0100000112 1???210?? ??00000010 0100011000 1000001000 1100011110 0101010010 1102110100 ??100
Lymn	*Lymeon adultus*	0101210012 00001310?? ??10000010 01000?1111 1100010000 1100110001 00?1000110 0212110001 ??101
Lymn	*Lymeon ariolator*	0111010101 11?01110?? ??00000011 1100011011 ?1?0011011 1110010000 1101000000 0112111001 ??101
Lymn	*Lymeon orbus*	0011010112 00001110?? ??10000010 00000?1101 1100000001 1110110001 0111000010 0012110000 ??011
Lymn	*Lymeon* sp. 1	00010a0012 10100210?? ??01000000 1101000010 1010111011 1100010000 0100000010 0012a10001 ??001
Lymn	*Lymeon* sp. 2	0000000012 20100210?? ??01100001 0101111010 1110111001 1100010000 0010000000 0012110011 1?001
Lymn	*Mallochia agenioides*	0010110112 20101000?? ??10000000 0000001001 1000011000 1100010001 0111000000 1112111001 ??111
Lymn	*Mallochia* sp. 1	0010100101 20100200?? ??01100101 0101031010 1000000001 00?0011000 0110000010 1002111000 ??101
Lymn	*Pachysomoides fulvus*	0101000112 1010?310?? ??00100010 0101111011 1000011001 1100010011 0111010010 1110111300 ??021

Table 2. Continued.

		0000000001	1111111112	2222222223	3333333334	4444444445	5555555556	6666666667	7777777778	88888
Subt	**Species**	**1234567890**	**1234567890**	**1234567890**	**1234567890**	**1234567890**	**1234567890**	**1234567890**	**1234567890**	**12345**
Lymn	*Pachysomoides* sp.	0110010111	0010?210??	??00001010	0000110111	1010110101	1110010001	0100000010	0111201010	1?001
Lymn	*Petila capixaba*	0010000002	20100010??	??00000000	0110001011	1101001001	1100011011	00?0000100	1213?10011	??001
Lymn	*Polycyrtidea* sp. 1	0101000112	0010011100	1101101101	0110101121	0011111101	1100111101	01?0010111	0002101010	??021
Lymn	*Polycyrtidea* sp. 2	0100000112	1010001100	1101100000	1100110120	1011010011	0111111101	01?0000011	0003?11000	??021
Lymn	*Polyphrix stellata*	0110000001	10000210??	??0001?000	001003000?	??00001020	0110011110	0100000011	0002110011	02020
Lymn	*Polyphrix varians*	0001000000	10000210??	??0001?001	1010031000	0000011020	10?0011110	0110010011	0002110010	02020
Lymn	*Priotomis* sp.	0100000002	1010?210??	??000002?0	0101031120?	??00001021	10?0010000	0000000010	0002110010	??111
Lymn	*Rhinium* sp. 1	0001000012	10000210??	??01100000	1101110001	0010110010	1110110000	0010000000	0012110011	??101
Lymn	*Rhinium* sp. 2	0100010012	10000210??	??01100000	0100101101	1010110011	1110110000	0000000000	0012110001	??101
Lymn	*Rhinium* sp. 3	0100010111	00100110??	??01100000	0100101010	0010110001	1110111001	0100001010	0211110011	1?121
Lymn	*Savolia maculata*	0100000012	001??300--	--10100011	1100021121	1100000111	1001111010	0110000011	0021100011	10010
Lymn	*Strabotes abdominalis*	0102110102	10101300--	--00000001	10000?1121	1100010011	1120110001	00?1000110	0110110301	2?101
Lymn	***Toechorychus albimaculatus***	**0101000112**	**00100310--**	**--01101101**	**1100131121**	**1010012001**	**1100111111**	**0111000010**	**0112100000**	**??121**
Lymn	***Toechorychus cassunungae***	**0101000102**	**00100110--**	**--01100111**	**0100101121**	**1010112001**	**1100111011**	**0111000010**	**0012110000**	**??101**
Lymn	***Toechorychus stramineus***	**0101000112**	**10100310--**	**--01101011**	**1100101111**	**1010012001**	**1100111011**	**0111000010**	**0102110000**	**??101**
Lymn	***Toechorychus* sp. nov. 2**	**0100000112**	**00000110--**	**--001001-0**	**11101?1121**	**1010112001**	**1100101010**	**0111000010**	**0002110000**	**--021**
Lymn	***Toechorychus* sp. nov. 3**	**0100000112**	**00000310--**	**--01000101**	**11101?1121**	**101?012001**	**1100101010**	**0111000010**	**0122100000**	**--101**
Lymn	***Toechorychus* sp. nov. 5**	**0101000112**	**10100010--**	**--01101101**	**1100101121**	**1010012001**	**1100111010**	**0111000012**	**0002110000**	**--021**
Lymn	***Toechorychus* sp. nov. 6**	**0100000112**	**00100210--**	**--011001-1**	**11001?1121**	**1010102001**	**1100010011**	**0111010010**	**0002110001**	**--101**
Lymn	***Toechorychus* sp. nov. 7**	**0101000112**	**00100010--**	**--01000010**	**0100111111**	**1011012001**	**1100111111**	**0111000010**	**0102100000**	**--121**
Lymn	***Toechorychus* sp. nov. 8**	**0101000111**	**00000110--**	**--01000011**	**0100131111**	**0010112001**	**1120101111**	**0111000010**	**0112100000**	**--121**
Lymn	***Toechorychus* sp. nov. 9**	**0101000111**	**00100110--**	**--01101101**	**1100101111**	**1010012001**	**0110111011**	**0111000010**	**0002100000**	**--021**
Lymn	***Toechorychus* sp. nov. 10**	**0100000112**	**00000110--**	**--01100100**	**0100131111**	**0110012001**	**0111111111**	**0111000010**	**0122100300**	**--021**
Lymn	***Toechorychus* sp. nov. 11**	**0100000111**	**0000?010--**	**--01100010**	**0100111121**	**1010012001**	**1110111111**	**0111000010**	**0112110000**	**--121**
Lymn	***Toechorychus* sp. nov. 12**	**0101000112**	**00000310--**	**--01100000**	**0100131121**	**1010012001**	**1100011011**	**0111000000**	**0112100000**	**--101**
Lymn	***Toechorychus* sp. nov. 15**	**0101000112**	**00100010--**	**--01100000**	**0110101121**	**1010012001**	**1100111011**	**0111000010**	**0112100000**	**--021**
Lymn	***Toechorychus* sp. nov. 16**	**0101000112**	**00?0?110--**	**--01100001**	**01001?1121**	**1010112001**	**1100111111**	**0111000010**	**0112110000**	**--001**
Lymn	***Toechorychus* sp. nov. 17**	**0101000112**	**00100010--**	**--01100200**	**0100131121**	**1010012001**	**1120111111**	**0111000012**	**0012110000**	**--021**
Lymn	***Toechorychus* sp. nov. 19**	**0100000112**	**00100210--**	**--00100010**	**01001?1121**	**1010012001**	**1100111011**	**0111000010**	**0112100000**	**--121**
Lymn	***Toechorychus* sp. nov. 20**	**0101000112**	**0010?310--**	**--01100011**	**1100111121**	**1010012011**	**1100111111**	**01?1000110**	**0012110000**	**--101**
Lymn	***Toechorychus* sp. nov. 26**	**0100000112**	**0010?010--**	**--01100111**	**1100111121**	**1010012001**	**1110111111**	**0111000010**	**0012110000**	**--021**
Lymn	***Toechorychus* sp. nov. 29**	**0101000112**	**00100010--**	**--01100101**	**01001?1121**	**1010012001**	**1110111111**	**0111000010**	**0112110000**	**--121**
Lymn	***Toechorychus* sp. nov. 30**	**0101000112**	**0000?310--**	**--01100011**	**1100100121**	**1010112001**	**0100111011**	**0111000010**	**0012110000**	**--021**
Lymn	***Toechorychus* sp. nov. 31**	**0101000112**	**00000310--**	**--01100011**	**1100101121**	**1010012001**	**1100111111**	**0111000010**	**0122100000**	**--021**
Lymn	***Toechorychus* sp. nov. 32**	**0101000112**	**00000010--**	**--01101211**	**1100101121**	**1010012001**	**1120111111**	**0101000010**	**0112100000**	**--101**
Lymn	***Toechorychus* sp. nov. 35**	**0101000112**	**0010?010--**	**--00000011**	**10001?1121**	**1010112001**	**1110111011**	**0101000010**	**0112110000**	**--101**
Meln	*Melanocryptus nigrum*	0002000001	21110300??	??00100111	0001010000	0010111020	1100011111	0120110001	0212111000	10100
Mest	*Acorystus circumflexus*	0111000012	0000000100	0000000000	0000031121	0000001020	10?0001010	01?0000100	1212110310	00120
Mest	*Cryptanura quadrimaculata*	0000000111	1000030110	0001100001	0100011111	0000010021	1110101001	0110010010	0101110300	02020
Mest	*Diloa* sp.	0011000012	10100100??	??00000000	1000011111	1010000020	1120001010	0101000000	1101100000	??101

Table 2. Continued.

		0000000001 1111111112 2222222223 3333333334 4444444445 5555555556 6666666667 7777777778 88888
Subt	**Species**	**1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 12345**
Mest	*Gotra marginata*	0101000001 00101300?? ??10100010 0101111111 10?0011011 1110100000 0111000000 0010110100 02120
Mest	*Irabatha* sp.	0002210012 1000?300?? ??11100000 0100000111 1110101001 1101000001 0111010010 1112110000 00120
Mest	*Mesostenus* sp.	0111000102 00000310?? ??00000000 0000001121 1010100000 1010000000 0111000000 1012110000 ??111
Mest	*Polycyrtus* sp. 1	0101000102 1000000100 0000100010 0010111121 0000012100 00?0001000 01?0000110 000111010a 02120
Mest	*Polycyrtus* sp. 2	0111000002 1000000100 0200100000 0110110121 0000000000 00?0001000 01?0000110 0001110101 02020
Ospr	*Acroricnus stylator*	0111001112 2000?110?? ??01100000 0100010001 1010001001 1110110001 01?11?0111 2200011311 20110
Ospr	*Acroricnus* sp. 1	0112001102 21?01310?? ??11100010 1100000001 0000012020 1110110101 10?1100111 2100111011 11200
Ospr	*Iaria* sp.	0002000112 00001300?? ??10101000 1001001101 1110011011 1100111101 0111000011 1121101100? 0?110
Ospr	*Messatoporus lissonotus*	0002011102 20011300?? ??0001?000 0000000121 0110100010 1120011110 01?1000111 0021101000 01200
Ospr	*Messatoporus paraguayensis*	0002011102 00011110?? ??0001?000 0000001100 0110111010 0110011110 01?1000111 2021001000 00000
Ospr	*Messatoporus* sp. nov. 1	0002011102 00011300-- --0001-000 0000001110 1110111010 0120011110 0101000011 0002110100 00000
Ospr	*Messatoporus* sp. nov. 2	0002011102 00001110?? ??1001?000 0000001110 0110101000 00?0011110 0111000011 0021001100? ?0010
Ospr	*Osprynchotus* sp.	0100001102 200?1300?? ??11100000 0000010001 0100112000 1100110001 2111110011 1210220301 12120
Ospr	*Photocryptus nigrosignatus*	0001001112 21?01310?? ??01100000 0110011110 0110110011 00?0110000 01?0000111 0201111111 11100
Sphe	*Latibulus argiolus*	0002000002 01-00000-- --01100000 0001031000 10000?1021 00-0110001 00?0000111 102211011- -----
–	*Ecthrus* sp.	0000110100 10001100-- --00000000 0000101121 1000101021 10-0100000 1101111010 0010111311 20100
–	*Gelis* sp.	0010000102 01-00000-- --10001000 1100030200 ---0--003- -100-10000 ---------- ---------- -----
–	*Phygadeuon* sp.	000120000? 21?00000?? ??00001000 000001020? ???0000010 1100100000 0021000010 0110111001 11100
–	*Platymystax* sp.	0a00011002 10100010?? ??00000000 1100010001 1000001010 1100100000 1021100010 1110110311 00010

Table 2. Continued. Characters 86–162.

		00000 0000000001 1111111111 1111111111 1111111111 1111111111 1111111111 1111111111 11
Subt		**88889 9999999990 0000000001 1111111112 2222222223 3333333334 4444444445 5555555556 66**
	Species	**67890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 12**
Agrt	*Agrothereutes* sp.	01101 1111210010 ?00?010212 001000?011 0?10111000 0001000000 0001000010 0000000100 00
Agrt	*Trychosis* sp.	01101 1010010010 ?00?010200 101000?011 0?12110011 0001011210 2001000000 0001000000 00
Barc	*Baryceros* sp.	10010 1000000010 ?00?010100 201000?0?2 1100111010 0000001221 2011010001 1000100000 00
Barc	*Chlorocryptus* sp.	00000 1210200010 ?01?001002 ?0?000?0?3 0?00110010 0100010000 2001000011 0000100100 00
Barc	*Whymperia* sp.	00100 0001000010 ?00?221100 001000?010 0?12110021 1101002220 2001010001 0000100100 00
Cert	*Lorio* sp.	?0100 0010210111 1100210002 2011100?2 0?11111010 1011110000 0101100011 1000000110 11
Cert	*Nematocryptus* sp.	11101 00102a0010 ?00?200012 ?000010?3 0?01110021 1001111221 1001000000 0000000100 ?0
Cryp	*Anacis apoeca*	00101 1100200010 ?000200010 000010?0?2 1011110010 0000011210 2000020000 0000000101 00
Cryp	*Anacis festiva*	00111 1010000010 ?00?101010 101000?011 0?12010010 0000000211 2001100000 0000000000 00
Cryp	*Buarthra laborator*	00100 1110200?10 ?000000002 101110?010 0?12111010 0100000001 2000000001 0000000000 00
Cryp	*Camera* sp.	00100 0100010010 ?01?210110 000010?011 0?11110011 0001011110 0001100000 0001000000 00
Cryp	*Compsocryptus callipterus*	00100 1010200110 ?000220012 000000?011 0?11110000 0011000201 2000200010 1001000000 00
Cryp	*Diplohimas* sp.	00101 1000010000 ?10?110101 200000?000 0?01110011 0000012221 ?001010000 0001000000 00
Cryp	*Dotocryptus* sp.	00100 0100210010 ?11?010012 001010?010 0?10110020 0110012211 1002221101 1000000120 00
Cryp	*Enclisis* sp.	00101 0110000001 1011011212 101010?010 0?02110011 1111100100 1000000001 0000000100 10
Cryp	*Ischnus* sp.	00101 1010010010 ?00?210112 001000?011 0?11110001 1001000111 2001000000 0001000000 00
Cryp	*Joppidium moerens*	00100 1200210010 ?10?201012 101000?0?2 0?11110021 1100102210 1011210000 0001000000 00
Cryp	*Meringopus* sp.	00100 1110200110 ?000000002 100000?010 0?10110000 0001000000 2000210000 0001000000 00
Cryp	*Monothela* sp.	00001 1010010110 ?100211001 200110?011 0?12110010 0010011210 2002000000 0001000000 00
Cryp	*Neodontocryptus* sp.	00000 1010100010 ?000000002 00?000?010 0?10120000 0101000001 ?001000011 0000000101 00
Cryp	*Trachysphyrus* sp.	00100 1100210010 ?00?020002 001??0?0?2 0?10111100 0000010200 2011100000 0000000000 00
Cryp	*Tricentrum* sp.	01111 1011110010 ?100211101 001000?010 0?12100010 0000011201 0002000000 0001000100 00
Cryp	*Trihapsis* sp.	00101 1011000000 ?00?121100 001000?000 0?11101110 0000010120 0001000000 0000000000 00
Gabn	*Agonocryptus varus*	01100 1000010011 0000200002 ?00000?0?3 0?01110001 1100100200 2100000011 1000000110 21
Gabn	*Cestrus calidus*	00100 0000010011 0000210112 001010?010 0?01110010 0110100001 1101000011 0000000010 00
Gabn	*Digonocryptus crassipes*	00001 1100000011 0000210102 a010010?2 0?11111001 0101101110 2110010011 1000000010 10
Gabn	*Distictus tibialis*	00101 1101010011 1101200212 2000010?2 0?11110001 0001101100 0100000011 0000000110 11
Gabn	*Eurycryptus* sp.	10001 1010210011 0100020010 1000100000 0?01110010 0001100200 2100010011 1000000110 01
Gabn	*Lagarosoma assitum*	10101 1201010011 1101100002 ?00000?0?3 0?01110010 1000112220 0112010011 1000000010 00
Gabn	*Prosthoporus nigrifemur*	10001 2101200000 ?101100000 ?000100?3 0?01110011 1010101221 0002010001 1000000001 00
Gabn	*Xantocryptus* sp.	00010 2100210011 0100200010 201010?0?2 0?02110000 1001101201 0101011001 1000000010 00
Gabn	*Xoridesopus* sp.	00101 0010010111 011?210000 000000?001 0?11110011 0001100100 1101010001 1000000110 11
Glod	*Glodianus* sp.	00000 1000010010 ?10?210000 0010010?2 0?12111021 1100002221 1001000000 1001010001 00
Glod	*Lamprocryptus* sp.	10010 1001010010 ?10?200100 101??100?1 0?12110021 1100002221 0001000000 1001010000 00
Gory	*Baltazaria* sp.	01101 1100010000 ?00?011112 101000?010 0?12111100 0001000001 0001000000 0001000000 00
Gory	*Bozakites* sp.	00101 1100200010 ?000011000 101010?010 0?10110000 0001000000 2100010001 0000000000 00

Table 2. Continued.

		00000 0000000001 1111111111 1111111111 1111111111 1111111111 1111111111 1111111111 11
Subt		**88889 9999999990 0000000001 1111111112 2222222223 3333333334 4444444445 5555555556 66**
	Species	**67890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 12**
Gory	*Buodias* sp.	01101 1000010010 ?00?021202 101010?0?2 0?10110000 0001010000 2000000001 0001000100 10
Gory	*Debilos* sp.	00101 1100000010 ?00?021102 200000?0?2 1001110020 0010000201 1001000001 1001000001 00
Gory	*Diapetimorpha* sp.	00101 1001010010 ?00?020210 10100a?010 0?11110021 0011000210 0111000000 0001000000 00
Gory	*Friona* sp.	10001 1010210010 ?100011202 1000000000 1001111010 1001010121 2101010000 0000000100 00
Gory	*Goryphus* sp. 1	01101 1000010010 ??0?221202 001000?0?2 0?10110010 0001000000 2000110011 0000000000 10
Gory	*Goryphus* sp. 2	00101 1000000010 ?00?010202 101000?0?0 0?10110000 0001000000 0000110011 0000000000 00
Gory	*Larpelites* sp.	10001 0210000110 ?000201202 101000?010 0?10111010 0101001000 2000210001 0000000000 00
Gory	*Loxopus australis*	01101 1100110010 ?00?100000 000010?000 0?11110001 0001000210 0010000000 0000000000 00
Gory	*Necolia* sp.	00101 1010210011 1000210212 111000?0?2 0?11110011 1101001111 1000010000 0001000001 00
Lymn	*Acerastes pertinax*	01101 1020010100 ?000220010 100010?0?2 1112111010 0000001211 0001000000 0001000101 00
Lymn	*Acerastes* sp. 1	00101 1000200010 ?00?200010 100110?0?2 1101110011 1000002221 1001100000 0001000000 00
Lymn	*Acerastes* sp. 2	10101 1000000010 ?11?100212 100000?0?3 0?01110011 0000002221 0001100001 0001000101 00
Lymn	*Acerastes* sp. 3	00101 0010000000 ?00?200210 001010?003 0?01110011 0000111221 0001100000 0001000001 ?0
Lymn	*Acerastes* sp. 4	01101 0000000010 ?00?010210 100010?000 0?11110011 0000012211 ?001110000 0001000100 00
Lymn	*Acerastes* sp. 5	01101 0010210000 ?00?200200 001010?000 1112110010 0000001221 1001110010 0001000001 ?0
Lymn	*Basileucus* sp.	01101 1001000010 ?00?210012 100000?0?2 1100110010 1000001210 0001000000 0000000000 00
Lymn	*Bathyzonus* sp.	00101 1000000000 ?11?220210 200010?000 0?01110001 1000111201 0001010000 0001000101 ??
Lymn	*Bicryptella* sp.	01101 1000010010 ?00?010102 001000?010 0?00111011 0100001210 1001010001 1000000100 00
Lymn	*Dismodix* sp. 1	00001 1000010010 ?00?200212 ?01010?0?3 0?01110021 1000112221 1001000001 1001000101 ??
Lymn	*Dismodix* sp. 2	00101 1010010010 ?00?200212 100000?0?3 0?01110010 0000002211 1001000001 1001000101 ?0
Lymn	*Dismodix* sp. 3	01101 1000110010 ?01?200212 100000?0?3 1102110010 1100012220 1001000001 1001000101 ?0
Lymn	*Golbachiella* sp. 1	00101 1000100000 ?11?210210 000000?0?3 0?01110000 1010001010 0001110001 1000000101 ??
Lymn	*Golbachiella* sp. 2	00101 1010110000 ?01?020212 101000?0?2 1101110011 0010002220 0001010000 0001000000 00
Lymn	*Latosculum* sp. 1	00100 1200010010 ?10?210100 100000?013 0?11110010 0000012211 0001000000 0000000100 00
Lymn	*Latosculum* sp. 2	00101 1010010110 ?100100001 1000000?3 10?1110010 0010012220 2001010000 0001000101 00
Lymn	*Lymeon adultus*	00101 1020001111 1000110011 1010000002 10?2110000 0000001200 2101000000 0001000001 00
Lymn	*Lymeon ariolator*	01101 1010000?11 1001020201 101000?0?2 10?1110000 0000001210 2101020001 0001000001 00
Lymn	*Lymeon orbus*	01101 1020010011 0000210011 0010100?3 11?2120001 0010011211 2001000000 0001000000 00
Lymn	*Lymeon* sp. 1	01101 1100010000 ?00?120102 100000?0?2 1001110011 1000001220 0001000000 0001000000 00
Lymn	*Lymeon* sp. 2	01101 1100200010 ?00?211100 100010?0?2 1002110011 0100011121 0001010000 0000000101 00
Lymn	*Mallochia agenioides*	01101 1020000111 1100120200 ?0000000?3 0??1111011 0100001201 0001000000 0001000000 20
Lymn	*Mallochia* sp. 1	01101 0000200001 1101120212 201110?0?3 0?11110000 1100101210 0000000010 0000000000 21
Lymn	*Pachysomoides fulvus*	00101 1010010110 ?0??010000 201000?010 1110001100 0000001001 0100000000 0001000101 00
Lymn	*Pachysomoides* sp.	01101 1100000010 ?01?2?0102 001010?010 0?10221000 0000001210 ?001110000 0001000001 00
Lymn	*Petila capixaba*	011?1 1?1?001100 ?01?100212 ?00000?0?3 0?01110001 1100112220 ?001000000 0001000001 00
Lymn	*Polycyrtidea* sp. 1	01101 1010011110 ?00?210010 100010?010 1112110021 1100102221 1001?00000 0001000000 00

Table 2. Continued.

		00000	**0000000001**	**1111111111**	**1111111111**	**1111111111**	**1111111111**	**1111111111**	**1111111111**	**11**
Subt		**88889**	**9999999990**	**0000000001**	**1111111112**	**2222222223**	**3333333334**	**4444444445**	**5555555556**	**66**
	Species	**67890**	**1234567890**	**1234567890**	**1234567890**	**1234567890**	**1234567890**	**1234567890**	**1234567890**	**12**
Lymn	Polycyrtidea sp. 2	00100	1020011?10	?000200110	001010?0?0	0?12000020	1100001220	?000100000	0001000000	00
Lymn	*Polyphrix stellata*	10001	0000010010	?10?200010	?000011?3	0?01110011	1100102220	1001010010	0001000101	00
Lymn	*Polyphrix varians*	10010	0000100010	?10?200010	?000011?3	0?01110021	1000102220	1001010010	0000000100	00
Lymn	*Priotomis* sp.	00101	0000110000	?10?200010	?0000100?3	0?01110000	0010001221	2001000000	0001100100	20
Lymn	*Rhinium* sp. 1	01101	1010000010	?00?020012	100000?0?2	1101110011	0000011200	0001000000	1000000001	00
Lymn	*Rhinium* sp. 2	00101	1101010010	?00?210112	001000?0?2	1101111021	0100002221	0001110000	0000000001	00
Lymn	*Rhinium* sp. 3	00101	1101010010	?00?220202	001010?0?2	1002110011	0100001121	0001000010	0000000001	00
Lymn	*Savolia maculata*	01-12	0102100010	0000010001	-0100100-3	---1111010	0011100110	0000010000	0000000001	00
Lymn	*Strabotes abdominalis*	01101	2011200011	0100210001	101110?0?2	0??0101010	0100000100	2110000011	0000000110	01
Lymn	***Toechorychus albimaculatus***	**10011**	**1010010110**	**?100110?11**	**?000000?3**	**0?00110011**	**1000011211**	**2002110001**	**0111000101**	**00**
Lymn	***Toechorychus cassunungae***	**10101**	**1010010010**	**?100120211**	**0000100?2**	**1011110011**	**0000011210**	**0002110001**	**0111000101**	**00**
Lymn	***Toechorychus stramineus***	**10111**	**1100210110**	**?100210211**	**100000?0?2**	**1010111011**	**0000001010**	**0002110001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 2**	**10001**	**1010010010**	**-100220211**	**-0000001-3**	**0--2110011**	**1100011110**	**2002110001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 3**	**11101**	**1010010010**	**-11-220211**	**-0001001-3**	**0--2110011**	**0000011210**	**2002110001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 5**	**00111**	**1010010010**	**-101220011**	**-0000000-3**	**0–11110111**	**0000122112**	**0021100000**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 6**	**00111**	**1010010010**	**-100221111**	**0000000000**	**1011100011**	**0000011211**	**1002010001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 7**	**01101**	**1010000010**	**-100220211**	**00000000-2**	**0-12121011**	**0000011211**	**0002110001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 8**	**00101**	**1010000010**	**-11-200211**	**-0000000-3**	**0--1110011**	**0000012211**	**1002110001**	**1111000101**	**00**
Lymn	***Toechorychus* sp. nov. 9**	**10101**	**0000010110**	**-100220011**	**-0000000-3**	**0--2120010**	**0000012211**	**0002110001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 10**	**00101**	**1010210110**	**-11-220-11**	**-0001002-3**	**0--1120011**	**1000012211**	**1002110001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 11**	**01101**	**1010010110**	**-100210211**	**00001001-2**	**1010100010**	**0100012010**	**000211000?**	**?111000101**	**00**
Lymn	***Toechorychus* sp. nov. 12**	**00111**	**1110010010**	**-100100211**	**-0000000-3**	**0–11210110**	**1000012110**	**0021100010**	**1110001010**	**00**
Lymn	***Toechorychus* sp. nov. 15**	**00101**	**1000010010**	**-11-221011**	**-0000000-3**	**0--1120010**	**1000011210**	**0002110001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 16**	**00101**	**1000010010**	**-11-110211**	**-0001000-3**	**0–21210100**	**0000112111**	**0021100011**	**1110001010**	**00**
Lymn	***Toechorychus* sp. nov. 17**	**10101**	**2200010010**	**-100020011**	**201000-1-2**	**1000120011**	**0000011211**	**2002110001**	**1111000101**	**00**
Lymn	***Toechorychus* sp. nov. 19**	**00101**	**1120010010**	**-100120210**	**-0000000-3**	**0–21210100**	**1000112110**	**0021000110**	**1110001010**	**00**
Lymn	***Toechorychus* sp. nov. 20**	**11101**	**1010210010**	**-100210211**	**100000-1-3**	**1012101110**	**0000011211**	**000???000?**	**?11?000101**	**00**
Lymn	***Toechorychus* sp. nov. 26**	**01101**	**1010010010**	**-100010211**	**200010-0-2**	**0-10100011**	**0000011210**	**0002110001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 29**	**00101**	**0110010110**	**-11-220211**	**-0000000-3**	**0--2121011**	**0000011211**	**0002110001**	**0111000101**	**00**
Lymn	***Toechorychus* sp. nov. 30**	**00101**	**0010210010**	**-11-220111**	**-0000000-3**	**0--2121011**	**0000011211**	**100????0??**	**???1000101**	**00**
Lymn	***Toechorychus* sp. nov. 31**	**00101**	**1020010010**	**-11-220210**	**000010-1-1**	**1010121011**	**0000011211**	**000???????**	**??????0???**	**??**
Lymn	***Toechorychus* sp. nov. 32**	**00101**	**0010010010**	**-11-020211**	**000000-0-2**	**0-11120110**	**0000011110**	**000???00??**	**?111000101**	**??**
Lymn	***Toechorychus* sp. nov. 35**	**00101**	**1000010010**	**-101220211**	**0000000001**	**0-12111010**	**0000001211**	**0002120001**	**0111000101**	**00**
Meln	*Melanocryptus nigrum*	00101	1001000010	?00?120211	000000?01a	0?12220010	00001a1200	1000000000	0000000100	00
Mest	*Acorystus circumflexus*	11111	1101200010	?11?201012	?00000?0?3	0?01110021	1100002210	0101000000	0001000001	00
Mest	*Cryptanura quadrimaculata*	10000	1100000010	?00?200210	001000?000	1012110010	00010a2200	2111100000	1001000000	00
Mest	*Diloa* sp.	00101	1010010000	?101221001	100000?000	0?12110111	1001011210	200101001?	?001?0010?	00
Mest	*Gotra marginata*	10101	1010200110	?000020202	101000?0?2	1000121000	0001001100	0000010000	0001000000	00
Mest	*Irabatha* sp.	00101	1100010110	?a00011011	001000?0?2	1002121011	1101002200	2000100001	0000000001	00

Table 2. Continued.

		00000 0000000001 1111111111 1111111111 1111111111 1111111111 1111111111 1111111111 11
Subt		**88889 9999999990 0000000001 1111111112 2222222223 3333333334 4444444445 5555555556 66**
	Species	**67890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 1234567890 12**
Mest	*Mesostenus* sp.	10101 1100100010 ?100220011 100110?011 0?11110021 1000001220 0002100001 1001000001 00
Mest	*Polycyrtus* sp. 1	10110 1001010010 ?10?101012 001000?0?1 1001110021 0011002221 0101000001 0000000000 00
Mest	*Polycyrtus* sp. 2	10000 1001000010 ?11?101112 201000?0?2 1101110021 0111002220 0011100000 0001000100 00
Ospr	*Acroricnus stylator*	00100 0021200011 101?220012 101010?000 0?00110020 1000012211 1101211111 1001000020 00
Ospr	*Acroricnus* sp. 1	00100 2010200111 001?100212 101010?010 0?02110021 1000011121 1001200111 1000000120 00
Ospr	*Iaria* sp.	00001 1010010011 1000010102 100000?0?2 1002111011 0001011110 2000201111 1000000110 00
Ospr	*Messatoporus lissonotus*	00001 2010010111 0101200212 ?0000000?3 0?01110021 1100112221 0112001101 1000001120 00
Ospr	*Messatoporus paraguayensis*	00001 2010210111 0101200212 0000000000 0?01110021 1100112220 0112001101 1000001120 00
Ospr	*Messatoporus* sp. nov. 1	00001 2010210011 0101200202 ?0000000?3 0?01110021 1110112221 2112001101 1000001120 00
Ospr	*Messatoporus* sp. nov. 2	00101 0011210111 0101100212 ?0000000?3 0?01110021 1100112221 0112001101 1000001120 00
Ospr	*Osprynchotus* sp.	00100 2011200011 101?000012 ?00000?0?3 0??0111020 1100002110 1002001111 0000000120 01
Ospr	*Photocryptus nigrosignatus*	00100 1001200010 ?01?000012 1000110?0 0?01110021 0100112220 1001221101 1001000100 10
Sphe	*Latibulus argiolus*	--100 2011000010 -11-120012 101000-010 0-00110010 0000012200 000????0?? ?00??00?0? 00
-	*Ecthrus* sp.	00110 1110200011 0000211201 101000-010 0-10101000 1000111200 2112200011 1000000010 10
-	*Gelis* sp.	----- -------0-0 -01-1000?0 -0---0-0-3 0--1110000 0000010220 ?002000001 1001000000 00
-	*Phygadeuon* sp.	001?1 1010000010 ?01?011000 002000?010 0?10001100 0000010000 0002000000 0000000100 00
-	*Platymystax* sp.	00101 1020000110 ?100011011 201000?012 0?12201110 0100000110 2002000001 0001000000 10

Table 3. Cladogram statistics for analyses with concavity constant (*K*) from 1 to 6. R, Rearrangements tried, in billions (B); Fit, tree fit; CI, consistency index; RI, retention index.

-	*K*=1	*K*=2	*K*=3	*K*=4	*K*=5	*K*=6
R	17 B	17 B	18 B	17 B	18 B	19 B
Fit	136.34819	128.70683	122.41428	116.937338	112.093733	107.72553
CI	0.05	0.05	0.05	0.05	0.05	0.05
RI	0.40	0.41	0.41	0.41	0.42	0.43

11 – Apêndice C

Figuras

Figure 1. *Toechorychus* sp. nov. 7, holotype, habitus. Photographed by Berthil B. Longo.

Figure 2. *Toechorychus* sp. nov. 7, holotype, dorsal view. Photographed by Berthil B. Longo.

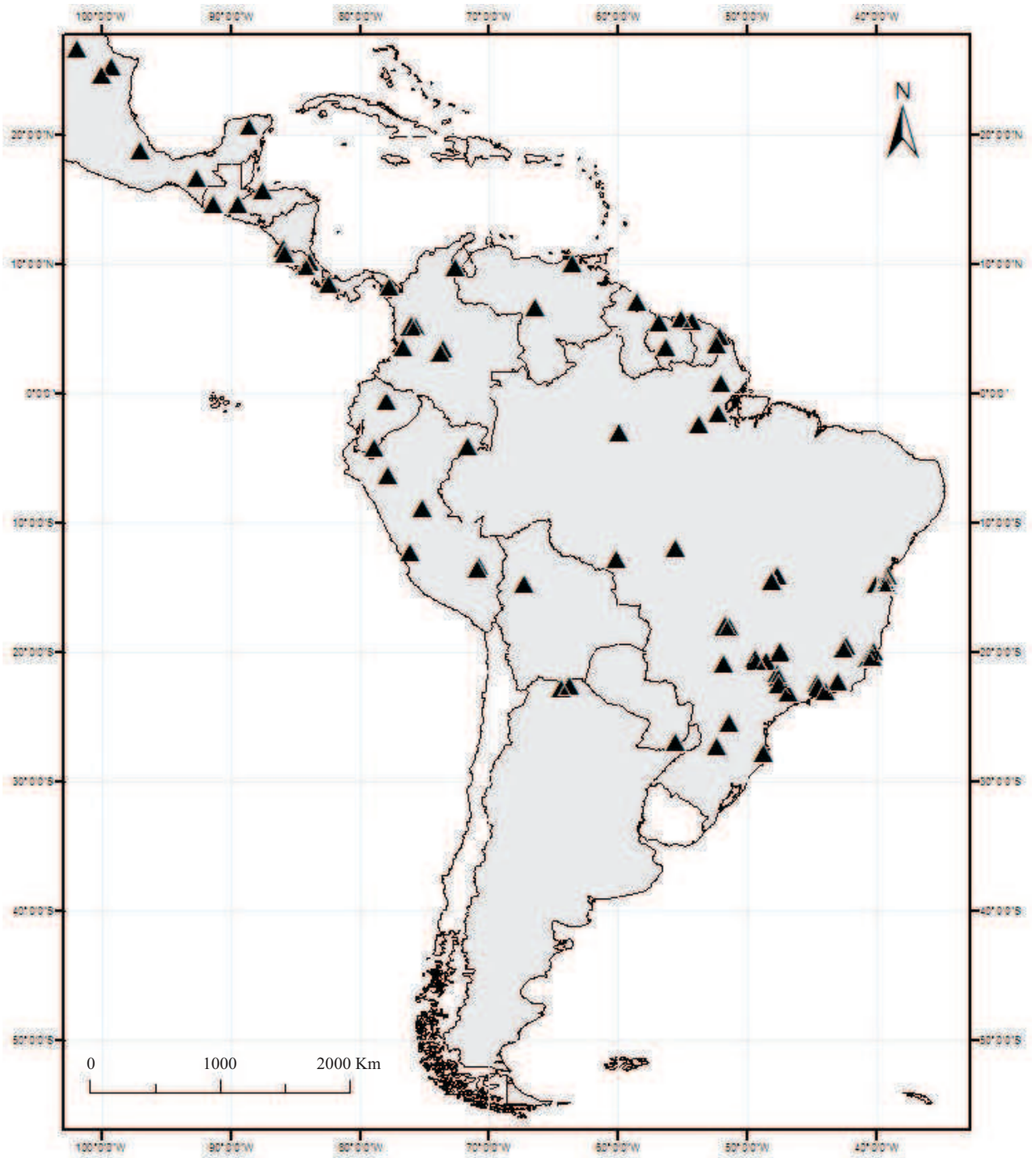


Figure 3. Distribution of *Toechorychus* Townes.

Figures 4–7. Lateral pictures of *Toechorychus*. **4** *T. stramineus* Taschenberg; **5** *T.* sp. nov. 16; **6** *T.* sp. nov. 14; **7** *T.* sp. nov. 22. Illustrations not to scale.

Figures 8–11. Lateral pictures of *Toechorychus*. **8** *T.* sp. nov. 13; **9** *T.* sp. nov. 24; **10** *T.* sp. nov. 10; **11** *T.* sp. nov. 34. Illustrations not to scale.

Figures 12–15. Lateral pictures of *Toechorychus*. **12** *T.* sp. nov. 29; **13** *T.* sp. nov. 3; **14** *T.* sp. nov. 15; **15** *T.* sp. nov. 19. Illustrations not to scale.

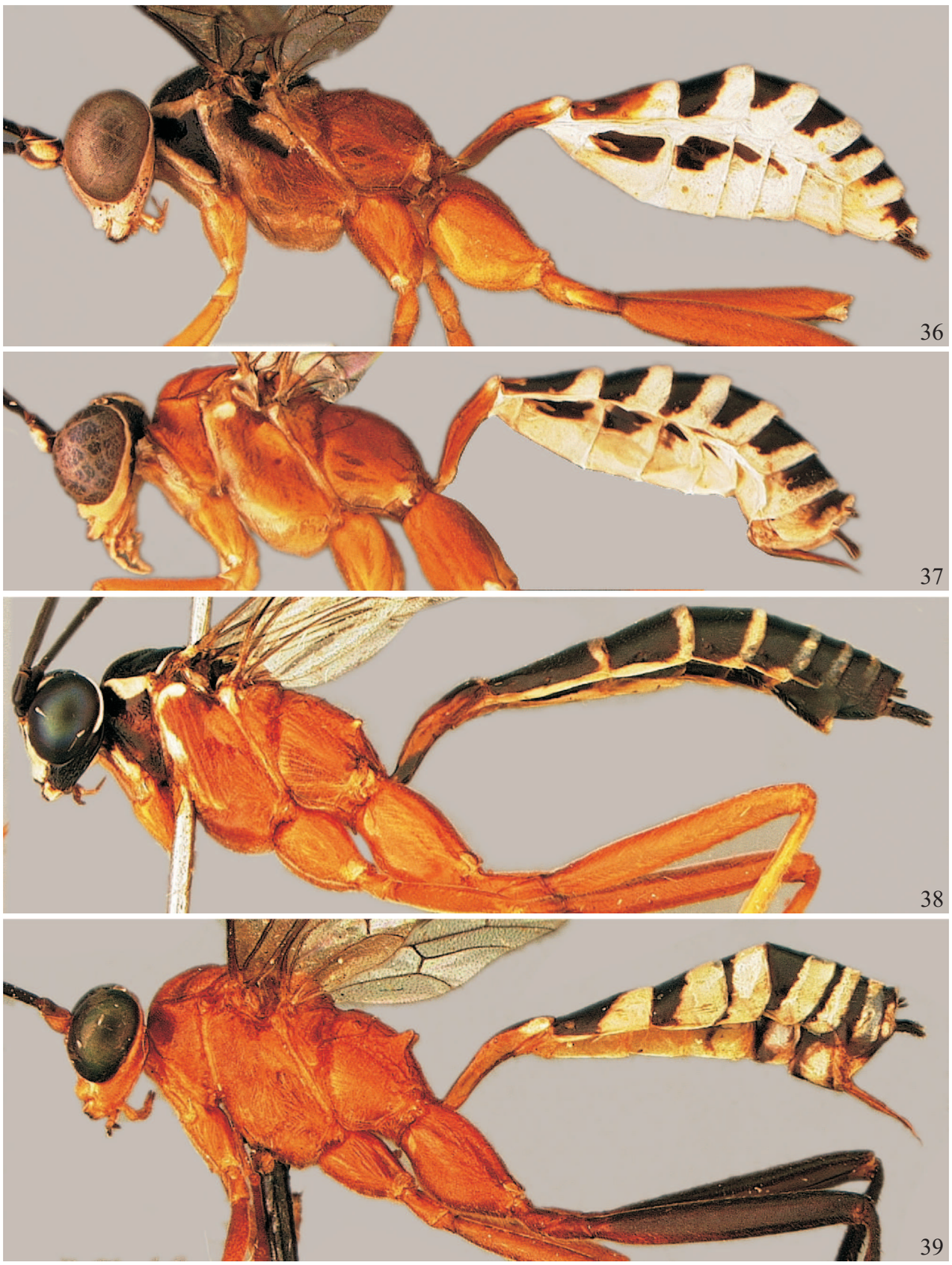
Figures 16–19. Lateral pictures of *Toechorychus*. **16** *T. cassunungae* Brauns; **17** *T.* sp. nov. 35; **18** *T.* sp. nov. 11; **19** *T.* sp. nov. 28. Illustrations not to scale.

Figures 20–23. Lateral pictures of *Toechorychus*. **20** *T.* sp. nov. 30; **21** *T.* sp. nov. 04; **22** *T.* sp. nov. 20; **23** *T.* sp. nov. 21. Illustrations not to scale.

Figures 24–27. Lateral pictures of *Toechorychus*. **24** *T.* sp. nov. 23; **25** *T.* sp. nov. 27; **26** *T.* sp. nov. 32; **27** *T.* sp. nov. 33. Illustrations not to scale.

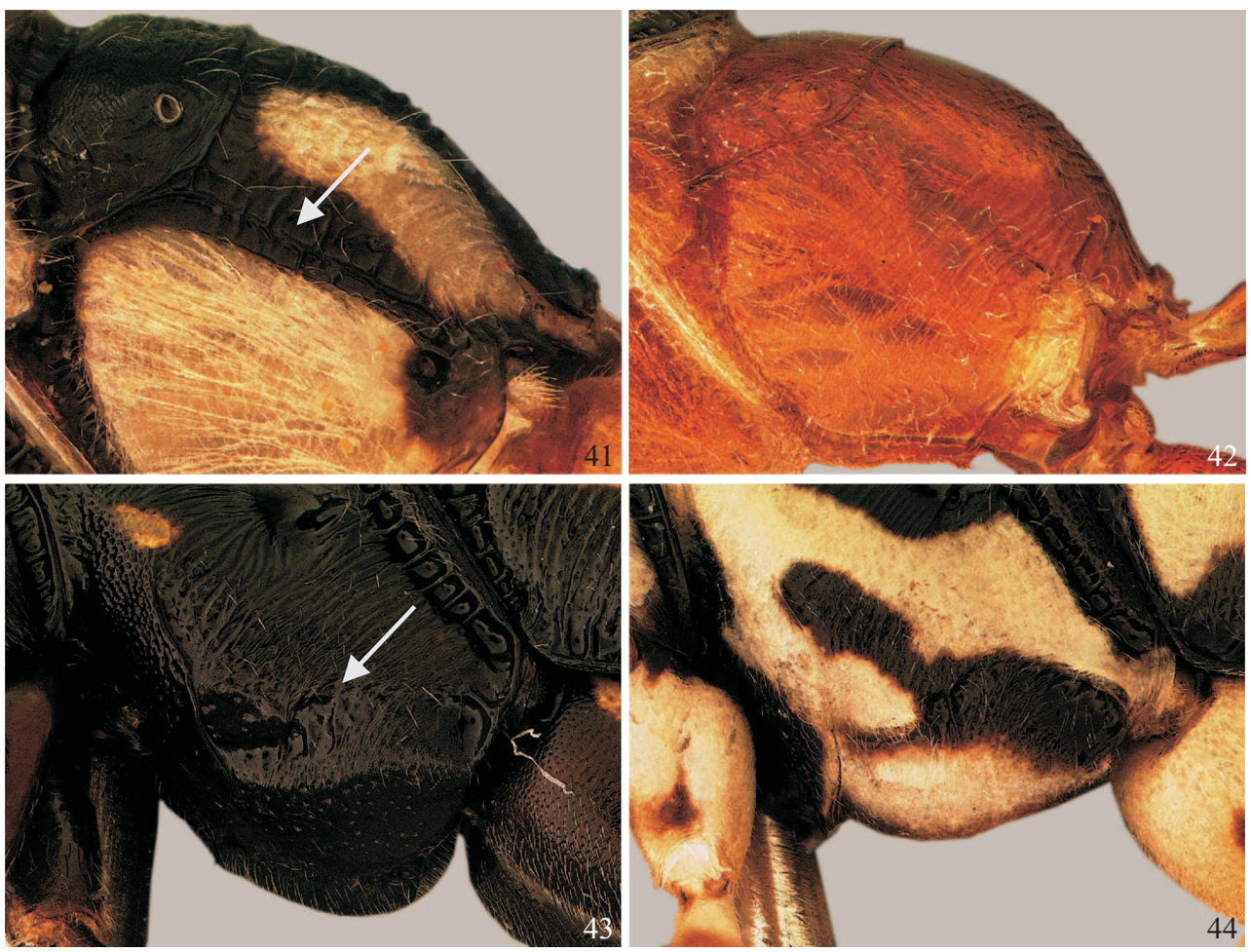
Figures 28–31. Lateral pictures of *Toechorychus*. **28** *T.* sp. nov. 1; **29** *T. albimaculatus* Taschenberg; **30** *T.* sp. nov. 31; **31** *T.* sp. nov. 2. Illustrations not to scale.

Figures 32–35. Lateral pictures of *Toechorychus*. **32** *T.* sp. nov. 25; **33** *T.* sp. nov. 5; **34** *T.* sp. nov. 9; **35** *T.* sp. nov. 18. Illustrations not to scale.

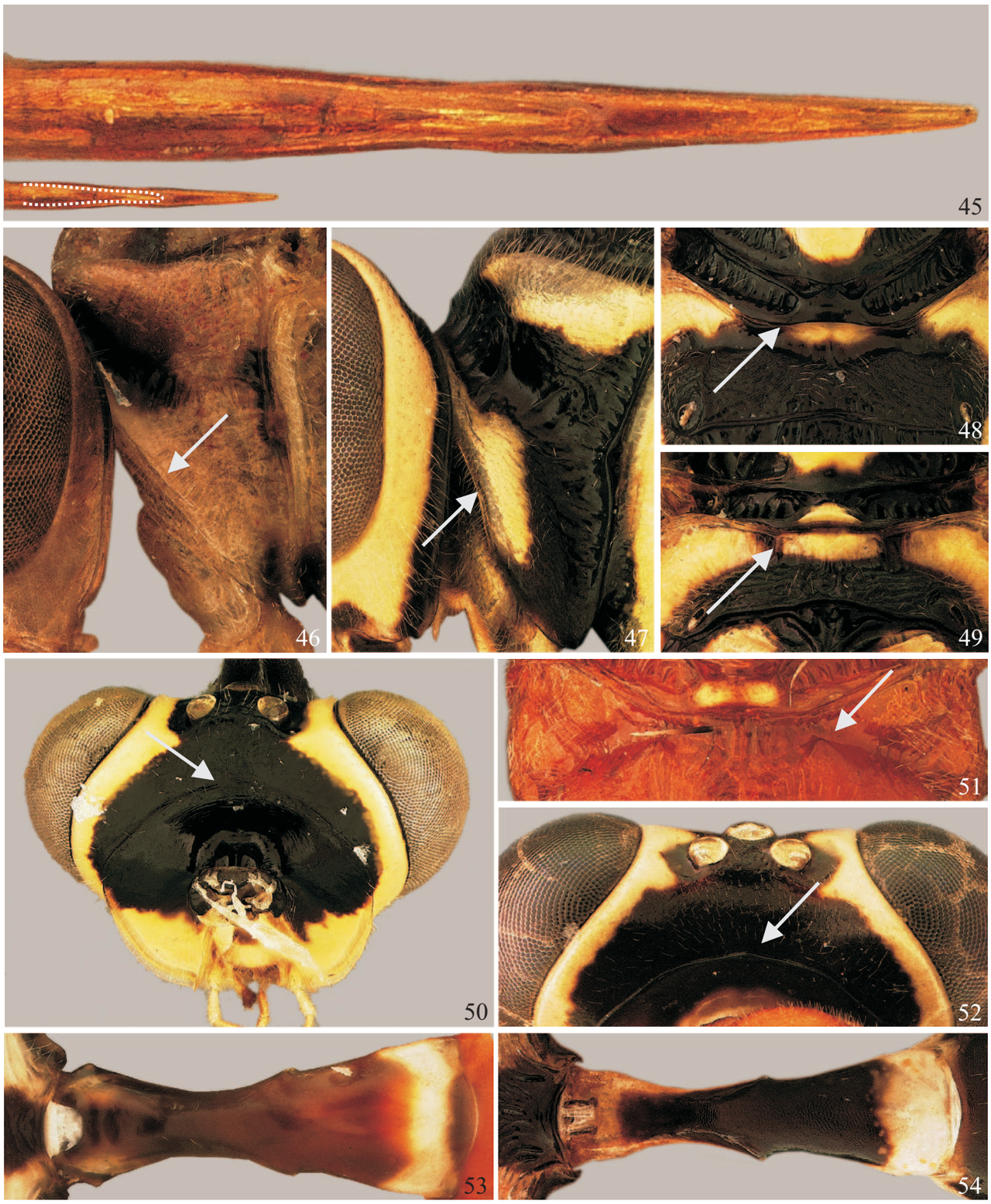


Figures 36–39. Lateral pictures of *Toechorychus*. **36** *T.* sp. nov. 12; **37** *T.* sp. nov. 8; **38** *T.* sp. nov. 6; **39** *T.* sp. nov. 17. Illustrations not to scale.

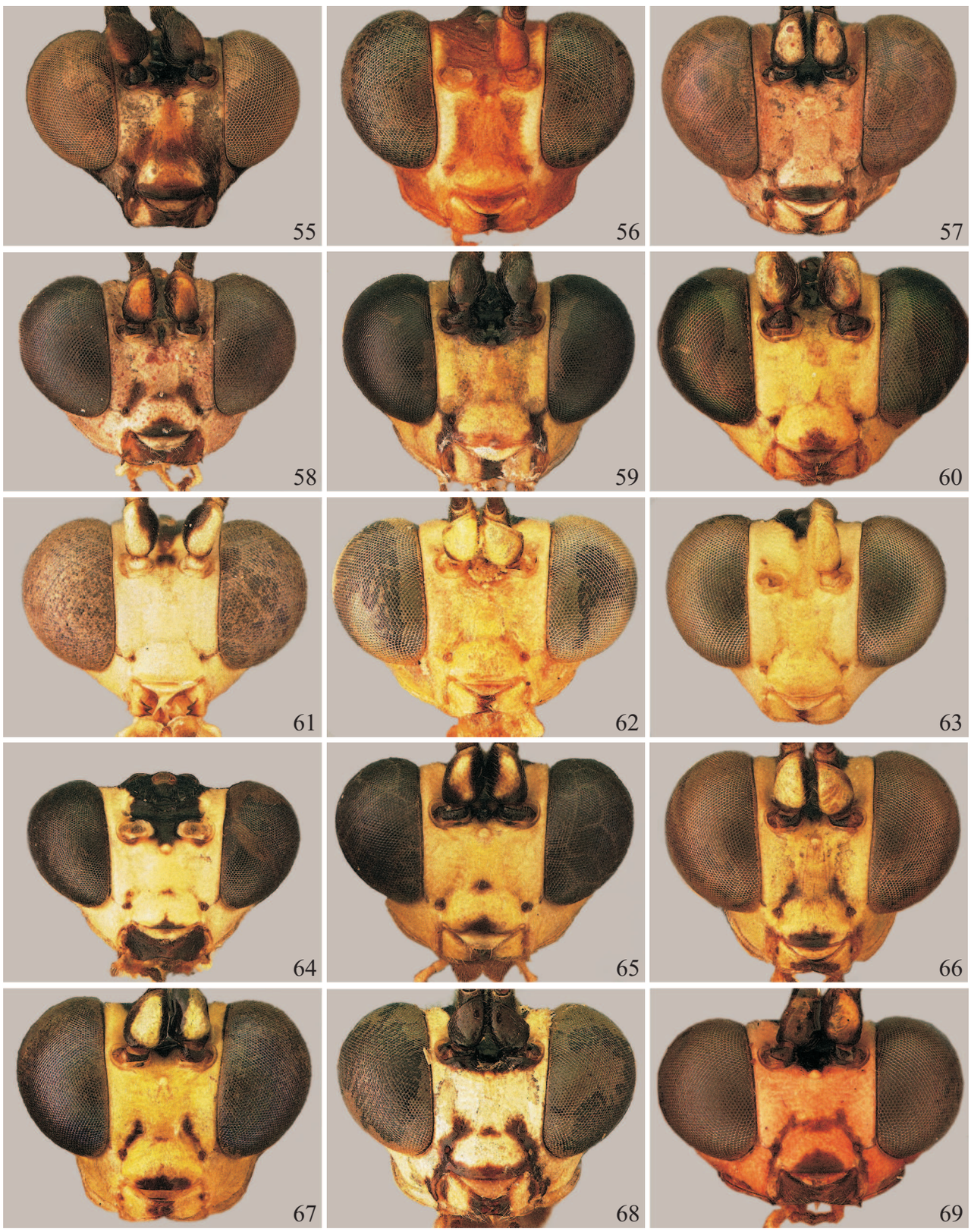
Figure 40. Lateral picture of *Toechorychus* sp. nov. 26. Illustration not to scale.



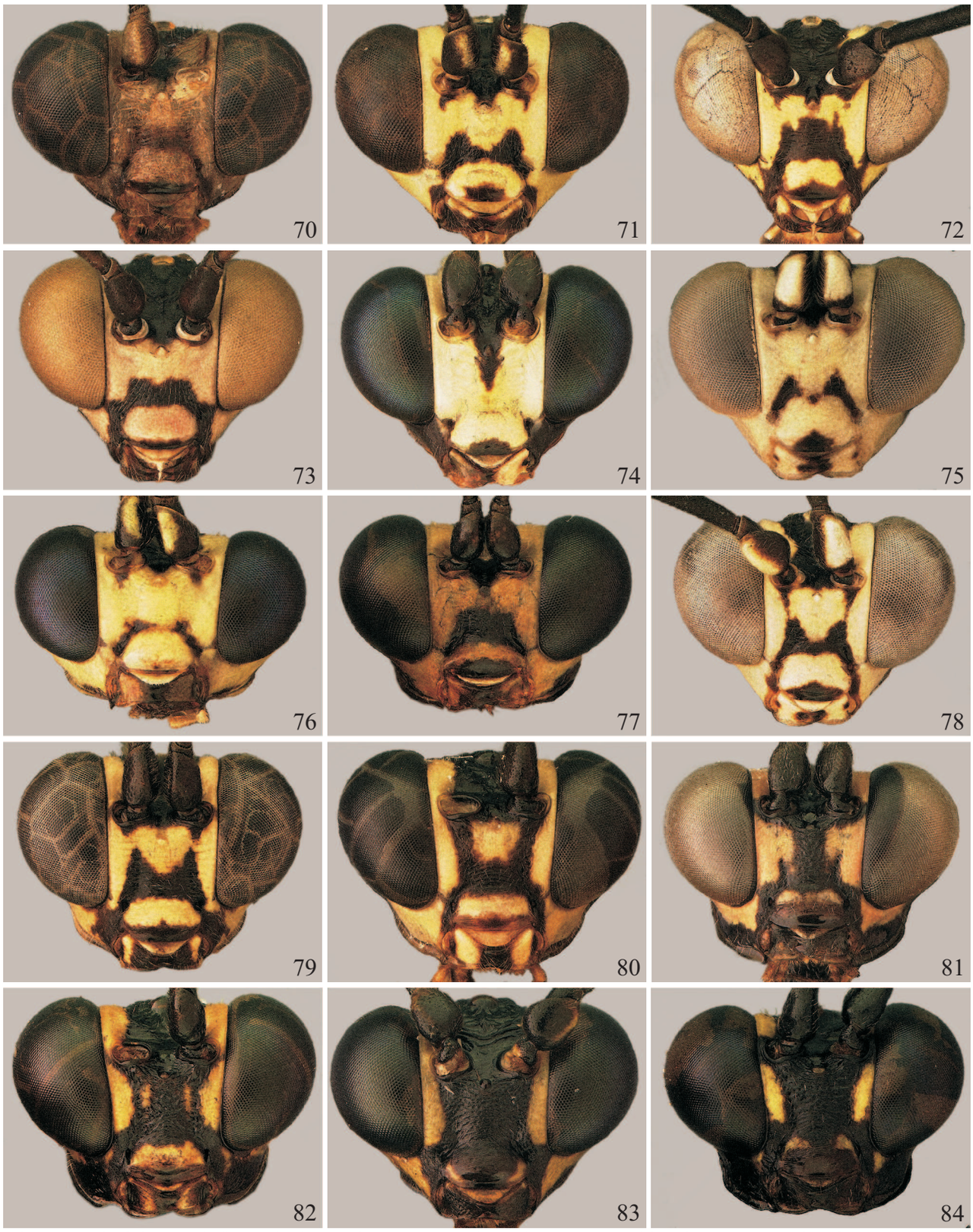
Figures 41–44. 41 *T.* sp. nov. 24, propodeum in dorsal view, pleural carina complete; **42** *T.* sp. nov. 12, propodeum in lateral view, pleural carina absent; **43** *T.* sp. nov. 27, mesopleuron in lateral view, sternaulus incomplete; **44** *T.* sp. nov. 32, mesopleuron in lateral view, sternaulus complete, reaching base of mid coxa. llustrations not to scale.



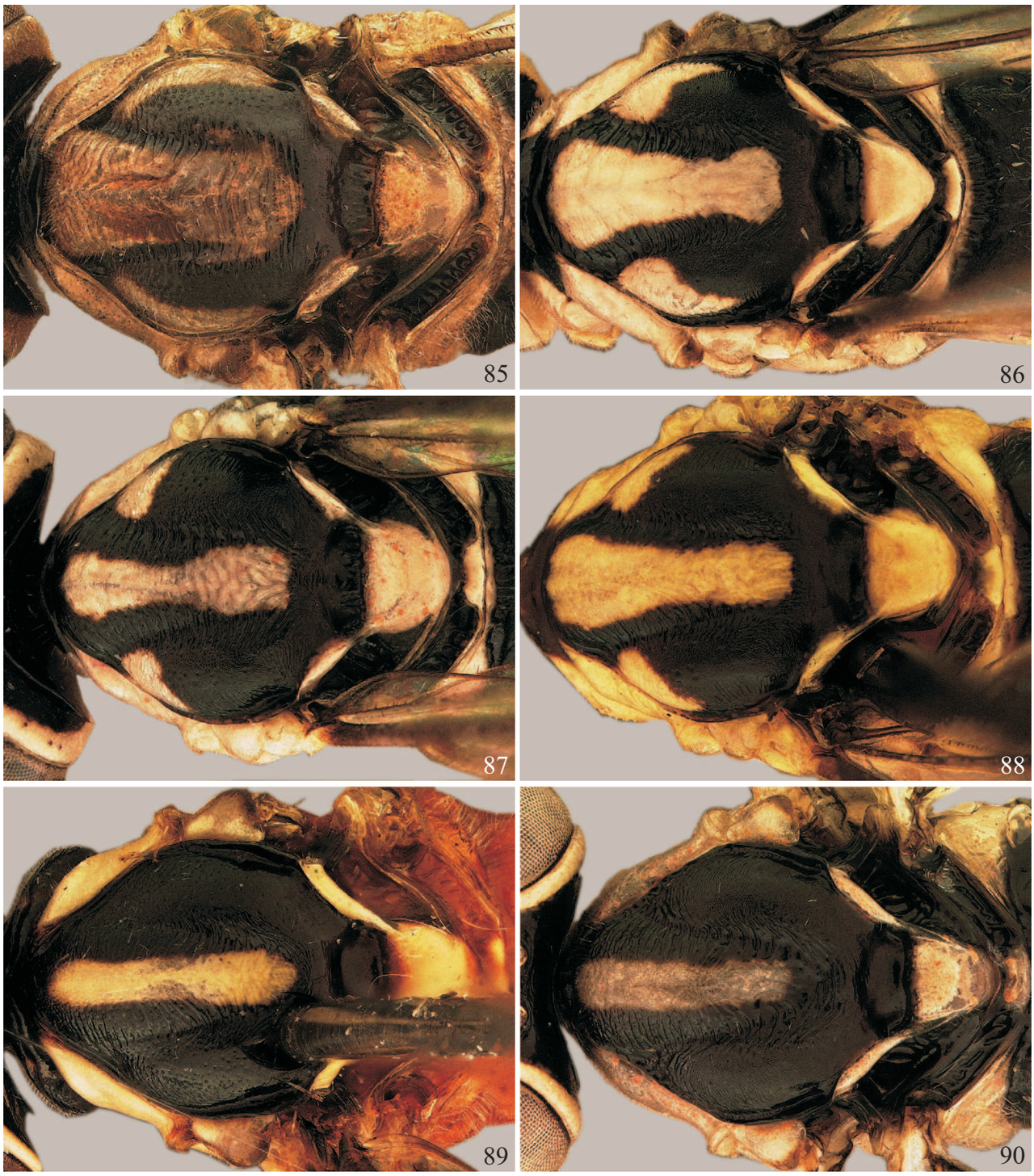
Figures 45–54. 45 *T*. sp. nov. 17, ovipositor in dorsal view, dorsal valve with posterior V-shaped sulcus, a synapomorphy for the genus. **46** *T*. sp. nov. 10, pronotum in lateral view, lateral portion of collar dorsally carinated; **47** *T*. sp. nov. 11, pronotum in lateral view, lateral portion of collar dorsally swollen; **48** *T*. sp. nov. 13, hind margin of metanotum without teeth or carinae; **49** *T*. sp. nov. 33, hind margin of metanotum with two lateral carinae; **50** *T*. sp. nov. 3, head in posterior view, occipital carina dorsally absent; **51** *T*. sp. nov. 6, anterior margin of propodeum with two lateral teeth. **52** *T*. sp. nov. 8, head in posterior view, occipital carina dorsally conspicuous. **53** *T*. sp. nov. 2, first tergite with two basolateral teeth; **54** *T*. sp.nov. 24, first tergite without basolateral teeth. llustrations not to scale.



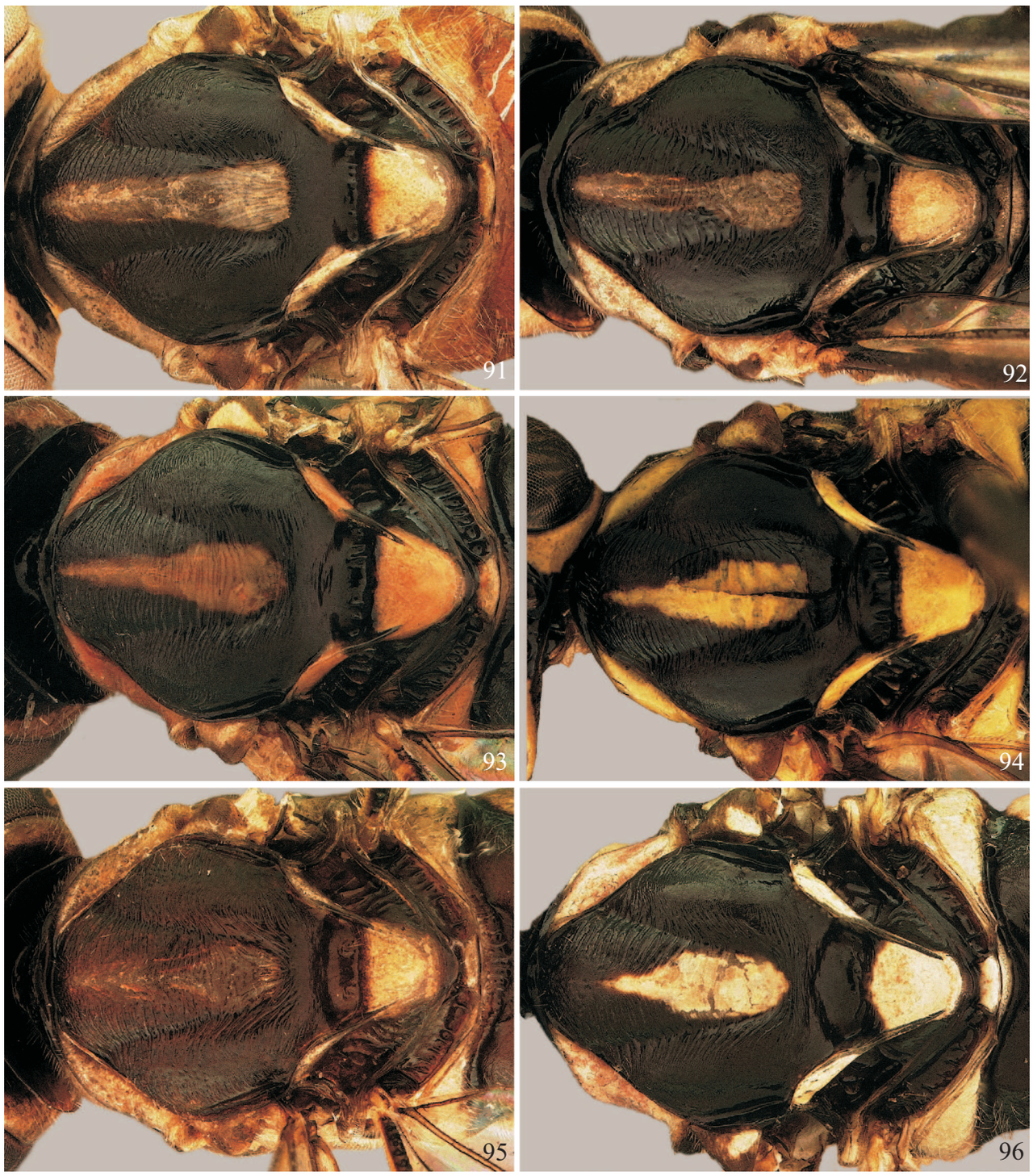
Figures 55–69. Head, frontal view. **55** *T.* sp. nov. 26; **56** *T.* sp. nov. 17; **57** *T.* sp. nov. 9; **58** *T.* sp. nov. 7; **59** *T.* sp. nov. 5; **60** *T.* sp. nov. 35;**61** *T.* sp. nov. 8; **62** *T. stramineus* Taschenberg; **63** *T.* sp. nov. 16; **64** *T.* sp. nov. 1; **65** *T.* sp. nov. 13; **66** *T.* sp. nov. 3; **67** *T.* sp. nov. 14; **68** *T. albimaculatus* Taschenberg; **69** *T. cassunungae* Brauns. Illustrations not to scale.



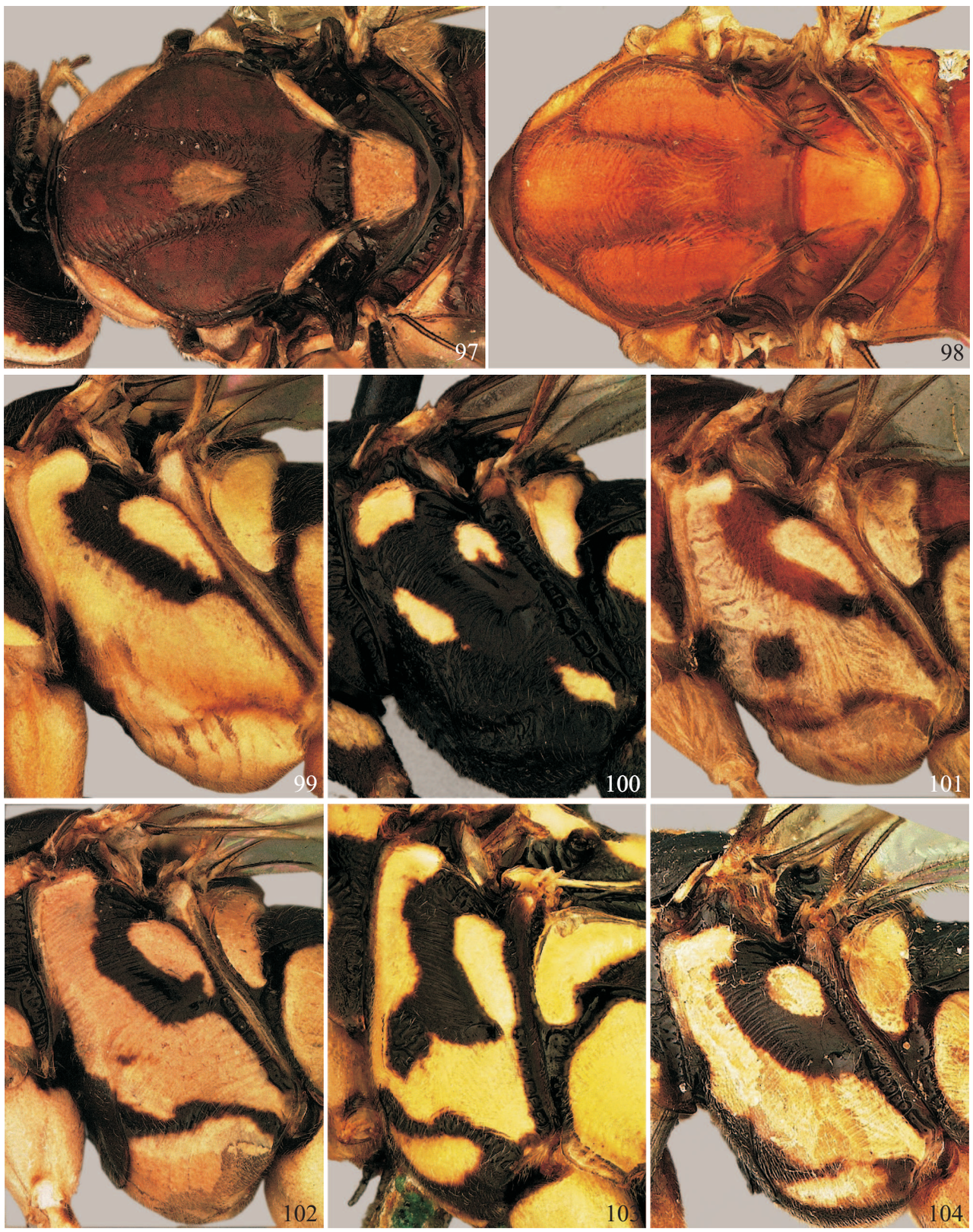
Figures 70–84. Head, frontal view. **70** *T.* sp. nov. 15; **71** *T.* sp. nov. 11; **72** *T.* sp. nov. 2; **73** *T.* sp. nov. 4; **74** *T.* sp. nov. 6; **75** *T.* sp. nov. 25; **76** *T.* sp. nov. 28; **77** *T.* sp. nov. 30; **78** *T.* sp. nov. 31; **79** *T.* sp. nov. 32; **80** *T.* sp. nov. 33; **81** *T.* sp. nov. 21; **82** *T.* sp. nov. 23; **83** *T.* sp. nov. 20; **84** *T.* sp. nov. 27. Illustrations not to scale.



Figures 85–90. Mesoscutum, dorsal view. **85** *T.* sp. nov. 10; **86** *T.* sp. nov. 34; **87** *T.* sp. nov. 22; **88** *T.* sp. nov. 16; **89** *T.* sp. nov. 6; **90** *T.* sp. nov. 24. Illustrations not to scale.



Figures 91–96. Mesoscutum, dorsal view. **91** *T.* sp. nov. 12; **92** *T.* sp. nov. 31; **93** *T.* sp. nov. 9; **94** *T.* sp. nov. 5; **95** *T.* sp. nov. 15; **96** *T.* sp. nov. 2. Illustrations not to scale.



Figures 97–98. Mesoscutum, dorsal view. **97** *T.* sp. nov. 7; **98** *T.* sp. nov. 8. **Figures 99–104.** Mesopleuron, lateral view. **99** *T.* sp. nov. 29; **100** *T.* sp. nov. 21; **101** *T.* sp. nov. 19; **102** *T.* sp. nov. 9; **103** *T.* sp. nov. 11; **104** *T. albimaculatus* Taschenberg. Illustrations not to scale.

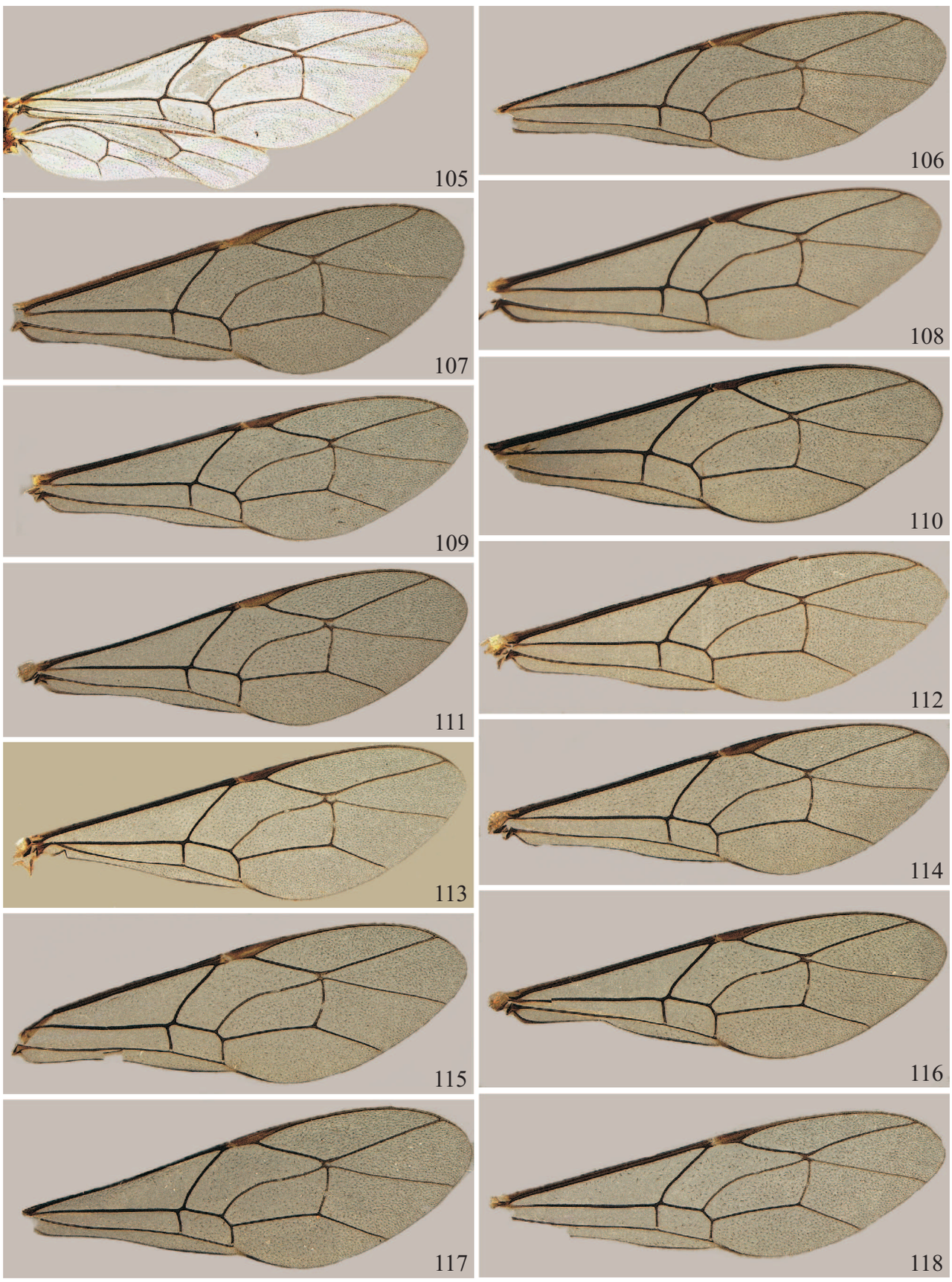
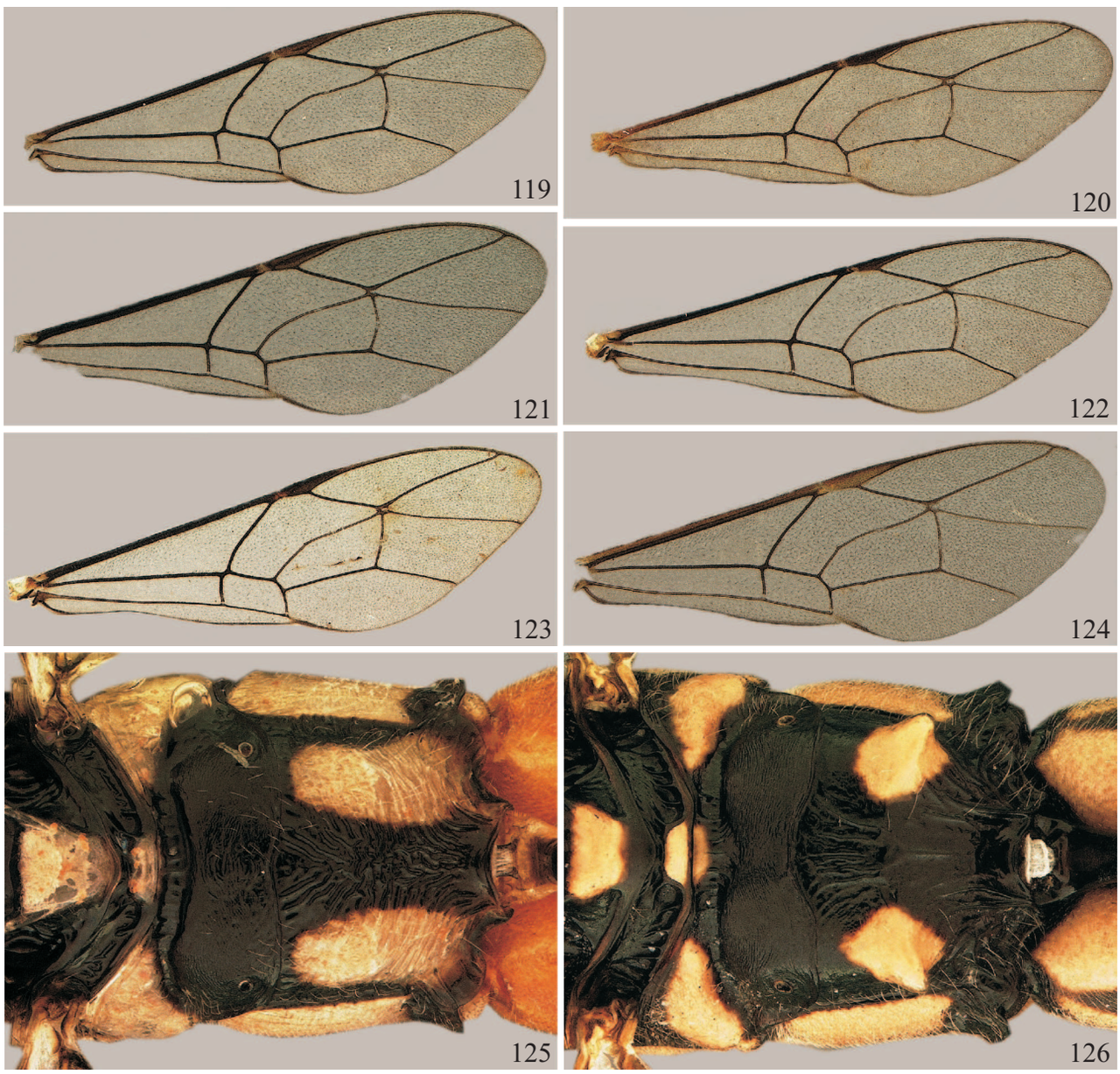
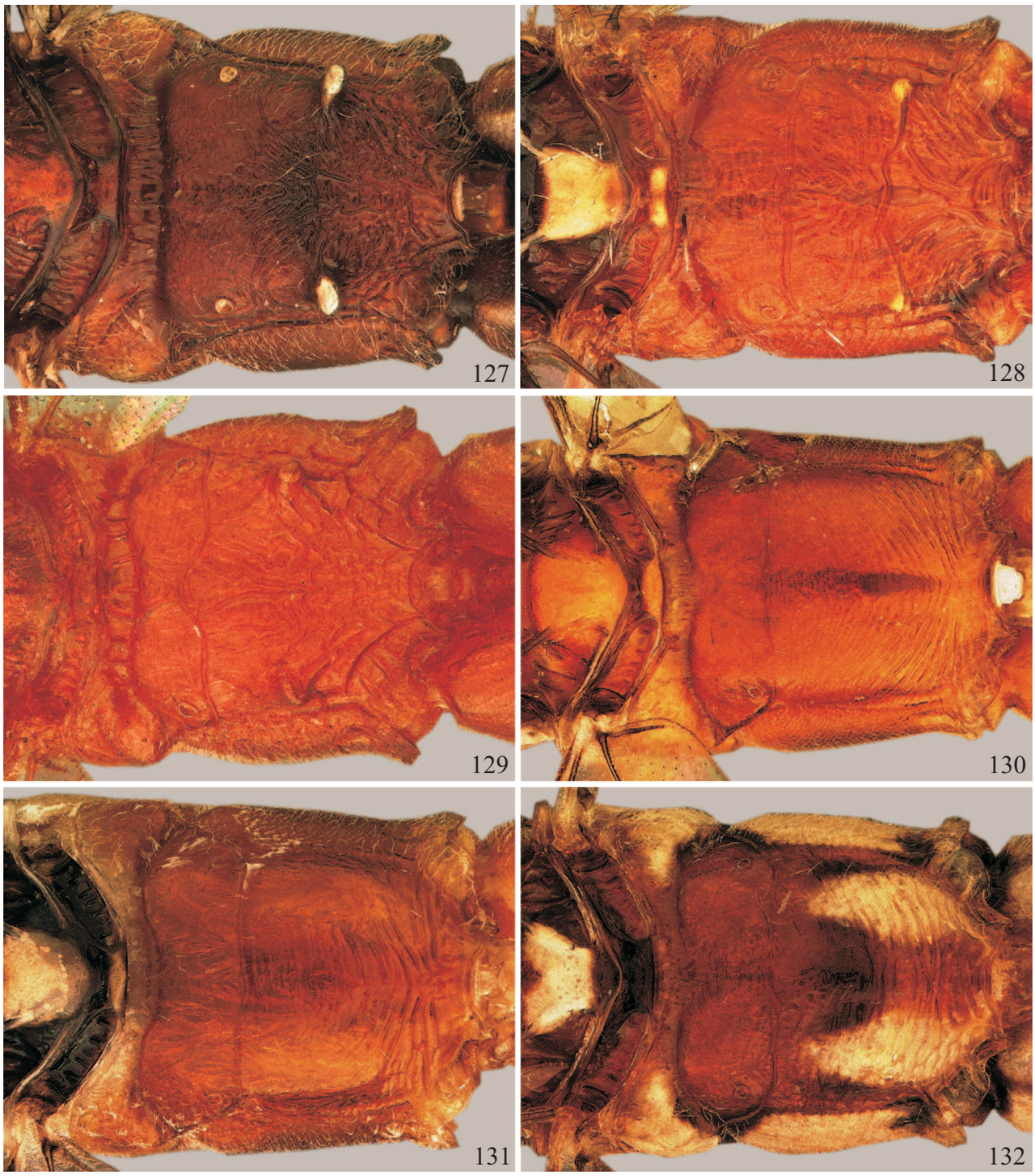


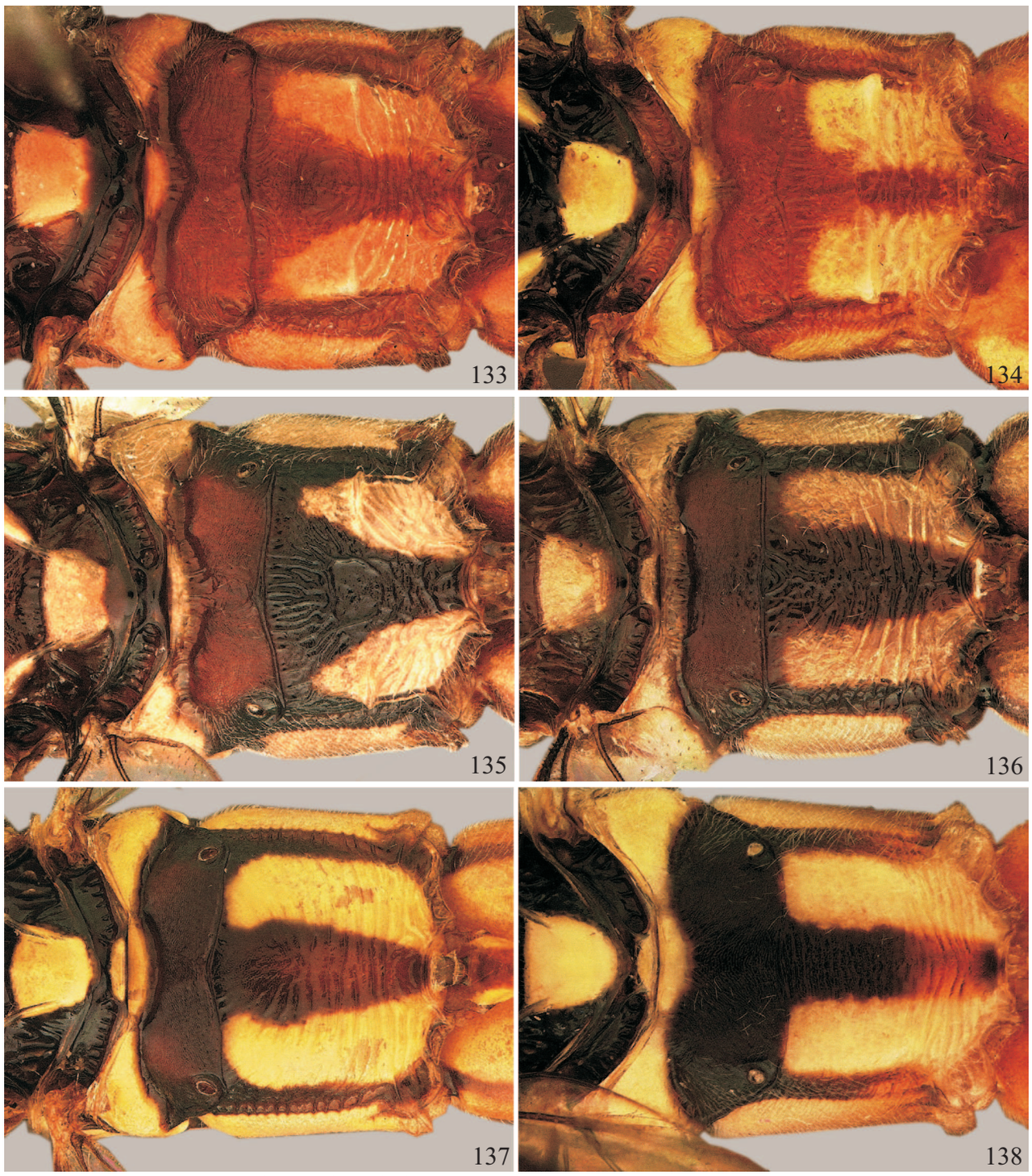
Figure 105. *T. albimaculatus* Taschenberg, fore and hind wings. **Figures 106–118.** Fore wing. **106** *T. cassunungae* Brauns; **107** *T. stramineus* Taschenberg; **108** *T.* sp. nov. 1; **109** *T.* sp. nov. 3; **110** *T.* sp. nov. 2; **111** *T.* sp. nov. 4; **112** *T.* sp. nov. 5; **113** *T.* sp. nov. 6; **114** *T.* sp. nov. 7; **115** *T.* sp. nov. 8; **116** *T.* sp. nov. 9; **117** *T.* sp. nov. 12; **118** *T.* sp. nov. 14. Illustrations not to scale.



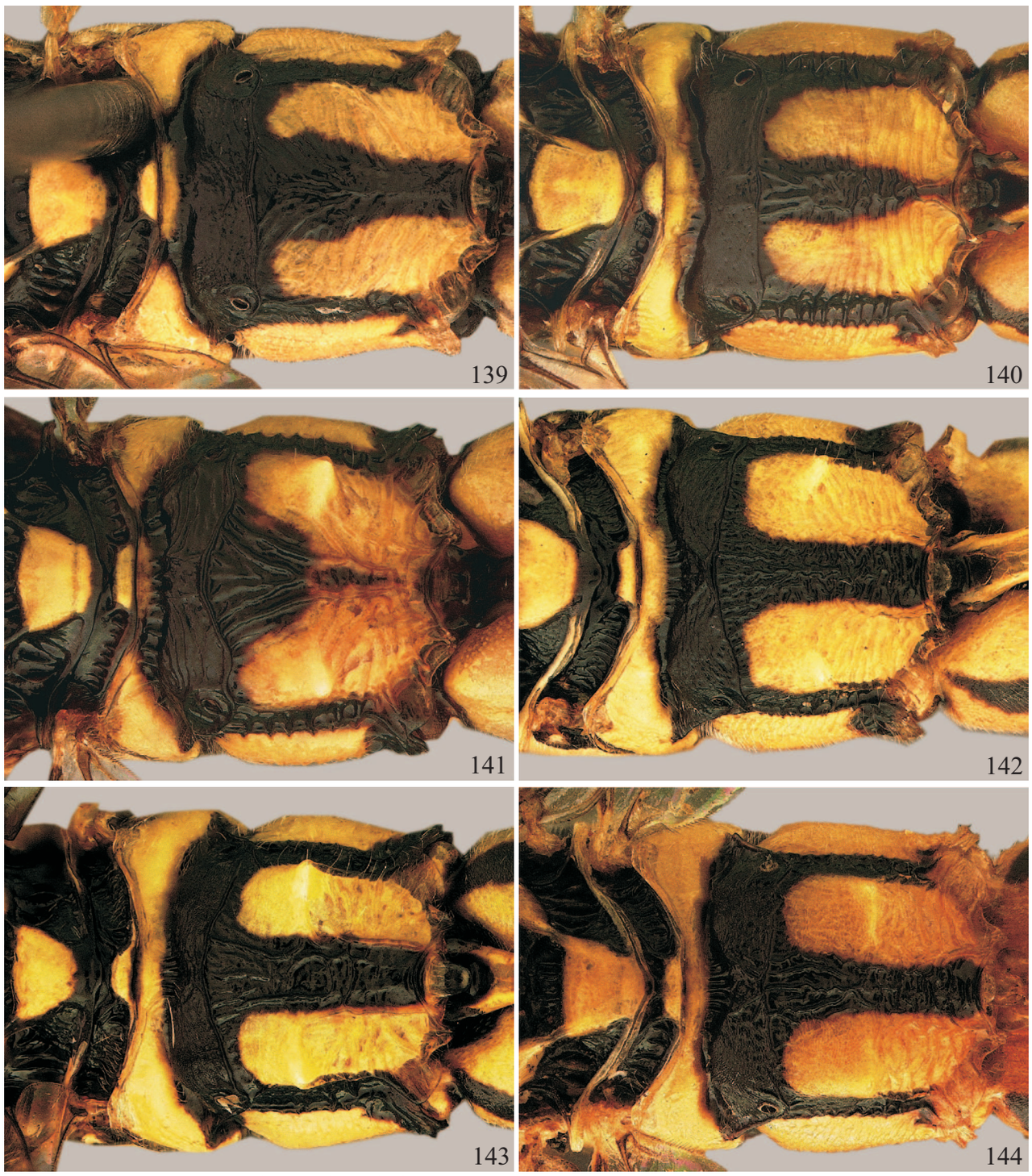
Figures 119–124. Fore wing. **119** *T.* sp. nov. 15; **120** *T.* sp. nov. 17; **121** *T.* sp. nov. 24; **122** *T.* sp. nov. 25; **123** *T.* sp. nov. 30; **124** *T.* sp. nov. 33. **Figures 125–126.** Propodeum, dorsal view. **125** *T.* sp.nov. 24; **126** *T.* sp. nov. 4. Illustrations not to scale.



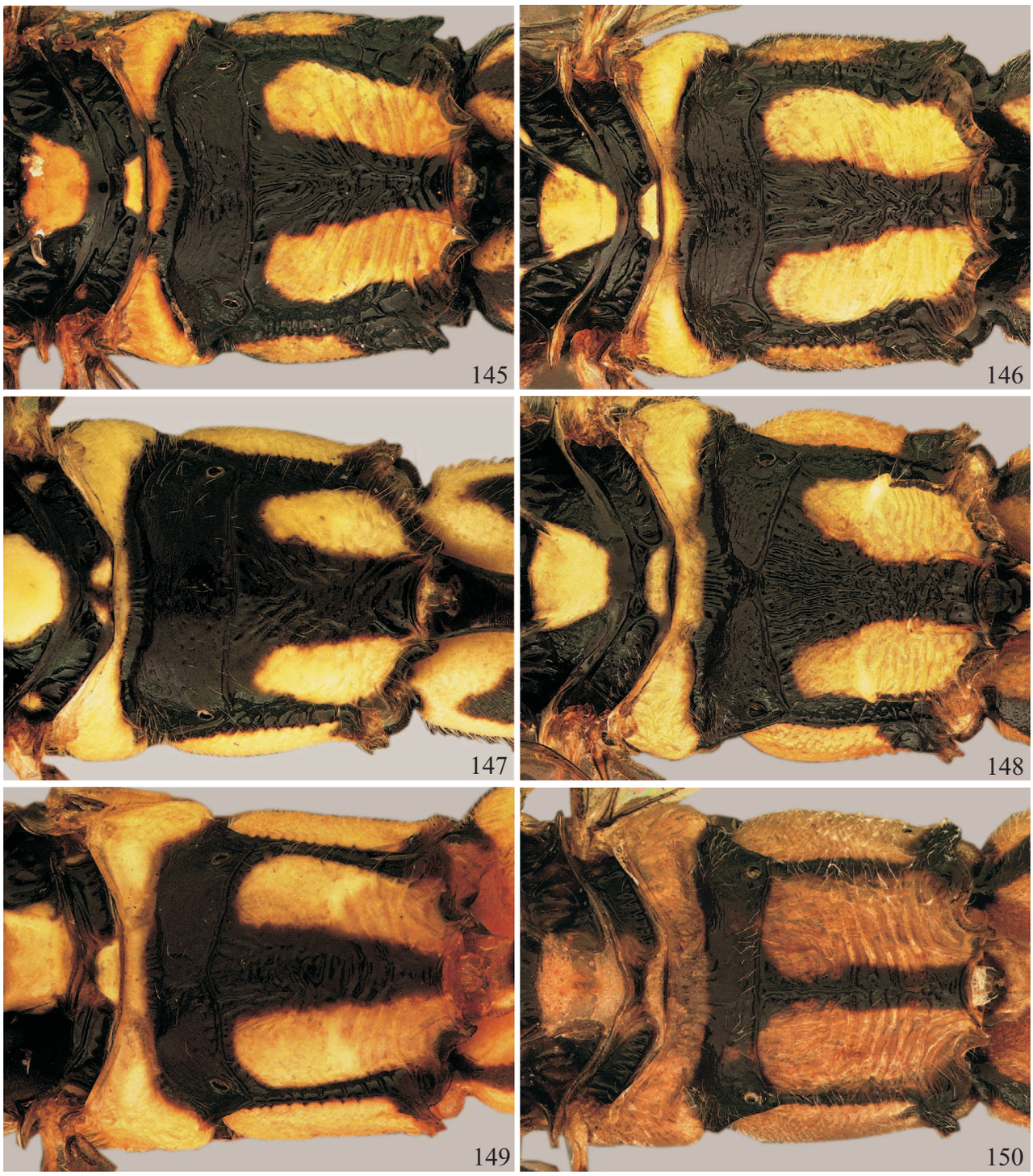
Figures 127–132. Propodeum, dorsal view. **127** *T.* sp. nov. 26; **128** *T.* sp. nov. 6; **129** *T.* sp. nov. 17; **130** *T.* sp. nov. 8; **131** *T.* sp. nov. 12; **132** *T.* sp. nov. 19. Illustrations not to scale.



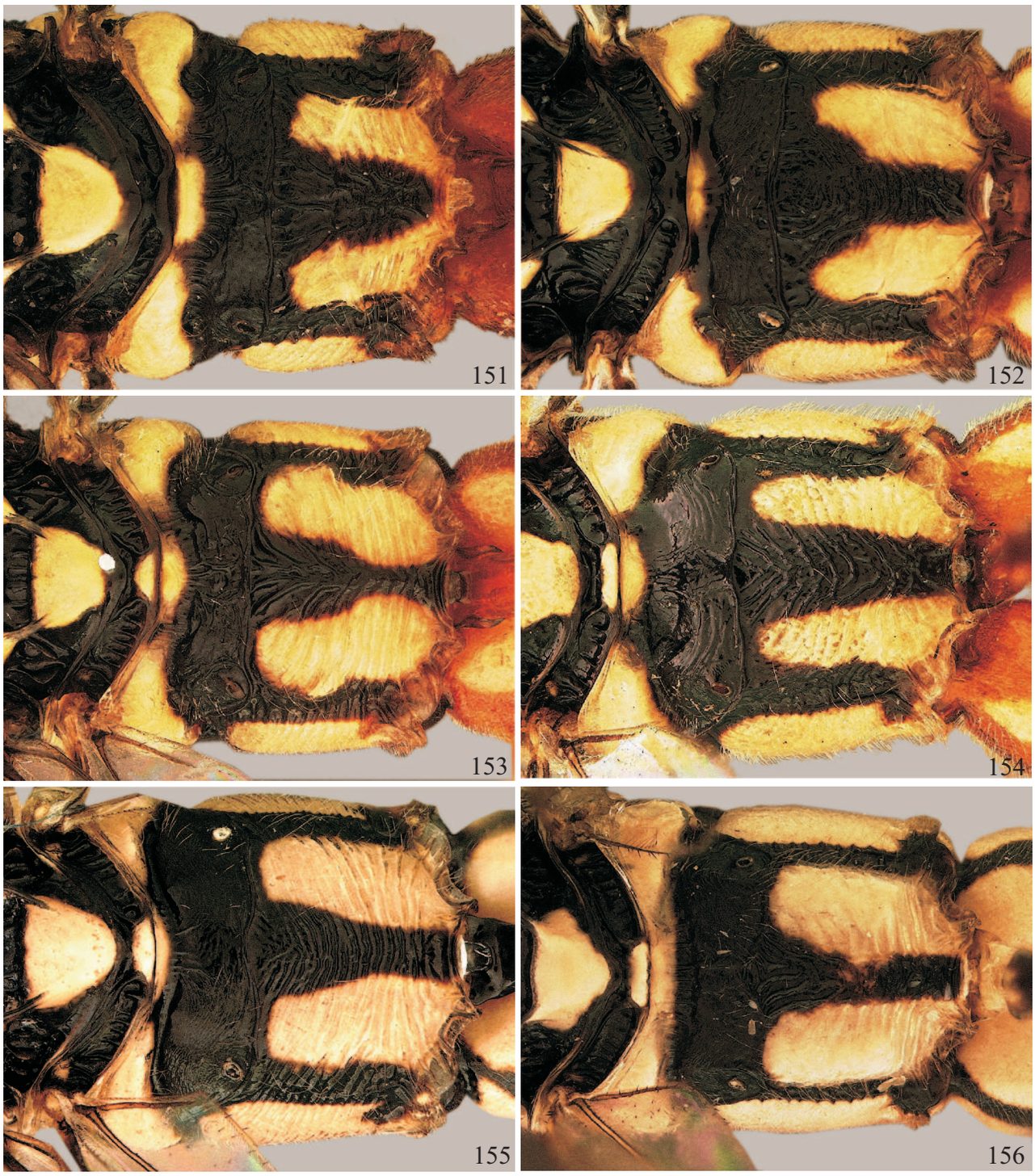
Figures 133–138. Propodeum, dorsal view. **133** *T. cassunungae* Brauns; **134** *T.* sp. nov. 35; **135** *T.* sp. nov. 7;**136** *T.* sp. nov. 15; **137** *T.* sp. nov. 3; **138** *T.* sp. nov. 29. Illustrations not to scale.



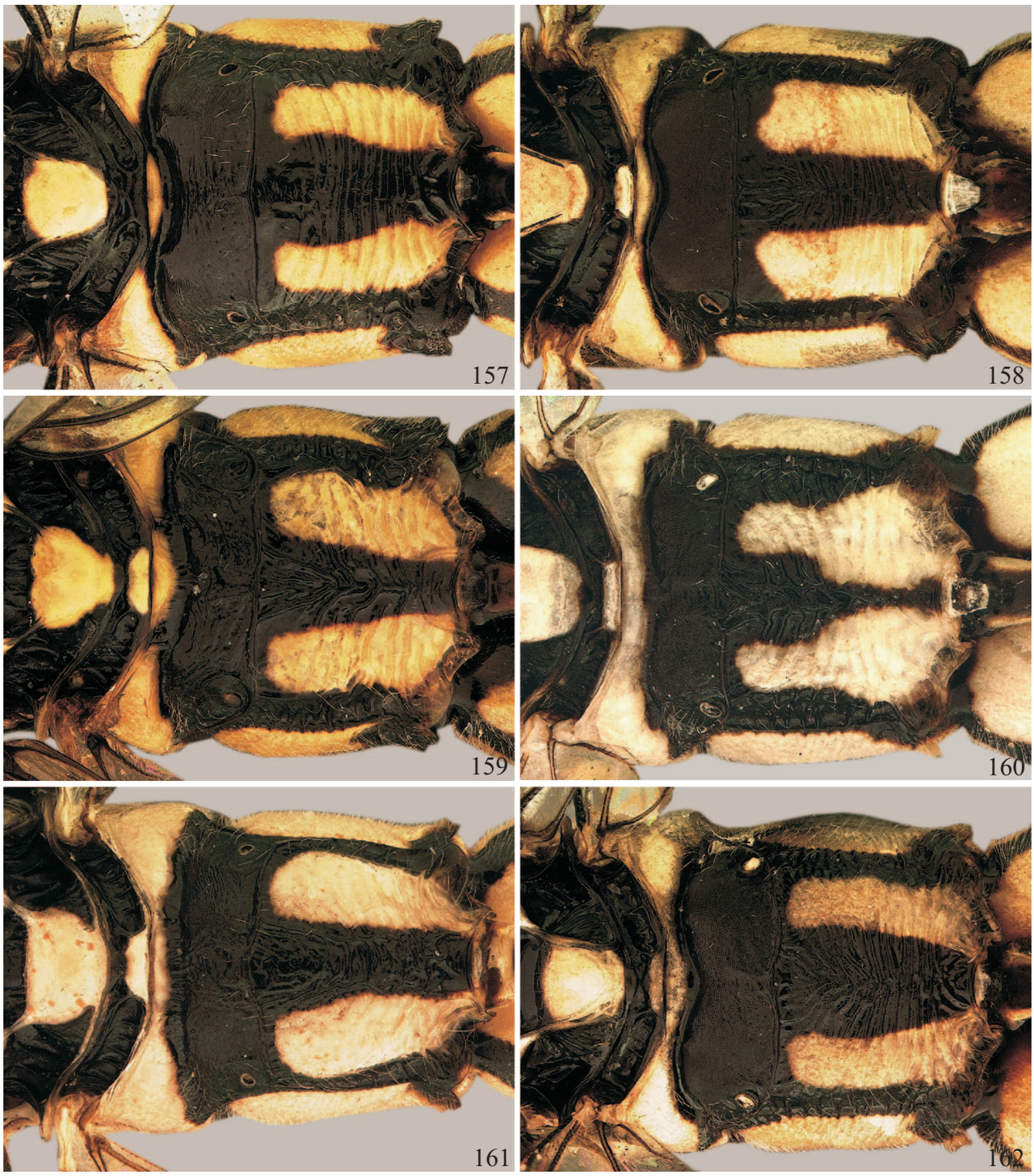
Figures 139–144. Propodeum, dorsal view. **139** *T.* sp. nov. 5; **140** *T.* sp. nov. 14; **141** *T.* sp. nov. 30; **142** *T.* sp. nov. 11; **143** *T.* sp. nov. 20; **144** *T. stramineus* Taschenberg. Illustrations not to scale.



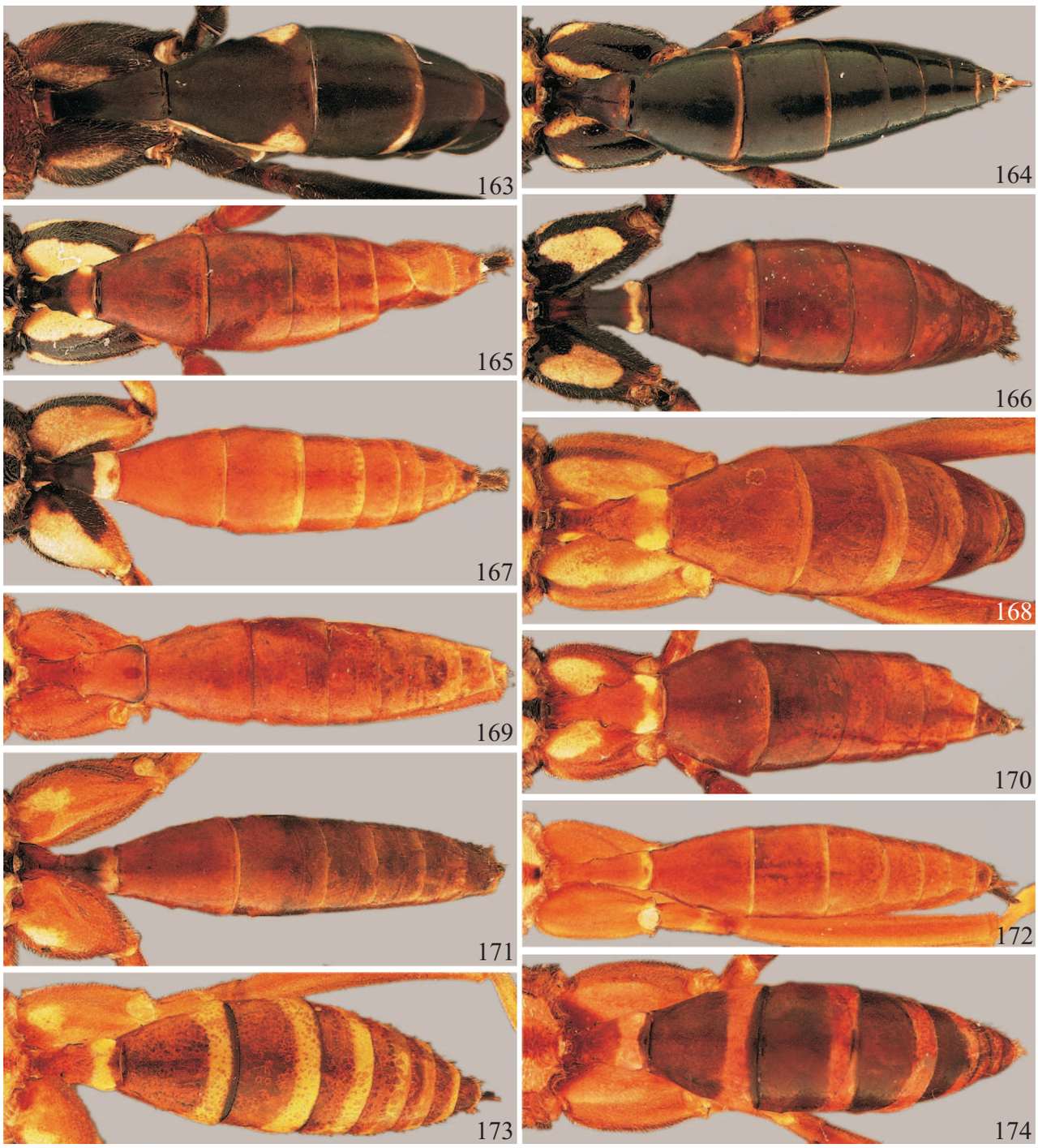
Figures 145–150. Propodeum, dorsal view. **145** *T.* sp. nov. 23; **146** *T.* sp. nov. 27; **147** *T.* sp. nov. 18; **148** *T.* sp. nov. 28; **149** *T.* sp. nov. 16; **150** *T.* sp. nov. 10. Illustrations not to scale.



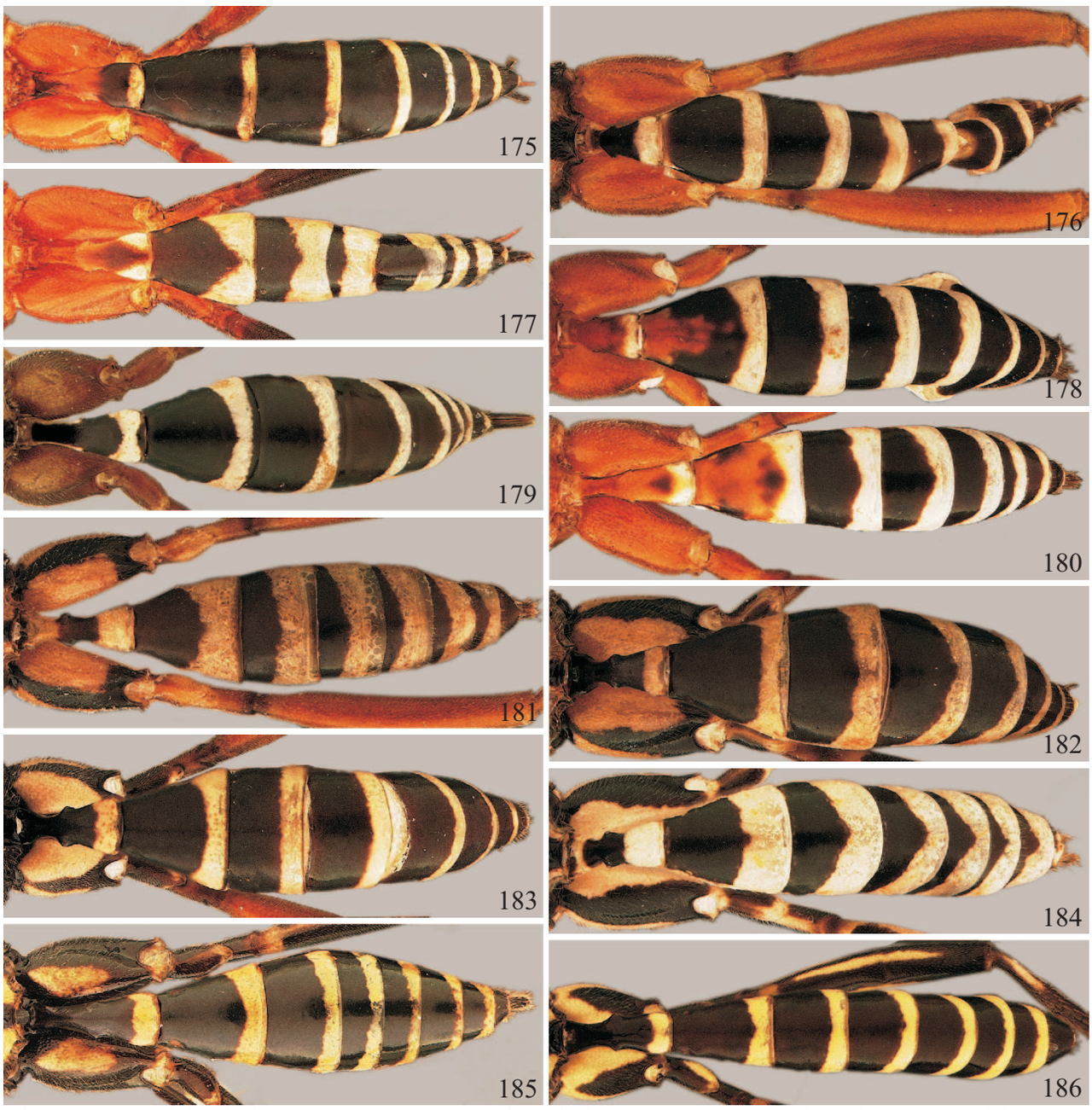
Figures 151–156. Propodeum, dorsal view. **151** *T.* sp. nov. 1; **152** *T.* sp. nov. 13; **153** *T.* sp. nov. 33; **154** *T. albimaculatus* Taschenberg; **155** *T.* sp. nov. 9; **156** *T.* sp. nov. 34. Illustrations not to scale.



Figures 157–162. Propodeum, dorsal view. **157** *T.* sp. nov. 32; **158** *T.* sp. nov. 2; **159** *T.* sp. nov. 21; **160** *T.* sp. nov. 25; **161** *T.* sp. nov. 22; **162** *T.* sp. nov. 31. Illustrations not to scale.

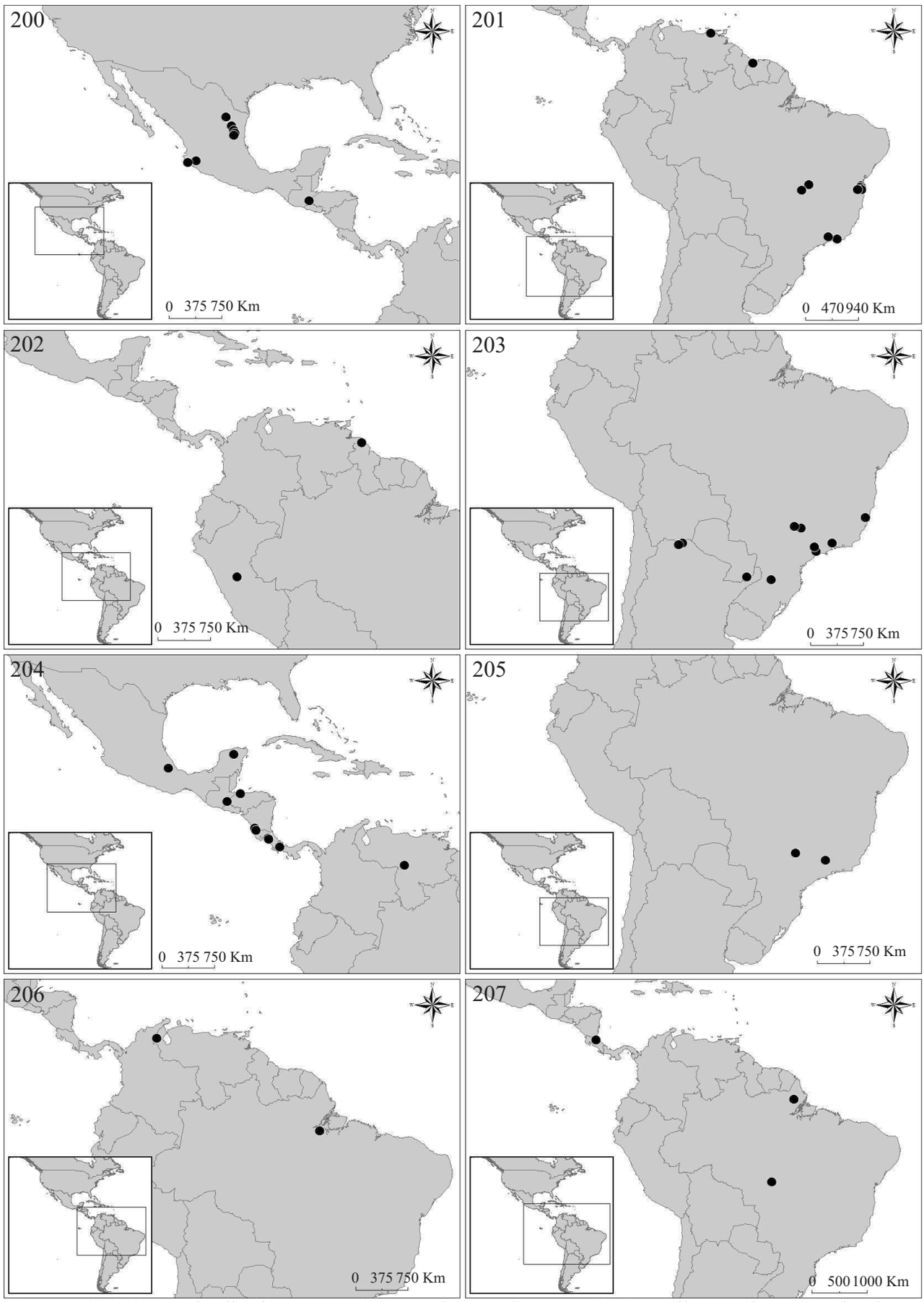


Figures 163–174. Hind coxa and metasoma, dorsal view. **163** *T*. sp. nov. 26; **164** *T*. sp. nov. 23; **165** *T*. sp. nov. 32; **166** *T*. sp. nov. 21; **167** *T*. sp. nov. 31; **168** *T*. sp. nov. 3; **169** *T*. sp. nov. 1; **170** *T*. sp. nov. 33; **171** *T. albimaculatus* Taschenberg; **172** *T*. sp. nov. 29; **173** *T*. sp. nov. 35; **174** *T. cassunungae* Brauns.

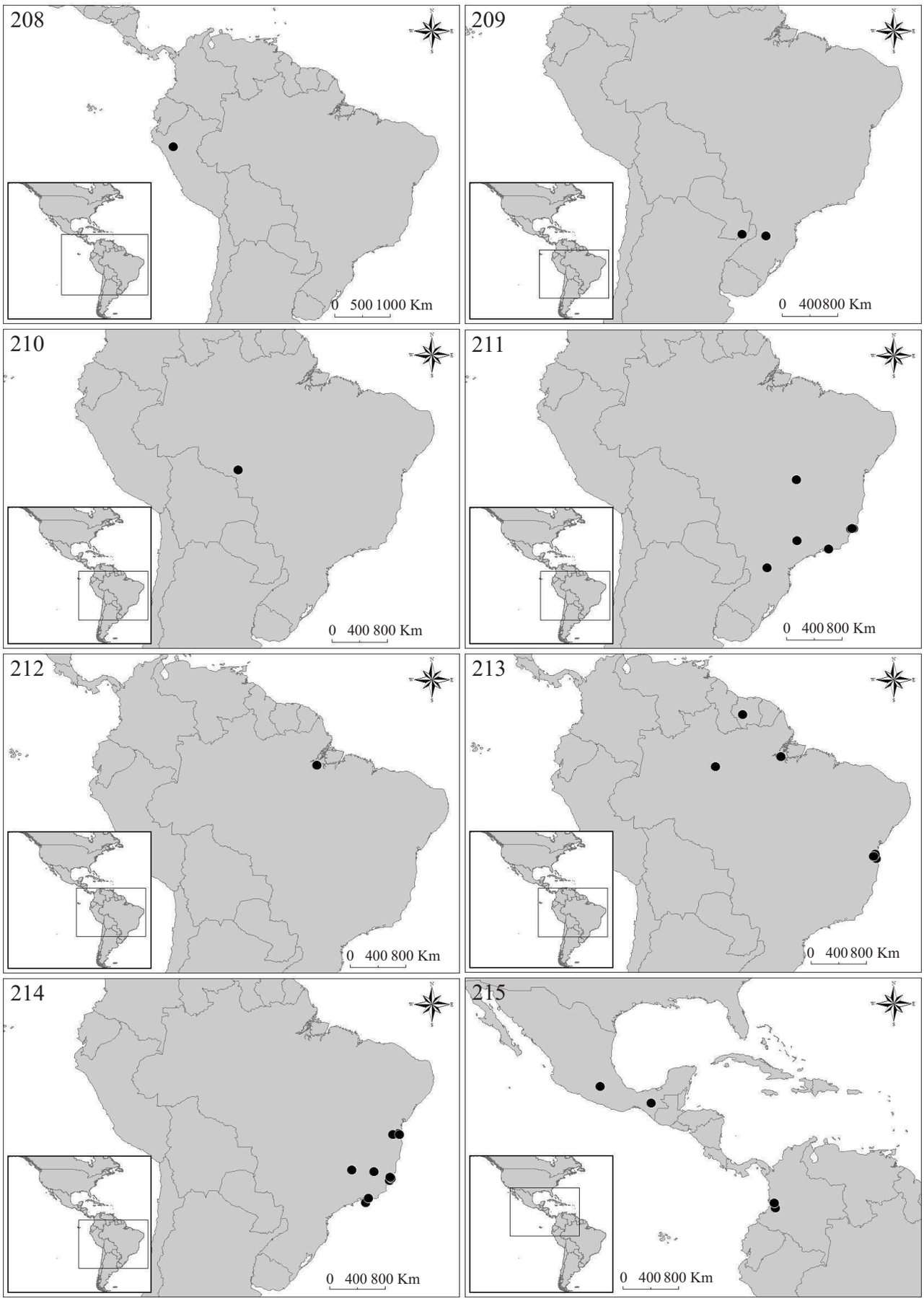


Figures 175–186. Hind coxae and metasoma, dorsal view. **175** *T.* sp. nov. 6; **176** *T.* sp. nov. 24; **177** *T.* sp. nov. 17; **178** *T.* sp. nov. 8; **179** *T.* sp. nov. 7; **180** *T.* sp. nov. 12; **181** *T.* sp. nov. 10; **182** *T.* sp. nov. 9; **183** *T.* sp. nov. 4; **184** *T.* sp. nov. 18; **185** *T.* sp. nov. 27; **186** *T.* sp. nov. 22. Illustrations not to scale.

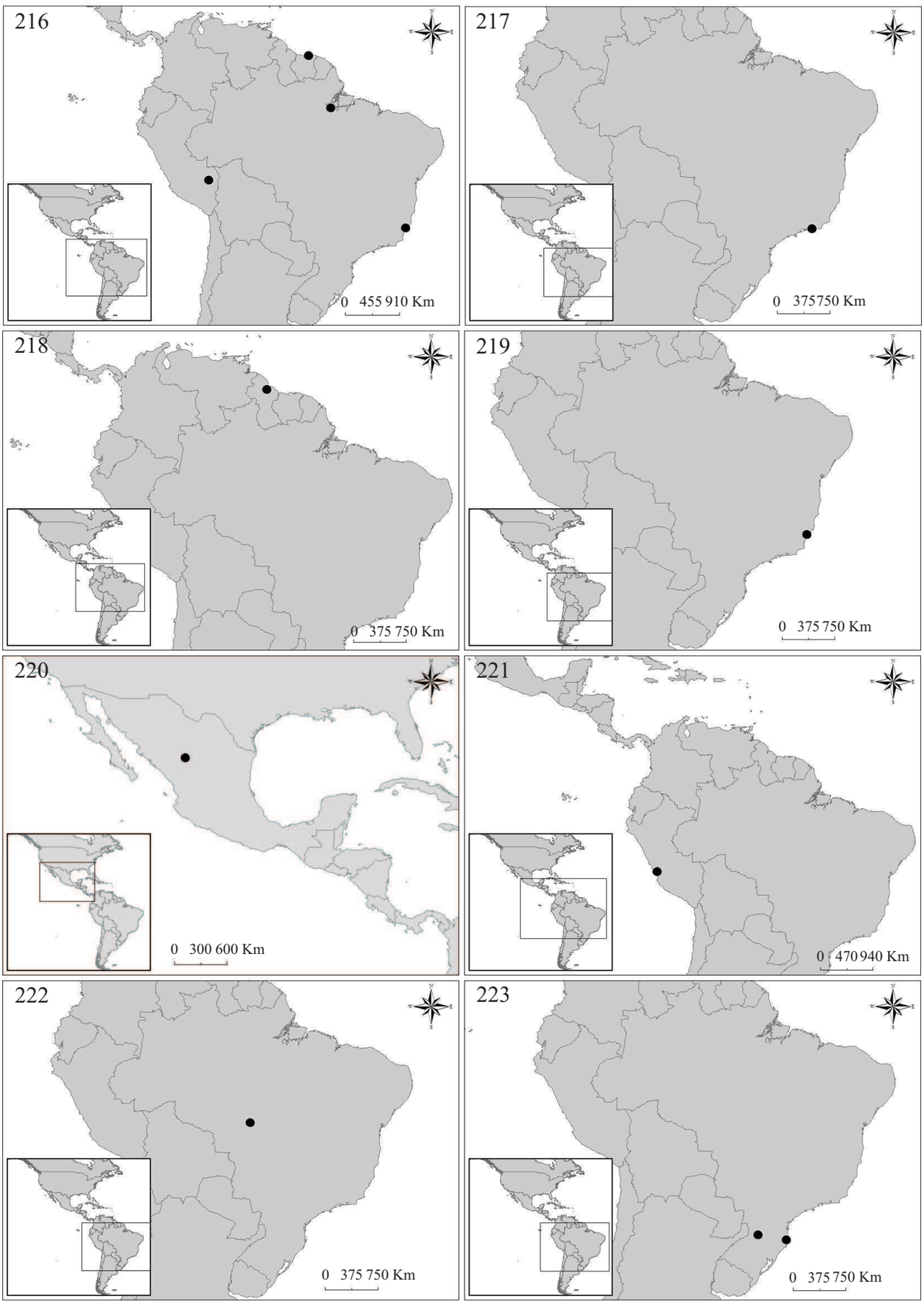
Figures 187–199. Hind coxae and metasoma, dorsal view. **187** *T.* sp. nov. 13; **188** *T.* sp. nov. 11; **189** *T.* sp. nov. 5; **190** *T.* sp. nov. 20; **191** *T.* sp. nov. 14; **192** *T.* sp. nov. 16; **193** *T.* sp. nov. 28; **194** *T.* sp. nov. 19; **195** *T.* sp. nov. 15; **196** *T. stramineus* Taschenberg; **197** *T.* sp. nov. 34; **198** *T.* sp. nov. 2; **199** *T.* sp. nov. 30. Illustrations not to scale.



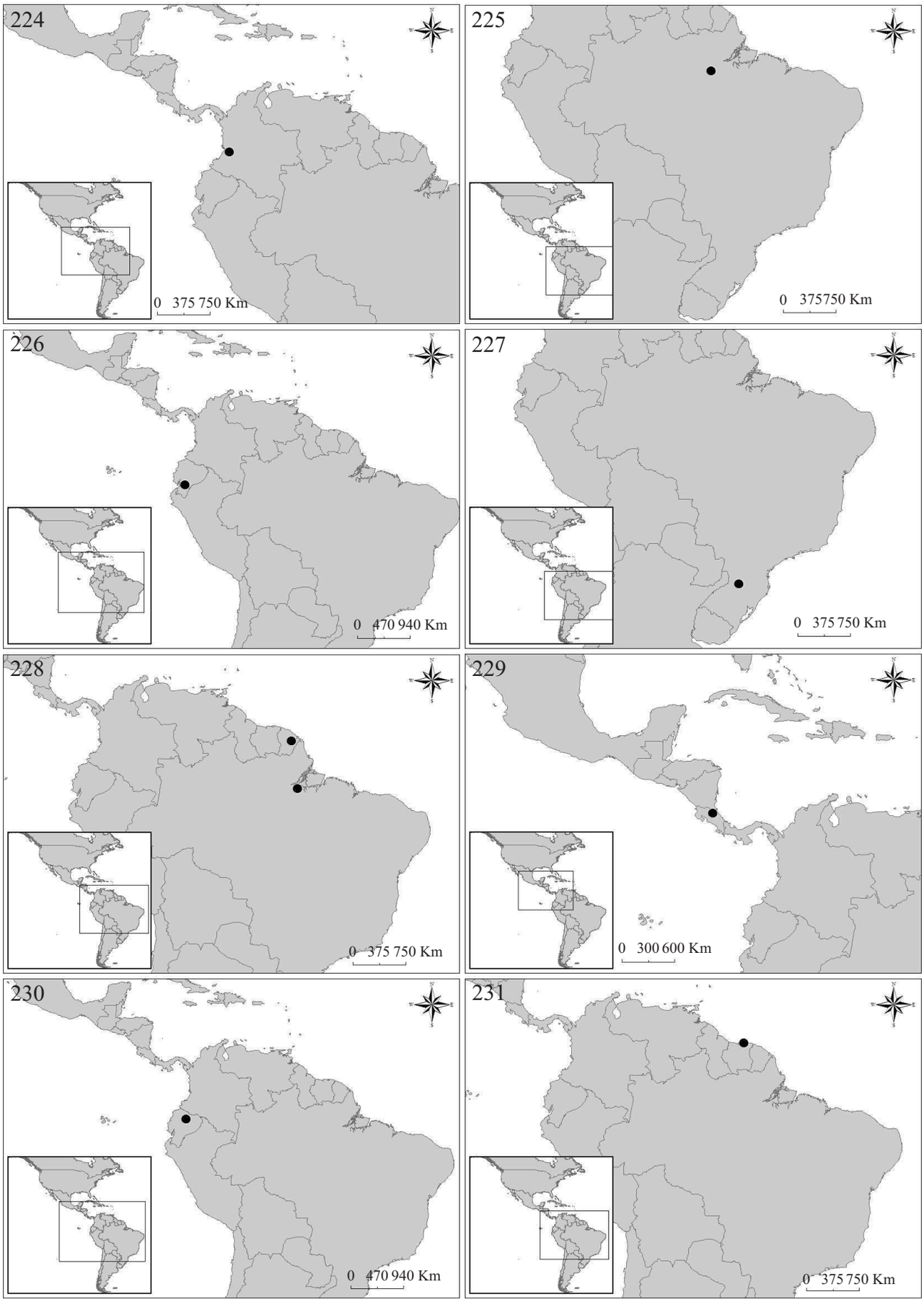
Figures 200–207. Distribution maps. **200** *T. abactus* Cresson; **201** *T. albimaculatus* Taschenberg; **202** *T. brevicaudis* Szépligeti; **203** *T. cassunungae* Brauns; **204** *T. stramineus* Taschenberg; **205** *T*. sp. nov. 1; **206** *T*. sp. nov. 2; **207** *T*. sp. nov. 3.



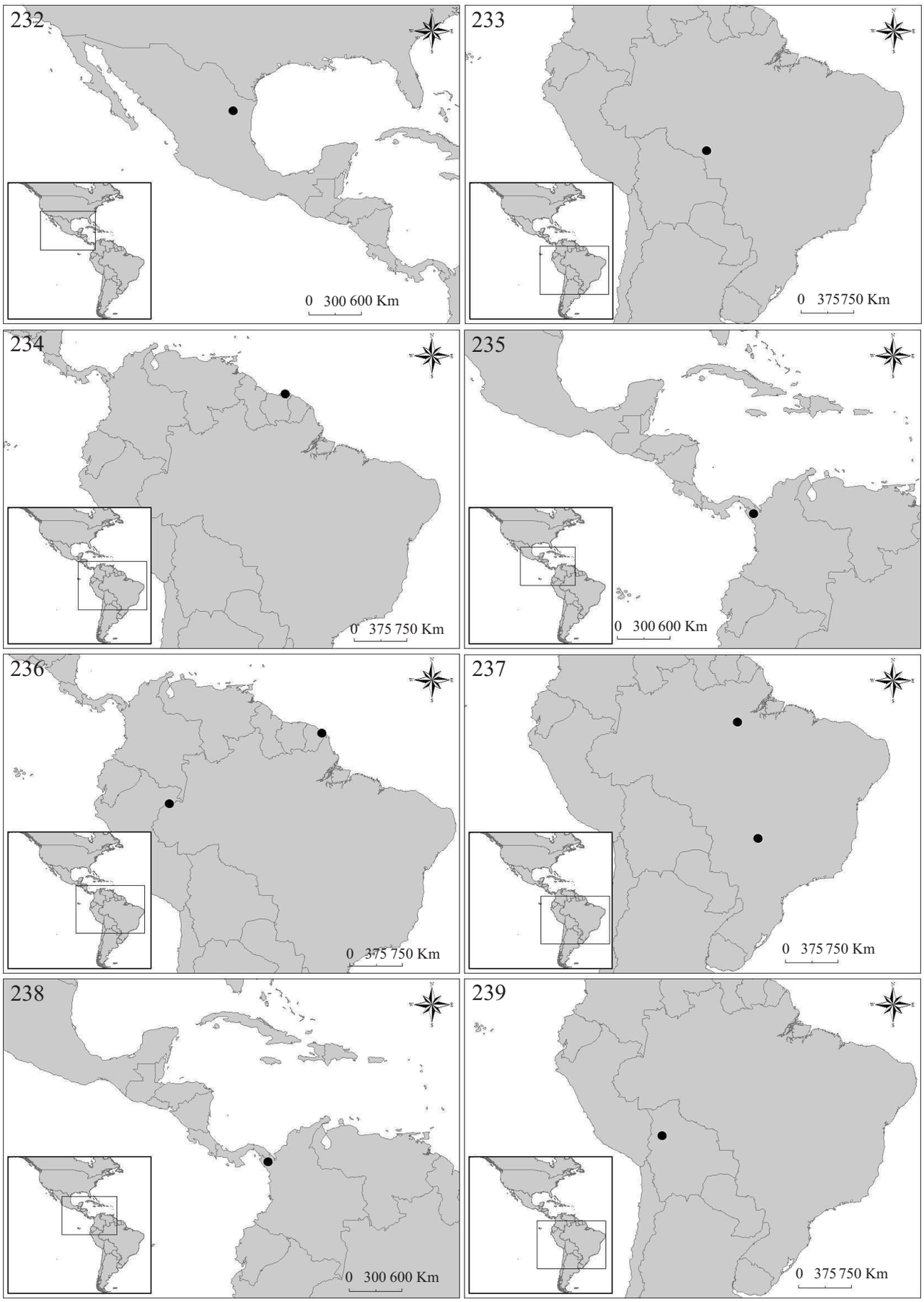
Figures 208–215. Distribution maps. **208** *T.* sp. nov. 4; **209** *T.* sp. nov. 5; **210** *T.* sp. nov. 6; **211** *T.* sp. nov. 7; **212** *T.* sp. nov. 8; **213** *T.* sp. nov. 9; **214** *T.* sp. nov. 10; **215** *T.* sp. nov. 11.



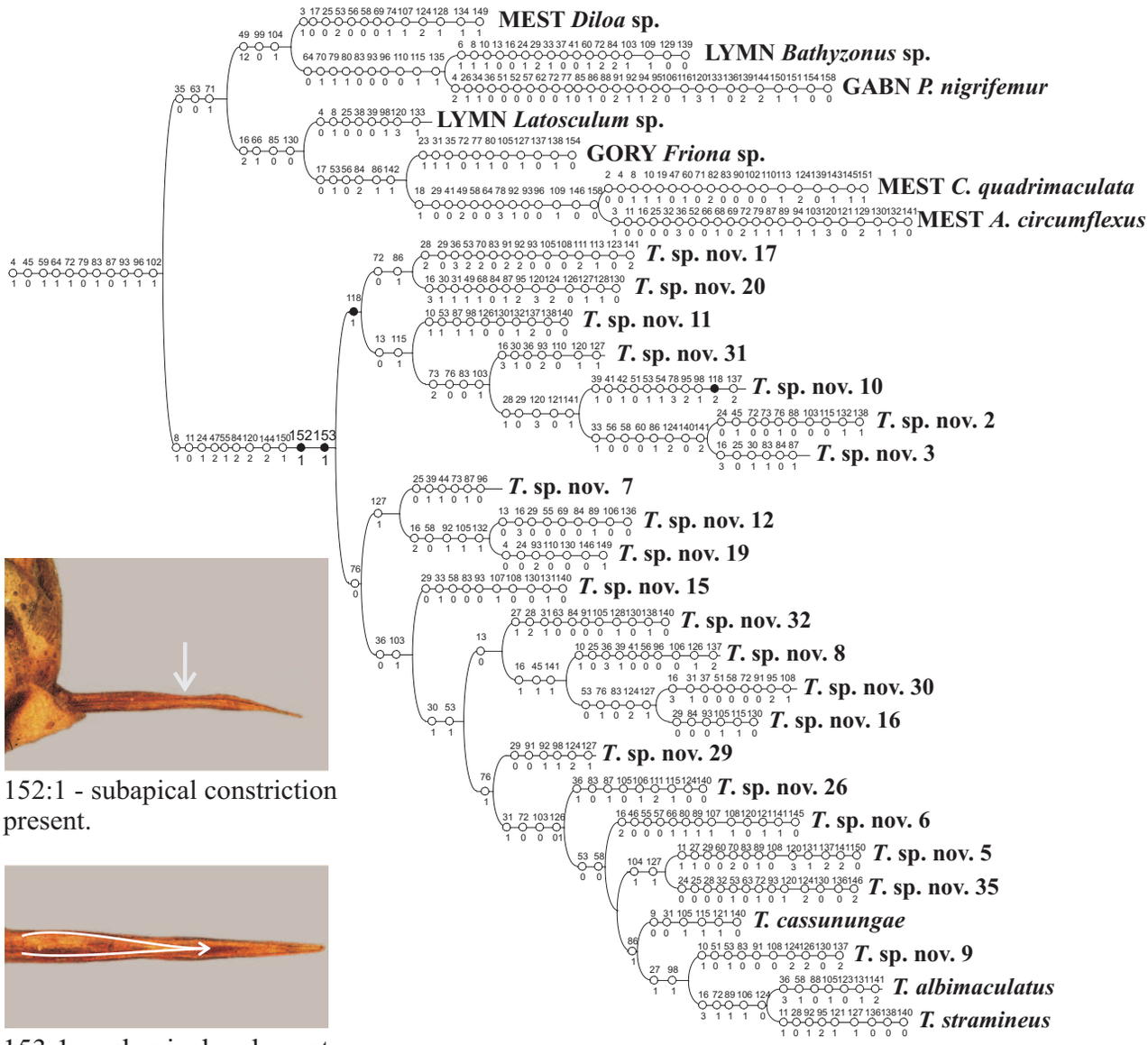
Figures 216–223. Distribution maps. **216** *T.* sp. nov. 12; **217** *T.* sp. nov. 13; **218** *T.* sp. nov. 14; **219** *T.* sp. nov. 15; **220** *T.* sp. nov. 16; **221** *T.* sp. nov. 17; **222** *T.* sp. nov. 18; **223** *T.* sp. nov. 19.



Figures 224–231. Distribution maps. **224** *T.* sp. nov. 20; **225** *T.* sp. nov. 21; **226** *T.* sp. nov. 22; **227** *T.* sp. nov. 23; **228** *T.* sp. nov. 24; **229** *T.* sp. nov. 25; **230** *T.* sp. nov. 26; **231** *T.* sp. nov. 27.



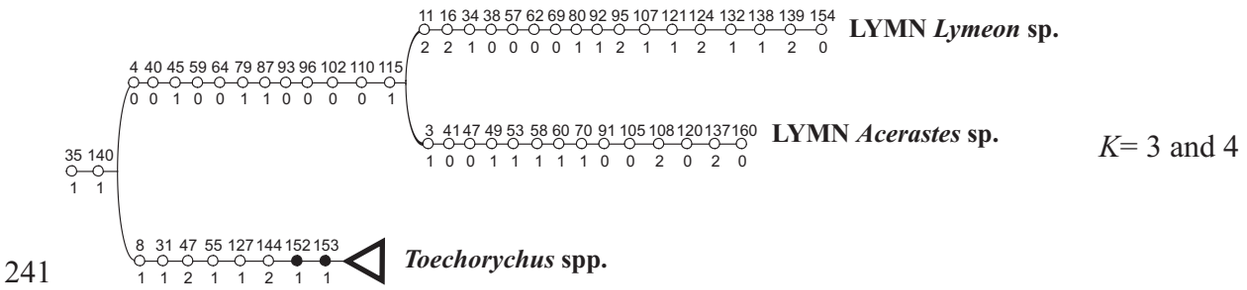
Figures 232–239. Distribution maps. **232** *T.* sp. nov. 28; **233** *T.* sp. nov. 29; **234** *T.* sp. nov. 30; **235** *T.* sp. nov. 31; **236** *T.* sp. nov. 32; **237** *T.* sp. nov. 33; **238** *T.* sp. nov. 34; **239** *T.* sp. nov. 35.

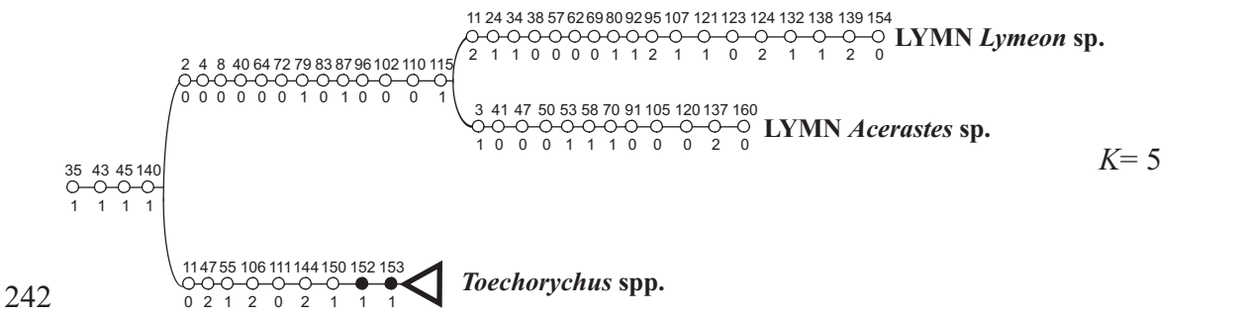


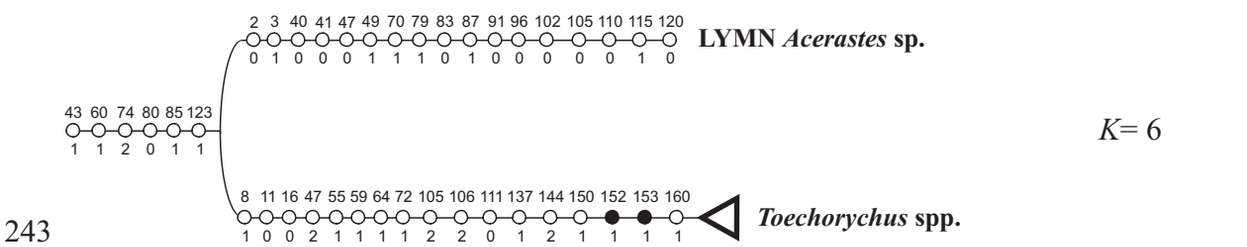
152:1 - subapical constriction present.

153:1 - subapical sulcus at dorsal valve present.

Figure 240. Cladogram from trees obtained with *K*=1 and 2 (identical). Numbered circles represent synapomorphies, with the respective character and state number. Black circles represent non-homoplasious synapomorphies, 152:1 and 153:1 (see Fig. 45). The arrows indicate these characters-states at the ovipositor illustration. Subtribes abbreviations: GABN, Gabuniina; GORY, Goryphina; LYMN, Lymeonina; MEST, Mesostenina.







Figures 241–243. Clades containing *Toechorychus* spp., obtained with implied weighting searches, with different values for the concavity constant, *K*. **241** Clade from tree obtained with *K*= 3. Identical to *K*=4, except for 8:1. **242** Clade from tree obtained with *K*=5. **243** Clade from tree obtained with *K*=6. Numbered circles represent synapomorphies, with the respective character and state number. Black circles represent non-homoplasious synapomorphies, 152:1 and 153:1. Subtribe abbreviation: LYMN, Lymeonina.

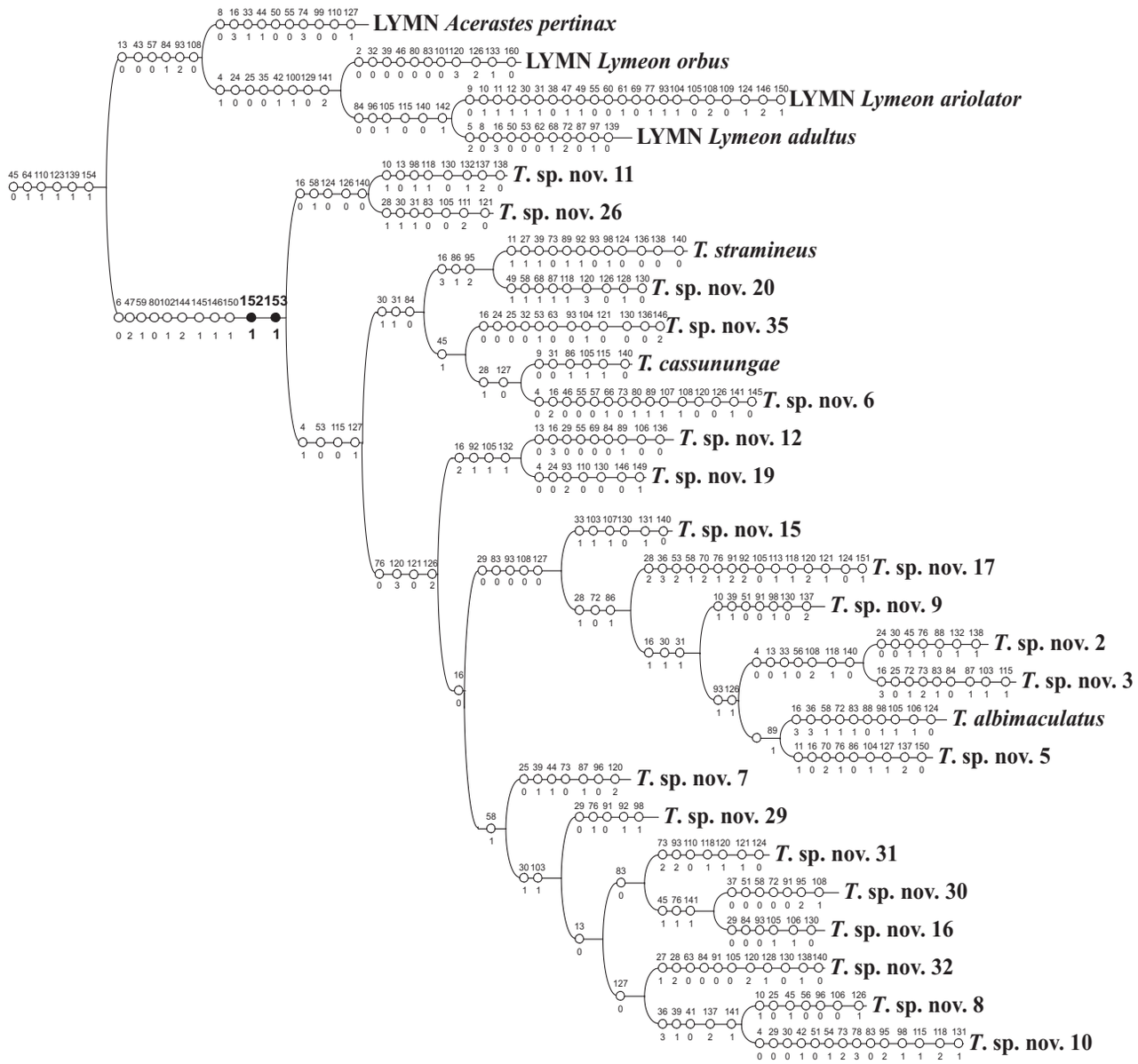


Figure 244. Cladogram from the strict consensus of the two most parsimonious trees obtained with equal weighting searches. Numbered circles represent synapomorphies, with the respective character and state number. Black circles represent non-homoplasious synapomorphies, 152:1 and 153:1. Subtribe abbreviation: LYMN, Lymeonina.