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FÁBIO CORREIA COSTA

REVISÃO TAXONÔMICA DO GÊNERO *MANONYCHUS* MOSER, 1919 E RELAÇÕES FILOGENÉTICAS NA SUBFAMÍLIA MELOLONTHINAE (COLEOPTERA: MELOLONTHIDAE)

Recife
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Tese apresentada ao Programa de Pós-graduação em Biologia Animal da Universidade Federal de Pernambuco, como parte dos requisitos para obtenção do grau de Doutor em Ciências Biológicas na área de Biologia Animal.

Área de concentração: Taxonomia de grupos recentes

Orientadora: Profa. Dra. Luciana Iannuzzi
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Aprovado em: 20/02/2020

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A todas as pessoas negras, gays e periféricas. Que vocês acreditem verdadeiramente em seus sonhos, e percebam o quanto são capazes de realizar coisas grandiosas.

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"*Nada tenho em minhas mãos*
Nada posso eu pra sempre segurar
Eu só tenho a certeza
Que nada nessa vida há de me faltar"
(FERNANDES, 2011)

RESUMO

Melolonthinae uma das maiores e mais diversas subfamílias de Melolonthidae (Coleoptera: Scarabaeoidea), composta por 28 tribos, aproximadamente 750 gêneros e 11000 espécies distribuídas pelo mundo, de hábito principalmente fitófago. Apesar da grande diversidade morfológica, existe uma insuficiência na quantidade de trabalhos sistemáticos que contribuam para o entendimento taxonômico, principalmente em nível de gênero. *Manonychus* Moser, 1919, gênero endêmico do Brasil com oito espécies, encontra-se em posição incerta dentro de Melolonthinae. Até o presente trabalho o gênero apresentava características diagnósticas não exclusivas, o que acarretava identificações incorretas de suas espécies. O presente trabalho tem como objetivo revisar o gênero *Manonychus* Moser, 1919 e seu status *incertae sedis* mediante a proposta de uma hipótese de relacionamento filogenético Melolonthinae neotropicais, a fim de definir seu posicionamento tribal. A monofilia de *Manonychus* foi recuperada com a exclusão de *M. rosettae* Frey. O gênero se aninhou em Sericoidini, com o clado N (*Apterodemidea* Saylor + *Sericoides* Guérin-Ménville) como grupo irmão e este clado irmão de Liparetrini. A partir deste resultado uma nova hipótese de relacionamento de *Manonychus* em Melolonthinae é proposta. A revisão taxonômica de *Manonychus* permitiu descrever 23 novas espécies, incluídos em uma chave de identificação e ampliamos a distribuição do gênero para Bolívia (*Manonychus unguicularis* Moser, 1919). *Ovomanonychus* **gênero novo** foi descrito a partir de *Ovomanonychus rosettae* (Frey, 1976) **nova combinação**, e duas novas espécies foram descritas.

Palavras-chave: Corós. Escaravelhos. Fitófagos. Neotrópico. Scarabaeiodea. Sistemática.

ABSTRACT

Melolonthinae is one of the largest and more diverse subfamily in Melolonthidae (Coleoptera: Scarabaeoidea), composed by 28 tribes, with approximately 750 genus and 11000 species distributed worldwide, with phytophagous habitus. Despite of the morphological diversity, there are some gaps in systematics works, primarily on genus level. *Manonychus* Moser, 1919, is an exclusively genus that occur in Brazil, composed by eight species, and lies in incertae sedis in Melolonthinae. Up to the study the genus does not have non-exclusive features in its diagnosis, which leads to incorrect species identification. This study aimed to review *Manonychus* Moser, 1919 and evaluate the incertae sedis status using phylogenetic analysis to define their tribe place in Melolonthinae. The monophyly of the genus can be recovered removing of *M. rosettae* Frey. The genus was placed within Sericoidini, in the Clade N (*Apterodemidea* Saylor + *Sericoides* Guérin-Ménville) as a sister-group, and these clade as a sister-group of Liparetrini. From this result, a new hypothesis of relationship of *Manonychus* within Melolonthinae is proposal. The review allowed the description of 23 new species included in an identification key, expanding the distribution of the genus, outside of Brazil (*Manonychus unguicularis* Moser, 1919). *Ovomanonychus* **new genus** was described from *Ovomanonychus rosettae* (Frey, 1976) **new combination** along with two new species.

Key words: Chafers beetles. Neotropics. Phytophagous. Scarabs. Scarabaeiodea. Systematics.

LISTA DE FIGURAS

RELAÇÕES FILOGENÉTICAS EM MANONYCHUS MOSER, 1919 (COLEOPTERA: MELOLONTHIDAE)

TAXONOMIC REVISION OF *MANONYCHUS* MOSER, 1919 (COLEOPTERA: MELOLONTHIDAE: MELOLONTHINAE: SERICOIDINI)

SUMÁRIO

1 INTRODUÇÃO

Melolonthidae Leach *sensu* Endrödi (1966), é a maior e mais diversa família dentro de Scarabaeoidea, além de ser amplamente distribuída em todas as regiões zoogeográficas. Os melolontídeos adultos são essencialmente fitófagos ou não se alimentam, e em alguns casos auxiliam na polinização principalmente de Annonaceae e Araceae (MAIA e SCHLINDWEIN, 2006). As larvas são popularmente conhecidas por corós, e algumas espécies são consideradas pragas agrícolas pelos danos nas raízes de plantas cultivadas (MORÓN, 1997). Em termos de classificação, atualmente a familia é composta por seis subfamílias: Euchirinae Hope, 1840; Dynastinae MacLeay, 1819; Hopliinae Latreille, 1829; Melolonthinae Leach, 1819; Rutelinae MacLeay e Sericinae Kirby, 1837 (CHERMAN e MORÓN, 2014).

Melolonthinae, a mais diversa e abundante dentre as subfamílias, possui uma classificação tribal confusa, principalmente pela insuficiência de conhecimento sistemático dos gêneros que as compõem (RATCLIFFE et al., 2002). Dentre esses gêneros, podemos destacar *Manonychus* Moser, 1919, gênero endêmico do Brasil que possui oito espécies válidas. A maior parte dos caracteres diganósticos do gênero é compartilhada com os demais gêneros da subfamília, o que dificulta a identificação de suas espécies e pode ter sido um determinante para sua atual classificação em *incertae sedis* (RATCLIFFE et al., 2002; KATOVICH, 2008; CHERMAN et al., 2013).

Neste sentido, este trabalho propõe um posicionamento tribal para o gênero mediante análise filogenética baseada na análise morfológica dos representantes de melolontíneos, em sua maioria neotropical. Também foi realizada revisão taxonômica, a fim de definir o limite do gênero e de suas espécies. Para isso, além de novos atos nomenclaturais e espécies novas, foram descritos pioneiramente caracteres referentes às peças bucais e genitália masculina, estruturas não mencionadas nas descrições originais das espécies.

Para a confeccão do texto da tese foram seguidas as normas da Associação Brasileira de Normas Técnicas (ABNT) para a defesa de tese em forma de artigo. A presente tese está dividida em três manuscritos. O primeiro é intitulado "**Relações filogenéticas em *Manonychus* Moser, 1919 (Coleoptera: Melolonthidae)**", versa sobre a análise cladística de *Manonychus*, onde é testada sua monofilia e o posicionamento tribal em Melolonthinae. Essa sessão está formatada de acordo com as

normas de publicação do periódico **Systematic Entomology**, ao qual o manuscrito será submetido.

O segundo intitulado "***Ovomanonychus*, a new genus of South American Sericoidini (Coleoptera: Scarabaeidae: Melolonthinae)**" é fruto dos resultados conjuntos entre a análise filogenética e a revisão taxonômica realizadas em *Manonychus*. Neste capítulo é descrito um novo gênero sulamericano de Melolonthinae, baseado em *Manonychus rosettae*. Além da redescrição desta, descrevemos mais dois novos táxons de *Ovomanonychus.* Este manuscrito encontra-se aceito e publicado para a revista **Zootaxa**.

O terceiro intitulado "**Taxonomic revision of Manonychus Moser, 1919 (Coleoptera: Melolonthidae: Melolonthinae: Sericoidini)**", tem como objetivo revisar o gênero *Manonychus*, baseado no material-tipo e não-tipo oriundo de instituições nacionais e internacionais. Foram analisados caracteres da morfologia externa (incluindo aparelho bucal) e genitália masculina desses exemplares. É apresentada a primeira chave taxonômica para as espécies de *Manonychus*, e a distribuição geográfica do gênero é atualizada e ampliada. Outra grande contribuição da revisão é a descrição de 23 novos táxons para a ciência. Este capítulo está formatado seguindo as normas da revista **Anais da Academia brasileira de Ciências**, à qual esse manuscrito será submetido.

1.1 OBJETIVOS

1.1.1 Objetivo geral

Este trabalho tem como objetivo propor uma hipótese de relacionamento filogenético de *Manonychus* Moser, 1919 na subfamília Melolonthinae para propor seu posicionamento em nível de tribo, atualmente incerta, e revisar a taxonomia do gênero.

1.1.2 Objetivos específicos

- ✓ Propor uma hipótese filogenética para *Manonychus* em Melolonthinae.
- ✓ Redescrever *Manonychus* Moser, 1919 e suas espécies.
- ✓ Construir uma chave taxonômica para o gênero.

2 REFERENCIAL TEÓRICO

Scarabaeoidea

Popularmente conhecidos por escaravelhos, Scarabaeoidea Latreille, 1802 é considerada um dos grupos mais diversos e cosmopolitas de Coleoptera, compreendendo 2.500 gêneros e 35.000 espécies (SCHOLTZ e GREBENNIKOV, 2005b). Os representantes do grupo são facilmente identificados pela clava antenal em forma de lamela (LAWRENCE e BRITTON, 1991). Ocupam diversos habitats, são polífagos, e apresentam uma diversidade de hábitos alimentares durante a fase adulta, sendo coprófagos, fitófagos, florívoros, saprófagos, melinívoros, micetófagos, necrófagos, predadores ou onívoros (JAMESON e RATCLIFFE, 2002; SCHOLTZ e GREBENNIKOV, 2005b). Contudo, algumas espécies, como *Canthon* Hoffmannsegg, 1877 são foréticos, vivendo entre os pêlos do ânus de preguiças, macacos e até de humanos além de serem excelentes predadores de formigas e milípedes (HALFFTER e MATTHEWS, 1966; SILVEIRA et al., 2006). Os representantes da superfamília são solitários, exceto os passalídeos que formam grupos subsociais com interações de defesa, cooperação e hierarquia, única dentro de Coleoptera (REYES-CASTILLO e HALFFTER, 1983; HALFFTER e MATTHEWS, 1966; LAWRENCE e BRITTON, 1994). As larvas popularmente conhecidas por “corós” são facilmente reconhecidas pela forma do corpo em “C”, pela região cefálica bem esclerotinizada, antenas e pernas bem desenvolvidas, espiráculos cribiformes e ausência de urogomphi (HAYES, 1929; RITCHER, 1966; SCHOLTZ, 1990; LAWRENCE e BRITTON, 1994).

Scarabaeoidea é um grupo monofilético, tendo sua monofilia suportada por caracteres sinapomórficos larvais (GREBENNIKOV e SCHOLTZ, 2004). Apresenta duas hipóteses de relacionamento com outras superfamílias: a) Hydrophiloidea (Staphylinoidea + Scarabaeoidea) grupo Staphyliniformia (MC KENNA et al., 2019); b) Staphyliniformia (Scarabaeoidea + Hydrophiloidea) grupo denominado de Haplogastra (SCHOLTZ et al., 1994; HANSEN, 1997; CATERINO et al., 2005; SONG et al., 2010; HUNT et al., 2007; LAWRENCE et al., 2011). Também não há consenso na sua classificação em nível de família, pois as análises filogenéticas não apresentam hipóteses robustas com uma representatividade abrangente (SCHOLTZ et al., 1994; HUNT et al., 2007; CHERMAN e MORÓN, 2014). Atualmente, o número de famílias que compõem Scarabaeoidea está sendo discutido, e pode variar de acordo com a

classificação adotada. Comumente a classificação proposta por Lawrence & Newton (1995) é a mais aceita, na qual a superfamília reúne 13 famílias, incluindo as linhagens de fitófagos junto com os coprófagos em Scarabaeidae. No entanto, Cherman e Morón (2014), classificação aqui adotada, elevam Melolonthidae Leach, 1819 sensu Endrödi (1966) e Cetonidae Leach, 1815 ao nível de família, baseados em trabalhos filogenéticos morfológicos e moleculares (SMITH et al., 2006; HUNT et al., 2007; MICÓ et al., 2008; LAWRENCE et al., 2011). Sendo assim, a superfamília é composta por 15 famílias: Belohinidae Paulian, 1959; Cetoniidae Leach, 1815; Diphyllostomatidae Holloway, 1972; Geotrupidae Latreille, 1802; Glaphyridae MacLeay, 1819; Glaresidae Shanski & Medvedev, 1932; Hybosoridae Erichson,1802; Lucanidae Latreille, 1804; Melolonthidae Leach, 1819; Ochodaeidae Mulsant & Rey, 1871; Passalidae Leach, 1815; Pleocomidae Le Conte, 1861; Scarabaeidae Latreille, 1802; Trogidae MacLeay, 1819.

Melolonthidae

Melolonthidae Leach em Samouelle, 1819, é uma das mais diversas famílias de Coleoptera, onde são estimadas cerca de 25000 espécies (AHRENS et al., 2014) distribuídas em todas as regiões biogeográfias. Seus indivíduos são reconhecidos pelo seguinte conjunto de caracteres: tamanho corpóreo entre 3 e 170 mm; mandíbulas esclerotinizadas (expostas ou abaixo do clípeo); antenas com 8-10 artículos, com escapo mais curto que o flagelo e clava antenal lamelada com 3-7 artículos (móveis), lamela as vezes mais longa nos machos; cabeça pequena, corpo ovalado e robusto, ou achatado e fino; abdome com seis segmentos visíveis; útlimo segmento abdominal exposto; pernas anteriores com tarsos as vezes mais largos nos machos; tarsômeros do tipo pentâmeros, garras bem desenvolvidas, móveis e de forma variada (bífidas, denteadas, simples) (ENDRÖDI, 1966; MORÓN, 1997).

A proposta de classificação adotada por Cherman e Morón (2014) revelou que a família representa a linhagem dos besouros fitófagos ou fitosaprófagos de Scarabaeoidea, com seis subfamílias: Euchirinae Hope, 1840; Dynastinae MacLeay, 1819; Hopliinae Latreille, 1829; Melolonthinae Leach, 1819; Rutelinae MacLeay e Sericinae Kirby, 1837. Na fase adulta os melolontídeos consomem húmus, madeira apodrecida, pólen, serrapilheira; ou secreções extraídas de frutos maduros e vegetais. Na fase larval podem ser saprófagas, fitosaprófagas, rizófagas ou xilófagas (ENDRÖDI

1966; MORÓN 1997; AMAT-GARCIA et al., 2005). O tipo de hábito alimentar faz com que a família possua importância econômica, podendo trazer malefícios para vários cultivos, mas tem um papel ecológico relevante por auxiliarem na edafogênese, quanto a abertura de galerias e facilitando a ciclagem de nutrientes incorporados no solo (GALLO et al., 2002; SALVADORI e PEREIRA, 2006; ALSTON e KOPP, 2010; CHERMAN et al., 2013).

Dentre as subfamílias, Melolonthinae Leach, 1819 destaca-se por sua diversidade, reunindo 28 tribos, aproximadamente 750 gêneros e 11000 espécies espalhadas pelo mundo (EVANS, 2002; SMITH, 2006; BOUCHARD et al., 2011). Dentre as tribos, sete ocorrem no Brasil: Athliini Smith & Evans, 2018, Diplotaxini Kirby, 1837, Macrodactylini Kirby, 1837, Melolonthini Leach, 1819, Tanyproctini Erichson, 1847, Sericini Kirby, 1837 e Sericoidini Erichson, 1847, somando 571 espécies de 43 gêneros (RATCLIFFE et al., 2002).

Apesar da importância econômica e diversidade dos melolontídeos, existem lacunas taxonômicas quanto à definição do número de tribos e gêneros (SMITH, 2006). Seu estudo possui obstáculos em virtude de material em museus com dados taxonômicos incompletos e poucos trabalhos de revisão, o que dificulta, por sua vez, os estudos filogenéticos relacionados a este grupo (RATCLIFFE et al., 2002). Estas lacunas levam à incorreta identificação das espécies, principalmente aquelas de importância econômica e consequentemente à falta de ferramentas para a conservação da riqueza nos agroecossistemas (CHERMAN et al., 2013).

Sericoidini

Sericoidini Erichson, 1847 é uma tribo restrita à América do Sul, representada por quatro gêneros e 72 espécies (EVANS e SMITH, 2009). É definida pela seguinte combinação de caracteres: “labro abaixo do clípeo, em planos distintos; labro separado (com labro protuberante, se extendendo além do clípeo) ou fusionado ao clípeo; antena com 8-9 artículos (incluindo 3-5 lamelas); processo meso/metasternal ausente; abdome com seis ventritos de igual comprimento, às vezes convexos, tergitos e ventritos separados por uma carena longitudinal (ausente em *Ulata* Saylor); metatíbia com dois esporões apicais, localizados acima e abaixo da articulação tarsal (tarso se movimenta entre os esporões), garras simétricas” (SMITH, 2008). Erichson (1847) definiu

Sericoidini pela primeira vez e incluiu nesta tribo *Sericoides* Guérin-Méneville, 1839 (gênero-tipo) e *Diaphylla* Erichson, 1847, este atualmente alocado em Tanyproctini Erichson, 1847. Posteriormente foram incluídos em Sericoidini *Ulata* Saylor, 1945 (Saylor, 1945, 1946), *Apterodemidea* Gutiérez, 1952 e *Blepharotoma* Blanchard, 1850 (Evans, 2003; Katovich, 2008). Smith & Evans (2018) descreveram Athliini, uma nova tribo sulamericana, e transferiram *Ulata* para esta nova tribo. *Blepharotoma* Blanchard não tem um posicionamento muito claro em Melolonthinae (KATOVICH, 2008). Este gênero foi descrito inicialmente em Melolonthini (BLANCHARD, 1850), posteriormente transferido para Macrodactylini (DALLA-TORRE, 1912-1913), depois para Sericini (FREY, 1974), Liparetrini (EVANS, 2003) e Smith (2008) o transfere para Sericoidini pela posição do labro escondido abaixo do clípeo e distribuição Neotropical. Somente a partir de novos estudos, será possível estabelecer uma definição mais consistente para *Blepharotoma*.

Quanto à aproximação entre os gêneros, Ahrens (2005) revelou a proximidade entre *Sericoides* (Sericoidini) e *Heteronyx* Guérin-Méneville, 1838 (Liparetrini), este último um gênero australiano. Cherman et al. (2016), no estudo sobre as relações filogenéticas em Diplotaxini Kirby, 1837, transferem quatro espécies de *Hilarianus* Blanchard, 1851 para Sericoidini, sugerindo a alocação de duas destas em *Blepharotoma* (*H. uniformis* Blanchard, 1851 e *H. suboblongus* Blanchard, 1851) e duas em *Manonychus* Moser, 1919 (*H. ovalis* Blanchard, 1851 e *H. rufinus* Blanchard, 1851), gênero até então com classificação incerta, segundo Katovich (2008). Entretanto, a representatividade da tribo nestes trabalhos é considerada baixa, não testando a monofilia da tribo até o presente. Atualmente Sericoidini é composta por três gêneros: *Sericoides*, *Apterodemidea* e *Blepharotoma*.

Manonychus Moser, 1919

Manonychus é um pequeno gênero de Melolonthinae originalmente descrito para *M. unguicularis* Moser, 1919. Inclui oito espécies, com distribuição exclusivamente no Brasil. Pela semelhança no formato, tamanho e coloração do corpo, diversos autores (LACORDAIRE, 1856; MOSER, 1919; FREY, 1974; MARTÍNEZ, 1959; GUTIÉREZ, 1952) tem confundido espécies de *Manonychus* com espécies de *Liogenys* Guérin-Méneville, 1831 e *Pachrodema* Blanchard, 1851. Estas semelhanças têm conduzido a

erros de identificação de espécimes nas coleções, revelando a necessidade de uma revisão (CHERMAN et al., 2016)

Manonychus caracteriza-se pelo clípeo subarredondado; antena com nove antenômeros; tarsômeros anteriores dilatados e coberto de cerdas na face ventral; garras simples e finas em todas as pernas (MOSER, 1919). Atualmente reúne *M. unguicularis* utilizada por Moser (1919) para definir o gênero, *M. birabeni* Martínez, 1959, diferindo da anterior pela forma posterior do pronoto quase reta e lamelas antenais longas; *M. densicollis* e *M. martinezi,* ambas descritas por Frey (1974), incluem ilustração da genitália masculina, além de ratifica a semelhança com *Liogenys* e *Hilarianus*. Em 1976, o mesmo autor descreve *M. conypigus* e *M. rosettae,* sendo esta última alocada em *Manonychus* devido à forma das garras simples (característica considerada pelo autor como genérica na diagnose do gênero).

A classificação de *Manonychus* em Melololonthinae tem sido inconsistente. Foi considerada em Macrodactylini onde se manteve por muitas décadas (BLACKWELDER, 1944; GUTIÉREZ, 1952; MARTÍNEZ, 1959; FREY, 1974, 76; EVANS, 2003; EVANS e SMITH, 2005). Katovich (2008) classificou este gênero como *incertae sedis,* e sugere que *Manonychus* poderia ser alocado em Sericoidini, pelo labro ligeiramente produzido e a posição dos esporões metatibiais. Ou em Liparetrini que apesar das semelhanças, o autor considera pouco o suporte a nível desta tribo, não sendo alocada na mesma.

3 RELAÇÕES FILOGENÉTICAS EM *MANONYCHUS* MOSER, 1919 (COLEOPTERA: MELOLONTHIDAE)

Resumo

Manonychus Moser, 1919 gênero neotropical, que reúne oito espécies, onde até or presente trabalho encontrava-se com classificação incerta dentro de Melolonthinae (Coleoptera: Scarabaeoidea: Melolonthidae). O objetivo do trabalho é testar a monofilia do gênero e verificar os relacionamentos dentro da subfamília. Foram analisados 300 táxons, incluindo espécies não descritas de *Manonychus,* e 65 caracteres de morfologia externa de adultos, incluindo caracteres de genitália e aparelho bucal. A partir da análise de parcimônia com pesagem igual de caracteres foram encontradas 10 árvores e um consenso com 432 passos (IC=0,167; IR=0,532). *Manonychus* se mostrou polifilético, sendo sua monofilia recuperada com a exclusão de um clado composto por *Manonychus rosettae* Frey, 1976, *Manonychus* sp. 23 e *Manonychus* sp. 24. *Manonychus* se aninhou aos gêneros de Sericoidini, alterando seu status de classificação tribal.

Palavras-chave: Cladistica; melolontíneos; Neotropical; Sericoidini

Introdução

Melolonthinae é uma das mais mairores e mais diversas subfamílias de Melolonthidae, a qual reúne as linhagens de escaravelhos fitófagos. Esta subfamília é composta por 28 tribos, aproximadamente 750 gêneros e 11000 espécies distribuídas no mundo (Evans, 2002; Bouchard, 2011; Cherman & Morón, 2014). Análises filogenéticas morfológicas têm sido realizadas, com o intuito de buscar a monofilia da família e de suas subfamílias, assim como conhecer as relações entre as tribos que as compõem (Smith *et al*., 2006; Lawrence *et al*., 2011; Cherman & Moron, 2014).

Contudo, alguns trabalhos utilizam uma baixa representatividade de táxons, principalmente aqueles que ocorrem na região Neotropical (Scholtz, 1990; Smith & Evans, 2005; Smith *et al*., 2006; Coca-Abia, 2007; Cherman *et al*., 2016). Nessa condição se encontra *Manonychus* Moser, 1919, descrito por monotipia (*M. unguicularis* Moser, 1919), e atualmente composto por oito espécies: *M. ovalis* (Blanchard, 1851); *M. rufinus* (Blanchard, 1851); *M. birabeni* Martínez, 1959; *M. conipygus* Frey, 1976; *M. densicollis* Frey, 1974; *M. martinezi* Frey, 1974 e *M. rosettae*

Frey, 1976, todas endêmicas do Brasil (Evans & Smith, 2009). *Manonychus* é caracterizado pelo clípeo arredondado, antena com nove artículos, clava antenal com três lamelas, garras simples em todas as pernas, tarsos anteriores dilatados, e garras finas e alongadas. Os machos, como em outros gêneros da família, possuem dimorfismo nos tarsômeros anteriores, com base dilatada e cobertos ventralmente por um conjunto denso de cerdas "em almofada" (Moser, 1919).

Manonychus foi incluído por Moser (1919) em Macrodactylini Burmeister, 1855 na ocasião da sua descrição, que destacou a semelhança do gênero com *Liogenys* Guérin-Méneville, 1831, *Hilarianus* Blanchard, 1851 (atualmente sinônimo de *Liogenys*) e *Pachrodema* Blanchard, 1851, gêneros também posicionados inicialmente em Macrodactylini, todos atualmente em Diplotaxini (Cherman *et al*., 2016). Katovich (2008), em seu trabalho de reclassificação e filogenia de Macrodactylini, excluiu *Manonychus* da tribo e o transferiu para o incertae sedis da subfamília. No entanto, o autor sugeriu duas possibilidades tribais para *Manonychus*: Liparetrini Dalla Torre, 1912 (= Colpochilini Britton, 1957), de distribuição australiana, que devido ao pouco suporte não justifica a alocação ou em Sericoidini Erichson, 1847, de ocorrência Neotropical. O autor justifica o posicionamento do labro escondido logo abaixo do clípeo, metatarsômero proximal entre os esporões das pernas posteriores e garras tarsais simples. No entanto, até o presente momento, nenhum trabalho testou a posição filogenética de *Manonychus*, nem sua monofilia. Diante do exposto, o objetivo deste trabalho é testamos a monofilia de *Manonychus* e verificamos o posicionamento filogenéticos nos Melolonthinae neotropicais.

Metodologia

Material de estudo

Foram examinados cerca de 300 exemplares adultos, pertencentes a 55 táxons terminais. O material foi proveniente de empréstimo e/ou doações de instituições nacionais e internacionais. O acrônimo de cada instituição é utilizado de acordo com Evenhuis (2016), quando disponível e o curador se encontra em parênteses:

CEMT, Seção de Entomologia da Coleção Entomológica UFMT, Cuiabá, Mato Grosso, Brasil (Dr. Fernando Zagury Vaz-de-Mello); CERPE, Coleção Entomológica da

Universidade Federal Rural de Pernambuco, Recife, Pernambuco, Brasil (Dr. Paschoal Coelho Grossi); CEUFPE, Coleção Entomológica da Universidade Federal de Pernambuco, Recife, Pernambuco, Brasil (Dra. Luciana Iannuzzi); DZRJ, Coleção Entomológica Professor José Alfredo Pinheiro Dutra, Rio de Janeiro, Rio de Janeiro, Brasil (Dr. José Ricardo Miras Mermudes); DZUP, Coleção Entomológica Pe. Jesus Santiago Moure, Universidade Federal do Paraná, Curitiba, Paraná, Brasil (Dra. Cibele Stramare Ribeiro-Costa); MNRJ, Museu Nacional do Rio de Janeiro, Universidade Federal do Rio Janeiro, Rio de Janeiro, Rio de Janeiro, Brasil (Dra. Marcela A. Monné); MZFS, Museu de Zoologia da Universidade Estadual de Feira de Santanta, Feira de Santana, Bahia, Brasil (Dr. Freddy Bravo); MZUFBA, Museu de Zoologia da Universidade Federal da Bahia, Salvador, Bahia, Brasil (Dra. Favizia Freitas); MZSP, Museu de Zoologia da Universidade de São Paulo, São Paulo, São Paulo, Brasil (Dra. Sônia Casari); MNHN - Museum National d'Histoire Naturelle, Paris, França (A. Mantilleri); NHMB, Naturhistorisches Museum, Basel, Suíça (Dr. Matthias Borer); ZMHB, Museum für Naturkunde der Humboldt-Universität, Berlim, Alemanha (Dr. Johannes Frisch).

Construção dos caracteres

A construção dos caracteres seguiu a metodologia descrita por Sereno (2007), quando possível. Foi baseada na morfologia externa de machos e fêmeas, incluindo peças bucais, e genitália masculina para cada terminal (Figs. 1, 2), exceto para *M. rufinus* e *Manonychus* sp. 11, das quais os machos não são conhecidos. Dos 65 caracteres, sete são exclusivos para indivíduos machos (37, 53, 60-65), os demais são aplicados para ambos os sexos. As medições foram tomadas a partir de régua graduada e ocular micrométrica acoplada ao estereomicroscópio Leica MZ6 e transformadas em caracteres descritivos. As ilustrações foram realizadas através de desenho manual, com auxílio de câmara clara, acoplada em estereomicroscópio Leica MZ6. Para a captura de imagens, utilizou-se câmera modelo Canon odelo EOS 60d com lente macro de 150 mm ou 100 mm.

A terminologia utilizada seguiu a bibliografia específica do grupo, tanto as de cunho taxonômico (Moser, 1919; Gutiérrez, 1952; Martínez, 1959; Harris, 1979; Frey, 1974, 76; Lacroix, 1989; Smith, 2008; Cherman *et al*., 2017), quanto filogenético

(Ahrens, 2005; Coca-Abia, 2007; Katovich, 2008; Ahrens & Lago, 2008; Lawrence *et al*., 2011; Fuhrmann, 2015; Tarasov & Genier, 2015; Cherman *et al*., 2016).

Escolha dos terminais

O grupo interno inclui oito espécies de *Manonoychus* Moser, 1919, além de 24 táxons terminais tratados aqui como *Manonychus* sp. 1 a sp. 24 (espécies não descritas). A representatividade de terminais do gênero foi delimitada em função da disponibilidade de material. Não foram acessados machos de *M. rufinus*, nem fêmeas de *M. conypigus* em virtude de não haver registro desses na literatura, nem disponibilidade de exemplares nas coleções consultadas.*a*

O grupo externo foi composto por representantes da tribo Cyclocephalini (Dynastinae), representada por *Cyclocephala lunulata* Burmeister, 1847, além dos representantes de tribos neotropicais de Melolonthinae: Melolonthini: *Melolontha melolontha* (Linnaeus, 1758) e *Phyllophaga* sp.; Macrodactylini: *Alvarinus hilarii* Blanchard, 1850, *Macrodactylus subspinosus* (Fabricius, 1775), *Plectris tomentosa* LePeletier de Saint-Fargeau & Audinet-Serville, 1828 e *Modialis prasinella* Fairmaire & Germain, 1860; Athliini Smith & Evans (2018): *Athlia rustica* Erichson, 1835; Sericini: *Astaena* sp., *Serica bruneri* (Linnaeus, 1758) e *Symmela mutabilis* Erichson, 1835; Diplotaxini, *Apogonia rauca* Fabricius, 1781, *Diplotaxis tristis* Kirby, 1837, *Liogenys palpalis* (Eschscholtz, 1822), *Liogenys diodon* Burmeister, 1855 e *Pachrodema castanea* Blanchard, 1851; Liparetrini: *Liparetrus discipennis* Guérin-Méneville, 1830 e *Costelytra zealandica* White, 1846; Sericoidini, *Apterodemidea paraguayensis* (Arrow, 1903), *Blepharotoma tarsalis* Blanchard, 1850, *Blepharotoma confusa* Martínez, 1959, *Sericoides glacialis* (Fabricius, 1775) e *Sericoides obesa* (Germain, 1863). Na escolha dos terminais foi priorizada a representatividade Neotropical de cada tribo. De Melolonthini, a tribo mais especiosa da subfamília e cosmopolita, foram incluídos dois gêneros com distribuição Neártica, Neotropical e do sul do Chile (em comum com outras regiões austrais do mundo); Macrodactylini foi incluída por *Manonychus* ter sido alocada na tribo, além de ser endêmica do Neotrópico e pela sua diversidade; Diplotaxini foi incluída como terminais de cada uma das regiões mundiais onde está presente, e sua importância na análise é devido a menção sobre a semelhança com *Liogenys* e *Pachrodema* segundo Moser (1919), Gutiérrez (1952) e Frey (1974). A escolha por Liparetrini e Sericoidini foi baseada na hipótese de alocação

de *Manonychus* em uma das duas tribos (Katovich, 2008). Da mesma forma, Cherman *et al*. (2016) também mencionaram o possível relacionamento de *Manonychus* com Sericoidini. De todas as tribos incluídas, apenas Liparetrini é estritamente australiana, não possuindo então representantes na América. As espécies estudadas encontram-se na Tabela 1, exceto as espécies novas não publicadas (*Manonychus* sp.).

Análise filogenética

A matriz de caracteres foi construída no programa OpenDelta, versão 1.0 (Dallwitz *et al*., 1999) e editada a partir do Mesquite v. 3.10 (Maddison & Maddison, 2015). A análise filogenética foi conduzida no programa TNT, versão 1.1 (Goloboff *et al*., 2008), com parcimônia de Fitch como critério de otimização, considerando todos os caracteres como não aditivos e com pesos iguais (Fitch, 1971).

Cyclocephala lunulata Burmeister, 1847 (Dynastinae) foi o terminal escolhido para o enraizamento da árvore. A busca heurística dos cladogramas mais parcimoniosos foi do tipo "Tradicional Search", seguindo as configurações: "hold=65000"; "Random seed=10; "Repls=6500", marcando posteriormente a opção "tree bisection reconnection (TBR)"; "trees to save per replication=10" como algoritmo de permuta dos ramos; "collapse trees after search". Uma árvore de consenso estrito foi gerada para agrupar as árvores (comprimento mínimo=0). O comprimento total da árvore foi obtido com o comando "optimize → Length".

Os índices de consitência (IC) e de retenção (IR), tanto para a árvore de consenso como para todos os caracteres, foram obtidos mediante o script "wstats.run". O índice de Bremer foi calculado para analisar o suporte dos ramos (Bremer, 1994), por meio de Traditional Search, método de bissecção e reconexão de árvores (TBR), memória (65000), réplicas (6500). Para o suporte de Bremer absoluto optou-se por reter árvores subótimas com até 100 passos extras ("Retain trees subotimal by"=100 steps). As autapomorfias e caracteres não informativos foram eliminados da análise. Os cladogramas foram confeccionados a partir do programa Winclada v. 1.00.08 (Nixon, 2002) e editados com o auxílio do Photoshop CS2 (adobe systems inc.).

Resultados e Discussão

Foram construídos 65 caracteres, sendo 27 relacionados à cabeça (incluindo peças bucais), 10 ao tórax, 17 a apêndices (élitros e pernas), cinco ao abdome e seis à genitália masculina, descritos abaixo e plotados na matriz de dados (Tabela 2). Cinquenta e nove caracteres são binários e seis multiestado. Os caracteres foram considerados não-ordenados, exceto caráter 1,13 e 41. Um total de 15 caractérers são inéditos para o gênero.

Lista de Caracteres

Cabeça (Caracteres 1-28)

1. Fronte, distância entre os olhos em relação a largura de um olho: (0) aproximadamente duas vezes a largura do olho (Fig. 3A); (1) aproximadamente três vezes a largura do olho; (2) cinco vezes a largura do olho ou mais (Fig. 3B) (IC=10; IR =32).

A largura interocular se refere a distância entre as margens internas dos olhos (Cherman *et al*., 2016).

2. Fronte, pontuação: (0) densa (Figura 3B); (1) esparsa (Fig. 3A) (IC=9; IR=9).

Foi considerada pontuação densa aquela cujo espaço entre os pontos foi menor que o diâmetro de um ponto (Cherman & Almeida, 2015).

3. Clípeo, concavidade fronto-clipeal: (0) presente; (1) ausente (IC=100; IR=100) (Cherman *et al*., 2016).

4. Clípeo, diferenciação da fronte: (0) com sutura fronto-clipeal (Fig. 3A); (1) sem sutura fronto-clipeal (IC=20; IR=33).

5. Clípeo, margem anterior, dentes: (0) presente; (1) ausente (IC=100; IR=100).

6. Clípeo, projeção lateral, canto ocular: (0) encoberto (Fig. 3C); (1) não encoberto (Fig. 3D) (IC=7; IR=31). (Furhrmann, 2015).

7. Peças bucais, posição em relação ao clípeo: (0) ocultas; (1) não ocultas (IC=33; IR=50).

8. Labro, posição em relação ao eixo do corpo: (0) vertical (Fig. 3E); (1) horizontal (IC=20; IR=33).

A condição vertical refere-se ao labro perpendicular ao clípeo. A condição horizontal refere-se ao labro paralelo ou subparalelo ao clípeo (Cherman *et al*., 2016).

9. Labro, sutura: (0) presente (Fig. 3E); (1) ausente (IC=100; IR=100).

10. Labro, diferenciação: (0) fusionado ao clípeo; (1) separado do clípeo (IC=25; IR=80).

Segundo Matsuda (1965), em Scarabaeoidea o clípeo e o labro são separados por sutura. Entretanto, Ahrens (2005) observou que alguns grupos de Melolonthidae possuem essas estruturas fusionadas, como Sericini e Ablaberini. O autor afirma ainda que a fusão dessas estruturas pode tratar-se de dimorfismo sexual, onde o labro de fêmeas é separado por uma fina sutura, e nos machos esta é bastante reduzida.

11. Labro, posição em relação ao clípeo: (0) no mesmo plano; (1) em planos distintos (Fig. 3F) (IC=25; IR=72).

Quando em planos distintos, o labro se posiciona em um nível mais abaixo que o clípeo.

12. Labro, vista frontal, emarginação na linha média, intensidade (0) rasa; (1) profunda (IC=25; IR=50). (Lacroix, 1989).

13. Labro, margem superior: (0) abaulada (Fig. 3E); (1) reta (2) aguda (IC=40; IR=50) (Cherman *et al*., 2016).

14. Mandíbula, mala, superfície: (0) multisulcada (Fig. 3F); (1) lisa; (2) carenada (IC=22; IR=41) (Coca-Abia, 2007).

A condição multissulcada indica marcas profundas que formam uma depressão. Já a condição carenada refere-se a projeção em formato de quilha, não apresentando depressão em sua extensão.

15. Mandíbula, mala, sulco superior, dentes: (0) presente (Fig. 3G); (1) ausente (IC=14; IR=40).

Contingente do estado de caráter 14 (0). A condição presente refere-se a uma serrilha de dentes, vista em grande aumento (>30x), na região superior da mala multisulcada.

16. Maxila, gálea, margem lateral, lobo: (0) presente (Fig. 3H); (1) ausente (IC=100; IR=100).

A condição presente refere-se à uma projeção, em forma de lobo, da margem superior lateral da gálea, antecedendo os dentes da gálea.

17. Maxila, gálea, dentes com relação ao eixo da maxila: (0) rotacionados; (1) não rotacionados (IC=100; IR=100).

Estado 0 refere-se a porção dentada da gálea com uma torção de 90 graus em relação ao eixo da maxila, portanto estão posicionados transversalmente a esta estrutura.

18. Maxila, gálea, margem superior basal sinuosa: (0) presente; (1) ausente (IC=25; IR=40).

19. Maxila, lacínia, dente: (0) presente (Fig. 3H); (1) ausente (IC=16; IR=54).

O dente situado próximo ao ápice da lacínia é fortemente esclerotinizado e desarticulado, sendo denominado de “uncus” (Lawrence *et al*., 2011).

20. Maxila, palpômero distal, relação largura máxima e largura distal: (0) duas vezes ou mais (Fig. 3I); (1) igual (Fig. 3H) (IC=10; IR=50) (Cherman *et al*., 2016).

A largura máxima foi mensurada na região média em todos os exemplares, onde em alguns indivíduos, sua largura é duas vezes a largura distal.

21. Lábio, forma: (0) mais largo que longo (Fig. 3J); (1) mais longo que largo; (2) tão longo quanto largo (IC=28; IR=64).

Estado 0, largura basal menor que largura apical; Estado 1, larguras basal e apical iguais, mas comprimento maior que as larguras; Estado 2, largura e comprimento iguais. Em todas as condições a medição foi realizada na maior largura do labro

22. Lábio, inserção do palpo, visibilidade ventral: (0) presente (Fig. 3J); (1) ausente (IC=20; IR=77) (Cherman *et al*., 2016).

23. Lábio, palpo, número de palpômeros: (0) dois; (1) três (IC=100; IR=100).

Em Coleoptera, o número de palpômeros varia entre dois e quatro, a exceção de *Rhipidioides* (Ripiphoridae) que possui um palpômero (Lawrence *et al*., 2011).

24. Lábio, margem anterior, emarginação mediana: (0) presente; (1) ausente (IC=33; IR=50).

25. Lábio, margem anterior, emarginação mediana, forma: (0) estreita e triangular; (1) larga e semicircular (Fig. 3J) (IC=33; IR=50).

Contingente do estado de caráter 24 (0).

26. Lábio, separação lígula-lábio: (0) presente; (1) ausente (IC=16; IR=58).

Estado 1, considerado uma condição basal dentro de Coleoptera, podendo remeter a fusão medial dos lobos da paraglossa (Lawrence *et al*., 2011; Ahrens, 2005).

27. Lábio, margem anterior, lobos anteriores: (0) presente; (1) ausente (IC=12; IR=30).

Estado 0, presente em alguns gêneros do grupo externo, refere-se aos lobos pré-ligulares.

Tórax (Caracteres 28-48)

28. Pronoto, disco, cerdas: (0) presente (Fig. 3K); (1) ausente (IC=14; IR=50).

29. Pronoto, relação comprimento/largura: (0) mais longo que largo; (1) mais largo que longo (IC=16; IR=28).

30. Pronoto, margem lateral, fileira longitudinal de cerdas esparsas: (0) presente; (1) ausente (IC=16; IR=16).

Estado 0, as cerdas são esparsas em quase todas as espécies de *Manonychus*, a exceção de *Manonychus* sp. 1 que apresenta a fileira longitudinal com cerdas densas, muito próximas umas das outras.

31. Pronoto, região póstero-lateral, depressão: (0) presente (Fig. 3L); (1) ausente (IC=25; IR=50).

32. Pronoto, canto posterior: (0) projetado (Fig. 3K); (1) não projetado (IC=10; IR=43).

Na condição projetado (0), a margem posterior do pronoto é sinuosa. Na condição não projetado (1) o canto é arredondado.

33. Escutelo, pontuação: (0) presente (Fig. 4A); (1) ausente (IC=14; IR=40).

34. Mesosterno, cerdas, comprimento: (0) curtas (Fig. 4B); (1) longas (IC=11; IR=42).

Estado 1, o comprimento das cerdas ultrapassa as margens laterais do mesosterno.

35. Mesepímero, canto posterior interno: (0) projetado (Fig. 4B); (1) paralelo ao superior interno (IC=10; IR=52).

36. Metasterno, comprimento em relação ao da metacoxa: (0) menor; (1) igual; (2) maior (IC=28; IR=64).

O comprimento do metasterno foi mensurado a partir da sua região lateral; a medida da metacoxa foi estimada em relação ao seu maior comprimento, situado na margem externa (Cherman *et al*., 2016).

37. Metasterno, machos, cerdas densas e longas: (0) presente; (1) ausente (IC=10; IR=43).

Estado 1, presença de cerdas longas e densas pode ser considerado uma caractertística dimórfica em *Manonychus*.

38. Élitros, costas: (0) presente; (1) ausente (Fig. 4A) (IC=20; IR=80).

Pernas (Caracteres 39-54)

39. Procoxas, forma: (0) transversal; (1) cônica (IC=50; IR=50).

40. Protíbias, dente I: (0) presente (Fig. 4C); (1) ausente (IC=11; IR=27).

Estado 0, o dente I refere-se aquele localizado na porção média posterior da protíbia. Na presença de 3 dentes, o I corresponde ao basal.

41. Protíbias, ângulo entre os dentes II e III: (0) obtuso; (1) reto; (2) agudo (IC=13; IR=56).

42. Mesocoxas: (0) contíguas; (1) não contíguas (IC=20; IR=50).

Estado 0, as mesocoxas se tocam na porção distal, junto a articulação das mesmas.

43. Mesocoxas, relação comprimento-largura: (0) duas vezes maior; (1) três vezes maior ou mais (IC=50; IR=66).

As medidas das coxas foram tomadas na largura máxima, região média da coxa, em relação ao comprimento total.

44. Mesofêmures, porção distal, dupla fileira de pontos, confluência: (0) presente (Fig. 4D); (1) ausente (IC=8; IR=56).

45. Mesotíbias, região proximal, carena transversal II: (0) presente; (1) ausente (IC=100; IR=100).

Estado 0, a carena transversal origina-se na margem dorsal e projeta-se em direção a ventral, podendo ser contínua ou interrompida (Ahrens, 2005).

46. Metacoxas, comprimento em relação ao comprimento do ventrito II: (0) menor ou subigual (Fig. 4B); (1) maior (IC=25; IR=85) (Cherman *et al*., 2016).

47. Metacoxas, margem lateral externa, ângulo: (0) reto; (1) obtuso (IC=20; IR=50).

48. Metatíbias, região proximal, carena transversal II: (0) presente (Fig. 4E); (1) ausente (IC=100; IR=100).

49. Metatíbias, esporões, posição quanto ao tarso: (0) esporões ao lado do tarso; (1) esporões acima e abaixo da articulação tarsal (IC=25; IR=76) (Katovich, 2008).

50. Metatíbias, esporões, comprimento: (0) iguais; (1) desiguais (IC=7; IR=35).

51. Metatíbias, ápice, superfície distal: (0) proeminente; (1) não proeminente (IC=6; IR=41).

Estado 1, considera-se não proeminente a superficie distal plana, sem qualquer projeção na margem interna.

52. Pro, meso e metatarsos, garras: (0) simples (Fig. 4C); (1) bífidas (IC=33; IR=87).

53. Pro e mesotarsômeros, face ventral, tufo de cerdas nos machos, distribuição: (0) esparsa; (1) densa (Fig. 4F) (IC=33; IR=86).

Estado 1, condição de dimorfismo sexual em *Manonychus*.

54. Protarsômeros II-IV, forma: (0) cilíndrica (Fig. 4C); (1) piriforme (IC=33; IR=50).

Abdome (Caracteres 55-59)

55. Abdome, carena lateral ao longo dos ventritos: (0) presente (Fig. 5A); (1) ausente (IC=33; IR=86).

Estado 0, ventritos e tergitos são separados por quilha situada entre as duas regiões. Algumas espécies de *Manonychus* possuem a quilha mais pronunciada do que outras.

56. Ventritos II ao VI, linha transversal de pontos: (0) presente (Fig. 5B); (1) ausente (IC=8; IR=35).

57. Ventrito V, sutura separando do propigídio: (0) presente (Fig. 5C); (1) ausente (IC=25; IR=66).

58. Propigídio, porção visível, pontuação: (0) presente (Fig. 5C); (1) ausente (IC=10; IR=18).

59. Pigídio, relação comprimento largura: (0) mais largo que longo; (1) igual; (2) mais longo que largo (IC=11; IR=15).

Genitália masculina (Caracteres 60-65)

60. Parâmeros, margem interna, região distal, forma: (0) reta (Fig. 5D); (1) curvilínea (Fig. 5E) (IC=7; IR=27).

61. Parâmeros, ápice, direção: (0) convergente (Fig. 5E); (1) paralelo (Fig. 5D) (IC=7; IR=45).

62. Parâmeros, vista lateral, superfície: (0) escavada (Fig. 5F); (1) plana (IC=10; IR=40).

63. Falobase, vista dorsal, margem distal, forma: (0) plana; (1) escavada (Fig. 5F) (IC=12; IR=58).

64. Falobase, vista dorsal, linha média longitudinal: (0) visível (Fig. 5F); (1) não visível (IC=12; IR=41).

65. Falobase, constrição na linha média: (0) presente; (1) ausente (IC=20; IR=60).

Estado 0, a constrição resulta na formação de uma região lobada na porção posterior da falobase.

A análise heurística dos dados da matriz resultou em dez árvores mais parcimoniosas. A árvore de consenso estrito teve comprimento de 432 passos (IC=0,167; IR=0,532) (Fig. 6). A topologia mostrou uma politomia entre três clados principais (Sericini) + (Melolonthini + Macrodactylini) + (Diplotaxini (Athliini (Liparetrini + Sericoidini))). Apesar da não resolução inicial, a maioria das tribos se

mostrou monofilética, exceto para o clado (Melolonthini + Macrodactylini), Liparetrini e Sericodini. Cada um dos 18 clados é discutido a seguir (Figs. 6, 7).

O clado A reúne três linhagens dos Sericini estudadas neste trabalho (*Astaena* sp. + *Serica bruneri* + *Symmela mutabilis*), suportado por cinco transformações, uma delas sinapomórfica: 9:1 (labro sem sutura), e quatro caracteres homoplásticos: 36:0 Metasterno de menor comprimento em relação ao comprimento da metacoxa; 44:0 Mesofêmures, porção distal com dupla fileira de pontos; 49:1 Metatíbias com esporões acima e abaixo da articulação tarsal; e 10:0 Labro fusionado com o clípeo, este incomum em Scarabaeoidea (Matsuda, 1965), na qual o labro e clípeo são separados. Segundo Ahrens (2005), membros de Sericini e Ablaberini Burmeister, 1855 tem clípeo e labro fusionados, mas em fêmeas de alguns gêneros, as peças podem se apresentar separadamente.

O clado B inclui representantes de Melolonthini + Macrodactylini, suportado por sete transformações: uma sinapomórfica 39:0 Procoxas com forma transversal e seis homoplásticas: 6:0 Clípeo, projeção lateral, canto ocular encoberto; 14:0 Mandíbula, mala com superfície mutilsulcada; 19:0 Maxila, lacínia dentada; 28:0 Pronoto, disco com cerdas (exceto em *Plectris tomentosa* 28:1); 35:1 Mesepímero, canto posterior interno paralelo; 46:0 Metacoxas, comprimento menor em relação ao comprimento do ventrito II (exceto no clado C (*Plectris tomentosa* + *Macrodactylus subspinosus* + *Alvarinus hilari* 46:1). As linhagens de Melolonthini não formam um clado monofilético e os gêneros estudados aqui se posicionam como grupos irmãos de Macrodactylini.

O clado C inclui gêneros atualmente alocados em Macrodactylini, sendo suportado por duas transformações sinapomórficas: Mesotíbias e metatíbias sem carena transversal II (45:1 e 48:1, respectivamente); e cinco homoplásticas: 13:1 Margem superior do labro reta; 25:0 Margem superior do lábio com emarginação mediana estreita e triangular; 40:1 Protíbias, Dente I das protíbias ausente; 42:1 Mesocoxas não contíguas; e 44:0 Porção dista dos mesofêmures com dupla fileira de pontos confluente. Dentre os gêneros incluídos nesse estudo, *Modialis*, endêmico do sul do Chile, apresenta um histórico de classificação instável. Incluso em tribos australianas, como Heteronychini (Arrow & Gahan, 1903) e Liparetrini (por Dalla-Torre, 1912,

Blackwelder, 1964 e Gutiérrez, 1942); porém, Evans (2003) o posiciona em Melolonthini, justamente pela sua distribuição geográfica não compartilhada com os representantes das duas tribos anteriores; e, por fim, em Macrodactylini, por Katovich (2008) e Smith & Mondaca (2015). No presente estudo, *Modialis* forma um clado com os demais gêneros de Macrodactylini, concordando com a classificação vigente do gênero.

O clado D inclui Diplotaxini (Athliini (Liparetrini + Sericoidini)), suportado por cinco transformações, sendo uma sinapomórfica 53:1 Pro e mesotarsômeros, face ventral, com tufo denso de cerdas nos machos, e quatro homoplásticas: 12:0 Labro, vista frontal, emarginação na linha média rasa (exceto *Pachrodema castanea* and *Sericoides glacialis*); 21:0 Lábio mais largo que longo (exceto *Costelitra zealandica*, *Blepharotoma* and *Sericoides* 21:1 e *Diplotaxis tristis* and *Liparetrus discipennis* 21:2); 34:0 Mesosterno, cerdas curtas (exceto em *Liogenys palpalis*, *Liparetrus discipennis*, *Sericoides obesa*, *Manonychus* sp. 23, *M. conypigus*, *Manonychus* sp. 18 and *Manonychus* sp. 9); e 47:1 Metacoxas, margem lateral externa com ângulo obtuso (except *Apogonia rauca* and *Manonychus rufinus*). O tufo de cerdas nos protarsômeros (53:1) foi considerado como caracter diagnóstico de *Manonychus* por Moser (1919). Contudo, nessa análise tal condição sustenta o clado que reúne as tribos Diplotaxini, Athliini, Liparetrini, Sericoidini, não sendo, portanto, exclusivo de *Manonychus*. As cerdas ventrais em forma de tufos estão ausentes em *Diplotaxis tristis* e no clado L.

O clado E corresponde a Diplotaxini, sendo suportado por quatro transformações homoplásticas: 14:2 Mandíbula, mala superfície carenada; 20:0 Maxila, palpômero distal, largura máxima duas vezes a largura distal; 35:1 Mesepímero, canto posterior interno paralelo; 57:1 Ventrito V fusionado com propigídio e sem sutura aparente. A tribo é recuperada como monofilética, corroborando a hipótese de Cherman *et al*. (2016). Também as relações internas da tribo se assemelham à proposta desses autores, uma vez que foram recuperados dois clados irmãos, o clado F de linhagens não-Neotropicais e o clado G de Neotropicais. O clado F (*Apogonia rauca* + *Diplotaxis tristis*) é suportado por seis transformações, uma sinapomórfica: 17:0 Maxila, gálea, dentes rotacionados com relação ao eixo da maxila; e cinco homoplásticas: 6:0 Clípeo, projeção lateral, canto ocular encoberto; 11:1 Labro, em plano distinto ao do clípeo; 24:0 Lábio, margem anterior, sem emarginação mediana; 27:0 Lábio, margem anterior,

com lobos anteriores; 46:0 Metacoxas, comprimento menor em relação ao comprimento do ventrito II. O clado G reune *Pachrodema castanea* + (*Liogenys palpalis* + *Liogenys diodon*) sendo suportado pela sinapomorfia 23:0 Lábio, palpo com dois palpômeros, e um caráter homoplástico 59:2 Pigídio, mais longo que largo. Os dois gêneros foram considerados semelhantes a *Manonychus* (Moser, 1919; Frey, 1974; Martínez, 1959; Gutiérrez, 1952), principalmente pelo forma do corpo oval e os protarsômeros nos machos com tufo de cerdas na porção ventral.

O clado H está representado por *Athlia rustica* (Athliini) como linhagem irmã de (Liparetrini + Sericoidini), e está suportado por três transformações homoplásticas: 10:0 Labro fusionado com o clípeo; 55:0 Abdome com carena longitudinal ao longo dos ventritos; e 65:0 Falobase constricta na linha média. *Athlia* é inicialmente alocado em Sericini por Blanchard (1851). Saylor (1945) o considera semelhante a *Ulata e* o aloca em Sericoidini. Frey (1973) e Martínez (1959) voltam a alocá-lo junto aos Sericini americanos. Contudo, Ahrens (2005) afirma que o mesmo deveria ser excluído de Sericini, dado o seu relacionamento com linhagens de Sericoidini, a exemplo de *Sericoides*. Contudo, *Athlia* é mantido em Sericini nos catálogos de Melolonthinae de Evans (2003) e Evans e Smith (2009). Recentemente, Smith e Evans (2018) estabelecem Athliini para *Athlia* e atualmente a tribo reune, além desse gênero, *Apteroathlia* Smith e Evans, 2018; *Dihymenonyx* Gutiérrez, 1949, e *Ulata*.

O clado I (Liparetrini + Sericoidini) está suportado por quatro transformações homoplásticas: 11:1 Labro em plano distinto ao do clípeo; 19:0 Lacínia maxilar denteada (exceto em: *Liparetrus discipennis* 19:1); 37:0 Metasterno, machos, com cerdas densas e longas (exceto na maioria dos *Manonychus* (menos em *M. conypigus*, *M. densicollis*, *Manonychus* sp.08, *Manonychus* sp. 18, *Manonychus* sp. 19 e *Manonychus rufinus*); 49:1 Metatíbias, esporões, acima e abaixo da articulação tarsal. O clado J reune Liparetrini e *Blepharotoma*, indicando a parafilia de Liparetrini, por três caracteres em condição homoplástica: 21:1 Lábio mais longo que largo; 50:0 Metatíbias com esporões de comprimento igual; 63:1 Falobase em vista dorsal com margem distal escavada. A monofilia da tribo pode ser recuperada com a inclusão de *Blepharotoma*. Historicamente o posicionamento tribal de *Blepharotoma* é confuso. O gênero é descrito em Melolonthini (por Blanchard, 1851), sendo transferido para Macrodactylini por Dalla-Torre (1912-1913), para Sericini por Frey (1973) e para Liparetrini por Evans (2003). Contudo, Britton (1980, 1990) e Katovich (2008) fornecem definições

diagnósticas para Liparetrini e Macrodactylini, respectivamente, excluindo a possibilidade da alocação de *Blepharotoma* nessas tribos. Katovich (2008) ainda menciona as semelhanças de *Blepharotoma* com Liparetrini e Sericoidini. Smith (2008) mantém *Blepharotoma* em Sericoidini e redefine a tribo, mas se baseando unicamente em dados morfológicos, não filogenéticos. A proposta filogenética do presente trabalho evidencia a relação mais próxima de *Blepharotoma* com os Liparetrini do que com Sericoidini, concordando com Evans (2003). No entanto, para retirar *Blepharotoma* de Sericoidini e realocá-lo em Liparetrini necessita de estudo filogenético com maior representatividade dos gêneros em quetão. As relações internas do clado J se dão com o clado K formado pelos dois gêneros atualmente alocados em Liparetrini (*Costelytra zeanlandica* e *Liparetrus discipennis*) e sustentado por quatro caracteres homoplásticos: 33:1 Escutelo liso; 42:1 Mesocoxas não contíguas; 44:0 Mesofêmures com dupla fileira confluente de pontos na porção distal; 55:1 Abdome sem carena longitudinal entre o ventrito e o tergito. E o clado K, reunindo as duas espécies de *Blepharotoma* (*B. tarsallis* e *B. confusa*), por tres transformações homoplásticas: 1:0 Distância entre os olhos aproximadamente duas vezes a largura do olho; 36:1 Metasterno, comprimento igual ao da metacoxa; e 54:1 Protarsômeros II-IV piriformes.

O clado L reúne os Sericoidini (menos *Blepharotoma*) + *Manonychus* sendo suportado por dois caracteres homoplásticos: 26:1 Lábio fusionado à lígula, o qual surgiu em várias linhagens em Coleoptera (Ahrens, 2005) e 32:0 Canto posterior do pronoto projetado, exceto em *Apterodemidea* e em um agrupamento dentro de *Manonychus* que possuem o canto posterior do pronoto não projetado, sendo arredondado (32:1). O clado M, grupo irmão de *Manonychus*, está conformado por ((*Apterodemidea* + *Sericoides*) + (*Manonychus* sp. 23, *Manonychus rosettae* + *Manonychus* sp. 24), e suportado por duas transformações homoplásticas: 36:1 Metasterno com comprimento igual ao da metacoxa; 53:0 Pro e mesotarsômeros com tufo de cerdas esparsas na face ventral, nos machos.

Segundo Erichson (1847) modificada por Smith (2008), Sericoidini caracteriza-se por possuir labro abaixo do clípeo, em planos distintos; labro separado (com labro protuberante, se extendendo além do clípeo) ou fusionado ao clípeo; antena com 8-9 artículos (incluindo 3-5 lamelas); processo meso/metasternal ausente; abdome com seis ventritos de igual comprimento, às vezes convexos, quilha lateral ao longo dos ventritos (ausente em *Ulata*); metatíbias com dois esporões apicais, localizados acima e abaixo da

articulação tarsal (tarso se movimenta entre os esporões); garras simétricas. Segundo Smith (2008), Sericoidini é composta pelos gêneros *Apterodemidea*, *Blepharotoma*, *Sericoides* e *Ulata*. No entanto, *Manonychus* também apresenta as características diagnósticas da tribo. Cherman *et al*. (2016), em análise filogenética em testaram o relacionamento entre os Diplotaxini, verificaram o relacionamento entre duas espécies de *Hilarianus* (*H. ovalis* e *H. rufinus*). Segundo os autores, os caracteres que suportam o clado são compartilhados por espécies de *Manonychus*, o que permitiu a transferência das duas espécies para o referido gênero. A partir dos resultados do presente estudo, Sericoidini passa a reunir *Apterodemidea* + *Manonychus* + *Sericoides* + (*Manonychus* sp. 23, *Manonychus rosettae* + *Manonychus* sp. 24). As espécies entre parênteses foram transferidas para *Ovomanonychus* Costa, Cherman & Iannuzzi (no prelo).

O clado N (*Sericoides* + *Apterodemidea*) é suportado por cinco transformações em condição homoplástica: 7:1 Peças bucais não ocultas em relação a posição do clípeo; 8:1 Labro horizontal; 10:1 Labro separado do clípeo; 35:1 Mesepímero com canto posterior interno paralelo; 63:1 Falobase com margem distal escavada.

O clado O, formado por *Manonychus* sp. 23, *Manonychus rosettae* + *Manonychus* sp. 24, é irmão do clado M (*Sericoides* + *Apterodemidea*) por um caráter em condição homoplástica: 43:1 Mesocoxas, comprimento três vezes a largura. De acordo com Frey (1976), *Manonychus rosettae* distingui-se das demais espécies de *Manonychus*, pelo tamanho do corpo maior, estrias elitrais, ausência do tufo de cerdas nas pernas anteriores e médias, dentre outras características, tendo sido mantida no gênero pela presença de garras simples. Devido a posição filogenética de todas as espécies de *Manonychus* como grupo irmão de *Apterodemidea* + *Sericoides*, neste trabalho o gênero é alocado de incertae sedis para Sericoidini.

As análises demonstraram que *Manonychus* comportou-se como um grupo polifilético, sendo a sua monofilia recuperada (clado P) com a exclusão do clado O (*Manonychus rosettae*, *Manonychus* sp. 23 e *Manonychus* sp. 24). O clado P, correspondente a *Manonychus* **sensu novo**, é suportado por três transformações, uma sinapomórfica: 16:0 Maxila, margem lateral da gálea com lobo; e dois caracteres homoplásticos: 1:0 Fronte, distância entre os olhos, duas vezes a largura de um olho (exceto *Manonychus* sp. 20, *Manonychus* sp. 16, *Manonychus* sp. 13, *Manonychus* sp. 18, *Manonychus* sp. 19, *Manonychus* sp. 12, *Manonychus* sp. 15, *Manonychus* sp. 10 e *Manonychus* sp. 09) e 46:0 Metacoxas com comprimento subigual ao do ventrito II.

Manonychus conypigus aparece como grupo irmão dos demais, mas mantendo-se no gênero. *Manonychus birabeni* se reúne, em uma politomia, aos clados Q e R por três transformações homopláticas: 37:1 Metasterno, machos, sem cerdas densas e longas; 41:0 Protíbias, ângulo reto entre os dentes II e III; e 44:0 Mesofêmures, porção distal, dupla com fileira confluente de pontos. O clado Q, formado por *Manonychus* sp. 20 + (*Manonychus martinezi* + *Manonychus* sp. 3) + ((*Manonychus* sp. 14 + (*Manonychus* sp. 7 + *Manonychus* sp. 11 + *Manonychus* sp. 16)) é sustentado pela transformação homoplástica 56:1 Ventritos II ao VI sem linha transversal de pontos. O clado R reúne (*Manonychus ovalis* + (*Manonychus* sp. 2 + *Manonychus* sp. 5) + (*Manonychus densicollis* + *Manonychus* sp. 8 + *Manonychus* sp. 13 + *Manonychus* sp. 21 + *Manonychus* sp. 22 + *Manonychus* sp. 18 + *Manonychus* sp. 19 + *Manonychus* sp. 12 + *Manonychus* sp. 15 + *Manonychus* sp10 + *Manonychus* sp. 17 + *Manonychus* sp. 6 + *Manonychus* sp. 1 + *Manonychus* sp. 4 + *Manonychus* sp. 9 + *Manonychus rufinus* + *Manonychus unguicularis*))), sendo sustentado por dois caracteres em condição homoplástica: 32:1 Pronoto, canto posterior não projetado; 35:1 Mesepímero, canto posterior interno paralelo.

A característica referente ao número de artículos antenais, utilizada por Moser (1919) na descrição de *Manonychus* foi desconsiderada na presente análise por se tratar de um caráter não informativo. O número de artículos antenais é uma característica que ocasiona grande confusão em Melolonthidae, acarretando problemas quanto à busca de homologias entre os antenômeros (Krell, 1992). Outra característica diagnóstica apontada por Moser (1919) foi "tarsos anteriores dilatados com tufo de cerdas". No presente estudo, o caráter foi desmembrado quanto à distribuição e densidade das cerdas nos tarsos anteriores (caráter 53) e quanto a dilatação dos tarsos anteriores (caráter 54). A condição densa do caráter 53:1 ocorreu em todos os machos de *Manonychus*, exceto em *Manonychus rosettae*, *Manonychus* sp. 23 e *Manonychus* sp. 24 . Moser (1919), apontou que os tarsos anteriores de *M. unguicularis* apresentam a forma dilatada. Contudo, no presente estudo, analisando as demais espécies do gênero foi verificado que os tarsômeros anteriores são um pouco mais dilatados que os médios e posteriores, mas são cilíndricos, e não aplanados como os *Blepharotoma*.

Conclusão

Manonychus é um gênero polifilético. Contudo, sua monofilia é recuperada a partir da exclusão de *M. rosettae* e mais duas espécies novas que formam um clado com esta última. O posicionamento do gênero em Melolonthinae é definido pela incusão de *Manonychus* em Sericoidini. Por sua vez, a tribo parece ser polifilética pela relação de *Blepharotoma* com os gêneros de Liparetrini. Tal hipótese poderá ser testada quando outros terminais da tribo forem incluídos. Da mesma forma, a posição de *Blepharotoma* poderá ser melhor estabelecida. O resultado do relacionamento de *Manonychus rufinus* e *M. ovalis* com os demais *Manonychus* permite corroborar a transferência dessas espécies de *Hilarianus* para *Manonychus*, realizada por Cherman *et al*. (2016). Por fim, *Manonychus* é redefinido em relação à proposta original de Moser, agora por: gálea maxilar com margem lateral lobada; distância entre os olhos, duas vezes a largura de um olho; e comprimento das metacoxas e do ventrito II subiguais.

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Fiiguras

Figura 1. Morfologia externa de *Manonychus unguicularis* Moser. (A) clípeo; (B) fronte; (C) disco do pronoto; (D) escutelo; (E) élitro esquerdo; (F) sutura elitral; (G) pigídio; (H) garras protarsais; (I) protarsômero direito; (J) antena, antenômero equerdo; (K) protíbia direita, vista ventral; (L) prosterno; (M) profêmur direito, vista ventral; (N) mesoesterno; (O) metepisterno; (P) metasterno; (Q) metacoxa esquerda; (R) ventrito II; (S) metatíbia direita, carena transversal II. Escala:1mm.

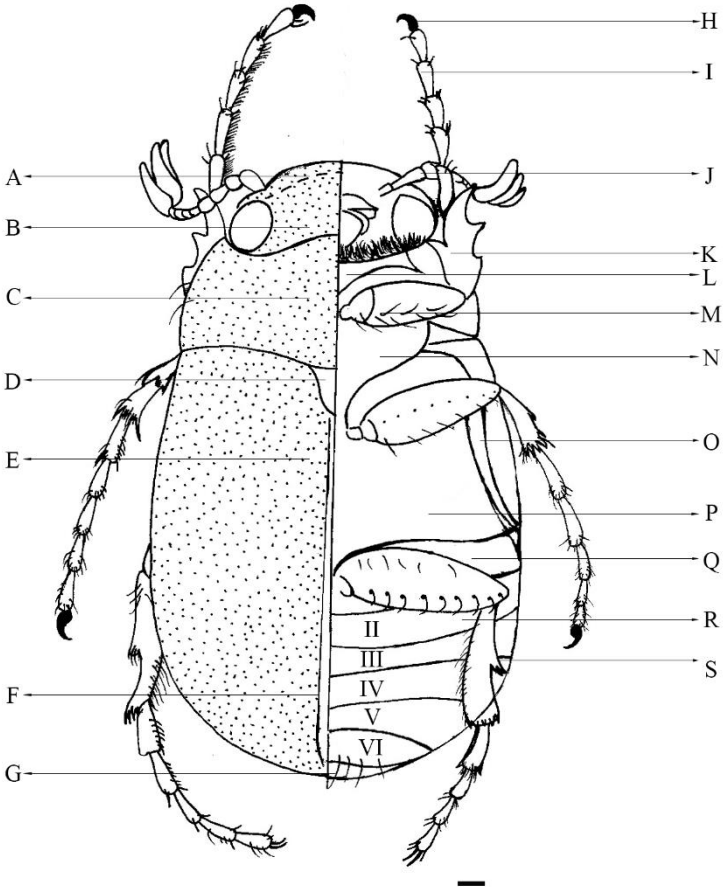


Figura 2. Genitália masculina de *Manonychus martinezi* Frey. (A) parâmero esquerdo, vista frontal; (B) margem externa do parâmero esquerdo; (C) margem interna do parâmero; (D) região distal do parâmero; (E) falobase, vista dorsal, margem distal escavada; (F) falobase, superfície; (G) falobase, constrição pós linha média; (H) genitália masculiana, vista lateral. Escala: 1mm.

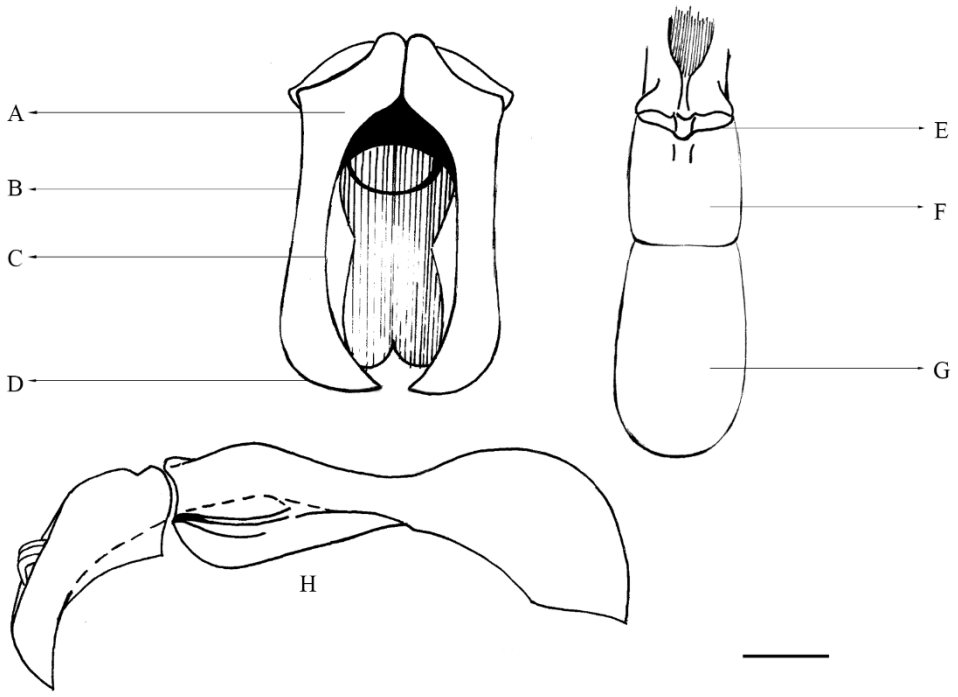


Figura 3. (A-C) Cabeça em vista dorsal; (D) cabeça e pronoto em vista dorsal; (E) cabeça, vista frontal; (F) mandíbula esquerda, mola multisulcada; (G) mandíbula direita, mola sulco superior, dentes; (H) maxila direita, vista dorsal; (I) palpômero maxilar direito, vista dorsal; (J) lábio, vista ventral; (K, L) pronoto. (A, K) *Manonychus martinezi* Frey; (B, H) *M. densicollis* Frey; (C) *Manonychus* sp. 1 (D) *M. rufinus* Blanchard (E, I, L) *M. unguicularis* Moser; (F) *M. ovalis* Blanchard; (G, J) *M. birabeni* Martínez. As setas indicam os caracteres e seus respectivos estados. Escala: 1mm.

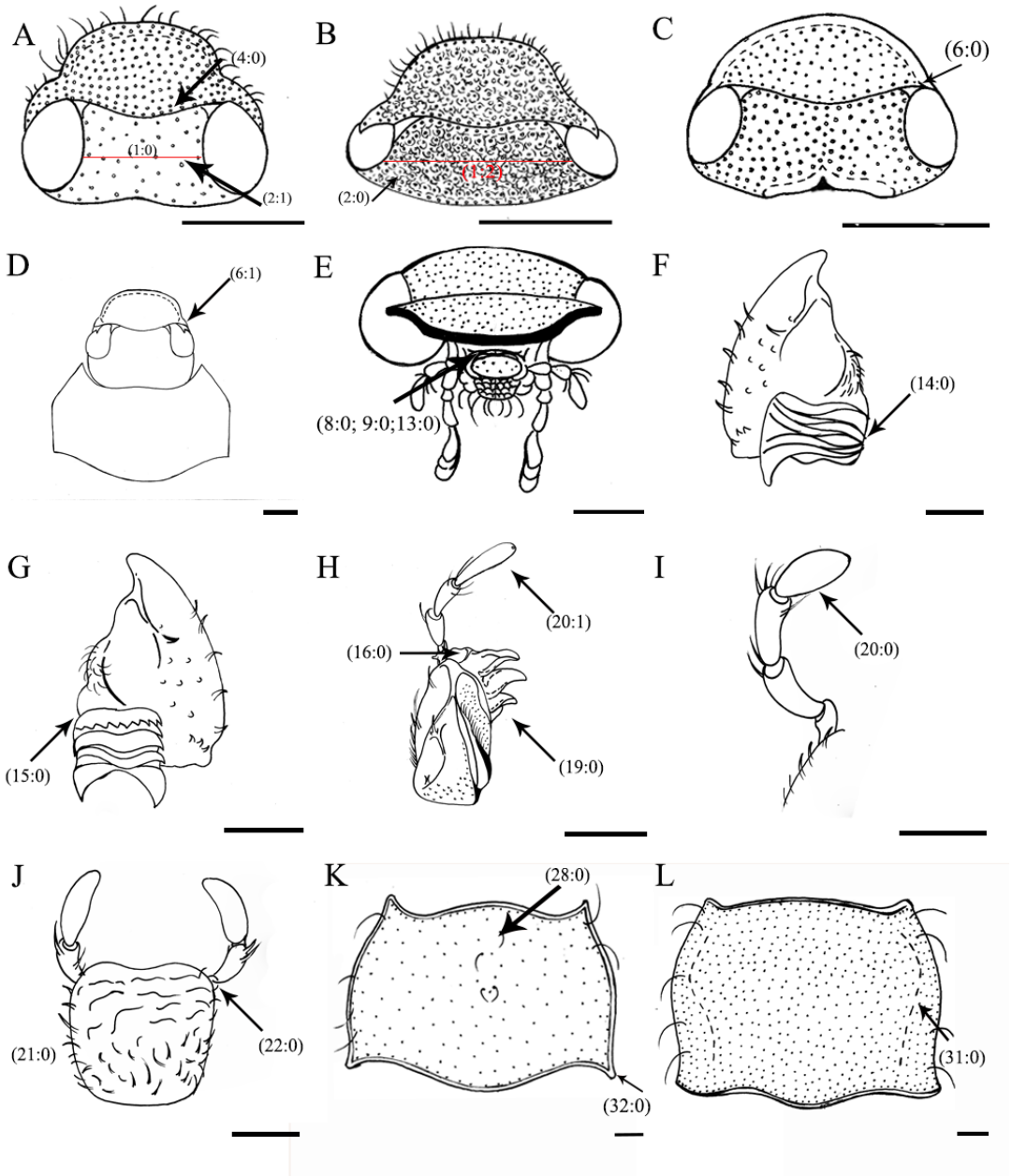


Figura 4. (A) élitro esquerdo e escutelo pontuado; (B) pterotórax, vista ventral; (C) perna anterior esquerda, vista ventral; (D) mesofemur direito, fileiras de pontos confluentes; (E) metatíbia direita, carena transversal II; (F) pro e mesotarsômeros, tufo de cerdas, vista lateral. (A, F) *Manonychus unguicularis* Moser; (B, C) *M. birabeni* Martínez. (D) *M. martinezi* Frey; (E) *Manonychus* sp. 10. As setas indicam os caracteres e seus respectivos estados. Escala: 1mm.

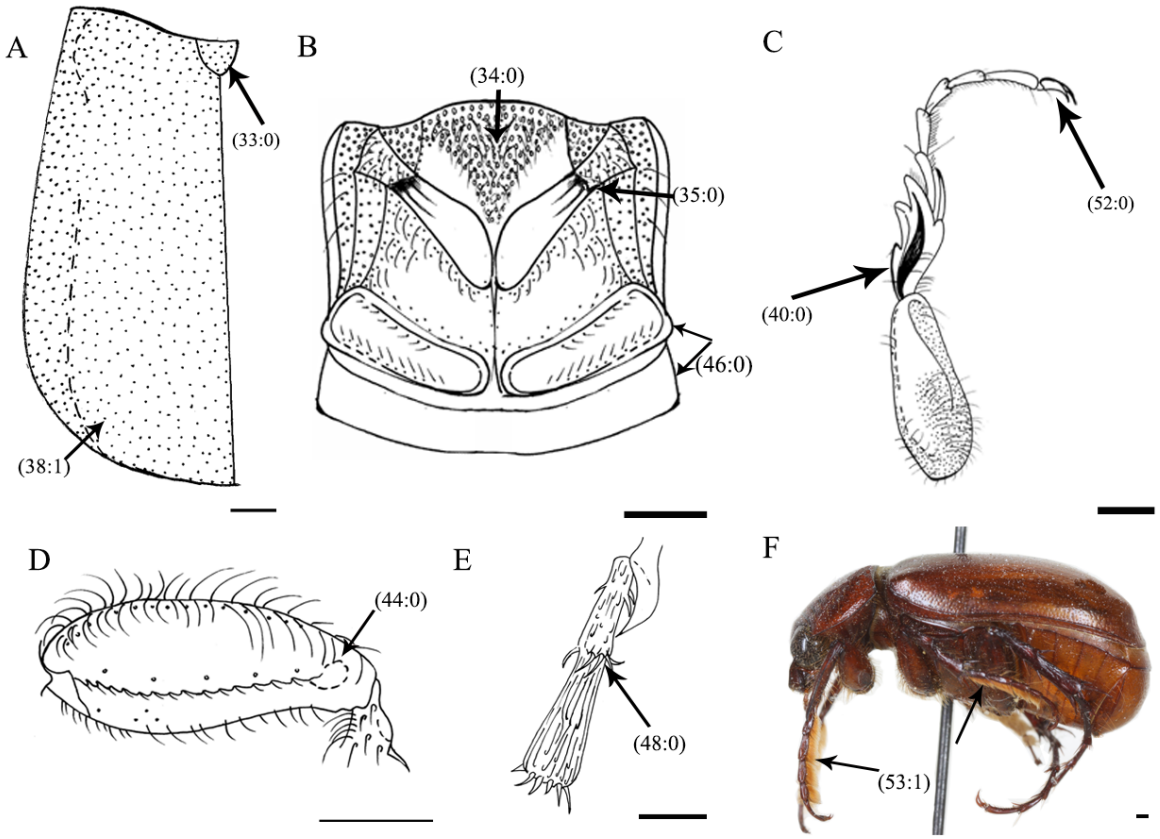


Figura 5. (A) abdome, vista lataeral; (B) abdome, vista ventral; (C) progídio e pigídio, vista frontal; (D, E) parâmeros, vista frontal; (F), genitália masculiana, vista lateral e falobase, vista dorsal. (A-C, E): *M. conypigus* Frey; (D) *M. unguicularis* Moser; (F) *Manonychus* sp.1 e *M. densicollis* Frey. As setas indicam os caracteres e seus respectivos estados. Escala: 1mm.

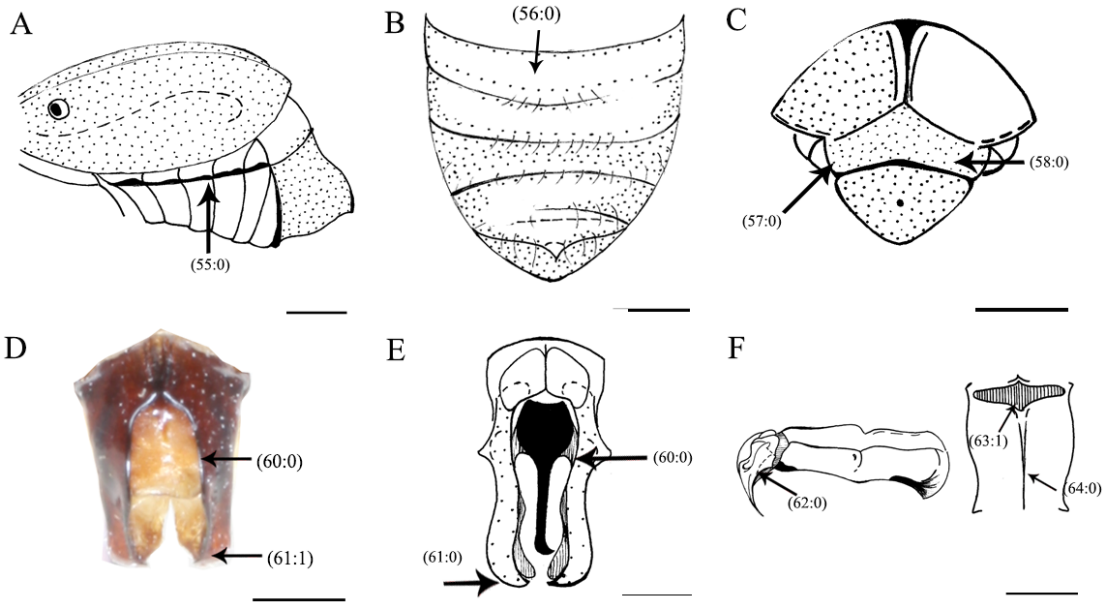


Figura 6. Cladograma de consenso estrito de *Manonychus* Moser, 1919 (Melolonthinae: Sericoidini), resultante de 10 árvores, com um total de 432 passos (IC=0,167; IR=0,532). As cores indicam as tribos de Melolonthinae. Caracteres acima e estados abaixo de cada ramo. Círculo preenchido, transformações não ambíguas, círculo vazio transformações ambíguas.

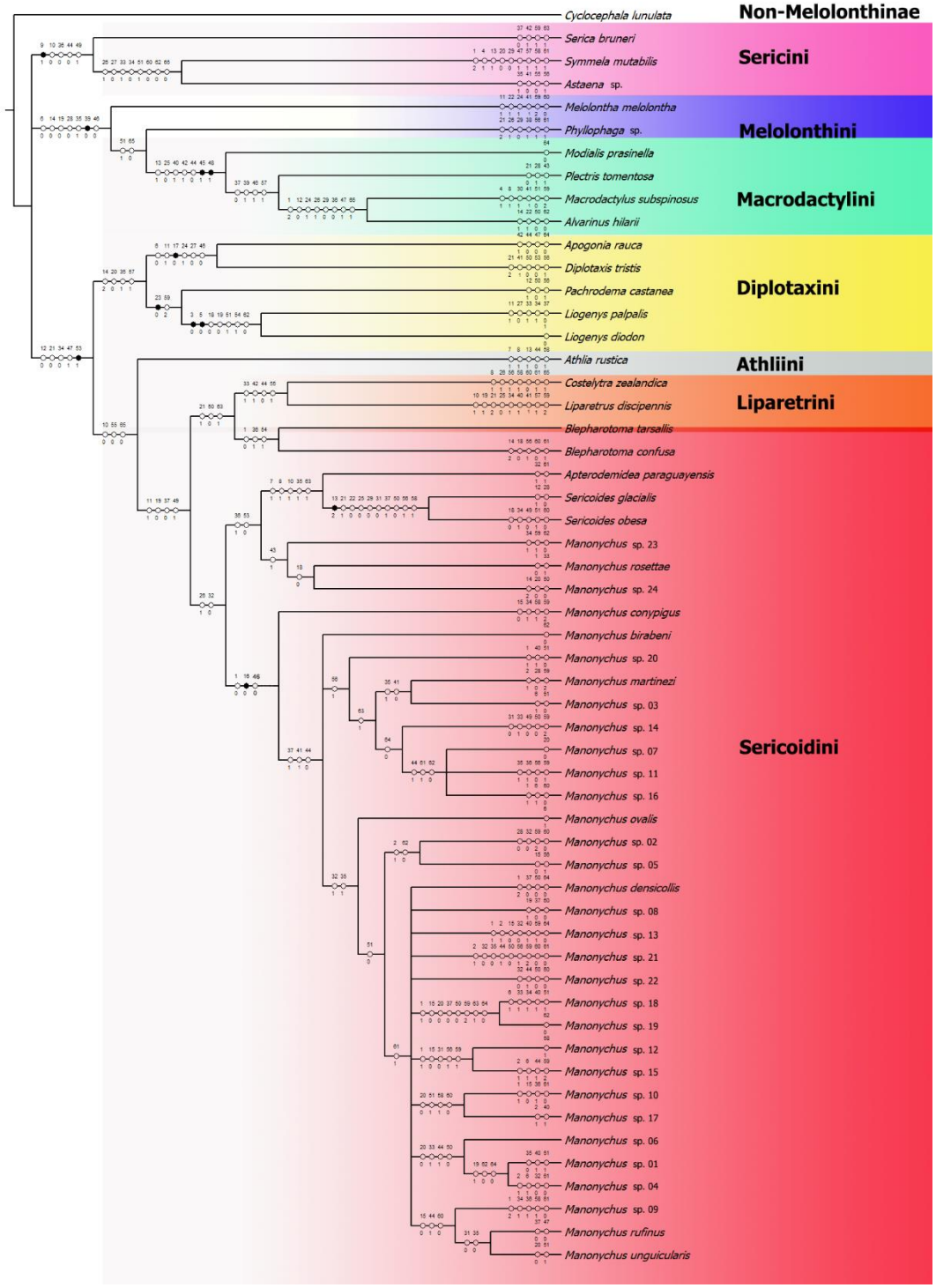
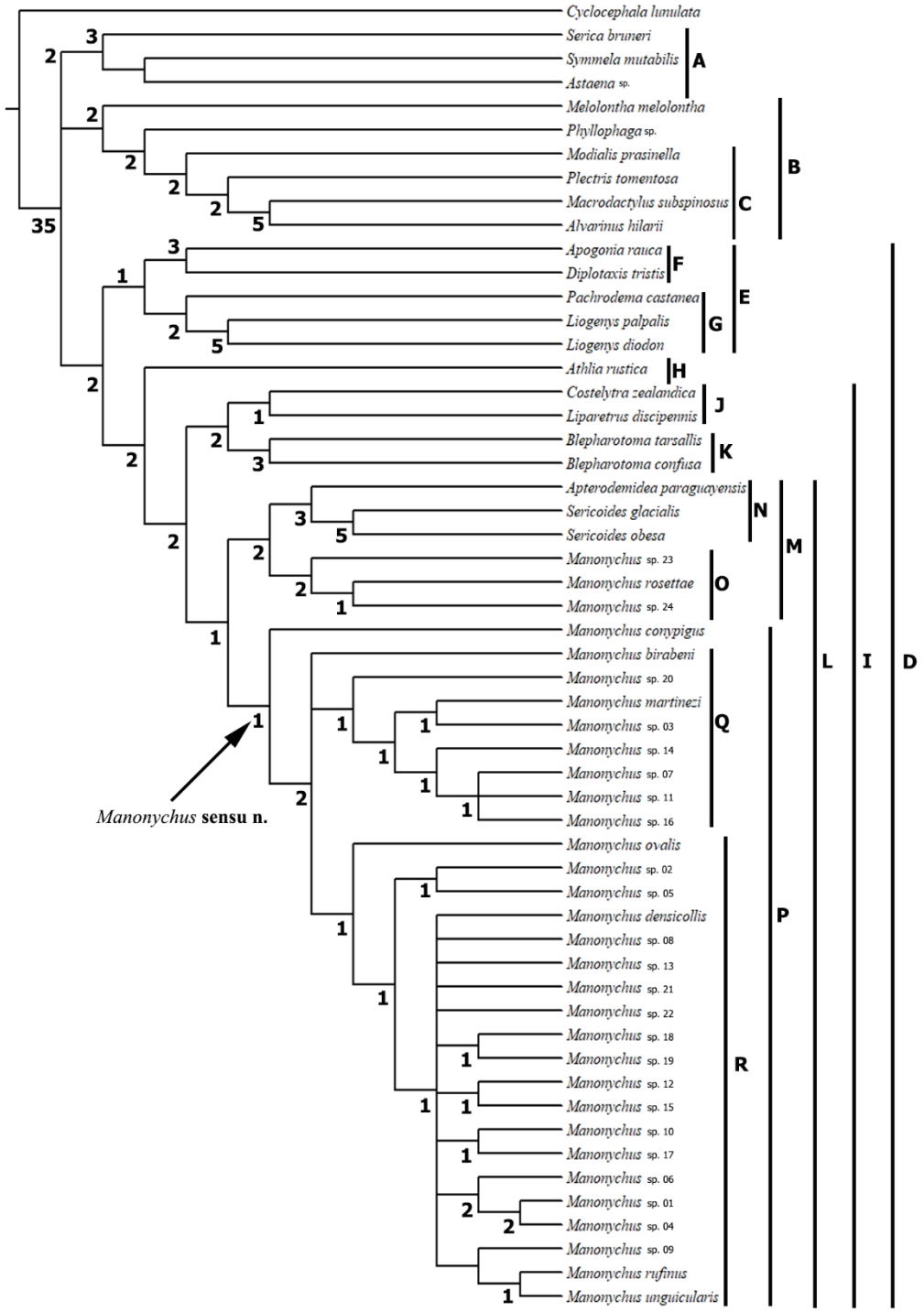


Figura 7 Cladograma de consenso estrito de *Manonychus* Moser, 1919 (Melolonthinae: Sericoidini), resultante de 10 árvores, com um total de 432 passos (IC=0,167; IR=0,532). Apoio dos clados obtidos segundo análise e suporte de Bremer absoluto.



Material Suplementar

Tabela 1. Lista das espécies incluídas na análise filogenética de *Manonychus* (Coleoptera: Melolonthinae: Sericoidini). (*) Tipo primário estudado; (§) Espécie-tipo do gênero.

Terminais	Material	Subfamília/Tribo	Distribuição do gênero	Número de indivíduos estudados	Coleção depositária
Grupos externos					
Cycloclephala lunulata Burmeister, 1847	§	Dynastinae/Cyclocephalini	Neártica/Neotropical	04	CEUFPE
Melolontha melolontha (Linaeus, 1758)	§	Melolonthinae/Melolonthini	Paleártica/Oriental	04	CEUFPE
Phyllophaga sp.	----	Melolonthinae/Melolonthini	Neotropical	06	CEUFPE
Alvarinus hilarii Blanchard, 1850	§	Melolonthinae/Macrodactylini	Neotropical	03	MZUP
Macrodactylus subspinosus (Fabricius, 1775)	§	Melolonthinae/Macrodactylini	Neártica/Neotropical	03	DZUP
Plectris tomentosa LePeletier de Saint-Fargeau & Audinet-Serville, 1828	§	Melolonthinae/Macrodactylini	Neotropical	02	MZUP
Modialis prasinella Fairmaire & Germain, 1860	§	Melolonthinae/Macrodactylini	Neotropical	04	MZUP
Athlia rustica Erichson, 1835	§	Melolonthinae/Macrodactylini	Neotropical	03	MZUP
Astaena sp	----	Melolonthinae/Sericini	Neotropical	05	MZUP
Serica bruneri (Linnaeus, 1758)	§	Melolonthinae/Sericini	Paleártica	02	MZUP
Symmela mutabilis Erichson, 1835	§	Melolonthinae/Sericini	Neotropical	02	MZUP
Apogonia rauca Fabricius, 1781	----	Melolonthinae/Diplotaxini	Neotropical	02	DZUP
Diplotaxis tristis Kirby, 1837	§	Melolonthinae/Diplotaxini	Neártica	02	DZUP
Liogenys palpalis (Eschscholtz, 1822)	§	Melolonthinae/Diplotaxini	Neártica	02	DZUP
Liogenys diodon Burmeister, 1855	----	Melolonthinae/Diplotaxini	Neotropical	04	CEUFPE
Pachrodema castanea Blanchard, 1851	§	Melolonthinae/Diplotaxini	Neotropical	03	DZUP
Liparetrus discipennis Guérin-Méneville,	§	Melolonthinae/Liparetrini	Australiana	02	MNHN

1830					
Costelytra zealandica White, 1846	----	Melolonthinae/Liparetrini	Australiana	02	MNHN
Apterodemidea paraguayensis (Arrow, 1903)	§	Melolonthinae/Sericoidini	Neotropical	08	CERPE
Blepharotoma tarsalis Blanchard, 1850	§	Melolonthinae/Sericoidini	Neotropical	03	ZMHB
Blepharotoma confusa Martínez, 1959	----	Melolonthinae/Sericoidini	Neotropical	02	NHMB
Sericoides glacialis (Fabricius, 1775)	§	Melolonthinae/Sericoidini	Neotropical	03	CEUFPE
Sericoides obesa (Germain, 1863)	----	Melolonthinae/Sericoidini	Neotropical	02	NHMB
Grupos internos					
Manonychus birabeni Martínez, 1959		Incertae sedis	Neotropical	07	MACN
Manonychus conypigus Frey, 1976	*	Incertae sedis	Neotropical	01	NHMB
Manonychus densicollis Frey, 1974	*	Incertae sedis	Neotropical	10	NHMB
Manonychus martinezi Frey, 1974	*	Incertae sedis	Neotropical	04	NHMB
Manonychus rosettae Frey, 1976	*	Incertae sedis	Neotropical	05	NHMB
Manonychus rufinus (Blanchard, 1850)	*	Incertae sedis	Neotropical	03	MNHN
Manonychus ovalis (Blanchard, 1850)	*	Incertae sedis	Neotropical	05	MNHN
Manonychus unguicularis Moser, 1919	*§	Incertae sedis	Neotropical	08	ZMHB

Tabela 2. Matriz de dados de 65 caracteres e estados atribuídos aos caracteres para as espécies incluídas na análise filogenética de *Manonychus* Moser, 1919 (Coleoptera: Melolonthidae). Dados não observados (?), dados não aplicáveis (-).

	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3
TAXONS/CARACTERES	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
Cyclocephala lunulata	0	0	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1
Serica bruneri	0	1	1	0	1	1	0	-	1	0	0	-	-	2	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	1	0	1
Symmela mutabilis	2	1	1	1	1	1	0	-	1	0	0	-	1	2	1	1	1	1	1	0	1	0	1	0	1	1	0	1	0	0	1	1	1	0
Astaena sp.	0	0	1	0	1	1	0	-	1	0	0	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	0	1	1	0	1	1	1	0
Melolontha melolontha	1	0	1	0	1	0	0	0	0	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	-	0	1	0	1	1	1	1	0	1
Phyllophaga sp.	0	0	1	0	1	0	0	0	0	1	0	1	0	0	1	1	1	1	0	1	2	0	1	0	1	1	1	0	0	0	1	1	0	1
Modialis prasinella	1	0	1	0	1	0	0	0	0	1	0	-	1	0	1	1	1	1	0	1	1	0	1	0	0	0	1	0	1	0	1	1	0	1
Plectris tomentosa	0	0	1	0	1	1	0	0	0	1	0	1	1	0	1	1	1	1	0	0	0	0	1	0	1	0	0	1	1	0	1	1	0	1
Macrodactylus subspinosus	2	0	1	1	1	1	0	1	0	1	0	0	-	0	1	1	1	1	0	1	1	0	1	1	-	1	0	0	0	1	1	1	0	1
Alvarinus hilarii	2	0	1	0	1	0	0	0	0	1	0	0	1	1	-	1	1	1	0	1	1	1	1	1	-	1	1	0	0	0	1	1	0	1
Apogonia rauca	2	0	1	1	1	0	0	0	0	1	1	0	0	2	-	1	0	1	1	0	0	0	1	1	-	0	0	1	1	1	1	1	0	0
Diplotaxis tristis	2	0	1	0	1	0	0	0	0	1	1	0	0	2	-	1	0	1	1	0	2	0	1	1	-	0	0	1	1	1	1	1	0	0
Pachrodema castanea	2	0	1	1	1	1	0	0	0	1	0	1	0	2	-	1	1	1	1	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0
Liogenys palpalis	2	0	0	1	0	1	0	0	0	1	1	0	0	2	-	0	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	1	1	1	1
Liogenys diodon	0	0	0	1	0	1	0	0	0	0	0	0	0	2	-	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0	1	1	1	0	0
Athlia rustica	2	0	1	0	1	1	1	1	0	0	0	-	1	0	1	1	1	1	1	1	0	1	1	0	1	0	1	0	1	0	1	1	0	0
Costelytra zealandica	2	0	1	0	1	1	0	1	0	0	1	0	0	0	1	1	1	1	0	1	1	0	1	0	1	1	0	0	1	0	1	1	1	0
Liparetrus discipennis	2	0	1	0	1	1	0	0	0	1	1	0	0	1	-	1	1	1	1	0	2	0	1	0	0	0	1	0	1	0	1	1	1	1
Blepharotoma tarsalis	0	0	1	0	1	0	0	0	0	0	1	0	0	1	-	1	1	1	0	0	1	0	1	0	1	0	0	0	1	0	1	1	0	0
Blepharotoma confuse	0	0	1	0	1	0	0	0	0	0	1	0	0	2	-	1	1	0	0	0	1	0	1	0	1	0	0	0	1	0	1	1	0	0
Apterodemidea paraguayensis	2	0	1	0	1	0	1	1	0	1	1	0	0	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Sericoides glacialis	2	0	1	0	1	0	1	1	0	1	1	1	-	0	1	1	1	1	0	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0
Sericoides obesa	1	0	1	0	1	0	1	1	0	1	1	0	-	0	1	1	1	0	0	1	1	0	1	0	0	1	1	1	0	0	0	0	0	1
*Manonychus sp. 2*3	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	1
Manonychus rosettae	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	1	1	0	0	1	0	1	1	0	1	1	1	1	1	0	1	0	1	0
*Manonychus sp. 2*4	1	0	1	0	1	0	0	0	0	0	1	0	0	2	-	1	1	0	0	0	0	1	1	0	1	1	1	1	1	0	1	0	0	0

Tabela 2. (Continuação)

TAXONS/CARACTERES	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Manonychus conypigus	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	1
Manonychus birabeni	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	0
Manonychus sp. 20	1	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	0
Manonychus martinezi	0	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	0	1	0	1	0	0	0
Manonychus sp. 3	0	0	1	0	1	1	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	0
Manonychus sp. 14	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	0	0	1	0
Manonychus sp. 7	0	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	0	0	0
Manonychus sp. 11	0	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Manonychus sp. 16	1	0	1	0	1	1	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Manonychus ovalis	0	0	1	0	1	1	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Manonychus sp. 2	0	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	0	1	0	1	0	0	0
Manonychus sp. 5	0	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Manonychus densicollis	2	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Manonychus sp. 8	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Manonychus sp. 13	1	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	0
Manonychus sp. 21	0	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	0
Manonychus sp. 22	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	0
Manonychus sp. 18	1	0	1	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	1	1	1
Manonychus sp. 19	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Manonychus sp. 12	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	0	1	0	0
Manonychus sp. 15	1	1	1	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	0	1	0	0
Manonychus sp. 10	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Manonychus sp. 17	0	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	1	0	0
Manonychus sp. 6	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	1	1	0
Manonychus sp. 1	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	1	0	0	1	1	0	1	1	1	1	1	0	1	1	1	0
Manonychus sp. 4	0	1	1	0	1	1	0	0	0	0	1	0	0	0	1	0	1	1	1	0	0	1	1	0	1	1	1	1	1	0	1	0	1	0
Manonychus sp. 9	2	0	1	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	1	0	1
Manonychus rufinus	0	0	1	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	0	1	0	0
Manonychus unguicularis	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	0	1	0	0

Tabela 2. (Continuação)

TAXONS/CARACTERES	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Cyclocephala lunulata	0	2	1	0	1	0	2	1	0	1	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	1	0	1	1
Serica bruneri	0	0	0	0	1	1	2	1	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	1	1	-	1	1	1	1
Symmela mutabilis	0	0	1	0	1	1	2	0	0	0	0	1	1	0	1	1	1	1	0	0	1	0	1	1	0	0	1	0	0	1	0
Astaena sp.	1	0	1	0	1	0	1	0	0	0	0	1	0	0	1	0	1	1	-	0	0	1	0	0	0	0	0	0	0	1	0
Melolontha melolontha	1	2	1	0	0	0	1	0	?	-	0	0	0	0	0	1	0	1	0	0	1	-	0	0	2	0	-	1	0	1	1
Phyllophaga sp.	1	2	1	1	0	0	2	0	0	1	0	0	0	0	0	1	1	1	0	0	1	1	0	0	0	1	1	1	0	1	0
Modialis prasinella	1	2	1	0	0	1	2	1	?	0	1	0	0	1	-	-	1	1	0	0	1	-	0	0	0	1	0	1	0	0	0
Plectris tomentosa	1	2	0	0	1	1	0	1	1	-	1	1	0	1	0	-	1	1	0	0	1	0	1	0	0	1	0	1	1	1	0
Macrodactylus subspinosus	1	0	0	0	1	1	1	1	0	0	1	1	1	1	0	1	0	1	0	0	1	0	1	0	2	1	0	1	1	1	1
Alvarinus hilarii	1	0	0	0	1	1	2	1	0	0	1	1	1	1	0	0	1	1	0	0	1	0	1	0	0	1	0	0	0	1	1
Apogonia rauca	1	2	1	0	1	0	2	1	0	0	0	0	0	0	0	1	0	1	1	0	1	0	1	0	0	1	0	1	0	0	1
Diplotaxis tristis	1	2	1	0	1	0	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1	1	0	0	0	1	1	0	1	1
Pachrodema castanea	1	2	1	0	1	0	2	0	0	1	0	1	1	0	0	0	0	1	1	0	1	1	1	1	2	0	1	1	0	1	1
Liogenys palpalis	1	2	0	0	1	0	2	0	?	1	0	1	1	0	0	1	1	1	1	1	1	0	1	0	2	0	1	0	0	1	1
Liogenys diodon	1	2	1	0	1	0	2	0	0	1	0	1	1	0	0	1	1	1	1	1	1	0	1	1	2	0	1	0	0	1	1
Athlia rustica	0	2	1	0	1	0	2	0	0	0	0	1	1	0	0	1	1	1	1	0	0	-	0	1	0	1	0	1	0	1	0
Costelytra zealandica	0	2	?	0	1	0	2	1	0	0	0	1	1	0	1	0	0	0	?	0	1	1	0	1	0	0	1	1	1	1	1
Liparetrus discipennis	?	2	?	1	1	1	1	1	?	0	0	1	1	0	1	0	0	0	?	0	1	0	1	0	2	1	0	1	?	?	0
Blepharotoma tarsalis	0	1	0	1	1	0	2	0	0	1	0	1	1	0	1	0	1	1	1	1	0	0	0	0	0	1	0	1	1	1	0
Blepharotoma confuse	0	1	0	1	1	0	2	0	0	1	0	1	1	0	1	0	1	1	1	1	0	1	0	0	0	0	1	1	1	1	0
Apterodemidea paraguayensis	1	1	0	1	1	0	2	0	0	1	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
Sericoides glacialis	1	1	1	0	1	0	2	0	0	1	0	1	1	0	1	0	0	0	0	0	0	1	0	1	0	1	0	1	1	1	0
Sericoides obesa	1	1	1	0	1	0	2	0	0	1	0	1	1	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	1	1	0
Manonychus sp. 23	0	1	0	0	1	0	2	0	1	1	0	1	1	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
Manonychus rosettae	0	1	0	0	1	0	2	0	1	1	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0
Manonychus sp. 24	0	1	0	0	1	0	2	0	1	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0

Tabela 2. (Continuação)

TAXONS/CARACTERES	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Manonychus conypigus	0	2	0	1	1	0	0	0	0	1	0	0	1	0	1	1	1	0	1	0	0	0	0	1	2	1	0	1	0	1	0
Manonychus birabeni	0	2	1	1	1	0	1	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	1	0
Manonychus sp. 20	0	2	1	1	1	1	1	0	0	0	0	0	1	0	1	1	0	0	1	0	0	1	0	0	0	1	0	1	0	1	0
Manonychus martinezi	1	2	1	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	0	1	0	0	2	1	0	1	1	1	0
Manonychus sp. 3	1	2	1	1	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	1	0	0	0	1	0	1	1	1	0
Manonychus sp. 14	0	2	1	1	1	0	1	0	0	0	0	0	1	0	1	0	1	0	1	0	0	1	0	0	2	1	0	1	1	0	0
Manonychus sp. 7	0	2	1	1	1	0	1	0	0	1	0	0	1	0	1	1	1	0	1	0	0	1	0	0	0	1	1	0	1	0	0
Manonychus sp. 11	1	1	1	1	1	0	1	0	0	1	0	0	1	0	1	1	1	0	1	0	0	0	0	0	1	1	1	0	1	0	0
Manonychus sp. 16	0	2	1	1	1	0	1	0	0	1	0	0	1	0	1	1	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0
Manonychus ovalis	1	2	1	1	1	0	1	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	1	0	1	0	1	0
Manonychus sp. 2	1	2	1	1	1	0	1	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	2	0	0	0	0	1	0
Manonychus sp. 5	1	2	1	1	1	0	1	0	0	0	0	0	1	0	1	1	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0
Manonychus densicollis	1	2	0	1	1	0	1	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0
Manonychus sp. 8	1	2	0	1	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0
Manonychus sp. 13	1	2	1	1	1	1	0	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	1	1	1	1	0	0	0
Manonychus sp. 21	0	2	1	1	1	0	0	0	0	1	0	0	1	0	1	0	0	0	1	0	0	1	0	0	2	0	0	1	0	1	0
Manonychus sp. 22	1	2	1	1	1	0	0	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0
Manonychus sp. 18	1	2	0	1	1	1	1	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	2	1	1	1	1	0	0
Manonychus sp. 19	1	2	0	1	1	0	1	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	2	1	1	0	1	0	0
Manonychus sp. 12	1	2	1	1	1	0	1	0	0	0	0	0	1	0	1	1	0	0	?	0	0	1	0	1	1	?	?	?	?	?	?
Manonychus sp. 15	1	2	1	1	1	0	1	0	0	1	0	0	1	0	1	1	0	0	1	0	0	1	0	0	2	1	1	1	1	0	0
Manonychus sp. 10	1	1	1	1	1	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	1	0	0	0	1	0	1	0
Manonychus sp. 17	1	2	1	1	1	1	0	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	1	0	0	1	1	0	1	0
Manonychus sp. 6	1	2	1	1	1	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	2	1	1	1	0	1	0
Manonychus sp. 1	0	2	1	1	1	1	0	0	0	1	0	0	1	0	1	0	1	0	1	0	0	0	0	0	2	1	1	0	0	0	0
Manonychus sp. 4	1	2	1	1	1	0	0	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
Manonychus sp. 9	1	1	1	1	1	0	1	0	0	1	0	0	1	0	1	1	0	0	1	0	0	0	0	1	0	0	0	1	0	1	0
Manonychus rufinus	0	2	0	1	1	0	1	0	0	1	0	0	0	0	1	1	0	0	?	0	0	0	0	0	0	?	?	?	?	?	?
Manonychus unguicularis	0	2	1	1	1	0	1	0	0	1	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0

4 TAXONOMIC REVISION OF *MANONYCHUS* MOSER, 1919 (COLEOPTERA: MELOLONTHIDAE: MELOLONTHINAE: SERICOIDINI)

Abstract

Manonychus Moser, 1919, occur predominantly to Brazil and placed in incertae sedis of Melolonthinae for over ten years, before its recent postion to Sericoidini (Chapter 1). The genus is revised, its richness increased from 7 to 30 species, out of which 23 are new species: *Manonychus bidentatus* **new species**; *Manonychus boraceiensis* **new species**; *Manonychus bravoi* **new species**; *Manonychus casariae* **new species**; *Manonychus cleideae* **new species**; *Manonychus cordiformis* **new species**; *Manonychus cuiabanus* **new species**; *Manonychus depressus* **new species**; *Manonychus freyi* **new species**; *Manonychus gracilis* **new species**; *Manonychus iris* **new species**; *Manonychus maranhensis* **new species**; *Manonychus massuttiae* **new species**; *Manonychus mermudesi* **new species**; *Manonychus monodentatus* **new species.**; *Manonychus morretensis* **new species**; *Manonychus moroni* **new species**; *Manonychus moseri* **new species**; *Manonychus omegoides* **new species**; *Manonychus paschoali* **new species**; *Manonychus planaltinensis* **new species**; *Manonychus stanleei* **new species**; *Manonychus truncatus* **new species**. The geographical distribution of the genus is updated, throughout Brazil excepting the Amazon region and expanded to Bolivia. A Key to species is presented along with illustrations, distributional data, and maps for all of them.

Key words: Chafers; Neotropics; Scarabaeoidea; systematics; taxonomy.

Introduction

Manonychus Moser, 1919 is a small genus described by monotype based on *M. unguicularis* Moser, 1919 within Melolonthidae (Melolonthinae). Nowadays comprises seven species, all endemic to Brazil. According to Moser (1919), *Manonychus* resembles *Liogenys* Guérin-méneville, 1831, *Pachrodema* Blanchard, 1851 and *Hilarianus* Blanchard, 1851. *Manonychus* distinguish from these genera by subrounded clypeus; antennae with nine antenomeres; dilated protarsomeres and with pads; all legs with simple fine and long claws; sexual dimorphism identified by protarsomeres with pads and dilated on males. Martínez (1959) described the second species, *M. birabeni* Martínez, 1959, which differs from *M. unguicularis* mainly by the pronotum shape (pronotal posterior corners almost straight) and antennae with long lamellae. Then, Frey (1974; 1976) made important contributions to *Manonychus* through descriptions of four species, as well as illustrations from male genitalia. In 1974, the author described *M. densicollis* Frey, 1974 and *M. martinezi* Frey, 1974, and reaffirms the resemblance with *Liogenys* and *Hilarianus*. In 1976, Frey described *M. conypigus* and *M. rosettae*. Recently, Cherman et al. (2016), transferred *Hilarianus rufinus* Blanchard, 1851 and *H. ovallis* Blanchard, 1851 to *Manonychus*.

The tribal classification of *Manonychus* has always been uncertain. In Blackwelder (1944) the genus is classified as Macrodactylini (Melolonthinae), also followed by Martínez (1959) and Frey (1974, 1976), until the Melolonthinae catalogs (Evans 2003; Evans and Smith 2005). The authors of the species on their own (Moser 1919; Frey 1974; 1976) compared *Manonychus* species with genera today placed in Diplotaxini (Evans and Smith 2009; Cherman et al. 2016), indicating that the features of the genus were not in the context of a tribal identity. Gutierrez (1952) was the only one who mentioned *Manonychus* into identification key, near to *Liogenys*. Lately, this genus was considered as incertae sedis within the subfamily (Katovich 2008; Evans and Smith 2009). Katovich (2008) mentioned that it is likely to be placed in Liparetrini or Sericoidini but, the author considered it has to be confirmed if more data morphological characters were included.

The latest contribution was a phylogenetic analysis, which painted the monophyly of genus and propose a position into Sericoidini (Chapter 1), from removing: *Manonychus rosettae*, *Manonychus* sp. 23 and *Manonychus* sp. 24 (Costa et al., accepted). In addition, after removing from taxa, was described a new genus based

on *Manonychus rosettae* (*Ovomanonychus* Costa et al., accepted) along two new species, within Sericoidini. In the present paper *Manonychus* is revised with 23 new species, the distribution records are updated for all species, and a key to species is presented along with illustrations.

Material and Methods

Material examined

Approximately 240 specimens of *Manonychus*, including the primary types, were studied during this revision. The specimens studied are deposited in the following collections, which acronyms are used according to Evenhuis (2016), when available:

CEMT Coleção de Zoologia da Coleção Entomológica da UFMT, Cuiabá, Mato Grosso, Brazil.

CERPE Coleção Entomológica da Universidade Federal Rural de Pernambuco, Pernambuco, Brazil.

CEUFPE Coleção Entomológica da Universidade Federal de Pernambuco, Recife, Pernambuco, Brazil

DZRJ Coleção Entomológica Professor José Alfredo Pinheiro Dutra, Rio de Janeiro, Brazil.

DZUP Coleção Entomológica Pe. J.S. Moure, Universidade Federal do Paraná, Curitiba, Brazil.

MHNRJ Museu Nacional, Universidade Federal do Rio Janeiro, Rio de Janeiro, Brazil.

MZFS Museu de Zoologia da Universidade Estadual de Feira de Santana, Feira de Santana, Bahia, Brazil.

MZUFBA Museu de Zoologia da Universidade Federal da Bahia, Salvador, Bahia, Brazil.

MZSP Museu de Zoologia, Universidade de São Paulo, São Paulo, São Paulo, Brazil.

NHMB Naturhistorisches Museum, Basel, Switzerland.

ZMHB Museum für Naturkunde der Humboldt-Universität, Berlim, Germany.

Morphological study

The present study was based on external morphology including, mouthparts and male genitalia. Specimens of each species were dissected, genitalia and/or mouthparts mounted beneath the specimen and examined and drawn using a Leica MZ6 stereomicroscope. The photographs were taken with Leica LAS Montage (Leica Microsystems, Wetzlar, Germany), Canon Rebel T5 / lens Canon Ef 100mm F/2.8 Macro Usm and Leica DFC 500 digital camera, using Auto-Montage Pro (Syncroscopy) software and a Leica MZ16 stereomicroscope. Body measurements were made on the

largest and smallest male and female specimens of each species with a micrometric ocular adapted to the Leica MZ6 stereomicroscope.

The morphological terms used on descriptions follow: *morphology of body and mouthparts* (Lacroix 1989; Moser 1919; Gutiérez 1952; Martínez 1959; Frey 1974; Frey 1976; Smith 2008 and Lawrence et al. 2011) *punctuation standards* (Haris 1919; Cherman and Almeida 2015); *male genitalia* (Ahrens and Lago 2008; Tarasov and Génier 2015). Species descriptions and redescription were adapted following Ratcliffe's, (2013) recommendations.

Data from the labels of the holotype material were transcribed between quotation marks (“”) with lines separated by slash marks (/). Data from paratypes and material examined were recorded as follows: name of country written in uppercase letters, name of state in bold, followed by municipality, other information (when present), sex, date, collector and collection.

Maps were created in ArcGIS (version 10.2), based on locality information beared on the labels and from literature.

The sequence of the descriptions followed the key order. This was based mainly on male features, except those species that only have females.

All the authors of this manuscript were equally responsible for coining the name and for satisfying all other availability criteria of each nomenclatural act.

Results

Systematics

***Manonychus* Moser, 1919**

Type species: *Manonychus unguicularis* Moser, 1919 by monotype

Figures 1 - 4

Manonychus Moser, 1919: 346; Blackwelder 1944: 227 (checklist); Gutierrez 1952 (identification key); Frey 1974: 320 (revision); Frey 1976: 377-378 (revision); Evans 2003: 302 (checklist); Katovich 2008 (taxonomic *status*); Evans and Smith 2005: 255-256 (checklist); Evans and Smith 2009: 308 (checklist); Krajcik 2012: 156 (catalogue); Cherman et al. 2016 (systematic); Grossi and Vaz-de-Mello 2020 (checklist-online); Costa et al., unpublished data (systematics).

Diagnosis. *Manonychus* is distinguished from all other Melolonthidae by the following combination of characters: Labium longer than it is wide; mala with transverse multigrooves; galea with outer margin lobed; antennae with nine antennomeres; profemur with aggregated punctures extending from the base to the disc; pro and mesotarsomeres I-IV with pads; metacoxae length equal to ventrite II length; all claws simple (Figure 1).

Redescription. Length 6.5-11 mm; width 3.0-5.5 mm. Body subparallel, species from wider medially to uniform in width; variable in color, from black, yellow, reddish-brown or brown, uniform or with head and pronotum different from elytra, the later usually lighter in color. *Head*: Anterior margin rounded; distance between eyes twice or five times the width of one eye; frons with punctures (dense or sparse); fronto-clypeal suture strongly impressed; clypeus trapezoidal or subrounded, anterior margin strongly bent upwards (Figure 1A), sometimes slightly emarginated; canthus covered by clypeus or not (Figure 1B); slightly sinuous in lateral view (Figure 1C); labrum vertical; superior margin bulged, hidden below clypeus, separated from it by a suture; mala transversely multigrooved (Figure 1D), sometimes four to eight grooves; sometimes proximal margin from it serrated (Figure 1E); outer margin of galea lobed (Figure 1F); teeth fused, teeth variable in number, from five, to seven; tooth I projected (concealing following tooth) or parallel; distal portion of lacinia toothed in most species (Figure 1F); distal maxillary palpomere with maximum width equal to apex (Figure 1F) or to up to twice the width of apex (Figure 1G); sensorial area flat and distal region bristled or

glabrous; labium longer than wider and apex wider than base; three labial palpomeres, palp insertion covered by labium and placed submedially (Figure 1H); labial anterior margin rounded; ligula and labium fused; antennae with nine antennomeres; club usually yellow uniform, sometimes colours different to flagellum. *Protorax*: Pronotum wider than longer, glabrous in most species; disc smooth, sparsely or densely punctate (Figures 2A; 2B); margin of anterolateral region slightly depressed or flat, arched or straight, with dense or sparse bristles; pronotal anterior and posterior corners rounded or acute; prosternum smooth or punctuated laterally. *Pterothorax*: Scutellum subtriangular or triangular in shape (Figures 2C; 2D), smooth or punctate, when so, punctures disposed randomly; mesosternum with circular and foveolate punctures, mainly on basis (Figure 2E), associated with short or long bristles, when so, extending past mesosternum margin; mesepimerum with inner corners parallel or projected (Figure 2E); metasternum bristles long, densely or sparsely disposed on anterior and lateral region around from discrimen; distance between meso and metacoxae equal or longer to the length of metacoxae; metepisternum with fine and coarse posterior punctures. *Elytra*: Shiny, glabrous; fine and coarse punctures densely disposed, elytral suture slightly elevated, usually darker than remaining elytra; outer margin angled or straight (Figure 2F). *Legs*: procoxae: usually with punctures on proximal region; profemur with aggregated punctures extending from base to disc (Figure 3A); protibia with two (Figure 3B) or three teeth; acute or obtuse angle from tooth II to tooth III of protibia; protarsomeres cylindrical (Figure 3B), protarsomere I longer than II, in most species; protarsomere III as long as IV; protarsomere V longer than IV; mesocoxae contiguous, punctuated distally and twice longer than it is wide; mesofemures with double row of confluent punctures (Figure 3C) or parallel; proximal portion punctuated; mesotibia gradually enlarged towards apex or almost straight, with two transverse carinae; transverse carinae II incomplete (not reaching the inner margin of mesotibia) (Figure 3D); two apical spurs in equal size and positioned below and above the tarsal articulation; mesotarsomeres with equal length; metacoxae length equal to ventrite II length (Figure 3E); metacoxal lateral margin obtuse or right angle; metafemur with row of punctures posteriorly complete or incomplete; transverse carinae II incomplete; metatibial with two apical spurs in different or equal size and positioned below and above the tarsal articulation; metatibial surface from distal portion prominent (Figure 3F) or flat in frontal view; metatarsomeres with tarsomere I shorter than II, in most

species; other tarsomere with equal length ventral surface of all tarsomeres with sparse bristles; all legs with symmetrical, simple claws. *Abdomen*: Six fused ventrites, except ventrite VI articulate; lateral keel along ventrites (Figure 3G); punctate or smooth and variable in length; ventrite VI visible, ventrites II-VI with transverse row of bristled punctures (Figure 3H); propygidium visible or hidden by elytra; punctate with tiny bristles or smooth and glabrous; pygidium subtrapezoidal (Figure I), wider than long, longer than wide or as wide it is long, with fine punctures, if they were less than 0.02 mm, never ocellated; basal width of the pygidium wider than or equal to the posterior width of propygidium.

Male. Length 6.5-11 mm; width 2.5-5.5 mm. Clypeus and pronotum narrow; lamellae longer than flagellum; protibia with two or three teeth, usually the basal tooth reduced; pro and mesotarsomeres I-IV with pads of bristles; *Genitalia*: parameres symmetrical or asymmetrical (Figures 4A; 4B); deflected distally (Figure 4A) or not deflected and converging or parallel on apex (Figure 4C); usually smooth; proximal region membranous or sclerotized; outer and inner margins sometimes toothed; inner margins straight (Figure 4C) or curved (Figure 4D); some species inner margins elevated in flap; few species with central apophysis in parameres (Figure 4E); laterally excavated (Figure 4F) or flat; phallobase in dorsal view, distal margin constricted or not; medial longitudinal line visible or hidden; medial portion of distal margin lobbed.

Female. Length 7.0-12 mm; width 3.0-6.0mm. In general, longer and wider than males mainly at the abdomen. Clypeus and pronotum usually wider; antennae with lamellae shorter; protibiae wider, teeth II and II well developed; protarsomeres without setose pads ventrally on I-IV, sparse bristles instead.

Etymology. Present proposal**.** Adjective in the nominative singular, masculine in gender. From the Ancient Greek μανός (mānós): "*gracilis",* simple + νύχι (nýchi): "*unguis",* nail, claw. The name of the genus is referring to the simple or thin claws in all legs, which is uncommon among the Melolonthines, usually with bifid claws.

Geographical distribution known. *Manonychus* is extended for almost all Brazilian territory, at Northeast region (Maranhão, Piauí, Pernambuco and Bahia); Midwest (Mato Grosso, Goiás, Distrito Federal and Mato Grosso do Sul); Southeast (Minas Gerais, Espírito Santo, Rio de Janeiro and São Paulo) and South (Paraná and Santa Catarina). This work includes the first record of the genus outside Brazil, in Santa Cruz at Bolivia (*M. unguicularis*) (Figures 5-8).

Remarks. As stated in Costa et al. (unpublished data), *Manonychus* shared characters with Sericoidini (which includes the following genera: *Apterodemidea* Gutiérez, 1952, *Blepharotoma* Blanchard, 1850 and *Sericoides* Guérin-Méneville, 1839): labrum hidden below the clypeus, not on same plane, separated by suture; distal maxillary palpomere with sensory area flat; galea with teeth fused; palpomeres placed submedially; protarsomeres cylindrical (except males from *Blepharotoma,* in which they are pyriformis); meso e mesotibia with two transverse carinae, being carinae II incomplete; metatibial apical spurs set below and above the tarsal articulation; meso and metasternal process absent; with two apical spurs, spurs set below and above the tarsal articulation (tarsus moves between tibial spurs); all claws symmetrical.

Manonychus resembles *Apterodemidea* in the all legs with simple claws; elytra without ridges parallel and mala with transverse multigrooved. Nevertheless, it differs by galea with outer margin lobed (galea with outer margin not lobed); males with protarsomeres and mesotarsomeres with pads (tarsomeres in all legs with sparse bristles); antennae lamellae from different size between gender (equal size) and posterior wings developed (posterior wings reduced, almost apters).

Manonychus resembles *Blepharotoma* in the clypeus deflected and males with protarsomeres and mesotarsomeres with pads. Nevertheless, it differs by ligula and labium fused (ligula and labium separated by suture); labium quadrate (labium oblong); all legs with simple claws (all legs with split claws); head and elytra glabrous (head and elytra partially or completely bristled).

Manonychus resembles *Sericoides* in the all legs with simple claws; labrum separated from clypeus. Nevertheless, it differs by labrum hidden below the clypeus (labrum protruding well beyond clypeus in dorsal view); labrum vertical (labrum subhorizontal); males with protarsomeres and mesotarsomeres with pads (tarsomeres in all legs with sparse bristles); males and females with three lamellae club (males with five and females with five lamellae club); scutellum wider than long (scutellum longer than wide); pronotum with posterior margin not lobed (pronotum with posterior margin lobed medially).

Key to species of *Manonychus* Moser, 1919

1 Males and females with pygidium depressed..... 2.

- Males and females with pygidium not depressed (disc with the same plane).. 3.

2 Elytra shiny, reddish-light brown and pale yellow; ventral region with sparse bristles; pygidial apex with a regular depression. Minas Gerais and São Paulo (Brazil)…….… *Manonychus rufinus* (Blanchard, 1851).

- Elytra shiny, uniform reddish-brown; ventral region with dense bristles; pygidial apex to apical third with not regular and strong depression. Maranhão (Brazil)..…….... *Manonychus depressus* **sp. nov.**.

3 Protarsomere V of males with base curved and enlarged distally…...……..... 4.

- Protarsomere V of males with base straight and not enlarged distally..... 8.

4 Ventrite(es) with lateral margin projected in flap..... 5.

- Ventrites with lateral margin not projected in flap..…..... 6.

5 All lateral margin of ventrites with projection; inner margin of parameres with medial tooth on apex; inner margins elevated and contiguous flap. Rio de Janeiro (Brazil)……..... *Manonychus moseri* **sp. nov.**.

- Only lateral of ventrite V with projection; parameres with inner margins unarmed elevated, not contiguous flap. Minas Gerais, Rio de Janeiro and São Paulo (Brazil)..... *Manonychus boraceiensis* **sp. nov.**.

6 Propygidium glabrous and hidden by elytra. Paraná (Brazil)….. *Manonychus morretensis* **sp. nov.**.

- Propygidium with bristles and visible.....7.

7 Propygidium finely punctate; basal width of the pygidium equal to the posterior width of propygidium; parameres in lateral view, strongly sinuous on third basal. Rio de Janeiro and Espírito Santo (Brazil)…..... *Manonychus massuttiae* **sp. nov.**.

- Propygidium coarsely punctate; basal width of the pygidium wider than posterior width of propygidium; parameres in lateral view, slightly sinuous on third basal. Bahia, Minas Gerais and São Paulo (Brazil)..... *Manonychus freyi* **sp. nov.**.

8 Male genitalia with parameres asymmetrical..... 9.

- Male genitalia with parameres symmetrical..... 12.

9 Pronotal margin with dense bristles. Pernambuco and Bahia (Brazil)… *Manonychus moroni* **sp. nov.**.

- Pronotal margin with sparse bristles…… 10.

10 Meso and metatibia with fine longitudinal sculpture (scars). Bahia (Brazil)…….. *Manonychus bravoi* **sp. nov.**.

- Meso and metatibia punctate or smooth, never with longitudinal sculpture (scars) ……..……..... 11.

11 Pronotum disc smooth, laterally with dense punctures; inner margin from paramere right with strong retiring, left paramere divided on medium region. Distrito Federal and São Paulo (Brazil)..... *Manonychus planaltinensis* **sp. nov.**.

- Pronotum disc sparsely punctate; inner margin from right paramere with tooth up projected medially. Ceará, Tocantíns and Paraná (Brazil)…..... *Manonychus monodentatus* **sp. nov.**.

12 Canthus not covered by clypeus..... 13.

- Canthus covered by clypeus..... 16.

13 Clypeus slightly emarginated (like a beak); parameres slim distally, occupying together one half of the phallobase width. Bahia (Brazil)..... *Manonychus gracilis* **sp. nov.**.

- Clypeus not emarginated; parameres large, together, with equal wide or longer than phallobase..... 14.

14 Body with strong iridescent reflexes..... 15.

- Body without iridescent reflexes..... 17.

15 Iridescent reflexes only on elytra; pronotal anterior margin straight and posterior arched. Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais and São Paulo (Brazil).....….... *Manonychus ovalis* (Blanchard, 1851).

- Iridescent reflexes on elytra and the other parts of body; pronotal anterior and posterior margins arched……...…….....…… 16.

16 Head and pronotum coarsely punctate; elytra reddish-brown uniform. Piauí, Bahia, Distrito Federal and Goiás (Brazil)…… *Manonychus densicollis* Frey, 1974.

- Head and pronotum sparsely punctate; elytra reddish-brown, with black shades Bahia (Brazil)..... *Manonychus iris* **sp. nov.**.

17 Male genitalia with parameres with central apophysis..... 18.

- Male genitalia with parameres without central apophysis..... 23.

18 Apophysis short, not projected beyond inner margin of parameres..... 19.

- Apophysis long, projected beyond inner margin of parameres……..…. 20.

19 Pygidium longer than wide; parameres with short central apophysis 1/4 beyond inner margins, truncate on apex. Mato Grosso (Brazil)..... *Manonychus stanleei* **sp. nov.**.

- Pygidium as wide it is long; parameres with short central apophysis, hidden by the parameres, acute on apex. São Paulo (Brazil).. *Manonychus bidentatus* **sp. nov.**.

20 Pygidium cone-shaped. Bahia (Brazil)…..... *Manonychus conipygus* Frey, 1976.

- Pygidum not as above (pygidium disc with the same plane) ..... 21.

21 Distance between eyes three times the width of one eye; metatarsomere I shorter than II……..…… 22.

- Distance between eyes five times the width of one eye; metatarsomere I longer than II. Minas Gerais (Brazil)…… *Manonychus paschoali* **sp. nov.**.

22 Elytral surface with fine punctures fading towards to lateral and base; parameres with inner margins strongly curved in heart-shape; apophysis acute on apex. Piauí (Brazil)…….. *Manonychus cordiformis* **sp. nov.**.

- Elytral surface with coarse punctures marked; parameres with inner margins straight; apophysis truncate on apex. Minas Gerais (Brazil)..... *Manonychus truncatus* **sp. nov.**.

23 Malar area with proximal groove not serrated..... 24.

- Malar area with proximal groove serrated..... 27.

24 Galea with five or six teeth visible in front view..... 25.

- Galea with seven teeth visible in front view. Bahia, Goiás and Minas Gerais (Brazil)……..….. *Manonychus casariae* **sp. nov.**.

25 Protibia with three teeth; parameres with proximal region sclerotized……. 26.

- Protibia with two teeth; parameres with proximal region membranous. Minas Gerais (Brazil)…….…….. *Manonychus cleideae* **sp. nov.**.

26 Pronotum with long and sparse bristles on disc and slightly iridescent reflexes; parameres inner margins not toothed; inner margins slightly curved. Rio de Janeiro and São Paulo (Brazil)..... *Manonychus martinezi* Frey, 1974.

- Pronotum glabrous and disc densely punctate; parameres with inner margin medially toothed on distal region and strongly curved. Minas Gerais, Espírito

Santo, Rio de Janeiro and Santa Catarina (Brazil)..... *Manonychus birabeni* Martínez, 1959.

27 Clypeus trapezoidal..... 28.

- Clypeus subrounded..... 30.

28 Frons sparsely punctate; clypeus with anterior margin slightly truncate, almost rounded……..…… 29.

- Frons densely punctate; clypeus with anterior margin strongly truncate. Maranhão and Piauí (Brazil)..... *Manonychus maranhensis* **sp. nov.**.

29 Metatibial apical spurs equal in size; parameres punctate and inner margins curved and with strongly sinuous distally. Goiás, São Paulo and Paraná (Brazil)……..... *Manonychus mermudesi* **sp. nov.**.

- Metatibial apical spurs different in size; parameres smooth and horseshoe-shaped; outer margin apically toothed. Espírito Santo (Brazil).. *Manonychus omegoides* **sp. nov.**.

30 Small individuals varying 6.0-6.5 mm length; pygidium with fine and sparse punctures; parameres with inner margins curved. Mato Grosso (Brazil)... *Manonychus cuiabanus* **sp. nov.**.

- Large individuals varying 8.0-9.0 mm length; pygidium with fine and dense punctures; parameres with inner margins straight. Mato Grosso, Espírito Santo and São Paulo (Brazil); Santa Cruz (Bolivia)..... *Manonychus unguicularis* Moser, 1919.

***Manonychus rufinus* (Blanchard, 1851)**

Figures 9A – E

Hilarianus rufinus Blanchard, 1851: 169-170; Harold 1869: 1141 (checklist); Dalla Torre 1913: 319 (checklist); Blackwelder 1944: 228 (checklist); Evans 2003: 303 (checklist); Evans and Smith 2005: 256 (checklist); Evans and Smith 2009: 309 (checklist); Cherman et al. 2016 (new combination); Costa et al., unpublished data (systematics).

Type material. *Manonychus rufinus* **holotype** ♀ BRAZIL: “Ouest Ouest/ Capitanie des/ Mines”, “H. rufinus./ Cat. Mus/ Bresil/ M. A. St. Hilaire”, “MUSÉUM PARIS/ Ouest Capita/ des Mines”, “HOLOTYPE” (MNHN).

Non-type material. BRAZIL. **Minas Gerais.** Uberlândia. Tapuirama: 1♀, 23.X.1962, K. Lenko, leg. (MZSP); **São Paulo.** São Paulo: 1♀, IX.1953; Nova Europa. Fazenda Itaquerê: 1♀, 26.XI.1963, Lenko leg; **Paraná.** Porecatu: 2♀, 20.X.1970, Becker-Hatschback leg. (DZUP).

Diagnosis. Body uniform in width; reddish-brown; frons and clypeus with equal length; clypeus trapezoidal; clypeus and frons densely punctate; canthus not covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra reddish-light brown with yellow reflexes; protibia with three teeth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II; pygidium with fine and sparse punctures.

Redescription. Holotype female: Length 7.5 mm; width 3.0 mm. *Head*: Shiny, reddish-brown; distance between eyes twice the width of one eye; frons and clypeus equal in length; clypeus trapezoidal; dense punctures; canthus not covered by clypeus; malar area with eight grooves; basal groove serrated; distal maxillary palpomere with maximum width equal to apex; galea with five teeth visible in front view; tooth I projected; lacinia toothed; antennae yellow uniform. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterotrax*: Scutellum triangular with coarse and dense punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, reddish-light brown and yellow reflexes; elytral suture elevated; elytral surface with coarse punctures fading towards to base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia with fine punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length longer than ventrite III; ventrite IV length subequal to ventrite V length; propygidium visible and finely punctate; pygidium wider than long, with fine and sparse punctures and apex region depressed; basal width of the pygidium wider than posterior of the propygidium; apex with regular depression.

Type locality. Minas Gerais.

Geographical distribution known. BRAZIL (Minas Gerais and São Paulo).

Remarks. This species was transferred from *Hilarianus* Blanchard, 1851 to *Manonychus* (Cherman et al. 2016). It resembles *M. birabeni* in the body uniform in

width and reddish-brown also in color. It differs in the canthus not covered by the clypeus (canthus covered by clypeus); clypeus trapezoidal (clypeus subrounded); pronotal anterior and posterior corners rounded (pronotal anterior corners rounded and posterior acute).

***Manonychus depressus* sp. nov.**

Figures 10A – E

Type material. *Manonychus depressus* **holotype** ♀ BRAZIL: "CZMA/ Brasil (MA), Mirador/ Parque Esta. Mirador,/ Base da Geraldina, 419 m/ 06°37'25"S/45°52'08"W" "CZMA/ Armadilha Luminosa/ 28- 29. xii. 2013, F. Limeira-de-Oliveira, T. T. A. Silva & L. L. M. Santos, cols.", [red printed] "Holotype/ *Manonychus depressus* / F. Costa, M. Cherman and L. Iannuzzi 2017". (CERPE). **Paratypes.** Brazil. **Maranhão.** Mirado. Parque Estadual do Mirador. Base da Geraldina: 1♀, 419 m, 06°37'25"S/45°52'08"W" light trap, 28-29.XII.2013, F. Limeira-de-Oliveira, T. T. A. Silva and L. L. M. Santos, legs.; 1♀, same locality but, 27.X-01.XI.2008, M. B. Aguiar-Neto & A. L. Costa, legs. (CERPE). "Paratype/ *Manonychus depressus* / F. Costa, M. Cherman and L. Iannuzzi 2017"

Diagnosis. Body uniform in width; reddish-dark brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus covered by clypeus; pronotum sparsely punctate; pronotal anterior and posterior margins arched; elytra shiny, reddish-brown uniform; protibia with three teeth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II; pygidium with fine and dense punctures.

Description. Holotype female: Length 8.0 mm; width 3.5 mm (variation 8.0-8.4 mm; 3.2-3.5 mm). *Head*: Shiny, reddish-dark brown; distance between eyes three times the width of one eye; frons longer than clypeus; clypeus subrounded; dense punctures; canthus covered by clypeus; malar area with five grooves; proximal grooved serrated; distal maxillary palpomere with maximum width equal to apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae with uniform yellow. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc sparsely punctate; pronotal anterior and posterior margins arched; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterothorax*: Scutellum subtriangular with coarse and dense punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny,

reddish-brown uniform; elytral suture elevated; elytral surface with coarse punctures marked. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia with coarse punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length subequal to ventrite V length; propygidium visible and finely punctate; pygidium as wide it is long, with fine and dense punctures and apex region strongly depressed; basal width of the pygidium equal to the posterior of the propygidium; half to apex with strongly depression.

Type locality. Mirador (Maranhão).

Geographical distribution known. BRAZIL (Maranhão).

Remarks. *Manonychus depressus* **sp. nov.** resembles *M. unguicularis* Moser, 1919 in the body color with reddish-brown and clypeus subrounded. It differs in the pronotum disc sparsely punctate (disc densely punctate); elytral surface with coarse punctures marked uniform (elytral surface with coarse punctures fading towards to lateral and base) and pygidium with apex to half strongly depressed (pygidium not depressed). The only three individuals studied are females.

Etymology. Adjective in the nominative singular. From Latin depressus "depressed, low, subdued, hipped". The name is referring to the apex region of the pygidium strongly depressed.

***Manonychus moseri* sp. nov.**

Figures 11A – E

Type material. *Manonychus moseri* **holotype** ♂ BRAZIL: "BRASIL, RJ, Petrópolis,/ Morim, Morro da Bandeira,/ 1600m, Torres da/ PETROBRAS/ 02-10/II/2010" "COLEÇÃO E./ & P. GROSSI" "Holotype/ *Manonychus moseri*/ F. Costa, M. Cherman and L. Iannuzzi 2017". Genitalia mounted (CERPE). **Paratypes.** Brazil. **Rio de Janeiro.** Petrópolis. Alto Mosela: 1♂, 1-2.VIII-III.1957, Delay leg. (MZSP); Engenheiro Paulo de Frontin. Instituto Zoobotânico de Morro Azul: 1♂, 05.XII.2002x; 1♂, 12.XII.2002; 1♂, 14.XII.2002; 1♂, 02.III.2003 (CERPE) "Paratype/ *Manonychus moseri*/ F. Costa, M. Cherman and L. Iannuzzi 2017".

Diagnosis. Body wider medially; reddish-light brown; frons longer than clypeus; clypeus trapezoidal; clypeus and frons sparsely punctate; canthus covered by clypeus;

pronotum densely punctate; pronotal anterior margin slightly arched and posterior straight; elytra reddish-light brown uniform; protibia with three teeth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II; pygidium with coarse punctures on disc, smooth laterally; parameres symmetrical, smooth with proximal region sclerotized, outer margins not toothed; inner margins medially toothed.

Description. Holotype male: Length 11 mm; width 4.0 mm (variation 11-11.5 mm; 3.5-4.0 mm). *Head*: Shiny, reddish-brown; distance between eyes twice the width of one eye; frons longer than clypeus; clypeus trapezoidal; sparsely punctate; canthus covered by clypeus; malar area with six grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width equal to apex; galea with five teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum disc with long and sparse bristles, shiny; unicolored with head; disc densely punctate; pronotal anterior margin slightly arched and posterior straight; margin with sparse bristles; pronotal anterior corners rounded and posterior acute. *Pterothorax*: Scutellum triangular with fine and sparse punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, reddish-light brown uniform; elytral suture elevated; elytral surface with fine punctures fading towards to base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; tarsomere V with curved and enlarged distally; mesofemurs with double row punctures confluent; mesotibia smooth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length longer than ventrite II length; ventrite IV length subequal to ventrite V length; propygidium visible and finely punctate; pygidium wider than long, with coarse punctures on disc, smooth laterally; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres not deflected distally and converging on apex; smooth with proximal region sclerotized; outer margins not toothed; inner margins medially toothed and curved; inner margins elevated and contiguous flap; laterally excavated; phallobase in dorsal view, distal margin constricted; medial longitudinal line hidden.

Type locality. Petrópolis. Morro da Bandeira (Rio de Janeiro).

Geographical distribution known. BRAZIL (Rio de Janeiro).

Remarks. *Manonychus moseri* **sp. nov.** resembles *M. birabeni* Martínez, 1959 in the body color reddish-light brown and parameres with inner margins medially toothed. It

differs in the body wider medially (body uniform in width); clypeus and frons sparsely punctate (clypeus and frons densely punctate); pronotum disc with long and sparse bristles (pronotum glabrous); ventrite IV length subequal to ventrite V length (ventrite IV length shorter than V length) and pygidium with coarse punctures on disc (fine and sparse punctures on disc). Up to now, females from species are unknown.

Etymology. Noun in the genitive case. The species is named in honor to Julius Moser, the author of *Manonychus*.

***Manonychus boraceiensis* sp. nov.**

Figures 12A – F

Type material. *Manonychus boraceiensis* **holotype** ♂ BRAZIL: "SALESÓPOLIS SP/ E. B. BORACÉIA/ IV.1997/ Exc. DZ - IBUSP col., "Holotype/ *Manonychus boraceiensis*/ F. Costa, M. Cherman and L. Iannuzzi 2017". Genitalia mounted. (MZSP). **Paratypes.** Brazil. **Minas Gerais.** Conceição do Mato Dentro: 2♂, 727m, 01.XII.2012, light trap, Uceli and Borges legs.. **Rio de Janeiro.** Itatiaia. Ponte Torta: 1♂, 2000m, 27-30.X.2012, Hermes, Melo, Cavachioli leg. (CERPE). **São Paulo.** Boracéia. Salesópolis: 1♀, 12.X.1967, noturna, M.H. Costa leg. (CERPE). "Paratype/ *Manonychus boraceiensis* / F. Costa, M. Cherman and L. Iannuzzi 2017"

Diagnosis. Body wider medially; reddish-dark brown; frons longer than clypeus; clypeus trapezoidal; clypeus and frons densely punctate; canthus not covered by clypeus; pronotum sparsely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, reddish-light brown; protibia with three teeth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 10.0 mm; width 3.5 mm (variation 10.0-10.5; 3.5-4.0 mm). *Head*: Shiny, reddish-dark brown; distance between eyes three times the width of one eye; frons longer than clypeus; clypeus trapezoidal; dense punctures; canthus not covered ; malar area with five grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width equal to apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc sparsely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles;

pronotal anterior corners rounded and posterior acute. *Pterothorax*: Scutellum subtriangular with fine and dense punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, slightly lighter than head and pronotum; elytral suture elevated; elytral surface with coarse punctures fading towards to base. *Legs*: Protibia with three teeth; obtuse angle from tooth II to tooth III; tarsomere V with base curved and enlarged distally; mesofemures with double row of confluent punctures; mesotibia with fine punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous; ventrite II length subequal to ventrite III length; ventrite IV length subequal to ventrite V length; propygidium visible and finely punctate; pygidium wider than long with fine and dense punctures; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected and converging on apex; smooth with proximal region sclertoinized; outer and inner margins not toothed; inner margins curved, slightly sinuous and elevated not contiguous flap; laterally flat; phallobase in dorsal view, distal margin constricted; medial longitudinal line hidden.

Type locality. Salesópolis (São Paulo).

Geographical distribution known. BRAZIL (Minas Gerais, São Paulo and Rio de Janeiro).

Remarks. *Manonychus boraceiensis* **sp. nov.** resembles *M. massutiae* **sp. nov.** in the body wider medially, body color reddish-dark brownand paramers inner margins elevated flap. It differs in the clypeus trapezoidal (clypeus subrounded); pronotum densely punctate (pronotum sparsely punctate); pronotal anterior margin arched (pronotal anterior margin straight) and parameres slightly sinuous in lateral view (parameres strongly sinuous in lateral view).

Etymology. Adjective masculine and feminine. The species is named referring to the "Estação Biológica de Boracéia", place where the specimens were collected.

***Manonychus morretensis* sp. nov.**

Figures 13A – E

Type material. *Manonychus morretensis* **holotype** ♂ BRAZIL: "VISTA LACERDA/ Morretes-17 III-1966/ PR Brasil Marinoni/ Giacomel, Marinoni" "DZUP/ 430107", "Holotype/ *Manonychus morretensis*/ F. Costa, M. Cherman and L. Iannuzzi 2017". Genitalia mounted (DZUP).

Diagnosis. Body uniform in width; light brown almost yellow; frons and clypeus with equal length; clypeus trapezoidal; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, yellow uniform; protibia with three teeth; metatibial apical spurs different in size; metatarsomers with tarsomere I shorter than II; pygidium with fine and dense punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 10.0 mm; width 3.5 mm. *Head*: Shiny, reddish-dark brown; distance between eyes twice the width of one eye; frons longer than clypeus; clypeus trapezoidal; dense punctures; canthus not covered; malar area with six grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width to up to twice the width of apex; galea with five teeth visible in front view; tooth I projected; lacinia not toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, reddish-light brown; disc sparsely punctate; pronotal anterior margin slightly arched and posterior straight; margin with sparse bristles; pronotal anterior corners rounded and posterior acute. *Pterothorax*: Scutellum triangular, smooth; mesepimerum with inner corners parallel. *Elytra*: Shiny, unicolored with pronotum; elytral suture elevated to third basal; elytral surface with coarse punctures fading towards to lateral and base. *Legs*: Protibia with three teeth; obtuse angle from tooth II to tooth III; tarsomere V with base curved and enlarged distally; mesofemures with double row of parallel punctures; mesotibia finely punctate; metatibial apical spurs equal in size; metatarsomere with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length subequal to ventrite V length; propygidium hidden by elytra and finely punctate; pygidium wider than long, with fine and sparse punctures; basal width of the pygidium equal to the posterior width of pygidium. *Male genitalia*: Parameres symmetrical; parameres deflected and converging on apex; smooth with proximal region sclerotized; outer and inner margins not toothed; inner margin curved and with elevated flap; laterally excavated occupying 2/3 from length; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Paraná).

Type locality. Morretes (Paraná).

Remarks. *Manonychus morretensis* **sp. nov.** resembles *M. martinezi*, 1974 in the body uniform in width and clypeus and frons sparsely punctate. It differs in the pronotal anterior margin slightly arched and posterior straight (pronotal anterior and posterior margins straight); scutellum smooth (scutellum with coarse and sparse punctures); pygidium wider than long (pygidium longer than wide) and parameres with inner margins curved and elevated flap (parameres inner margins slightly curved, not flap).

Etymology. Adjective masculine and feminine. The species is named referring to the Brazillian Town "Morretes – Paraná".

***Manonychus massuttiae* sp. nov.**

Figures 14A – F

Type material. *Manonychus massutiae* **holotype** ♂ BRAZIL: "SANTA TEREZA; ES – BRASIL/ 13/XI/1966/ C. Elias leg", "DPT° ZOOL/ UF-PARANÁ" "DZUP/ 430103", "Holotype/ *Manonychus massuttiae* / F. Costa, M. Cherman and L. Iannuzzi 2017". Genitalia mounted (DZUP). **Paratypes.** Brazil. **Espírito Santo.** Santa Tereza: 1♀, 13.XI.1966, C. Elias leg, [DZUP 430080], 1♀ 06.XI.1966, C. Elias leg, [DZUP 430104]. Reserva do Museu: 1♂, 13.XI.1955, Santos, Machado and Barros leg. (DZUP). **Rio de Janeiro.** Jussaral: 1♀, IX/1934, Mendes, D. leg; (MHNRJ). "Paratype/ *Manonychus massuttiae* / F. Costa, M. Cherman and L. Iannuzzi 2017".

Diagnosis. Body wider medially; reddish-dark brown; frons and clypeus with equal length; clypeus subrounded; clypeus and frons sparsely punctate; canthus covered by clypeus; pronotum sparsely punctate; pronotal anterior and posterior margins straight; elytra shiny, reddish-light brown; protibia with three teeth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 9.0 mm; width 3.5 mm (variation 9.0-9.5 mm; 3.2-3.5 mm). *Head*: Shiny, reddish-dark brown; distance between eyes three times the width of one eye; frons and clypeus with equal length; clypeus subrounded; sparse punctures; canthus covered by clypeus; malar area with six grooves; proximal grooved serrated; distal maxillary palpomere with maximum width equal to apex; galea with five teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc sparsely punctate; pronotal anterior and posterior margins straight; margin with sparse bristles;

pronotal anterior rounded corners and posterior acute. *Pterothorax*: Scutellum subtriangular with fine and sparse punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, slightly lighter than head and pronotum; elytral suture slightly elevated; elytral surface with coarse punctures fading towards to base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; tarsomere V with base curved and enlarged distally; mesofemures with double row of confluent punctures; mesotibia smooth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length shorter than V length; propygidium visible and finely punctate setose; pygidium wider than long, with fine and dense punctures; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and converging on apex; smooth with proximal region sclerotized; outer and inner margins not toothed; inner margins curved, strongly sinuous on third basal and with elevated flap;; laterally excavated occupying 2/3 from length; phallobase in dorsal view, distal margin constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Rio de Janeiro and Espírito Santo).

Type locality. Santa Tereza (Espírito Santo).

Remarks. *Manonychus massuttiae* **sp. nov.** resembles *Manonychus freyi* **sp. nov.** in the clypeus subrounded and elytra shiny, reddish-brown. It differs in the frons and clypeus with equal length (frons longer than clypeus); pronotal anterior and posterior margins straight (pronotal anterior margin arched and posterior straight); protibia with three teeth (protibia with two teeth) and parameres laterally excavated (parameres laterally flat).

Etymology. Noun in the genitive case. The species is named in honor to Dr. Lúcia Massutti de Almeida, a great researcher from Coleoptera at Brazil and former teacher of the Zoology Department from Universidade Federal do Paraná, Curitiba, Brazil.

***Manonychus freyi* sp. nov.**

Figures 15A – F

Type material. *Manonychus freyi* **holotype** ♂ BRAZIL: "MZFS/ Brasil, Bahia, Abaíra, Catolés de/ Cima, Mata da Tijuquinha,/ 13°16'08.4"S 41°54'39.8"W/ 30.X-01.XI.2013 1690 m.a.n.m.,/ armadilha luminosa,/ Bravo, F.; Carvalho, J.R.; Cordeiro, D.;/ Menezes,

E.; Nascimento, F.E. cols." "Holotype/ *Manonychus freyi* / F. Costa, M. Cherman and L. Iannuzzi 2017". Genitalia mounted. (UEFS) **Paratype.** Brazil. **Bahia.** São Felix do Coribe: 1♀, 07.XII.2007, FB,TZ,NA,JR,A Legs. (UEFS); **Minas Gerais.** Barreiros. Serra do Anastácio: 1♂, 1300m, 20.XII.2012, light trap, P. Grossi. and G. Melo. legs. (CERPE); **São Paulo.** Pindamonhangaba: 1♂ 1♀, III.1963 (MZSP)."Paratype/ *Manonychus freyi*/ F. Costa, M. Cherman and L. Iannuzzi 2018".

Diagnosis. Body uniform in width; reddish-light brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra reddish-light brown uniform; protibia with two teeth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 9.5 mm; width 3.5 mm (variation 9.5-11; 3.5-4.0 mm). *Head*: Shiny, reddish-light brown; distance interocular three times the width of one eye; frons longer than clypeus; clypeus subrounded; dense punctures; canthus covered by clypeus; malar area with six grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width equal to apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior and posterior corners acute. *Pterothorax*: Scutellum subtriangular with fine and sparse punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, reddish-light brown uniform; elytral suture slightly elevated; elytral surface with coarse fading in fine punctures towards to lateral and base. *Legs*: Protibia with two teeth; acute angle from tooth II to tooth III; tarsomere V with base curved and enlarged distally; mesofemures with double row of confluent punctures; mesotibia finely punctate; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length shorter than ventrite V length; propygidium visible and coarsely punctate setose; pygidium wider than long, with fine and sparse punctures; basal width of the pygidium wider than posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected and converging on apex; smooth with

proximal region sclerotized; outer and inner margins not toothed; inner margins curved, slightly sinuous on third basal with elevated flap; laterally flat; phallobase in dorsal view, distal margin constricted; longitudinal medina hidden.

Geographical distribution known. BRAZIL (Bahia, Minas Gerais and São Paulo).

Type locality. Catolé de Cima (Bahia).

Remarks. *Manonychus freyi* **sp. nov.** resembles *Manonychus moseri* **sp. nov.** in the body wider medially, body color reddish-light brown and frons longer than clypeus. It differs in the clypeus subrounded (clypeus trapezoidal); clypeus and frons densely punctate (clypeus and frons sparsely punctate); pygidium with fine and sparse punctures (pygidium with coarse and dense punctures) and parameres inner margins not toothed (parameres inner margins medially toothed).

Etymology. Noun in the genitive case. The species is named in honor to Georg Frey, the author of many *Manonychus* species.

***Manonychus moroni* sp. nov.**

Figures 16A – E

Type material. *Manonychus moroni* **holotype** ♂ BRAZIL: "BUÍQUE PE/ Catimbau/ Brasil, 21.IX.2005/ C. E. B. Nobre leg.", "CE-UFPE", "Holotype/ *Manonychus moroni*/ F. Costa, M. Cherman and L. Iannuzzi 2017". Genitalia mounted (CEUFPE). **Paratypes.** Brazil. **Pernambuco.** Buíque. Parque Nacional do Vale do Catimbau: 1♂, 05.VI.2005, C.E. Nobre leg. [3786]; 4♀, 21.IX.2005 [3778; 3780; 3782; 3783] 1♀, 25.I.2005, M. Schessl, leg. [3788]; 3♂, 21.IV.2014, Silva, F.M. leg. [5330; 5328; 5329]; 2♀, 22.IV.2014, Silva, F.M. leg. [5331; 5332]; 2♂ 2♀, 27.VI – 06.V.2015 Neves, H and Barros, R. leg. [6491; 6492; 6493; 6494]; 3♂, 05.VI.2016; 3♂, without data (CEUFPE); 1♂ 1♀, 24.IX.2014, Manual [3779] (CERPE); 1♂ 1♀, 25.I.2005/ M. Schessi leg. [3778; 3785] (CEMT); 1♂ 1♀ 14.IV.2017. Manual. Neves, H. leg. (DZUP); 1♂ 1♀, 14.IV.2017. Manual. Neves, H. leg. (MNRJ); 1♂ 1♀, 05.VI.2016 (MZSP); 2♂ 1♀, 14.IV.2017. C.E. Nobre leg. (NHMB); 1♂ 1♀, 02.VIII.2015, Neves, H, leg.; 2♂ 2 ♀, 21.IX.2005. C.E. Nobre leg. [3781; 23116; 3777; 3784] (ZMHB). **Bahia.** Estação Ecológica Raso da Catarina-SEMA: 3♂ 1♀, 7.XI.1983, 17.XII.1981, 08.XII.1982, 26.X.1982 [000173; 009170; 000172; 000171]; 1♀, Jeremoabo, 07.V.1983, Abreu, H. leg. [000169] (MZUFBA). "Paratype/ *Manonychus moroni*/ F. Costa, M. Cherman and L. Iannuzzi 2017".

Diagnosis. Body wider medially; shiny dark brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior and posterior margins arched; elytra shiny, reddish-brown uniform; protibia with two teeth; metatibial apical spurs equal in size; metatarsomere I shorter than II; pygidium with coarse and dense punctures; parameres asymmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 8.2 mm; width 3.4 mm (variation 8.0-9.0 mm; 3.0-4.0 mm). *Head*: Shiny dark brown; distance between eyes twice the width of one eye; frons longer than clypeus; clypeus subrounded; dense punctures; canthus covered by clypeus; malar area with six grooves; proximal grooved not serrated; distal maxillary with maximum twice the width of apex; galea six teeth visible in front view; tooth I parallel; lacinia: not toothed; antennae lamellae darker than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior and posterior margins arched; margin with dense bristles; pronotal anterior and posterior corners rounded. *Pterotrax*: Scutellum triangular, smooth; mesepimerum with inner corners projected. *Elytra*: Shiny, reddish-brown uniform; elytral suture dark and slightly elevated; elytral surface with fine punctures fading towards to base. *Legs*: Protibia with two teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia smooth; metatibial apical spurs equal in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length longer than III; ventrite IV length shorter than V; propygidium visible and finely punctate; pygidium wider than long, with coarse and dense punctures; basal width of the pygidium wider than posterior of the propygidium. *Male genitalia*: Parameres asymmetrical; parameres not deflected distally and parallel on apex; smooth with proximal region sclerotized; inner margin form right paramere with a strong twist in the proximal half; outer and inner margins not toothed; inner margins slightly curved; laterally excavated occupying 2/3 from length; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Pernambuco and Bahia).

Type locality. Buíque (Pernambuco).

Remarks. *Manonychus moroni* **sp. nov.** resembles *Manonychus unguicularis* Moser, 1919 in the body wider medially and clypeus subrounded. It differs in the pronotal

anterior and posterior margins arched (pronotal anterior margin arched and posterior straight); protibia with two teeth (protibia with three teeth); metatibial apical spurs equal in size (metatibial apical spurs different in size) and parameres asymmetrical (parameres symmetrical).

Etymology. Noun in the genitive case. The species is named in honor to Dr. Miguel Angel Morón Ríos. He was a great researcher from Instituto de Ecologia, A.C., Xalapa, Veracruz, Mexico, contributing immensely to the taxonomy of Scarabaeidae.

***Manonychus bravoi* sp. nov.**

Figures 17A – E

Type material. *Manonychus bravoi* **holotype** ♂ BRAZIL: "Brasil, Bahia, São Felix/ do Coribe-Coribe, km 24,/ 493m de altitude, 13°33'S/ 44°'15'w./ 07/XII/2007/ Lg. FB,TZ,AN,JR,A." "MZUEFS/ #41202" "Holotype/ *Manonychus*/ *bravoi*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (UEFS). **Paratypes.** Brazil. **Bahia.** São Felix do Coribe-Coribe: 2♂, 13°33'S 44°'15'W, 493m, 07.XII.2007, Bravo, F., Zacca, T., Silva-Neto, A., Rezende, J. and Almeida legs. [MZUEFS #41201] (UEFS). "Paratype/ *Manonychus bravoi*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted.

Diagnosis. Body wider medially; reddish-light brown; frons longer than clypeus; clypeus subrounded; clypeus and frons sparsely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, reddish-light brown and yellow reflexes; protibia with two teeth; metatibial apical spurs different in size; metatarsomere I shorter than II; pygidium with fine and sparse punctures; parameres asymmetrical, smooth with proximal region sclerotized, outer not toothed and inner margin from right paramere distally projected toothed.

Description. Holotype male: Length 8.0 mm; width 3.2 mm (variation 8.0-8.2 mm; 3.0-3.2 mm). *Head*: Shiny, reddish-light brown; distance between eyes twice the width of one eye; frons longer than clypeus; clypeus subrounded; sparse punctures; canthus covered by clypeus; malar area with five grooves; proximal grooved serrated; distal maxillary with maximum twice the width of apex; galea with five teeth visible in front view; tooth I projected; lacinia: toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal

anterior and posterior corners rounded. *Pterotrax*: Scutellum subtriangular with coarse and dense punctures; mesepimerum: inner corners parallel. *Elytra*: Shiny, reddish-light brown and yellow reflexes; elytral suture slightly elevated; elytral surface with fine punctures fading towards to base. *Legs*: Protibia with two teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia smooth; meso and metatibia with fine longitudinal sculpture (scars); metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length longer than III length; ventrite IV length longer than ventrite V length; propygidium hidden by elytra and smooth; pygidium wider than long with fine and sparse punctures; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres asymmetrical; parameres not deflected and parallel on apex; smooth with proximal region sclerotized; inner margin from right paramere distally projected toothed; outer margins not toothed; inner margins straight; laterally flat; phallobase in dorsal view, distal margins not constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Bahia).

Type locality. São Felix do Coribe (Bahia).

Remarks. *Manonychus bravoi* **sp. nov.** resembles *M. conypigus* Frey, 1976 in the pronotum densely punctuate and pronotal anterior margin arched and posterior straight. It differs in the body wider medially (body uniform in width); frons longer than clypeus length (frons and clypeus with equal length); clypeus subrounded (clypeus trapezoidal); clypeus and frons sparsely punctate (clypeus and frons densely punctuate) and parameres asymmetrical (parameres symmetrical). Up to now, females from species are unknown.

Etymology. Noun in the genitive case. The species is named in honor to Drº Freddy Bravo, curator and teacher of the Entomology Collection from Universidade Estadual de Feira de Santana, Bahia, Brazil.

***Manonychus planaltinensis* sp. nov.**

Figures 18A – F

Type material. *Manonychus planaltinensis* **holotype** ♂ BRAZIL: "BRASIL: Distrito Federal./ Planaltina. ESESC Águas/ Emendadas. 15°32'31"S 47°/ 36'49"W. 1-15-X-2010./ Pitfall. M. R. Frizzas" "Holotype/ *Manonychus planaltinensis*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (CEMT). **Paratypes.** Brazil.

Distrito Federal. Planaltina. ESESC Águas Emendadas: 4♀, 15°32'31"S 47° 36'49"W. 1-15.X.2010, Pitfall, M. R. Frizzas leg. (CEMT). **Minas Gerais.** Itirapina. Região do Cerrado: 4♂ and 2♀, 600m, 5.IV-5.V.2000, Glauco Machado leg. (CERPE) "Paratype/ *Manonychus planaltinensis*/ F. Costa, M. Cherman and L. Iannuzzi 2018".

Diagnosis. Body wider medially; shiny, reddish-dark brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate, disc smooth; canthus not covered by clypeus; pronotum disc smooth; pronotal anterior margin arched and posterior straight; elytra shiny, reddish-dark brown; protibia with three teeth; metatibial apical spurs different in size; metatarsomere I longer than II; pygidium with fine and sparse punctures; parameres asymmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 6.5 mm; width 2.5 mm (variation 6.0-6.5 mm; 2.5-3.0 mm). Shiny, reddish-dark brown; distance between eyes three times the width of one eye; frons longer than clypeus; clypeus subrounded; dense punctures with disc smooth; not suture clypeus-frons; canthus not covered by clypeus; malar area with four grooved; proximal grooved not serrated teeth; distal maxillary palpomere with maximum width equal to apex; galea five teeth visible in front view; tooth I parallel; lacinia toothed; antennae lamellae darker than flagellum. *Protorax*: Pronotum glabrous, unicolored with head; disc smooth, laterally with dense punctures; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterotrax*: Scutellum subtriangular, with fine and sparse punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, unicolored with head and pronotum; elytral suture elevated; elytral surface with fine punctures fading towards to base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia smooth; metatibial apical spurs different in size; metatarsomeres with tarsomere I longer than II. *Abdomen*: Ventrites with inconspicuous punctures; ventrite II length longer than III; ventrite IV length longer than V length; propygidium visible and finely punctate; pygidium wider than long with fine and sparse punctures; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres asymmetrical; parameres deflected distally and parallel on apex; smooth with proximal region sclerotized; inner margin from paramere right with strong retraction, left paramere divided medially; outer and inner margins not toothed; inner margins straight; laterally excavated occupying 2/3

from length; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Distrito Federal and São Paulo).

Type locality. Planaltina (Distrito Federal).

Remarks. *Manonychus planaltinensis* **sp. nov.** resembles *Manonychus cuiabanus* **sp. nov.** in the body wider medially; body color reddish-dark brown; clypeus subrounded and pygidium with fine and sparse punctures. It differs in the clypeus and frons densely punctuate (clypeus and frons sparsely punctuate); pronotum disc smooth (pronotum disc densely punctuate); metatarsomere I longer than II (metatarsomere I shorter than II) and parameres asymmetrical (parameres symmetrical).

Etymology. Adjective masculine and feminine. The species is named referring to the Brazilian Town "Planaltina – Distro Federal".

***Manonychus monodentatus* sp. nov.**

Figures 19A – F

Type material. *Manonychus monodentatus* **holotype** ♂ BRAZIL: "BRASIL: Ceará. Ubajara. PN/ Ubajara. Cachoeira Rio Cafundó,/ 3°50'13"S 40°54'35"W. 795m./ 16-II-2013. Pennsylvania./ D M Takiya & A P M Santos" "Holotype/ *Manonychus monodentatus*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (CEMT). **Paratypes.** Brazil. **Ceará.** Parque Nacional Ubajara. Cachoeira Rio Cafundó: 1♂, 3°50'13"S 40°54'35"W, 795m, 16.II.2013. Pennsylvania, D M Takiya & A P M Santos legs.; (CEMT); 1♀, 3°50'13"S 40°54'35"W, 795m, l- 16.II.2013, Pennsylvania, D M Takiya and A P M Santos legs. (CERPE). **Tocantins.** Porto Nacional: 1♂, 10°33'78"S 48°22'24"W, 225m, 05.XII.2013, Chargas and Giupponi legs.. **Piauí.** Piracuruca. Paraque Nacional Sete Cidades: 1♂ 2♀, 4°5'32"S 41°40'48"W, 180m, 06-12.II.2013, Malaise, Limeira, F and et al. legs. (CEMT). **Paraná.** Piraquara. Mananciais da Serra: 1♂ 1♀, 1000m, 24-25.I.2012, Grossi, P. leg. (CERPE). "Paratype/ *Manonychus monodentatus*/ F. Costa, M. Cherman and L. Iannuzzi 2018".

Diagnosis. Body wider medially; reddish-brown; frons shorter than clypeus; clypeus trapezoidal; clypeus and frons densely punctate; canthus covered by clypeus; pronotum sparsely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, light brown uniform; protibia with three teeth; metatibial apical spurs equal in size; metatarsomere I longer than II; pygidium with fine and sparse punctures; parameres

asymmetrical, smooth with proximal region sclerotized, inner margin to right paramere with tooth up projected medially; smooth; outer margins not toothed.

Description. Holotype male: Length 6.2 mm; width 2.5 mm (variation 6.2-7.0 mm; 2.5-3.0 mm). *Head*: Shiny, reddish-brown; distance between eyes twice the width twice of one eye; frons shorter than clypeus; clypeus trapezoidal; dense punctures; canthus covered by clypeus; malar area with five grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width equal to apex; galea with seven teeth visible in front view; tooth I projected; lacinia: toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc sparsely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior and posterior corners acute. *Pterotrax*: Scutellum triangular with coarse and dense punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, light brown uniform; elytral suture elevated; elytral surface with coarse and fine punctures fading towards to base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of confluent punctures mesotibia smooth; metatibial apical spurs equal in size; metatarsomeres with tarsomere I longer than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length longer than ventrite III length; ventrite IV length shorter than ventrite V length; propygidium visible and coarsely punctate; pygidium wider than long, with fine and sparse punctures; basal width of the pygidium wider than posterior width of propygidium. *Male genitalia*: Parameres asymmetrical; paramere deflected, projected distally and converging on apex; smooth with proximal region sclerotized; inner margin from right paramere with tooth up projected medially; outer margins not toothed; inner margins curved; laterally excavated occupying 2/3 from length; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Ceará, Tocantíns, Paraná).

Type locality. Ubajara (Ceará).

Remarks. *Manonychus monodentatus* **sp. nov.** resembles *M. rufinus* (Blanchard, 1851) the clypeus trapezoidal and pronotal anterior margin arched and posterior straight. It differs in the frons shorter than clypeus length (frons and clypeus with equal length); canthus covered by clypeus (canthus not covered by clypeus) and pronotal anterior and posterior corners acute (pronotal anterior and posterior corners rounded).

Etymology. Adjective in the nominative singular. From Latin *mono* “single” + dentatus (“tooth”). The name of the species is referring to the tooth projected in inner margin of the right paramere.

***Manonychus gracilis* sp. nov.**

Figures 20A – F

Type material. *Manonychus gracilis* **holotype** ♂ BRAZIL: “BRASIL: Bahia. Pilão/ Arcado. 26.x.2008. Light/ trap. Silva-Neto, A.” “Holotype/ *Manonychus gracilis* / F. Costa, M. Cherman and L. Iannuzzi 2018”. Genitalia mounted. (UEFS). **Paratypes.** Brazil. **Bahia.** Pilão Arcado. Brejo do Morro: 2♂, 10°06’654”S 42°53’680”W, 27.XI.2008, light trap, Silva-Neto, A., Menezes, E., Silva, E.M. legs.; 3♀, 26.X.2008, light trap, Silva-Neto, A. leg. (UEFS). “Paratype/ *Manonychus gracilis* / F. Costa, M. Cherman and L. Iannuzzi 2018”.

Diagnosis. Body uniform in width; reddish-dark brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus not covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, light brown uniform; protibia with two teeth; metatibial apical spurs equal in size; metatarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth and slim distally with proximal region sclerotized; outer and inner margins not toothed.

Description. Holotype male: Length 7.0 mm; width 3.0 mm (variation 7.0-7.5 mm; 3.0-3.5 mm). *Head*: Shiny, reddish-dark brown; distance between eyes three times the width of one eye; frons shorter than clypeus; clypeus subrounded, slightly emarginated (like a beak); dense punctures; canthus not covered by clypeus; malar area with five grooves; proximal grooved serrated; distal maxillary palpomere with maximum width to up to twice the width of apex; galea with five teeth visible in front view; tooth I parallel; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior corners rounded and posterior acute. *Pterothorax*: Scutellum subtriangular, smooth; mesepimerum with inner corners parallel. *Elytra*: Shiny, light brown uniform; elytral suture elevated; elytral surface with coarse punctures fading in fine punctures towards to lateral and base. *Legs*: Protibia with two teeth; acute angle from tooth II to tooth III; mesofemures with double

row of confluent punctures; mesotibia with fine punctures; metatibial apical spurs equal in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length longer than ventrite III length; ventrite IV length shorter than ventrite V length; propygidium hidden by elytra and coarsely punctate; pygidium longer than wide, with fine and sparse punctures; basal width of the pygidium wider equal to the posterior of the propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally na parallel on apex; smooth with proximal region sclerotized; parameres slim distally, occupying together one half of the phallobase width; outer and inner margins not toothed; inner margins straight; laterally flat; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Bahia).

Type locality. Pilão Arcado (Bahia).

Remarks. *Manonychus gracilis* **sp. nov.** resembles *Manonychus monodentatus* **sp. nov.** in the clypeus and frons densely punctuate and pronotal anterior margin arched and posterior straight. It differs in the body uniform in width (body wider medially); frons longer than clypeus length (frons shorter than clypeus length); protibia with two teeth (protibia with three teeth) and parameres symmetrical (parameres asymmetrical).

Etymology. Adjective masculine and feminine. From Latin graceo "slim, meager". The name is referring to the parameres shape very slim distally.

***Manonychus ovalis* (Blanchard, 1851)**

Figures 21A – E

Hilarianus ovalis Blanchard, 1851: 170; Harold 1869: 1141 (checklist); Dalla Torre 1913: 319 (checklist); Blackwelder 1944: 228 (checklist); Evans 2003: 303 (checklist); Evans and Smith 2005: 256 (checklist); Evans and Smith 2009: 309 (checklist); Cherman et al. 2016 (systematic); Grossi and Vaz-de-Mello 2020 (checklist-online); Costa et al., unpublished data (systematics).

Type material: *Manonychus ovalis* **holotype** ♀ BRAZIL: "H ovalis./ Cat. Mus/ Goyaz/ M. de Castelnau.", "Museum Paris/ Goyaz/ de Castelnau", "HOLOTYPE" (MNHN).

Non-type material. BRAZIL. **Mato Grosso.** Rio Verde: 2♀, 400m, XI.1959; 1♂ Chapada dos Guimarães, 19.XI.1983, [430078]; 1♀ Rio Juruena, BR-29, XI.1960, Alvarenga, M. leg; **Mato Grosso do Sul.** 400 m, XI.1965, [430089] (DZUP). **Minas Gerais.** Lagoa Santa: 2♀, 10.XII.2010, light trap. Itirapina. Região do Cerrado: 3♀, 600m, 5IV-5.V.2000, Glauco Machado leg. (CERPE).

Diagnosis. Body wider medially; reddish-dark brown; frons shorter than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus not covered by clypeus; pronotum sparsely punctate; pronotal anterior margin straight and posterior arched; elytra reddish-brown with iridescent reflexes; protibia with three teeth; metatibial apical spurs different in size; metatarsomere I longer than II; pygidium with coarse and dense punctures; parameres symmetrical, smooth with proximal region membranous; outer and inner margins not toothed.

Redescription. Length 10.5 mm; width 4.3 mm (variation 10-10.5 mm; 4.0-4.2 mm). *Head*: Shiny, reddish-dark brown; distance between eyes twice the width of one eye; frons shorter than clypeus; clypeus subrounded; dense punctures; canthus not covered by clypeus; malar area with six grooves; proximal grooved serrated; distal maxillary palpomere with maximum width equal to apex; galea with six teeth visible in frontal view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, unicolored with head; disc sparsely punctate; pronotal anterior margin straight and posterior arched; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterothorax*: Scutellum subtriangular with fine and sparse punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, reddish-brown with iridescent reflexes; elytral suture elevated; elytral surface with coarse punctures fading towards to lateral and base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia with fine and coarse punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I longer than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length subequal to ventrite V length; propygidium visible and coarsely punctate; pygidium wider than long, with coarse and dense punctures and basal region with depression laterally; basal width of the pygidium wider than posterior of the propygidium. *Male genitalia*: Parameres symmetrical; parameres not deflected distally and converging on apex; smooth with proximal region membranous; outer and inner margins not toothed; inner

margins slightly curved; laterally flat; phallobase in dorsal view, distal margins not constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Goiás, Mato Grosso and Mato Grosso do Sul).

Type locality. Goiás.

Remarks. *Manonychus ovalis* resembles *M. unguicularis* Moser, 1919 in the body wider medially and clypeus subrounded. It differs in the antennae lamellae flat (antennae lamellae with fovea); frons shorter than clypeus length (frons longer than clypeus length); canthus not covered by clypeus (canthus covered by clypeus) and elytra reddish-brown with iridescent reflexes (elytra shiny, reddish-light brown, darker in lateral).

***Manonychus densicollis* Frey, 1974**

Figures 22A – E

Manonychus densicollis Frey, 1974f: 320-321; Evans 2003: 303 (checklist); Evans and Smith 2005: 256 (checklist); Evans and Smith 2009: 309 (checklist); Krajcik 2012: 156 (catalogue); Grossi and Vaz-de-Mello 2020 (checklist-online); Costa et al., unpublished data (systematics).

Type material: *Manonychus densicollis* **holotype** ♂ BRAZIL: "Bras., Goias/ Jataí, XI. 1971/ F. M. Oliveira", "Type/ Manonychus/ densicollis/ G. Frey 1973". Genitalia mounted (NHMB).

Non-type material. BRAZIL. **Distrito Federal.** Planaltina, Embrapa Cerrados, Cerrado Nativo: 2♀ and 2♂, 15°36'16"S 47°44' 16W, 03.XI.2006, light trap, Oliveira, C. leg.; **Goiás.** Mineiros: 1♀, 1999, Machado, G leg. (CEMT); **Piauí.** Caracol, Serra das Confusões: 5♀ and 4♂, 9°13'543" 23O, 720m, 9-16.XII.2010, light trap, Silva-Neto, A. leg.; **Bahia.** Catolé de Cima, Chapada Diamantina: 1♀ and 1♂, 01.XI.2003, Bravo, F. leg. (UEFS).

Diagnosis. Body wider medially; opaque black; frons shorter than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior and posterior margins arched; elytra reddish-brown uniform with iridescent reflexes; protibia with three teeth; metatibial apical spurs equal in size; metatarsomere I shorter than II; pygidium with coarse and sparse punctures;

parameres symmetrical, smooth with proximal region membranous, outer and inner margins not toothed.

Redescription. Holotype male: Length 7.0 mm; width 3.0 mm (variation 7.0-9.0 mm; 3.0-4.0 mm). *Head*: Opaque black; distance between eyes five times the width of one eye; frons shorter than clypeus; clypeus subrounded; dense punctures; canthus covered by clypeus; malar area with six grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width equal to apex; galea with five teeth visible in front view; tooth I projected; lacinia not toothed; antennae lamellae darker than flagellum. *Protorax*: Pronotum glabrous, unicolored with head; disc densely punctate; pronotal anterior and posterior margins arched; margin with sparse bristles; pronotal anterior corners acute and posterior rounded. *Pterothorax*: Scutellum subtriangular with coarse and dense punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, elytra reddish-brown uniform with iridescent reflexes; elytral suture slightly elevated; elytral surface with coarse punctures fading in fine punctures towards to lateral and base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia with coarse punctures; metatibial apical spurs equal in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrite with inconspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length shorter than ventrite V length; propygidium visible and coarsely punctate setose; pygidium wider than long, with coarse and sparse punctures; basal region flat laterally; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and parallel on apex; smooth with proximal region membranous; outer and inner margins not toothed; inner margins slightly curved; laterally flat; phallobase in dorsal view, distal margin constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Piauí, Bahia, Distrito Federal and Goiás).

Type locality. Jataí (Goiás).

Remarks. *Manonychus densicollis* resembles *M. ovalis* (Blanchard, 1851) in the body wider medially; clypeus subrounded; elytra reddish-dark brown with iridescent reflexes and parameres with proximal region membranous. It differs in the head colour opaque black (reddish-dark brown); canthus covered by clypeus (canthus not covered by

clypeus); pronotum densely punctate (pronotum sparsely punctate); metatibial apical spurs equal in size (metatibial apical spurs different in size).

Although the similarity share, the geographical distribution of *M. densicollis* occurs towards to Caatinga region (Dry Forest), expand from this study. On the other hand, *M. ovalis* has predominance in Midwest, South and Southeast Brazilian regions.

***Manonychus iris* sp. nov.**

Figures 23A – E

Type material. *Manonychus iris* **holotype** ♂ BRAZIL: "BRASIL. Bahia. Lençóis/ Rio Muçugezinho. Bandeja 03./ 01.viii.2010/ light trap" "Holotype/ *Manonychus iris*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (CEUFPE).

Diagnosis. Body wider medially; shiny, reddish-brown; frons shorter than clypeus; clypeus trapezoidal; clypeus and frons sparsely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior and posterior margins arched; elytra reddish-brown, with black shades and iridescent reflexes; protibia with three teeth; metatibial apical spurs equal in size; metatarsomere I shorter than II; pygidium with coarse and dense punctures, disc smooth; parameres symmetrical, smooth with proximal region sclerotized, outer margins distally toothed; inner margins not toothed.

Description. Holotype male: Length 9.0 mm; width 3.5 mm. *Head*: Shiny, black and reddish-brown reflexes; distance between eyes twice the width of one eye; frons shorter than clypeus; clypeus trapezoidal; sparse punctures; canthus covered by clypeus; malar area with eight grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width equal to apex; galea with five teeth in frontal view; tooth I parallel; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior and posterior margins arched; margin with sparse bristles; pronotal anterior and posterior corners acute. *Pterothorax*: Scutellum subtriangular and iridescent reflexes; coarse and dense punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, reddish-brown, with black shades and iridescent reflexes; elytral suture slightly elevated; elytral surface with coarse marked punctures fading in fine punctures towards to base. *Legs*: Protibia with three teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia with fine punctures; metatibial apical spurs equal in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with

conspicuous punctures and iridescent reflexes; ventrite II length subequal to ventrite III length; ventrite IV length shorter than ventrite V length; propygidium visible and finely punctate; pygidium longer than wide, with coarse and dense punctures, disc smooth; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and converging on apex; smooth with proximal region sclerotized; outer margins with distally toothed; inner margins straight and not toothed; laterally excavated; phallobase in dorsal view, distal margins not constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Bahia).

Type locality. Lençóis (Bahia).

Remarks. *Manonychus iris* **sp. nov.** resembles *M. densicollis* Frey, 1974 in the body wider medially; canthus covered by clypeus; pronotal anterior and posterior margins arched and elytra reddish-brown uniform with iridescent reflexes. It differs in the clypeus trapezoidal (clypeus subrounded); clypeus and frons sparsely punctate (clypeus and frons densely punctate); elytra with shades (elytra not shades); pygidium longer than wide (pygidium wider than long) and parameres with proximal region sclerotized (parameres with proximal region membranous). Up to now, females from species are unknown.

Etymology. Substantive in the nominative singular. From Greek îris "rainbow". The name is referring to the iridescent reflexes in the body, similar rainbow shiny when it in contact with the light.

***Manonychus stanleei* sp. nov.**

Figures 24A – E

Type material. *Manonychus stanleei* **holotype** ♂ BRAZIL: "Utiariti/ Rio Papagaio, Mt/ 1-12.XI.1966/ Lenko & Pereira", "Holotype/ *Manonychus stanleei*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (MZSP).

Diagnosis. Body wider medially; reddish-dark brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior and posterior margins arched; elytra shiny, brown uniform; protibia with three teeth; metatibial apical spurs equal in size; metatarsomere I shorter than II; pygidium with fine and sparse punctures; parameres

symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 6.5 mm; width 3.0 mm *Head*: Shiny, reddish-dark brown; distance between eyes three times the width of one eye; frons longer than clypeus; clypeus subrounded; dense punctures; canthus covered by clypeus; malar area with six grooves; proximal grooved serrated; distal maxillary with maximum twice the width of apex; galea with six teeth visible in front view; tooth I parallel; lacinia not toothed; antennae lamellae and flagellum yellow uniform. *Protorax*: Pronotum shiny, reddish-light brown; disc densely punctate; pronotal anterior and posterior margins arched; margin with sparse bristles; pronotal anterior and posterior corners acute. *Pterothorax*: Scutellum subtriangular and smooth; mesepimerum with inner corners parallel. *Elytra*: Shiny, unicolored with pronotum; elytral suture elevated; elytral surface with coarse punctures fading in fine punctures towards to lateral and base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia smooth; metatibial apical spurs equal in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length shorter than ventrite V length; propygidium visible and densely punctate; pygidium longer than wide, with fine and sparse punctures; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and parallel on apex; smooth with proximal region sclerotized; outer and inner margins not toothed; inner margins curved and distally projected; parameres with short central apophysis 1/4 beyond inner margins, truncate on apex; laterally flat; phallobase in dorsal view, distal margins not constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Mato Grosso).

Type locality. Utiariti (Mato Grosso).

Remarks. *Manonychus stanleei* **sp. nov.** resembles *Manonychus casariae* **sp. nov.** in the body wider medially and clypeus subrounded. It differs in the length 6.5 mm (length 7.0 mm); frons longer than clypeus length (frons shorter than clypeus length); clypeus and frons densely punctate (clypeus and frons sparsely punctate); pronotal anterior and posterior margins arched (pronotal anterior and posterior margins straight); pygidium

longer than wide (pygidium wider than long) and parameres with with short central apophysis 1/4 beyond inner margins (parameres not apophysis).

Etymology. Noun in the genitive case. The species is named in honor to Stanley Martin Lieber, better known as Stan Lee. Creator from countless of the Marvel Comics heroes.

***Manonychus bidentatus* sp. nov.**

Figures 25A – F

Type material. *Manonychus bidentatus* **holotype** ♂ BRAZIL: "Ribeirão Preto/ (Tamanduá)/ X.1954/ Barreto col." "Coleção/ M. P. Barreto/ 1969", "Holotye/ *Manonychus bidentatus*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (MZSP).

Diagnosis. Body uniform in width; reddish-brown; frons longer than and clypeus length; clypeus trapezoidal; clypeus and frons densely punctate; canthus not covered by clypeus; pronotum densely punctate; pronotal anterior and posterior margins straight; elytra reddish-light brown and yellow reflexes; protibia with two teeth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth with proximal region membranous; outer margins distally toothed; inner margins not toothed.

Redescription. Holotype male: Length 6.8 mm; width 2.7 mm. *Head*: Shiny, reddish-brown; distance between eyes three times the width of one eye; frons longer than clypeus length; clypeus trapezoidal; dense punctures; canthus not covered by clypeus; malar area with six grooves; proximal grooved serrated; distal maxillary palpomere with maximum width to up to twice the width of apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae and flagellum black uniform. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior and posterior margins straight; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterotrax*: Scutellum triangular with coarse and dense punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, reddish-light brown and yellow reflexes; elytral suture elevated; elytral surface with coarse punctures fading towards to lateral and base. *Legs*: Protibia with two teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia with fine punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length

longer than ventrite III; ventrite IV length longer than ventrite V length; propygidium visible and coarsely punctate with bristles; pygidium as wide it is long, with fine and sparse punctures; basal width of the pygidium wider than posterior of the propygidium. *Male genitalia*: Parameres symmetrical; parameres not deflected distally and parallel on apex; smooth with proximal region membranous; outer margins distally toothed, inner margins not toothed; inner margins distally straight; parameres with short central apophysis, hidden by the parameres, acute on apex; laterally flat; phallobase in dorsal view, distal margins not constricted; medial longitudinal line hidden.

Type locality. São Paulo.

Geographical distribution known. BRAZIL (São Paulo).

Remarks. *Manonychus bidentatus* **sp. nov.** resembles *Manonychus rufinus* (Blanchard, 1851) in the body uniform in width, head color reddish-brown, clypeus trapezoidal and canthus not covered by clypeus. It differs in the frons longer than clypeus length (frons and clypeus with equal length); pronotal anterior and posterior margins straight (pronotal anterior margin arched and posterior straight); protibia with two teeth (protibia with three teeth) and pygidium as wide it is long (pygidium wider than long).

Etymology. Noun in the genitive case. From Latin bidentatus "two teeth". The name is referring to the teeth at the inner margin of parameres.

***Manonychus conypigus* Frey, 1976**

Figures 26A – E

Manonychus conypigus Frey, 1976b: 378; Evans 2003: 303 (checklist); Evans and Smith 2005: 256 (checklist); Evans and Smith 2009: 309 (checklist); Krajcik 2012: 156 (catalogue); Grossi and Vaz-de-Mello 2020 (checklist-online); Costa et al., unpublished data (systematics).

Type material. *Manonychus conypigus* **holotype** ♂ BRAZIL: "Encruzilhada/ 960m, Bahia/ 2 Alvarenga, XI. 72", "Type/ Manonychus/ conypigus/ G. Frey 19 75". Genitalia mounted (NHMB). **Paratype.** Brazil. **Bahia.** Encruzilhada: 1♂, XI.1972, Alvarenga leg (NHMB).

Diagnosis. Body uniform in width; light brown almost yellow; frons and clypeus with equal length; clypeus trapezoidal; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, yellow uniform; protibia with three teeth; metatibial apical spurs

different in size; metatarsomere I shorter than II; pygidium with fine and dense punctures; parameres symmetrical, with fine punctures and with proximal region membranous, outer and inner margins not toothed.

Redescription. Holotype male: Length 7.5 mm; width 2.5 mm. *Head*: Shiny, light brown almost yellow; distance between eyes twice the width of one eye; frons and clypeus with equal length; clypeus trapezoidal; dense punctures; canthus covered by clypeus; malar area with four grooves; proximal grooved serrated; distal maxillary palpomere with maximum width equal to apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae and flagellum yellow uniform. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior and posterior corners acute. *Pterothorax*: Scutellum triangular with fine and coarse punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, yellow uniform; elytral suture elevated; elytral surface with fine punctures fading towards to lateral and base. *Legs*: Protibia with three teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia with fine punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III; ventrite IV length subequal to ventrite V length; propygidium visible and smooth; pygidium cone-shaped, wider than long, with fine and dense punctures and basal region flat laterally; basal width of pygidium wider than posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and converging on apex; finely punctate with proximal region membranous; outer and inner margins not toothed; inner margins slightly curved; parameres with long central apophysis beyond inner margins, acute on apex; laterally flat; phallobase in dorsal view, distal margins not constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Bahia).

Type locality. Encruzilhada (Bahia).

Remarks. *Manonychus conypigus* different from other species of *Manonychys* in the body with strong color yellow uniform; slim body and pygidium cone-shaped. Besides that, into group of species from central apophysis in parameres, it is very long and acute on apex.

Only two individuals are known, both deposited in Naturhistorisches Museum, Basel, Switzerland.

***Manonychus paschoali* sp. nov.**

Figures 27A – F

Type material. *Manonychus paschoali* **holotype** ♂ BRAZIL: "BRASIL. Minas Gerais São/ Gonçalo do Rio Preto,/ P.E. do Rio Preto/ 23.xii.2011, Luz Negra,/ Oliveira & Ferreira." "Holotype/ *Manonychus paschoali* / F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (CERPE). **Paratypes.** Brazil. **Minas Gerais.** São Gonçalo do Rio Preto: 6♂ 1♀, 22.XII.2011; 8♂ 3♀, 23.XII.2011; 2♂, 24.I.2012 light trap, Oliveira and Ferreira legs.; São Gonçalo do Rio Abaixo. Reserva Peti: 2♂ 1♀, 11.I.1987 (CERPE). "Paratype/ *Manonychus paschoali* / F. Costa, M. Cherman and L. Iannuzzi 2018"

Diagnosis. Body uniform in width; reddish-dark brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus not covered by clypeus; pronotum densely punctate; pronotal anterior and posterior margins arched; elytra reddish-light brown; protibia with three teeth; metatibial apical spurs different in size; metatarsomere I longer than II; pygidium with fine and dense punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 7.0 mm; width 3.0 mm (variation 7.0-7.5 mm; 3.0-3.5 mm). *Head*: Shiny, reddish-dark brown; distance between eyes five times the width of one eye; frons longer than clypeus; subrounded; dense punctures; canthus not covered by clypeus; malar area with four grooves; proximal grooved not serrated; distal maxillary with maximum width equal to apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior and posterior margins arched; margin with sparse bristles; pronotal anterior and posterior corners acute. *Pterothorax*: Scutellum subtriangular with fine and sparse punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, reddish-light brown; elytral suture elevated; elytral surface with coarse punctures fading towards to base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia smooth; metatibial apical spurs different in

size; metatarsomeres with tarsomere I longer than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length shorter than ventrite V length; propygidium hidden by elytra and smooth; pygidium wider than long, with fine and dense punctures; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected and converging on apex; smooth with proximal region sclerotized; outer and inner margins not toothed; inner margins curved; parameres with short central apophysis beyond inner margins, truncate on apex; laterally flat; phallobase in dorsal view, distal margin constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Minas Gerais).

Type locality. São Gonçalo do Rio Preto (Minas Gerais).

Remarks. *Manonychus paschoali* **sp. nov.** resembles *Manonychus truncatus* **sp. nov.** in the body uniform in width and pronotal anterior and posterior margins arched. It differs in the body uniform in width (body wider medially); canthus not covered by clypeus (canthus covered by clypeus); metatarsomere I longer than II and pygidium with sparse punctures (pygidium with dense punctures).

Etymology. Noun in the genitive case. The species is named in honor to Dr. Paschoal Coelho Grossi, curator and teacher of the Entomology Collection from Universidade Federal Rural de Pernambuco, Pernambuco, Brazil. Thanks for all support during this work.

***Manonychus cordiformis* sp. nov.**

Figures 28A – F

Type material. *Manonychus cordiformis* **holotype** ♂ BRAZIL: "BRASIL: Piauí. Caracol./ Serra das Confusões./ 9°13'543"23 O. 720m. 9-/16.xii.2010. Light trap./ Silva-Neto, A." "Holotype/ *Manonychus cordiformis*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (UEFS). **Paratypes.** Brazil. **Piauí.** Caracol. Serra das Confusões: 2♂ 1♀, 9°13'543"23 O, 720m, 9-16.XII.2010, light trap, Silva-Neto, A. leg.; Piracuruca. Pilão Arcado. Brejo do Morro. 10°06'654"S 42°53'680"W, 27.XI.2008, light trap, A. Silva-Neto, E. Menezes, E. M. Silva, legs: 1♀. Parque Nacional de Sete Cidades. Posto do ICMBIO: 1♂, 04°05'57"S 41°42'34"W, 11–14.XII. 2012, light trap, F. Limeira-de-Oliveira, J. S. Pinto Júnior, legs. (UEFS). "Paratype/ *Manonychus cordiformis*/ F. Costa, M. Cherman and L. Iannuzzi 2018".

Diagnosis. Body uniform in width; reddish-brown; frons longer than clypeus; clypeus trapezoidal; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, light brown and yellow reflexes; protibia with three teeth; metatibial apical spurs equal in size; metatarsomere I shorter than II; pygidium with coarse and dense punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 7.0 mm; width 3.0 mm (variation 7.0-7.5 mm; 3.0-3.5 mm). *Head*: Shiny, reddish-brown; distance between eyes three times the width of one eye; frons longer than clypeus; clypeus trapezoidal; dense punctures; canthus covered by clypeus; malar area with five grooves; proximal grooved serrated; distal maxillary palpomere with maximum width equal to apex; galea with six teeth visible in front view; tooth I parallel; lacinia toothed; antennae lamellae darker than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterothorax*: Scutellum subtriangular, with coarse and sparse punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, light brown and yellow reflexes; elytral suture elevated; elytral surface with fine punctures fading towards to lateral and base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia finely punctate; metatibial apical spurs equal in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length subequal to ventrite V length; propygidium visible and finely punctate setose; pygidium longer than wide, with coarse and dense punctures marked; basal width of the pygidium wider than posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected and parallel on apex; smooth with proximal region sclerotized; outer and inner margins not toothed; inner margins strongly curved in heart-shape; parameres with long central apophysis beyond inner margins, acute on apex; laterally excavated occupying 2/3 from length; in dorsal view, distal margins constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Piauí).

Type locality. Pilão Arcado (Piauí).

Remarks. *Manonychus cordiformis* **sp. nov.** resembles *Manonychus gracilis* **sp. nov.**. It differs in the clypeus trapezoidal (clypeus subrounded); protibia with three teeth (protibia with two teeth); pygidium with coarse and dense punctures (pygidium with fine and sparse punctures); parameres with long central apophysis (parameres not apophysis) and parameres laterally excavated (parameres laterally flat).

Etymology. Adjective in the nominative singular. From Latin cor "heart". The name is referring to the heart-shape of the parameres of males.

***Manonychus truncatus* sp. nov.**

Figures 29A – F

Type material. *Manonychus truncatus* **holotype** ♂ BRAZIL: "BRASIL. Minas Gerais São/ Gonçalo do Rio Preto,/ P.E. do Rio Preto/ 23.xii.2011, Luz Negra,/ Oliveira & Ferreira." "Holotype/ *Manonychus truncatus*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (CERPE); **Paratype.** Brazil. **Minas Gerais.** São Gonçalo do Rio Preto: 1♀, 23.XII.2011, light trap, Oliveira and Ferreira legs. (CERPE). "Paratype/ *Manonychus truncatus* / F. Costa, M. Cherman and L. Iannuzzi 2018"

Diagnosis. Body wider medially; reddish-dark brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior and posterior margins arched; elytra shiny, brown uniform; protibia with three teeth; metatibial apical spurs equal in size; metatarsomere I shorter than II; pygidium with fine and sparse punctures; parameres asymmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 6.5 mm; width 3.0 mm (variation 6.5-7.0 mm; 3.0-3.2 mm). *Head*: Shiny, reddish-dark brown; distance between three times the width of one eye; frons longer than clypeus; clypeus trapezoidal; dense punctures; canthus covered by clypeus; malar area with four grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width to up to twice the width of apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae darker than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior and posterior margin straight; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterothorax*: Scutellum subtriangular with coarse and dense punctures; mesepimerum with inner corners

parallel. *Elytra*: Shiny, light brown uniform; elytral suture elevated medially; elytral surface with coarse punctures marked. *Legs*: Protibia with three teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia with coarse punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II Length subequal to ventrite III Length; ventrite IV Length subequal to ventrite V length; propygidium visible and finely punctate; pygidium wider than long, with coarse and dense punctures; basal width of the pygidium wider than posterior of the propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and parallel on apex; smooth with proximal region sclerotized; outer and inner margins not toothed; inner margins straight; parameres with long central apophysis beyond inner margins, truncate on apex; laterally flat; phallobase in dorsal view, distal margin constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Minas Gerais).

Type locality. São Gonçalo do Rio Preto (Minas Gerais).

Remarks. *Manonychus truncatus* **sp. nov.** resembles *Manonychus paschoali* **sp. nov.** in the frons longer than clypeus; clypeus subrounded; pronotal anterior and posterior margins arched; parameres with long central apophysis. It differs in the body wider medially (body uniform in width); head color reddish-dark brown (head color light brown, almost yellow); pronotum and elytra with punctures marked (pronotum and elytra finely punctate) and pygidium convex (pygidium cone-shaped).

Etymology. Adjective in the nominative singular. From Latin truncātus “flatted” “maimed”. The name is referring to apex of central apophysis flatted in parameres.

***Manonychus casariae* sp. nov.**

Figures 30A – F

Type material. *Manonychus casariae* **holotype** ♂ BRAZIL: “Unaí (Faz. Bolívia)/ MG, Brasil/ 22-24. X. 1964/ Exp. Dep. Zool. col.”, “Holotype/ *Manonychus casariae*/ F. Costa, M. Cherman and L. Iannuzzi 2017”. Genitalia mounted (MZSP). **Paratypes.** Brazil. **Bahia.** São Felix do Coribe-Coribe: 1♂, 493m, 13°33’S 44°15’W, 07.XII.2007, Bravo, F., Zacca, T., Silva-Neto, A., Rezende, J. and Almeida legs. (UEFS). **Minas Gerais.** Unaí. Fazenda Bolívia: 4♂ 1♀, 22-24. X. 1964/ Exp. Dep. Zool. col.”. Pouso Alegre: 5♂ 1♀, 24-25.VI.1965, Vulcano and Pereira leg. **Goiás.** Cabeceiras, Lagoa

Formosa: 8♂ 4♀, 24-27.X.1964, Exp. Dep. Zool leg.. (MZSP). “Paratype/ *Manonychus casariae*/ / F. Costa, M. Cherman and L. Iannuzzi 2017”.

Diagnosis. Body wider medially; shiny, reddish-brown; frons shorter than clypeus; clypeus subrounded; clypeus and frons sparsely punctate; canthus covered by clypeus; pronotum sparsely punctate; pronotal anterior and posterior margins straight; elytra reddish-brown; protibia with three teeth; metatibial apical spurs different in size; metatarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 7.0 mm; width 2.8 mm (variation 7.0-8.0 mm; 2.8-3.0 mm). *Head*: Shiny, reddish-brown; distance between eyes three times the width of one eye; frons shorter than clypeus; clypeus subrounded; sparse punctures; canthus covered by clypeus; malar area with five grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width to up to twice the width of apex; galea with seven teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc sparsely punctate; pronotal anterior and posterior margins straight; margin with sparse bristles; pronotal anterior and posterior corners acute. *Pterothorax*: Scutellum subtriangular with coarse and dense punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, unicolored with head and pronotum; elytral suture elevated; elytral surface with fine punctures fading towards to lateral and base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia smooth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with inconspicuous punctures; ventrite II length longer than ventrite III; ventrite IV length subequal to ventrite V length; propygidium visible and finely punctate; pygidium wider than long, with fine and sparse punctures, coarsely punctate laterally; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and parallel on apex; smooth with proximal region sclerotized; outer and inner margins not toothed; inner margins curved; laterally excavated occupying 2/3 from length; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Bahia, Goiás and Minas Gerais).

Type locality. Unaí (Minas Gerais).

Remarks. *Manonychus casariae* **sp. nov.** resembles *Manonychus mermudesi* **sp. nov.** in the body wider medially and body color shiny, reddish-brown. It differs in the frons shorter than clypeus length (frons longer than clypeus); pronotal anterior and posterior margins straight (pronotal anterior margin arched and posterior straight); metatibial apical spurs different in size (metatibial apical spurs equal in size) and parameres smooth (parameres punctate).

Etymology. Noun in the genitive case. The species is named in honor to Drª Sônia Aparecida Casari, curator and teacher of Zoology Museum from Universidade Federal de São Paulo, São Paulo, Brazil.

***Manonychus cleideae* sp. nov.**

Figures 31A – F

Type material. *Manonychus cleideae* **holotype** ♂ BRAZIL: "BRASIL. Minas Gerais./ Berizal. Faz. Veredão. 09-12.xii.2012. E. e P. Grossi./ Legs." "Holotype/ *Manonychus cleideae*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (CERPE).

Paratypes. Brazil. **Minas Gerais.** Berizal. Fazenda Varedão: 6♂ 7♀, 09-12.XII.2012. E. e P. Grossi. legs.. São Gonçalo do Rio Preto: 1♀ 23.XII.2011, light trap. Oliveira & Ferreira, legs.. São Gonçalo do Rio Abaixo. Reserva Peti: 2♀, 11.I.1987 (CERPE). "Paratype/ *Manonychus cleideae*/ / F. Costa, M. Cherman and L. Iannuzzi 2018"

Diagnosis. Body wider medially; reddish-dark brown; frons shorter than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, reddish-lightbrown; protibia with two teeth; metatibial apical spurs different in size; metatarsomere I shorter than II; pygidium with coarse and dense punctures; parameres symmetrical, finely punctate with proximal region membranous, outer and inner margins not toothed.

Description. Holotype male: Length 8.0 mm; width 3.5 mm (variation 8.0-9.0 mm; 3.5-4.0 mm). *Head*: Shiny, reddish-dark brown; distance between eyes twice the width of one eye; frons shorter than clypeus; clypeus subrounded; dense punctures; canthus covered by clypeus; malar area with six grooves; proximal grooved not serrated; distal maxillary with maximum width equal to apex; galea with six teeth visible in front view; tooth I projected; lacinia not toothed; antennae lamellae darker than flagellum.

Protorax: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior corners rounded and posterior acute. *Pterothorax*: Scutellum subtriangular with fine and sparse punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, reddish-light brown; elytral suture hard elevated; elytral surface with coarse punctures fading towards to base. *Legs*: Protibia with three teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia with coarse punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length subequal to ventrite V length; propygidium hidden and finely punctate; pygidium wider than long and with coarse and dense punctures; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and parallel on apex; finely punctate with proximal region membranous; outer and inner margins not toothed; inner margins straight; laterally flat; phallobase in dorsal view, distal margins not constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Minas Gerais).

Type locality. Berizal (Minas Gerais).

Remarks. *Manonychus cleideae* **sp. nov.** resembles *M. martinezi* Frey, 1974 in the body wider medially; body color reddish-dark brown and frons shorter than clypeus. It differs in the clypeus subrounded (clypeus trapezoidal); pronotal anterior margin arched and posterior straight (pronotal anterior and posterior margins straight); protibia with two teeth (protibia with three teeth) and pygidium wider than long (pygidium longer than wide).

Etymology. Noun in the genitive case. The species is named in honor to Dr. Cleide Maria Ribeiro de Albuquerque, former teacher of Universidade Federal de Pernambuco, Pernambuco, Brazil. All respect and admiration.

***Manonychus martinezi* Frey, 1974**

Figures 32A – F

Manonychus martinezi Frey, 1974f: 320-321; Evans 2003: 303 (checklist); Evans and Smith 2005: 256 (checklist); Evans and Smith 2009: 309 (checklist); Krajcik 2012: 156

(catalogue); Grossi and Vaz-de-Mello 2020 (checklist-online); Costa et al., unpublished data (systematics).

Type material. *Manonychus martinezi* **holotype** ♂ BRAZIL: "m#", "Fry/ Rio Jan", "Fry Coll./ 1905-100", "Type/ Manonychus/ martinezi/ Moser 1973". Genitalia mounted (NHMB).

Non-type material. BRAZIL. **Rio de Janeiro.** Angra dos Reis, Jussaral: 1♀, IX.1935, D. Mendes leg., 1♂ same locality and leg. but, IX.1935; 1♀ same locality but, X.1934 Litraviet Lopes leg. (MNRJ).

Diagnosis. Body wider medially; reddish-dark brown; frons shorter than clypeus; clypeus trapezoidal; clypeus and frons sparsely punctate; canthus covered by clypeus; pronotum sparsely punctate; pronotal anterior and posterior margins straight; elytra shiny, reddish-light brown; protibia with three teeth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Redescription. Holotype male: Length 9.0 mm; width 3.0 mm (variation 9.0-9.4 mm; 3.0-3.6 mm). *Head*: Shiny, reddish-dark brown; distance between eyes twice the width of one eye; frons shorter than clypeus; clypeus trapezoidal; sparse punctures; canthus covered by clypeus; malar area with six grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width equal to apex; galea with five teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae darker than flagellum. *Protorax*: Pronotum with long and sparse bristles on disc, shiny (slightly iridescent reflexes), unicolored with head; disc sparsely punctate; pronotal anterior and posterior margins straight; margin with sparse bristles; pronotal anterior and posterior corners acute. *Pterothorax*: Scutellum subtriangular with coarse and sparse punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, reddish-light brown; elytral suture elevated; elytral surface with fine punctures fading towards to lateral and base. *Legs*: Protibia with three teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia with fine punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length subequal to ventrite V length; propygidium visible and finely punctate; pygidium longer than wide with fine and sparse punctures; basal width of the

pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres not deflected distally and converging on apex; smooth with proximal region sclerotized; outer and inner margins not toothed; inner margins slightly curved; laterally flat; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Rio de Janeiro and São Paulo).

Type locality. Rio de Janeiro.

Remarks. *Manonychus martinezi* resembles *M. birabeni* Martínez, 1959 in thte elytra reddish-light brown uniform; metatibial apical spurs different in size and pygidium with fine and sparse punctures. It differs in the body wider medially (body uniform in width); clypeus trapezoidal (clypeus subrounded); pronotal anterior and posterior margins straight (pronotal anterior margin arched and posterior straight) and parameres inner margins not toothed (parameres inner margins toothed).

During the *Manonychus martinezi* description, Frey (1974), mentioned that main difference to *M. birabeni* is ventrites sparse punctures (dense punctures). Nevertheless, the analysis of type material allowed us that both species has dense punctures in ventrites.

***Manonychus birabeni* Martinez, 1959**

Figures 33A – E

Manonychus birabeni Martínez, 1959b: 59-60; Evans 2003: 303 (checklist); Evans and Smith 2005: 256 (checklist); Evans and Smith 2009: 309 (checklist); Krajcik 2012: 156 (catalogue); Grossi and Vaz-de-Mello 2020 (checklist-online); Costa et al., unpublished data (systematics).

Type material. *Manonychus birabeni* **holotype** ♂ BRAZIL: “Brasil/ Estado de Rio”, “P.N. Itatiaia/ 700 m alt/ Vulcano, Rego Barros Y Martínez, coll/ II-1957”. Genitalia mounted (MACN).

Non-type material. BRAZIL. **Minas Gerais.** Rio Vermelho: 1♀, II/1949; Vila Monte Verde: 1♀, 26.XII.1970, Halik, F. leg. (MZSP); **Espírito Santo.** Santa Tereza: 1♀, 13.XI.1966, C. Elias leg. [430104]; **Paraná.** Foz do Iguaçu: 1♀, 07.XII.1966, light trap, Dep. Zool. UFPR leg. [430084] (DZUP); **Santa Catarina.** 1♀ and 2♂, Reitter leg., (ZMHB).

Diagnosis. Body uniform in width; reddish-light brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra reddish-light brown uniform; protibia with three teeth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth with proximal region sclerotized; outer margins not toothed; inner margins medially toothed.

Redescription. Holotype male: Length 8.0 mm; width 3.0 mm (variation 8.0-8.3 mm; 3.0-3.5 mm). *Head*: Shiny, reddish-light brown; distance between eyes twice the width of one eye; frons longer than clypeus; clypeus subrounded; dense punctures; canthus covered by clypeus; malar area with five grooves; proximal grooved not serrated; distal maxillary palpomere with maximum width equal to apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior corners rounded and posterior acute. *Pterothorax*: Scutellum subtriangular with coarse and dense punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, unicolored with head and pronotum; elytral suture elevated; elytral surface with coarse punctures fading in fine punctures towards to base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia with fine punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length longer than ventrite III; ventrite IV length shorter than V length; propygidium visible and finely punctate; pygidium wider than long, with fine and sparse punctures; basal width of the pygidium wider than posterior of the propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and converging on apex; smooth with proximal region sclerotized; outer margins toothed; inner margins medially toothed and strongly curved; laterally excavated distally; phallobase in dorsal, distal margin constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Minas Gerais, Espírito Santo, Rio de Janeiro and Santa Catarina).

Type locality. Parque Nacional do Itatiaia (Rio de Janeiro).

Remarks. *Manonychus birabeni* Martinez, 1959 resembles *M. martinezi* Frey, 1974, and yours differences were approached in *Manonychus birabeni* remarks.

***Manonychus maranhensis* sp. nov.**

Figures 34A – E

Type material. *Manonychus maranhensis* **holotype** ♂ BRAZIL: "CZMA/ Brasil (MA), Caxias/ Reserva Ecol. Inhamum/ Povoado Caités / 04°54'43"S/43°25'30"W" "CZMA/ Armadilha Luminosa/ 25 – 26.xi.2011,.M.K.A. Santos, C.M.S. silva & A.A. santos, cols", "Holotype/ *Manonychus maranhensis*/ F. Costa, M. Cherman and L. Iannuzzi 2017". Genitalia mounted. (CERPE). **Paratypes.** Brazil. **Piauí.** Caracol. Serra das Confusões: 3♂, 9°13'543"23º, 720m, 25-26.XI.2011, light trap, Silva-Neto, A. leg. (UEFS). "Paratype/ *Manonychus maranhensis*/ / F. Costa, M. Cherman and L. Iannuzzi 2018"

Diagnosis. Body wider medially; reddish-light brown and yellow reflexes; frons longer than clypeus; clypeus trapezoidal; clypeus and frons sparsely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior and posterior margins arched; elytra shiny, yellow uniform; protibia with three teeth; metatibial apical spurs different in size; metatarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 7.0 mm; width 3.0 mm (variation 7.0-7.2 mm; 3.0-3.5 mm). *Head*: Shiny, reddish-light brown and yellow reflexes; distance between eyes twice the width of one eye; frons longer than clypeus; clypeus trapezoidal; sparse punctures; canthus covered by clypeus; malar area with five grooves; proximal grooved serrated; distal maxillary palpomere with maximum width equal to apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior and posterior margins arched; margin with sparse bristles; pronotal anterior corners acute and posterior rounded. *Pterothorax*: Scutellum triangular with fine punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, yellow uniform; elytral suture elevated; elytral surface with coarse punctures fading towards to base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia smooth; metatibial apical spurs

different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length longer than ventrite III length; ventrite IV length longer than ventrite V length; propygidium visible and finely punctate; pygidium as wide it is long, with fine and sparse punctures; basal width of the pygidium wider than posterior of the propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected ana parallel on apex; smooth with proximal region sclerotized; parameres in arc-shaped; outer and inner margins not toothed; inner margins strongly curved; laterally excavated occupying 2/3 from length; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Maranhão and Piauí).

Type locality. Caxias (Maranhão).

Remarks. Up to this study females are unknown. *Manonychus maranhensis* **sp. nov.** resembles *M. conypigus* Frey, 1976 in the elytra yellow uniform; clypeus trapezoidal and metatibial apical spurs different in size. It differs in the body wider medially (body uniform in width); pronotal anterior and posterior margins arched (pronotal anterior margin arched and posterior straight) and pygidium convex, as wide it is long (pygidium cone shape, wider than long).

Etymology. Adjective masculine and feminine. The species is named referring to the Brazilian State "Maranhão", where the specimens were collected.

***Manonychus mermudesi* sp. nov.**

Figures 35A – F

Type material. *Manonychus mermudesi* **holotype** ♂ BRAZIL: "Bananeiras/ Goyaz 10. x. 38/ Coll. Zellibor-Hauff" "Holotype/ *Manonychus mermudesi*/ F. Costa, M. Cherman and L. Iannuzzi 2017". Genitalia mounted. (MNRJ). **Paratypes.** Brazil. **Goiás.** Bananeiras: 2♀, 10.X.1938, Zellibor-Hauff leg.. **São Paulo.** Angatuba: 2♂, I.1923, Bussmeyer leg. (MNRJ). **Paraná.** Tibagi. Parque Estadual Guartelá: 1♂, 28-30.X.2011, Luiz P.C., and Grossi, P. legs. (CERPE). "Paratype/ *Manonychus mermudesi*/ F. Costa, M. Cherman and L. Iannuzzi 2017"

Diagnosis. Body wider medially; shiny, reddish-brown; frons longer than clypeus; clypeus trapezoidal; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra light brown and red reflexes to apex; protibia with three teeth; metatibial apical

spurs equal in size; metatarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, punctate and with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 8.0 mm; width 3.0 mm (variation 8.0-8.5 mm; 3.0-3.5 mm). *Head*: Shiny, reddish-brown; distance between eyes twice the width of one eye; frons longer than clypeus; clypeus trapezoidal; dense punctures; canthus covered by clypeus; malar area with five grooves; proximal grooved serrated; distal maxillary palpomere with maximum width to up to twice the width of apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae and flagellum with same color. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior corners rounded and posterior acute. *Pterothorax*: Scutellum triangular with coarse and dense punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, light brown and red reflexes to apex; elytral suture elevated; eltytral surface with fine punctures fading towards to lateral and base. *Legs*: Protibia with three teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia with fine punctures; metatibial apical spurs equal in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length subequal to ventrite V length; propygidium hidden by elytra and finely punctate; pygidium wider than long, with fine and sparse punctures; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and parallel on apex; finely punctate with proximal region sclerotized; outer and inner margins not toothed; inner margins curved and strongly sinuous distally; laterally flat; phallobase in dorsal view, distal margins not constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Goiás, São Paulo and Paraná).

Type locality. Bananeiras (Goiás).

Remarks. *Manonychus mermudesi* **sp. nov.** resembles *M. rufinus* Blanchard, 1851 in the head color reddish-brown; clypeus trapezoidal and pronotal anterior margin arched and posterior straight. It differs in the body wider medially (body uniform in width); canthus covered by clypeus (canthus not covered by clypeus); metatibial apical spurs

equal in size (metatibial apical spurs different in size) and pygidium apex not depressed (pygidium apex region depressed).

The labels have locality as Bananeiras, dated 1938. But the District created under the name Bananeiras By State Decree-Law N. 1,233 of October 31, 1938, the municipality of Bananeiras was renamed Goiatuba, placed on South of Goiás Brazillian States.

Etymology. Noun in the genitive case. The species is named in honor to Drº José Ricardo Mermudes, curator and teacher of the Entomology Collection from Universidade Federal Rio de Janeiro, Rio de Janeiro, Brazil.

***Manonychus omegoides* sp. nov.**

Figures 36A – E

Type material. *Manonychus omegoides* **holotype** ♂ BRAZIL: "Armadilha;/ luminosa/ Área Bic" "Linhares, ES/ Reser. Natural Vale/ 12-14/X/2012/ C.C.L Teixeira col." "Holotype/ *Manonychus omegoides*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (CEMT). **Paratypes.** Brazil. **Espírito Santo.** Linhares. Reserva Natural Vale: 1♂, 12-14.X.2012, light trap, C.C.L Teixeira leg. (CEMT). "Paratype/ *Manonychus omegoides*/ F. Costa, M. Cherman and L. Iannuzzi 2018"

Diagnosis. Body uniform in width; reddish-dark brown; frons longer than clypeus; clypeus trapezoidal; clypeus and frons sparsely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, reddish-light brown uniform; protibia with two teeth; metatibial apical spurs different in size; metatarsomere I shorter than II; pygidium with coarse and dense punctures; parameres symmetrical, smooth with proximal region sclerotized; outer margins distally toothed; inner margins not toothed**.**

Description. Holotype male: Length 8.0 mm; width 3.5 mm (variation 8.0-9.0 mm; 3.5-4.0 mm). *Head*: Shiny, reddish-dark brown; distance between eyes three times the width of one eye; frons longer than clypeus; clypeus trapezoidal; sparse punctures; canthus covered by clypeus; malar area with six grooves; proximal grooved serrated; distal maxillary with maximum width to up to twice the width of apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae and flagellum yellow uniform. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterothorax*: Scutellum

subtriangular with coarse and dense punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, unicolored with head and pronotum; elytral suture slightly elevated; elytral surface with coarse punctures fading in fine punctures towards to lateral and base. *Legs*: Protibia with two teeth; obtuse angle from tooth II to tooth III; mesofemures with double row of confluent punctures; mesotibia smooth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite I length subequal to ventrite II length; ventrite IV length longer than ventrite V length; propygidium visible and coarsely punctate; pygidium as wide it is long, with coarse and dense punctures; basal width of the pygidium wider equal to the posterior of the propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and parallel on apex; smooth with proximal region sclerotized; parameres horseshoe-shaped; outer with apically toothed, inner margins not toothed; inner margins curved; laterally flat; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Espírito Santo).

Type locality. Linhares (Espírito Santo).

Remarks. *Manonychus omegoides* **sp. nov.** resembles *Manonychus cleideae* **sp. nov.** in the body wider medially; body color reddish-dark brown and clypeus subrounded. It differs in the frons longer than clypeus length (frons shorter than clypeus length); pronotal anterior and posterior margins arched (pronotal anterior margin arched and posterior straight); protibia with three teeth (protibia with two teeth); pygidium with fine and sparse punctures (pygidium with coarse and dense punctures) and parameres symmetrical (parameres asymmetrical).

Etymology. Adjective masculine and feminine. The name is referring to the parameres in Omega-shaped, like horseshoe-shaped.

***Manonychus cuiabanus* sp. nov.**

Figures 37A – E

Type material. *Manonychus cuiabanus* **holotype** ♂ BRAZIL: "BRASIL: Mato Grosso,/ Cuiabá, 15°16'45"S 56°00'/ 06"W, 07.xii.2015, A. Frolov/ & L. Akhmetova", [red printed] "Holotype/ *Manonychus cuiabanus*/ F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia mounted. (CEMT). **Paratypes.** Brazil. **Mato Grosso.** Cuiabá: 1♂ 2♀, 15°16'45"S 56°00'06"W, 07.XII.2015, A Frolov and L Akhmetova legs.; Chapada dos

Guimarães: 1♀, 15°24’31”S 55°45’53”W, 02/XII/2015, light trap, A Frolov and L Akhmetova legs.; Fazenda Mutuca: 1♀, 15°19’31”S, 55°58’03”W, 285m, XI.2015, light trap, R V Nunes and A Frolov legs.; Nova Xavantina: 1♀, 22/IV/1990, Marcos Pinceoher leg.. **Distrito Federal.** Brasília: I/2003, Degallier, N. leg. (CEMT). “Paratype/ *Manonychus cuiabanus*/ F. Costa, M. Cherman and L. Iannuzzi 2018”.

Diagnosis. Body wider medially; reddish-dark brown; frons longer than clypeus; clypeus subrounded; clypeus and frons sparsely punctate; canthus not covered by clypeus; pronotum densely punctate; pronotal anterior and posterior margins arched; elytra shiny, reddish-dark brown uniform; protibia with three teeth; metatibial apical spurs different in size; metatarsomere I shorter than II; pygidium with fine and sparse punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Description. Holotype male: Length 6.0 mm; width 2.5 mm (variation 6.0-6.5 mm; 2.5-3.0 mm). *Head*: Shiny, reddish-dark brown; distance between eyes three times the width of one eye; frons longer than clypeus; clypeus subrounded; sparse punctures; canthus not covered by clypeus; malar area with five grooves; proximal grooved not serrated; distal maxillary with maximum width equal to apex; galea with six teeth visible in front view; tooth I projected; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior and posterior margins arched; pronotal posterior depressed; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterothorax*: Scutellum triangular with coarse and dense punctures; mesepimerum with inner corners parallel. *Elytra*: Shiny, unicolored with head and pronotum; elytral suture elevated; elytral surface with fine punctures fading towards to base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia smooth; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length subequal to ventrite III length; ventrite IV length subequal to ventrite V length; propygidium visible and coarsely punctate; pygidium longer than wide, with fine and sparse punctures; basal width of the pygidium wider than posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected and parallel on apex; smooth with proximal region sclerotized; outer and inner margins not toothed;

inner margins curved; laterally flat; phallobase in dorsal view, distal margin constricted; medial longitudinal line visible.

Geographical distribution known. BRAZIL (Mato Grosso).

Type locality. Cuiabá (Mato Grosso).

Remarks. *Manonychus cuiabanus* **sp. nov.** resembles *Manonychus omegoides* **sp. nov.** in the body color reddish-dark brown. It differs in the body wider medially (body uniform in width); clypeus subrounded (clypeus trapezoidal); anterior and posterior arched (pronotal anterior margin arched and posterior straight) and protibia with three teeth (protibia with two teeth).

Etymology. Adjective neuter singular. The species is named referring to the Brazilian Town "Cuiabá – Mato Grosso".

***Manonychus unguicularis* Moser, 1919**

Figures 38A – F

Manonychus unguicularis Moser, 1919c: 346-347; Blackwelder 1944: 228 (checklist); Evans 2003: 303 (checklist); Evans and Smith 2005: 256 (checklist); Evans and Smith 2009: 309 (checklist); Krajcik 2012: 156 (catalogue); Grossi and Vaz-de-Mello 2020 (checklist-online); Costa et al., unpublished data (systematics).

Type material. *Manonychus unguicularis* **holotype** ♂ BRAZIL: "Brasilia/ Cuyaba", "Manonychus/ unguicularis/ Typen/ Mos", "Type/ Manonychus/ unguicularis/ Moser 19 19". Genitalia mounted (ZMHB).

Non-type material. BOLIVIA. **Santa Cruz.** Chiquitos: 1♂, 20 km E, Santiago Chiquitos, 18°08'45"S 59°16'45"W, 215m, XI.2008, light trap, Edmonds, W.D leg.; BRAZIL. **São Paulo.** Agudos: 1♀, 1909 (MZSP); Engenho Coelho: 1♀, 1920, Richeter, A. leg.. **Mato Grosso.** Cuiabá. Gustavo Dutra: 1♀, 26.X.1953, Gonçalves, C. R. leg. (MNRJ). Campos de Júlio, Chapada dos Parecir: 1♀, 30km, 14°17'S 59°15'W, 15.XII.2001, FIT, Foucart leg. (CEMT). **Mato Grosso do Sul.** Porto Murtinho: 1♀, XI.1929, Melm, H. leg.; Corumba: 1♀, Passo do Lontra, XI.2000, Raizer, J. leg. (CEMT); **Espírito Santo.** Corrego Itá: 1♀, XI.1955, Zikan, W. leg (MNRJ).

Diagnosis. Body wider medially; reddish-light brown; frons longer than clypeus; clypeus subrounded; clypeus and frons densely punctate; canthus covered by clypeus; pronotum densely punctate; pronotal anterior margin arched and posterior straight; elytra shiny, reddish-light brown, darker in lateral; protibia with three teeth; metatibial

apical spurs different in size; metatarsomere I shorter than II; pygidium with coarse and dense punctures; parameres symmetrical, smooth with proximal region sclerotized, outer and inner margins not toothed.

Redescription. Holotype male: Length 8.0 mm; width 3.5 mm (variation 8.0-9.0 mm; 3.0-3.5 mm). *Head*: Shiny, reddish-light brown; distance between eyes twice the width of one eye; frons longer than clypeus; clypeus subrounded; dense punctures; canthus covered by clypeus; malar area with six grooves; proximal grooved serrated; distal maxillary palpomere with maximum width equal to apex; galea with five teeth visible in frontal view; tooth I parallel; lacinia toothed; antennae lamellae lighter than flagellum. *Protorax*: Pronotum glabrous, shiny, unicolored with head; disc densely punctate; pronotal anterior margin arched and posterior straight; margin with sparse bristles; pronotal anterior and posterior corners rounded. *Pterothorax*: Scutellum subtriangular with coarse and dense punctures; mesepimerum with inner corners projected. *Elytra*: Shiny, unicolored with head and pronotum, darker in lateral; elytral suture slightly elevated; elytral surface with coarse punctures fading towards to lateral and base. *Legs*: Protibia with three teeth; acute angle from tooth II to tooth III; mesofemures with double row of parallel punctures; mesotibia with fine punctures; metatibial apical spurs different in size; metatarsomeres with tarsomere I shorter than II. *Abdomen*: Ventrites with conspicuous punctures; ventrite II length longer than ventrite III; ventrite IV length subequal to ventrite V length; propygidium visible and finely punctate; pygidium wider than long, with fine and dense punctures; basal width of the pygidium equal to the posterior width of propygidium. *Male genitalia*: Parameres symmetrical; parameres deflected distally and parallel on apex; smooth with proximal region sclerotized; outer and inner margins not toothed; inner margins straight; laterally excavated occupying 2/3 from length; phallobase in dorsal view, distal margins not constricted; medial longitudinal line hidden.

Geographical distribution known. BRAZIL (Mato Grosso, Mato Grosso do Sul, Espírito Santo and São Paulo). BOLIVIA (Santa Cruz).

Type locality. Cuiabá (Mato Grosso).

Remarks. *Manonychus unguicularis* Moser, 1919 resembles *M. ovalis* (Blanchard, 1851) in the body wider medially and clypeus subrounded. It differs in the frons longer than clypeus length (frons shorter than clypeus length); pronotal anterior margin arched and posterior straight (pronotal anterior margin straight and posterior arched); elytra

shiny, reddish-light brown, darker in lateral (elytra reddish-dark brown with iridescent reflexes) and metatarsomere I shorter than II (metatarsomere I longer than II).

In this study the geographical distribution data is expanded to Brazilian Southeast (Espírito Santo and São Paulo). In addition, we recorded the first report outside Brazilian territory, placed in Santa Cruz from Bolivia, near to borders from Brazil.

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Figures

Figure 1. *Manonychus rufinus* (Blanchard). A. female clypeus with anterior margin strongly bent upwards; *M. ovalis* (Blanchard) B. canthus not covered by clypeus; *M. rufinus* (Blanchard). C. clypeus lateral view, slightly sinuous; *M. birabeni* Martínez D. mola transversely multigrooved; *M. mermudesi* **sp. nov.** E. transverse multigrooves, with proximal margin serrated; *M. birabeni* Martínez F. galea with outer margin lobed; *M. mermudesi* **sp. nov.** G. distal maxillary palpomere with maximum width to up to twice the width of apex; *M. birabeni* Martínez. H. labium and palp insertion covered by the labium and placed submedially. Scale: 500µm – 1mm.

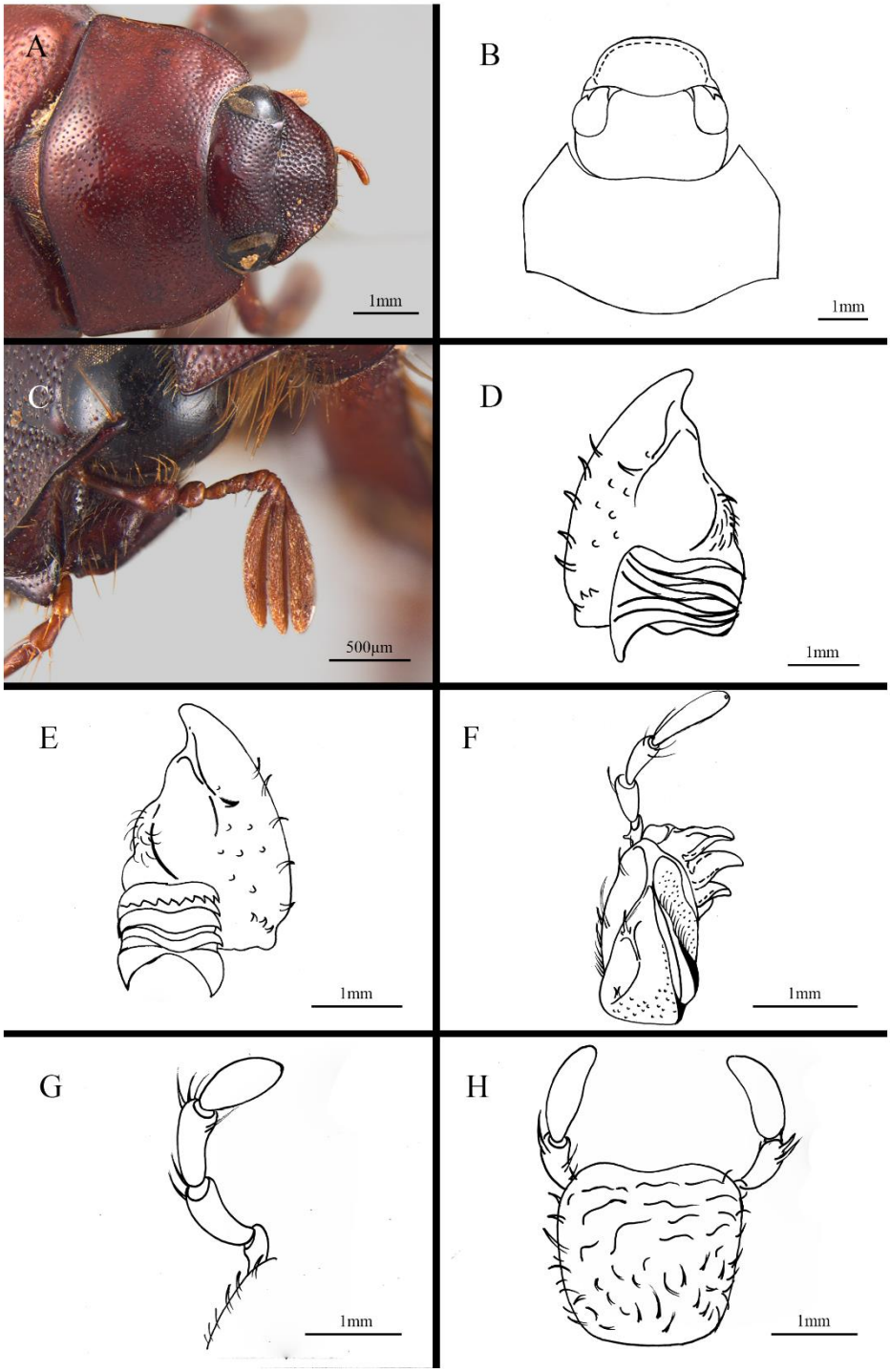


Figure 2. *Manonychus martinezi* Frey: A. Pronotum disc sparsely punctate; *M. densicollis* Frey: B. Pronotum disc sparsely punctate; *M. ovalis* (Blanchard): C. Scutellum subtriangular; *M. moroni* **sp. nov.**: D. Scutellum triangular; E. Mesosternum with regular and foveolate punctures, mainly on basis; *M. unguicularis* Moser: F. Elytra, outer margin angled. Scale: 1mm.

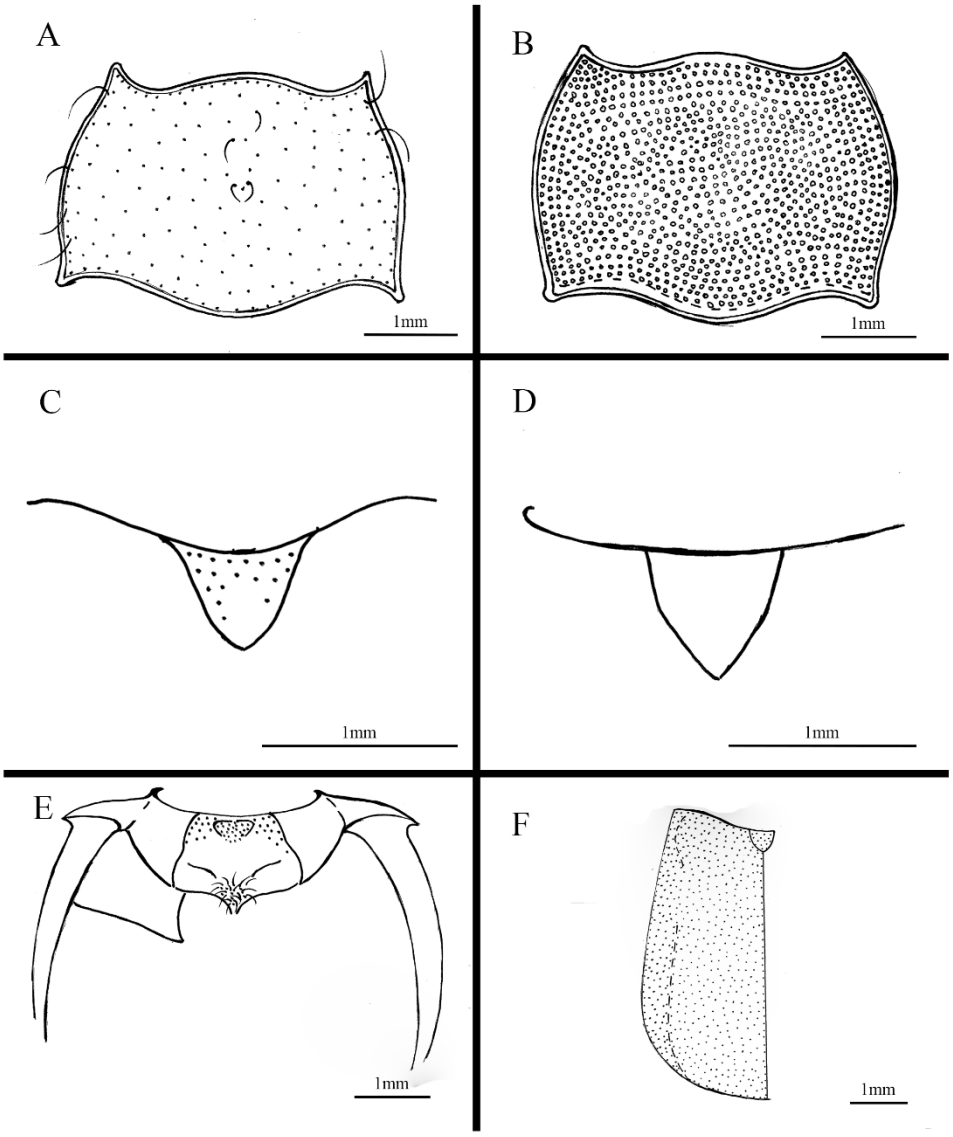


Figure 3. *Manonychus unguicularis* Moser: A. Right profemur with aggregated punctures extending from the base to the disc; *M. omegoides* **sp. nov.**: B. Protibia with two teeth male lateral view; *M. depressus* **sp. nov.**: C. Left mesofemures with double row of confluent punctures; *M. bravoi* **sp. nov.**: D. Left mesotibia, transverse carinae II incomplete; *M. unguicularis* Moser: E. Metacoxae length equal to ventrite II length; *M. depressus* **sp. nov.**: F. Left metatibial surface from distal portion prominent; *M. conypigus* Frey: G. Ventrites separated from tergites by keel; *M. unguicularis* Moser: H. Ventrite VI visible and ventrites II-VI with transverse row of bristled punctures; *M. birabeni* Martínez: I. Pygidium subtrapezoidal. Scale: 1mm.

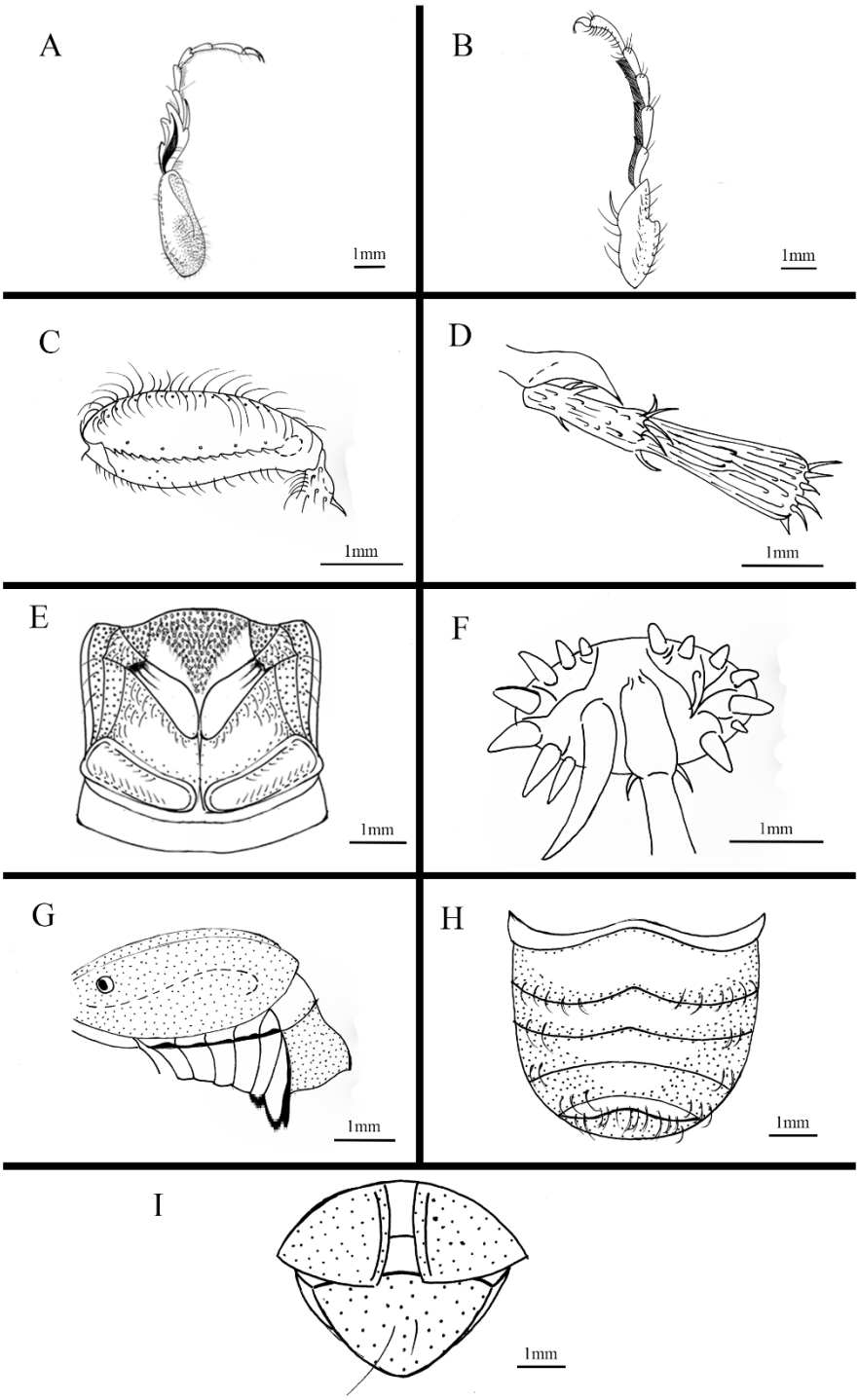


Figure 4. *Manonychus martinezi* Frey: A. Male genitalia, parameres symmetrical; *M. moroni* **sp. nov.**: B. Male genitalia, parameres asymmetrical; *M. gracillis* **sp. nov.**: C. Parameres not deflected and parallel on apex; *M. birabeni* Martínez: D. Parameres, inner margins curved; *M. conypigus* Frey: E. Parameres with central apophysis; *M. moseri* **sp. nov.**: F. Parameres laterally excavated. Scale: 1mm.

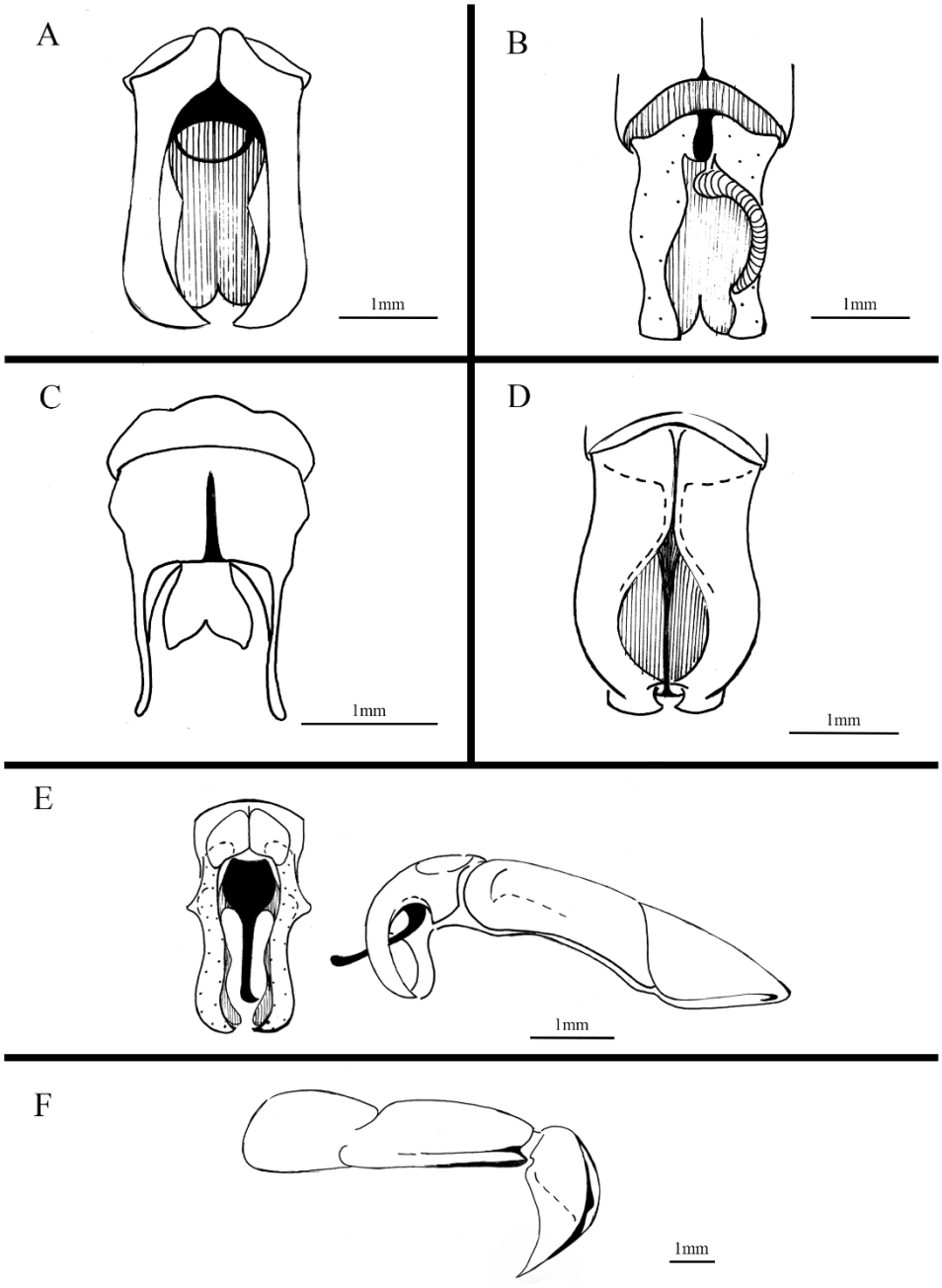


Figure 5. Distribution known of species from *Manonychus* Moser, 1919: *M. rufinus* (Blanchard, 1851) (red circle); *M. depressus* Costa, Cherman & Iannuzzi, new species (black circle); *M. moseri* Costa, Cherman & Iannuzzi, new species (blue circle); *M. boraceinesis* Costa, Cherman & Iannuzzi, new species (green circle); *M. morretensis* Costa, Cherman & Iannuzzi, new species (yellow circle); *M. massuttiae* Costa, Cherman & Iannuzzi, new species (pink circle); *M. freyi* Costa, Cherman & Iannuzzi, new species (orange circle).

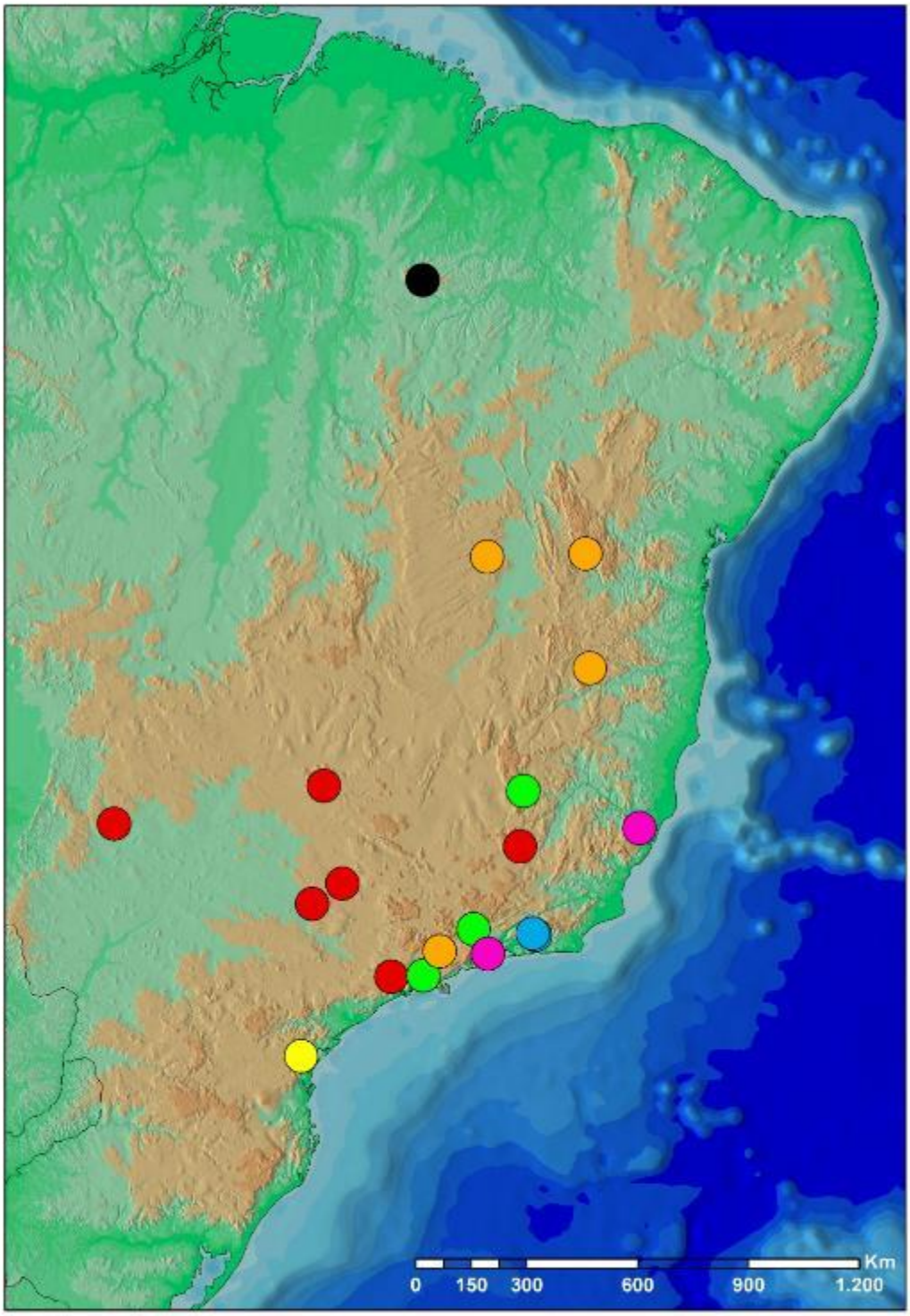


Figure 6. Distribution known of species from *Manonychus* Moser, 1919: *M. moroni* Costa, Cherman & Iannuzzi, new species (red circle); *M. bravoi* Costa, Cherman & Iannuzzi, new species (black circle); *M. planaltinesis* Costa, Cherman & Iannuzzi, new species (blue circle); *M. monodentatus* Costa, Cherman & Iannuzzi, new species (green circle); *M. gracilis* Costa, Cherman & Iannuzzi, new species (yellow circle); *M. ovalis* (Blanchard, 1851) (pink circle); *M. densicollis* Costa, Cherman & Iannuzzi, new species (orange circle); *M. iris* Costa, Cherman & Iannuzzi, new species (purple circle).

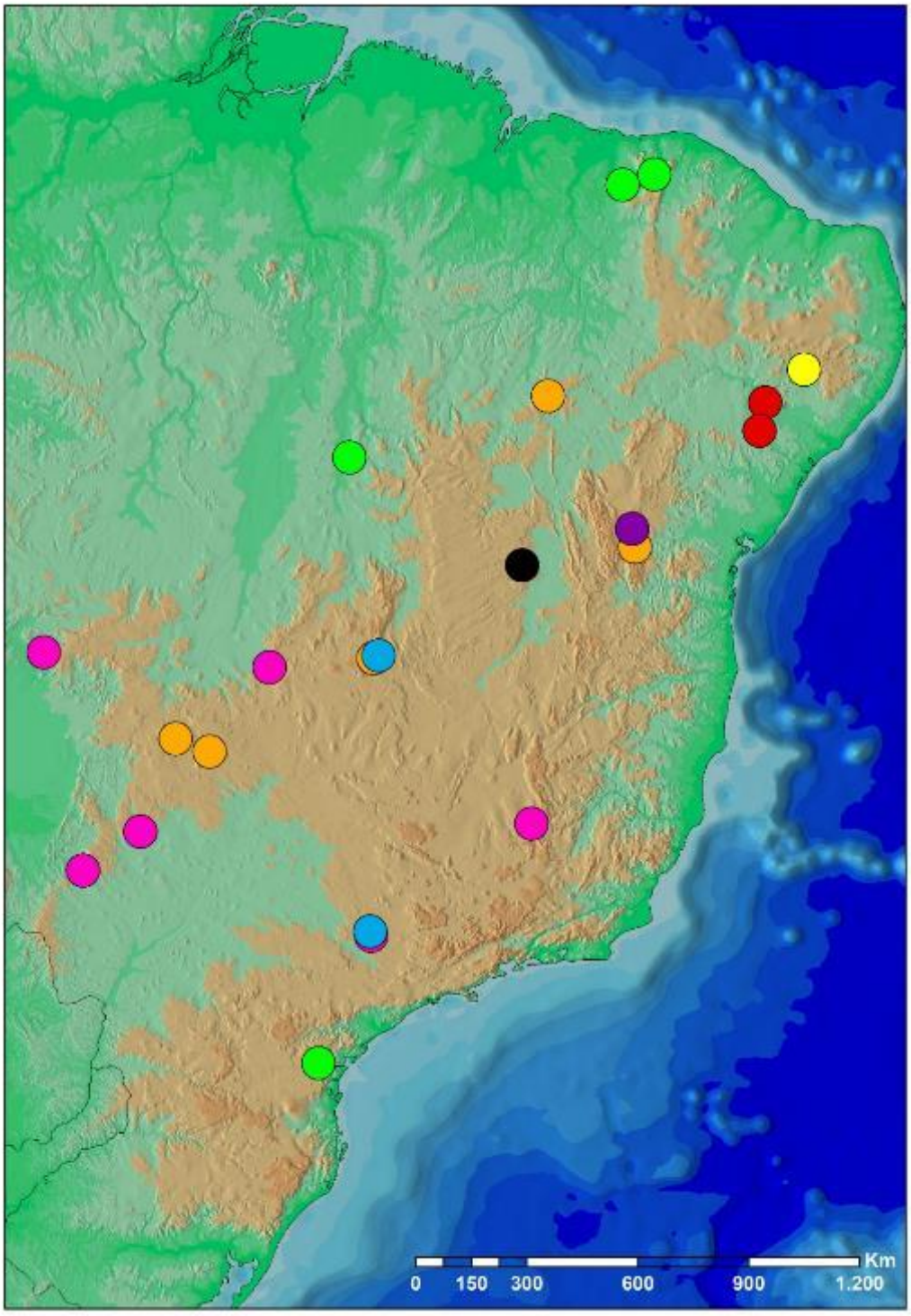


Figure 7. Distribution known of species from *Manonychus* Moser, 1919: *M. stanleei* Costa, Cherman & Iannuzzi, **new species** (red circle); *M. bidentatus* Costa, Cherman & Iannuzzi, **new species** (black circle); *M. conypigus* Frey, 1976 (blue circle); *M. paschoali* Costa, Cherman & Iannuzzi, **new species** (green circle); *M. cordiformis* Costa, Cherman & Iannuzzi, **new species** (yellow circle); *M. truncatus* (Blanchard, 1851) (pink circle); *M. casariae* Costa, Cherman & Iannuzzi, **new species** (orange circle).

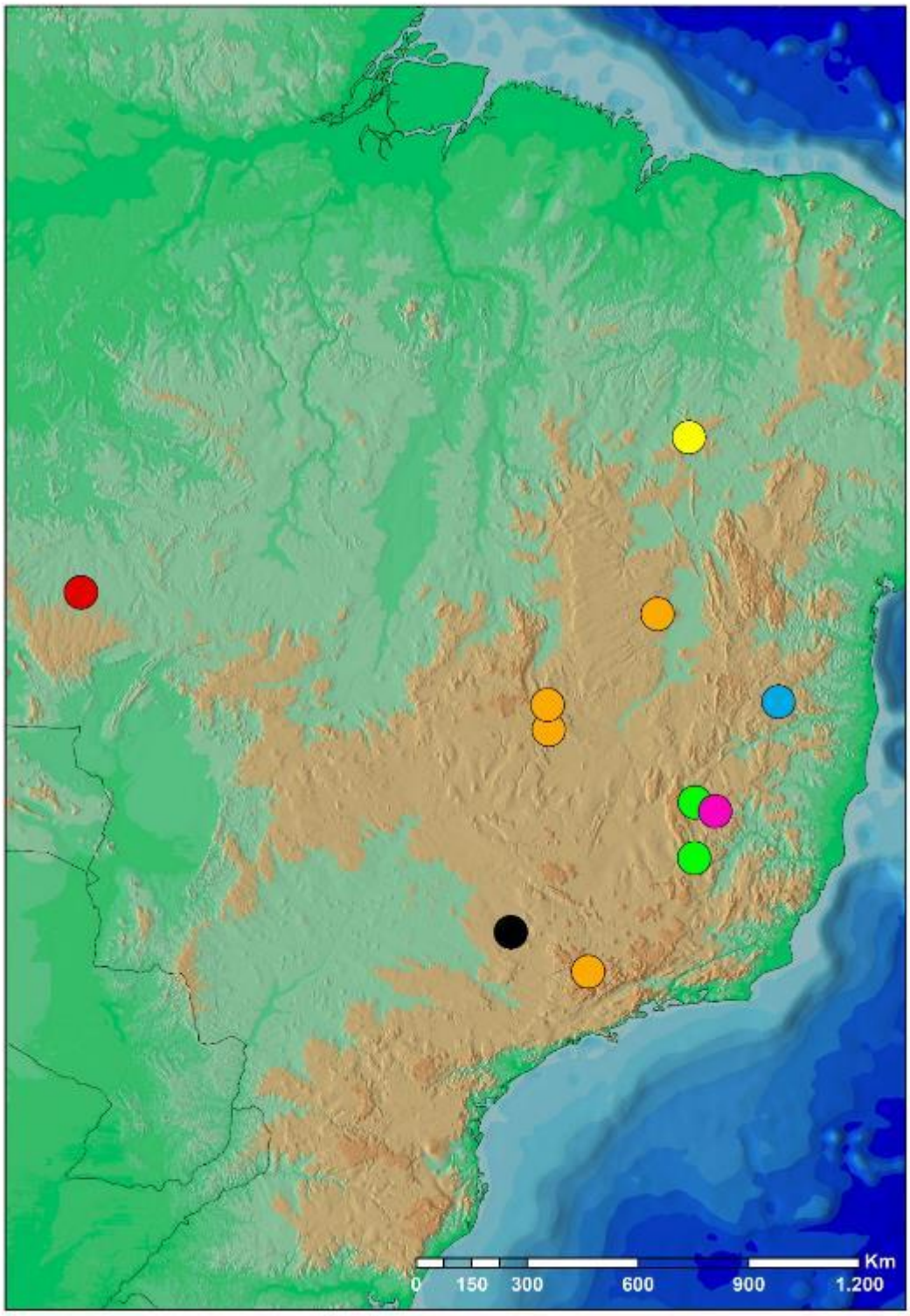


Figure 8. Distribution known of species from *Manonychus* Moser, 1919: *M. cleideae* Costa, Cherman & Iannuzzi, new species (red circle); *M. martinezi* Frey, 1974 (black circle); *M. birabeni* Martínez, 1959 (blue circle); *M. maranhensis* Costa, Cherman & Iannuzzi, new species (green circle); *M. mermudesi* Costa, Cherman & Iannuzzi, new species (yellow circle); *M. cuiabanus* Costa, Cherman & Iannuzzi, new species (pink circle); *M. unguicularis* Moser, 1919 (orange circle).

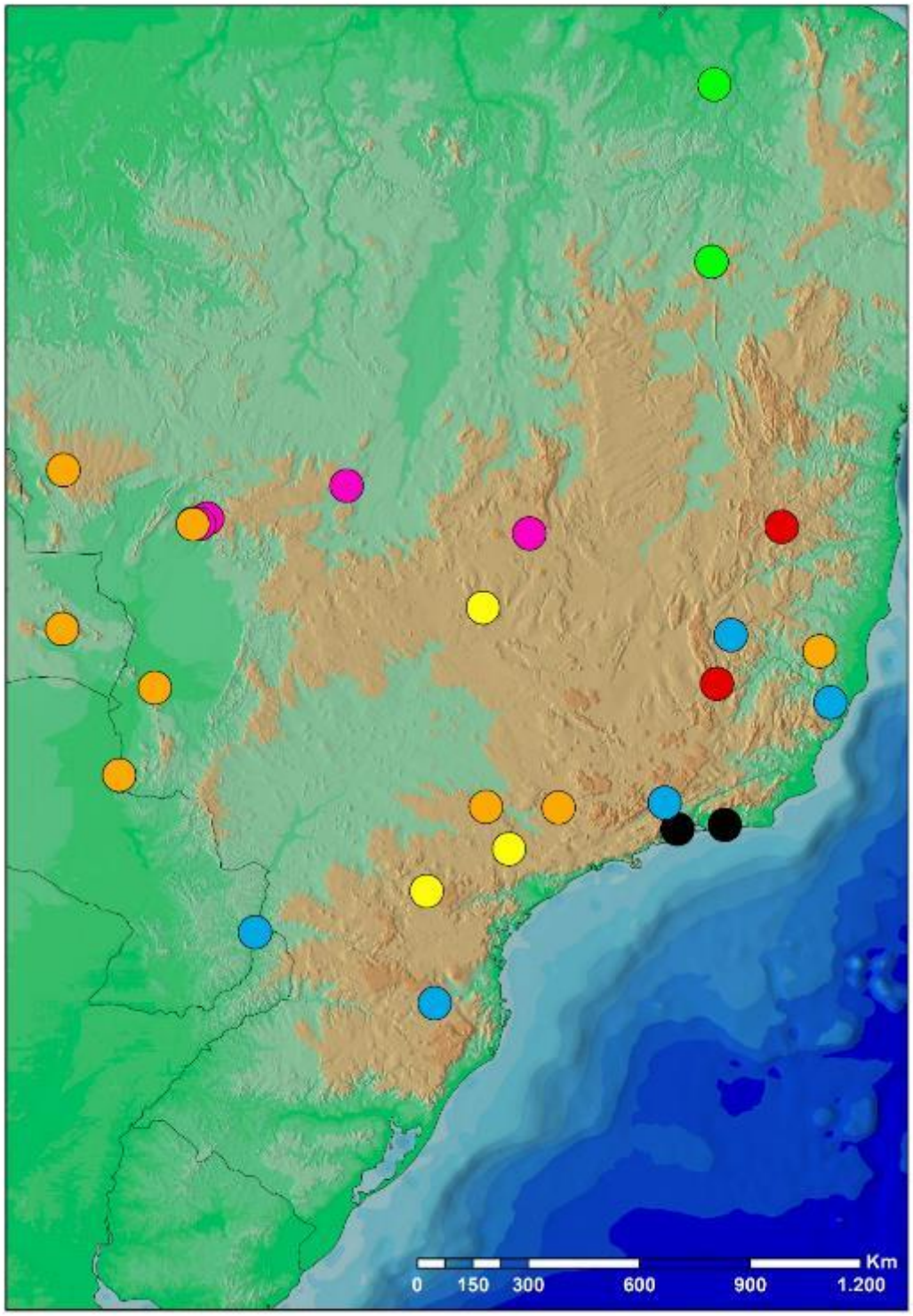


Figure 9. *Manonychus rufinus* (Blanchard): A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Diagonal view; E. Pygidium; F. Labels. Scale: 500 μm – 2mm.

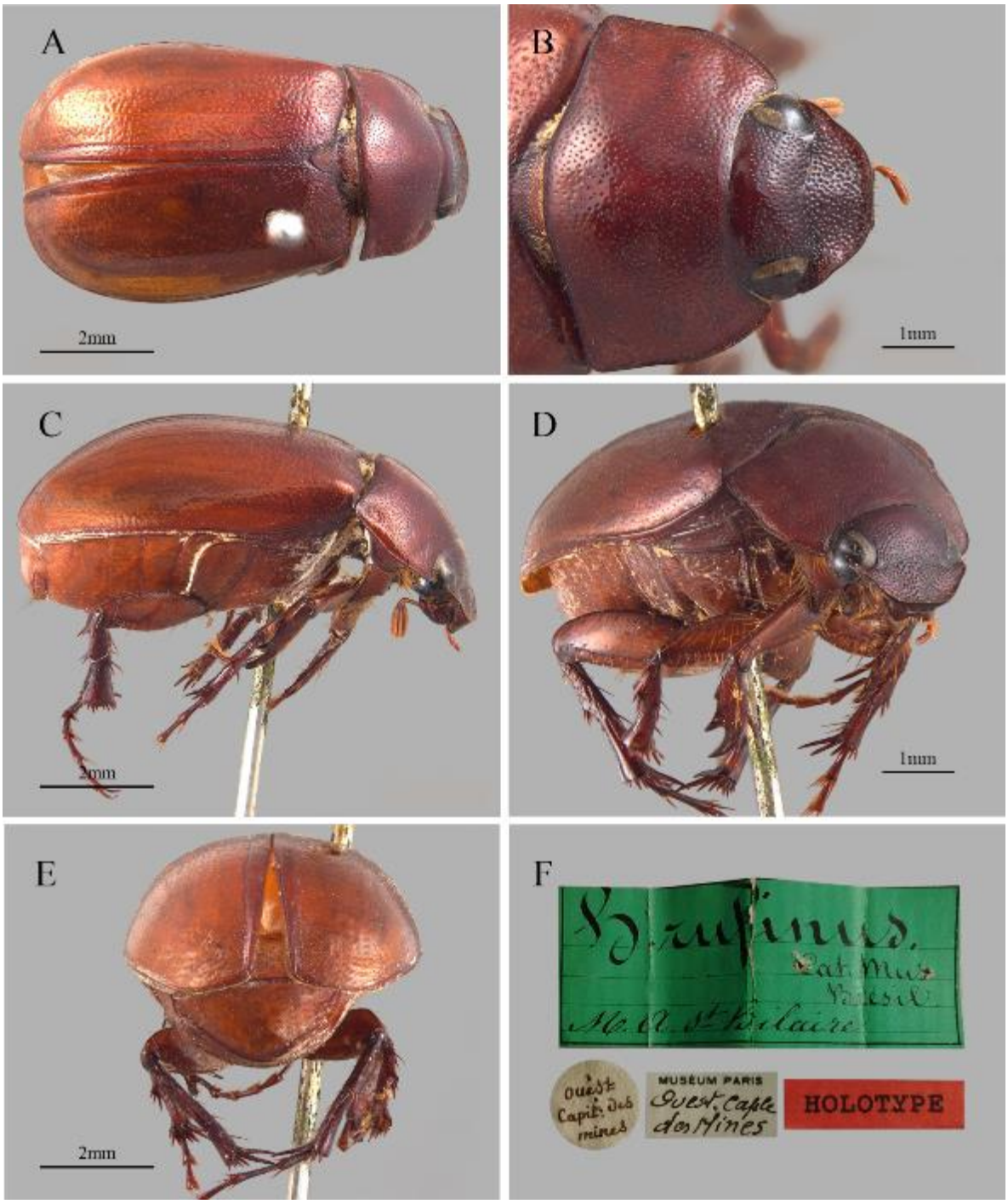


Figure 10. *Manonychus depressus* **sp. nov.**: A. Dorsal habitus; B. Clypeus and pronotum; C. Frontal view; D. Lateral view; E. Pygidium. Scale: 1mm.

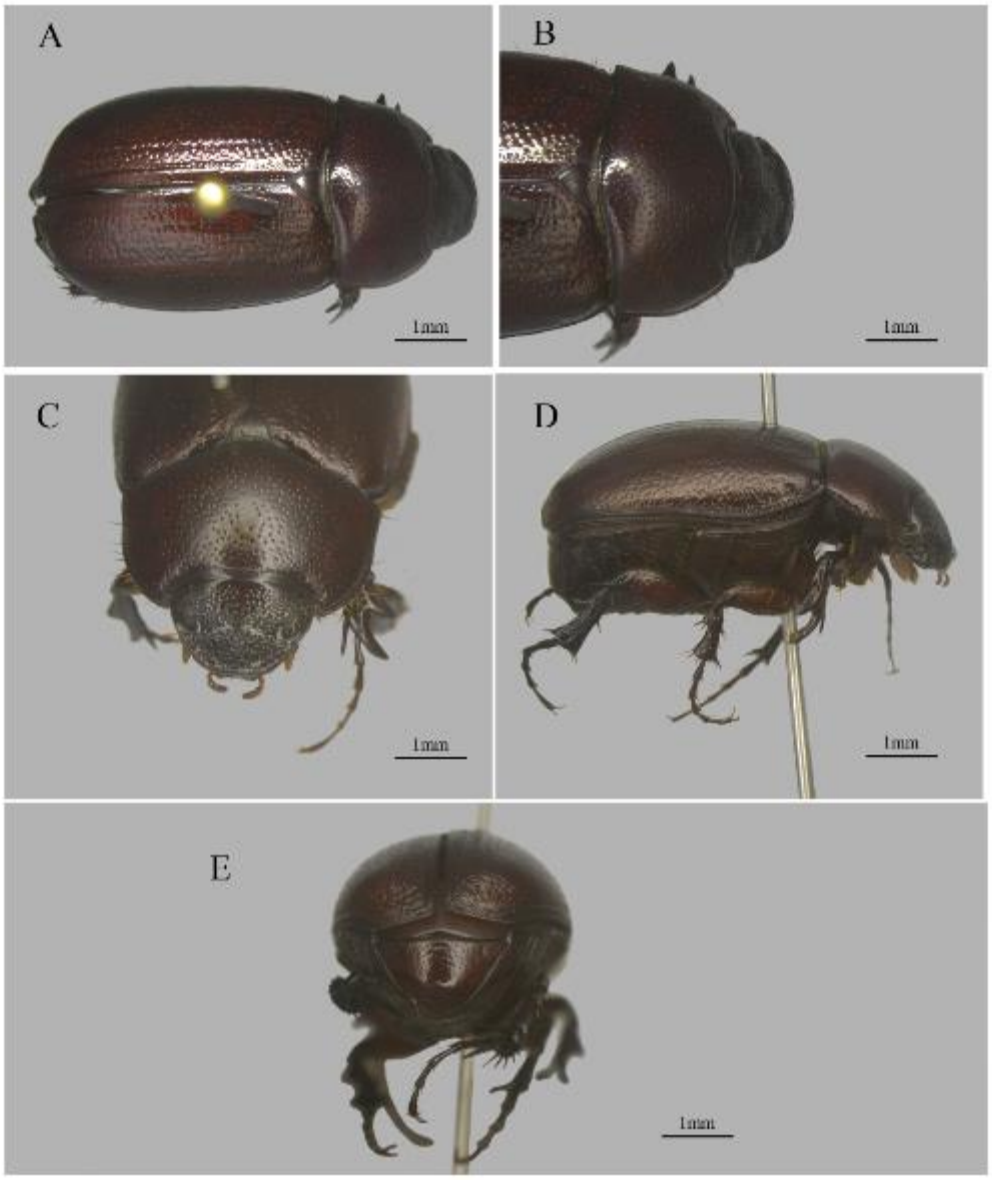


Figure 11. *Manonychus moseri* **sp. nov.**: A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view. Scale: 1mm.

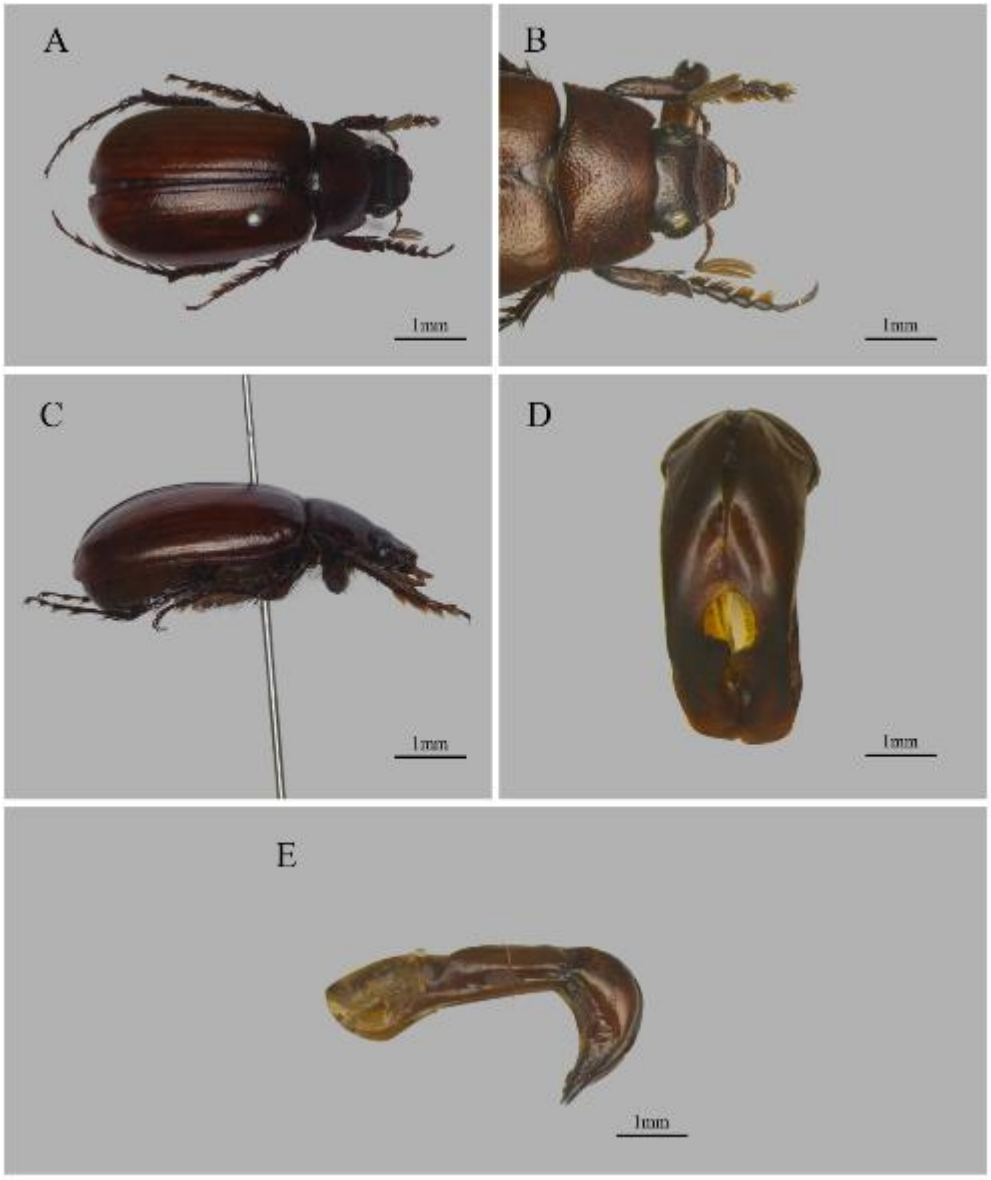


Figure 12. *Manonychus boraceiensis* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

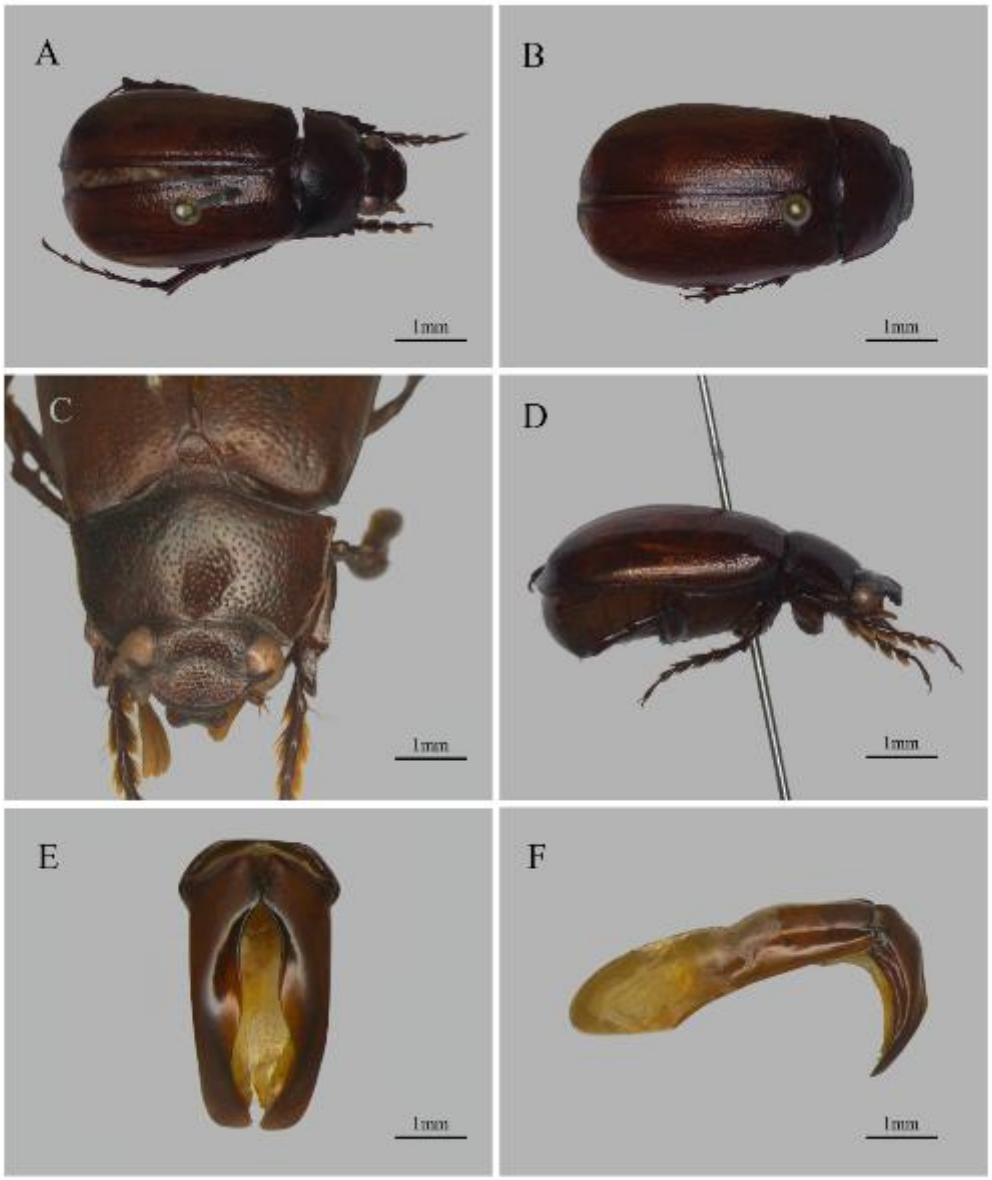


Figure 13. *Manonychus morretensis* sp. nov.: A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view. Scale: 1mm.

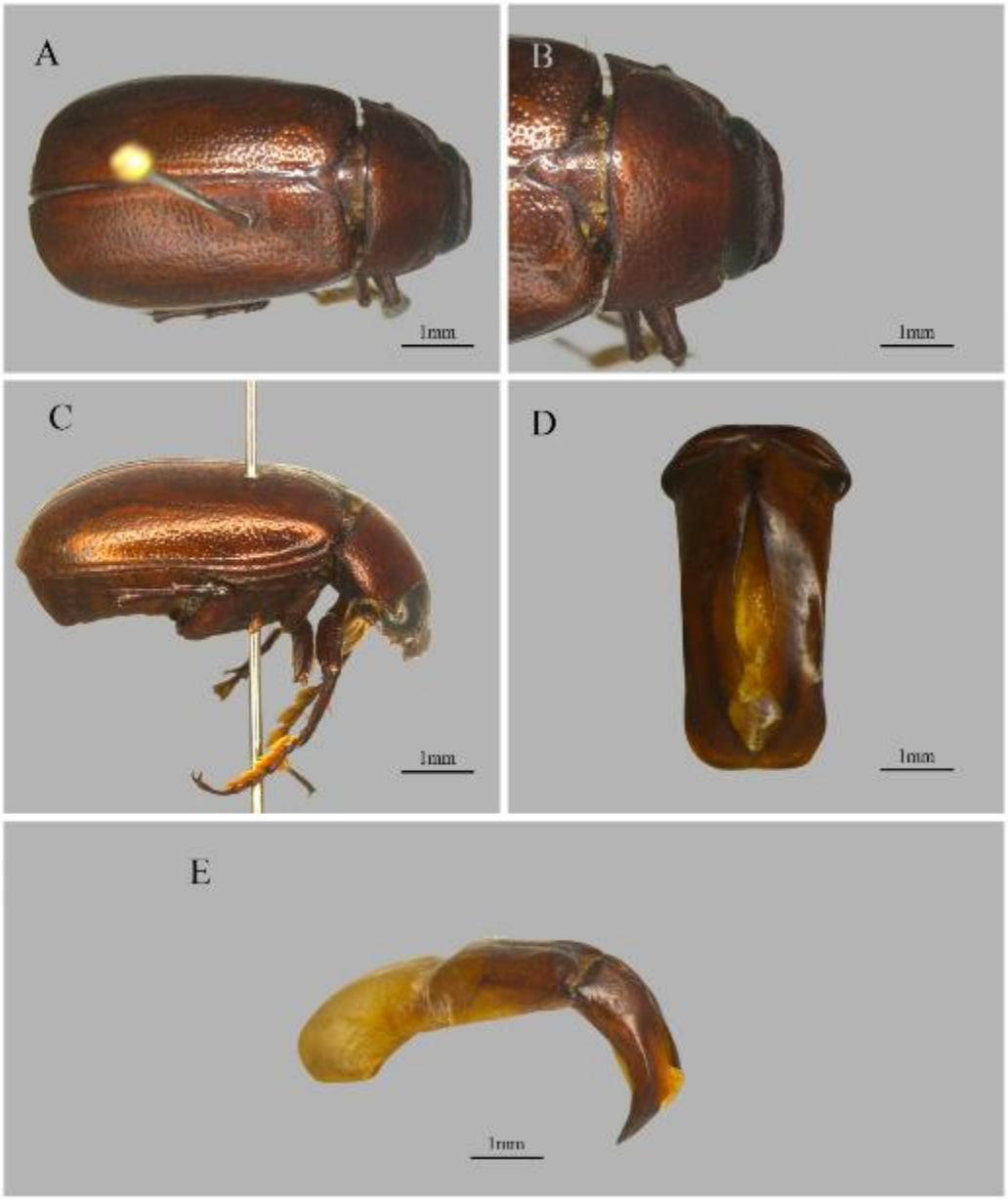


Figure 14. *Manonychus massuttiae* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

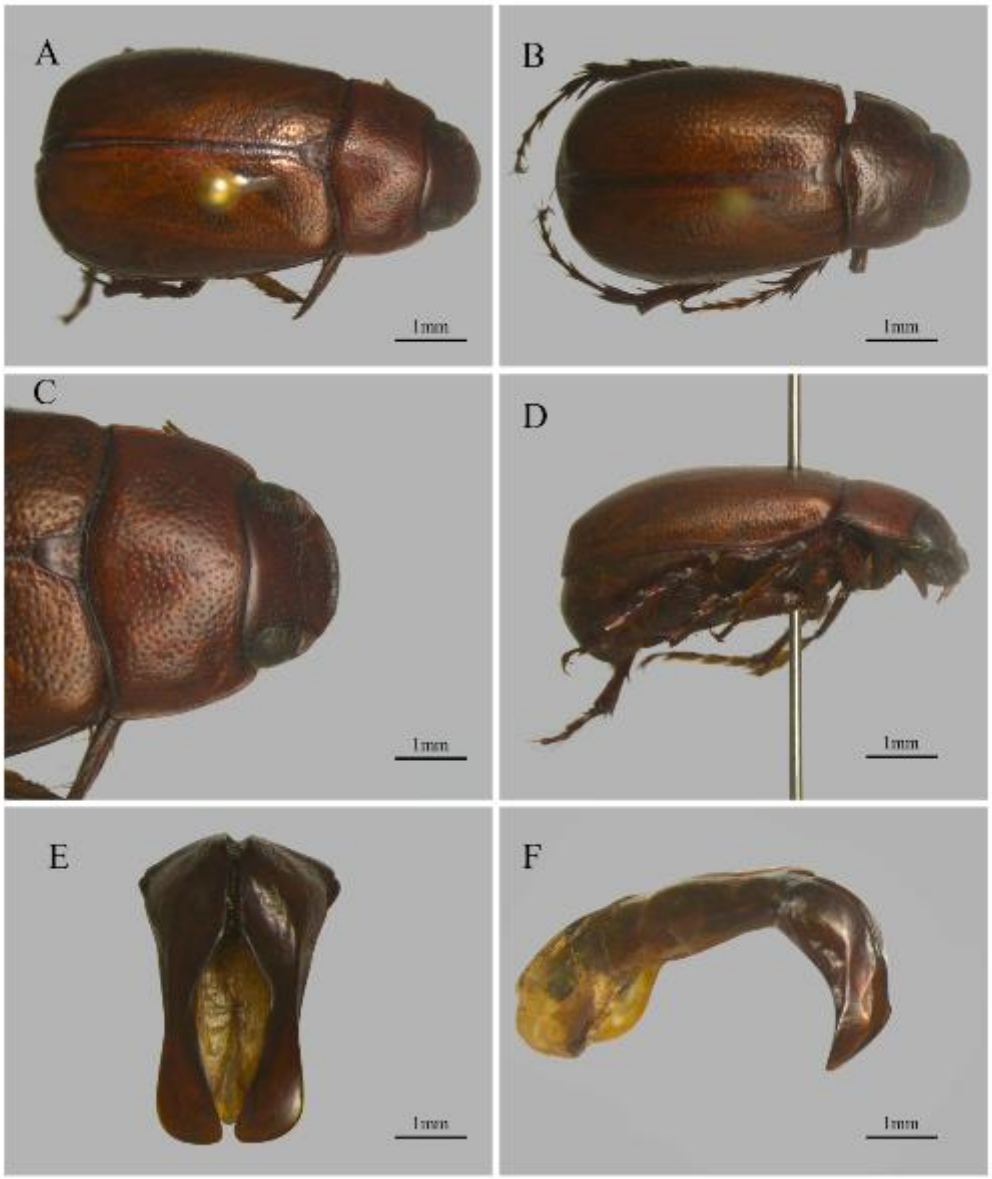


Figure 15. *Manonychus freyi* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

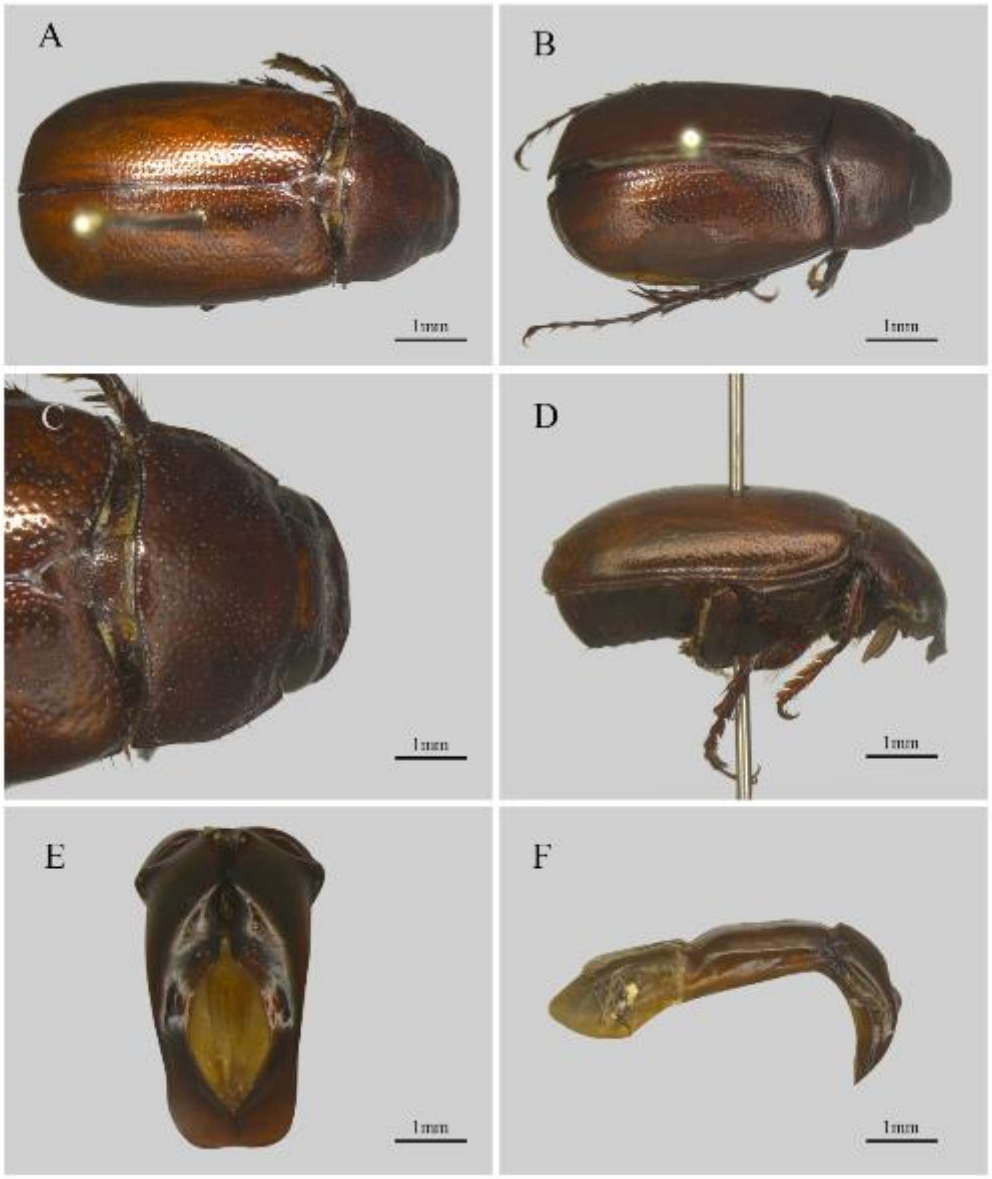


Figure 16. *Manonychus moroni* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

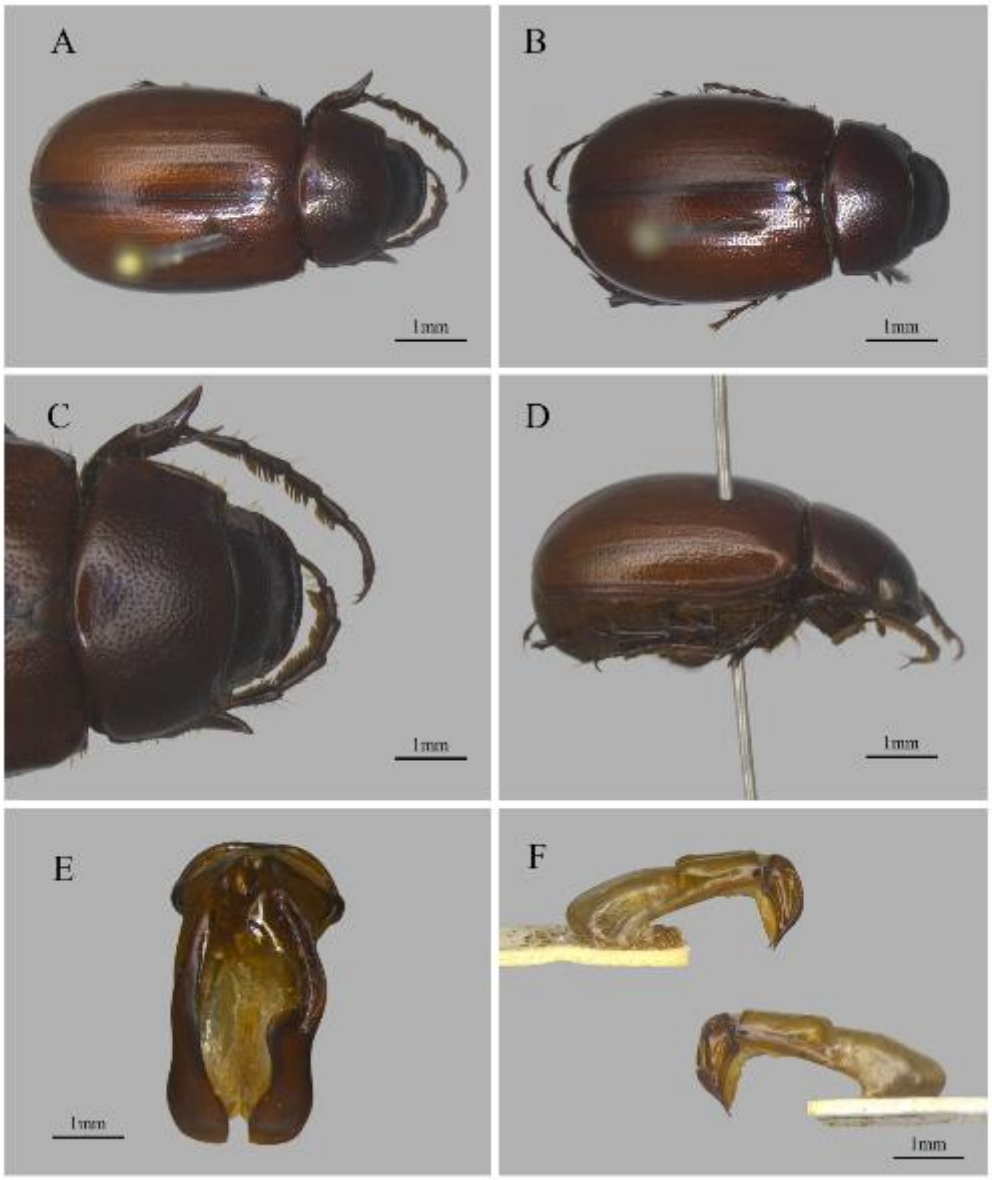


Figure 17. *Manonychus bravoi* **sp. nov.** A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view. Scale: 1mm.

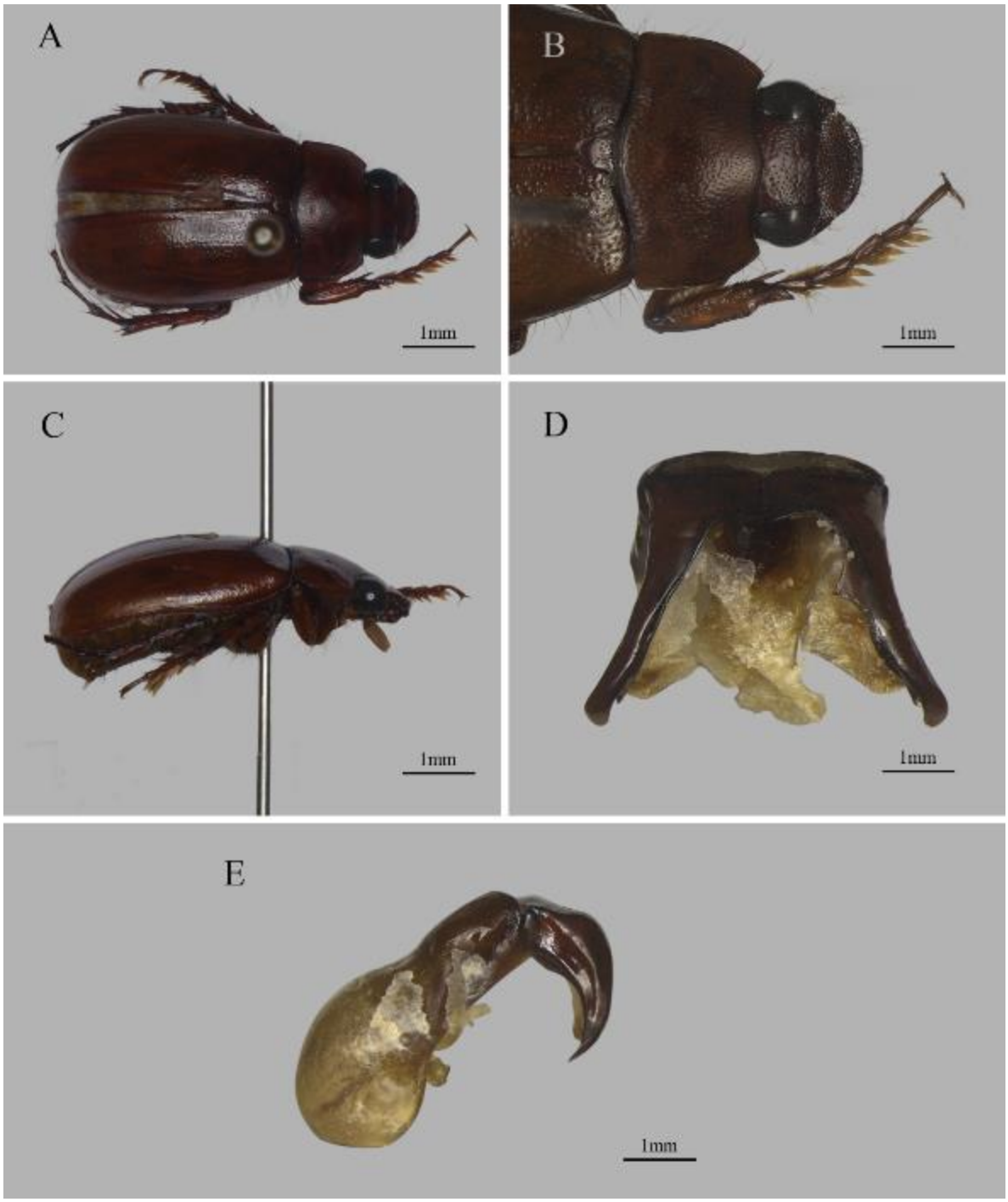


Figure 18. *Manonychus planaltinensis* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

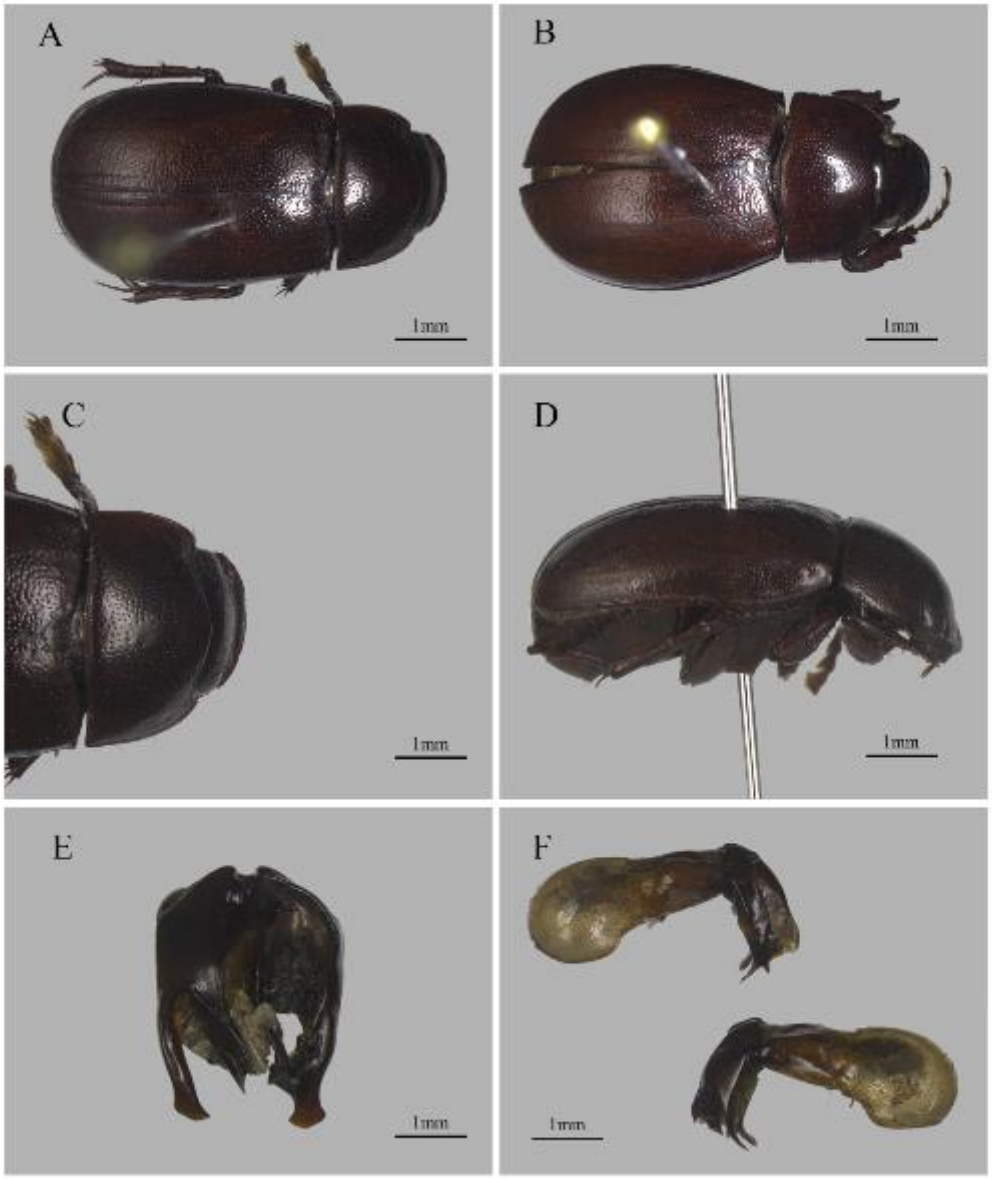


Figure 19. *Manonychus monodentatus* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

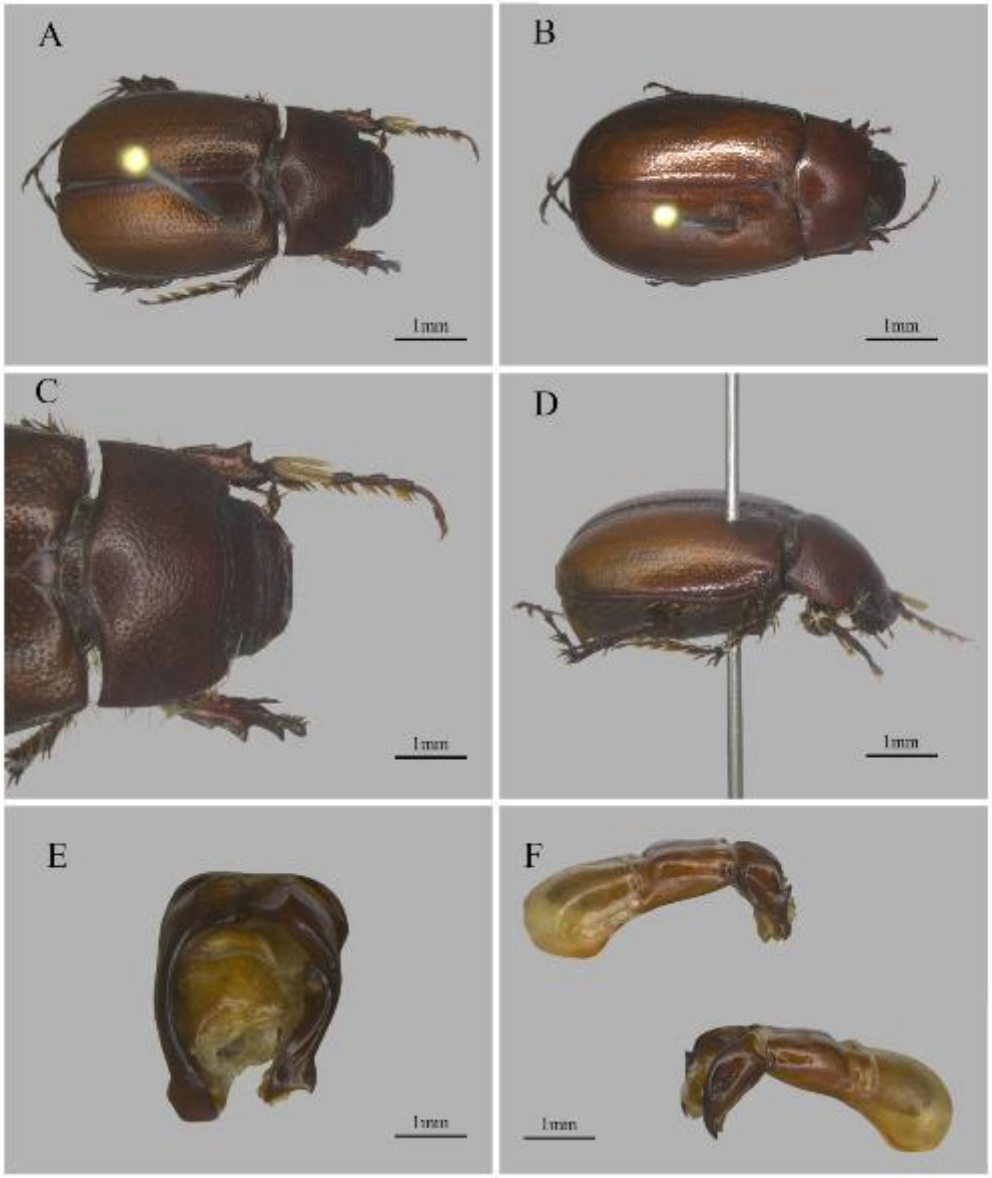


Figure 20. *Manonychus gracilis* sp. nov.: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

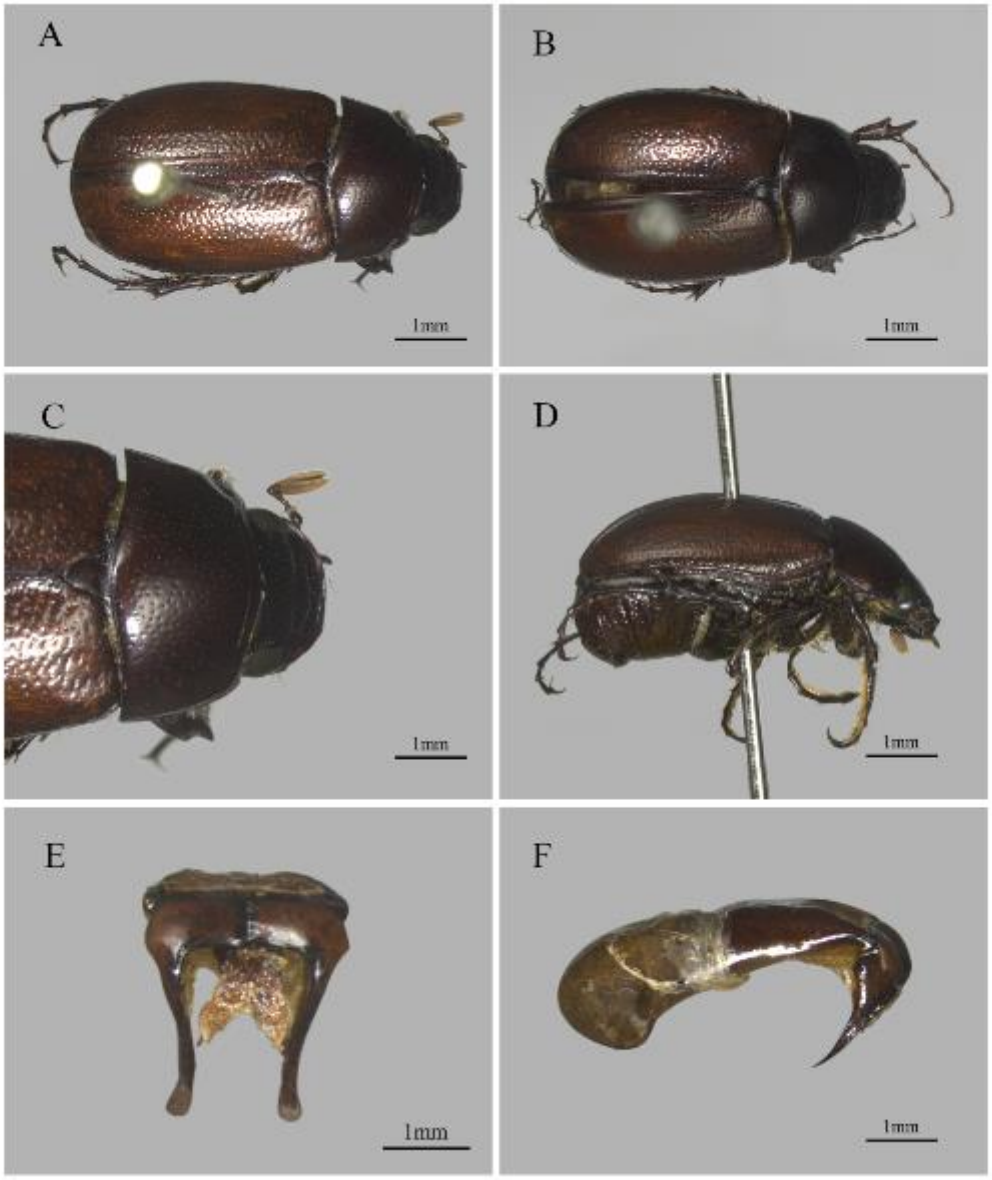


Figure 21. *Manonychus ovalis* (Blanchard): A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Diagonal view; E. Pygidium; F. Labels. Scale: 500 μm – 2mm.

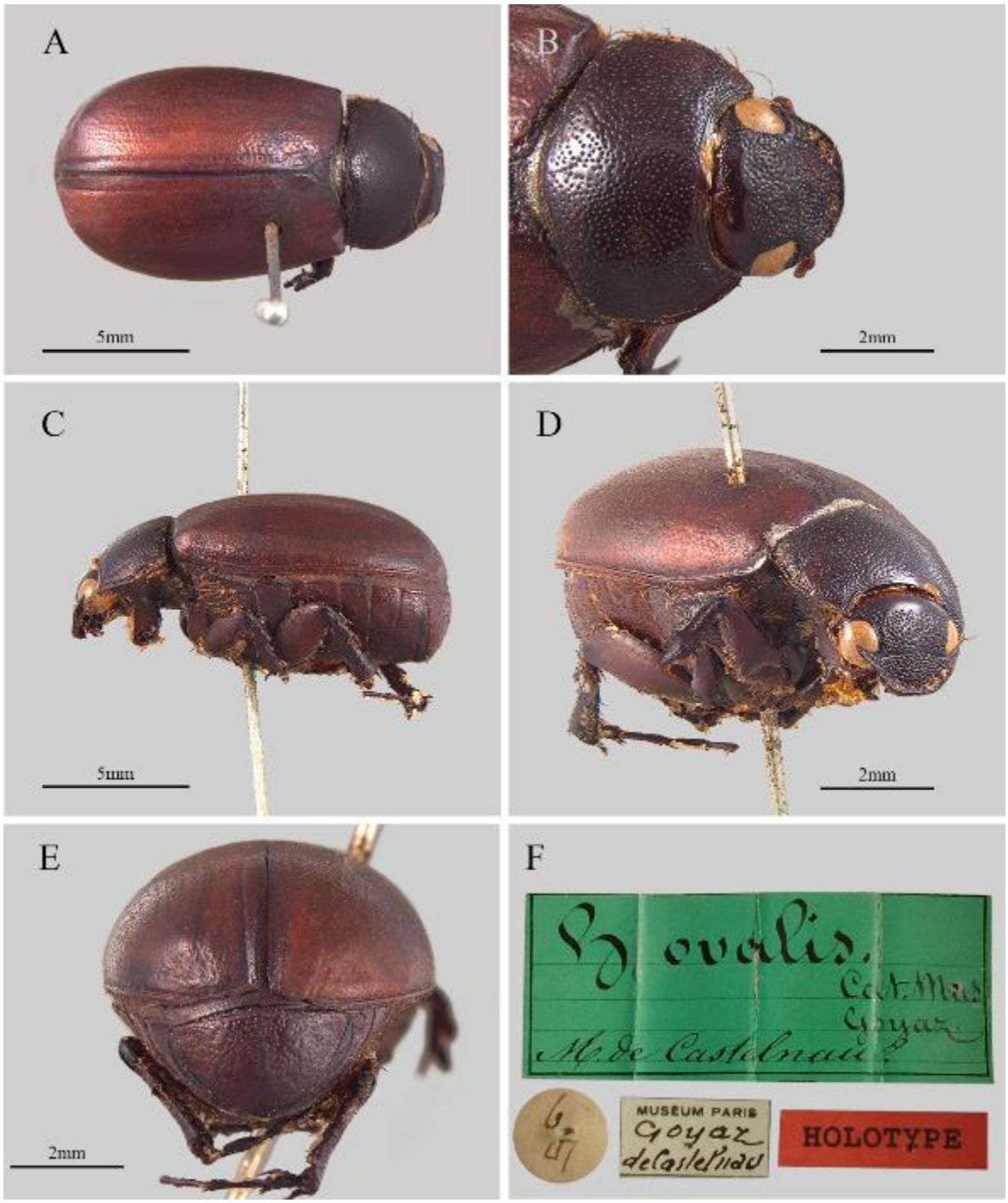


Figure 22. *Manonychus densicollis* Frey: A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view; F. Labels. Scale: 1mm.

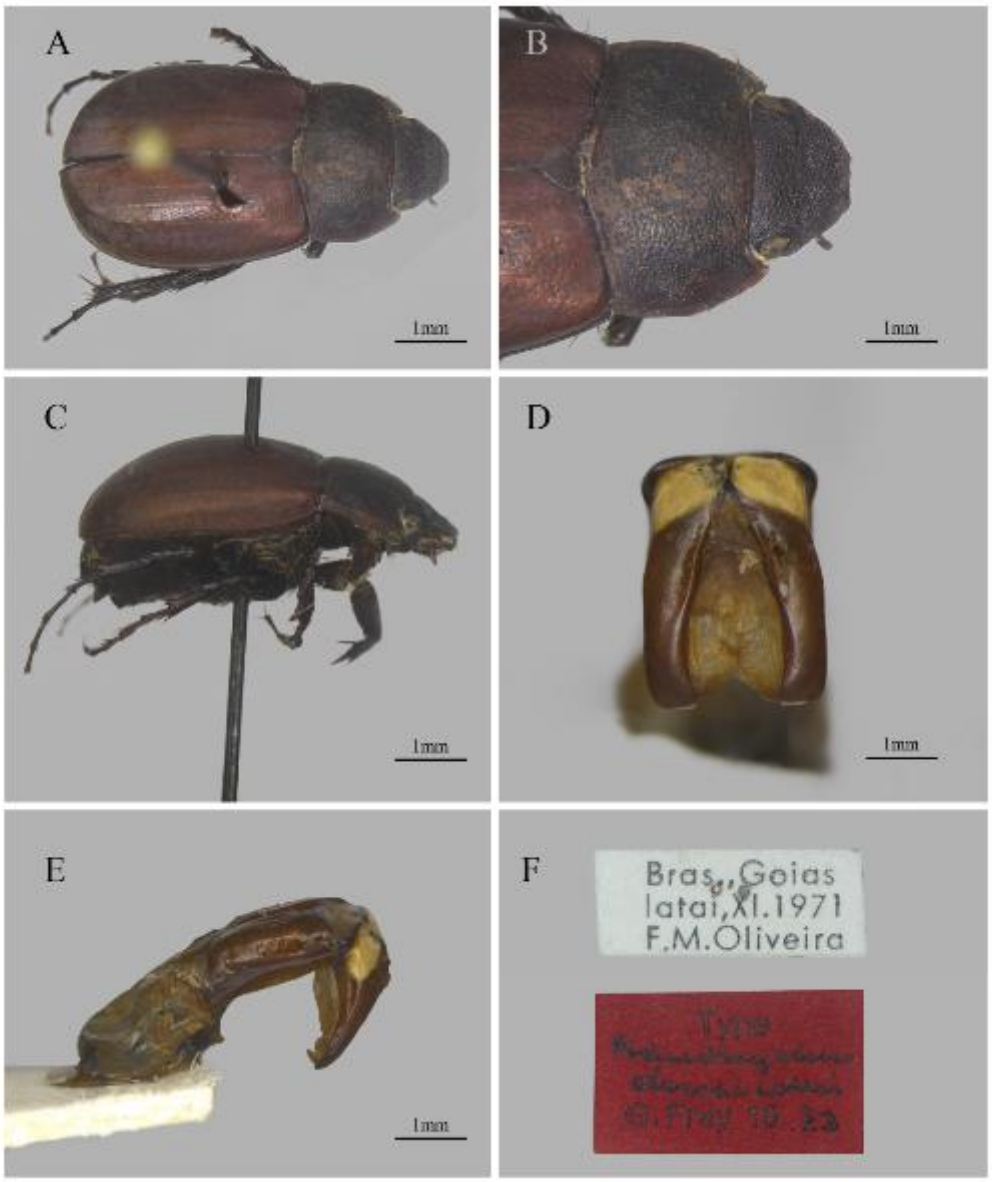


Figure 23. *Manonychus iris* **sp. nov.**: A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view. Scale: 1mm.

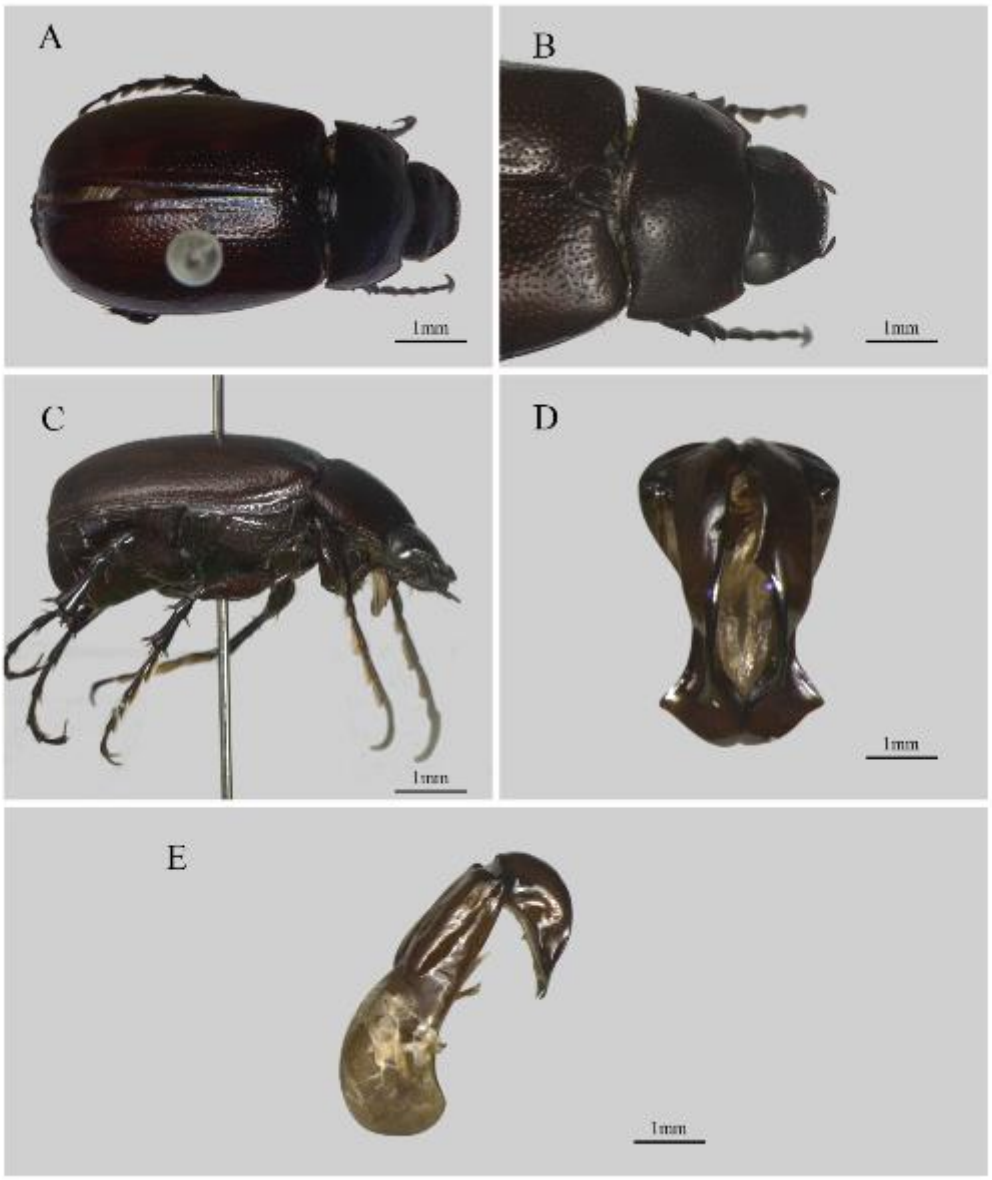


Figure 24. *Manonychus stanleei* **sp. nov.** A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view. Scale: 1mm.

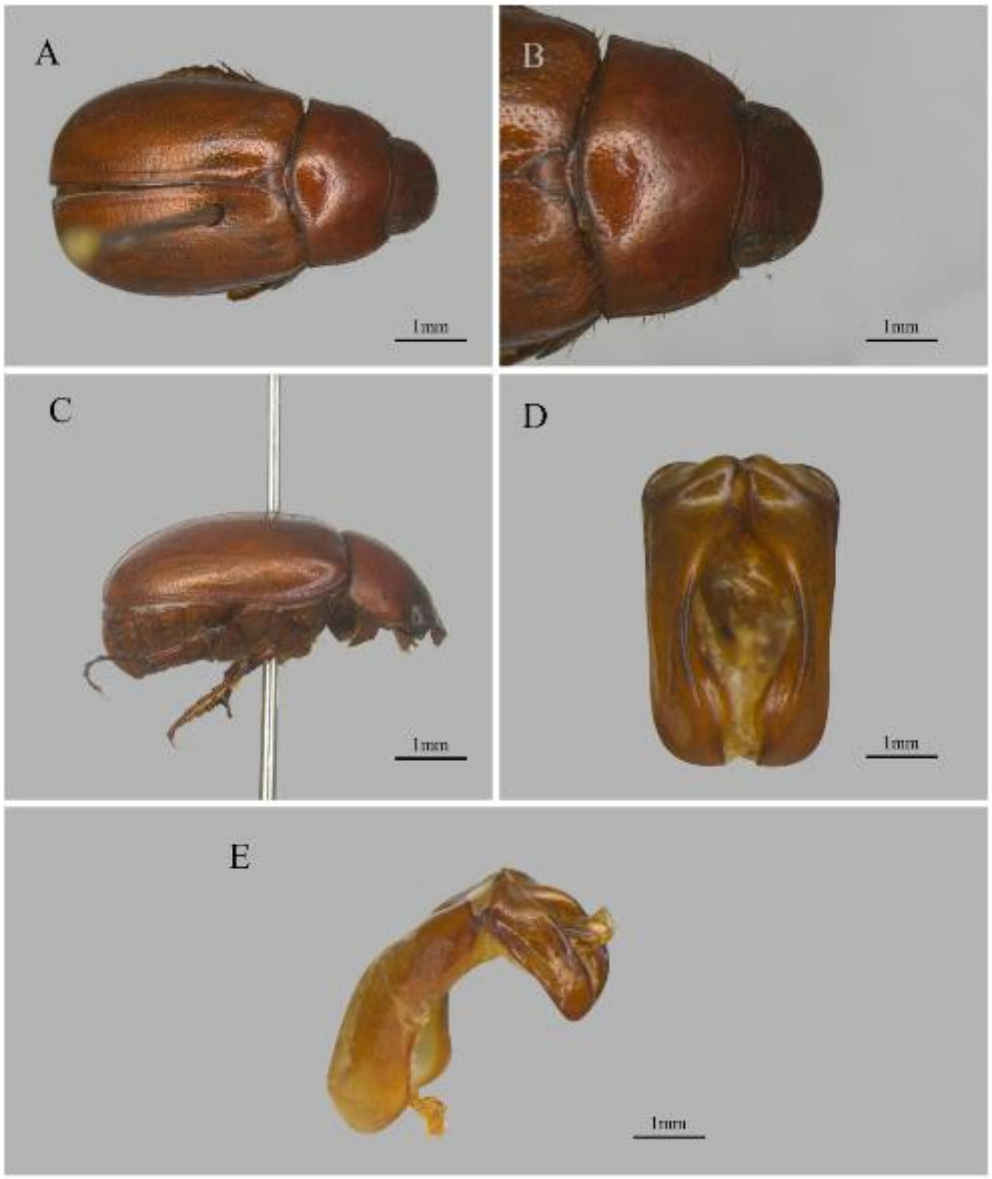


Figure 25. *Manonychus bidentatus* **sp. nov.** A. dorsal habitus; B. clypeus and pronotum; C. Lateral view; D. parameres, dorsal view; E. parameres, lateral view. Scale: 1mm.

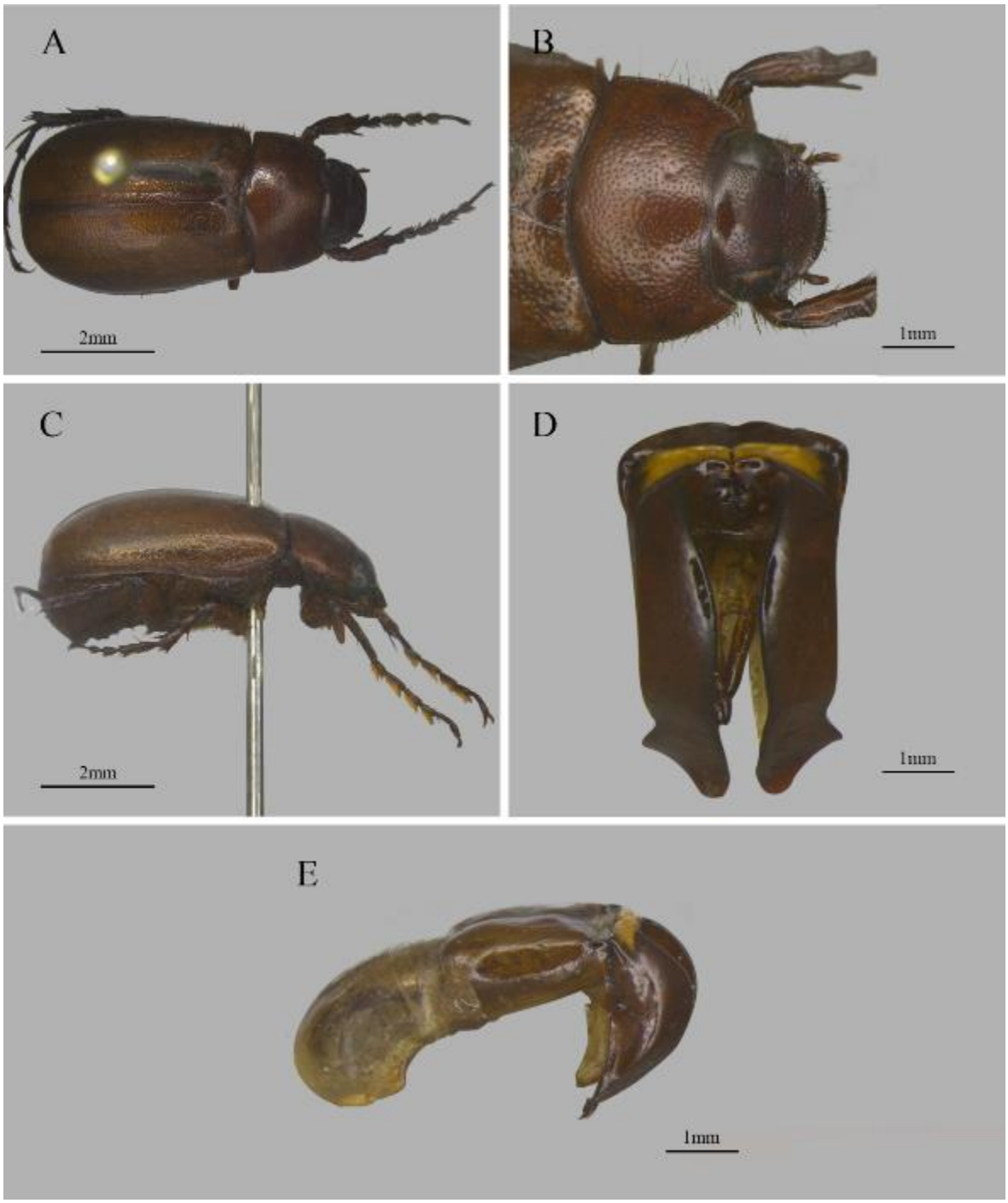


Figure 26. *Manonychus conypigus* Frey: A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view; F. Labels. Scale: 1mm.

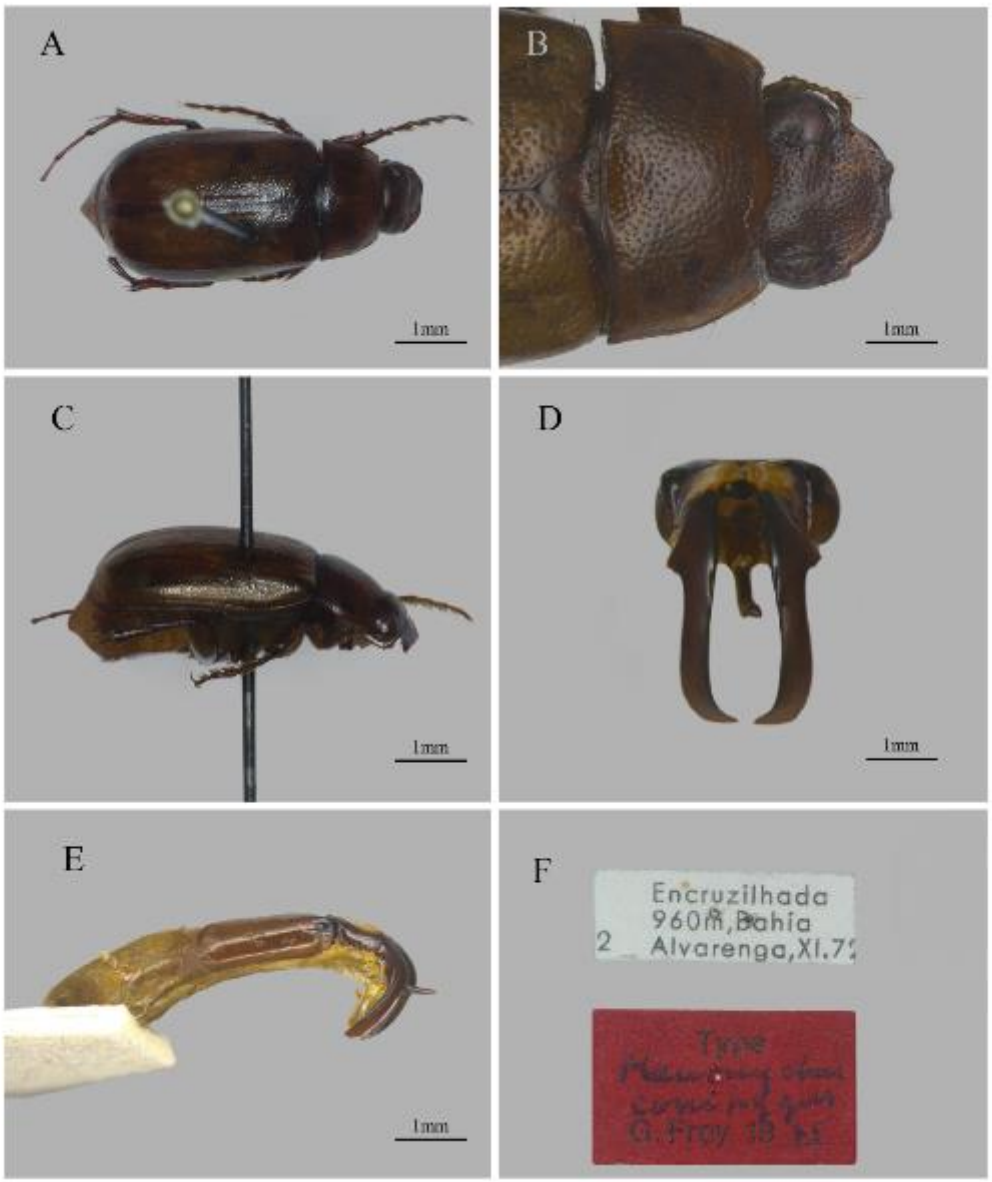


Figure 27. *Manonychus paschoali* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

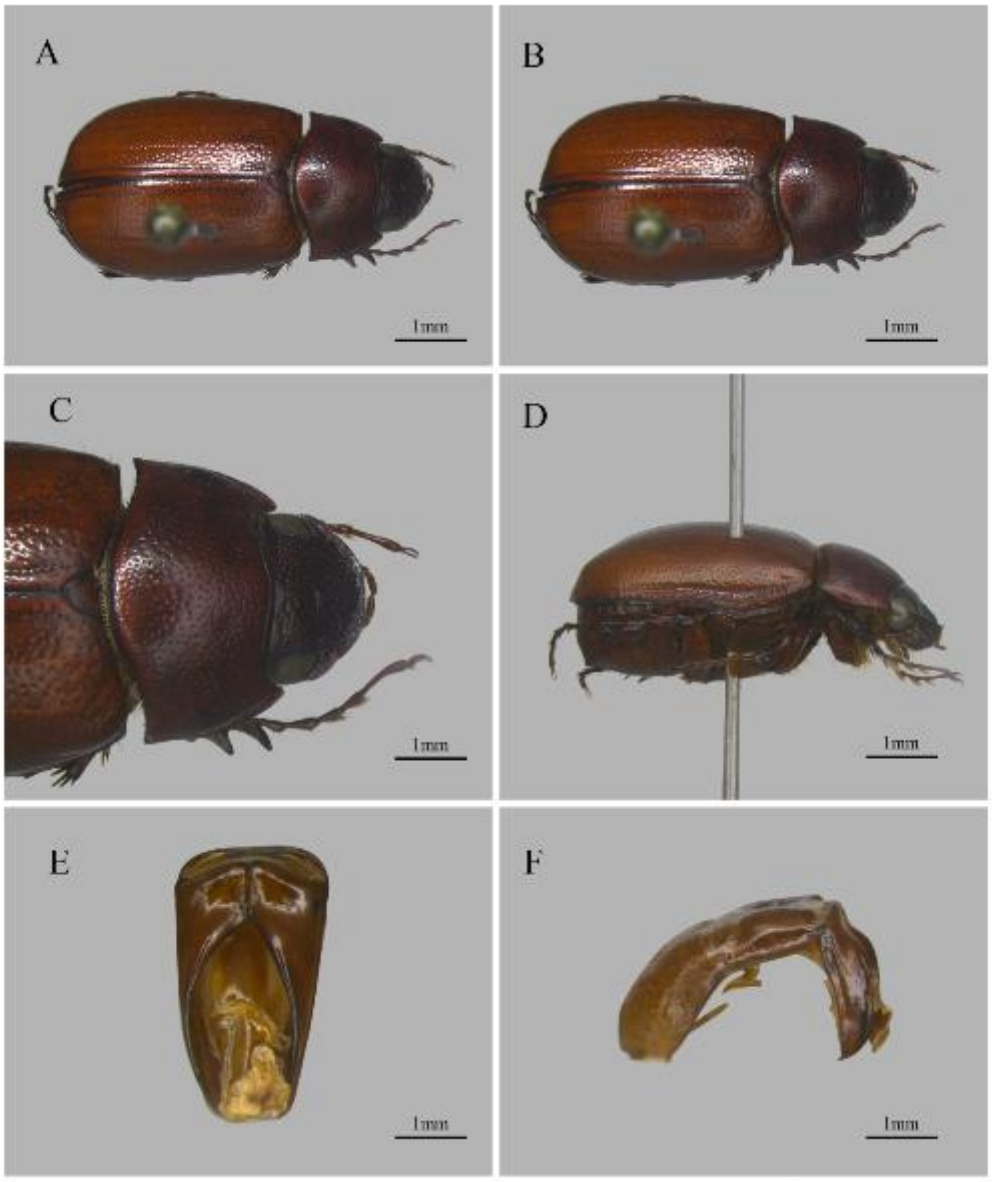


Figure 28. *Manonychus cordiformis* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

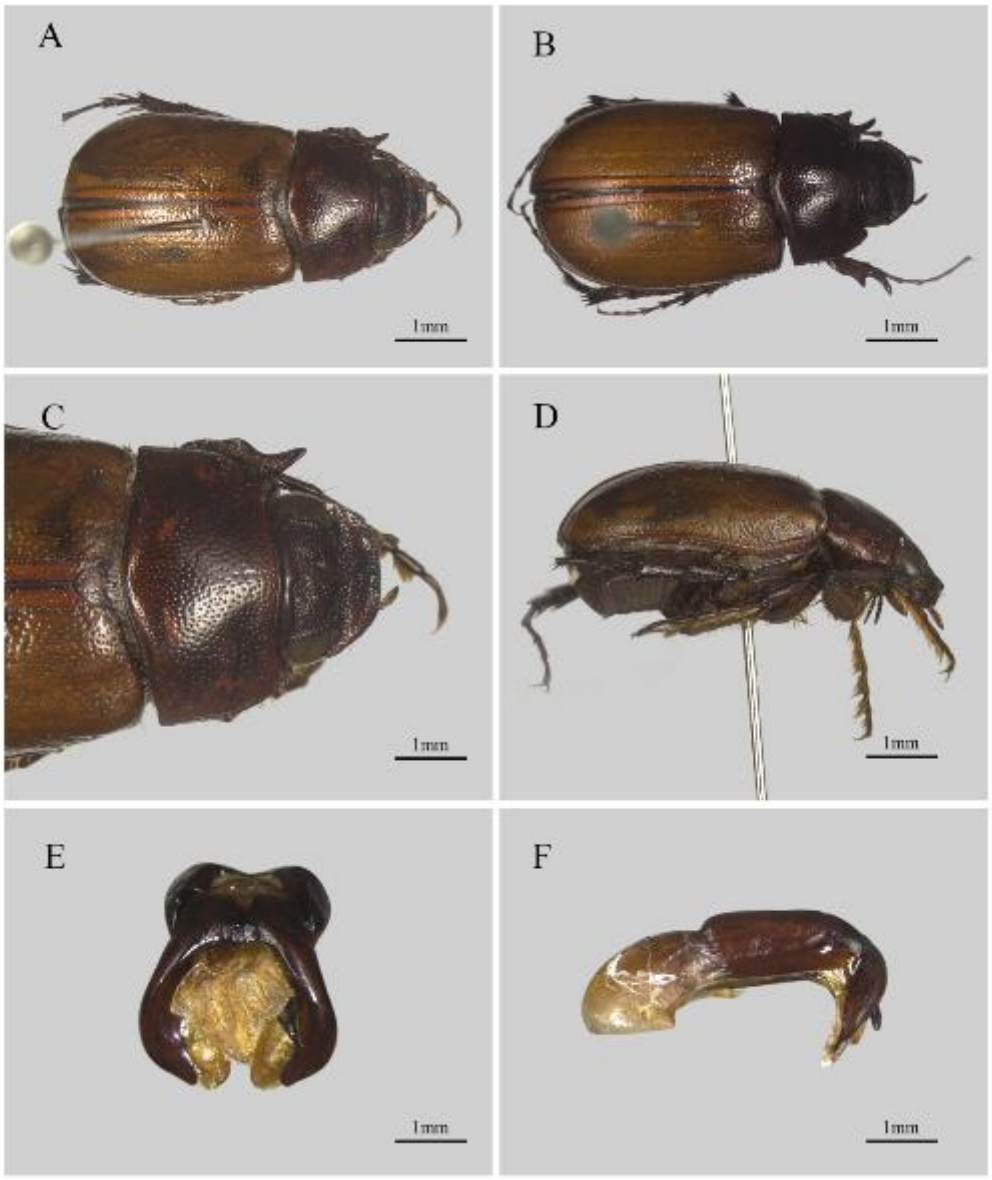


Figure 29. *Manonychus truncatus* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

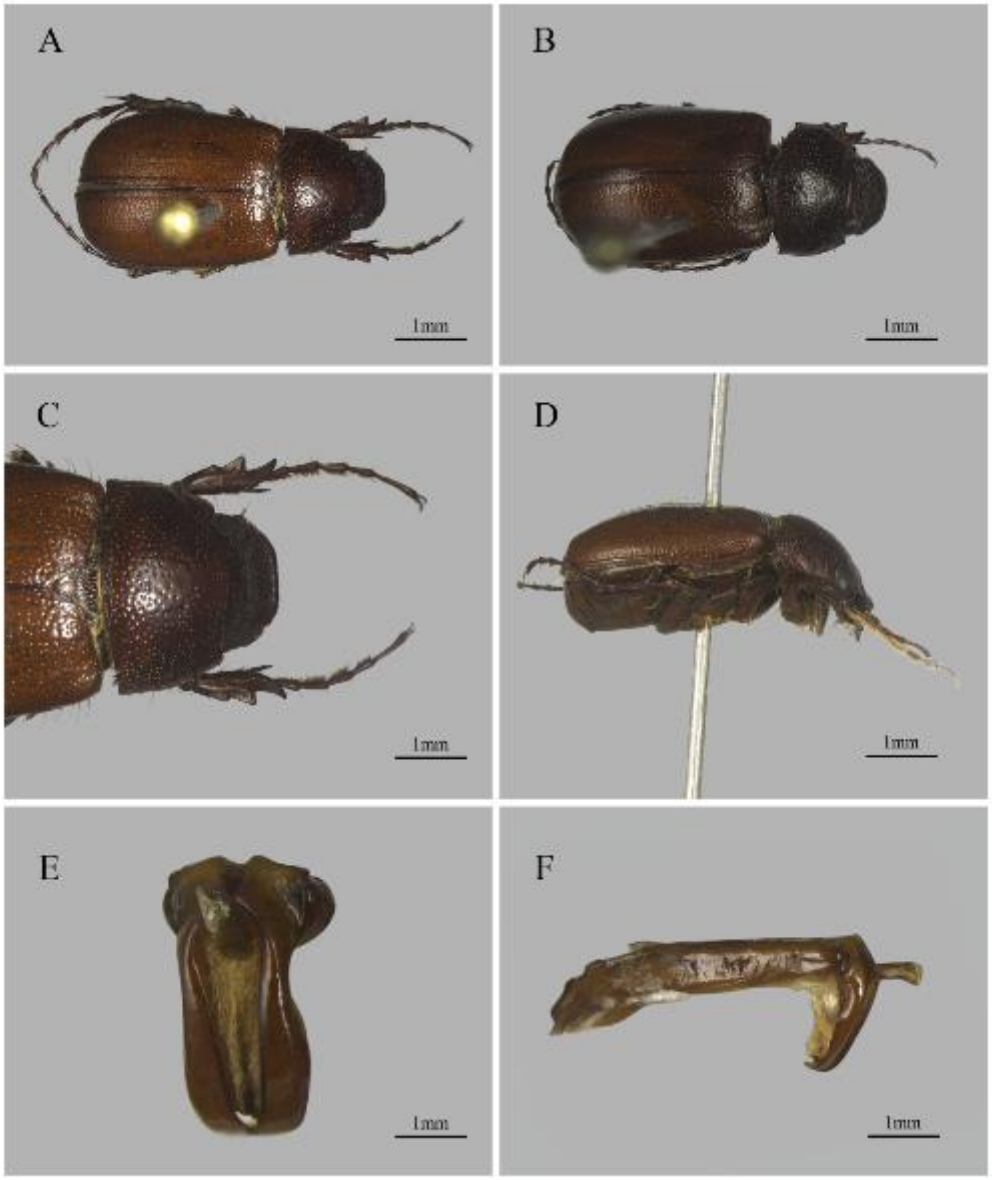


Figure 30. *Manonychus casariae* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

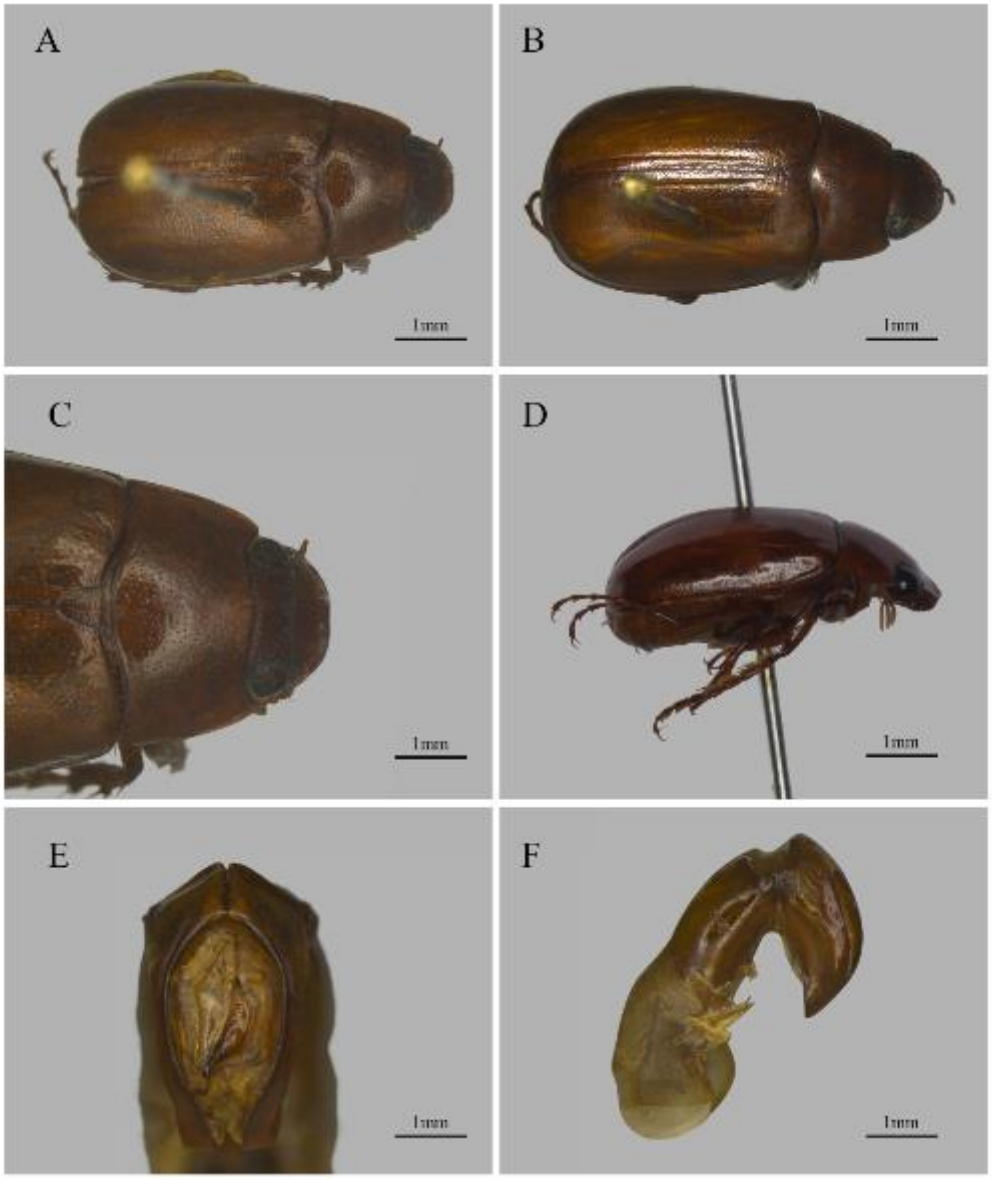


Figure 31. *Manonychus cleideae* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

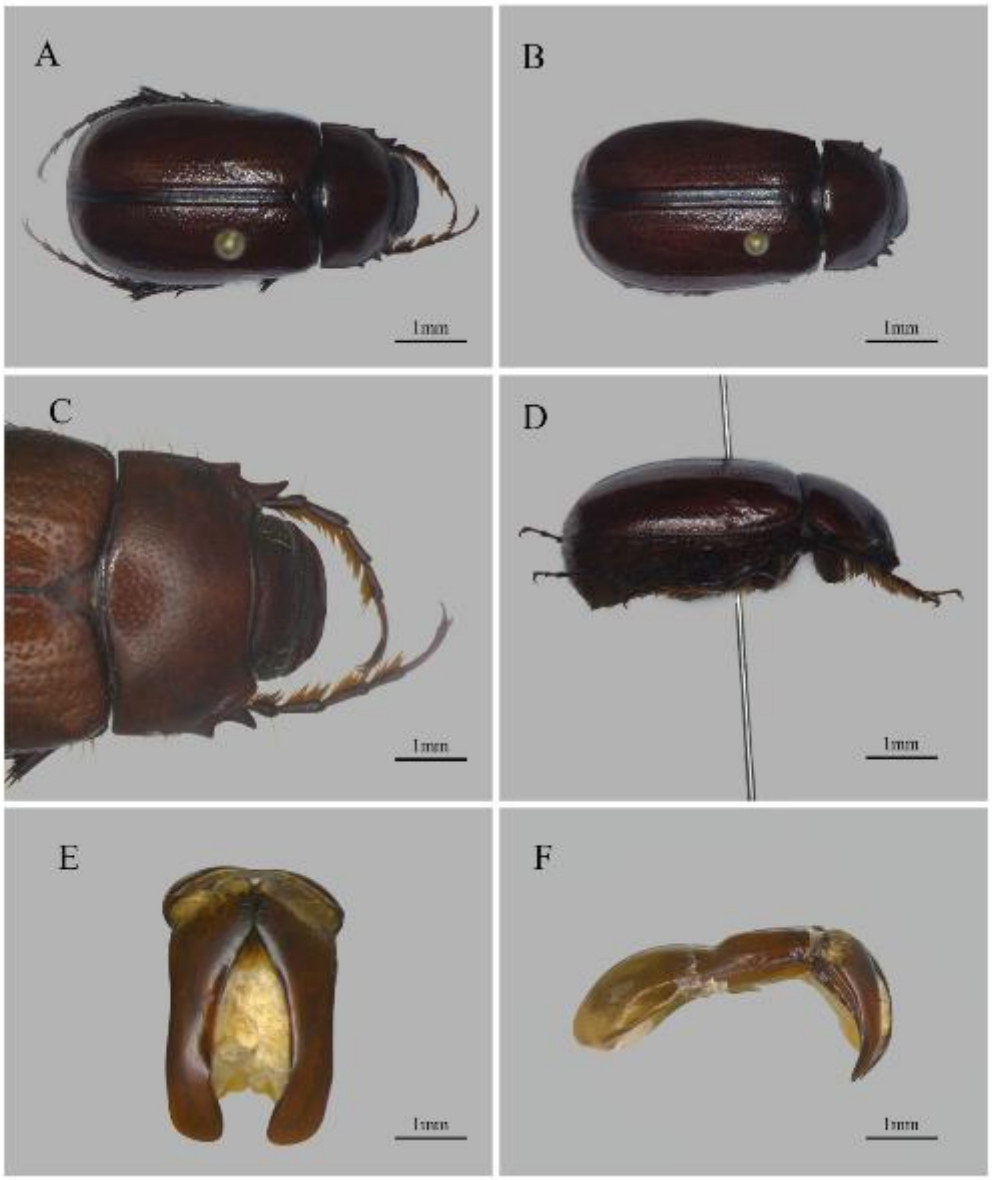


Figure 32. *Manonychus martinezi* Frey: A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view; F. Labels. Scale: 1mm.

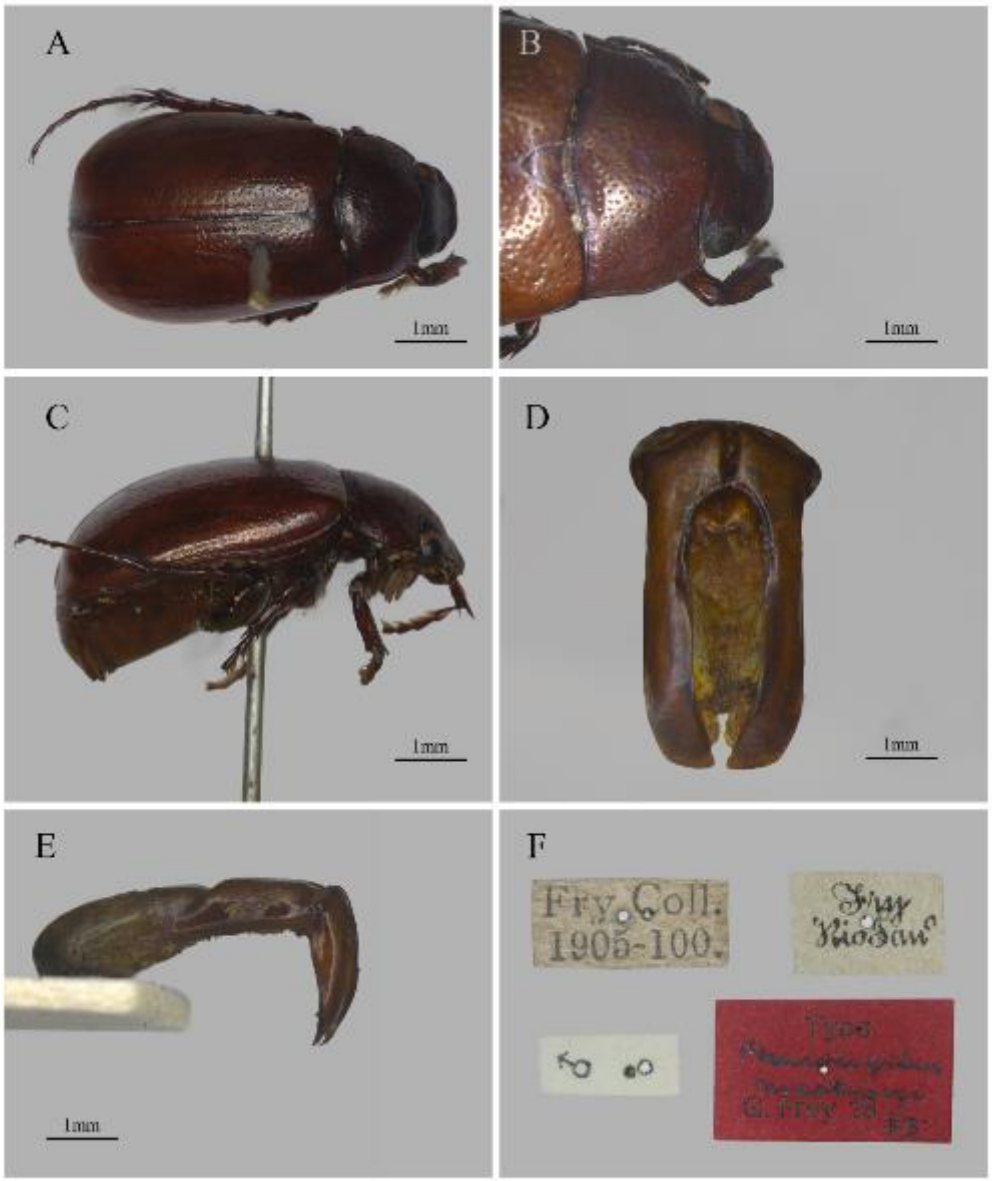


Figure 33. *Manonychus birabeni* Martínez: A. Dorsal habitus; B. Frontal view; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view; F. Labels. Scale: 1mm.

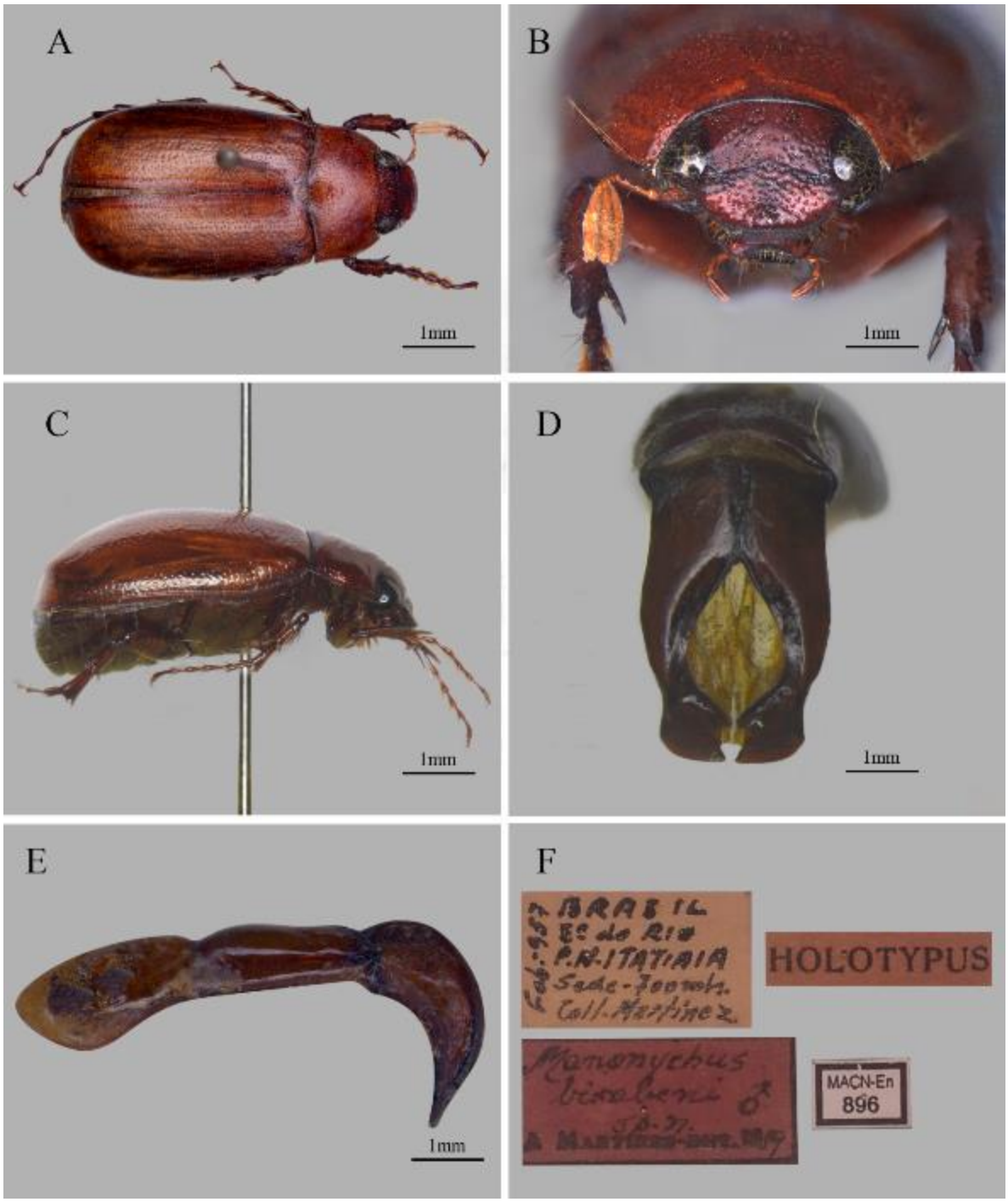


Figure 34. *Manonychus maranhensis* **sp. nov.**: A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view. Scale: 1mm.

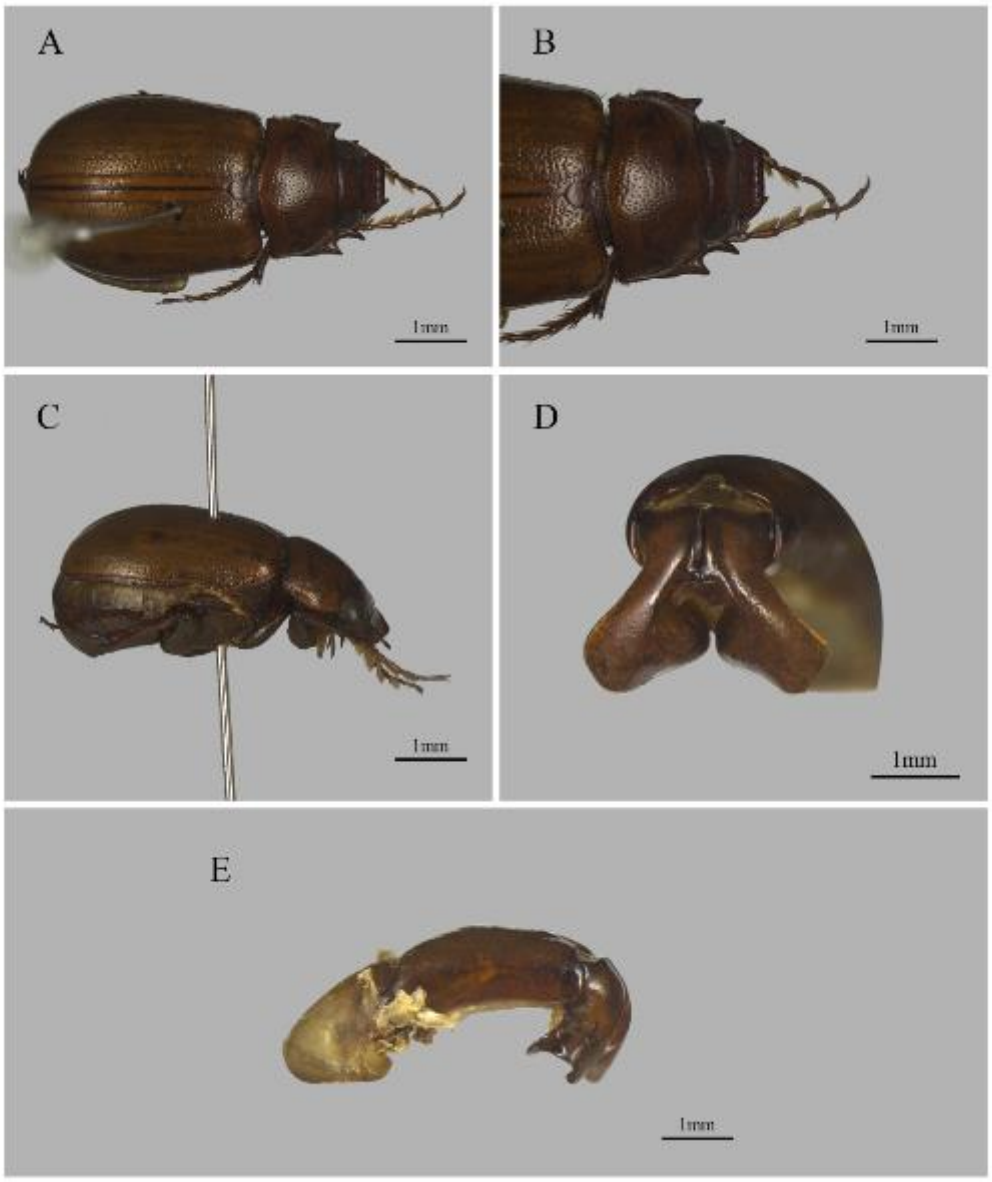


Figure 35. *Manonychus mermudesi* **sp. nov.**: A. Male, dorsal habitus; B. Female, dorsal habitus; C. Clypeus and pronotum; D. Lateral view; E. Parameres, dorsal view; F. Parameres, lateral view. Scale: 1mm.

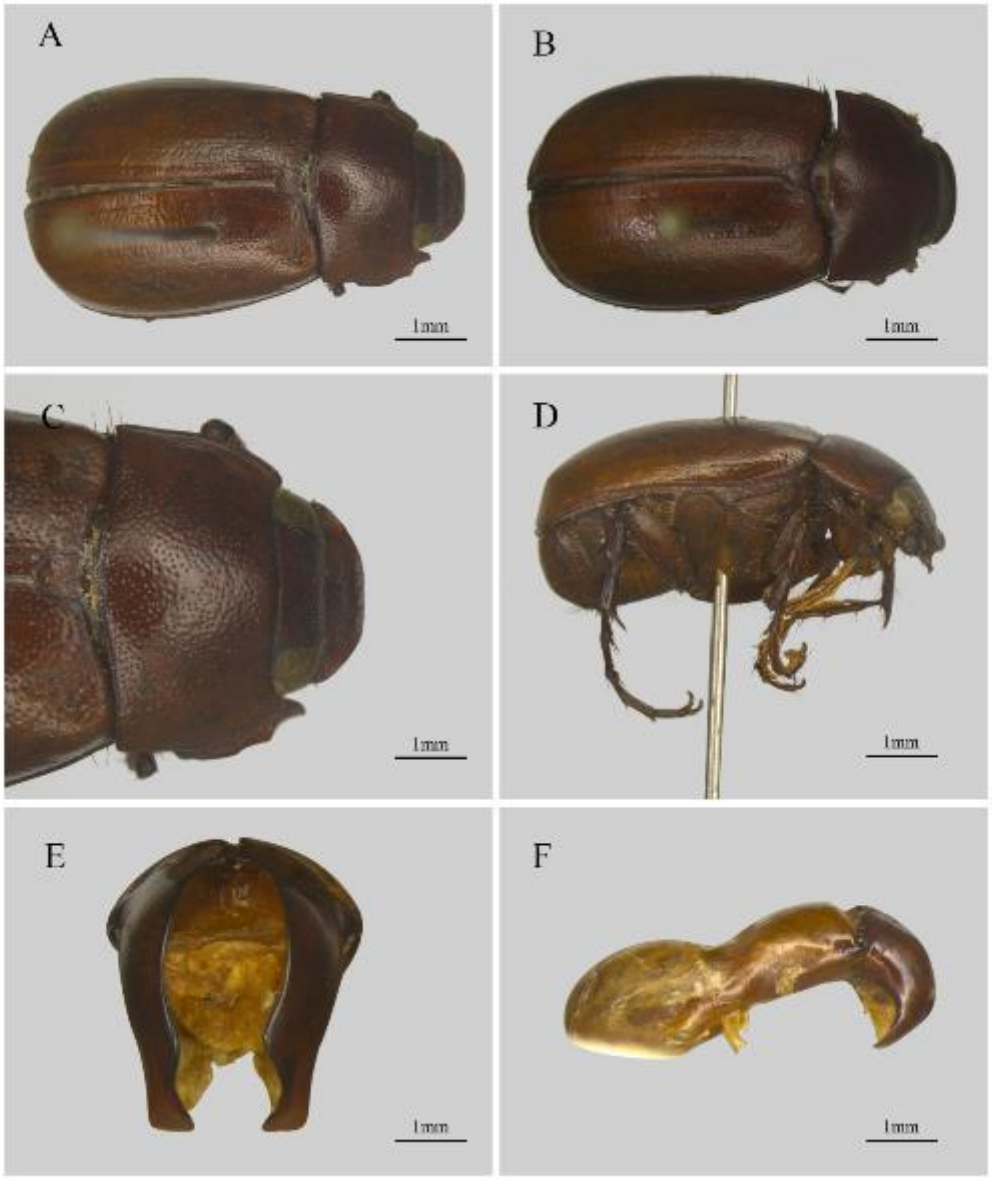


Figure 36. *Manonychus omegoides* sp. nov.: A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view. Scale: 1mm.

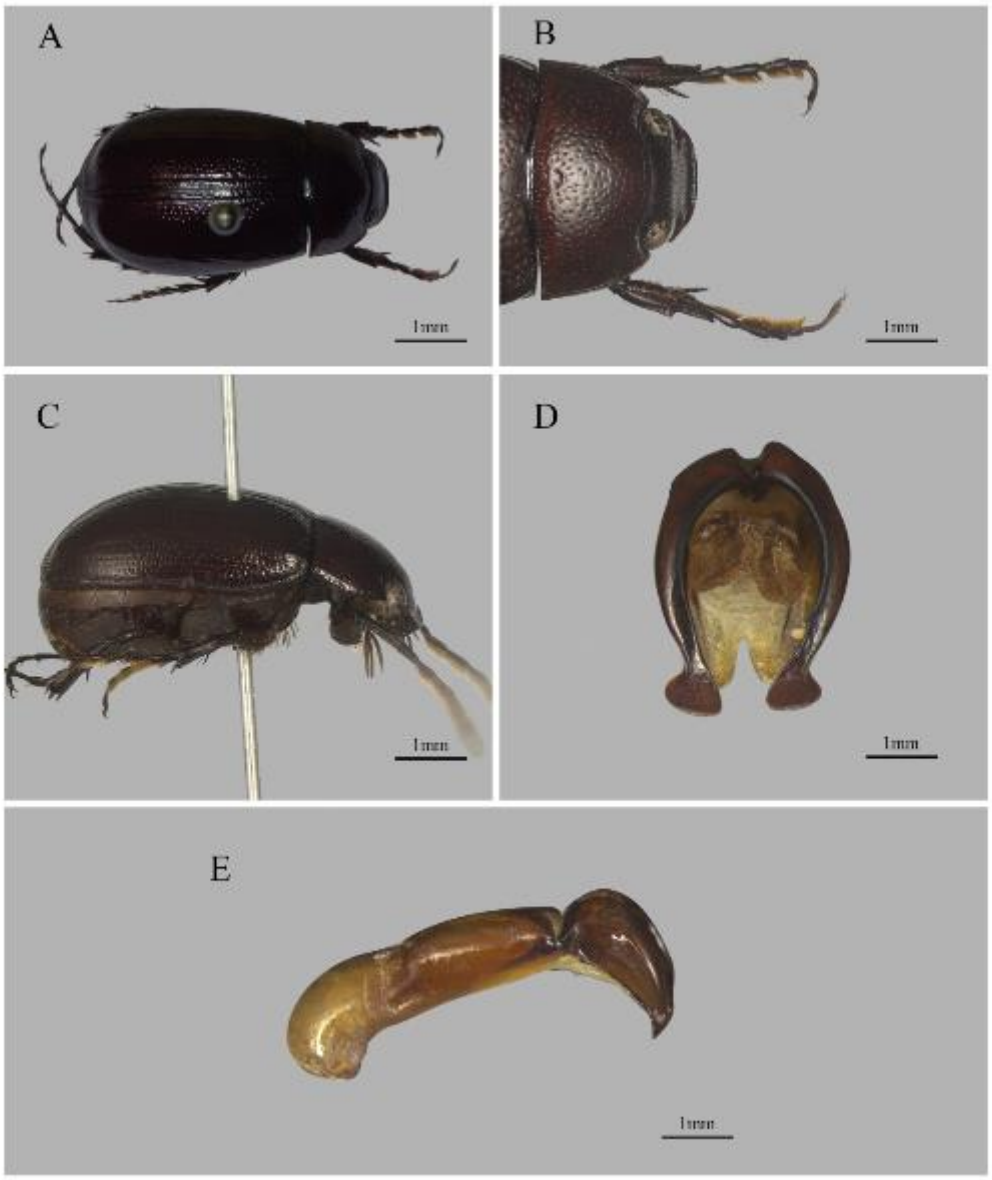


Figure 37. *Manonychus cuiabanus* **sp. nov.** A. Dorsal habitus; B. Clypeus and pronotum; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view. Scale: 1mm.

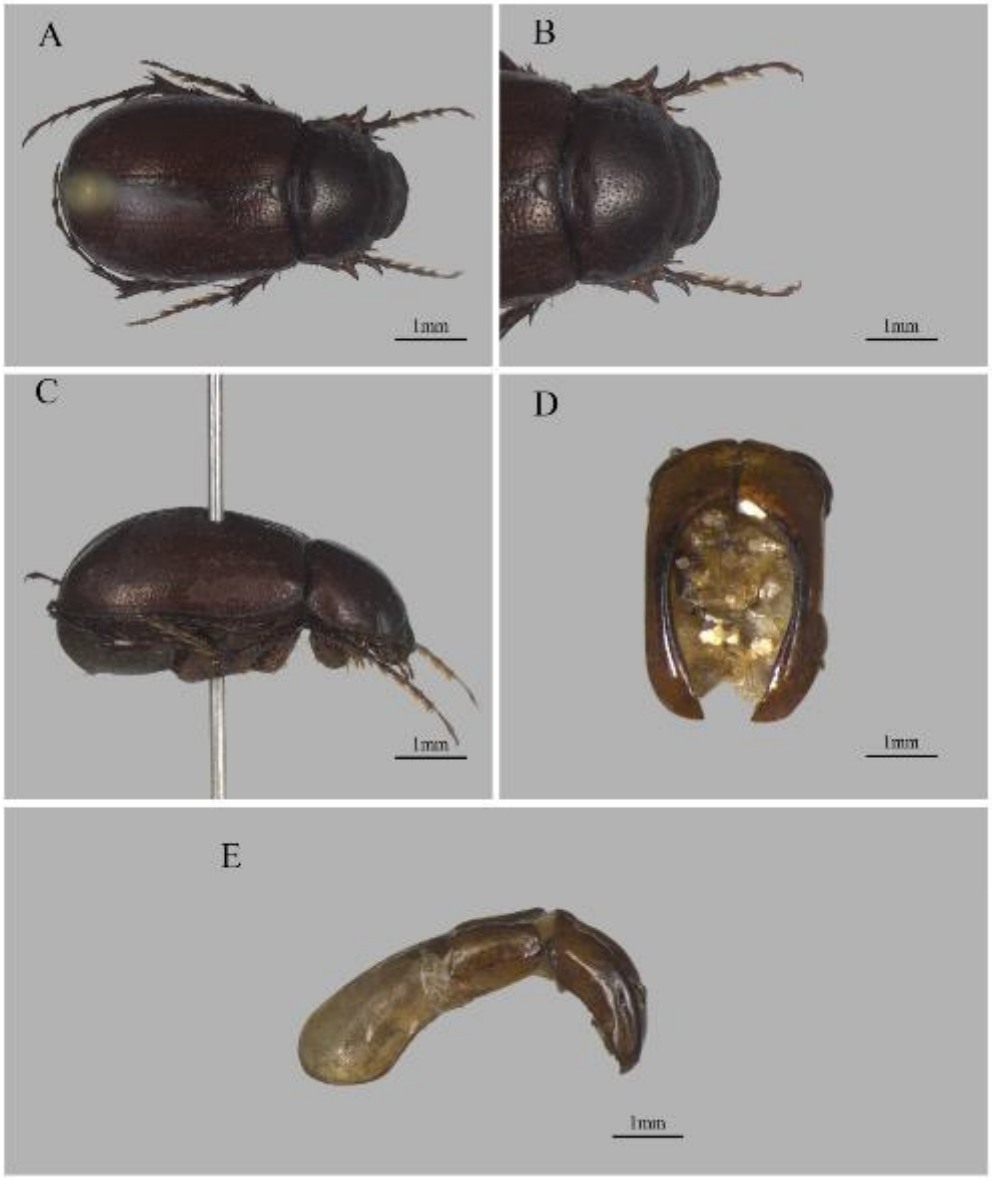
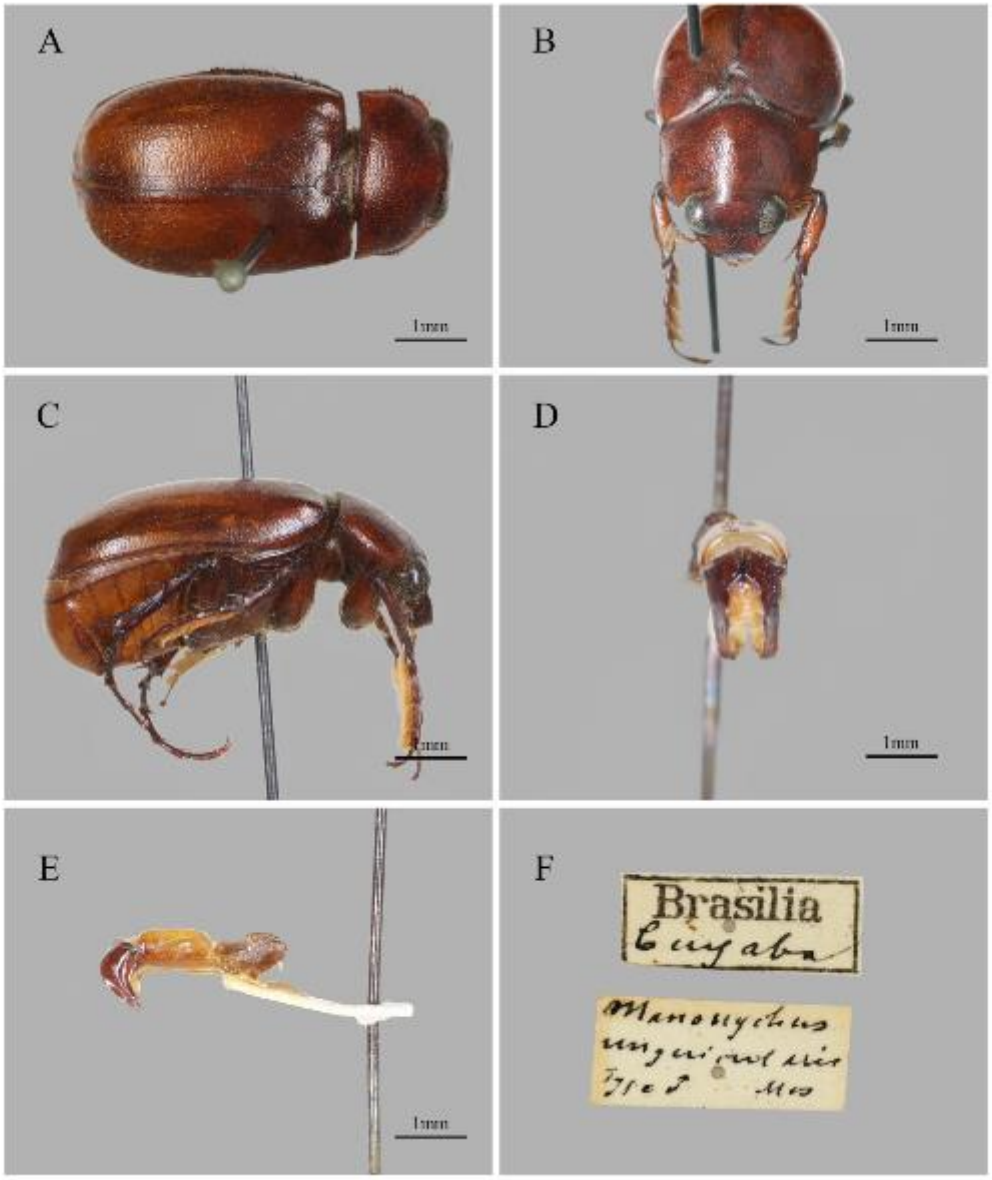


Figure 38. *Manonychus unguicularis* Moser: A. Dorsal habitus; B. Frontal view; C. Lateral view; D. Parameres, dorsal view; E. Parameres, lateral view; F. Labels. Scale: 1mm.



5 CONSIDERAÇÕES FINAIS

Um novo posicionamento tribal de *Manonychus* é proposto com base na análise filogenética, sendo alocado em Sericoidini.

Uma das espécies foi excluída de *Manonychus* o que resultou na definição de um gênero novo em Melolonthinae (Sericoidini). Dessa forma, *Ovomanonychus* **gen. n.** reúne *O. rosettae* (Frey, 1976), juntamente com *O. striatus* sp.n. e *O. inajae* sp.n.

A partir da revisão de *Manonychus*, foi possível sua delimitação taxonômica. Com a análise do material proveniente das coleções foi possível descrever 23 espécies novas para o gênero, aumentando para 30 o número de espécies conhecidas em *Manonychus*. Ainda na revisão, foram ampliados os registros para o gênero, que até o momento ocorria exclusivamente para o Brasil, mas que a partir do nosso trabalho, a distribuição geográfica também se dá para a Bolívia.

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APÊNDICE A – *OVOMANONYCHUS*, A NEW GENUS OF SOUTH AMERICAN SERICOIDINI (COLEOPTERA: SCARABAEIDAE: MELOLONTHINAE)

Ovomanonychus, a new genus of South American Sericoidini (Coleoptera: Scarabaeidae: Melolonthinae)

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Abstract

Ovomanonychus **new genus** (Coleoptera: Scarabaeidae: Melolonthinae: Sericoidini) is described based on *Ovomanonychus rosettae* (Frey, 1976), **new combination** (the type species), *Ovomanonychus inajae* **new species**, and *Ovomanonychus striatus* **new species**. The genus occurs in Bahia, Espírito Santo, Minas Gerais, Paraná, Rio de Janeiro, and São Paulo, Brazil. Justifications are provided for the new genus and for its placement in Sericoidini. A key to species is presented along with illustrations, distributional data, and maps for each species.

Key words: *Manonychus*, Neotropics, Brazil, chafers, taxonomy.

Introduction

The genus *Manonychus* Moser, 1919 (Coleoptera: Scarabaeidae: Melolonthinae: Sericoidini) is endemic to Brazil and consists of eight species (Evans & Smith 2009; Cherman *et al*. 2016). Previously, this genus was considered morphologically similar to *Hilarianus* Blanchard, 1851, *Liogenys* Guérin-Méneville, 1831, and *Pachrodema* Blanchard, 1851 (Moser 1919; Frey 1974; Gutiérrez 1952; Katovich 2008). The classification of *Manonychus* and these other genera have changed in recent years. *Manonychus* was placed in Macrodactylini (Moser 1919; Blackwelder 1944; Gutiérrez 1952; Frey 1976; Evans 2003; Evans & Smith 2005), and then was later considered to be *incertae sedis* by Katovich (2008) and Evans & Smith (2009). The senior author is preparing a phylogeny and taxonomic revision of *Manonychus* in order to determine what Melolonthinae tribe it should be placed. During this project, *M. rosettae* Frey, 1976 was determined to have enough morphological differences to warrant placement in a new genus. Specimens representing two similar new species were also discovered.

The purpose of this paper is to describe *Ovomanonychus* **new genus** based on *Ovomanonychus rosettae* (Frey, 1976) **new combination**, *Ovomanonychus inajae* **new species**, and *Ovomanonychus striatus* **new species**.

Material and Methods

Material examined. The specimens examined during this study are deposited in the following institutions listed below (curators in brackets), using acronyms in Evenhuis (2016).

BMNH–The Natural History Museum, London, United Kingdom (Max Barclay)

CASC–California Academy of Sciences, San Francisco, California, United States of America (Christopher Grinter)

CEMT–Seção de Zoologia da Coleção Entomológica da Universidade Federal do Mato Grosso, Cuiabá, Mato Grosso, Brazil (Fernando Vaz-de-Mello)

CERPE–Coleção Entomológica da Universidade Federal Rural de Pernambuco, Recife, Pernambuco, Brazil (Paschoal Coelho Grossi)

CMNC–Canadian Museum of Nature, Ottawa, Ontario, Canada (François Génier, Robert Anderson)

CNCI–Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, Ontario, Canada (Serge Laplante)

DZUP–Coleção Entomológica Pe. J.S. Moure, Universidade Federal do Paraná, Curitiba, Paraná, Brazil (Lúcia Massutti and Cibele Stramare Ribeiro-Costa)

FSCA–Florida State Collection of Arthropods, Gainesville, Florida, United States of America (Paul Skelley)

MZSP–Museu de Zoologia, Universidade de São Paulo, São Paulo, São Paulo, Brazil (Carlos Campaner and Sônia Casari)

NHMB–Naturhistorisches Museum, Basel, Switzerland (Matthias Borer)

Morphological study. This study was primarily based on the examination of the external morphology, mouthparts, and male genitalia. Specimens of each species were dissected, and the genitalia and/or mouthparts were mounted and examined using a Leica MZ6 stereomicroscope. The photographs were taken with a Zeiss stereo microscope Stemi 305 and camera Canon Rebel T5 / lens Canon EF 100 mm F/2.8 Macro USM. Body measurements are based on measurements of the largest and smallest male and female specimens of each species with a micrometric ocular adapted to the Leica MZ6 stereomicroscope.

The morphological terms used in the descriptions are as follows: morphology of body and mouthparts (Moron 1986; Lawrence *et al*. 2011); terminology of punctures (Harris 1979; Cherman & Almeida 2015); and male genitalia (Ahrens & Lago 2008; Tarasov & Génier 2015). Species descriptions and redescription were adapted following Ratcliffe (2013).

Data from the labels of the type material are verbatim between quotation marks (“”) with lines separated by slash marks (/). Data from non-type material were recorded as follows: name of country written in uppercase letters, name of state in bold, followed by municipality, other information (when present), sex, date, collector, and collection.
Maps were created in ArcGIS (version 10.2), based on label data and from the literature. All the authors of this manuscript were equally responsible for coining the name and for satisfying all other availability criteria of each nomenclatural act (International Commission on Zoological Nomenclature 1999).

***Ovomanonychus* Costa, Cherman, & Iannuzzi, new genus**

Type species. *Manonychus rosettae* Frey, 1976, here designated.

Diagnosis. *Ovomanonychus* is distinguished from all other Sericoidini by the following combination of characters: ovate body; labrum vertical, with anterior margin inflated, hidden below the clypeus, not on same plane; galea with outer margin curved; labrum vertical; labium longer than it is wide; antennae with nine antennomeres and club (with three antennomeres) longer than flagellum; absence of membrane along median of anterior pronotal margin; six fused ventrites, except the VI is articulate; ventrite I with basal half hidden by metacoxae and ventrite VI one quarter the length of other ventrites; pygidium and propygidium separated by suture; tarsomeres with sparse setae ventrally; elytra with strong costae; procoxae conical; apical protibial spur in both sexes; mesocoxae three times longer than wide; metacoxae longer than ventrite II; mesotarsomere I longer than mesotarsomere II; claws simple on all tarsi; metatibia with two apical spurs, spurs set below and above the tarsal articulation (Fig. 1).

Description. Length: 10–12 mm; width: 4.0–5.5mm. Body reddish brown, ovate sides slightly arcuate at middle of elytra (Fig. 1A). *Head*: Anterior margin rounded; distance between eyes twice or three times the width of one eye; frons densely punctate; frontoclypeal suture strongly impressed; canthus covered by clypeus; clypeus trapezoidal, punctate, strongly reflexed, and separated from labrum by a suture; labrum with anterior margin bulged, vertical; hidden below the clypeus, not on same plane;maxilla with galea with outer margin curved (Fig. 1B); galea with tooth I projected; lacinia with distal portion forming a tooth–like projection; labium densely setose along the lateral margin, longer than wide (Fig. 1D); palp insertion covered by the labium and placed submedially; ligula and labium fused; antennae with nine antennomeres, club with three antennomeres and longer than flagellum (Fig. 1E). *Prothorax*: Pronotum wider than long, glabrous, densely punctate disc narrowly smooth along midline; absence of membrane along median of anterior pronotal margin (Fig. 1E); anterolateral region slightly depressed; lateral margin sparsely setose; anterior angle rounded; pronotum with anterolateral margin arcuate, posterolateral margins straight; proepimeron smooth laterally. *Pterothorax*: Scutellum subtriangular; mesosternum with foveolate punctures with bristles (Fig. 1A); internal posterior angle

of mesepimeron acute and projected; metasternum bristles long; distance between the mesocoxae and metacoxae equal to length of metacoxae; metepisternum with coarse punctures. *Elytra*: Shiny, with costae parallel to the elytral suture, which is elevated (Fig. 1A). *Legs*: Procoxae conical, with sparse punctures on proximal region; profemurs with aggregated punctures extending from the base to the disc; protibia with sculpture and three teeth well developed, tooth II forming an acute angle with tooth III;apical protibial spur in both sexes; protarsomeres cylindrical; mesocoxae contiguous, punctate distally and three times longer than wide; mesofemur with parallel double row of punctures; mesotibia gradually enlarged towards apex, and with two transverse carinae; transverse carinae II incomplete (non-reaching inner margin of mesotibia); two apical spurs, spurs set below and above the tarsal articulation; mesotarsomere I longer than mesotarsomere II (Fig.2A); metacoxae longer than ventrite II, with dense or sparse bristles; metacoxal lateral margin in obtuse angle; metafemur with row of punctures posteriorly and smooth basally; transverse carinae II incomplete; metatibial apical spurs with equal or different size (Fig. 2B), spurs set below and above the tarsal articulation; apex of metatibia prominent at the tarsal articulation; ventral surface of all tarsomeres with sparse bristles (Fig. 1F); all claws simple. *Abdomen*: Six fused ventrites, except ventrite VI is articulate; ventrite I with basal half hidden by metacoxae and ventrite VI one quarter the length the others (Fig.2C); lateral keel along the ventrites; ventrites II–VI with transverse row of setose punctures; pygidium and propygidium separated by suture; propygidium punctate. *Male genitalia*: Parameres symmetrical, converging at apex; outer margin slightly curved on distal third; inner margin on distal portion curved; medial portion of proximal margin lobed.

Sexual dimorphism. Males and females are quite similar, except protibial tooth I stronger in females and pygidium slightly convex in females and flat in males.

Etymology. Adjective in the nominative singular. From the Latin *ovum* (“egg”) + *Manonychus* in reference to the body shape and original placement of the type species. The name is masculine in gender.

Composition. *Ovomanonychus rosettae* (Frey, 1976) **new combination**, *Ovomanonychus inajae* **new species**, and *Ovomanonychus striatus* **new species**.

Geographical distribution. Endemic to the southeastern (Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo), northeastern (Bahia), and southern (Paraná) regions of Brazil (Fig.3).

Remarks. *Ovomanonychus* resembles *Manonychus* in the labrum hidden by the clypeus (in dorsal view), with superior margin inflated and labium quadrate. *Ovomanonychus* differs from *Manonychus* (characters in parenthesis), in the galea with outer margin curved (Fig. 1B) (galea with outer margin lobed; Fig. 1C); elytra with costae (Fig. 1A) (elytra almost smooth); tarsomeres in all legs with sparse bristles (Fig. 1F) (protarsomeres and mesotarsomeres with pads; Fig. 1G); metacoxae longer than ventrite II (Fig. 2C) (metacoxae length equal to ventrite II; Fig. 2D).

We place *Ovomanonychus* in Sericoidini based on the following combination of characters: labrum hidden by the clypeus (in dorsal view); clypeus and labrum separate by suture; ligula and labium fused; metatibial apically with two spurs, spurs set below and above the tarsal articulation; lateral keel along the abdominal ventrites; abdomen with six ventral sternites (basal sternite partially hidden by metacoxae), sternites approximately equal in length, evenly convex, separated by distinct sutures (Smith 2008).

Identification key to species of *Ovomanonychus* new genus

1. Scutellum smooth; metacoxae sparsely bristled; ventrites with inconspicuous punctures (Fig. 2C); apical region of phallobase excavate (Fig. 2F). Bahia, Minas Gerais, and Espírito Santo, Brazil……*Ovomanonychus rosettae* (Frey, 1976)

- Scutellum punctate (Fig. 5A); metacoxae densely bristled; ventrites with conspicuous punctures (Fig. 2E); apical region of phallobase flat ……2

2. Clypeus broadly rounded (Fig. 5A); elytra with four longitudinal costae weakly defined; metatibial spurs unequal in length (Fig. 2B); frontoclypeal suture elevated (Fig. 5D); galea with six teeth. Mato Grosso, Brazil…..*Ovomanonychus inajae* **new species**

- Clypeus trapezoidal, with anterior margin truncate (Fig. 6A); elytra with six longitudinal costae well defined (Fig. 6A); metatibial spurs equal in length; frontoclypeal suture not elevated; galea with eight teeth. Minas Gerais, Rio de Janeiro, São Paulo, and Paraná, Brazil….....*Ovomanonychus striatus* **new species**

***Ovomanonychus rosettae* (Frey, 1976) new combination**

Figures 4A–G.

Manonychus rosettae Frey, 1976: 377; Evans 2003: 303 (checklist); Evans & Smith 2005: 256 (checklist); Evans & Smith 2009: 309 (checklist).

Type material. *Ovomanonychus rosettae* **holotype** male BRAZIL: "Encruzilhada / 960m, Bahia / Alvarenga, XI. 72" "Type / *Manonychus* / *rosettae* / G. Frey 1975". (NHMB). **Paratypes.** Brazil. **Bahia.** Encruzilhada, xi.1972, 960 m, Alvarenga: 1 female (NHMB).

Non-type material. BRAZIL. **Minas Gerais**. Águas Vermelhas, 13.xii.2007, 840 m, light trap, 15°42'27"S 41°32'02"W, Grossi, Rafael, and Parizotto: 1 male (CEMT); **Espírito Santo**. Linhares, Reserva Natural Vale, 13.xi.2012, Martins and Fiuza: 1 male (CEMT); 1 male Linhares, Sooretama, xi.1962, A. Martínez (CMNC); 1 male Conceição da Barra, x.1972, M. Alvarenga (CMNC).

Type locality. Brazil, Bahia, Encruzilhada, 960 m.

Diagnosis. Clypeus trapezoidal, with anterior margin truncate; large eyes; pronotal anterior and posterior angles rounded; scutellum smooth; elytra with four longitudinal costae; protibia strongly sculptured; metacoxae with sparse bristles; metatibial spurs with different lengths; in males parameres wide, deflected distally and punctate, lateral flat; phallobase with medial constriction.

Redescription. Holotype. Male: Length 11.2 mm; width 4.8 mm (variation 11.0–11.4 mm; 4.6–4.8 mm). *Head*: Shiny, light reddish brown; distance between eyes twice the width of one eye; frons longer than clypeus; clypeus trapezoidal; labrum, in frontal view, with width one third greater than the width of the clypeus; mandibles with mala multigrooved; distal maxillary palpomere with maximum width equal to apex width; galea with seven teeth, seen in dorsal view; labium with apex wider than the base; labial anterior margin from rounded to strongly sinuate. *Prothorax*: Pronotal anterior and posterior angles rounded. *Pterothorax*: Scutellum smooth; mesosternum with short bristles; metasternum with long and dense bristles on disc. *Elytra*: Four longitudinal costae; elytral suture strongly elevated, and distal portion darker than the elytra; coarse punctures, fading towards lateral and apical margin. *Legs*: Protibia strongly sculptured

along the toothed margin; protarsomere I length subequal to protarsomere II; mesotarsomeres with proximal portion smooth; metacoxae with sparse bristles; metatibial spurs with different length. *Abdomen*: Ventrites with inconspicuous punctures; ventrite II–V length subequal; propygidium glabrous, with coarse punctures; pygidium wider than it is long, with coarse and dense punctures and basal region depressed laterally; basal width of the pygidium equal to the posterior width of the propygidium. *Male genitalia*: Parameres wide, deflected distally and punctate; inner margin strongly curved on distal portion; lateral flat; phallobase with medial constriction.

Sexual dimorphism. Female with metasternal bristles sparser than male. Females longer than males (12 mm; 4.6 mm).

Geographical distribution. Brazil (Bahia, Minas Gerais, and Espírito Santo).

Remarks. *Ovomanonychus rosettae* differs to *Ovomanonychus striatus* in: the large eyes (small eyes); mala multigrooved (mala with carinae slightly impressed); scutellum smooth (scutellum with fine and dense punctures); metacoxae with sparse bristles (metacoxae with dense bristles); and parameres wide and deflected distally (parameres narrow and non-deflected distally). *Ovomanonychus rosettae* differs to *O. inajae* in that the clypeus trapezoidal and frons longer than clypeus (clypeus is broadly rounded and the frons as long as the clypeus); scutellum smooth (scutellum punctate); pygidium wider than it is long and with coarsely marked punctures (pygidium as wide as it is long and with finely marked punctures); lateral of parameres without excavation (lateral of parameres with strong excavation).

Up to now, *O. rosettae* was only known from the type locality, Encruzilhada, Bahia, at 960 m. With this study, the records were expanded north to Minas Gerais (840 m) and Linhares, Espírito Santo.

***Ovomanonychus inajae* Costa, Cherman, & Iannuzzi, new species**

Figures 5A–G.

Type material. *Ovomanonychus inajae* **holotype** male BRAZIL: "BRAZIL: Mato Grosso. / Naviraí. Fazenda Paraíso / IX-1983. R Torres", "Holotype / *Ovomanonychus* / *inajae* F. Costa, M. Cherman and L. Iannuzzi 2018". Genitalia and mouth parts mounted (CEMT).

Diagnosis. Clypeus rounded; small eyes; pronotal anterior and posterior corners rounded; scutellum punctate; four longitudinal costae; metacoxae with dense tufts of bristles; protibia strongly sculptured; metatibial spurs with different lengths; parameres wide, deflected distally and punctate; lateral with excavation; phallobase non-constricted.

Description. Holotype. Male. Length 10.2 mm; width 4.2 mm. *Head*: Shiny, light reddish brown; distance between eyes three times the width of one eye; frons as long as clypeus; clypeus rounded; labrum, in frontal view, with width less than one third that width of the clypeus; mandibles with mala multigrooved; distal maxillary palpomere with maximum width from equal to apex width; galea with six teeth, seen in dorsal view; labium with apex as wide as the base; anterior margin almost truncate. *Prothorax*: Pronotal anterior and posterior corners rounded. *Pterothorax*: Scutellum with coarse and dense punctures; mesosternum with long bristles; metasternum with long and dense tuft of bristles on disc. *Elytra*: Four longitudinal costae; elytral suture weakly elevated, unicolored and with coarse punctures. *Legs*: Protibia strongly sculptured along the toothed margin; protarsomere I longer than protarsomere II; mesotarsomeres with proximal portion smooth; metacoxae with dense bristles; metatibial spurs with different lengths. *Abdomen*: Ventrites with conspicuous punctures; ventrite II longer than III; ventrite IV shorter than ventrite V; propygidium glabrous, with fine punctures; pygidium as long as wide, with fine punctures and disc smooth along the longitudinal midline; basal region flat laterally; base of pygidium wider than the posterior margin of the propygidium. *Male genitalia*: Parameres wide, deflected distally and punctate; inner margin slightly curved on distal portion; lateral excavation occupying two thirds of the maximum length; phallobase not constricted.

Females. Unknown.

Etymology. The species is named after Mrs. Inajá Correia Costa, mother of the first author, for all the support received. The name is a noun in the genitive case.

Type locality. BRAZI, Mato Grosso, Naviraí, Fazenda Paraíso.

Geographical distribution. BRAZIL (Mato Grosso).

***Ovomanonychus striatus* Costa, Cherman, & Iannuzzi, new species**

Figures 6A–G.

Type material. *Ovomanonychus striatus* **holotype** male BRAZIL: "BRASIL. Minas Gerais / Extrema. Estrada da Torre da Embratel / 09.xii.2012. 160m / Grossi & Melo" "Holotype / *Ovomanonychus striatus* / F. Costa, M. Chermanand L. Iannuzzi 2019". (CERPE). **Paratypes.** Brazil. *Minas Gerais*. Extrema Torre da Embratel, 9.xii.2012, 160 m, Grossi and Melo: 1 male (CERPE); Lavras, 1.v.2008, F.A.P. Brito: 1 male (CEMT); **Rio de Janeiro.** Nova Friburgo, i.1998, E. and P. Grossi: 1 male; 5.xi.2009, 1450 m, 22°22'2"S 42°29'11"W, E. and P. Grossi: 4 males (CERPE); 2 males Nova Friburgo, 2004, 1500 m, P. Grossi: 2 males (CERPE); Nova Friburgo, xi.2008, P. Grossi: 1 male (CEMT); Nova Friburgo, vi.1934: 1 male (DZUP); Nova Friburgo, vi.1935 P. Arp: 2 males (DZUP); Nova Friburgo: 1 male (BMNH). **Espírito Santo.** Santa Tereza, 12.xii.1966, C. and C.T. Elias: 1 male; Santa Tereza, 16–22.xii.1966: 1 male (DZUP); Santa Tereza, 23–31.xii.1966: 1 male (DZUP). **São Paulo.** Salesópolis, Estação Biológica Boracéia, 3–8.i.1974, light trap, Vaninand Leme: 1 male (MZSP); Salesópolis, Estação Biológica Boracéia, 17–26.xii.1969, J.M. and B.A. Campbell: 4 males (3 CNCI, 1 CMNC); Salesópolis, Estação Biológica Boracéia, 21.i.1975, T.E. Rogers: 3 males (FSCA); Campinas, Mogi Guaçu, 1–8.i.1970, J.M. and B.A. Campbell: 1 male (CNCI); Guarulhos, Cumbica, xii.1968, A. Bello: 1 male (CEMT); Campos do Jordão, xii.1962. 1300 m, A. Martínez: 2 males (CMNC); Ipiranga, F. Ohaus: 1 male (CASC); Ipiranga, x.1906: 1 female (CMNC); Ipiranga, 25.x.1968, A. Martínez: 1 male (CMNC); Ipiranga, xi.1955, A. Martínez: 1 male (CMNC); Alto da Serra, ii.1928: 1 male (CMNC); Alto da Serra, xii.1932, F. Campos: 1 male (DZUP). **Paraná.** Ponta Grossa, Parque Estadual de Vila Velha, Reserva Iapar, 25–26.xi.2011, light, Grossi,

Santos, and Melo: 1 male, 1 female (CERPE); Ponta Grossa, Parque Estadual de Vila Velha, Reserva Iapar, 19.xi.1997: 4 males (CERPE); Jaguaraíva, x.1953, C. Bruhn: 1 male; São José dos Pinhais, Serra do Mar, BR 277, 1.i.1987, Lâmpada: 1 male (CERPE).

Diagnosis. Clypeus trapezoidal with anterior margin truncate; eyes small; pronotal anterior and posterior angles acute and projected; scutellum punctate; six longitudinal costae; metacoxae with dense tuft of bristles; protibia slightly sculptured; metatibial spurs equal in length, in males parameres narrow, deflected smooth, not deflected distally; lateral flat; phallobase not constriction.

Description. Holotype. Male. Length 12.1 mm; width 5.0 mm (variation 10.5–12.1 mm; 4.6–4.8 mm). *Head*: Shiny, reddish brown; distance between eyes three times the width of one eye; frons as long as the clypeus; clypeus trapezoidal with anterior margin truncate; labrum, in frontal view, less than one third the width of the clypeus; mandibles with mala with carinae slightly impressed; distal maxillary palpomere width twice the width at apex; galea with eight teeth in dorsal view; labium with apex wider than the base; labial anterior margin strongly sinuate. *Prothorax*: Pronotal anterior and posterior angles acute and projected. *Pterothorax*: Scutellum with fine and dense punctures; mesosternum with long tuft of bristles; metasternum with long and dense tuft of bristles on disc. *Elytra*: Six longitudinal costae; elytral suture strongly elevated, unicolored and with fine punctures fading towards the proximal region. *Legs*: Protibia slightly sculptured; protarsomere I longer than protarsomere II; mesotarsomeres with proximal portion punctate; metacoxae with dense bristles; metatibial spurs with equal lengths. *Abdomen*: Ventrites with conspicuous punctures; ventrite II longer than III; ventrite IV shorter than ventrite V; propygidium with both coarse and fine punctures and short bristles laterally; pygidium wider than it is long, dense and fine punctures on margins and disc smooth; basal region flat laterally; base of pygidium wider than posterior margin of the propygidium. *Male genitalia*: Parameres narrow and smooth; not deflected distally; outer margin curved; inner margin slightly curved, almost straight on distal portion; lateral flat; phallobase not constriction.

Sexual dimorphism. Female with length of antennal club shorter than males. Length 11 mm and width 4.1 mm (12 mm; 5.0 mm).

Etymology. From the Latin striātus “furrowed, grooved, fluted, striated”. The name is referring to the ridges of the elytra and is an adjective in the nominative singular.

Type locality. Brazil, Extrema. Estrada da Torre da Embratel, 160 m.
Distribution. Brazil (Minas Gerais, Rio de Janeiro, São Paulo, and Paraná).

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Figures

Figure 1. *Ovomanonychus* diagnostic characters. A, *Ovomanonychus striatus* new species male dorsal habitus; B, *O. striatus* right maxilla, galea with outer margin curved; C, *Manonychus birabeni* Martínez, 1959 right maxilla, galea with outer margin lobed; D, *O. striatus* labium; E, *O. rosettae* (Frey, 1976) frons and antennae; F, *O. rosettae* left anterior tarsomeres with sparse bristles; G, *M. birabeni* right anterior tarsomeres with pads.

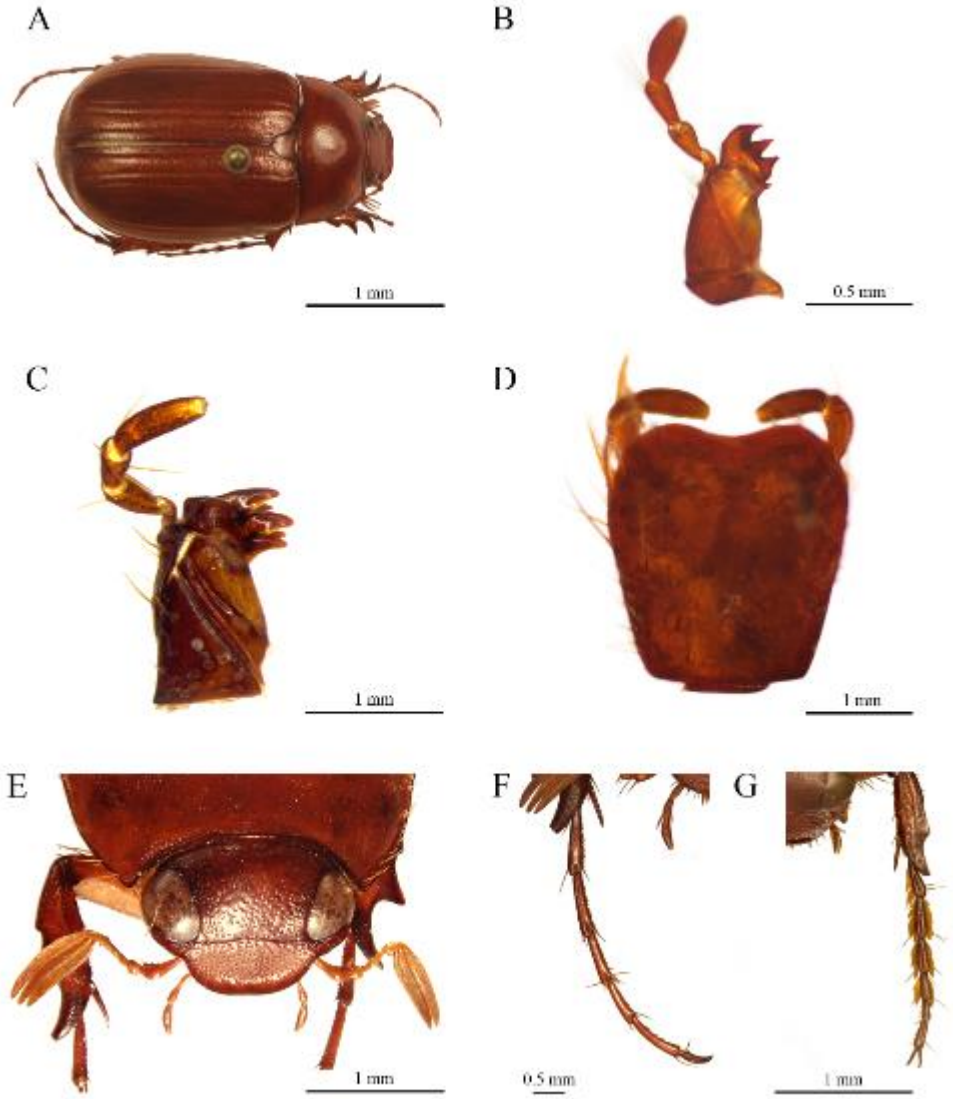


Figure 2. *Ovomanonychus* diagnostic characters. **A**, *Ovomanonychus rosettae* (Frey, 1976) mesotarsomere; **B**, *O. inajae* **new species** spurs set below and above the tarsal articulation; **C**, *O. rosettae* metacoxae longer than ventrite II; **D**, *Manonychus ovalis* (Blanchard, 1851) metacoxae length equal to ventrite II; **E**, *O. striatus* **new species** metacoxae densely bristled; **F**, *O. rosettae* apical region of phallobase excavated.

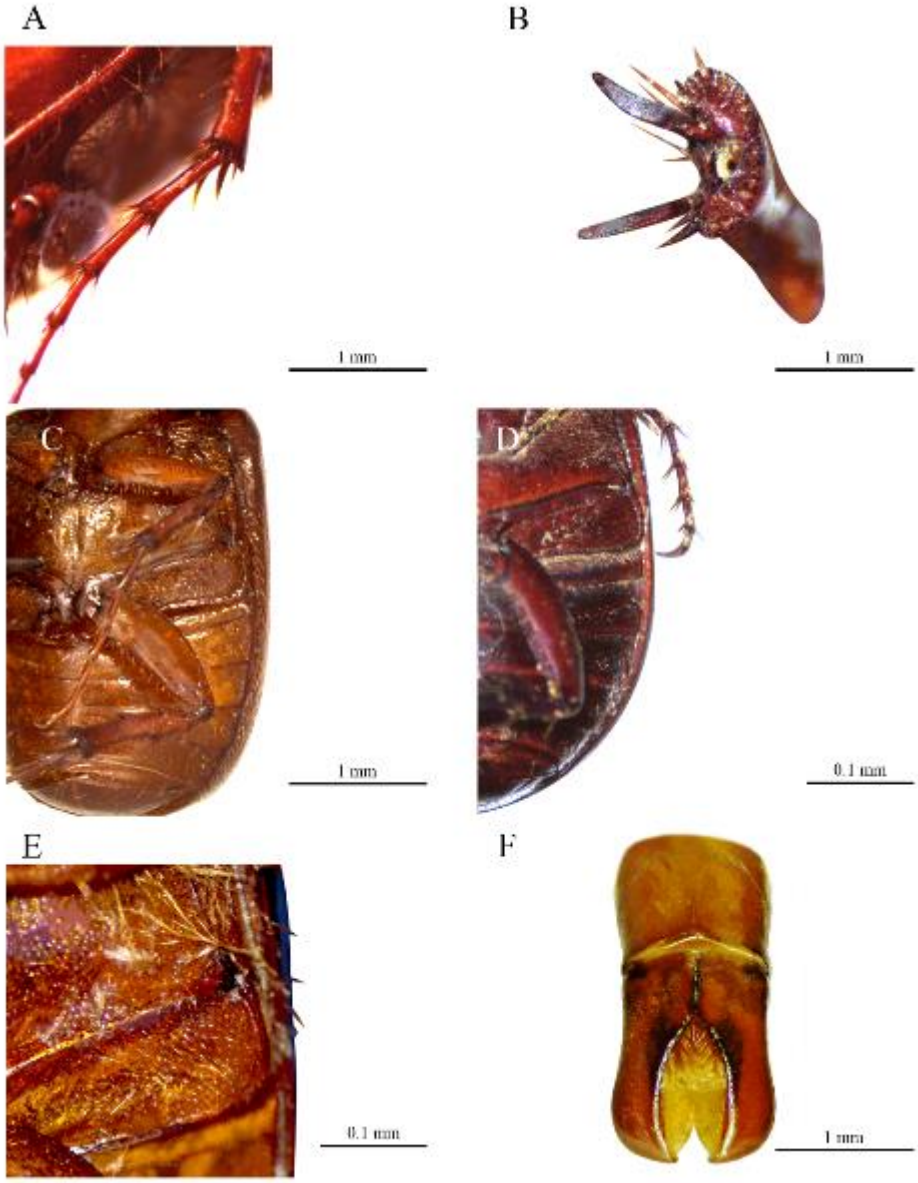


Figure 3. Distribution map of *Ovomanonychus*: *Ovomanonychus inajae* **new species** (red square), *Ovomanonychus striatus* **new species** (yellow circles), and *Ovomanonychus rosettae* (blue diamonds).

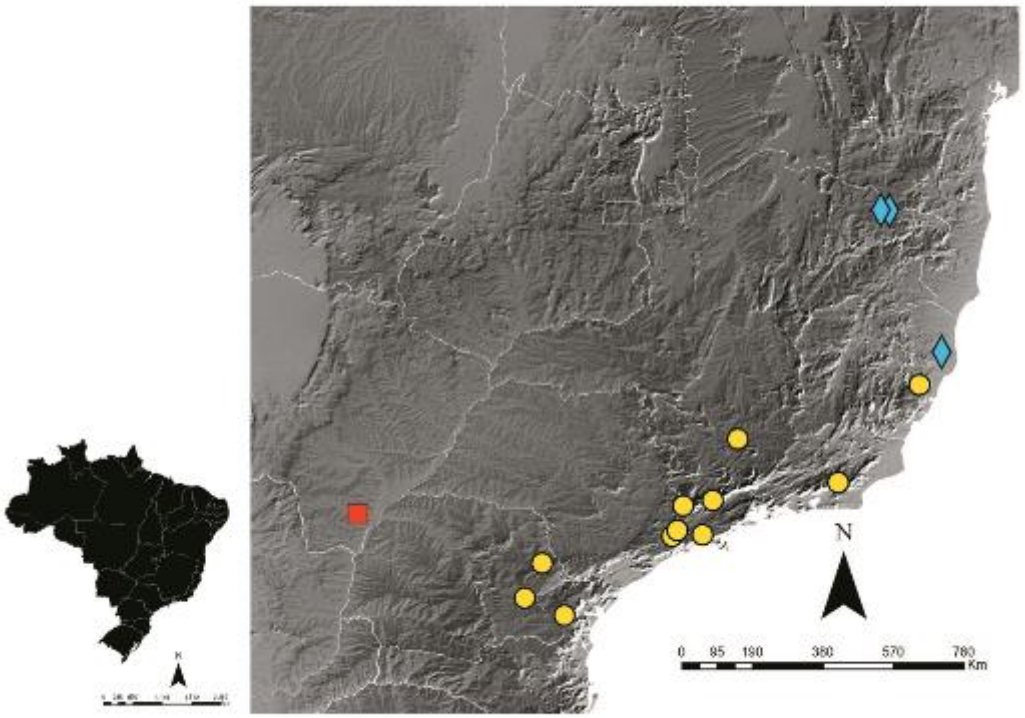


Figure 4. *Ovomanonychus rosettae* (Frey, 1974) **new combination** holotype male. **A**, Dorsal habitus; **B**, lateral view; **C**, frontal view; **D**, diagonal view; **E**, parameres dorsal and lateral view; **F**, labels.

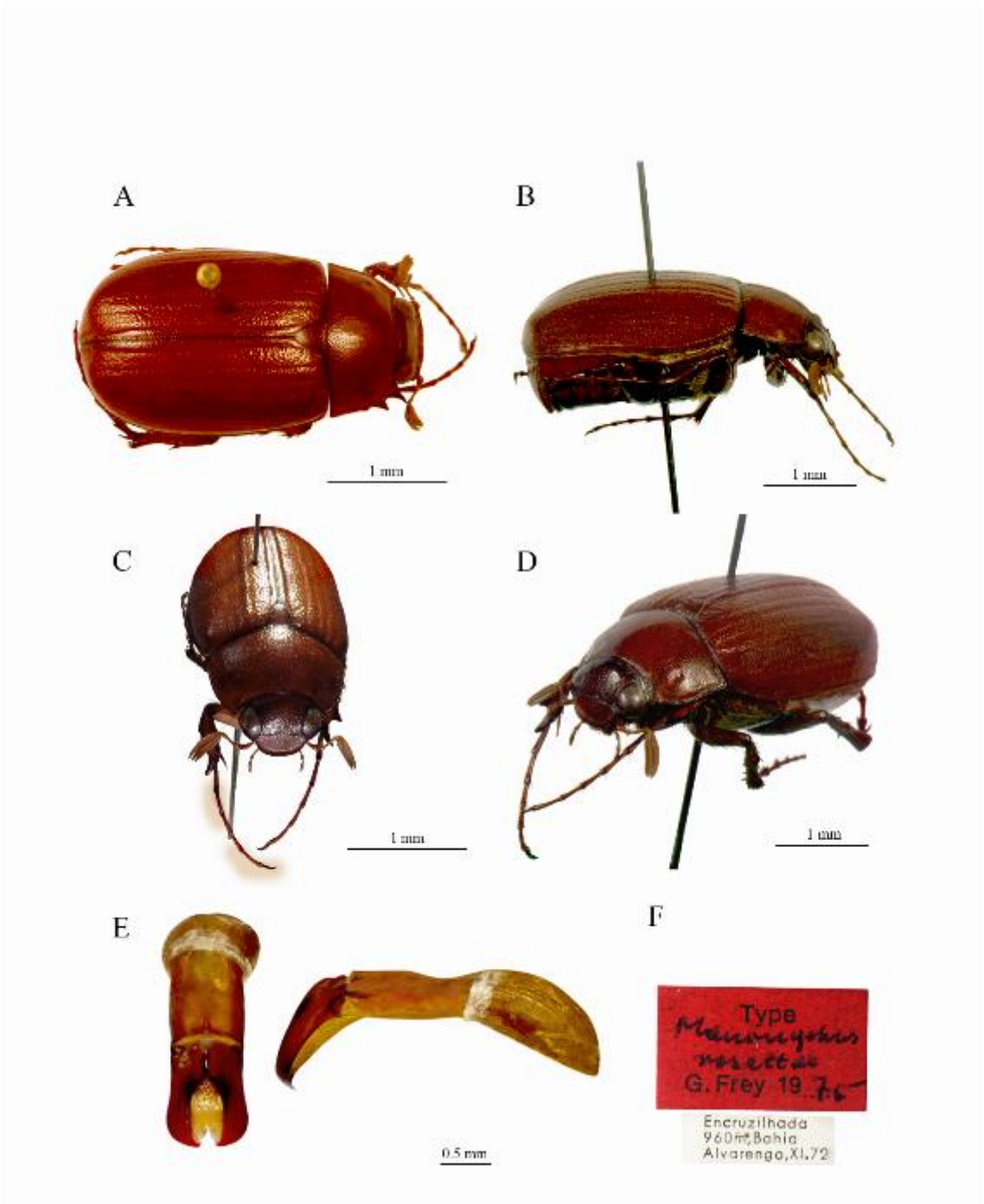


Figure 5. *Ovomanonychus inajae* **new species** holotype male. **A**, Dorsal habitus; **B**, lateral view; **C**, frontal view; **D**, diagonal view; **E**, parameres dorsal view; **F**, parameres lateral view.

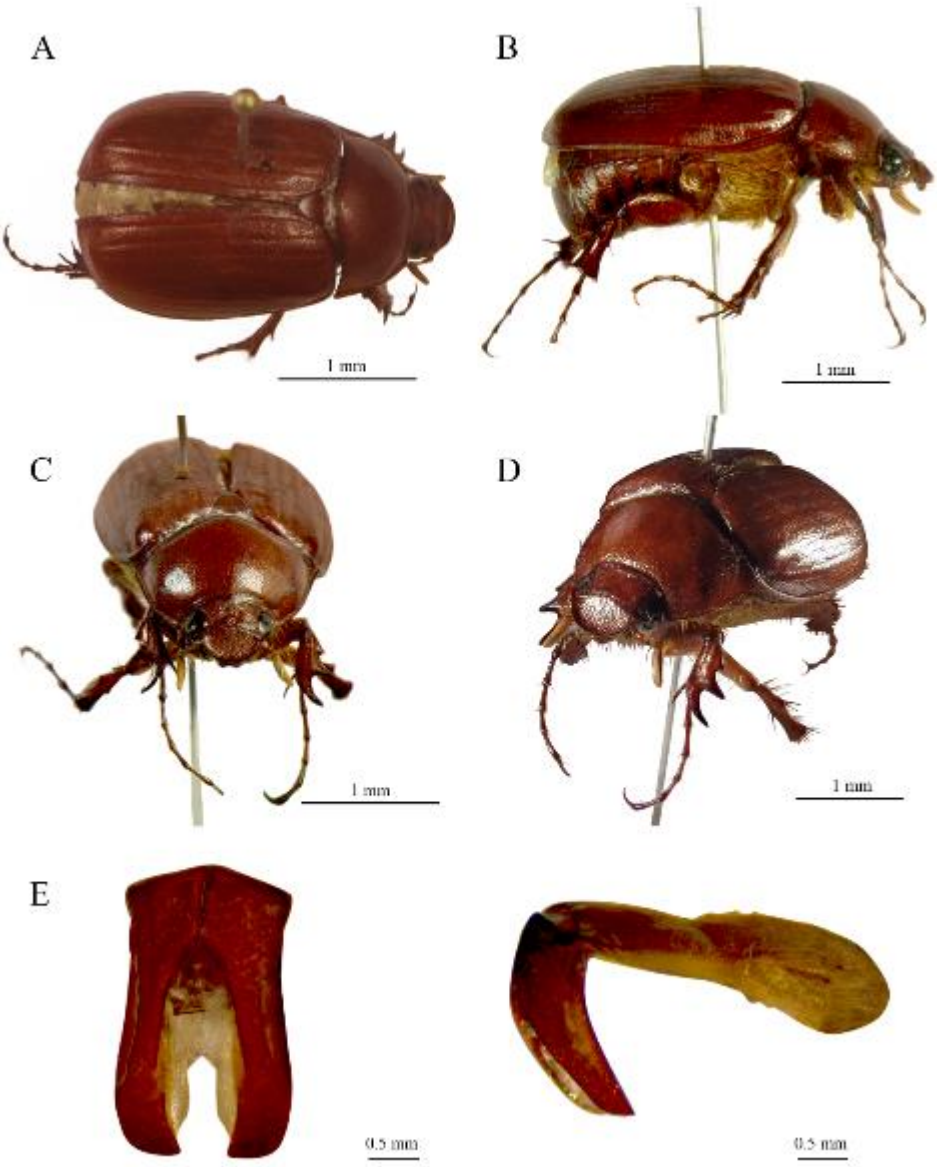
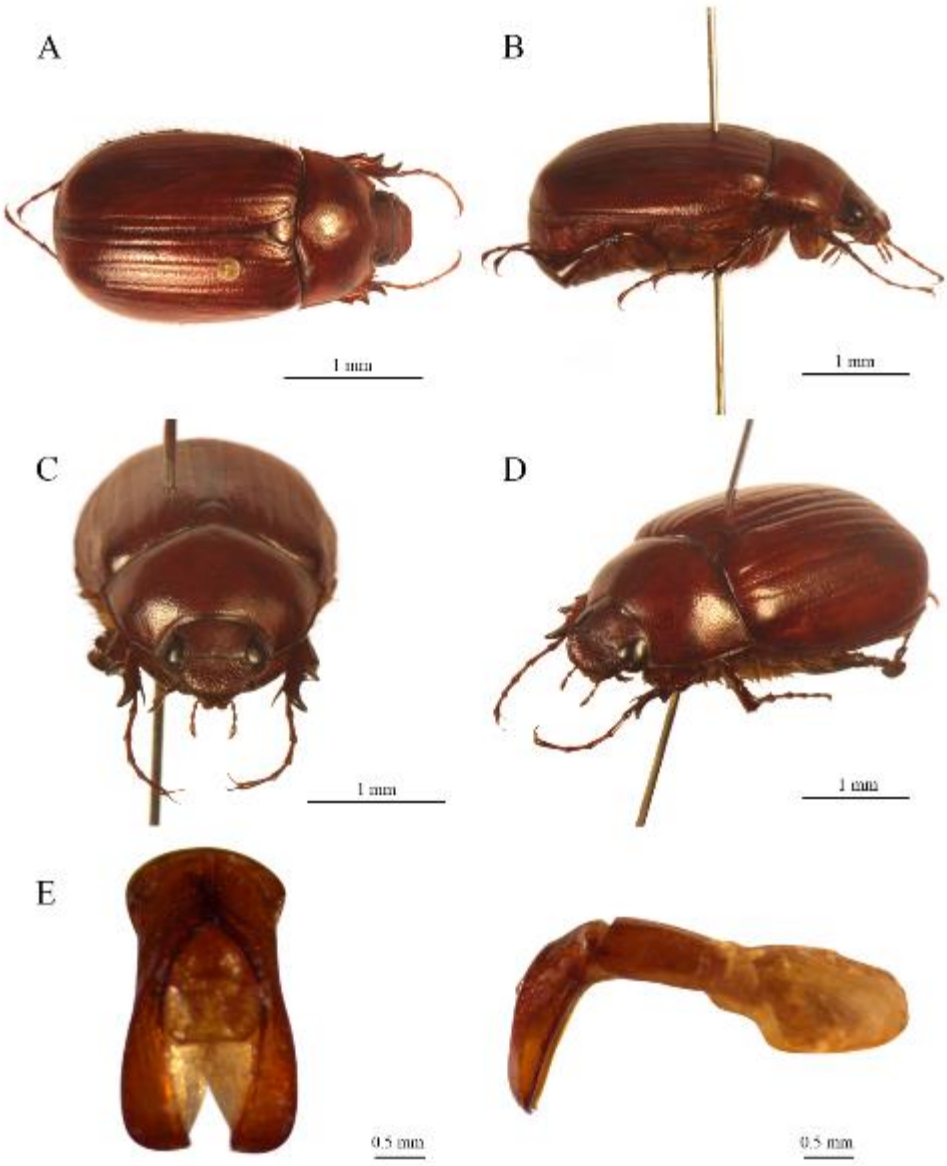


Figure 6. *Ovomanonychus striatus* new species paratype male. A, Dorsal habitus; B, lateral view; C, frontal view; D, diagonal view; E, parameres dorsal view; F, parameres lateral view.



ANEXO A– NORMAS DO PERIÓDICO CIENTÍFICO ZOOTAXA

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

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

D) Internet resources

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

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