ESTER HELENA DE OLIVEIRA

SISTEMÁTICA DO GRUPO *taurus* DE *Cis* LATREILLE (COLEOPTERA: POLYPHAGA: CIIDAE)

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

VIÇOSA
MINAS GERAIS – BRASIL

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

T
O48s
2013

Oliveira, Ester Helena de, 1989-
Sistemática do grupo *taurus* de *Cis* Latreille (Coleoptera: Polyphaga: Ciidae) / Ester Helena de Oliveira. – Viçosa, MG, 2013.
vii, 79f. : il. ; 29cm.

Orientador: Cristiano Lopes Andrade.
Dissertação (mestrado) - Universidade Federal de Viçosa.
Inclui bibliografia.

1. Ciidae. 2. Zoologia - Classificação. 3. Coleoptero - Aparelho genital. 4. Tenebrionoidea. 5. Polyphaga. I. Universidade Federal de Viçosa. Departamento de Entomologia. Programa de Pós-Graduação em Entomologia. II. Título.

CDD 22. ed. 595.76

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APROVADA: 26 de fevereiro de 2013

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Daniele Regina Parizotto

_____Paschoal
Coelho Grossi

Cristiano Lopes Andrade (Orientador)

A todos os pequeninos seres ainda desconhecidos por nós, companheiros com os quais dividimos esse período na Terra, dedico este e todos os próximos trabalhos.

AGRADECIMENTOS

Agradeço sinceramente ao meu orientador Cristiano Lopes Andrade pela paciência ebom humor contagiante assim como pelos ensinamentos e sábios conselhos que marcaram profundamente essa fase de minha formação e que não só me guiaram nesse período mas certamente serão levados para a vida toda. Aos professores Daniele Regina Parizotto e Paschoal Coelho Grossi por terem aceitado o convite em avaliar essa tese e aos suplentes prof. Adilson Zacaro e profa. Maria Augusta; muito obrigado pela paciência e dedicação.

A toda minha família pelo apoio, principalmente aosmeus pais Luciano e Sandra por acreditarem em mim. Aos meus irmãos Gustavo e Sabrina, biólogos de coração, por compartilharem comigo o amor às ciências da vida e pelo incentivo recebido em cada sorriso de deslumbramento frente ao mundo natural. Ao Arthur,que sempre me apoiou, pelo amor e compreensão. Ao pessoal do Laboratório de Biologia e Sistemática de Coleoptera da UFV, com quem compartilho a paixão por esses pequeninos seres, Sérgio Aloquio, Juliana Chamorro, Lucimar Araujo, Nilcilene Resende, Artur Orsetti; aos companheiros Anderson Puker e Caio Carvalho; e à Vivian Sandovál em especial por gentilmente ter trazido os tipos dos museus europeus.

A todos os curadores dos museus que nos proveram espécimes emprestados e ao Dr. Lawrence que mesmo à distância sempre auxilia os trabalhos do laboratório. A todos os funcionários, alunos e professores do programa de Pós-Graduação em Entomologia da Universidade Federal de Viçosa pela convivência e troca intelectual. À secretaria do Programa de Pós-Graduação em Entomologia, especialmente às secretárias Silvânia e Cláudia, pela boa vontade e paciência com que sempre nos atendem.

Ao Conselho de Desenvolvimento Científico e Tecnológico pela bolsa de estudos concedida durante o período de mestrado (CNPq: bolsa n° 130002/2011-9), ao suporte financeiro provido (CNPq: PROTAX 52/2010 n° 562229/2010-8; Universal nº 479737/2012-6) e também à Fundação de Amparo à Pesquisa de Minas Gerais (FAPEMIG: Universal APQ-00653-12) pelo financiamento de parte dessa pesquisa. Compartilhamos o sonho de ver a ciência brasileira crescer e, cada vez mais, destacar-se internacionalmente.

SUMÁRIO

RESUMO

OLIVEIRA,Ester Helena de, M. Sc., Universidade Federal de Viçosa, fevereiro de 2013. **Sistemática do grupo *taurus*de *Cis* Latreille (Coleoptera: Polyphaga: Ciidae)**. Orientador: Cristiano Lopes Andrade.

O grupo *taurus* do gênero *Cis* Latreille (Coleoptera: Ciidae) compreende um conjunto de espécies cuja morfologia externa se assemelha a de *C. taurus* (Reitter), que dá nome ao grupo. O agrupamento dessas espécies não se baseia em nenhuma análise filogenética sendo, portanto, uma ferramenta taxonômica informal e não necessariamente um clado. Como a maioria dos ciídeos, as espécies do grupo *taurus* habitam e se alimentam de fungos orelhas-de-pau, entretanto, alguns espécimes já foram coletados em serapilheira. A presente dissertação tem por objetivo resolver os principais problemas taxonômicos do grupo *taurus* incluindo a designação de lectótipos para as espécies já descritas. A partir de comparações morfológicas, morfométricas, dissecação e análise de terminálias abdominais de machos e estudo da literatura, *C. bison* (Reitter) é proposta como sinônimo júnior de *C. diabolicus* (Reitter), *Trichapus pubescens* Friedenreich é transferida para o grupo, levando à sinonímia de *Trichapus* Friedenreich com *Cis*. *Trichapus glaber* é incluída provisoriamente no gênero *Porculus* Lawrence; *C. capricornis* Kawanabe e *C. longipilis*Pic são incluídas em *taurus*, sendo a última incluída com dúvida, e nove espécies são redescritas: *C. bahiensis*(Pic)*, C. diabolicus* (Reitter)*, C. grandicornis* (Pic)*, C. kawanabei* Lopes-Andrade*, C. pubescens* (Friedenreich) **comb. nov.***, C. rufescens* (Pic)*, C. setifer* (Gorham)*, C. taurus* (Reitter) e *C. testaceimembris* (Pic), resultando em doze espécies reportadas para o grupo. Foram também reportados e discutidos dados de distribuição geográfica, fungos hospedeiros, aspectos morfológicos e grupos supostamente relacionados à *taurus*. Devido à grande quantidade de indivíduos e morfoespécies reconhecidas no decorrer do trabalho, cerca de 80 morfoespécies, acreditamos que o grupo *taurus* é possivelmente o maior grupo de espécies de ciídeos Neotropicais. Propomos prosseguir com o estudo aprofundado do grupo e descrições das novas espécies encontradas.

ABSTRACT

OLIVEIRA,Ester Helena de, M. Sc., Universidade Federal de Viçosa, February, 2013. **Systematics of *taurus* group of *Cis* Latreille (Coleoptera: Polyphaga: Ciidae)**. Advisor: Cristiano LopesAndrade.

The *taurus* group of the genus *Cis*Latreille (Coleoptera: Ciidae) comprises species in which the external morphology resemblesthat of *C. taurus* (Reitter), that names the group. The grouping of these species are not based in any phylogenetic analyses, and thus it is an informal taxonomical tool and not necessarily a clade. As most Ciidae, species of the *taurus* group live and feed on bracket fungi, however, specimens have already being collected in leaflitter. The present dissertation aimsto solve the main taxonomic problems of the *taurus* group including designation of lectotypes for the species already described. As a result of morphological and morphometric comparisons, dissection and examination of male abdominal terminalia and study of the literature, *C. bison* (Reitter) is proposed as junior synonym of *C. diabolicus* (Reitter), *Trichapus pubescens* Friedenreich is transferred to the group, leading to the synonymization of *Trichaphus* Friedenreich with *Cis*.*Trichapus glaber* Friedenreich is included in *Porculus* Lawrence*;C. capricornis* Kawanabe and *C. longipilis* Pic are included in *taurus*, the latter with doubt, and nine species are redescribed: *C. bahiensis* (Pic)*, C. diabolicus* (Reitter)*, C. grandicornis* (Pic)*, C. kawanabei* Lopes-Andrade*, C. pubescens* (Friedenreich)**comb. nov***, C. rufescens* (Pic)*, C. setifer* (Gorham)*, C. taurus* (Reitter)*, C. testaceimembris* (Pic), resulting in twelve species recongnized in the group. Data on geographic distribution and host fungi are provided, and morphological aspects and groups possibly related to *taurus* group are discussed. Because of the great number of specimens and morphospecies recongnized during this work, about 80 morphospecies, we believe the *taurus* group is possibly the most speciose ciid species-group in the Neotropical region. We intend to keep working and advancing in studies on the group, and describe the recognized new species.

1. INTRODUÇÃO

1.1. Breve introdução sobre Ciidae

Ciidae é uma família diversa e cosmopolita, somente não ocorrendo nos polos. Possui 43 gêneros, com mais de 650 espécies descritas (Lawrence & Lopes-Andrade 2008, Lawrence & Lopes-Andrade 2010, Antunes-Carvalho *et al.* 2012). Ciidae é bem definida como um clado, mas ainda há controvérsias sobre a inclusão de Sphindociinae (Buder *et al.* 2008, Levkanicová 2009), táxon representado por somente uma espécie da Califórnia. As relações filogenéticas da família com os demais besouros ainda não foram elucidadas. Há estudos que colocam a família em posição basal dentre os Tenebrionoidea (Hunt *et al.* 2007, Levkanicová 2009, Lawrence *et al* 2011), relacionada à Mycetophagidae e Tetratomidae (Lawrence 1977) ou próxima à Zopheridae (Robertson *et al.* 2004, 2008). Em outros trabalhos, Ciidae aparece como grupo-irmão de Nitidulidae ou como um agrupamento irmão de várias famílias de Cucujoidea e Tenebrionoidea (Buder *et al.* 2008), formando um clado com Tenebrionidae e Colydiinae ou como grupo-irmão de Tenebrionidae (Levkanicová 2009). Assim, as relações de Ciidae com outras famílias de Tenebrionoidea estão sempre em discussão (Thayer & Lawrence 2002, Buder *et al.* 2008, Levkanicová 2009, Lawrence *et al.* 2011). As relações filogenéticas internas da família também são pouco conhecidas e nunca os grupos mais representativos foram comparados a fundo ou analisados filogeneticamente (Buder *et al.* 2008, Lopes-Andrade 2008a, Antunes-Carvalho 2012).

Atualmente, os ciídeos estão agrupados em duas subfamílias: Sphindociinae e Ciinae. Sphindociinae é uma subfamília monotípica, cuja única espécie, *Sphindocis denticollis* Fall, é descrita da Califórnia. As demais espécies estão agrupadas em Ciinae, que por sua vez divide-se em Ciini, Orophiini e Xylographellini. A morfologia externa, incluindo terminália abdominal de machos e fêmeas, apontam para a monofilia de Xylographellini, mas dificilmente Ciini e Orophiini seriam clados (Lopes-Andrade 2008a).

As linhagens incluídas em Ciinae são caracterizadas pelas seguintes características morfológicas: corpo convexo com élitros recobrindo todo o abdome; clípeo reduzido e fusionado à fronte (formando a placa frontoclipeal); lígula reduzida ou ausente; palpo maxilar com quatro palpômeros e palpo labial com três palpômeros; mandíbula bidentada; antena com oito a dez antenômeros e clava formada usualmente por três antenômeros; fórmula tarsal 4-4-4 com último tarsômero mais longo que os três anteriores; cinco ventritos abdominais expostos; primeiro ventrito abdominal visível e não-conado (livre); primeiro ventrito abdominal em machos da maioria das espécies portando marca sexual; aedeagus com falobase (peça basal) reduzida, extremamente membranosa ou mesmo ausente; parâmeros fusionados formando um tegmen e pênis (lobo mediano) dorsal e interno ao tegmen; fêmeas com espermateca inconspícua e oitavo esternito com âncora anterior desenvolvida (*spiculum ventrale*) (Lawrence 1971, Lawrence 1974, Navarrete-Heredia & Burgos Solorio 2000, Thayer e Lawrence 2002, Lawrence & Lopes-Andrade 2010).

Ciidae são pequenos besouros (de 0.5 a 7 mm) que vivem, se alimentam e se reproduzem em basidiomas de macrofungos Polyporales e Hymenochaetales, principalmente (Pavior-Smith 1960, Epps &Arnold 2010, Lawrence & Lopes-Andrade 2010). Ciídeos também ocorrem em serapilheira (Lopes-Andrade 2007) e algumas poucas espécies são associadas à madeira morta, como *Cis pygmaeus* (Marsham) (Freude *et al.* 1967).

Dentre os Coleoptera, Ciidae é a mais especiosa e abundante família com espécies associadas à basidiomas. Os ciídeos estão envolvidos diretamente na fase inicial de degradação de

basidiomas persistentes, onde usualmente cavam túneis e se alimentam do tecido estéreo de suporte (Lawrence & Lopes-Andrade 2010), construindo galerias e empupando no interior dessas estruturas (Lawrence 1973), somente deixando o fungo para a dispersão. São gregários e milhares de indivíduos podem viver no mesmo basidioma (Lawrence & Britton 1991), inclusive indivíduos de espécies diferentes, sendo que uma possível partição espacial ou temporal de nichos ocorra entre as espécies (Guevara *et al.* 2000, Kadowaki 2010). Suas funções ecológicas são obviamente deduzidas de seu nicho ecológico e por trabalhos que demonstram que Ciidae é uma família importante na guilda de fungívoros (*e.g.* Pavior-Smith 1960, Rimsaite 2000, Epps & Arnolds 2010). Apesar da biomassa movimentada pelos ciídeos ser menor que a movimentada por outros artrópodes, essa biomassa possui maiores concentrações de elementos importantes como nitrogênio e fósforo (Watkinson *et al.* 2006). Assim, ciídeos prestam serviços ecológicos importantes na ciclagem de elementos, principalmente cádmio, crômio, molibdênio, manganês e selênio, que podem estar até dez vezes mais concentrados nos basidiomas do que no substrato que os fungos utilizam (Hsu *et al.* 2002). Basidiomas sem ciídeos persistem na natureza por um tempo muito maior, impedindo nutrientes de voltarem aos seus ciclos. Portanto, alterações ambientais que interfiram nas populações de ciídeos vão interferir diretamente no processo de ciclagem de nutrientes. Há estudos que apontam para uma maior vulnerabilidade da comunidade de insetos fungívoros, dentre eles os ciídeos, à fragmentação de hábitat, levando-os a risco de extinção e trazendo danos à ciclagem de nutrientes e aos processos de decomposição locais (Rukke 2000, Komonen 2001).

1.2. O grupo *taurus*

Cis Latreille, 1796 é o gênero nominotípico de Ciidae e foi proposto antes da família ser descrita por Leach (Samouelle 1819). É o gênero com o maior número de espécies descritas, cerca de 370, e ocorre em todas as regiões biogeográficas. *Cis* é definido por um conjunto de características comuns a diversos gêneros de Ciidae: 10 antenômeros, processo prosternal largo, protíbia sem espinhos no ângulo externo, macho com ornamentos na cabeça e/ou no pronoto. Contudo, tais características podem ser convergências morfológicas entre linhagens distintas ou plesiomorfias de Ciidae. A única análise filogenética de Ciidae disponível na literatura, com base em dados moleculares, aponta *Cis* como um grupo polifilético (Buder *et al.* 2008). As espécies de *Cis* foram agrupadas de forma artificial em grupos de espécies que compartilham semelhanças morfológicas (Lawrence 1971). Apesar de amplamente utilizados, vários autores têm ressaltado que tais agrupamentos são ferramentas taxonômicas e não correspondem necessariamente à clados (Lopes-Andrade *et al.* 2003, De Almeida & Lopes-Andrade 2004, Lopes-Andrade 2008b). Um desses grupos é conhecido como grupo *taurus* e inclui principalmente espéciesoutrora classificadas no gênero *Macrocis* Reitter.

Macrocis foi descrito por Reitter (1878) baseado em três espécies: *M. bison* Reitter, 1878 e *M. diabolicus* Reitter, 1878, ambas da Colômbia; e *M. taurus* Reitter, 1878, do México. Lawrence (1971), em sua revisão dos ciídeos norte-americanos, sinonimizou *Macrocis* com *Cis* e designou *M. taurus* como a espécie-tipo do antigo gênero. Todas as espécies descritas originalmente em *Macrocis* por Reitter (1878) e autores subsequentes foram incluídas no grupo *taurus* por Lawrence (1971), que também descreveu uma espécie do grupo. Atualmente o grupo *taurus* compreende dez espécies, como se segue: *C. bahiensis* (Pic, 1916), *C. bison* (Reitter, 1878), *C. cornelli* Lawrence, 1971, *C. diabolicus* (Reitter, 1878), *C. grandicornis* (Pic, 1917), *C. kawanabei* Lopes-Andrade, 2002, *C. rufescens* (Pic, 1922), *C. setifer* (Gorham, 1883), *C. taurus* (Reitter, 1878) e *C. testaceimembris* (Pic, 1916). Contudo, há dezenas de espécies ainda não descritas ou que devam ser transferidas para o grupo *taurus* (Lawrence 1971).

O grupo *taurus* é essencialmente neotropical, com somente uma espécie, *C. cornelli*, encontrada na região Neártica (Lawrence 1971). Inclui espécies caracterizadas morfologicamente por um corpo robusto, arredondado e extremamente convexo; placa frontoclipeal usualmente com um par de chifres laterais nos machos,sendo que essas estruturas não são tão desenvolvidas nas fêmeas aparecendo nestas como um par de protuberâncias curtas; prosterno elevado e carenado na linha mediana em frente às coxas; processo prosternal estreito no meio e alargado no ápice; protíbia com um conjunto de espinhos no ápice e ângulo apical externo denteado e projetado (Oliveira & Lopes-Andrade 2013). Não são conhecidas as relações entre o grupo *taurus* com outros grupos de *Cis* ou com outros gêneros de Ciidae.

Espécies do grupo *taurus* estão entre os ciídeos mais abundantes e frequentes em diversos biomas neotropicais e, por isso, podem ser considerados organismos-chave na decomposição de

matéria fúngica e ciclagem de nutrientes desses ecossistemas. Pouco se sabe sobre os hábitos alimentares das espécies do grupo. Um mesmo basidioma pode abrigar mais de uma espécie do grupo *taurus*, além de espécies de outros grupos de *Cis* e gêneros de Ciidae (E. H. Oliveira, obs. pess.), entretanto não se sabe da dinâmica desta comunidade ou da existência de algum tipo de partição de nicho. A espécie *C. taurus* propriamente ditapossui registro de ocorrência em fungos *Trametes versicolor*(L.) Lloyd e *Bjerkandera fumosa*(Pers.) P. Karst, alguns sendo foram coletados em serapilheira (Oliveira & Lopes-Andrade 2013). Como os registros de coleta de *C. taurus* são escassos, não há como determinar o hábito alimentar da espécie. Em trabalhos na floresta subtropical chuvosa de São Francisco de Paula (RS)(Graf-Peters *et al.* 2011), uma espécie identificada como *C. kawanabei* foi coletada em *Rigidoporus* sp. (Polyporales), embora não foi possível juntar evidência suficiente para classificar seu hábito alimentar.Porém, a identificação de espécies de *taurus* foi dificultada pela falta de conhecimento e revisão prévia do grupo, o que culminou em identificações equivocadas, assim os indivíduos identificados como *C. kawanabei*não pertencem a essa espécie (E. H. Oliveira, obs. pess.). Outra espécie identificada como *C. testaceimembris* por Graf-Peters *et al.*(2011) foi considerada polífaga e há relatos de ocorrência em *Inonotus* sp. (Hymenochaetales), *Ganoderma australe*(Fr.) Pat.e *Perenniporia martia* (Berk.) Ryvarden (Polyporales), porém essa é uma identificação duvidosa pois, à época, os tipos do grupo ainda não tinham sido examinados. Ainda uma espécie nova do grupo *taurus*, identificada no trabalho de Graf-Peters *et al.* (2011) como "*Cis* sp. 1", foi considerada polífaga, com registros em *Inonotus tabacinus*(Mont.) G. Cunn. (no trabalho chamada de *Cyclomyces tabacinus,* nome atualizado), *Phellinus gilvus*(Schwein.) Pat.(no artigo *Polyporus gilvus*, nome atualizado) e *Phellinus* sp. (Hymenochaetales), e *Amauroderma coltricioides* T.W. Henkel, Aime & Ryvarde, *Ganoderma australe*(Fr.) Pat., *Bjerkandera adusta* (Willd.) P. Karst., *Rigidoporus microporus*(Sw.) Overeem*, Junghuhnia undigera*Berk. & M.A. Curtis) Ryvarden*, Flaviporus subhydrophilus*(Speg.) Rajchenb. & J.E. Wright*, Trametes villosa*(Sw.) Kreisel*, Trametes membranácea* (Sw.) Kreisel*, Perenniporia* sp.*, Perenniporia martia* (Berk.) Ryvarden *, Fomitella supina*(Sw.) Murrill e *Datronia mollis* (Sommerf.) Donk (Polyporales) (Graf-Peters *et al.* 2011). *Cis cornelli*, única espécie do grupo *taurus* de ocorrência neártica, foi coletada em *Hirschioporus* (Lawrence 1973) e em *Trichaptum* (Orledge & Reynolds 2005).Além dos trabalhos taxonômicos, alguns faunísticos e trabalhos sobre hábitos alimentares (*e.g.* Lawrence 1973, Graf-Peters *et al.* 2011) não existem outros estudos sobre espécies do grupo *taurus*como biologia básica,comportamento, ecologia ou evolução. Esses trabalhos são dificultados pela falta de conhecimento aprofundado da sistemática do grupo.

2. OBJETIVOS

A presente dissertação teve como objetivos primordiais:

(1) Redescrever todas as espécies neotropicais do grupo *taurus;*

(2) Designar lectótipos para as espécies descritas com base em síntipos;

(3) Propor sinonímias;

(4) Incluir no grupo *taurus* espécies descritas em outros gêneros, associadas a outros grupos de espécies ou mesmo ainda não agrupadas;

(5) Fornecer as primeiras descrições de terminália abdominal de machos dessas espécies;

(6) Fornecer novos dados de distribuição das espécies do grupo *taurus;*

(7) Fornecer dados de fungos hospedeiros;

(8) Discutir dados de morfologia externa e biologia das espécies;

3. RESULTADOS

Esta dissertação é apresentada na forma de dois capítulos, sendo o primeiro um artigo publicado e o outro um manuscrito:

i)"Redescription of *Cis taurus* (Reitter, 1878) (Coleoptera: Ciidae)", redescrição da espécie que nomeia o grupo *taurus* que inclui a primeira descrição de terminália de macho da espécie além de informações sobre fungos hospedeiros e distribuição geográfica. Esse artigo foi publicado recentemente na revista Zootaxa.

ii)"Taxonomic Review of Neotropical *Cis* of the *taurus* species-group " trata da redescrição de todas as demais espécies neotropicais do grupo *taurus*, proposta de uma sinonímia, incorporação de duas espécies ao grupo, designação de lectótipos, descrição da terminália abdominal de machos e informações sobre hábitos alimentares e distribuição geográfica reconhecida. Pretende-se submeter este manuscrito à revista Zookeys.

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CAPÍTULO I

Redescription of *Cis taurus* (Reitter, 1878) (Coleoptera: Ciidae)

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Artigo publicado na revista *Zootaxa* (2013), 3599 (5): 483–489.

Zootaxa 3599 (5): 483–489
www.mapress.com/zootaxa/

Article

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

http://dx.doi.org/10.11646/zootaxa.3599.5.5
http://zoobank.org/urn:lsid:zoobank.org:pub:984CA2B4-9AF8-45B1-9CB9-79E59A1B513C

Redescription of *Cis taurus* (Reitter, 1878) (Coleoptera: Ciidae)

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Abstract

Cis taurus (Reitter) is the type-species of *Macrocis* Reitter, a genus subsequently synonymized with *Cis* Latreille. It names a diversified but barely studied species-group of *Cis*, the *taurus* group. The objective of the present work is to redescribe *C. taurus*, designate a lectotype and provide the first description of male abdominal terminalia of the species. We also provide new data on its geographic distribution, restricted to three major Mexico mountain ranges: the Sierra Madre Oriental, the Sierra Madre de Chiapas and the Transmexican Volcanic Belt (Sierra Nevada). This is a first and important step in the ongoing revision of the *taurus* species-group.

Key words: Minute tree-fungus beetles, Ciinae, Mexico, Neotropical, Tenebrionoidea

Introduction

The genus *Macrocis* was described by Reitter (1878) based on three species. Lawrence (1971) synonymized the genus with *Cis* Latreille and designated *M. taurus* as the type-species. Most authors followed Lawrence's classification (e.g. Kawanabe 1997; Navarrete-Heredia & Burgos-Solorio 2000), so far ignored only by Abdullah (1973). All the species originally described in *Macrocis* were included in the *Cis taurus* species-group by Lawrence (1971), who also described an additional species. Therefore, the *taurus* group currently comprises nine species, as follows: *C. bison* (Reitter, 1878), *C. cornelli* Lawrence, 1971, *C. diabolicus* (Reitter, 1878), *C. grandicornis* (Pic, 1917), *C. kawanabei* Lopes-Andrade, 2002, *C. rufescens* (Pic, 1922), *C. setifer* (Gorham, 1883), *C. taurus* (Reitter, 1878) and *C. testaceimembris* (Pic, 1916). The group also includes several unnamed forms and other described *Cis* species not currently included in any species-group. The single Nearctic species and several Neotropical species of the *taurus* group differ from other *Cis* in the following features: (i) body plump and stocky, strongly convex; (ii) frontoclypeal ridge usually with a pair of lateral horns in males and two short projections in females; (iii) prosternum in front of coxae strongly tumid and carinate at the longitudinal midline; (iv) prosternal process comparatively narrower at base and enlarged at apex; (v) protibial apex with a row of spines and outer apical angle produced into a stout tooth.

We are currently revising the *taurus* group and, as a first step, it is necessary to clarify the morphological limits of the nominal species. The objective of the present work is to redescribe *C. taurus* proper, the species that names the *taurus* group, designate a lectotype, provide the first description of its male abdominal terminalia and present new data on its geographic distribution.

Materials and methods

The redescription of *C. taurus* is based on a plesiotype (a specimen used for a redescription, supplementary description, or illustration published subsequent to the original description; sensu Evenhuis 2008). A lecotype, here

Accepted by N. Lord: 21 Nov. 2012; published: 9 Jan. 2013

designated, one female paralectotype and identified specimens from other localities in Mexico were also examined. The lectotype and plesiotype were not dissected and the description of the male abdominal terminalia is based on another specimen collected at the type locality. The lectotype is a fully pigmented male, but it is damaged, and that is why we prefer to base the redescription on a plesiotype. Terms for external morphology and male abdominal terminalia of ciids follow Lopes-Andrade and Lawrence (2005). The term "single" refers to the punctation consisting of uniformly-sized punctures and "dual" to the punctation consisting of two puncture sizes, following the usual nomenclature in taxonomic works on Ciidae (e.g. Lawrence 1971; Lawrence & Lopes-Andrade 2005; Lopes-Andrade 2011). The following symbols are used for measurements (in mm) and ratios: BW, basal width of the scutellum; CL, length of the antennal club (measured from base of the eighth to apex of the tenth antennomere); EL, elytral length (at midline, from base of scutellum to elytral apex); EW, greatest elytral width; FL, length of the antennal funicle (measured from base of the third to apex of the seventh antennomere); GD, greatest depth of the body (from elytra to metaventrite); GW, greatest diameter of the eye; PL, pronotal length along midline; PW, greatest pronotal width; TL, total length (=EL+PL; head not included). The ratio GD/EW was recorded as an indication of degree of convexity; TL/EW indicates degree of body elongation. All specimens available to us were measured.

Specimens were studied and measurements were taken under a Zeiss Stemi 2000-C stereomicroscope. Digital photographs of specimens (Figs 1–5, 8–10) were taken under a Zeiss Discovery V8 stereomicroscope with a Zeiss Axiocam MRc digital camera attached to it. Final images were the result of montaging 25 to 125 image slices at different focal lengths using the extended focus module of Zeiss Axiovision 4.8 software. Whole mount preparations of male abdominal terminalia followed the protocol described by Lopes-Andrade (2011) and photography of dissected sclerites were made under a Zeiss Axiolab compound microscope equipped with a Zeiss Axiocam ERc 5s digital camera.

Specimens have been deposited in (or belong to) the following institutional and private collections (with acronyms used in this paper):

ANIC	Australian National Insect Collection, CSIRO Entomology (Canberra, Australia)
CNCI	Canadian National Collection of Insects (Ottawa, Ontario, Canada)
HNHM	Coleoptera Collection, Hungarian Natural History Museum (Budapest, Hungary)
LAPC	Cristiano Lopes-Andrade Private Collection (Viçosa, MG, Brazil)
MNHN	Muséum National d'Histoire Naturelle (Paris, France)
NHM	Naturhistorisches Museum Wien (Vienna, Austria)

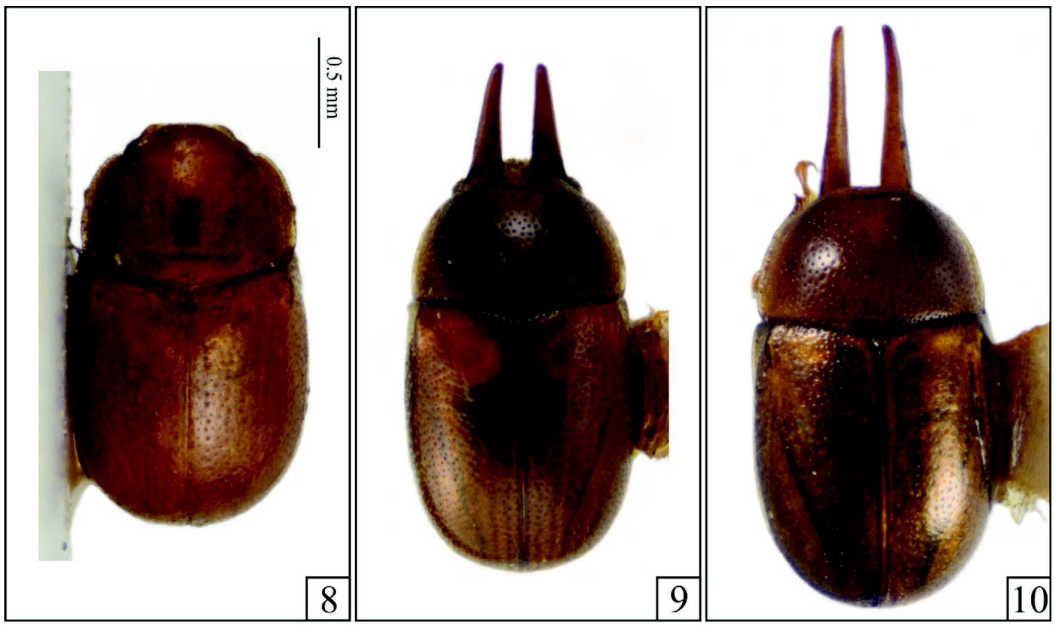
Systematics

Cis taurus (Reitter, 1878)

(Figs 1–11)

Diagnosis. (i) body glabrous dorsally; (ii) males with frontoclypeal ridge bearing two long horns with acute apices, inner edges parallel and outer edges slightly converging; (iii) both lateral margins of pronotum visible for their entire lengths from above, weakly crenulate; (iv) pronotum with microreticulate sculpture between punctures; (v) elytral punctation dual, mostly confused, slightly subseriate on disc; (vi) abdominal sex patch about half the length of the first abdominal ventrite at the longitudinal midline.

Redescription. Plesiotype, male (Fig. 1–5), measurements (in mm): TL 1.98, PL 0.73, PW 1.08, EL 1.25, EW 1.18, GD 0.95. Ratios: PL/PW 0.67, EL/EW 1.06, EL/PL 1.72, GD/EW 0.81, TL/EW 1.68. Body robust, strongly convex, shiny, glabrous dorsally and with sparse setae ventrally; mouthparts, tarsi and antennae goldish yellow. Head concave dorsally, glabrous; punctation single, fine and sparse; frontoclypeal ridge reduced and bearing a pair of long (length 0.88mm; width 0.23 mm), parallel horns; horns separated by a distance of about 0.10 mm at base, apices acute, punctation single and fine, inner edges parallel and outer edges slightly converging. Antenna (left antenna measured; FL 0.17 mm, CL 0.30 mm, CL/FL 1.76) with length of antennomeres (in mm), from antennomere one to ten, as follows: 0.09, 0.07, 0.06, 0.04, 0.03, 0.02, 0.03, 0.10, 0.08, 0.14. Eyes glabrous (GW 0.10 mm), coarsely granulate. Pronotum shiny, with single punctation and microreticulate sculpture between punctures (Fig. 4); punctures separated by a distance of about two puncture-widths at disc and each puncture bearing a very short minute seta (barely visible even at a magnification of 100x); anterior margin strongly arched;



FIGURES 8–10. *Cis taurus* (Reitter, 1878). **8.** Female paralectotype from Orizaba, Veracruz. **9.** Male from Tlanchinol, Hidalgo. **10.** Male from Xilitla, San Luis Potosí.

anterior angles rounded, distinctly produced forward; both lateral margins explanate, arched, weakly crenulate, visible for their entire lengths from above; posterior edge widest and sublinear, rounded near scutellum. Scutellum (BW 0.08 mm), triangular, glabrous, bearing a few punctures. Elytra strongly convex; punctation dual, mostly confused but slightly subseriate at disc; the large punctures similar in size to those of pronotum and the small ones with about one-third the diameter of the large punctures; punctures very close to each other, distanced by one puncture-width or less and each bearing a minute seta (barely visible at magnification of 100X); humeri conspicuous and prominent. Prosternum biconcave, strongly tumid and carinate at the longitudinal midline; surface granulate, vestiture consisting of minute setae; prosternal process narrowest at its base and gradually expanded to a blunt apex. Metaventrite slightly convex, subglabrous, granulate, with sparse, minute setae. Abdominal ventrites with coarse, shallow punctation; surface granulate and vestiture consisting of sparse, slender setae; length of the ventrites one to five as follows (in mm, from base to apex of each ventrite at the longitudinal midline): 0.15, 0.08, 0.07, 0.07, 0.10; first abdominal ventrite bearing a circular, margined and pubescent sex patch at the center (Fig. 5 arrow), the patch with a transverse diameter of 0.07 mm. Protibia with apex bearing a row of spines and outer apical angle produced into a stout tooth. Meso- and metatibiae with apex bearing a row of spines; outer apical angle angulate but not forming a distinct tooth.

Male abdominal terminalia (Figs 6–7). Eighth sternite (Fig. 6) (length 0.09 mm, width 0.24 mm) with posterior margin curved inward, bearing minute setae medially and long setae at the lateral corners; lateral margins diverging; anterior margin membranous and devoid of median strut. Ninth segment (= genital ring) U-shaped. Aedeagus (Fig. 7) subtrapezoidal, about twice as long as wide. Basal piece subtriangular, membranous, with rounded angles. Tegmen almost as long as penis (length 0.22 mm, width 0.12 mm); lateral margins slightly diverging apically; apical one-fourth with a V-shape emargination forming two lateral lobes, each one with an small excavation near apex (Fig. 7, arrows). Penis subcylindrical (length 0.24 mm, width 0.07 mm); lateral margins slightly divergent to apex; apical one-fourth conspicuously narrow and mostly membranous.

Females (Fig. 8). Similar to males except for the following features: head concave, vertex flattened, frontoclypeal ridge with two very short projections at the same position of the horns in males, first abdominal ventrite devoid of sex patch. Female abdominal terminalia not examined.

Variation. Males (n = 17, including the lectotype and the plesiotype): TL 1.60–2.03 (1.85 ± 0.12), PL 0.48–0.80 (0.61 ± 0.10), PW 0.78–1.08 (0.95 ±0.08), EL 1.10–1.45 (1.24 ±0.10), EW 0.88–1.20 (1.06 ± 0.10), GD 0.68–0.98 (0.82 ± 0.09), Ratios: PL/PW 0.51–0.74 (0.64 ± 0.07), EL/EW 0.92–1.30 (1.18 ± 0.11), EL/PL 1.38–2.84 (2.08 ± 0.39), GD/EW 0.68–0.88 (0.78 ± 0.06), TL/EW 1.58–1.90 (1.75 ± 0.08). Females (n = 13, including the paralectotype): TL 1.83–2.43 (1.97 ± 0.16), PL 0.50–0.93 (0.63 ± 0.11), PW 0.95–1.15 (1.00 ± 0.06), EL 1.20–1.55 (1.34 ± 0.09), EW 1.03–1.18 (1.09 ± 0.05), GD 0.80–0.95 (0.88 ± 0.04). Ratios: PL/PW 0.53–0.80 (0.62 ± 0.08), EL/EW 1.12–1.35 (1.23 ± 0.06), EL/PL 1.62–2.95 (2.18 ± 0.38), GD/EW 0.76–0.86 (0.81 ± 0.03), TL/EW 1.70–2.11 (1.81 ± 0.10). Dorsal and ventral surfaces varying from dark reddish -brown to light brown. Males from Banderilla (Veracruz) and Xilitla (Sán Luís Potosí; Fig. 10) have comparatively longer and more conspicuous elytral setae, being subglabrous near the sides of elytra. Males from Tlanchinol (Hidalgo; Fig. 9) have comparatively longer and denser setae at the ventral surface and conspicuous fine setae at the elytral surface. Male horns' length ranges from 0.17mm to 0.88mm.

Material examined. Lectotype, male (HNHM) \Mexico leg Bilimek [handwriten] \ Holotypus [printed, in orange ink] 1878 Macrocis taurus ♂ Reitter [handwritten, orange border] \ Macrocis taurus Mexico Reitt [sic][handwritten] \50831 [handwritten, black border] \ LECTOTYPUS Oliveira & Lopes-Andrade det. [handwritten in pink label]\. One female paralecotype (HNHM) \Mexico leg. Bilimek [handwritten] \ Allotypus [printed, in orange ink] 1878 Macrocis taurus ♀ Reitter [handwritten, orange border] \ 50831 [handwritten, black border] \ PARALECTOTYPUS Oliveira & Lopes-Andrade [handwritten in beige paper]\. Other specimens as follows: male plesiotype (NHM) \Orizaba, MEX. Mai 1871. Bilimek Coll. [handwritten] \ Bilimek Mexico 1871 [printed] \ Orizaba [handwritten] \ WIEN [printed] \ Cis (taurus) taurus 565 Reitter [printed] \ PLESIOTYPUS Oliveira & Lopes-Andrade [handwritten in gray paper]\; 2 males (LAPC) \MÉXICO: Veracruz, Banderilla, La Martinica, [printed] 19.vi.2001 En Polyporus sp.[handwritten] Alt. 1550m, L. Delgado col. [printed] \ Cis taurus (Reitter) L. Delgado det. 2004[handwritten] \ ♂ 17.i.2007 [handwritten]\; 1 male: (ANIC) \MEXICO: S.L.P. 14 mi W Xilitla, 4800ft, Liq.for. vi.29.1973 [printed] \ leaf litter forest floor A. Newton [printed]\; 1 male (CNCI) \ MEX.San Luís P, 1600m 20KmW.Xilitla, 12.VI–6.VIII.1983, S&J. Peck cloud for.fl.interc. [printed] \ Cis taurus (Reitter) [handwritten] C. Lopes-Andrade det. 2007 [printed]\; 5 males (3 ANIC, 2 LAPC, one dissected) and 5 females (3 ANIC, 2 LAPC) \14 mi. W. Xilitla 4800' S.L.P. MEX. vi-28-71 A. Newton [printed] \ J.F. Lawrence Lot 3239\; 1 male (ANIC) \14 mi. W. Xilitla 4800' S.L.P. MEX. vi-28-71 A. Newton [printed] \ J.F. Lawrence Lot [printed] 3239 [handwritten]\; 4 specimens in two double montages (1 female and 1 male in each) (CNCI) \14mi. W. Xilitla 4800' S.L.P. MEX. VI-28-71 A. Newton [printed] \ J. F. Lawrence Lot [printed] 3239 [handwritten]\; 2 males (1 ANIC, 1 LAPC, one dissected) and 4 females (2 ANIC, 2 LAPC) \MEX: Hdg. 2.5m N Tlanchinol 5200' VII-[printed] 11 [handwritten]-73 A. Newton, coll. [printed] \ J. F. Lawrence Lot [printed] 3515 [handwritten] \ Bjerkandera fumosa [printed]\; 1 male (ANIC) \MEX: Hdg. 2.5–3.5 mi N Tlanchinol 5200' VII-11-73 A. Newton, coll [printed] \ J.F. Lawrence Lot [printed] 3514 [handwritten] \ Polyporus versicolor [printed]\; 1 female (CNCI) \MEX., CHIS.,3mi.N. S.Cristóbal de las Casas 12.VI.1969 E.E.Lindquist [printed] \ Bracket fungi [printed]\.

Discussion

Data on host fungi of the *taurus* group species are scarce. The Nearctic *C. cornelli* is possibly monophagous, to date being found only in *Trichaptum sector* (Polyporaceae) (Lawrence 1973). This work also mentioned that about ten species of the *taurus* group has been collected in Barro Colorado Island, Panama, each occurring in a different species of host fungus. In a study at southern Brazil (Graf-Peters *et al.* 2011) *Cis testaceimembris* and an unidentified similar species were found to be polyphagous. However, most records (87.5%, see Graf-Peters *et al.* 2011) of *C. testaceimembris* were from *Ganoderma australe* (Ganodermataceae) and only two in other host fungi. Future work may show that this species is indeed oligophagous. In the latter study, *C. kawanabei* was found in species of *Rigidoporus* (Meripilaceae), being the only ciid species occurring exclusively in *Rigidoporus* fungi at the surveyed locality. Considering the available data and unpublished data of our ongoing studies, we may hypothesize that a few species of the *taurus* group is polyphagous and widespread in the neotropics. Most *taurus* species are possibly specialists (oligophagous or even monophagous), leading to the usually observed pattern of a polyphagous (generalist) species co-occurring with specialists species of the group at a single locality (Lopes-Andrade, pers. obs.). *Cis taurus* proper were collected in an unidentified *Polyporus* species, in *Polyporus*

versicolor (Polyporaceae) and in *Bjerkandera fumosa* (Grammotheleaceae). Therefore, the available data is not sufficient to discuss its feeding habits.

Cis taurus proper occurs in the Mexican Transitional Zone and in the Neotropical region (Fig. 11) in altitudes above 1400m, where the weather is humid, cold and rainy. The Mexican Transitional Zone is a complex and heterogeneous area where Neotropical and Nearctic biotic components overlap (Hallfter 1964; Morrone *et al.* 1999). It includes the Sierra Madre Oriental, the Transmexican Volcanic Belt and the Sierra Madre del Sur. In the Mexican Transitional Zone, Nearctic biotic components increase at higher altitudes and Neotropical biotic components at lower altitudes (Morrone 2006). Although *C. taurus* occurs in high altitudes, we believe it is a Neotropical species that has become adapted to montane conditions.

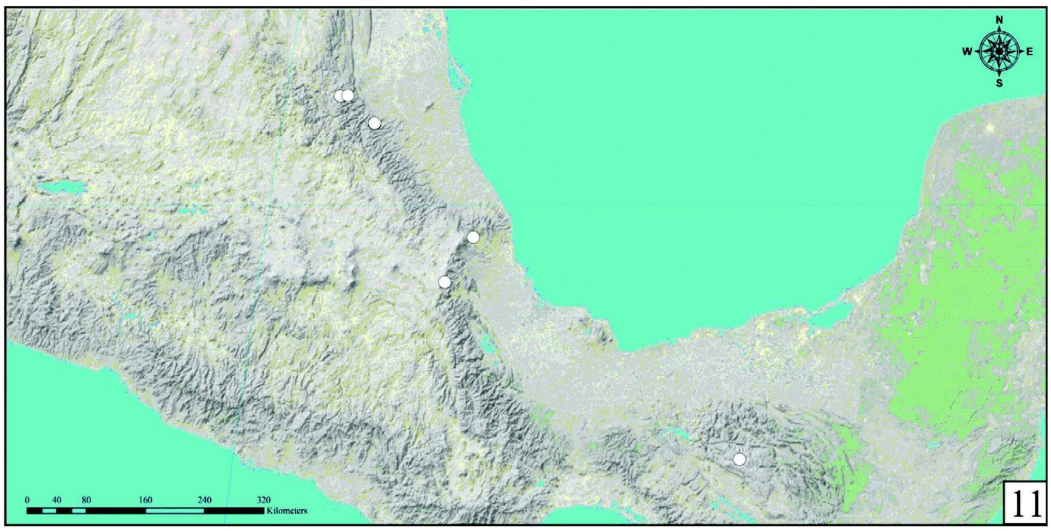


FIGURE 11. Distribution map for *Cis taurus* (Reitter, 1878).

Morrone and Márquez (2001) studied distributional patterns of some beetle families and found a northern generalized track comprising montane areas (Sierra Madre Oriental, Sierra Madre Occidental, Transmexican Volcanic Belt, Balsas Basin and Sierra Madre del Sur) and a southern generalized track (Sierra Madre of Chiapas, Mexican Gulf and Mexican Pacific Coast). *Cis taurus* occurs in both tracks, but it is not reported from Sierra Madre Occidental and Balsas Basin. The northern generalized track has the highest mixture of Neartic and Neotropical biotic components (Morrone & Márquez 2001; Morrone 2006). A cladistic biogeographic analysis based on Carabidae genera recovered one area clade including the Sierra Madre Occidental and the northern part of the Sierra Madre Oriental, and another area clade including the Transamerican Volcanic Belt, Sierra Madre del Sur and southern part of the Sierra Madre Oriental (Liebherr 1986). *Cis taurus* occurs in the latter area clade. In the Neotropical region, *C. taurus* has been collected in northern Chiapas at San Cristóbal de las Casas. Chiapas and eastern Central America together form the Caribbean subregion, which has a complex geobiotic history and is related to areas of the Neotropics, Nearctic and the tropics of the Old World (Morrone 2006). This subregion has the highest species diversity in Central America, with species that evolved in humid montane habitats and that possibly have affinities with South American species.

Acknowledgments

We wish to express our thanks to Leonardo Delgado for the donation of two males specimens of *Cis taurus* collected at Veracruz, and John F. Lawrence for the loan of several specimens of the *C. taurus* group. We also thank current and past curators of ANIC, CMN, CMNH, HNHM, NHM and MNHN for the loan of ciids. Financial support was provided by Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG: PPP 21/2008

2008, APQ-00049-09; Edital PPM 03/2010, PPM-00017-10), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq: PROTAX 52/2010 nº 562229/2010-8; master degree grant to the senior author, nº 130002/2011-9), SISBIOTA (CNPq/FAPEMIG nº 5653360/2010-0) and the Graduate Program in Entomology of the Federal University of Viçosa (UFV).

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CAPÍTULO II

Taxonomic Review of Neotropical *Cis*of the *taurus* species-group

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Manuscrito a ser submetido à revista *Zookeys*.

Taxonomic Review of Neotropical *Cis* of the *taurus* species-group

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Abstract

The described Neotropical species of *Cis* belonging to the *taurus* group are revised here. We transfer *Trichapus pubescens* Friedenreich to *Cis* Latreille and include it in the *taurus* species-group. We synonymize *Trichapus* Friedenreich with *Cis* and transfer *T. glaber* Friedenreich to *Porculus* Lawrence, we include *C. capricornis*Kawanabe and *C. longipilis* Pic in the *taurus*groupand propose *C. bison* (Reitter) as a junior synonym of *C. diabolicus* (Reitter).We redescribe eight Neotropical species and designate lectotypes for them, together with information on their geographic distribution and host fungi. This work solves the major taxonomic problems with the described *taurus* species and also provide detailed morphological information on them, including that of male abdominal terminalia, allowing accurate identification of these species.

Keywords

Ciini, male abdominal terminalia, minute tree-fungus beetles, Polyphaga, Tenebrionoidea

Introduction

Ciidae is a diverse and cosmopolitan family of micetophagous beetles with 43 genera and more than 650 described species (Lawrence & Lopes-Andrade 2008, Lawrence & Lopes-Andrade 2010, Antunes-Carvalho *et al.* 2012). They live, feed and reproduce inside basidiomes of Polyporales and Hymenochaetales fungi (Pavior-Smith 1960, Epps & Arnold 2010, Lawrence & Lopes-Andrade 2010) building tunnels and feeding on the support stereo tissue of the fungus (Lawrence & Lopes-Andrade 2010), leaving it just to dispersion. *Cis*Latreille, 1796, is the most speciose ciid genera and comprises about 370 species. It is an assemblage of 25 species-groups, which are used today as taxonomic tools to better deal with such a diversified taxon (Lawrence 1971, Lopes-Andrade 2008a). However, not all species of the genus are organized in groups. The few proposed subgenera of *Cis* are currently not used by authors (e.g. Kawanabe 1997, Lawrence 1971, Lopes-Andrade 2008a, Lopes-Andrade et al. 2009, Lopes-Andrade 2010) and the whole genus deserves a careful revision. The genus *Cis* is defined by a set of characteristics common to several ciid lineages, however these caracteristics can be convergences between distinct lineages or plesiomorfiesof Ciinae. The only phylogenetics analyses of the family (Buder *et al.* 2008) suggeststhat the genus *Cis* is polyphyletic.

The morphological species-group of *Cis* named *taurus* group currently comprisesten species, as follows: *C. bahiensis* (Pic, 1916), *C. bison* (Reitter, 1878), *C. cornelli* Lawrence, 1971, *C. diabolicus* (Reitter, 1878), *C. grandicornis* (Pic, 1917),*C. kawanabei* Lopes-Andrade, 2002, *C. rufescens* (Pic, 1922), *C. setifer* (Gorham, 1883), *C. taurus* (Reitter, 1878) and *C. testaceimembris* (Pic 1916). Most of them were described in the genus *Macrocis* Reitter, 1878, later synonymized with *Cis* by Lawrence (1971). The *taurus* groupis possibly the most speciose species-group of *Cis* in the Neotropical region. However, few species are described and, except for *C. cornelli* and *C. taurus*, the available information on literature do not allow accurate identifications.

Here, we transfer *Trichapus pubescens* Friedenreich, 1881 to *Cis* in the *taurus* group.It is the type-species of *Trichapus* Friedenreich, 1881, and thus leads to the synonymization of *Trichapus* with *Cis*. The other species of *Trichapus*, *T. glaber*Friedenreich, 1881, is here transferred to *Porculus* Lawrence, 1987. Weconfirm the inclusion of the palearctic *C. capricornis* Kawanabe, 1997 and include the Neotropical *C. longipilis* Pic, 1930in the *taurus* group, propose *C. bison* as a junior synonym of *C. diabolicus*, redescribe and designate lectotypes for all Neotropical *taurus* species,

except for *C. cornelli*, *C. capricornis* and *C. taurus*, and provide information on their geographic distribution and host fungi.

Materials and methods

We examined more than one thousand mounted specimens of about 80 morphospecies of the *taurus* group. The redescriptions of eight species were based on their respective lectotypes, designated in the present work, except for *C. diabolicus,* which redescription was based in a paralectotype, and *C. setifer*, which redescription was based in a specimen compared to the type series and here called plesiotype (sensu Evenhuis 2008). In the case of *C. bahiensis*, *C. grandicornis* and *C. bison*, only the lectotype was available to us. For *C. diabolicus*, we had only one paralectotype in hands, of *C. testaceimembris* we had the lectotype and a paralectotype, and of *C. rufescens* we had the lectotype and only one named specimen.

We dissected lectotypes to clarify doubts on species limits of very similar morphospecies by comparing male abdominal terminalia, except for *C. diabolicus* (paralectotype dissected),*C. rufescens* and *C. setifer* (a specimen compared to the type was dissected). In the case where a morphospecies was very similar to any described species, including the ones transferred to the group here, we dissected and compared male abominal terminalia of specimens from each recognized population, if any. The terminology used here follows Lopes-Andrade and Lawrence (2005). Range, mean and standard deviation values for measurements (in millimeters) and ratios are provide in the description and the following abbreviations are used: BW, basal width of the scutellum; CL, length of the antennal club (measured from base of the eighth to apex of the tenth antennomere); EL, elytral length (at midline, from base of scutellum to elytral apex); EW, greatest elytral width; FL, length of the antennal funicle (measured from base of the third to apex of the seventh antennomere); GD, greatest depth of the body (from elytra to metaventrite); GW, greatest diameter of the eye; PL, pronotal length along midline; PW, greatest pronotal width; TL, total length (=EL+PL; head not included). The ratio GD/EW was recorded as an indication of degree of convexity; TL/EW indicates degree of body elongation. We measured a maximum of five males and five females from each locality. In case of species with fewer known specimens, we measured all of them. Differences among specimens are given in the section on ‘‘Variation’’, together with standard measurements and ratios.

We examined and compared specimens under a Zeiss Discovery V8 stereomicroscope. Measurements of specimens and redescriptions were made under a Zeiss Stemi 2000-C stereomicroscope. Digital photographs of specimens were taken under a Zeiss Discovery V8, the final images being the result of montaging 25 to 60 image slices at different focal lengths using the extended focus module of Zeiss Axiovision 4.8 software. Whole mount preparations of male abdominal terminalia followed the protocol described by Lopes-Andrade (2011) and photography of dissected pieces were made under a Zeiss Axiolab compound microscope equipped with a Zeiss Axiocam ERc 5s digital camera. We created distribution maps using latitude and longitude coordinates estimated by tracking localities in the online database GeoNames (Wick 2010) and plotting them in a map using the software ArcGis 9.3. We do not provide an identification key to *taurus* species because there is a high number of morphoespecies. At this moment, a key restricted to the described species would be of no help to anyone working on *taurus* species.

Specimens examined in this work belong to the following scientific collections (with acronyms used in this paper):

ANIC Australian National Insect Collection, CSIRO Entomology (Canberra, Australia)
FMNH Field Museum of Natural History (Chicago, Illinois, USA)
LAPC Cristiano Lopes-Andrade Private Collection (Viçosa, MG, Brazil)
MNHN Muséum National d'Histoire Naturelle (Paris, France)
MZSP Museu de Zoologia da Universidade de São Paulo (São Paulo, Brazil)
NMNH National Museum of Natural History, Smithsonian Institution (Washington, D. C., USA)

Systematics

We found additional specimens and expanded the distributional records for *C. kawanabei*, *C. pubescens***new combination**, *C. rufescens* and *C. setifer*. However, we did not locate additional specimens of *C. bahiensis*, *C. diabolicus* (including *C. bison***new synonym**), *C. grandicornis* and *C. testaceimembris*, so they remain known only from their original type-series.*Cis taurus* was recently redescribed, and geographic distribution and other information on it was provided by

Oliveira & Lopes-Andrade (2013). The palearctic *C. capricornis* and the nearctic *C. cornelli* are adequately described and thus we do not provide further information on them. We did not locate the type or named specimens of *C. longipilis* Pic, 1930. We inferred it belongs to the *taurus* group according to its original description. We did not have access to any *C. capricornis* either and we include it in the group based on its description and comments by Kawanabe (1997).

The *taurus* species-group of *Cis* is now constituted by the following species (species redescribed here preceded by an asterisk):

**Cis bahiensis* (Pic, 1916)
Cis capricornis Kawanabe, 1997
Cis cornelli Lawrence, 1971
**Cis diabolicus* (Reitter, 1878)
Macrocis bison (Reitter, 1878), **new synonym**
**Cis grandicornis* (Pic, 1917)
**Cis kawanabei* Lopes-Andrade, 2002
Cis longipilis Pic, 1930, doubtfully included
Cis pubescens* (Friedenreich, 1881), **new combination
**Cis rufescens* (Pic, 1922)
**Cis setifer* (Gorham, 1883)
Cis taurus (Reitter, 1878)
**Cis testaceimembris* (Pic, 1916)

Redescriptions, lectotype designations and complete historical and taxonomic information are provided bellow.

***Cis* Latreille, 1796**

Cisdygma Reitter, 1885
Eridaulus Thomson, 1859
Macrocis Reitter, 1878
Malacocis Gorham, 1886 (in part),**new synonym**
Trichapus Friedenreich, 1881(in part), **new synonym**
Xestocis Casey, 1898

Comments. The transfer of *Trichapus pubescens*, type-species of the genus *Trichapus* (see Lawrence 1987) to *Cis* and consequent synonymization of *Trichapus* with *Cis* leads *Trichapus glaber* Friedenreich, 1881, without genus assignment. We did not locate the type of *T. glaber*. Here we transfer the species to *Porculus* Lawrence, 1987, leading to *P. glaber* (Friedenreich, 1881), **new combination**, a decision based on its original description and on comments by Lawrence (1987).

***Cis bahiensis* (Pic, 1916)**

Figs 1–7

Malacocis bahiensis Pic, 1916: 5; Lopes-Andrade 2002a.

C*is bahiensis;* Lawrence, 1971: 505.

Diagnosis. (i) Pronotum short and much wider than long; (ii) vestiture of long setae; (iii) male's frontoclypeal ridge bearing a pair of short subtriangular horns; (iv) pronotum surface between punctures with microreticulate sculpture; (v) lateral margins of pronotum explanate, not crenulate and visible for their entire length from above; (vi) elytral punctation single; (vii) male abdominal sex patch of about one-fourth the length of the first abdominal ventrite.

Redescription. Male lectotype not fully pigmented, possibly a teneral adult with soft cuticle and in relatively bad condition. Measurements (in mm): TL 1.30, PL 0.45, PW 0.73, EL 0.85, EW 0.76, GD 0.63. Ratios PL/PW 0.62, EL/EW 1.12, EL/PL 1.89, GD/EW 0.83, TL/EW 1.71. Body robust, convex, rounded, yellowish brown; mouthparts, tarsi and antennae goldish yellow; vestiture consisting of slender setae as long as the base of scutellum. **Head** concave between horns, with sparse slender setae and sparse fine punctation; frontoclypeal ridge reduced and bearing a pair of short subtriangular horns (length 0.15 mm; width 0.10 mm at base) width decreasing to apiceswhich are rounded, horns separated by a distance of about 0.13mm at base. **Antennae** (left antennae measured; FL 0.13, CL 0.15, CL/FL 1.15), with length of antennomeres one to ten (in mm) as follows: 0.10, 0.08, 0.04, 0.03, 0.02, 0.02, 0.02, 0.05, 0.04, 0.06. **Eyes** glabrous; GW 0.10. **Pronotum** much wider than long with about half the length of elytra length; anterior margin arched outward; anterior angles rounded and produced forward; both lateral margins explanate, not crenulate, sub-arched outward and visible for their entire lengths from above; single and coarse punctation with microreticulate sculpture between punctures. **Scutellum** U-shaped, BW 0.06. **Elytra** subquadrate, strongly convex, punctationsingle with coarse punctures about the same size of

those on pronotum; vestiture consisting of sparse yellowish setae, twice as long as the base of scutellum; humeral calli conspicuous. **Prosternum** biconcave, strongly tumid and weakly carinate at the longitudinal midline; vestiture consisting of short setae; surface granulate; prosternal process narrow at base and abruptly expanded to a blunt and triangular apex. **Metaventrite** convex, granulate, with single fine punctation and slender setae. **Abdominal ventrites** granulate; punctation single and subseriate, consisting of shallow fine punctures; vestiture of sparse slender setae;length of ventrites one to fifth (in mm, from base to apex at the longitudinal midline) as follows: 0.19, 0.06, 0.06, 0.07, 0.10; first abdominal ventrite bearing an oval and pubescent sex patch (Fig. 5, arrow) with a transverse diameter of 0.05mm, closest to the posterior margin. **Protibia** with outer apical angle produced into a stout tooth,with a tuft of setae above tarsus and at the inner margin. **Meso- and Metatibia** with apical margin bearing a row of spines but devoid of tooth at the apical angle.**Male abdominal terminalia**(Figs 6–7).**Eighth sternite** (Fig. 6) 1.3 times wider than long, almost three times shorter than penis; posterior margin broadly emarginated to approximately one-fourth the sternite length, forming two lateral lobes rounded at apices, slightly converging and bearing long setae, the margin between lobes being almost linear. **Tegmen** (Fig.7, right) subcylindrical, about2.6 times longer than wide, 1.6 times shorter than penis; anterior margin subrounded, bearing an angulate minute projection at its center; lateral margins sclerotized and subparallel; distal portion bearing basiconical sensilla, apical portion divided by a dorsal fissure into two small lobes, subpyramidal and bearing basiconical sensilla, outer edge of each lobe with an inflexion at base (Fig.7, arrow). **Penis** (Fig. 7, left) subcylindrical (about 0.33mm long),near 5.3 times longer than wide; proximal portion narrowed to a sclerotized rectangular tip, apex membranous; lateral margins subparallel; ratio of the length of penis and body size of 0.25.

Females. Unknown.

Type Material. Lectotype here designated, male (MNHN) \Bahia [handwritten]\Malacocis bahiensis Pic [handwritten] \ Type [handwritte in yellow paper] \LECTOTYPE [printed] MALACOCIS BAHIENSIS PIC [handwritten] [red paper] \ TYPE [printed]\ orange circle \ ♂ dissected 17.i.2013 Lopes-Andrade [handwritten]\.

Comments. Known only from the type-series collected in the state of Bahia, Brazil (Fig.75). There is no other locality information on labels and host fungi are unknown.

***Cis capricornis* Kawanabe, 1997**

Cis capricornis Kawanabe, 1997: 326; Kawanabe, 1998: 312; Orledge & Reynolds, 2005: 625, 634.

Comments. Kawanabe (1997) mentioned the similarities of*C. capricornis*to South American species of the *taurus* group, as *C. kawanabei*, *C. grandicornis* and *C. testaceimembris*, and the north American *C. cornelli*. However, he treated *C. capricornis*as part of the *castaneus*group (once *nitidus* group, see Jelinek 2007) due to its dorsal vestiture of minute setae and prosternum carinate at the longitudinal midline. However, a dorsal vestiture of minute setae is a peculiarity found in few *taurus* species, considering described and undescribed forms, and this feature alone is not sufficient to include it in the *castaneus* group. Without a consistent phylogenetic scenario, it is better to maintain *castaneus* and *taurus* as separate groups, although morphologically related. The *taurus* species are mostly Neotropical, while *castaneus* species are Holarctic.*Cis capricornis* is known only from Japan. There's no other *taurus*species occurring in the Palearctic region, considering described and undescribed forms. We suggest here that it may be an allochthonous species, a possibility that shall be evaluated by authors working on that fauna. Information on its morphology, geographic distribution and host fungi is provided in its original description (Kawanabe 1997).

***Cis cornelli* Lawrence, 1971**

Fig. 8–10

Cis cornelli Lawrence, 1971: 450; Kawanabe, 1997: 328; Lawrence, 1982: 2; Oliveira & Lopes-Andrade, 2013: 483.

Comments. The species is known from Florida, North and South Carolina (USA), but it is probably distributed throughout the Southern Coastal Plain (Lawrence 1971). It is important to note that the southern Florida is considered by authors to be part of the Neotropical region (see Morrone 2002, 2006). Therefore, the areas around it, where *Cis cornelli* occurs, may be interpreted as being a transition zone to the Nearctic region. Under such view, *Cis cornelli* would be considered neotropical, rather than nearctic.Information on the morphology and host fungi of the species is fully provided in its original description (Lawrence 1971).

***Cis diabolicus* (Reitter, 1878)**

Figs 11–19

Macrocis diabolicus Reitter, 1878: 35; Gorham, 1883: 220.

Macrocis diabolica; Blackwelder, 1945: 549 (incorrect spelling).

Cis diabolicus; Lawrence, 1971: 438;Oliveira & Lopes-Andrade, 2013: 483.

Macrocis bison Reitter, 1878, **new synonymy**;Gorham, 1883: 220; Blackwelder, 1945: 549.

Cis bison Lawrence, 1971: 438;Oliveira & Lopes-Andrade: 483.

Diagnosis. (i) body elongate; (ii) dense dorsal vestiture of long grayish setae; (iii) males with frontoclypeal ridge bearing two long, cylindrical and parallel horns with rounded apex; (iv) pronotum with punctures coarse and side by side; (v) lateral margins of pronotum explanate, crenulate and visible for their entire lengths from above; (vi) elytral punctation dual and confused; (vii) abdominal sex patch of about one-fifth the length of the first abdominal ventrite at midline.

Redescription. Male paralectotype (Figs. 11–17), fully pigmented and in good condition. Measurements (in mm): TL 2.6, PL 0.83, PW 1.24, EL 1.77, EW 1.38, GD 1.11. Ratios PL/PW 0.67, EL/EW 1.28, EL/PL 2.13, GD/EW 0.80, TL/EW 1.88. Body robust, convex, shiny black; dorsal vestiture consisting of dense and long gray setae, each longer than the width of the scutellum; ventral vestiture of sparse slender setae; body elongate. **Head** with vestiture of slender setae; punctationdeep, coarse and single; frontoclypeal ridge reduced and bearing a pair of long and parallel, fine cylindrical horns (length 0.73; width at base 0.25 mm) horns with fine punctures and short slender setae, width tapering to a rounded apex and distanced by 0.19mm at base. **Antennae** (left antennae measured; FL 0.22, CL 0.26, CL/FL 1.18mm) goldish yellow, with length of antennomeres one to ten (in mm) as follows: 0.12, 0.08, 0.08, 0.05, 0.04, 0.02, 0.03, 0.08, 0.06, 0.12. **Eyes** glabrous, GW 0.19mm. **Pronotum** with anterior margin arched outwards, anterior angles rounded and very prominent; lateral margins explanate and crenulate, visible for their entire lengths from above; posterior margin sublinear, slightly arched near the scutellum; punctation dense and single, coarse and deep punctures separated from each other by less than one puncture-width (the punctures are almost side by side); pronotum surface between punctures smooth. **Scutellum** subtriangular punctures single with deep and coarse punctures, each one bearing a seta; BW 0.18mm. **Elytra** about twice as long as pronotum convex, elongate; punctation dual, confuse at disc, the large punctures similar in size to those of pronotum and the small ones with about two-

thirds the diameter of the largest; distance between punctures about twice a large puncture-width or less; vestiture consisting of long grayish setae; humeral calli conspicuous. **Prosternum** biconcave, tumid and weakly carinate at the longitudinal midline; surface granulate, vestiture consisting of sparse slender short setae; prosternal process wide and subretangular. Metaventrite convex; surface granulate with sparse slender setae. **Abdominal ventrites** with shallow punctures; surface granulate with sparse slender setae; length of ventrites one to fifth as follows (in mm, from base to apex of each ventrite at the longitudinal midline): 0.30, 0.15, 0.11, 0.10, 0.18. First abdominal ventrite bearing a circular, marginate and pubescent sex patch (Fig. 15, arrow), closest to the posterior margin, with a transverse diameter of 0.06mm. **Protibiae** with apex bearing a row of short spines, outer apical angle produced into a stout tooth, inner margin with thick setae. **Meso- and metatibia** with apex bearing a row of spines, outer apical angle angulate but not forming a stout tooth, inner margin bearing thick setae.**Male abdominal terminalia**(Figs 16–17).**Eigth sternite** (Fig. 16) wider than long, a bit shorter than penis; posterior margin with a V-shapeemargination at middle about one-third deep the sternite's length, forming two pyramidal lateral lobes bearing long setae at margins;lateral margins converging; anterior margin membranous, sublinear and devoid of strut. **Tegmen** (Fig. 17, right) subcylindrical, about 2.5 times longer than wide, as long as the penis; anterior margin slightly rounded; lateral margins sclerotized diverging to apical portion; one sixth of the apicalportion separated by a dorsal fissure into two sclerotized lobes bearing basiconical sensilla and narrowed by an inflexion (Fig 17, arrows). **Penis** (Fig. 17, left) subcylindrical (of about 0.27mm),about 4.3 times longer than wide; anterior margin slightly sinuous; lateral margins subparallel until two-thirds of their lengths, then converging and forming a sclerotized triangular apex ventrally and a wrinkled membranous lobe dorsally;ratio of the length of penis and body size of 0.10.

Females. Unknown.

Variation. Males (n = 2, included the paralectotype and the lectotype of *Cis bison*) TL 2.34–2.60 (2.47 ± 0.18); PL 0.75–0.83 (0.79 ± 0.06); PW 1.24–1.09 (1.17 ± 0.11); EL 1.59–1.77 (1.68 ± 0.13); EW 1.32–1.38 (1.35 ± 0.04); GD 1.14–1.11 (1.13 ± 0.02); PL/PW 0.67–0.69 (0.68 ± 0.01); EL/EW 1.20–1.28 (1.24 ± 0.06); EL/PL 2.12–2.13 (2.13 ± 0.01); GD/EW 0.80–0.86 (0.83 ± 0.04); TL/EW 1.77–1.88 (1.83 ± 0.08).

Type Material. ***Cis diabolicus*****, lectotype here designated, male (MNHN)** \La Luzera [handwritten] \Ex. Musæo E.Steinheil [printed, black border] \ LECTOTYPE [printed] MACROCIS DIABOLICUS REITTER [handwritten] [red paper]\. **Paralectotype, male(MNHN)** \La Luzera [handwritten] \Ex. Musæo E.Steinheil [printed, in black border] \ PARALECTOTYPE [printed] MACROCIS DIABOLICUS REITTER [handwritten] [yellow paper] \ ♂ dissected 16.i.2013 Lopes-Andrade [handwritten]\. ***Cis bison*****,lectotype here designated, male(MNHN)**\La Luzera [handwritten]\Macrocis Bison m Colombia [handwritten in light green paper] \ Ex. Musæo E.Steinheil [printed, in black border] \ LECTOTYPUS [printed] MACROCIS BISON REITTER [handwritten] [in red paper] \ *Cis diabolicus* (Reitter, 1878) det. E.H. Oliveira [printed]\.

Comments. The names*C. diabolicus* and *C. bison* were proposed in the same paper and have the same type-locality, somewhere near La Lucera stream (called "La Luzera" by Reitter 1878), currently in the department of Caquetá (Colombia) (Fig.77). It's plausible to suppose that the type specimens of both were collected together. For us, the specimens formerly described as *C. bison* (Figs. 18–19) aretenerals males of *C. diabolicus*, bearing all the diagnostic characteristics but with shorter horns and lighter color surface. Reitter (1878) wrote about the very similar morphology of both species, but he decided that some variant characteristics were fundamental to separate them into two species, as color, horns' size and differences indorsal punctation. For us, these are all intraspecific variation. *Cis diabolicus*is known only from the type-locality and has no host fungus record. A remarkable characteristic is its reduced male abdominal terminalia relative to their large body size, in comparison to other species of the group: the ratio of penis length to total length of the body is 0.10, while in other examined *taurus*species it rangesfrom 0.15 to 0.32, except for *C. rufescens* in which this ratio is also about 0.10.

Cis grandicornis **(Pic, 1917)**

Figs 20–26

Macrocis grandicornis Pic, 1917: 4; Blackwelder, 1945: 549.

Cis grandicornis; Lawrence, 1971: 438;Kawanabe, 1997: 328; Oliveira & Lopes-Andrade, 2013: 483.

Diagnosis. (i) Body strongly robust; (ii) dense dorsal vestiture of long yellowish setae; (iii) males with frontoclypeal ridge bearing a pair of thick, laminar and parallel horns with rounded apices; (iv) pronotal surface between punctures with an hexagonal microreticulate sculpture; (v) lateral margins of pronotum not explanate, not crenulate and not visible from above; (vi) elytral punctation dual and confuse; (vii) abdominal sex patch of about one-sixth the length of the first abdominal ventrite at midline.

Redescription. Male lectotype, fully pigmented and in good condition. Measurements (in mm): TL 2.07, PL 0.69, PW 1.12, EL 1.38, EW 1.21, GD 1.03. Ratios PL/PW 0.62, EL/EW 1.14, EL/PL 2.00, GD/EW 0.85, TL/EW 1.71. Body strongly robust and convex, shiny yellowish brown; vestiture dorsally consisting of dense yellow setae as long as scutellum base and slender setae ventrally. **Head** granulate, subglabrous; punctation fine, single and sparse; frontoclypeal ridge reduced and bearing a pair of long, parallel and thick laminate horns (length 0.53mm; width at base 0.19mm), granulate with fine punctuation, diameter remaining almost the same until the apex, horns separated by a distance of about 0.2mm at base. **Antennae** (left antennae measured; FL 0.15, CL 0.18, CL/FL 1.2mm) with length of antennomeres one to eighth (in mm) as follows: 0.08, 0.05, 0.04, 0.03, 0.03, 0.02, 0.03, 0.05, 0.05, 0.08. **Eyes** glabrous, GW 0.18mm. **Pronotum** much more wide than long; anterior margin arched outwards, anterior angles rounded and not proeminent; both lateral margins arched outwards, not explanate, not crenulate, not visible for above; posterior margin sublinear and slightly arched near the scutellum; punctation single, deep, separated by a distance of about one-puncture or less at disc, coarse microreticulate hexagonal sculpture between punctures, each puncture bearing a yellow setae. **Scutellum** semitriangular, BW 0.07mm. **Elytra** convex, compact; punctation coarse, confuse at the disc, dual with large punctures a little bit smaller than the pronotum ones and small punctures of about a half of big ones size, distance between punctures about one puncture-width or less; humeral calli conspicuous. **Prosternum** biconcave, strongly tumid and weakly carinate at longitudinal midline, granulate, fine, with single punctures and short slender setae; prosternal process wide and semi-rectangular.**Metaventrite** convex, granulate with fine punctures and sparse slender setae. **Abdominal ventrites** with shallow punctures, surface granulate and vestiture consisting of sparse setae, length of ventrites one to fifth (in mm) 0.27, 0.08, 0.08, 0.08, 0.14. First ventrite bearing a circular, marginate and pubescent sex patch (Fig. 24, arrow) closest to the posterior margin with a transverse diameter of 0.04mm. **Protibia** with apex bearing a row of spines; outer apical angle angulated and produced into a stout tooth, inner apical angles bearing a tuft of setae. **Meso- and metatibia** with apex bearing a row of

spines, outer apical angles angulate but not forming a distinct tooth, inner angle bearing a tuft of setae.**Male abdominal terminalia**(Figs 25–26)**.Eighth sternite** (Fig. 25) 1.6 times wider than long, twice shorter than penis; posterior margin widely emarginated at middle about one-third deep the sternite's length, forming two lateral lobesslightly convergent,with rounded apices and bearing long setae; margin between lobes broadly curved inward and bearing short setae; lateral margins subparallelat basal half, then inflexed and converging; anterior margin membranous, almost straight and devoid of median strut.**Tegmen** (Fig. 26, right) subcylindrical, three times longer than wide and four-fifths the length of penis; anterior with a minute angulate projection at middle; lateral margins sclerotized and subparallel; distal portion divided into two lobes by a dorsal fissure, each lobe with an inflexion at base (Fig.26, arrows), sclerotized and bearing basiconical sensilla. **Penis**(Fig. 26, left)subcylindrical, about 0.39mm long, five times longer than wide; anterior portion subtriangular; lateral margins sclerotized and subparallel; distal third consisting of two pairs of a set of wrinkled membranes dorsally and a barely sclerotized triangular apex ventrally;ratio of the length of penis and body size of 0.19.

Females. Unknown.

Type Material.Lectotype here designated, male (MNHN) \GUYANE SAINT-LAURENT DU MARONI [printed] \ DÉCEMBRE [printed] \ Macrocis grandicornis [handwritten] \ type [handwritten in old yellow paper] \ LECTOTYPE [printed] MACROCIS GRANDICORNIS [handwritten] [red paper] \ TYPE [printed, red paper] \ ♂ dissected 16.i.2013 Lopes-Andrade [handwritten]\.

Comments. Known only from the type-locality (Fig. 77), without host fungus record. It is morphologically close related to *C. pubescens***new combination**, the latter widespread in tropical and subtropical forests of eastern Brazil. See the section on "Discussion".

***Cis kawanabei* Lopes-Andrade, 2002**

Figs 27–42

Macrocis testaceus Pic, 1916: 5.

Macrocis testacea;Blackwelder, 1945: 549 (incorrect spelling).

Cis testaceus(not *Cis testaceus* Fåhraeus, 1871); Lawrence, 1971: 438; Kawanabe, 1997: 328.

Cis kawanabei Lopes-Andrade, 2002: 54; Graf-Peters *et al.* 2011: 556 (incorrect identification); Oliveira & Lopes-Andrade, 2013: 483.

Diagnosis. (i) Body elongate; (ii) dorsal vestiture of long yellowish setae; (iii) males with frontoclypeal ridge bearing a pair of long, fine and subcylindrical horns, converging and tapering to rounded apices; (iv) pronotum with surface between punctures smooth; (v) lateral margins of pronotum explanate, crenulate and visible from above; (vi) elytral punctation dual and subseriate; (vii) abdominal sex patch of about one-fourth the length of the first abdominal ventrite at midline.

Redescription. Male lectotype (Figs. 27–33), not fully pigmented, in relatively good condition but with head and pronotum stuck to the abdomen. Measurements (in mm) TL 2.05, PL 0.64, PW 0.96, EL 1.41, EW 1.08, GD 0.92. Ratios: PL/PW 0.67, EL/EW 1.31, EL/PL 2.20, GD/EW 0.85, TL/EW 1.90. Body robust,strongly convex, elongate, elytra length approximately the double of length of pronotum, shiny yellowish brown, dorsal vestiture consisting of yellowish setae as long as the base of scutellum and slender setae ventrally. **Head** granulate, subglabrous with spares slender setae, frontoclypeal ridge reduced and bearing a pair of long, fine, cylindrical and convergінghorns (length 0.46mm; width at base 0.18mm), granulate with fine punctation and minute setae, width tapering at a rounded apex, horns separated at a distance of 0.20mm at base. **Antennae** with clave of about twice longer than the funicle (right antennae measured; FL 0.12; CL 0.21; CL/FL 1.75) with length of antennomeres one to tenth as follows: 0.10, 0.05, 0.03, 0.03, 0.02, 0.02, 0.02, 0.07, 0.05, 0.09. **Eyes** glabrous, GW 0.18. **Pronotum** with anterior margin arched outward; anterior angles rounded and barely produced; lateral margins explanate, arched and crenulate (in the Lectotype the crenulation is not very easy to identified because of the age of the specimen), barely visible for their entire length from above; posterior margin sublinear and slightly arched near the scutellum; punctation single, distance between punctures of about one-puncture-width, pronotum surface between punctures smooth; vestiture consisting of long yellow setae. **Scutellum**with punctation, BW 0.09. **Elytra** strongly convex, punctation dual, coarse and subseriate at disc, size of

the larger punctures near the size of punctation of the pronotum, small ones being a little small than the larger ones; distance between punctures of about two-punctures-widths, each small puncture bearing a yellowish setae, larger punctures are devoid of setae; humeral calli conspicuous. **Prosternum** biconcave, granulate, tumid and weakly carinate at longitudinal midline; prosternal process barely narrowest at its base and gradually expanded to a bit wider apex. **Metaventrite** convex, granulate with sparse slender setae. **Abdominal ventrites** with coarse, single and seriate punctures, long slender setae, surface granulate, length of ventrites one to fifth (in mm, from base to apex of each ventrite at longitudinal midline): 0.25; 0.09; 0.08; 0.09; 0.14. First abdominal ventrite bearing a circular and marginate sex patch (Fig. 31, arrow) closest the posterior margin, with a transverse diameter of 0.07. **Protibia** with apex bearing a row of small spines and outer apical angle produced into a stout tooth. **Meso- and metatibia** with apex bearing a row of small spines, outer apical angle angulate but not produced into a stout tooth.**Male abdominal terminália (**Figs.32–33)**.Eigth sternite** (Fig. 32) 1.4 times wider than long, twice shorter than the penis; anterior margin linear; lateral margins subparallel; posterior margin slightly emarginated at middle about one-sixth deep of the sternite length resulting in two lateral lobes rounded, subparallel and bearing long setae, margin between lobes almost linear.**Tegmen** (Fig. 33, right) subcylindrical; about twice longer than wide, three-fourths of penis length; anterior margin rounded; lateral margins subparallel; apex divided in two short, central and subpyramidal lobes (Fig. 33, arrow) of one-seventh of the length of the tegmen bearing basiconical sensillae. **Penis** (Fig. 33, left) subcylindrical, about 0.31mm of length; four times longer than wide; anterior margin linear; lateral margin converging; one-third apical consisting of membranous and filamentous lamellae; ratio length of the penis in relation to the body size of 0.15.

Females (Fig. 34–35) Similar to males, but devoid of sex patch at the first abdominal ventrite; frontoclypeal ridge devoid of horns and bearing a pair of short arched projections at the same position of male horns; head convex with vestiture consisting of dense and long yellowish setae.

Variation. Males (Fig. 36–40) (n = 22, including the lectotype) TL 1.63–2.20 (1.91 ± 0.15); PL 0.43–0.70 (0.58 ± 0.08); PW 0.75–1.08 (0.92 ± 0.06); EL 1.13–1.60 (1.33 ± 0.11); EW 0.80–1.13 (1.02 ± 0.08); GD 0.38–0.95 (0.82 ± 0.13); PL/PW 0.46–0.75 (0.63 ± 0.07); EL/EW 1.13–1.53 (1.30 ± 0.09); EL/PL 1.92–3.59 (2.34 ± 0.39); GD/EW 0.38–0.95 (0.80 ± 0.11); TL/EW 1.63–2.06 (1.87 ± 0.10). Females (n = 14) TL 1.63–2.18 (1.88 ± 0.16); PL 0.43–0.68 (0.56 ± 0.06); PW 0.78–1.03 (0.86 ± 0.08); EL 1.08–1.50 (1.33 ± 0.14); EW 0.83–1.18 (0.97 ± 0.10); GD 0.58–0.88 (0.79 ±

0.09); PL/PW 0.53–0.74 (0.64 ± 0.07); EL/EW 1.16–1.58 (1.37 ± 0.12); 1.95–3.53 (2.42 ± 0.41); GD/EW 0.62–0.92 (0.82 ± 0.09); TL/EW 1.76–2.11 (1.95 ± 0.12). Pronotal surface is smooth (completely devoid of lines or microreticulate sculpture) or weakly striated (with minute and fine transverse lines) and can present few very small punctures (Fig. 41, arrows) between the punctures of pronotum in some specimens, some times these small punctures are numerous and very concentrate in certain areas (Fig. 42, arrow); in some specimens these small punctures are between the elytra puncture too (Fig 42, arrow). The dual elytral punctation is not clear in some specimens, and the small punctures can be larger in some specimen. Color is not a reliable characteristic; teneral adults show a light yellow to yellowish brown coloration, while fully-pigmented ones are reddish-brown. Male frontoclypeal horns vary from short (minimum of 0.28mm) to long (maximum of0.46mm), and they may be convergent to subparallel, almost straight to slightly curved inward.The population of Colombia has finer setae and not so seriated punctures in the elytra. There are some tenuous differences in the terminália but we considered those variations as intraspecific variation and they are not so strong to separate them in different species.

Type Material. Lectotype here designated, male (MNHN)\Blumenau S.O.Brasilien (Reitter) [printed in black border] \ Macrocis testaceus [handwritten] \ Type [printed in red paper] \ LECTOTYPE [printed] MACROCIS TESTACEUS PIC [handwritten] \ ♂ dissected 18.i.2013 Lopes-Andrade [handwritten]\.

Complementary Material.**1male and 1 female(LAPC)** \BRASIL: RJ Itatiaia, “Parque Nacional de Itatiaia”;09.XI.2011 leg.L. S. Araújo [printed] \ Código: Trans.: [printed] 1 [handwritten] Parcela: [printed] E [handwritten] Fungo [printed] 2 [handwritten]\ **1male (LAPC)**\BRASIL: RJ Teresópolis, “P N Serra dos Órgãos”;14.XI.2011 leg. L. S. Araújo [printed] \ Código: Trans.: [printed] 1 [handwritten] Parcela: [printed] A [handwritten] Fungo [printed] 1 [handwritten]\ **1 female(LAPC)**\BRASIL: RJ Teresópolis, “P N Serra dos Órgãos”;14.XI.2011 leg. L. S. Araújo [printed] \ Código: Trans.: [printed] 2 [handwritten] Parcela: [printed] E [handwritten] Fungo [printed] 1 [handwritten]**1 male and 1 female(LAPC)**\BRASIL: ES Santa Teresa, “Estação Ecológica de Santa Lúcia” 27.XI.2011 leg. L. S. Araújo [printed] \ Código: Trans.: [printed] 2 [handwritten] Parcela: [printed] E [handwritten] Fungo [printed] 4 [handwritten]\ **1 male (LAPC)** \BRASIL: ES Domingos Martins; “Parque Estadual da Pedra Azul” 04.ix.2003 legs. K. S. Furieri & F.C.C. Barreto [printed]\, **1 male(LAPC)** \BRASIL: ES Domingos Martins; “Parque Estadual da Pedra Azul” 04.ix.2003 legs. K. S. Furieri & F.C.C. Barreto [printed] \ ♂ dissected

09.i.2013 Oliveira, E.H. [handwritten]\, **1 male(LAPC)** \BRASIL: ES DOMINGOS MARTINS; "P.E Pedra Azul" 17-18/I/2000 leg. C. Lopes-Andrade [printed]\ **2 males and 1 female(LAPC)**\BRASIL: MG: Araponga, "Parque Estadual Serra do Brigadeiro" 13.XII.2011 leg.L. S. Araújo [printed] \ Código: Trans.: [printed] 3 [handwritten] Parcela: [printed] D [handwritten] Fungo [printed] 1 [handwritten]\ **1 male(LAPC)** \BRASIL: MG: Viçosa, "Mata do Paraíso"; 28.IX.2011 leg L. S. Araújo [printed] \ Código: Trans.: [printed] 3 [handwritten] Parcela: [printed] A [handwritten] Fungo [printed] 2 [handwritten]\ **1 female(LAPC)** \BRASIL: MG: Viçosa, "Mata do Paraíso"; 28.IX.2011 leg L. S. Araújo [printed] \ Código: Trans.: [printed] 3 [handwritten] Parcela: [printed] B [handwritten] Fungo [printed] 1 [handwritten]\ **1 female(LAPC)** \BRASIL: MG: Viçosa, "Mata do Paraíso"; 28.IX.2011 leg L. S. Araújo [printed] \ Código: Trans.: [printed] 3 [handwritten] Parcela: [printed] A [handwritten] Fungo [printed] 1 [handwritten]\ **1 female(LAPC)** \BRASIL: MG: Viçosa, "Mata do Paraíso"; 28.IX.2011 leg L. S. Araújo [printed] \ Código: Trans.: [printed] 3 [handwritten] Parcela: [printed] C [handwritten] Fungo [printed] 1 [handwritten]\ **2 males and 3 females (LAPC)** \BR: MG: Viçosa, "Mata da Biologia" 05.vii.2012. Madalena et al Leg. [printed]\ **1 male(LAPC)** \BRASIL: MG: VIÇOSA. "Mata da Biologia", 20/1/2002 leg. C. Lopes-Andrade [printed] \ Fungo #25 [handwritten]\ **1 male (LAPC)** \BRASIL: MG: VIÇOSA. "Mata da Biologia", 20/1/2002 leg. C. Lopes-Andrade [printed] \ Fungo #09 [handwritten]\ **1 male and 2 females (LAPC)** \BRASIL: MG Viçosa; "Belvedere" 17/IX/2000 leg. C. Lopes-Andrade & F. Gumier-Costa [printed]\ **1 male (LAPC)** \BRASIL: MG Viçosa; "Belvedere" 17/IX/2000 leg. C. Lopes-Andrade & F. Gumier-Costa [printed] \♂ dissected 07.1.2013 Oliveira, E.H. [handwritten]\ **1 male (LAPC)** \BRASIL: MG Viçosa; "Belvedere" 17/IX/2000 leg. C. Lopes-Andrade & F. Gumier-Costa [printed] \ citogenética [handwritten]\ **1 male (LAPC)** \BRASIL: MG Ingaí, "Res. Biol. Boqueirão" 28.viii.2002 legs. S.E. Guimarães, J.M. Oliveira & C. Lopes-Andrade [printed]\ **1 male (LAPC)** \BRASIL: MG Ingaí, "Res. Biol. Boqueirão" 28.vii.2002 legs. S.E. Guimarães, J.M. Oliveira & C. Lopes-Andrade [printed] \ ♂ dissected 09.i.2013 Oliveira, E.H.\

Material Included with doubt.4 males and 2 females (LAPC) \COLÔMBIA: Cauca Papayan Vda Rio Blanco, Fca San Millán, Bosque de Roble. 23.vii.2009 Sandovál-Gómez,V.E. leg. Em *Phellinus gilvus*\ **1 male (LAPC)**\COLOMBIA: Cauca Papayan Vda Rio Blanco, Fca San Millán, Bosque de Roble. 23.vii.2009 Sandovál-Gómez,V.E. leg. Em *Phellinus gilvus*. [printed] \ ♂ dissected 07.iii.2013 Oliveira, E.H. C. kawanabei [handwritten]\ **2 males and 6 females (LAPC)** \COLOMBIA Cauca Popayan Corr. Las Piedras Vda. Clarete Fca. San Millán 02°30'14"**N**

76°33’13**”**W 1750m Bosque de Quercus sp. 23.vii.2009 V.E. Sandovál-Gómez leg. [printed]\ **1 male (LAPC)**\COLOMBIA Cauca Popayan Corr. Las Piedras Vda. Clarete Fca. San Millán 02°30’14”**N** 76°33’13**”**W 1750m Bosque de Quercus sp. 23.vii.2009 V.E. Sandovál-Gómez leg. [printed] \ ♂ dissected 08.iii.2013 Oliveira, E.H. [handwritten] \ C. kawanabei [handwritten]\

Comments. This species inhabits remnants of the Atlantic Forest and subtropical rainforest of southeastern and southern Brazil (Fig. 75), in Colombia it was collected in Popayan in the Cauca department occurring in a *Quercus* sp. Woodland in *Phellinus gilvus*, the only record of host fungus we have so far.

***Cis longipilis* Pic, 1930**

*Cis longipilis*Pic, 1930: 176.

Cis longispilis; Blackwelder, 1945: 549 (incorrect spelling).

Comments. Species reported only from Tucuman, Argentina, and provisionally included here in the *taurus* group. Type not located.

***Cis pubescens* (Friedenreich, 1881), new combination**

Figs. 43–52

Trichapus pubescens Friedenreich, 1881; Lawrence, 1987: 41; Costa-Lima, 1953: 209.

Diagnosis. (i) body with long and dense yellow setae; (ii) males with frontoclypeal ridge bearing two long, thick and laminar horns with rounded apex; (iii) pronotum surface between punctures with hexagonal microreticulate sculpture; (iv) both lateral margins of pronotum explanate, weakly crenulate and visible for their entire length from above; (v) elytral punctation dual and not seriate; (vi) abdominal sex patch of about one-fourth of the length of the first abdominal ventrite.

Redescription. Male lectotype (Figs. 43–49), fully pigmented but with cuticle partially eroded. Measurements (in mm): TL 1.60, PL 0.66, PW 0.83, EL 0.94, EW 0.89, GD 0.14. Ratios: PL/PW 0.80, EL/EW 1.06, EL/PL 1.42, GD/EW 0.84, TL/EW 1.80. Body robust, convex, shiny reddish brown, vestiture consisting dorsally of long and yellowish setae as long as the base length of the

scutellum and ventrally sparse slender setae. **Head** subglabrous, concave at center, granulate, frontoclypeal ridge reduced and bearing a pair of long, thick laminate horns (length 0.42mm, width at base 0.15mm), their outer margins angulate at one-third the basal length, diameter remains almost the same until the rounded apex, granulate with fine punctation and short slender setae, horns separate by a distance of about 0.21mm at base. **Antennae** gold yellowish (right antennae measured; FL 0.16; CL 0.17; CL/FL 0.94), with length of antennomeres one to tenth as follows: 0.07; 0.06; 0.05; 0.03; 0.03; 0,03; 0.02; 0.06; 0.04; 0.07. **Eyes** glabrous, GW 0.14mm. **Pronotum** shiny, anterior margin arched outwards, anterior angles rounded and barely produced, both lateral margin explanate, weakly crenulate and visible for their entire length from above; posterior margin sublinear and slightly arched near the scutellum; punctation coarse and single punctures separate at a distance of about one-punctures-widths, coarse hexagonal microreticulate sculpture between punctures;vestiture consisting of long and yellowish setae as long as the base length of the scutellum. **Scutellum** subtriangular with few punctures, BW 0.09. **Elytra** convex in the direction, punctation not seriate at disc, dual with large punctures a bit smaller to the punctures of pronotum and small punctures of about two-thirds of diameter of the large ones, each small puncture bearing a setae; distance between punctures of about one puncture-widths; humeral calli conspicuous and proeminent. **Prosternum** biconcave, strongly tumid and weakly carinate at longitudinal midline, surface granulate, sparse slender setae, prosternal process barely narrowest at its base and gradually expanded to a bit wider apex. **Metaventrite** convex, granulate with sparse slender setae**. Abdominal ventrites** with fine punctures, surface granulate and sparse short setae; length of ventrites one to fifth as follows (in mm, from base to apex of each ventrite at longitudinal midline): 0.24; 0.07; 0.06; 0.06; 0.10. First abdominal ventrite bearing a circular, marginate and pubescent sex patch (Fig. 46, arrow), closest to posterior margin of the ventrite, with a transversal diameter of 0.06mm. **Protibia** with apex bearing a row of spines, outer apical angle produced into a stout tooth. **Meso- and metatibia** with apex bearing a row of spines, outer apical angle angulate but not forming a stout tooth.**Male abdominal terminália (**Figs.47–49**).Eighth sternite** (Fig. 47)of twice wider than long,3.6 times shorter than the penis; anterior margin membranous and devoid of strut; lateral margin slightly converging; posterior margin emarginated at middle approximately one-fourth deep of the sternite's length resulting in two produced and barely converging lateral lobes each one bearing long setae, margin between lateral lobes slightly arched. **Tegmen** (Figs. 48 and 49, rigth)subcylindrical, twice longer than wide, three quarters of the penis length; anterior margin sublinear forming an angulate minute projection at the center of the margin; lateral margins subparallel; posterior portion divided in two lobes by a dorsal fissure of about one-fifth of the

tegmen length, each lobe bearing basiconical sensillaand a lateral excavation (Fig. 48, arrow) at base. **Penis** (Fig. 49, left) subcylindrical (of about 0.35mm long); about four times longer than wide, anterior margin subrounded; lateral margin subparallel; the third distal portion consisting of a membranous portion dorsally and a ventral narrowed portion; ratio length of the penis in relation to the body size of 0.22.

Females (Fig. 50). Similar to males, but with two short arched frontoclypeal projectionsinstead of horns,but the same positions of male horns. Devoid of sex patch at the first abdominal ventrite and head convex with dense and long yellowish setae.

Variation. Males (Figs. 51–52) (n = 51 including the lectotype): TL 1.40–2.15 (1.76 ± 0.17); PL 0.50–1.40 (0.65 ± 0.15); PW 0.68–1.05 (0.88 ± 0.09); EL 0.80–1.40 (1.14 ± 0.13); EW0.73–1.25 (0.96 ± 0.11); GD 0.23–0.95 (0.76 ± 0.12); PL/PW 0.57–1.33 (0.73 ± 0.12); EL/EW 0.92–1.47 (1.20 ± 0.11); EL/PL 1.00–2.50 (1.81 ± 0.27); GD/EW 0.25–0.91 (0.79 ± 0.11); TL/EW 1.50–2.14 (1.85 ± 0.13). Females (n = 42): TL 1.45–2.25 (1.81 ± 0.16); PL 0.50–0.88 (0.62 ± 0.08); PW 0.68–1.15 (0.88 ± 0.10); EL 0.93–1.38 (1.18 ± 0.12); EW 0.70–1.15 (0.94 ± 0.10); GD 0.55–0.95 (0.77 ± 0.08); PL/PW 0.57–0.95 (0.71 ± 0.09); EL/EW 0.93–1.68 (1.26 ± 0.11); EL/PL 1.39–2.38 (1.92 ± 0.24; GD/EW 0.67–1.12 (0.82 ± 0.07); TL/EW 1.50–2.43 (1.93 ± 0.15). The specimens vary substantially in size and coloration; the fully pigmented ones display a reddish-brown color while the teneral individuals are light yellowish to yellowish-brown. Frontoclypeal horns vary from short (minimum of 0.1mm, as short as females projections) to long (maximum of 0.55mm). The typical angulation of the third proximal portion of hornsare absent in males with very short horns,andbarely discernible to conspicuous in some males with median to long horns. In some cases, these horns are more convergent. Some individuals of some populations can present the pronotum with very a few small punctation between the larger commun punctation. Most specimens of *C. pubescens* have the same body-shape with a convexity apparent (mainly when seen in lateral view) and pronotum wider at the posterior portion.

Type Material. Lectotype here designated, male (MZSP) \Solenopus pubescens Fried. i.l. Brasilien [handwritten]\LECTOTYPE Oliveira & Lopes-Andrade det. [printed in red paper] \ ♂ dissected 17.i.2013 Lopes-Andrade**1 female paralectotype (MZSP)**\Solenopus pubescens Fried. i.l. Brasilien [handwritten]\

Complemetary Material. 1male and 1 female (ANIC) \Nova Teutônia Santa Catarina BRAZIL [printed] XI-64 [handwritten] Fritz Plaumann [printed]\ **1 male and 2 females (ANIC)** \Brasilien Nova Teutonia 27° 11'B. 52°23'L. Fritz Plaumann [printed] v. [handwritten] 196[printed]0[handwritten] 300. 500m [printed]\ **3 males and 8 females(ANIC)** \Nova Teutonia Sta.Catarina BRAZIL I-1964 FritzPlaumann [printed]**1 male (ANIC)** \Brasilien Nova Teutonia 27°11'B, 52°23'L. Fritz Plaumann [printed] ix.1965 [handwritten] 300 a 500 m [printed]**8 males and 3 females (FMNH)** \Nova Teutonia, Sta Catarina, BRAZ. [printed] V:-:1941 [handwritten] Fritz Plaumann leg. [printed]\ Orange circle\ **7 males and 2 females (LAPC)** \BRASIL: SP; Peruíbe, Juréia, Trilha Cachoeira Perequê. 11.vii.2011. Oliveira, E.H. leg. [DC/E1-2-2011]. Mata Atlântica [printed]\ **1 male(LAPC)** \BRASIL: SP; Peruíbe, Juréia, Trilha Cachoeira Perequê. 11.vii.2011. Oliveira, E.H. leg. [DC/E1-2-2011]. Mata Atlântica [printed] \ ♂ dissected 05.i.2013 Oliveira, E.H. [handwritten]\ **16 males and 9 females(LAPC)** \BRASIL: SP Piracicaba VIII/2000 leg. P.Milano [printed]\ **1 male(LAPC)** \BRASIL: SP Piracicaba VIII/2000 leg. P.Milano [printed]\ ♂ dissected 10.i.2013 Oliveira, E.H. [handwritten\ **10 males and 3 females (LAPC)** \BR: RJ: Nova Friburgo, X.2004. Grossi, E.J. Leg [printed]\ **7 males and 2 females (LAPC)** \BRASIL: RJ Nova Friburgo x.2004 leg. E.J. Grossi [printed]\ **3 males (LAPC)** \BRASIL: RJ Nova Friburgo x.2004 leg. E.J. Grossi [printed]\ dissected 19.x.2012 Oliveira, E.H. [handwritten]\ **1 male and 3 females(LAPC)**\BRASIL: MG UBÁ VIII/2001 leg. C. Lopes-Andrade & F. Gumier-Costa [printed]**1male(LAPC)**\BRASIL: MG UBÁ VIII/2001 leg. C. Lopes-Andrade & F. Gumier-Costa [printed]\♂ dissected 10.i.2013 Oliveira, E.H. [handwritten]\ **2 males (LAPC)** \BRASIL: MG Florestal 08.xi.2003 leg. D.J. de Souza [printed]\ **2 males(LAPC)** \BRASIL: MG; Viçosa "Vila Gianetti" 02.vi.2006 leg. C.B. Oliveira [printed]\ **10 males and 6 females(LAPC)** \BRASIL: MG Viçosa "próx. do prédio da Reitoria" 13/V/2002 leg. A.A.Zacaro [printed]\ **1 male(LAPC)** \BRASIL: MG Viçosa "próx. do prédio da Reitoria" 13/V/2002 leg. A.A.Zacaro [printed] \dissected 01.i.2013 Oliveira, E.H. [handwritten]**1 male and 1 female(LAPC)** \BRASIL: MG Viçosa, "Mata do Paraíso"; 28.IX.2011 leg. L.S. Araújo [printed] \Código transc.:[printed] 1[handwritten] Parcela: [printed] B [handwritten] Fungo [printed] 4 [handwritten]\ **1 male(LAPC)** \BRASIL: MG Viçosa, "Mata do Paraíso"; 28.IX.2011 leg. L.S. Araujo [printed]\Código transc.:[printed] 2[handwritten] Parcela: [printed] C [handwritten] Fungo [printed] 3 [handwritten]\ **1 male(LAPC)** \BRASIL: MGViçosa, "Mata do Paraíso"; 28.IX.2011 leg. L.S. Araujo [printed]\Código transc.:[printed] 1[handwritten] Parcela: [printed] C [handwritten] Fungo [printed] 4 [handwritten]**1 female (LAPC)** \BRASIL: MG Viçosa 29.xi.2000 leg. C.Lopes-Andrade [printed]**1 male and 2 female(LAPC)** \BRASIL: MG Rio Paranaíba 05.I.2012 leg. N.F. Resende [printed]\ cerrado E.S-

(CE 12) [printed]\ **5 males and 3 females(LAPC)** \BRASIL: MG Rio Paranaíba 05.I.2012 leg. N.F. Resende [printed]\ campo limpo [printed]\ **1 male (LAPC)** \BRASIL: MG Rio Paranaíba 05.I.2012 leg. N.F. Resende [printed]\ cerrado ES-(CE 11) [printed]\ **2 males and 1 female (LAPC)** \BRASIL: ES: Ibiraçu, Sítio Sto Antônio. 18.iii.2008. Furieri & K.S.Furieri leg. [printed]\ **1 male (LAPC)** \BRASIL: ES: Ibiraçu, Sítio Sto Antônio. 18.iii.2008. Furieri & K.S.Furieri leg. [printed]\ ♂ dissected 05.1.2013 Oliveira, E.H. [handwritten]\ **7 males and 1 female (LAPC)** \BRASIL: ES St. Teresa; 'ESBL trilha Rio Timbuí' 09.iv.2003; legs. K.S. Furieri, G.R. Loiola [printed]\Ex. Ganoderma [printed]\ **1 male(LAPC)** \BRASIL: ES St. Teresa; 'ESBL trilha Rio Timbuí' 09.iv.2003; legs. K.S. Furieri, G.R. Loiola [printed]\ Ex. Ganoderma [printed] \ ♂ dissected 03.i.2013 Oliveira, E.H [handwritten]\ **1 males and 6 females (LAPC)** \BRASIL: BA Jussari; "RPPN Serra do Teimoso"; 23.iii a 17.iv.2005 leg. K.S. Furieri [printed]\ **1 male(LAPC)** \BRASIL: BA Jussari; "RPPN Serra do Teimoso"; 23.iii a 17.iv.2005 leg. K.S. Furieri [printed]\dissected 23.i.2013 Oliveira, E.H. [handwritten]\,**1 male and 4 females(LAPC)** \BRASIL: PA Marabá; "Reserva Biológica de Tapirapé; Amazônia Legal" 20.xi.2003 leg. F.Gumier-Costa [printed] \ AMOSTRA N°25 Mata 2°, Divino 20.xi.2003 [printed] 25 [handwritten]\, **1male(LAPC)** \BRASIL: PA Marabá; "Reserva Biológica de Tapirapé; Amazônia Legal" 20.xi.2003 leg. F.Gumier-Costa [printed]\AMOSTRA N°25 Mata 2°, Divino 20.xi.2003 [printed] 25 [handwritten]\♂ dissected 03.i.2013 Oliveira, E.H. [handwritten]\ **3 males and 3 females(LAPC)** \BRASIL: PA Marabá; "Reserva Biológica de Tapirapé; Amazônia Legal" 19.xi.2003 leg. F.Gumier-Costa [printed] \ AMOSTRA N°19 Parcelas REF. 19.xi.2003 [printed] 19 [handwritten]\ **1 male (LAPC)** \Colômbia: Meta Vista. Hermosa,Vda La Reforma, PNN La Macarena, 2-3.iv.2010 Contreiras, J.L. leg. [printed] \ ♂ dissected 07.iii.2013 Oliveira, E.H. C. pubescens [handwritten]\ **1 male (ANIC)** \Barro Colorado Is. CANAL ZONE Feb. 24. 1968 \ J.F.Lawence Lot. [printed] 2484 [handwritten] \ ex. Polyporus hydnoides\ **1 male (ANIC)** \11 mi.N.Cordoba Ver. Mexico VII-2-1962 [printed] \ ♂ dissected 16.iii.2013 Oliveira, E.H. Cis pubescens [handwritten]\.

Comments. Lawrence (1987) designated *Trichapuspubescens* as the type-species of *Trichapus* and was the former to suggest it could belong to the *taurus*group. The second species of the genus, *T. glaber*, was suggested to be a *Porculus* (Lawrence 1987). However, we could not locate the type of the latter. We located specimens of the original Friedenreich collection deposited at MZSP. Some historical facts shall be mentioned here, which are arguments to sustain our proposition that a few of these specimens constitute the type-series of *T. pubescens*. The author Karl Wilhelm Friedenreich

(who assumed the portuguese name Carlos Guilherme Friedenreich) was one of the seventeenth pioneer German immigrants of the Blumenau province, founded by Hermann Bruno Otto Blumenau in the state of Santa Catarina (formerly Santa Catharina), southern Brazil, in 1850. As far as we could trace, he was a veterinary and physician, and constructed the first lodging-house of Blumenau, being involved in several other initiatives and activities important for the development and history of the settlement. He was a volunteer soldier in the Paraguayan War (1864–1870), joining the Brazilian army in 1865. His political opinions diverged from those of other immigrants of Blumenau, as for instance Fritz Mueller. However, we could not evaluate whether or not this fact led him to leave Blumenau. In October 22th 1881 he assumed a position of "travelling naturalist" of the Museu Nacional do Rio de Janeiro. By that time, other famous naturalists shared the same position in this museum, as Ernesto Ule, Fritz Mueller, Gustavo Rumbelsperger and Hermann von Ihering. It is interesing to note that in the end of the 1930's, two thirds of the Coleoptera of the Museu Nacional were of specimens collected by Karl Friedenreich (Mello Leitão 1937). In 1891 he became assistant naturalist of the Museu Sertório, in the state of São Paulo, together with Alexandre Hummel. He has possibly permanently moved to the municipality of São Paulo with his family, because in 1892 his grandson Arthur Friedenreich, one of the most famous soccer Brazilian players in history, was born there. In 1894, the Museu Sertório gave rise to the Museu Paulista. In 1939, the entomological collection of the Museu Paulista was transferred to the Zoology Department of the Agriculture Office of São Paulo, which later gave rise to which is nowadays the Museu de Zoologia da Universidade de São Paulo (MZSP). We did not locate specimens labeled as belonging to the Friedenreich collection in the Museu Nacional do Rio de Janeiro, but we found some in MZSP. Three specimens were labelled "*Solenopus pubescens* Fried. i.l. [=in litteris] Friedenreich Brasilien", which means that they were labeled before publishing the description. By that time the name "*Solenopus*" was already attributed to three genera: *Solenopus* Schoenherr, 1825 (Coleoptera Curculionidae), *Solenopus* Sars, 1868 and *Solenopus* Koren & Danielssen, 1877 (Mollusca). We believe that, after sending his work for publication, Friedenreich noted or was advised of these homonyms, changing the genus' name to *Trichapus*. However, he did not change the specimens' labels. Therefore, three arguments are the strongest to sustain our proposition that these are the type specimens: (i) The last employment of Karl Friedenreich was at the Museu Paulista (currently MZSP), where the specimens are deposited; (ii) The specimens are labeled "i.l." (= in litteris"); (iii) The labels indicate a generic name used before publishing the description. We designate the male specimen which fits the original description as the lectotype. A female of the same species we labeled as paralectotype. The third specimen is a male of a completely different species and do not

fit the original description. The recognition of this lectotype is important to stabilize the nomenclature, mainly because it is a name for a species widespread in Brazil and that was sometimes erroneously identified as *C. testaceimembris*, of which the type-locality is also Blumenau. *Cis pubescens***new combination** is tetramerous, and not trimerous as supposed by Friedenreich (1881). Therefore, only one ciid species is still believed to be trimerous, *Paratrichapus sechellarum* Scott, 1926. All other trimerous ciids proved to be cases in which authors did not see the first minute tarsomere of the legs (Lopes-Andrade 2007, 2008b). *C. pubescens* was already collected in Cerrado (Brazilian savanna) stricto sensu occurring in*Ganoderma* sp,*Pycnoporus sanguineus* (L.) Murrill; in a Cerrado's phytophysionomy called 'Campo limpo' in *Trametes villosa*(Sw.) Kreisel and *Hexagonia hydnoides*(Sw.) M. Fidalgo and it was collected in Barro Colorado occurring in *Hexagonia hydnoides* too, beyond several other unidenfied host fungi in several anothers biomes.

***Cis rufescens* (Pic, 1922)**

Figs 53–59

Macrocis rufescens Pic, 1922; Blackwelder, 1945: 549.

Cis rufescens; Oliveira & Lopes-Andrade, 2013: 483.

Diagnosis. (i) Body subglabrous and reddish; (ii) males with frontoclypeal ridge bearing a pair of long horn, barely converging and tapering at a rounded apex; (iii) pronotum surface between punctures with hexagonal microreticulate sculpture (iv); both lateral margins of the pronotum weakly explanate, weakly crenulate and visible for their entire length from above; (v) elytral punctation dual and seriate; (vi) abdominal sex patch of about one-fourth of the length of the first abdominal ventrite.

Redescription. Male lectotype (Figs. 53–56), fully pigmented and in good condition. Measurements (in mm): TL 1.67, PL 0.59, PW 0.83, EL 1.08, EW 0.90, GD 0.79. Ratios PL/PW 0.71, EL/EW 1.20, EL/PL 1.83, GD/EW 0.88, TL/EW 1.86. Body robust, strongly convex, reddish brown, subglabrous dorsally and ventrally. **Head**subtriangular, concave near the horns, subglabrous; punctation fine and sparse; frontoclypeal ridge reduced and bearing a pair of long, fine and cilindrical horns (length 0.46mm, width at base 0,15mm), granulate with fine punctuation, barely converging, tapering at a rounded apex, horns separated at a distance of 0.15mm at base.

Antennae goldish yellow (left antennae measured; FL 0.10; CL 0.16; CL/FL 1.60) with length of antennomeres (in mm) from antennomere one to tenth, as follows: 0.07; 0.06; 0.03; 0.02; 0.02; 0.01; 0.02; 0.04; 0.04; 0.08. **Eyes** glabrous, GW 0.14mm. **Pronotum** shiny; anterior margin arched outwards, anterior angles rounded and not so proeminent, both lateral margins weakly explanate, arched and weakly crenulate, visible for their entire length from above; posterior margins sublinear and rounded near the scutellum; punctation single and coarse with hexagonal microreticulate sculpture between punctures; punctures separated by a distance of about two punctures-widths or more at disc and each puncture bearing a barely visible minute setae. **Scutellum**subtriangular, bearing few punctures, BW 0.06. **Elytra** convex, punctation dual with small ones of about a half of the diameter of the large ones; large ones similar in size to the punctures of pronotum; punctation seriate at disc, distance between punctures of about two-large-punctures-widths or more, vestiture consisting of barely visible minute setae; humeral calli conspicuous and proeminent. **Prosternum** biconcave, glabrous, granulate, tumid and weakly carinate at the longitudinal midline; prosternal process wide and sub-rectangular. **Metaventrite** convex, glabrous and granulate. **Abdominal ventrites** with punctures deep andcoarse; surface granulate and glabrous, length of ventrites one to fifth as follows: (in mm, from base to apex of each ventrite at the longitudinal midline) 0.22; 0.08; 0.08; 0.09; 0.13. First abdominal ventrite bearing a circular and marginate sex patch (Fig. 57, arrow) closest to the posterior margin direction, with a transversal diameter of 0.06mm. **Protibia** with outer apical angle produced into a stout tooth and inner margin bearing thick setae. **Meso- and metatibia** with apex bearing a row of spines, outer apical angle angulate but not forming a stout tooth, inner margin devoid of thick setae.**Male abdominal terminalia**(in a specimen compared with the type, Figs.58–59)**.Eigth sternite** (Fig. 58) 1.50 times wider than long; so long asone-fifth of the penis's length; anterior margin linear, membranous and devoid of strut; lateral margins converging; posterior margin strongly emarginated at middle about almost the half of sternite's length giving rise to two lateral, parallel and produced lobes, bearing long setae, margin between lobes almost linear and a bit convex in the distal direction.**Tegmen** (Fig. 59, right)subcylindrical, two times longer than wide, same size of the penis; anterior margin rounded; lateral margins sclerotized and subparallel; the third portion of the apical region with two lateral (one in each corner) lobes(Fig. 59, arrow) bearing basiconical sensilla, apical middle portion sclerotized. **Penis** (Fig. 59, left)subcylindrical, about 0.17 mm; four times longer than wide; anterior margin lineal; lateral margins barely converging; one-third apical consisting of membranous and filamentous lamellae; ratio length of the penis in relation to the body size of 0.10.

Females. Unknown.

Variation. Males (n = 2, included the lectotype). TL 1.67–1.88 (1.77 ± 0.14); PL 0.59–0.63 (0.61 ± 0.02); PW 0.80–0.83 (0.82 ± 0.02); EL 1.08–1.25 (1.17 ± 0.12); EW 1.00–0.95 (0.95 ± 0.07); GD 0.68–0.79 (0.73 ± 0.08); PL/PW 0.71–0.78 (0.75 ± 0.05); EL/EW 1.20–1,25 (1.23 ± 0.04); EL/PL 1.83–2.00 (1.92 ± 0.12); 0.68–0.88 (0.78 ± 0.14) and TL/EW 1.86–1.88 (1.87 ± 0.01).

Type Material. Lectotype here designated, male (MNHN) \Guadeloupe [printed] \Macrocis rufescens [handwritten] \ LECTOTYPE [printed] MACROCIS RUFESCENS [handwritten] [red paper]\.

Complementary Material. **1 male (NMNH)** \Trinidad PofSpain [printed] xi.24.35 [handwritten]\Sta [printed] 94 [handwritten] Blackwelder [printed]\Green circle\ ♂ dissected 18.i.2013 Lopes-Andrade [handwritten]\.

Comments. Known only from theLesser Antilles, recorded from the islands of Trinidad and Guadeloupe (type-series) (Fig. 76), without data on host-fungi. As *C.diabolicus*, the species shows a reduced male abdominal terminalia when compared to its body size.

***Cis setifer* (Gorham, 1883)**

Figs 60–68

Macrocis setifer Gorham, 1883: 220; Blackewelder, 1945: 549.

Cis setifer, Lawrence, 1971: 438; Navarrete-Heredia, 1997: 380; Navarrete-Heredia & Burgos-Solorio, 2000: 414; Oliveira & Lopes-Andrade, 2013: 483.

Diagnosis. (i) body compact with short setae; (ii) males with frontoclypeal ridge bearing a pair of fine and slightly convergent horns with base subtriangular tapering to a rounded apex; (iii) pronotum surface between punctures with hexagonal microreticulate sculpture; (iv) both lateral margins of pronotum very explanate, not crenulate and visible for their entire legth from above; (v) elytral punctationsubseriate and dual; (vi) abdominal sex patch of about two-fifths of the length of the first abdominal ventrite.

Redescription. Male plesiotype (Figs. 60–63), fully pigmented, good condition. Measurements (in mm) TL 1.20, PL 0.40, PW 0.67, EL 0.80, EW 0.75, GD 0.52. Ratios: PL/PW 0.60, EL/EW 1.07, EL/PL 2.00, GD/EW 0.69, TL/EW 1.60. Body robust, compact, convex, shiny reddish brown, dorsal vestiture consisting of short yellowish seta. **Head** subtriangular, subglabrous and granulate; frontoclypeal ridge reduced and bearing a pair of long, fine, cylindrical and slightly convergent horns (length 0.24mm; width at base 0.11mm), base subtriangular, granulate, tapering to a rounded apex, distance between horns of about 0.11mm. **Antennae** goldish yellow (right antennae measured; FL 0.08; CL 0.13 ; CL/FL 1.62) with length of antennomeres one to tenth as follows: 0.06; 0.04; 0.03; 0.02; 0.01; 0.01; 0.01; 0.03;0.04; 0.06. **Eye** glabrous, GW 0.11mm. **Pronotum** with anterior margin arched outwards, anterior angles rounded and produced, both lateral margins very explanate, not crenulate, arched outwards and visible for their entire legth from above; posterior margin barely arched, mainly near the scutellum; punctation coarse an single, pronotum surface with hexagonal microreticulate sculpture, distance between punctures of about one-puncture-width, each puncture bearing a small yellow setae almost as long as a half of the length of base of scutellum. **Scutellum** U-shape, with fine punctures, BW 0.04. **Elytra** compact (almost so wide than long) and convex; punctation coarse, subseriate and dual with large punctures with the same diameter of punctation of the pronotum and small punctures about one-fourth of diameter of the large ones, each small puncture bearing a short setae as long as half of the length of base of scutellum; humeral calli conspicuous. **Prosternum** biconcave, tumid, slightly carinate and granulate; Prosternal process wide and subretangular. **Metaventrite** conxev, granulate. **Abdominal ventrite** granulate with sparse slender setae, length of ventrites as follows (in mm, from base to apex of each ventrite at longitudinal midline): 0.16; 0.05; 0.05; 0.05; 0.07. First abdominal ventrite bearing a circular, marginate sex patch (Fig. 63, arrow) with a transversal diameter of 0.06mm closest to the posterior margin of ventrite direction. **Protibia** with outer apical angle bearing a stout tooth and inner margin bearing small spines. **Meta and Mesotibia** with apex bearing a row of spines and outer apical angle acute but not produced into a tooth.**Male abdominal terminalia**(in a specimen compared with the type, Figs 64–65).**Eighth sternite** (Fig. 64) almost as wider than long, one-third of the penis length; anterior margin membranous, linear and devoid of median strut; lateral margins subparallel or slightly converging; posterior margin slightly emarginated at middle about a third of the sternite length's and lateral corners bearing long setae; margin between corner linear. **Tegmen** (Fig. 65, right) subcylindrical,1.7 times longer than wide, as long as two-thirds of the penis length; anterior margin subrounded; lateral margins subparallel; distal portion bearing two small lobes (at about one-fifth of the tegmen length) near the apex, bearing basiconical sensilla.

Penis (Fig. 65, left) subcylindrical, about 0.18mm of length, 3.6 times longer than wide; anterior margin produced into a tip; lateral margins subparallel; apical region forming two small protuberances;ratio length of the penis in relation to the body size of 0.16.

Females (Fig. 66). Similar to males except in the following features: abdominal sex patch absent; head convex and bearing short yellow setae and frontoclypeal region devoid of horns and bearing two short and arched projections.

Variation. Males (Figs. 67–68) (n = 11, including the lectotype) TL 1.20–1.45 (1.31 ± 0.09); PL 0.35–0.45 (0.41 ± 0.03); PW 0.63–0.73 (0.67 ± 0.03); EL 0.80–1.00 (0.90 ± 0.07); EW 0.65–0.85 (0.75 ± 0.06); GD 0.50–0.83 (0.57 ± 0.09); PL/PW 0.54–0.68 (0.62 ± 0.04); EL/EW 1.07–1.31 (1.21 ± 0.07); EL/PL 1.83–2.44 (2.18 ± 0.19); GD/EW 0.65–1.06 (0.76 ± 0.11); TL/EW 1.60–1.86 (1.76 ± 0.09). Females (n = 7) TL 1.25–1.33 (1.29 ± 0.03); PL 0.43–0.50 (0.45 ± 0.03); PW 0.63–0.73 (0.68 ± 0.03); EL 0.75–0.88 (0.84 ± 0.05); EW 0.70–0.75 (0.74 ± 0.02); GD 0.50–0.63 (0.55 ± 0.05); PL/PW 0.62–0.80 (0.67 ± 0.06); EL/EW 1.07–1.21 (1.13 ± 0.05); EL/PL 1.50–2.06 (1.86 ± 0.2); GD/EW 0.67–0.83 (0.74 ±0.07); TL/EW 1.67–1.83 (1.75 ± 0.05). Size seems not fluctuate so much in *Cis setifer* species. Coloration can vary in fully-pigmented individuals from yellowish-brown to brown, while teneral individuals are yellowish. Horns can range from short (minimum of 0.14mm) to long (maximum of 0.44mm).

Material Examined. **Plesiotype(ANIC)** \Barro Colorado Is. CANAL ZONE Feb. 10. 1968 [printed]\J.F. Lawrence Lot. [printed] 2378\J.F. Lawrence collector\Trametes corrugate \PLESIOTYPUS Oliveira & Lopes-Andrade det.\ **2 males and 1 female(ANIC)**\Barro Colorado Is. CANAL ZONE July [printed] 2 [handwritten] 1969 [printed]\J.F. Lawrence Lot. [printed] 2738\ Rigidoporus sp.\ **1 male(ANIC)** \Barro Colorado Is. CANAL ZONE July [printed] 2 [handwritten] 1969 [printed]\J.F. Lawrence Lot. [printed] 2738\ Rigidoporus sp.\ ♂ dissected 09.i.2013 Oliveira, E.H.\ **3 males and 1 female (ANIC)**\Barro Colorado Is. CANAL ZONE July [printed] 3 [handwritten] 1969 [printed]\J.F. Lawrence Lot. [printed] 2750 \ Ganoderma sp.\ **1 male(ANIC)** \Barro Colorado Is. CANAL ZONE July [printed] 31 [handwritten] 1969 [printed]\J.F. Lawrence Lot. [printed] 2983\Polyporus lignosus**1 male and 1 female(ANIC)**\Barro Colorado Is. CANAL ZONE Aug. [printed] 2 [handwritten] 1969 [printed]\J.F. Lawrence Lot. [printed] 2996\Trametes corrugata**1 male and 1 female(ANIC)** \Barro Colorado Is. CANAL ZONE Feb. 10. 1968 [printed]\J.F. Lawrence Lot. [printed] 2378 \Trametes corrugata\ **2 males (ANIC)** \Barro Colorado

Is. CANAL ZONE Feb. 12, 1968 [printed]\J.F. Lawrence Lot. [printed] 2387\Ganoderma sp\ **1 male(ANIC)** \Barro Colorado Is. CANAL ZONE Feb. 12, 1968 [printed]\J.F. Lawrence Lot. [printed] 2387\Ganoderma sp\ ♂ dissected 17.i.2013 Lopes-Andrade [handwritten]\ **1 male and 1 female(ANIC)** \Barro Colorado Is. CANAL ZONE Feb. 12, 1968 [printed]\J.F. Lawrence Lot. [printed] 2389\Polyporus concrescens**1 female(ANIC)** \Barro Colorado Is. CANAL ZONE July [printed] 25 [handwritten] 1969 [printed]\J.F. Lawrence Lot. [printed] 2957\Polyporus hydnoides**1 male and 1 female(ANIC)** \Cerro Campana Panama, PANAMA Aug. 9, 1969 [printed]\J.F.Lawrence Lot [printed] 3023 [handwritten]\Rigidoporus sp.[printed]**1 male(FMNH)** \R. PANAMA: Almirante 1959 H.S.Dybas FMNH(HD) # 59-157 Polyporus zonalis [printed]**1 male (LAPC)** \MÉXICO: Veracruz, Banderilla La Martinica [printed] 31.V.2001 Em Polyporus sp. [handwritten] Alt. 1550 m, L. Delgado col. [printed]\Cis setifer (Gorham) 1883 L.Delgado det.2004 [handwritten]\ ♂ 17.i.2007 [handwritten]**2 males(ANIC)** \Canyon R. Metlac Fortin, Veracruz MEXICO Aug.5, 1969[printed]\J.F. Lawrence Lot. [printed] 3091 [handwritten]\S. & J. Peck Collectors [printed]\Rigidoporus sp. [printed]\ **1 female (ANIC)** \MEXICO Veracruz Dos Amates 28/22 1987 polypore 0114 J.Navarrete [printed]\

Comments. Restricted to Central America, occurring in Guatemala (type-series), Mexico and Panama (Fig. 76). It occurs from the mountaine portions of Veracruz in Mexico to the Caribbean coast of Panama and the Barro Colorado Island at the Canal Zone. The original series comprises one male and two females, but we did not have access to them. The recorded host-fungi are: *Ganoderma* sp.*Hexagonia hydnoides* (Sw.) M. Fidalgo*;Rigidoporus* sp.; *Rigidoporus microporus* (Sw.) Overeem;*Rigidoporus lineatus* (Pers.) Ryvarden and *Earliella scabrosa* (Pers.) Gilb. & Ryvarden.

***Cis taurus* (Reitter, 1878)**

Macrocis taurus Reitter, 1878; Gorham, 1883: 219; Blackwelder, 1945: 549.

Cis taurus, Lawrence, 1971: 438; Navarrete-Heredia & Burgos-Solorio, 2000: 418; Oliveira & Lopes-Andrade, 2013: 484.

Comments. Species recently redescribed by Oliveira & Lopes-Andrade (2013), who provided new data on its external morphology, geographic distribution and host fungi.

***Cis testaceimembris* (Pic, 1916)**

Figs 69–74

Macrocis testaceimembris Pic, 1916: 6; Blackwelder, 1945: 549.

Cis testaceimembris, Lawrence, 1971: 451; Kawanabe, 1997: 328; Graf-Peters, 2011: 558 (incorrect identification); Oliveira & Lopes-Andrade, 2013: 483.

Cis testaceimembrius; Lopes-Andrade, 2002: 7 (incorrect spelling).

Diagnosis. (i) body elongate with short yellowish setae; (ii) males with frontoclypeal ridge bearing a pair of long, fine, subparallel, subcylindrical and a bit flattened horns; (iii) pronotum surface between punctures with hexagonal microreticulate sculpture; (iv) both lateral margins of pronotum weakly explanate, crenulate and barely visible for their entires length from above; (v) elytral punctation dual and not seriate; (vi) sex patch reduced, just a small mark can be visible.

Redescription. Male lectotype (Figs. 69–73), fully pigmented, in good condition. Measurements (in mm): TL 1.7, PL 0.59, PW 0.84, EL 1.11, EW 0.96, GD 0.84. Ratios PL/PW 0.70, EL/EW 1.16, EL/PL 1.88, GD/EW 0.88, TL/EW 1.77. Body robust, strongly convex, elongated, shiny, reddish brown; mouthparts, tarsi and antennae goldish yellow; vestiture consisting of dense yellowish setae as long as a half of the length of base of scutellum.**Head**subtriangular, concave dorsally, subglabrous, punctation fine, frontoclypeal ridge reduced and bearing a pair of long, subcylindrical and a bit flattened, fine and subparallel horns (length 0.34mm, width at base 0.14mm), punctation fine and sparse, with diameter remaining almost the same until the rounded apex, horns separated by a distance of about 0.18mm at base. **Antennae** (Paralectotypus left antenna measured CL 0.22, FL 0.12, CL/FL 1.83) with length of antennomeres one to tenth as follows: 0.08, 0.05, 0.04, 0.02, 0.02, 0.02, 0.02, 0.05, 0.07, 0.10. **Eyes** glabrous, GW 0.14. **Pronotum** with anterior margins arched; anterior angles rounded and proeminent; both lateral margins weakly explanate, crenulate, arched outwards and barely visible for their entires length from above; posterior margin slightly arched near scutellum; punctation single, deep, coarse, with coarse hexagonal microreticulate sculpture between punctures, punctures separate by a distance of about two-punctures-width at disc and each puncture bearing a yellowish setae. **Scutellum** subtriangular bearing setae, BW 0.10. **Elytra**elongate, strongly convex; punctation coarse, confuse at disc, dual with large punctures with the same size of pronotum punctures and the small ones with approximately half of the size of the big ones, distance between punctures of about one-puncture-widths, each small puncture bearing a yellowish setae as long as a half of the length of base of scutellum; humeral calli conspicuous.

Prosternum biconcave, tumid, weakly carinate at the longitudinal midline, surface granulate and glabrous; prosternal process narrow at apical portion and gradually expanded to a blunt apex. **Metaventrite** convex, granulate, with sparse minute setae. **Abdominal ventrites** elongate with shallow and punctation; surface granulate, subglabrous; length of ventrites one to fifth (in mm, from base to apex at the longitudinal midline) as follows: 0.23, 0.1, 0.1, 0.1, 0.17; first abdominal ventrite bearing a minute sex patch (Fig. 73, arrow). **Protibia** with apical margin bearing a row of small spines, outer apical angle produced into a stout tooth, inner margin of tibia with long and numerous setae. **Meso- and metatibia** with apical margin bearing a row of spines and inner margin with setae.**Male abdominal terminaliain the Paralectotype**.**Eigth sternite** 1.3 times wider than longer, three times shorter than the penis; anterior margin membranous, linear and devoid of median strut; lateral margins subparallel slightly convergent; posterior margin slightly emarginated (almost linear) bearing long setae at the lateral corners, lateral corners rounded and subparallel.**Tegmen**(Fig. 74, right) subcylindrical, about 4.4 times longer than wide, as long as four-fifths at penis's length; proximal half portion more membranous margins and the half distal portion with sclerotized margins; anterior margin rounded; lateral margins sub parallel; one third of the distal region separated in two lateral lobes divided by a dorsal fissure of about one third of the tegmen length, each lobes bearing an excavation (Fig. 74, arrow) in a half of its length separating a more membranous region of a more sclerotized region full of basiconical sensilla. **Penis**(Fig.74, left) subcylindrical, about 0.54mm),very sclerotized, about ten times longer than wide; anterior margin produced into a tip; lateral margins subparallel; posterior portion ventrally tapering to a sclerotized hook curved backwards and dorsally bearing a membranous region consisting of lamellar filaments;ratio length of the penis in relation to the body size of 0.32.

Females. Unknown.

Type Material. Lectotype here designated, male (MNHN) \Blumenau S.O.Brasilien (Reitter) [printed in black border] \ Macrocis testaceimembris Pic [handwritten] \ Type [handwritten in old yellow paper] \ LECTOTYPE [printed] MACROCIS TESTACEIMEMBRIS PIC [handwritten] [red paper] \ TYPE [printed in red paper]\ 1 **paralectotype male (MNHN)** \Blumenau S.O.Brasilien (Reitter) [handwritten in black border] \ Malacocis [handwritten] \ PARALECTOTYPE [printed] MACROCIS TESTACEIMEMBRIS PIC [handwritten] [yellow paper] \ ♂ dissected 16.1.2013 Lopes-Andrade [handwritten]\.

Comments. Known only for its type-series from Blumenau (Fig. 75), Santa Catarina (Brazil), with no host fungus record. We did not find any other specimen, besides great collection efforts in southern Brazil and access to museum material collected there. The species identified as *C. testaceimembris* in the work of Graf-Peters et al. (2011) is indeed an undescribed species.

Discussion

The distribution of the *taurus*group is primarily Neotropical, with only *C. cornelli*assigned as a Nearctic species(Lawrence 1971) and *C. capricornis*from the Palearctic region (Kawanabe 1997). *Cis capricornis* occurs in the Nansei Islands (Yaku-shima Is., Ishigaki-jima Is., Iriomote-jima Is.; Kawanabe 1997) and we suggest it is pobbible an allochthonous species.Thischain of islands is covered by subtropical evergreen forest,with subtropical climate of warm winters and hot summers, so it can be considered a species adapted to subtropical environments and not exactly Palearctic. The Nearctic species, *C. cornelli,* was collected in Florida, South and North Carolina (USA). However, according to works on biogeography of the American continent, Florida can be interpreted as part of the Neotropical region (Morrone 2002, 2006). The Neotropical region comprises most tropical and subtropical areas of the New World: most of South America, Central America, southern Mexico, the West Indies, and southern Florida (Morrone 2006). In fact, the Neotropical region expands eastern at the Mexican Golf and part of the Atlantic Coast and reaches Florida. South and North Carolina may be interpreted as a transitional zone between the Neotropical and Nearctic regions so *C. Cornelli* is not exactly a Nearctic species. *Cis taurus* properly is recorded from the Mexican Transitional Zone (Oliveira & Lopes-Andrade 2013), an area composed by a mix of Neotropical and Nearctic species (Morrone 2006, Oliveira & Lopes-Andrade 2013). We can suppose that the *taurus* group had its origin at the Neotropical region and reached the Mexican Transitional Zone. However, more detailed studies on distribution and phylogeography are necessary to evaluate the origin of the group and its posterior irradiation.

*Cis pubescens*is morphologically similar to *C. grandicornis*, the latter only known from the type-series collected in French Guiana (Fig. 77). Both species have good diagnostic characteristics, but the similar morphology of the body and the most remarkable similar appearance of the male terminalia show that they may be close related.While *C. grandicornis* seems to be arestricted Amazonian species,*Cis pubescens*has a large distribution along Latin America and reaches places as Colombia and the north of Brazil in state of Pará which is part of the Amazonian subregion, so it

mightco-occur with *C. grandicornis* in some extension or we will see a division of occurrence between these species at this region. However, *C. grandicornis* was not recollected yet and we could not expande its distribution. *Cis pubescens* is recorded to occur from subtropicalAtlantic Forest in south and southeast of Brazil (Fig. 78), extending western to the Cerrado biome of the state of Minas Gerais and reaching the Amazonic Forest in Pará, north of Brazil, where it was colected in undisturbed fragments and in fragments in regeneration. It can be collected at anthropic environmentsas the gardens of Federal University of Viçosa. *Cis pubescens* has still recorded to occur in Vista Hermosa, Colombia, where the climate is sub-humid and the tropical forest predominate and in the tropical forests of Barro Colorado Island, in Panama, and of Cordoba, Mexico. Further works shall evaluate whether it is polyphagous, which is plausible for a so wide distributed species, with the greatest plasticity and capacity for living in a variety of biomes among all examined *taurus* species.

Species of the *taurus*group are usually collected with other ciid species ofCis and also of other genera, we registered taurus species co-ocorring with *Xylographus* Mellié, *Grossicis* Antunes-Carvalho et al., *Ceracis* Mellié, *Strigocis* Dury and *Porculus*Lawrence. It is common to observe two or more *taurus* species inhabiting the same basidiome, even morphologically related species. It is not clear if there is any kind of niche partition, either temporal or spatial, between ciid species coocurring in a basidiome. It still not certain how the community of ciid works and which kind of interaction exist between these species of Ciidae, between Ciidae and other families of Coleoptera or either between all the artrophod-species that coexist at the fungus.

The affinities of the *taurus* group inside *Cis* is unknown and even its classification at the genus *Cis* is uncertain. The group can regain the status of genus in the future, for which the name Macrocis Reitter, 1878, is available (Lawrence 1971). We suggest an affinity of the *taurus* group with the *tricornis* group of *Cis* that comprises the following species: *C. tricornis*, *C. delicatulus* and *C. miles*. The *tricornis* group shares characteristics with species of the genus *Grossicis*. Species of *Grossicis*, the *tricornis* group and the *taurus* group all have dual elytral punctation, carinate prosternum, protibial apex with a row of spines and outer apical angle with a conspicuous tooth. The shape of tegmen is also similar. Species of the *castaneus* group (previously*nitidus* group) alsoshare characteristics with the *taurus* group. Kawanabe (1997) indicated the similarities between these groups when he described*C. capricornis*. Among these characteristics are a shining body, the

carinate prosternum, a tooth at the outer apical angle of protibia and frontoclypeal ridge bearing a pair of subtriangular plates.

The *taurus* group is possible the most diverse and speciose Ciidae group in the neotropics. The number of species, mostly undescribed, is astonishing and surely will increase even more with the growing sampling effort in the region. The knowledge and description of these species, as well as theirphylogenetic analysis and study of their basic habits and biology are fundamental to succeed in understanding the evolution and ecology of fungivorous beetles in the neotropics. We intend to collaborate with this enterprise by redescribing and bringing new information on species already recognized by us and, in the future, describing new species and evaluating the position of the *taurus* group among the other ciids and also its internal phylogenetic relationships since we are revising all the group.

Acknowledgments

We would like to express our gratitude to all current and past curators of museums which gently loaned several specimens to us. Financial support to CLA was provided by Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG: Universal APQ-00653-12), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq: PROTAX 52/2010 n° 562229/2010-8; Universal nº 479737/2012-6; research grant to CLA nº 302480/2012-9; master degree grant to EHO, n° 130002/2011-9), SISBIOTA (CNPq/FAPEMIG n° 5653360/2010-0) and the Graduate Program in Entomology of the Federal University of Viçosa (UFV).

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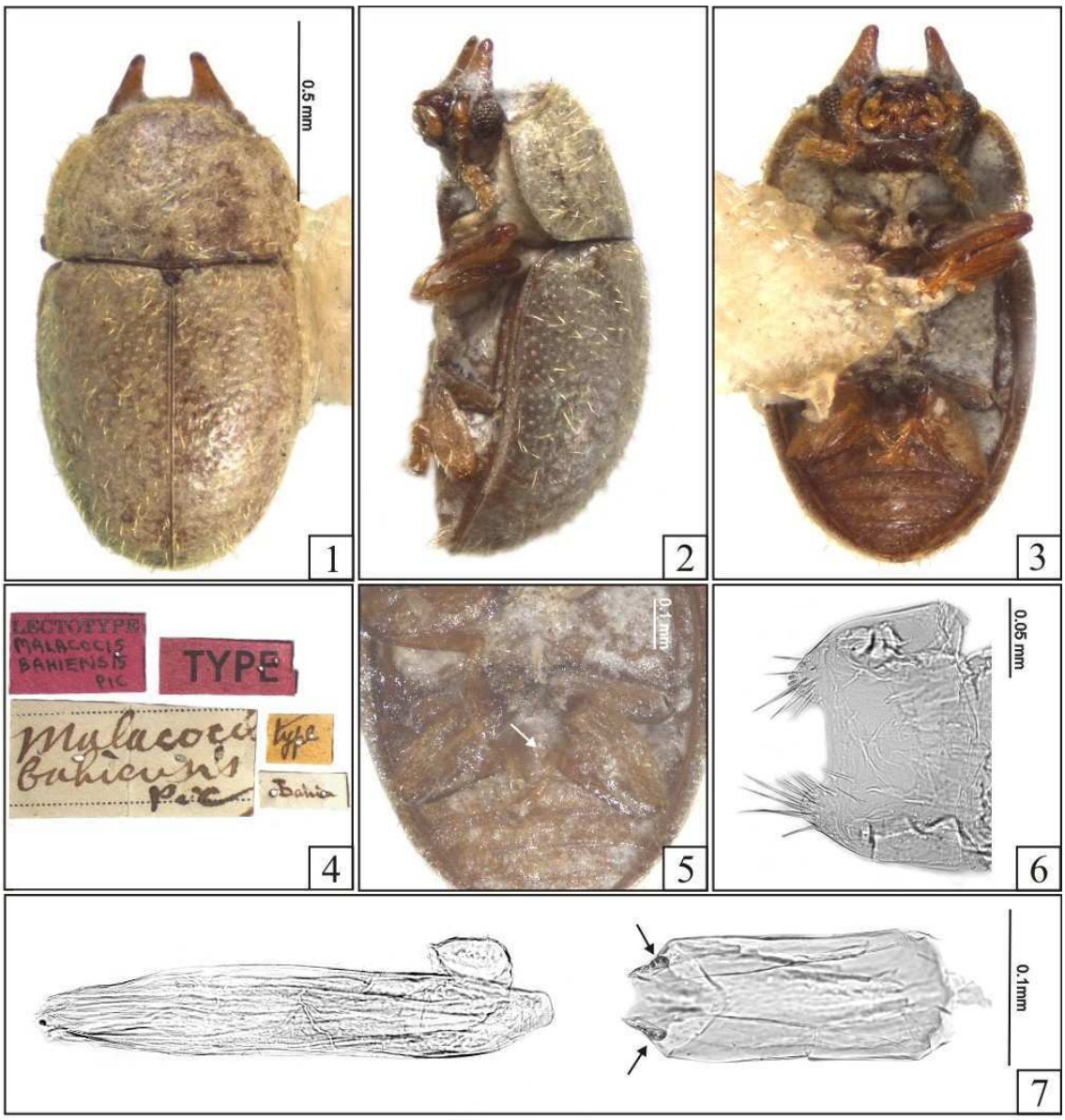
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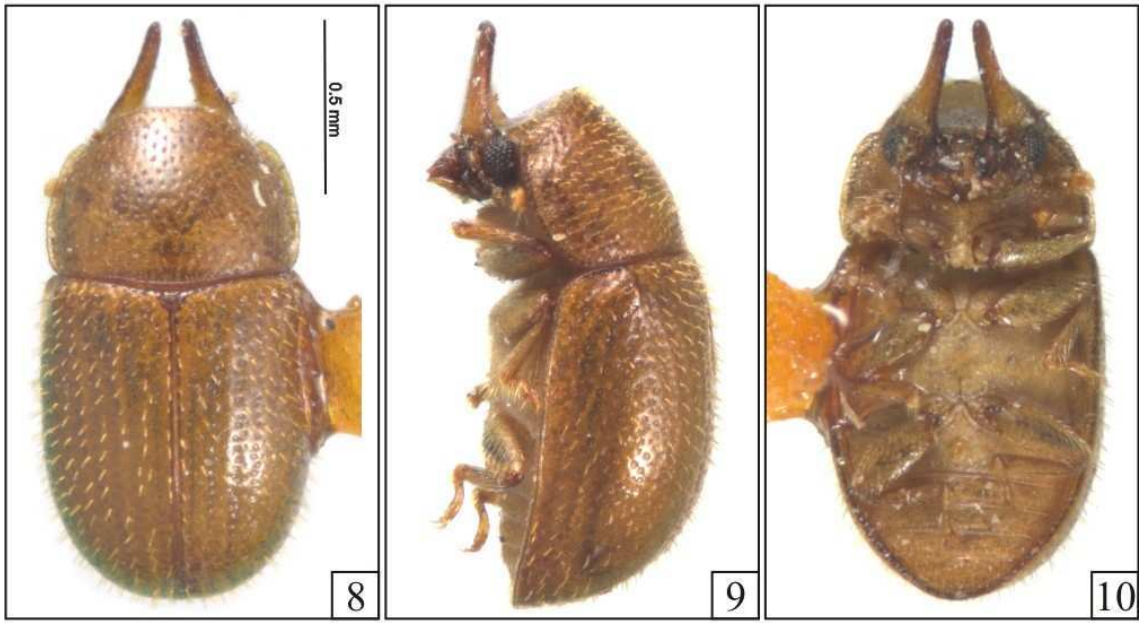
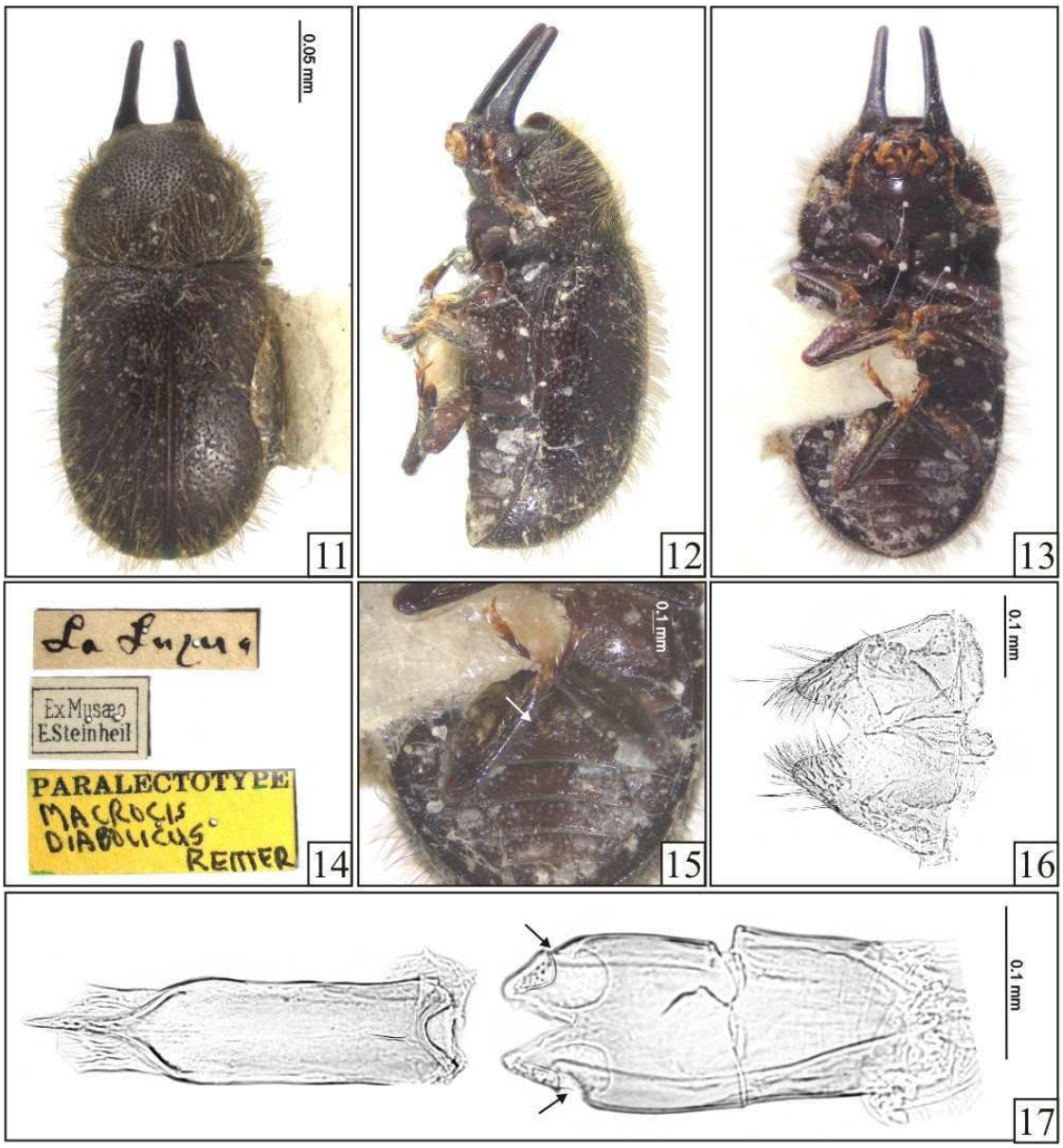
Figures 1–7. *Cis bahiensis* (Pic, 1916), male lectotype from the state of Bahia, Northeast Brazil **1** Dorsal view **2** Lateral view **3** Ventral view **4** Labels **5** Abdominal ventrites, with sex patch at the first ventrite (arrow) **6** Eigth abdominal sternite **7** Penis shown at left and tegmen atright. Arrows indicate lateral inflexions near the apex of tegmen.



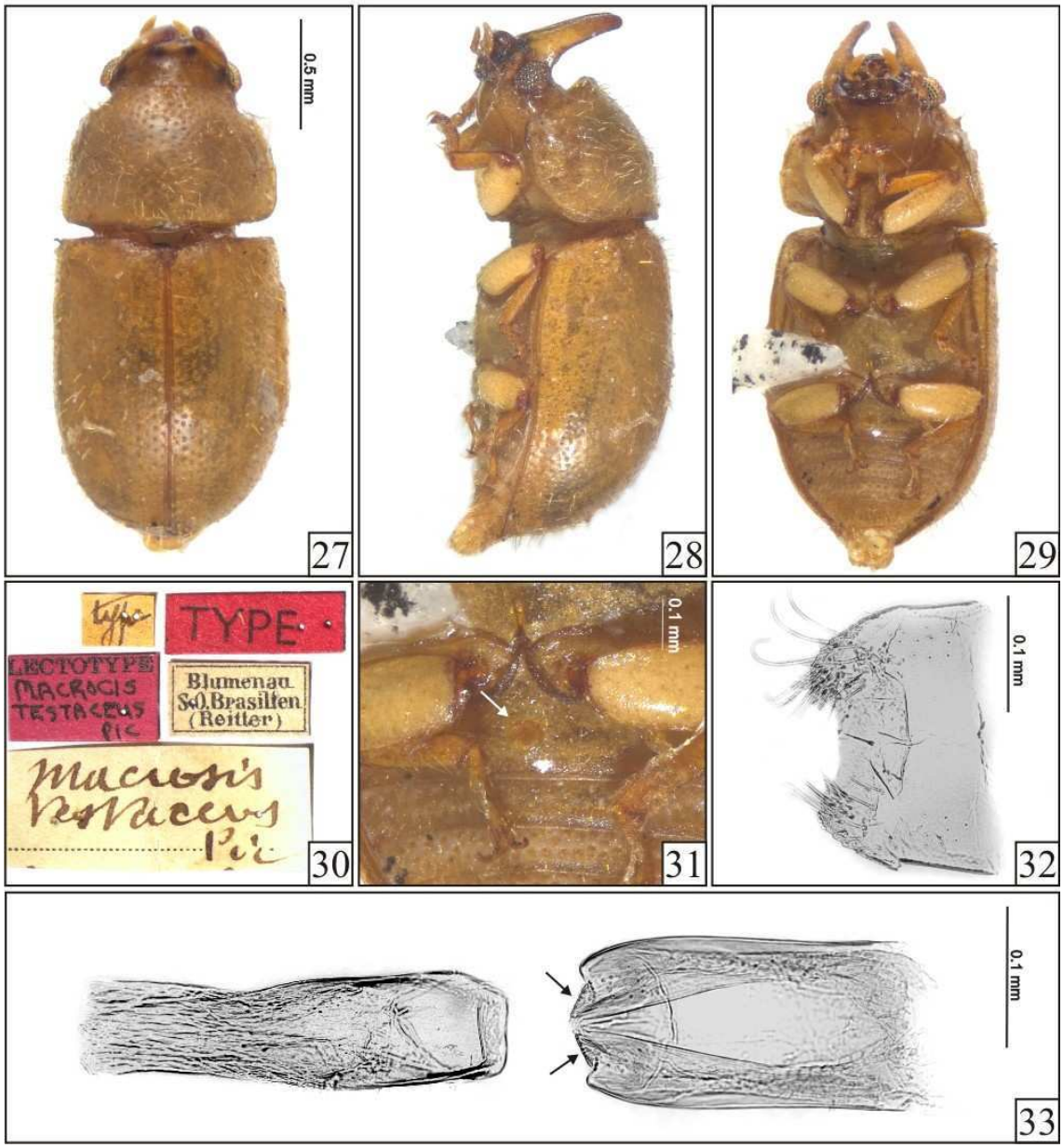
Figures 8–10. *Cis cornelli* (Lawrence, 1971), male from Liberty Co. St. Catherines I.**8** Dorsal view **9** Lateral view **10** Ventral view.



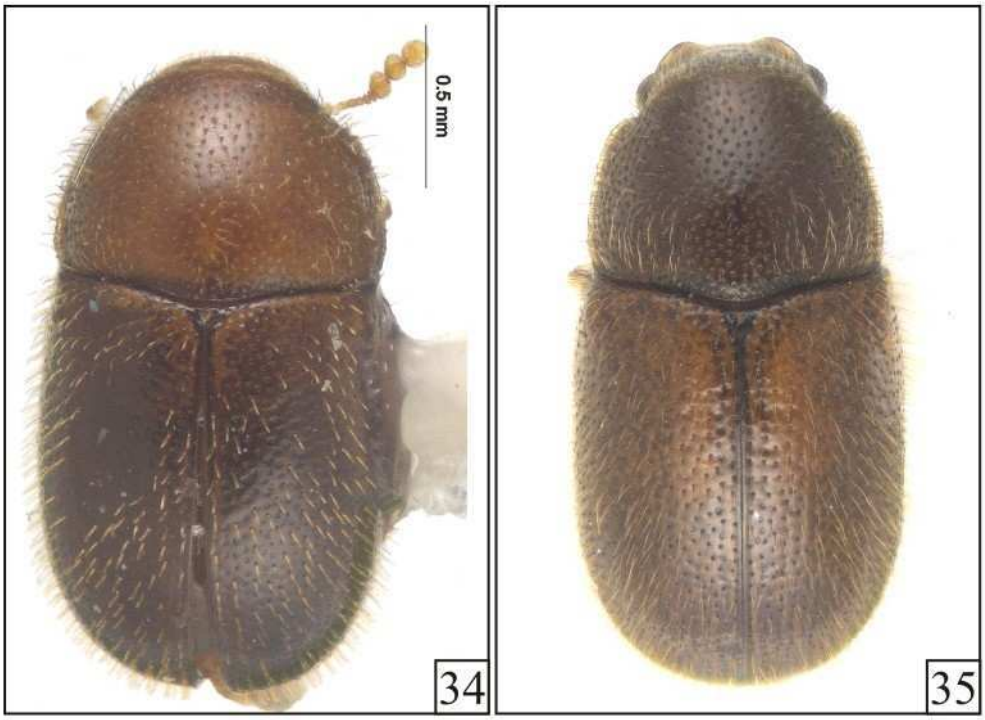
Figures 11–17. *Cis diabolicus* (Reitter, 1878), male paralectotype from La Lucera, Department of Caquetá, Colombia **11**Dorsal view **12**Lateral view **13** Ventral view**14** Labels **15**Abdominal ventrites, with sex patch at the first ventrite (arrow) **16** Eighth abdominal sternite **17** Penis shown at left and tegmen at right. Arrows indicate lateral inflexions near the apex of tegmen.

Figures 18–19. Lectotype of *Cis bison* (Reitter, 1878) new synonym of *C. diabolicus* (Reitter, 1878), from La Lucera, department of Caquetá, Colombia. **18** Dorsal view **19** Labels.

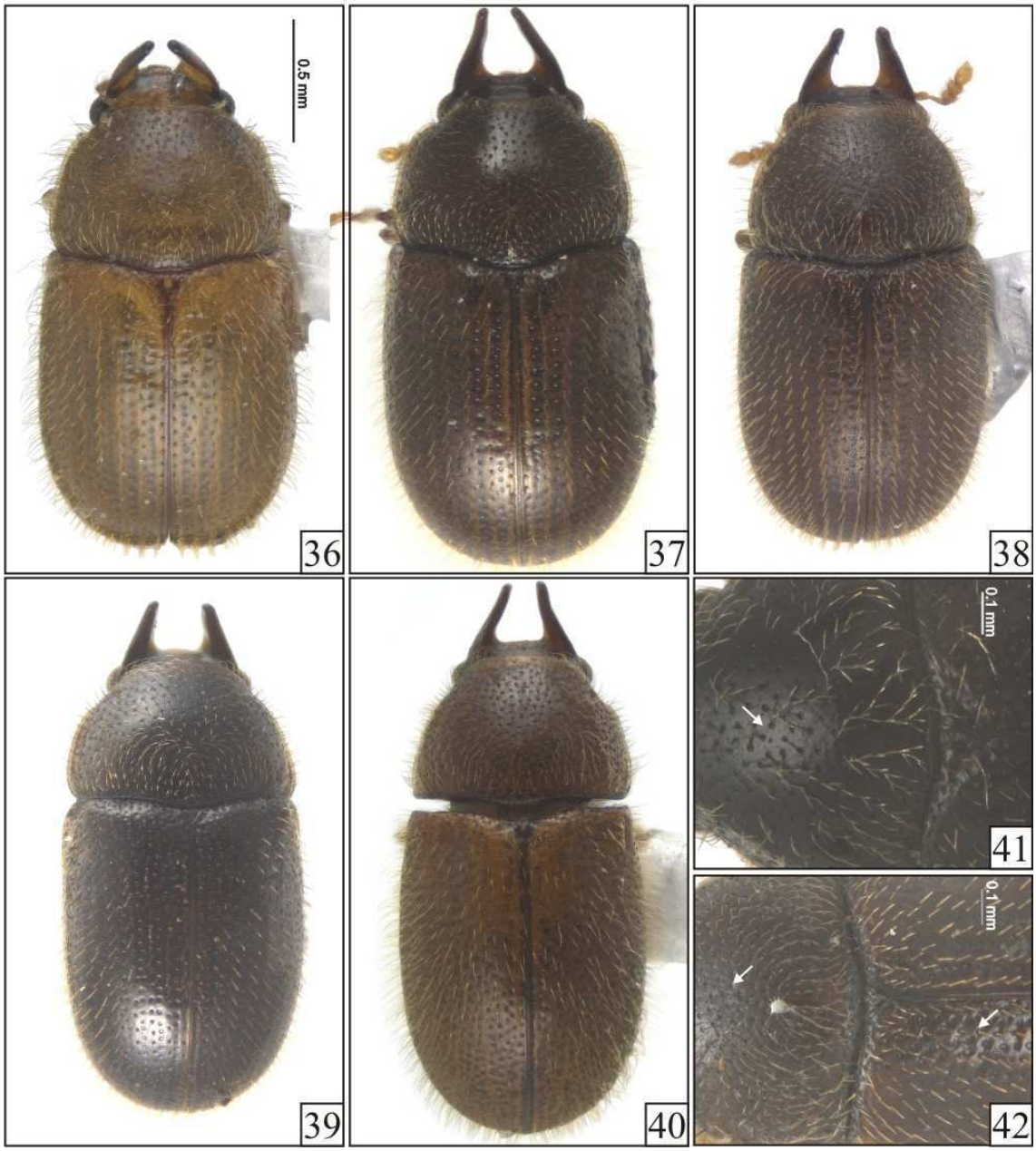
Figures 20–26. *Cis grandicornis* (Pic, 1917), male lectotype from Saint-Laurent du Marroni, French Guiana. **20** Dorsal view **21** Lateral view **22** Ventral view **23** Labels **24** Abdominal ventrites with sex patch at the first ventrite (arrow) **25** Eighth abdominal sternite **26** Penis shown at left and tegmen at right. Arrows indicate lateral inflexions near the apex of tegmen.



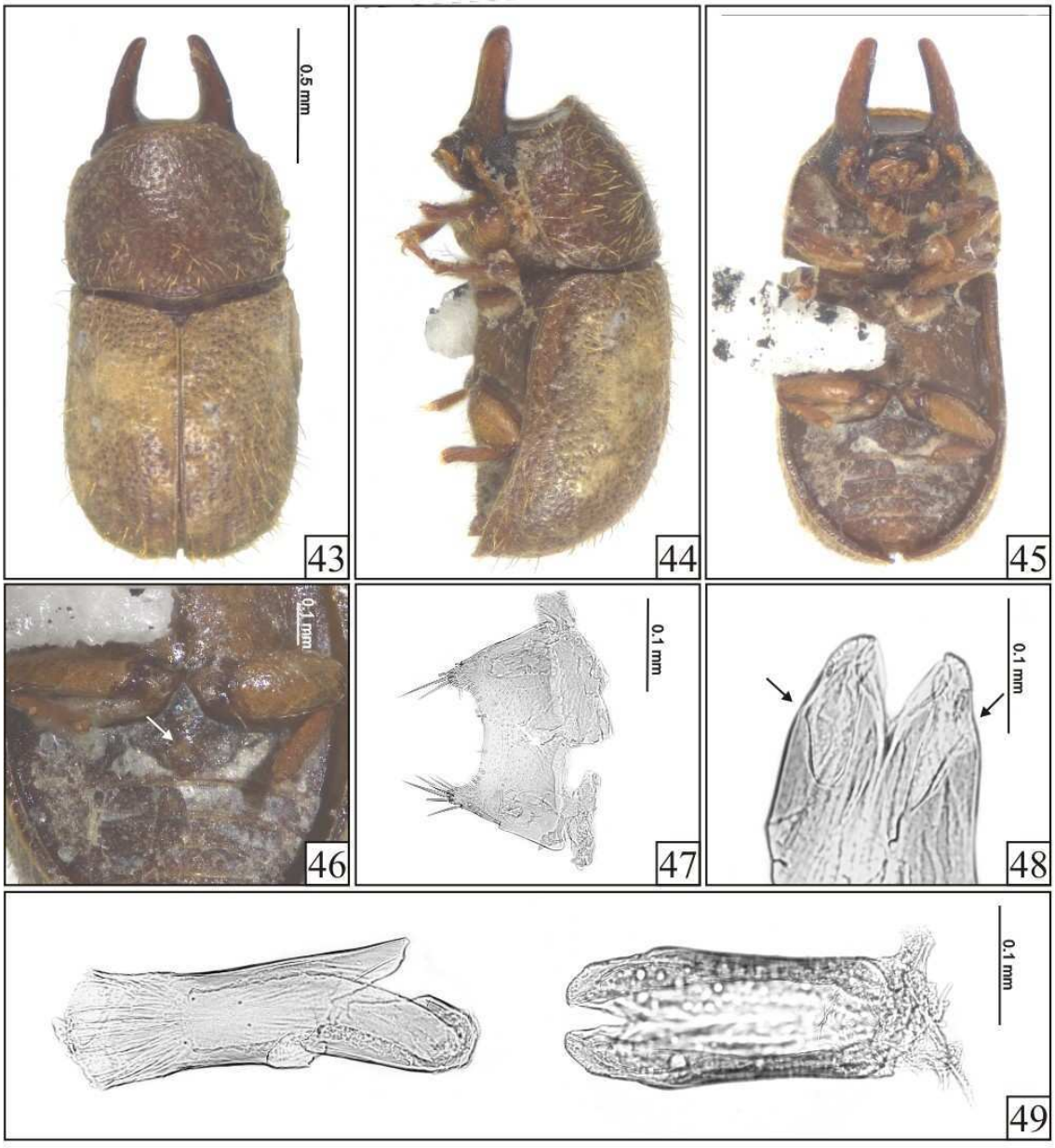
Figures 27–33.*Cis kawanabei* Lopes-Andrade, 2002, male lectotype from Blumenau, in the state of Santa Catarina, South Brazil. **27** Dorsal view **28** Lateral view **29** Ventral view **30** Labels **31** Abdominal ventrites with sex patch at the first ventrite (arrow) **32** Eighth abdominal sternite **33** Penis shown at left and tegmen at right. Arrows indicate subpyramidal lobes near the apex of tegmen.



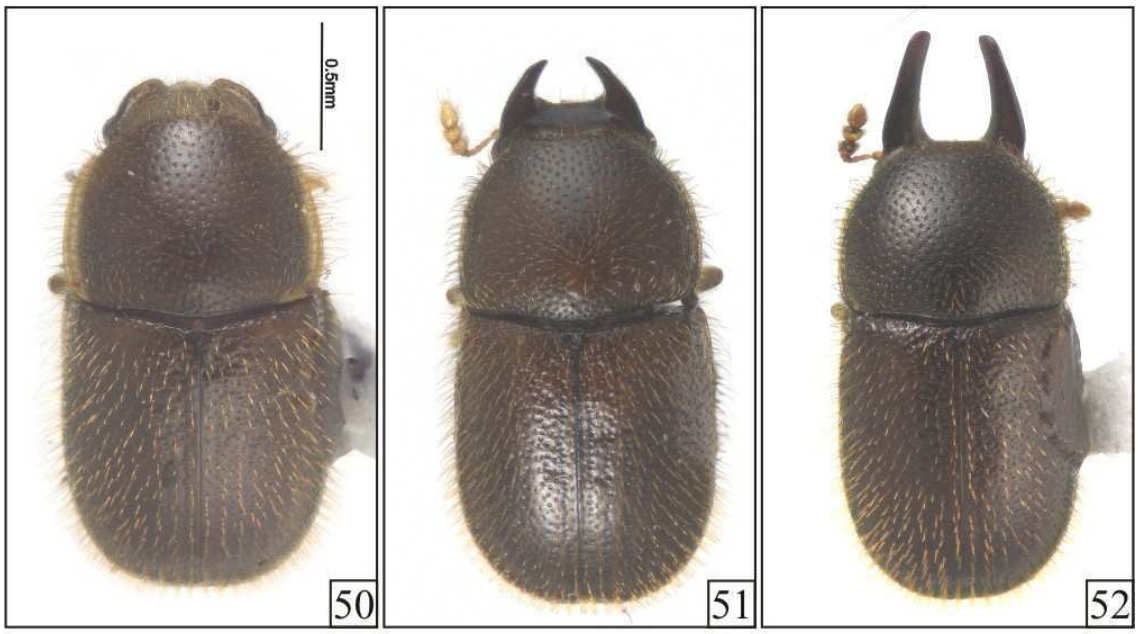
Figures 34–35. *Cis kawanabei* Lopes-Andrade, 2002, females. **34**Femalefrom Viçosa, state of Minas Gerais, Southeast Brazil, dorsal view **35** Female from Popayan, Cauca, Colombia, dorsal view.



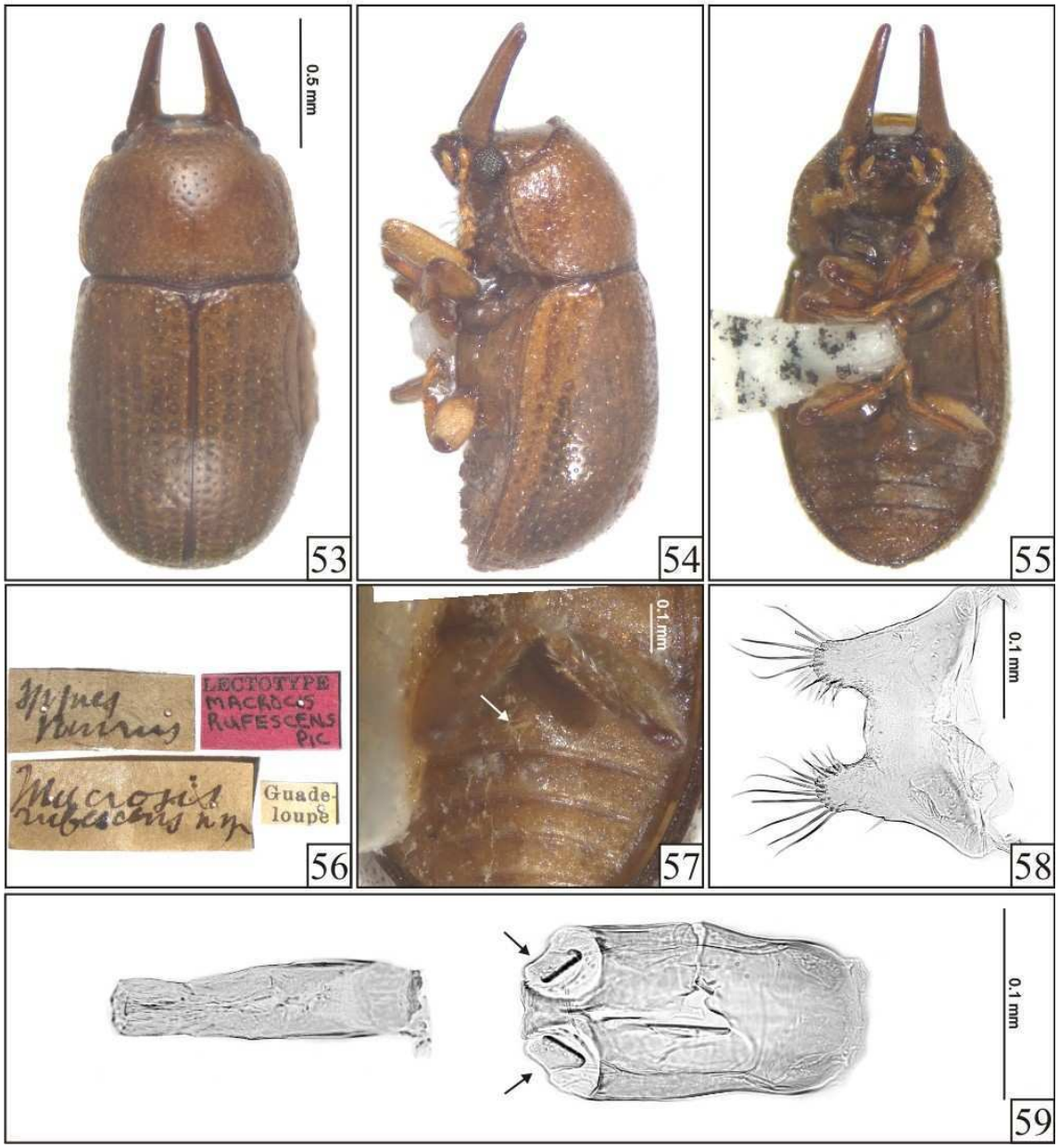
Figures 36–42. Variação em *Cis kawanabei* Lopes-Andrade, 2002.**36** Male from Viçosa, Minas Gerais, Brazil, dorsal view **37** Male from Araponga, Minas Gerais, Brazil, dorsal view **38** Male from Itatiaia, Rio de Janeiro, Brazil, dorsal view **39** Male from Santa Teresa, Espírito Santo, Brazil, dorsal view **40**Male from Colombia, Cauca, Popayan, dorsal view**41**Pronotum of female from Araponga, Brazil, showing small few punctures between the commun puntures (arrow) **42** Detail of pronotum and elytra disc showing numerous, small and gregarious punctures beetween the commun punctures from the male of Itatiaia, Brazil (arrows).



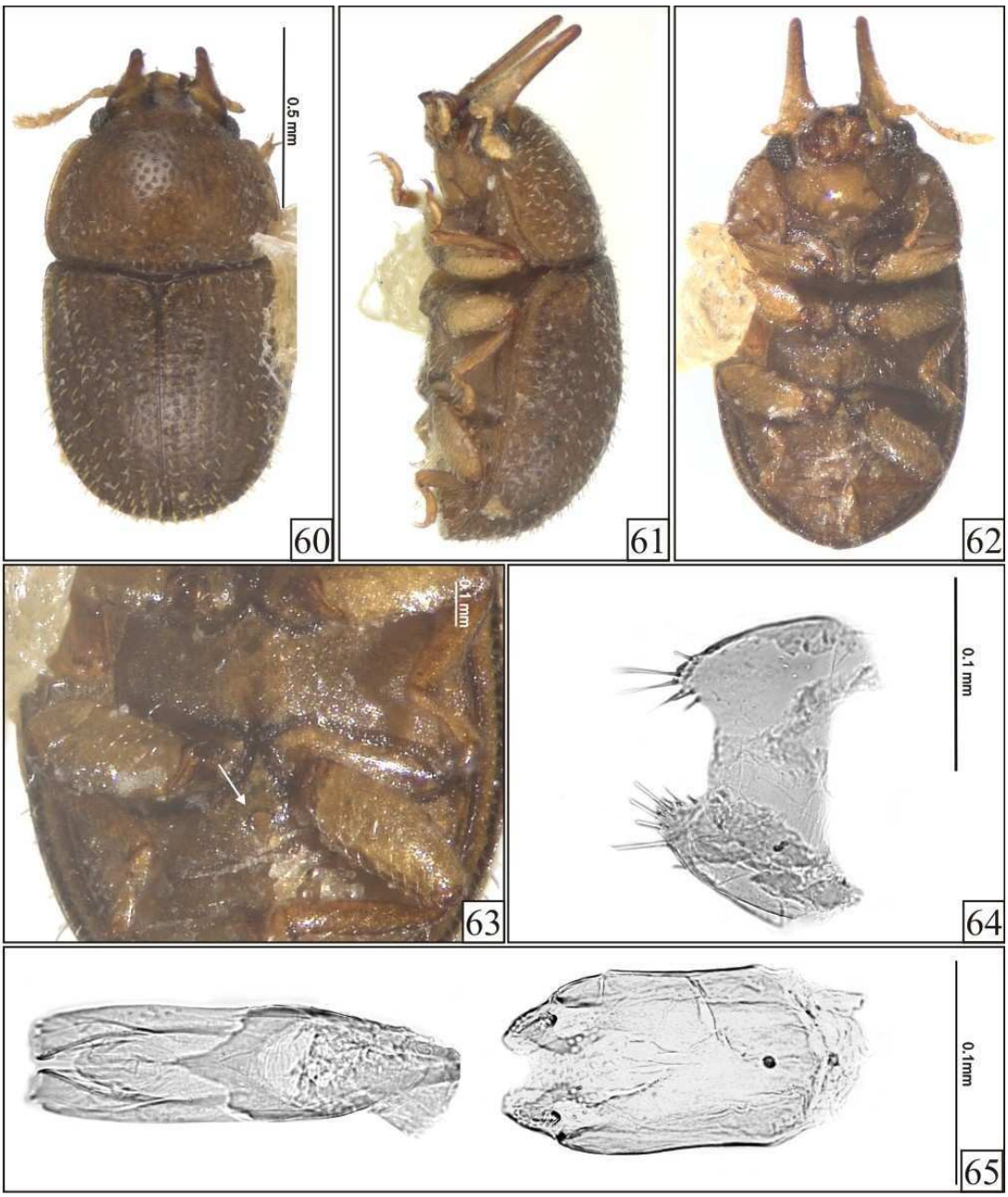
Figures 43–49. *Cis pubescens* (Friedenreich, 1881) male lectotype from Blumenau, in the state of Santa Catarina, South Brazil. **43** Dorsal view **44** Lateral view **45** Ventral view **46** Abdominal ventrites with sex patch at the first ventrite (arrow) **47** Eighth abdominal sternite **48**Detail of the apical portion of the tegmen, arrows indicate excavation lateral near the apex of the tegmen **49**Penis shown at left(with a little damage at the final portion) and tegmen (of a specimen from Ubá, Minas Gerais, Brazil, compared to the type) at right.



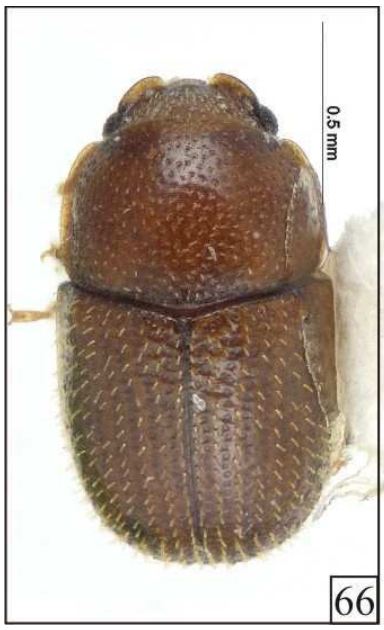
Figures 50–52. *Cis pubescens*. **50** Dorsal view of female from Santa Teresa, in the state of Espírito Santo, Southeast Brazil **51** Male with short horns from Vista Hemosa, department of Meta, Colombia**52** Male with long horns from Peruíbe, in the state of São Paulo, Southeast Brazil.



Figures 53–59. *Cis rufescens* (Pic, 1922), male Lectotype from Guadeloupe. **53** Dorsal view **54** Lateral view **55** Ventral view **56** Labels **57–59.** Male abdominal ventrites and male abdominal terminália from a male from Trinidad compared to the type. **57**Male abdominal ventrites with sex patch at the first ventrite (arrow) **58** Eighth abdominal sternite **59** Penis shown at left and tegmen at right. Arrows indicate lateral lobes of the tegmen.



Figures 60–65.*Cis setifer* (Gorham, 1883), male Lectotype from Barro Colorado, Panama. **60** Dorsal view **61** Lateral view **62** Ventral view **63** Abdominal ventrites with sex patch at the first ventrite (arrow) **64–65.** Male abdominal terminália of a male from Barro Colorado compared to the type. **64** Eighth abdominal sternite **65** Penis shown at left and tegmen at right.


0.5 mm
66


67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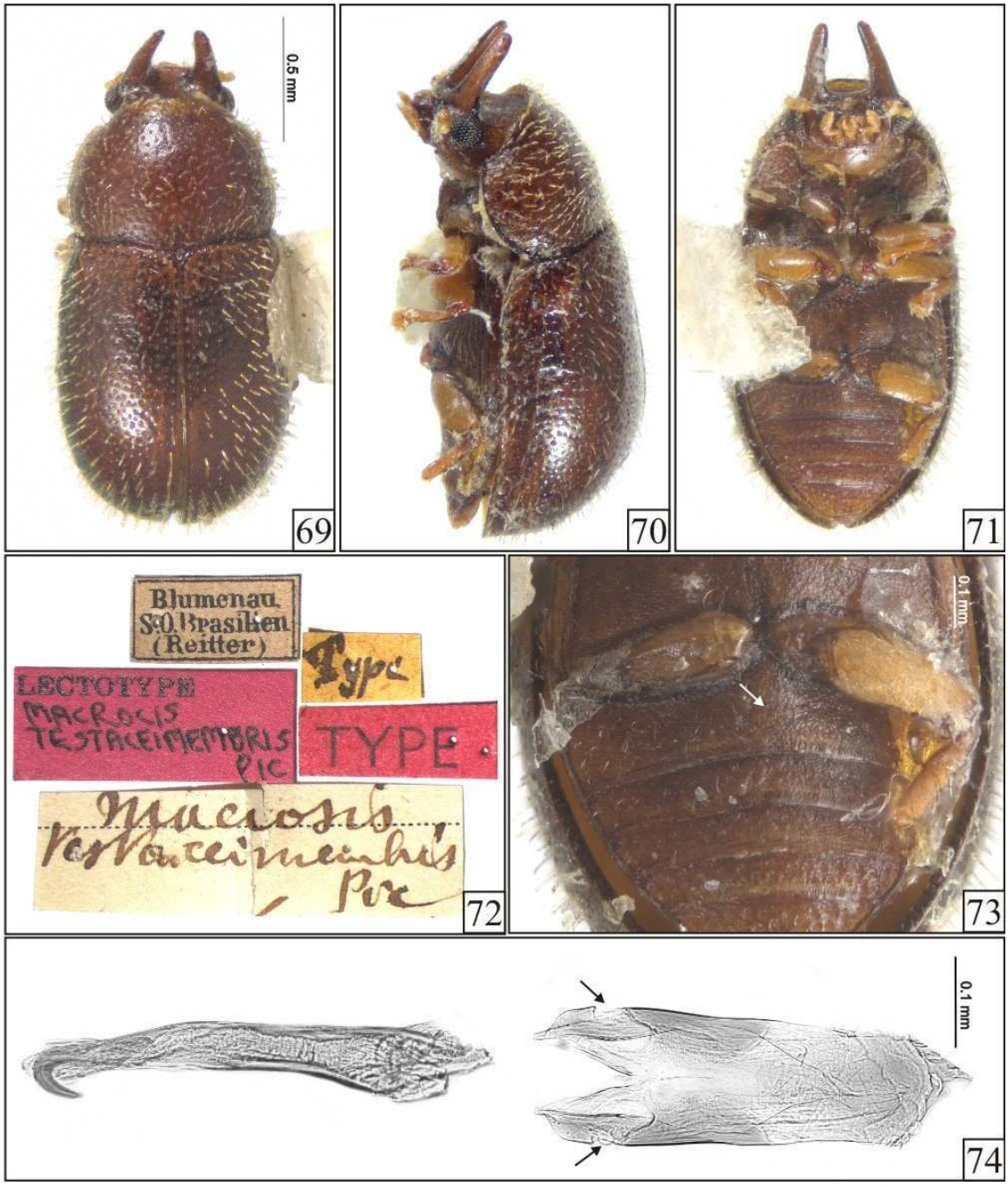
Figures 66–68. *Cis setifer* (Gorham, 1883). **66** Female from Barro Colorado, Panama **67** Small male from El Fortin, Mexico **68** Large malefrom Barro Colorado, Panama.



Figures 69–74.*Cis testaceimembris* (Pic, 1916), male Lectotype from Blumenau, in the state of Santa Catarina, South Brazil.**69** Dorsal view **70** Lateral view **71** Ventral view **72** Labels **73** Abdominal ventrites with minute sex patch at the first ventrite **74** Penis shown at left and tegmen at right in the male Paralectotype. Arrows indicate the lateral excavations near the apex of tegmen.

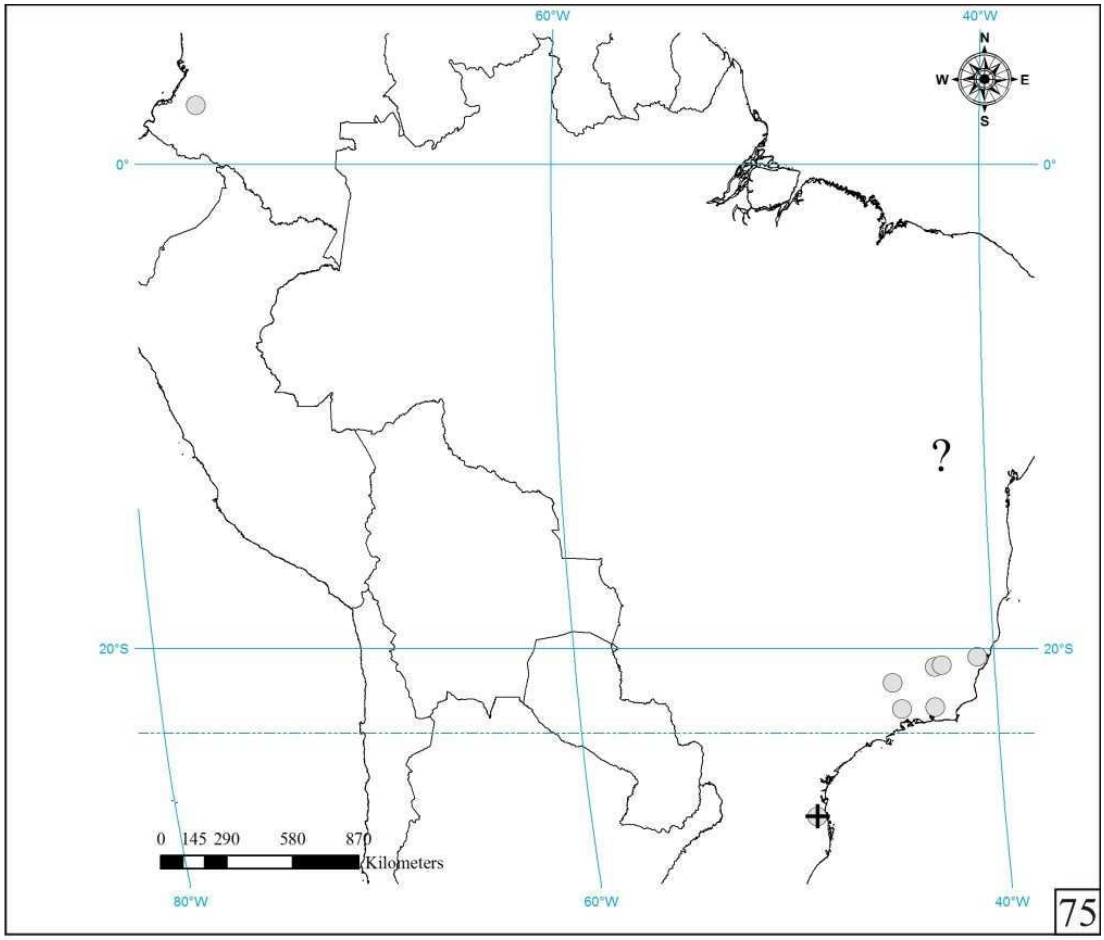


Figure 75. Distribution map for *Cis bahiensis*(Pic, 1916) (question mark, with no specific locality), *C. kawanabei*Lopes-Andrade, 2002 (gray circle) and *C. testaceimembris*(Pic, 1916) (cross). The overlap region to *C. testaceimembris* and *C. kawanabei* is showed as a gray circle with a cross, Blumenau, South of Brazil.

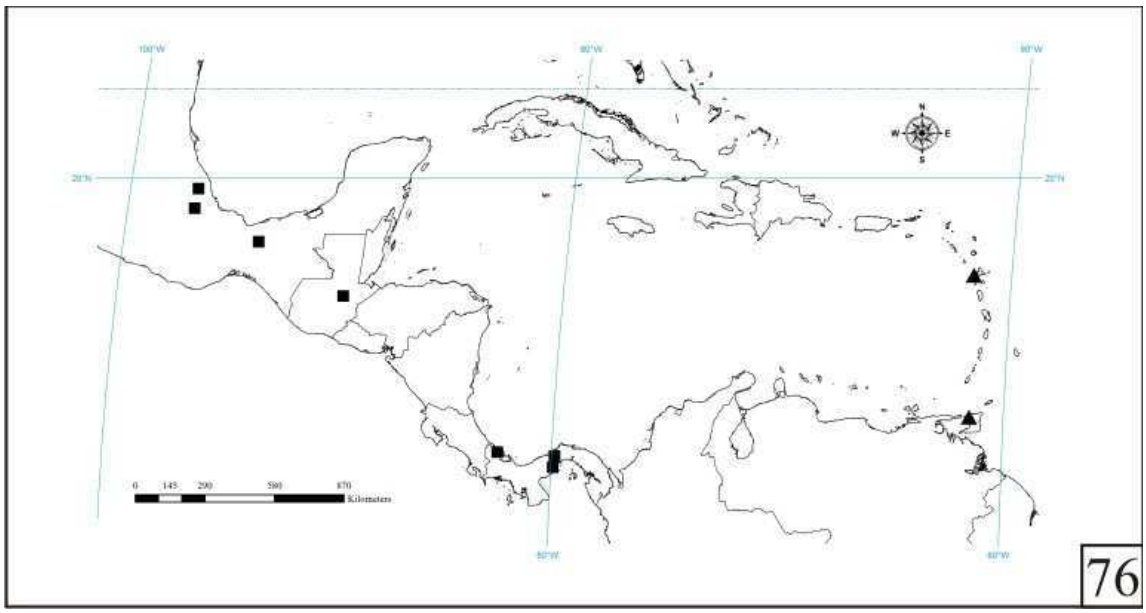


Figure 76. Distribution map for *Cis setifer*(Gorham, 1883) (square) and *C. rufescens*(Pic, 1922) (triangle).

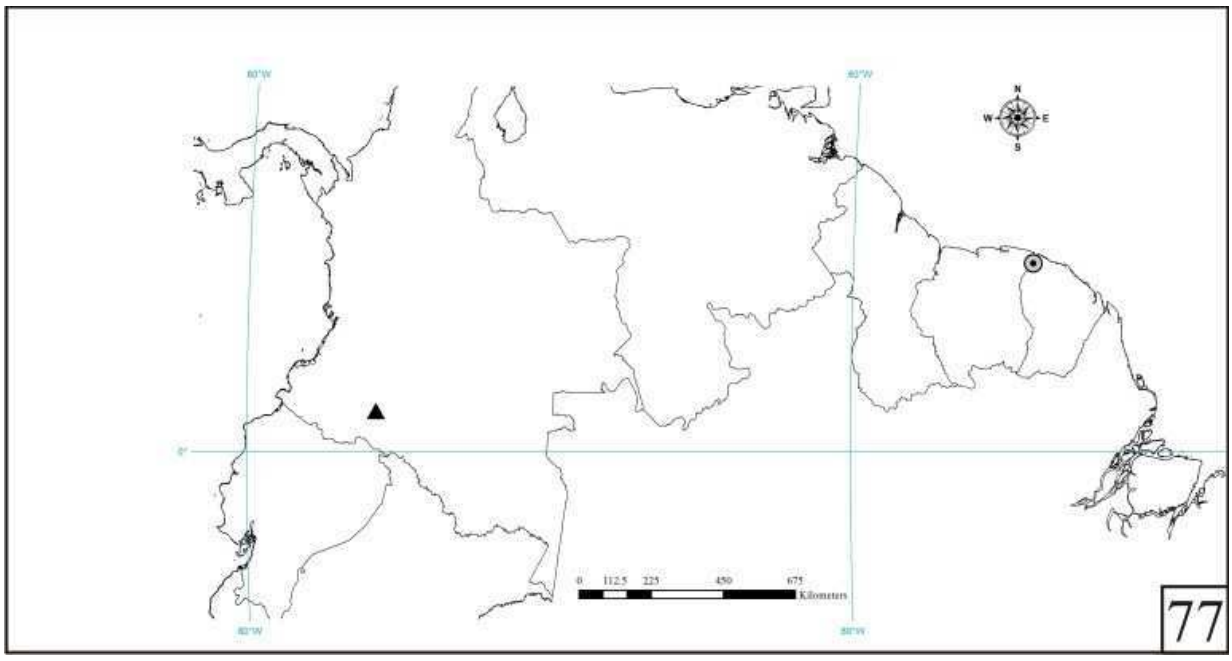


Figure 77. Distribution map for *Cis grandicornis*(Pic, 1917) (circle with point) and *C. diabolicus*(Reitter, 1878) (triangle).

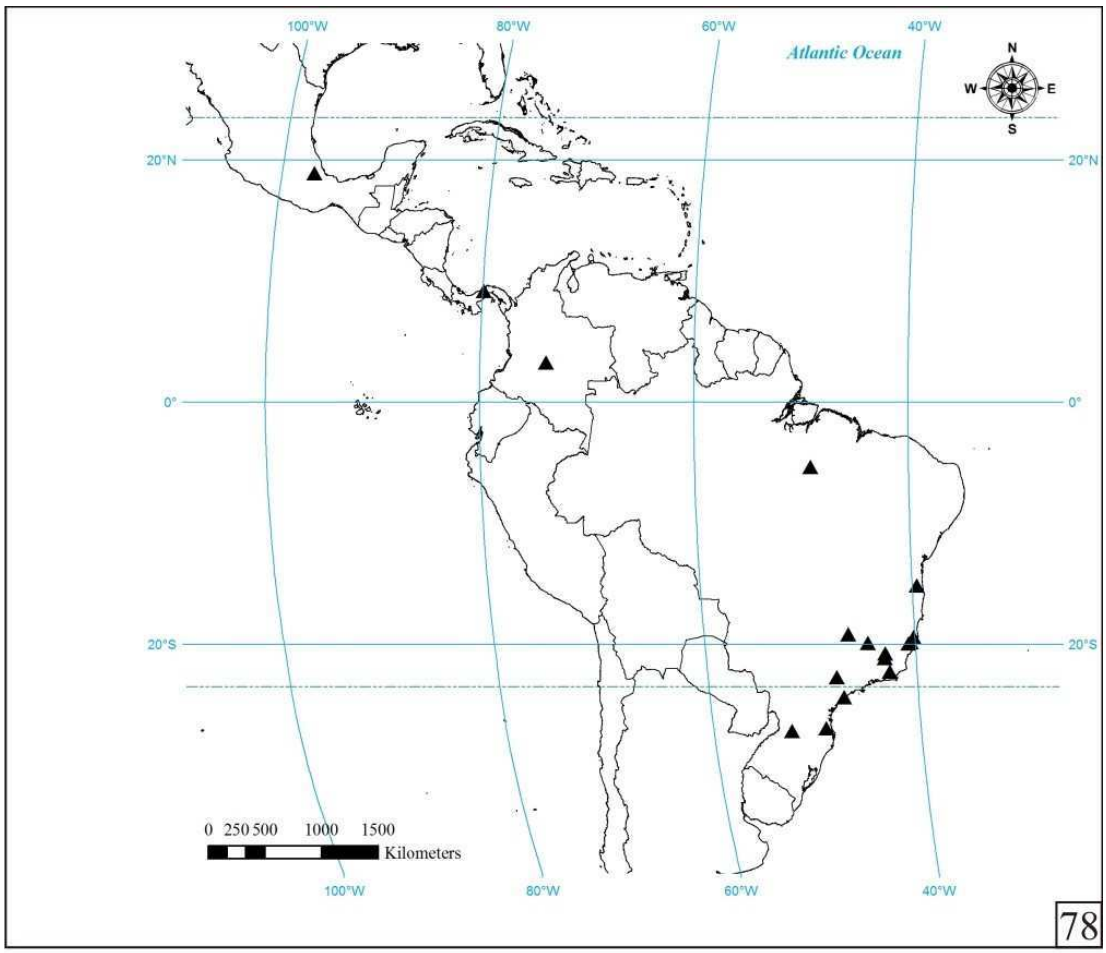


Figure 78. Distribution map for *Cis pubescens* (Friedenreich, 1881).

5. CONSIDERAÇÕES FINAIS

Muitos esforços têm sidofeitos recentemente para a coleta e estudo de ciídeos Neotropicais. Tal fauna vem sendo extensivamente pesquisada e divulgada com descrições de gêneros novos e registros de gêneros até então desconhecidos para a região,além de revisões taxonômicas de alguns táxons. Do ano 2000 até o presente, cerca de 30 espécies novas foram descritas somente para essa região e, visto o crescente esforço de coleta e as grandes coleções já existentes, muitas outras devem se somar a esse quadro aumentando consideravelmente o número de espécies neotropicais conhecidas e alterando o panorama do final de década de 60 _ dominado pelo conhecimento dos ciídeos Europeus _ trazendo ao conhecimento científico as espécies neotropicais. O desafio se encontra em realizar coletas extensas, manejá-las e organizá-las, manter vasto material em criação, cruzar informações de fungos hospedeiros e coexistência de espécies, delimitar grupos taxonômicos de espécies para nortear o trabalho, reconhecer e delinear táxons e hipotetizar suas relações para posterior análise.

O estudo do grupo *taurus* visa somar conhecimento sobre este que é, certamente, o maior grupo de ciídeos dos neótropicos. Nos próximos quatro anos, esperamos descrever uma grande quantidade de espécies do grupo *taurus*de vários biomas, muitas já presentes em coleções científicas e disponíveis para estudo, reportar sua distribuição e seus fungos hospedeiros, estudar suas relações evolutivas e sua biologia básica. O grupo *taurus* pode até mesmo apresentar-se (com o aprofundamento dos estudos e se descobrindo características robustas) como um gênero a parte de *Cis*, auxiliando na resolução do gênero mais diverso e polimórfico de Ciidae e revalidando *Macrocis* _ que se tornaria um dos maiores gêneros de ciídeos neotropicais.

Fornecendo novos dados sobre as espécies em questão, um novo leque de possibilidades de pesquisas e perguntas científicas se abrem clamando por questões mais amplas como as interações existentes na comunidade de micetócolos, o estudo das várias famílias micetócolas, com taxonomia e biologia praticamente desconhecidas, a evolução do hábito micetofágico e adaptações moldadas por ele, a ecologia nos ciclos de nutrientes concentrados por fungos e a participação dos micetócolos nos processos de degradação destes, assim como questões de amplitude mundial como a importância desses grupos para a manutenção dos ecossistemas e da biosfera como um todo. Certamente, esse é um assunto que só tem a crescer e aflorar conhecimentos em várias áreas das ciências biológicas.