



LUIS FELIPE LIBREROS HERNÁNDEZ

**SYNOPSIS OF THE GENERA AND SPECIES OF THE TRIBE
CLIVININI (COLEOPTERA: CARABIDAE) OF THE CHACO
PROVINCE AND SYSTEMATIC REVIEW OF THE
NEOTROPICAL GENUS *Pyramoides* BOUSQUET, 2002
(SCARITINAE: CLIVININI)**

LAVRAS-MG

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Dissertação apresentada à Universidade Federal de Lavras, como parte das exigências do Programa de Pós-Graduação em Entomologia, para a obtenção do título de Mestre.

Profa. Dra. Letícia Maria Vieira

Orientadora

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CARABIDAE) DA PROVÍNCIA DO CHACO E REVISÃO SISTEMÁTICA DO
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Dra. Jéssica Herzog Viana	UEPA
Dr. Marcel Gustavo Hermes	UFLA
Dr. Bolívar Rafael Garcete Barrett	MHNP
Dr. Danilo Cesar Ament	UFLA

Profª. Dra. Letícia Vieira

Orientadora

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RESUMO

O Chaco é uma das províncias biogeográficas mais extensas da América do Sul, abrangendo partes da Argentina, Paraguai, Bolívia e sul do Brasil. Caracteriza-se por florestas decíduas e semidecíduas, vegetação xerófila e savanas com inundações sazonais que enfrentam sérias ameaças devido à intervenção antrópica, o que leva à perda de biodiversidade e à degradação dos habitats. O conhecimento sobre os carabídeos da tribo Clivinini nessa região é limitado e carece de estudos abrangentes de caracterização da fauna. Reconhecendo tal importância, esta dissertação é apresentada em dois capítulos, cada um focado em aspectos fundamentais da sistemática dos Clivinini (Coleoptera: Carabidae) na região Neotropical. O primeiro capítulo, intitulado “Sinopse dos gêneros e espécies de Clivinini (Coleoptera: Carabidae) da província do Chaco”, cujo objetivo consistiu em desenvolver a sinopse dos gêneros e espécies dessa tribo para a província biogeográfica do Chaco. Neste trabalho, foram documentadas 57 espécies distribuídas em 12 gêneros e três subtribos. Os gêneros mais representativos foram *Semiclivina* Kult, 1947, com 12 espécies, seguido de *Clivina* Latreille, 1802, com nove espécies, *Schizogenius* Putzeys, 1846 com oito espécies, *Semiardistomis* Kult, 1950, e *Aspidoglossa* Putzeys, 1846 com seis espécies cada. Foram identificados 16 novos registros de espécie: 14 para a Argentina, um para o Brasil e o primeiro registro do gênero *Nyctosyles* Putzeys, 1867 para a Bolívia. Este estudo também ampliou significativamente o conhecimento da distribuição de várias espécies na província biogeográfica do Chaco, destacando a relevância dessa região como refúgio biogeográfico e a necessidade de investigações futuras para preencher as lacunas de conhecimento sobre os Clivinini neotropicais. O segundo capítulo, intitulado “Revisão Sistemática do gênero Neotropical *Pyramoides* Bousquet, 2002 (Scaritinae: Clivinini)”, focou em uma revisão sistemática abrangente desse gênero, reconhecendo 10 espécies. O gênero *Pyramoides* e a espécie-tipo, *Pyramoides crassicornis* (Putzeys, 1845) e *Pyramoides oblongicollis* (Putzeys, 1861), foram redescritas. Além disso, nove espécies novas foram descritas: *Pyramoides lispectora* sp.nov., *Pyramoides matogrossensis* sp.nov., *Pyramoides amazonensis* sp.nov., *Pyramoides colombianaensis* sp.nov., *Pyramoides martinae* sp.nov., *Pyramoides garciae* sp.nov., *Pyramoides merianae* sp.nov., *Pyramoides paraensis* sp.nov. e *Pyramoides pantanensis* sp.nov. As novas espécies foram determinadas a partir da análise de caracteres morfológicos externos e das genitálias masculinas e femininas. Também foram desenvolvidas chave de identificação, mapas de distribuição geográfica e incluídas fotografias das espécies estudadas. A monofilia do gênero *Pyramoides* foi confirmada por meio de uma análise filogenética baseada em uma matriz de 82 caracteres morfológicos externos de adultos, que incluiu 16 espécies (um grupo externo e 15 espécies internas). O grupo externo selecionado foi *Scarites paraguayensis* Bänninger, 1928, enquanto o grupo interno incluiu espécies representativas das subtribos Clivinina e Forcipatorina. As análises, realizadas sob ponderações iguais e implícitas, geraram árvores que corroboraram a monofilia do gênero. Essa revisão não apenas amplia o conhecimento taxonômico e biogeográfico de *Pyramoides*, mas também destaca sua importância como modelo para estudar processos evolutivos dentro dos Clivinini. Além disso, estabelece uma base sólida para pesquisas futuras, promovendo o entendimento e a conservação da biodiversidade em uma das regiões mais ricas e menos exploradas do mundo.

Palavras-chave: Inseto; Diversidade; Besouros fossoriais; Filogenia; Predadores.

ABSTRACT

The Chaco is one of the most extensive biogeographic provinces in South America, encompassing parts of Argentina, Paraguay, Bolivia, and southern Brazil. It is characterized by deciduous and semi-deciduous forests, xerophytic vegetation, and savannas with seasonal flooding, which face serious threats due to anthropogenic intervention, leading to biodiversity loss and habitat degradation. Knowledge about the carabids of the tribe Clivinini in this region is limited and lacks comprehensive studies for fauna characterization. Recognizing its importance, this dissertation is presented in two chapters, each focusing on fundamental aspects of the systematics of Clivinini (Coleoptera: Carabidae) in the Neotropical region. The first chapter, entitled “Synopsis of the Genera and species of Clivinini (Coleoptera: Carabidae) of the Chaco Biogeographic Province,” aimed to develop a synopsis of the genera and species of this tribe for the Chaco biogeographic province. In this work, 57 species were documented, distributed among 12 genera and three subtribes. The most representative genera were *Semiclivina* Kult, 1947, with 12 species; *Clivina* Latreille, 1802, with nine species; *Schizogenius* Putzeys, 1846, with eight species; *Semiardistomis* Kult, 1950; and *Aspidoglossa* Putzeys, 1846, with six species each. Sixteen new species records were identified: 14 for Argentina, one for Brazil, and the first record of the genus *Nyctosyles* Putzeys, 1867 for Bolivia. This study also significantly expanded the knowledge of the distribution of several species in the Chaco biogeographic province, highlighting the relevance of this region as a biogeographic refuge and the need for future research to fill knowledge gaps on Neotropical Clivinini. The second chapter, entitled “Systematic Revision of the Neotropical Genus *Pyramoides* Bousquet, 2002 (Scaritinae: Clivinini),” focused on a comprehensive systematic revision of this genus, recognizing 11 species. The genus *Pyramoides* and its type species, *Pyramoides crassicornis* (Putzeys, 1845) and *Pyramoides oblongicollis* (Putzeys, 1861), were redescribed. In addition, nine new species were described: *Pyramoides lispectorae* sp. nov., *Pyramoides matogrossensis* sp. nov., *Pyramoides amazonensis* sp. nov., *Pyramoides colombianaensis* sp. nov., *Pyramoides martinae* sp. nov., *Pyramoides garciae* sp. nov., *Pyramoides merianae* sp. nov., *Pyramoides paraensis* sp. nov., and *Pyramoides pantanensis* sp. nov. These new species were determined based on the analysis of external morphological characters and the male and female genitalia. Identification keys, geographic distribution maps, and photographs of the studied species were also developed. The monophyly of the genus *Pyramoides* was confirmed through a phylogenetic analysis based on a matrix of 82 external morphological characters of adults, which included 16 species (one outgroup and 15 ingroup species). The selected outgroup was *Scarites paraguayensis* Bänninger, 1928, while the ingroup included representative species of the subtribes Clivinina and Forcipatorina. The analyses, performed under both equal and implied weighting, generated trees that corroborated the monophyly of the genus. This revision not only expands the taxonomic and biogeographic knowledge of *Pyramoides* but also highlights its importance as a model for studying evolutionary processes within Clivinini. In addition, it establishes a solid foundation for future research, promoting the understanding and conservation of biodiversity in one of the richest and least explored regions of the world.

Keywords: Insect; Diversity; Fossorial beetles; Phylogeny; Predators.

Impactos sociais, econômicos e culturais

Esta dissertação, dedicada ao estudo dos besouros da tribo Clivinini na província biogeográfica do Chaco e à revisão do gênero *Pyramoides*, buscou ampliar o conhecimento sobre um grupo pouco explorado de insetos em uma das regiões mais ameaçadas da América do Sul. Ao registrar 57 espécies em 12 gêneros, incluindo 16 novos registros para o Chaco, e ao descrever nove novas espécies de *Pyramoides*, o trabalho oferece informações inéditas que ajudam a compreender melhor a biodiversidade regional. Esses resultados têm um impacto social e ambiental direto, pois fornecem subsídios para a conservação de ecossistemas fortemente pressionados pelo avanço da agricultura, da pecuária e do desmatamento, ao mesmo tempo em que valorizam o patrimônio natural de países como Argentina, Paraguai, Bolívia e Brasil. Do ponto de vista econômico, a pesquisa reforça a importância dos carabídeos como agentes naturais de controle biológico, mostrando seu potencial em práticas agrícolas mais sustentáveis, que reduzem custos e a dependência de agrotóxicos. Também se destacam os impactos culturais e educacionais: a produção de chaves de identificação, mapas de distribuição e registros acessíveis fortalece coleções entomológicas e cria oportunidades para que estudantes, técnicos e pesquisadores da região se aproximem do estudo da fauna de insetos, promovendo a difusão do conhecimento científico. A dimensão extensionista se manifesta na articulação com instituições de pesquisa e no benefício indireto a comunidades que dependem da conservação dos recursos naturais. O trabalho se conecta a áreas temáticas como educação, meio ambiente, cultura e tecnologia e dialoga com os Objetivos de Desenvolvimento Sustentável, especialmente o ODS 4 (educação de qualidade), ODS 12 (consumo e produção responsáveis), ODS 13 (ação contra a mudança climática) e ODS 15 (vida terrestre). Mais do que gerar dados científicos, a dissertação contribui para aproximar a ciência da sociedade, reforçando a importância de conhecer, valorizar e proteger a biodiversidade do Chaco e de outras regiões neotropicais.

Social, economic and cultural impacts

This dissertation, focused on the study of beetles of the tribe Clivinini in the biogeographical province of the Chaco and on the revision of the genus *Pyramoides*, aimed to expand knowledge about a little-explored group of insects in one of the most threatened regions of South America. By recording 57 species in 12 genera, including 16 new records for the Chaco, and by describing nine new species of *Pyramoides*, the work provides unprecedented information that helps to better understand regional biodiversity. These results have direct and potential social and environmental impacts, as they provide support for the conservation of ecosystems under strong pressure from the expansion of agriculture, livestock, and deforestation, while also valuing the natural heritage of countries such as Argentina, Paraguay, Bolivia, and Brazil. From an economic perspective, the research emphasizes the importance of carabid beetles as natural agents of biological control, demonstrating their potential in more sustainable agricultural practices that reduce costs and dependence on pesticides. Cultural and educational impacts are also highlighted: the production of identification keys, distribution maps, and accessible records strengthens entomological collections and creates opportunities for students, technicians, and researchers in the region to engage with the study of insect fauna, promoting the dissemination of scientific knowledge. The extensionist dimension is expressed in collaboration with research institutions and in the indirect benefits to communities that depend on the conservation of natural resources. The impacted territory corresponds primarily to the American Chaco (Argentina, Paraguay, Bolivia, and Brazil), but also extends to other Neotropical areas where the genus *Pyramoides* occurs. The impacts fall within the thematic

areas of culture, education, environment, technology, and work, aligning with several United Nations Sustainable Development Goals, especially SDG 4 (quality education), SDG 12 (responsible consumption and production), SDG 13 (climate action), and SDG 15 (life on land). Beyond generating scientific data, the dissertation contributes to bringing science closer to society, reinforcing the importance of understanding, valuing, and protecting the biodiversity of the Chaco and other Neotropical regions.

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PRIMEIRA PARTE: INTRODUÇÃO GERAL

GENERAL INTRODUCTION

Carabidae Latreille, 1802 constitutes one of the most diverse families within Coleoptera, with 41,237 species described to date (Ślipiński; Lawrence, 2019; Anichtchenko et al., 2025), representing almost 90% of the diversity of the suborder Adephaga. In the Neotropical region, the family comprises 336 genera, 50 tribes, and 18 subfamilies, five of which are exclusive to this region (Reichardt, 1977; Hogan, 2012). Its diversity results from a complex evolutionary history, the occupation of a wide variety of habitats, and the development of different reproductive, defensive, and feeding strategies (Lövei; Sunderland, 1996; Thiele, 1977).

Carabids are terrestrial, with diurnal, nocturnal, or crepuscular habits, and most species exhibit a generalist diet. However, some species may be herbivorous, feeding on seeds, pollen, and fallen fruits (Paarmann et al., 2000; Vieira et al., 2008; Ślipiński; Lawrence, 2019). This group plays a fundamental ecological role in the soil fauna, both in natural ecosystems and agroecosystems, acting as biological control agents of pests (Hogan, 2012). Their sensitivity to environmental changes makes them effective bioindicators (Thiele, 1977; Holland; Luff, 2000; Resquin, 2000).

Morphologically, they are characterized by a margined pronotum, the presence of a notopleural suture, relatively immobile metacoxae that divide the first abdominal ventrite, and an antennal-cleaning organ on the first pair of tibiae (Martínez, 2005). The elytra are striated, with sensory setae arranged in punctures, which are important for taxonomic identification (Ślipiński; Lawrence, 2019). Additionally, some species of the tribes Brachinini and Galeritini possess defense glands to deter predators (Reichardt, 1977). Although there is morphological variability within the family, these characteristics remain consistent and stable in Carabidae.

The subfamily Scaritinae Bonelli, 1810 is one of the 36 subfamilies of Carabidae, comprising approximately 2,416 described species, represented in 149 genera and four tribes: Clivinini Rafinesque, 1815, Dyschiriini Kolbe, 1880, Salcediini, 1830, and Scaritini Bonelli, 1810. Members of this subfamily occupy a wide variety of habitats, ranging from tropical and subtropical regions to arid, mountainous, and some cave environments (Hogan, 2012; Oliveira et al., 2023). In particular, scaritines (Scaritini) exhibit considerable size variation, ranging from 8 to 70 mm in length, and are characterized by a constricted body and modified forelegs adapted for digging (Hogan, 2012). Most species are generalist predators and necrophages, feeding on

any available arthropod prey, with nocturnal and fossorial habits (Hogan, 2012; Lawrence; Ślipiński, 2019). These beetles have a significant positive impact in agriculture as natural enemies of many Lepidoptera larvae and other pest species (Hogan, 2012).

The tribe Clivinini Rafinesque, 1815 (Coleoptera: Carabidae: Scaritinae) currently comprises 78 genera and 1,273 species distributed across all zoogeographical regions, with fossorial species ranging from 2 to 30 mm in body length (Perrault, 1994; Lorenz, 2005; Dostal, 2015). Despite some taxonomic contributions (Reichardt, 1974; Adis, 1981; Baehr, 2002; Bulirsch, 2009) and the presence of 22 genera endemic to the Neotropical region, many specimens remain without specific names (L. Vieira, pers. comm.). Currently, the identification of Neotropical Clivinini genera is based on taxonomic keys (Dostal; Vieira, 2018). However, the taxonomy of the group is complex, and several genera require revision. Therefore, the study of Clivinini is essential to advance knowledge on ecosystem biodiversity and ecology, as well as its applications in conservation and biological pest control.

Species of the tribe Clivinini exhibit a high capacity for adaptation, occupying diverse habitats such as forests, savannas, coastal zones, caves, and high-mountain areas. Among these environments, the biogeographical province of the Chaco, or Gran Chaco Americano, stands out, covering approximately 1,100,000 km² across Argentina (62.19%), Paraguay (25.43%), Bolivia (11.61%), and a small fraction of Brazil (0.77%) (Cabrera; Willink, 1973; Morrone, 2000, 2006a; Torres et al., 2023). This biome, characterized by intermittent forests, xerophilous deciduous vegetation, semi-deciduous forests, thorny savannas, and areas subject to seasonal flooding (Cabrera, 1951, 1976; Morrone, 2000, 2014; Delgado et al., 2021), harbors high biodiversity. However, in recent decades, it has experienced intense degradation due to deforestation associated with agricultural and livestock expansion, indiscriminate logging, and the conversion of native forests into productive lands (Cabido et al., 1999; Cuadra, 2012; WWF, 2015; Ibarra-Polesel; Damborsky; Porcel, 2015; Montes et al., 2015). The taxonomic knowledge of Carabidae, particularly the tribe Clivinini in the Neotropical region and the Chaco biogeographical province, remains limited. To date, studies have focused primarily on inventories, species descriptions, taxonomic keys, and monographs (Sawada; Wiesner, 2000; Garcete-Barret, 2001; Roig-Junent, 2002; Vieira; Bello, 2004; Vieira et al., 2008; Drechsel; Drechsel-García, 2014; Wiesner; Bandinelli, 2014). However, a comprehensive analysis documenting the diversity of carabids throughout the province has not yet been conducted. This gap highlights the need for a synopsis of Clivinini genera and species, as well as the revision and description of new species within the genus *Pyramoides*. The establishment of a robust

taxonomic framework is essential not only to expand knowledge of regional biodiversity but also to support conservation efforts and future research.

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SEGUNDA PARTE: ARTIGOS

ARTICLE I

Synopsis of the genera and species of the tribe Clivinini (Coleoptera: Carabidae) of the Chaco province

Normas NEOTROPICAL ENTOMOLOGY (versão preliminar)

Luis Felipe Libreros Hernández^{1,2}, Sergio Roig-Juñent³, Letícia Vieira^{1,2,4}

1 Programa de Pós-graduação em Entomologia, Universidade Federal de Lavras (UFLA), 37203–202, Lavras, MG, Brasil.

2 Centro de Biodiversidade e Patrimônio Genético, Laboratório de Sistemática e Biologia de Insetos, Universidade Federal de Lavras, 37203–202, Lavras, MG, Brasil.

3 Laboratório de Entomologia, Instituto Argentino de Investigaciones de las Zonas Áridas (IADIZA, CRICYT), CC 507. 5500 Mendoza, Argentina.

4 Departamento de Ciências Florestais, Laboratório de Ecologia Florestal, Universidade Federal de Lavras (UFLA), 37203–202, Lavras, MG, Brasil.

Corresponding author:

Luis Felipe Libreros Hernández

E-mail: felipe.librerosh@gmail.com

ABSTRACT

The tribe Clivinini Rafinesque, 1815 (Coleoptera: Carabidae: Scaritinae) comprises 1,302 species distributed worldwide across 79 genera, of which 22 are endemic to the Neotropical region. These beetles exhibit terrestrial, cavernicolous, and fossorial habits. Despite previous advances, the diversity and distribution of species in the Neotropical region, especially in the Chaco, remain poorly understood. The Chaco biogeographic province, one of the most extensive ecosystems in South America, encompasses areas of Argentina, Paraguay, Bolivia, and Brazil. It is characterized by deciduous and semi-deciduous forests, xerophilous vegetation, savannas, and seasonally flooded areas. However, it faces severe threats due to agricultural and livestock expansion, resulting in forest cover degradation and loss of biodiversity, including species that have not yet been documented. This study aimed to develop a synopsis of the genera and species of Clivinini in the Chaco province. Based on the works of Putzeys and Reichardt, as well as species listings and the analysis of specimens deposited in collections and museums across South America, a total of 57 species were recorded, distributed in 12 genera and four subtribes (Forcipatorina, Ardistomina, Schizogeina, and Clivinina). The most diverse genera recorded for Chaco are *Semiclivina* (12 species), *Clivina* (9 species), and *Schizogenius* (8 species). Additionally, 16 new occurrence records were included: 14 from Argentina, one from Brazil, and the first record of the genus *Nyctosyles* in Bolivia. Nine nomenclatural changes were also reported, transferring nine species from the genus *Clivina* to *Semiclivina*. This study highlights the relevance of future research and the use of integrative taxonomy to deepen our understanding of Clivinini in the Neotropical region.

Keywords: Clivinina, Beetle, Biogeography, *Pyramoides*, La Pampa

RESUMO

A tribo Clivinini Rafinesque, 1815 (Coleoptera: Carabidae: Scaritinae) inclui 1.302 espécies distribuídas mundialmente em 79 gêneros, dos quais 22 são endêmicos da região neotropical. Esses coleópteros apresentam hábitos terrestres, cavernícolas e fossoriais. Apesar de avanços prévios, a diversidade e distribuição das espécies na região neotropical, especialmente no Chaco, ainda são pouco compreendidas. A província biogeográfica do Chaco, um dos ecossistemas mais extensos da América do Sul, abrange áreas da Argentina, Paraguai, Bolívia e Brasil. Caracteriza-se por florestas decíduas e semidecíduas, vegetação xerófila, savanas e áreas sazonalmente inundáveis. Contudo, enfrenta ameaças severas devido à expansão agrícola e pecuária, resultando na degradação da cobertura florestal e perda de biodiversidade, incluindo espécies ainda não documentadas. Este estudo teve como objetivo elaborar uma sinopse dos gêneros e espécies de Clivinini na província do Chaco. Baseado nos trabalhos de Putzeys e Reichardt, bem como em listagens de espécies, além da análise de exemplares depositados em coleções e museus da América do Sul. Como resultado foram registradas 57 espécies, distribuídas em 12 gêneros e quatro subtribos (Forcipatorina, Ardistomina, Schizogeina e Clivinina). Os gêneros mais diversos com registro para o Chaco são *Semiclivina* (12 espécies), *Clivina* (9 espécies) e *Schizogenius* (8 espécies). Além disso, foram incluídos 16 novos registros de distribuição: 14 na Argentina, uma no Brasil e o primeiro registro do gênero *Nyctosyles* na Bolívia. Também foram reportadas nove mudanças nomenclaturais, transferindo nove espécies do gênero *Clivina* para *Semiclivina*. Este estudo destaca a relevância de pesquisas futuras e do uso da taxonomia integrativa para aprofundar o conhecimento sobre os Clivinini na região Neotropical.

Palavras-chaves: Clivinina, Besouros fossoriais, Biogeografia, *Pyramoides*, a Pampa.

1. INTRODUCTION

The tribe Clivinini Rafinesque, 1815 (Coleoptera: Carabidae: Scaritinae) is a diverse group of beetles comprising 1,302 described species, distributed across 79 genera, of which 22 are endemic to the Neotropical region (Anichtchenko et al. 2025). These species exhibit a wide range of terrestrial, cavernicolous, and fossorial habits, with body sizes ranging from 2 to 30 mm (Perrault 1994; Lorenz 2005; Dostal 2015; De Oliveira et al. 2023). Despite previous taxonomic contributions (Whitehead 1972; Reichardt 1974, 1977; Adis 1981; Baehr 2002; Bulirsch 2009; Balkenohl et al. 2018), much of the diversity and distribution of this group in the Neotropical region remains poorly understood, particularly in highly biodiverse biomes such as the Chaco province.

The Chaco biogeographic province is one of the four provinces that make up the Chaco domain, considered one of the most extensive and important ecosystems in South America. It covers an area of approximately 1,100,000 km² (Torres et al. 2023) and extends across central and northern Argentina (62.19%), western Paraguay (25.43%), southern Bolivia (11.61%), and a small portion of southern Brazil in the state of Mato Grosso do Sul (0.77%) (Cabrera & Willink 1973; Morrone 2000, 2006). The Chaco province is composed of deciduous and semi-deciduous forests with xerophilous vegetation, savannas, and areas subject to seasonal flooding (Cabrera 1951, 1976; Morrone 2000, 2001, 2014), making it a priority biome for biodiversity studies. However, this ecosystem faces severe threats due to high rates of deforestation, indiscriminate logging, and land-use changes driven by the ongoing expansion of agricultural and livestock frontiers (Cabido et al. 1999; WWF 2015; Montes et al. 2015), leading to forest cover degradation and biodiversity loss, including species that remain undocumented (Cabido et al. 1999; Ibarra-Polese, Damborsky & Porcel 2015; Ibarra-Polese & Damborsky 2018).

In this context, the taxonomic knowledge of carabids, including the tribe Clivinini, remains limited in the countries comprising the Chaco province. Although some studies have addressed inventories, taxonomic keys, and monographs (Sawada & Wiesner 2000; Garcete-Barret 2001; Roig-Junent 2002; Vieira & Bello 2004; Drechsel & Drechsel-Garcia 2014; Wiesner & Bandinelli 2014), no comprehensive research has specifically focused on the diversity of Clivinini genera and species in this region. This lack of information hinders not only the understanding of local ecosystems but also the implementation of effective conservation strategies.

Since biodiversity documentation forms the foundation for species monitoring and conservation, it is crucial to provide a synopsis of the genera and species of Clivinini in the Chaco province. Such work will help to fill existing knowledge gaps and supply essential information for future research and conservation initiatives. In summary, the aim of this study is to prepare a synopsis of the genera and species of the tribe Clivinini for the biogeographic province of the Chaco, representing a significant step forward in the knowledge of one of the most diverse tribes of carabids.

2. MATERIALS AND METHODS

2.1 Area of study

The Chaco biogeographic province, which extends from tropical latitudes (18°S) to subtropical environments (31°S), encompasses vast areas of Argentina, Paraguay, Bolivia, and southern Brazil (Morrone, 2000, 2001, 2014) (Fig. 1). This biome includes a wide variety of environments, such as deciduous and semi-deciduous forests, seasonal savannas, shrublands, grasslands, and temporary wetlands, and is characterized by predominantly xerophilous vegetation (Cabrera, 1951, 1976; Morrone, 2000, 2001, 2014; Torres et al., 2018). Due to its phytophysiognomic features, the Chaco province presents transition zones and diffuse boundaries with other biogeographic provinces in South America: to the north, with the Yungas province of the South Brazilian domain; to the east, with the Cerrado province and the Paraná forests; to the west, with the Monte and Comechingones provinces, located in the transition zone; and to the south, with the Pampas province (Arana, 2017; Morrone, 2022). These ecotonal zones, being difficult to delimit, may constitute areas of endemism for several species.

2.2 Data collection

The following synopsis was primarily elaborated based on the foundational works of Putzeys (1846, 1866) and Reichardt (1977), as well as the database compiled by the Carabidae specialist Dr. Sergio Alberto Roig-Juñent (SARJ), curator of the Entomological Collection at the Instituto Argentino de Investigaciones de las Zonas Áridas (IADIZA). In addition to species distributions reported in the works of Burmeister (1875), Steinheil (1869), Bruch (1911), Zotta (1930), Tremoleras (1931), Blackwelder (1944), Kult (1950), Whitehead (1972), Whitehead & Reichardt (1977), Cicchino et al. (2003), Bachmann (2004), Bousquet (2006), Cicchino & Farina (2007), Canepuccia et al. (2009), Valdés (2009, 2012), Marasas et al. (2010), Dostal

(2011), Erwin (2011), Paleologos (2012), and Porrini et al. (2014), the genus diagnoses were based on the works of Putzeys (1846, 1866), Burmeister (1875), Zotta (1930), Whitehead (1972), Whitehead & Reichardt (1977), Reichardt (1974, 1977), Perrault (1994), Martinez (2005), Bousquet (2006), Valdés (2009, 2012), Dostal (2011, 2017), and Dostal & Vieira (2018).

Furthermore, material from the following institutions was reviewed:

MNHNP - Museo Nacional de Historia Natural de Paraguay; Paraguay.

MHNNKM - Museo de Historia Natural Noel Kempff Mercado; Santa Cruz, Bolivia.

CEMT - Coleção Entomológica da Universidade Federal do Mato Grosso; Brazil.

CEUFLA - Coleção Entomológica da Universidade Federal de Lavras, Brazil.

MZSP - Coleção de Coleoptera (Carabidae) do Museu de Zoologia da Universidade de São Paulo, Brazil.

CEI - Colección Entomológica del Instituto Argentino de Investigaciones de las Zonas Áridas (IADIZA), Mendoza; Argentina.

MACN-En - Colección Nacional de Entomología del Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires, Argentina.

FIML - Colección Entomológica de la Fundación-Instituto Miguel Lillo, Tucumán, Argentina.

UNLP - Colección Entomológica del Museo de La Plata, La Plata, Argentina.

ENTOCOR - Colección Entomológica de Córdoba de la Universidad Nacional de Córdoba, Argentina.

2.3 Photography and image processing

Specimens were photographed using a Leica M205 stereomicroscope, with automated handling performed via the Leica Application Suite software. Subsequently, all images were processed, edited, and arranged into plates using Corel Draw® X7.

2.4 Distribution maps

Distribution maps were generated based on locality and geographic coordinate data recorded on specimen labels, as well as information provided in published works and the SARJ database. Using these data, distribution and altitudinal maps for Clivinini species were produced with QGIS 3.40.2 (QGIS 2025). Based on geographic coordinates, several distribution records were identified outside or near the boundaries of the Chaco. However, these were considered part of the Chaco province, as at least one record is located within it, while others are situated on the boundaries or in ecotonal zones between different biogeographic provinces.

3. RESULTS

A total of 57 carabid species belonging to the tribe Clivinini were recorded in the Chaco province (Fig. 1), distributed across 12 genera and four subtribes: Forcipatorina, Ardistomina, Schizogeina, and Clivinina. The genus *Semiclivina* Kult, 1947, was the most represented, with 12 species, followed by *Clivina* Latreille, 1802, with nine species, *Schizogenius* Putzeys, 1846, with eight species, and *Semiardistomis* Kult, 1950, and *Aspidoglossa* Putzeys, 1846, with six species each.

Other genera, such as *Camptodontus* Dejean, 1826, with three species, *Ardistomis* Putzeys, 1846, and *Pyramoides* Bousquet, 2002, with two species each, were also recorded, while *Nyctosyles* Putzeys, 1867, was represented by a single species. Among the undetermined material at the species level, specimens corresponding to new species were found, including *Obadius* Burmeister, 1875 sp., *Mesus* Chevrolat, 1858 sp. 1 and sp. 2, as well as *Pyramoides* sp. Formal descriptions of these new species are beyond the scope of the present study and will be addressed in future publications.

Regarding geographic distribution, Argentina showed the highest number of recorded species, with a total of 52, followed by Brazil with 10 species, Paraguay with 8, and Bolivia with 3 species. In addition, 16 new distribution records were documented, including 14 in Argentina, 1 in Brazil, and the first record of *Nyctosyles* sp. in Bolivia.

Nine nomenclatural changes are reported in this study. We propose the transfer of the genus *Clivina* to *Semiclivina*, resulting in the following combinations: *S. antennaria* (Putzeys, 1866), *S. bidentata* (Putzeys, 1846), *S. carbonaria* (Putzeys, 1866), *S. cruralis* (Putzeys, 1866), *S. longipennis* (Putzeys, 1861), *S. nitidula* (Putzeys, 1866), *S. parvula* (Putzeys, 1866), *S. platensis* (Putzeys, 1866), and *S. putzeysi* (Csiki, 1927).

SYNOPSIS OF GENERA AND SPECIES OF THE CHACO BIOGEOGRAPHIC PROVINCE

Family Carabidae Latreille, 1802

Subfamily Scaritinae Bonelli, 1810

Tribe Clivinini Rafinesque, 1815

Subtribe Forcipatorina Bänninger, 1938

Genus *Obadius* Burmeister

(Fig. 2A, 5A).

Obadius Burmeister, 1875

Type species: *Obadius insignis* Burmeister, 1875: 341.

Differential diagnosis: Body pedunculate: black, appendages light brown. Head longer than wide. Surface with irregularly scattered wrinkles; mandibles arched and strongly curved, acuminate; thick at the base and narrow at the apex; crossing over each other when closed. Labrum with two lateral setiferous punctures. Clypeal wings slightly arched; anterior angles rounded. Last maxillary palpomere dilated in the middle, glabrous, and rounded at the apex; antennal scape glabrous and swollen at the apex; longer than the following three antennomeres. Pronotum subquadrate with transverse striae. Length of meso- and metatarsomeres longer than the tibiae.

Global distribution: The genus *Obadius* is restricted to the Neotropical region, specifically South America: Argentina, Brazil, and Uruguay.

Chaco distribution: Argentina: Tucumán Province. Brazil: Mato Grosso do Sul State.

Diversity: The genus *Obadius* currently includes two described species. In the Chaco, one known species, *O. insignis*, and one new species were recorded.

Obadius insignis Burmeister, 1875: 341. Bachmann, 2004: 138

Distribution: Argentina: Tucumán Province, Leales, Tacanas. (Fig. 8)

Obadius sp.

Distribution: Brazil: Mato Grosso do Sul State, Corumbá and Passo de Lontra. (Fig. 8)

Material examined: 142 specimens, CEUFLA; Brazil: Mato Grosso do Sul State, Corumbá, Passo de Lontra. Raizer et al. leg. Oba001–142.

Genus *Camptodontus* Dejean

(Fig. 2B, 5B).

Camptodontus Dejean, 1826

Type species: *Camptodontus cayennensis* Dejean, 1826: 477

Differential diagnosis: Body pedunculate, black. Labial and maxillary appendages light brown. Head with longitudinal grooves, wrinkles, or depressions, mostly between eyes; one pair of supraorbital setiferous pores present. Mandibles falcate, curved, smooth, slender, acute at apex. Labrum with six setiferous pores on anterior margin. Second segment of labial palpus with two medial setae; penultimate maxillary palpomere longer than terminal one. Mentum with median tooth longer than lateral lobes. Pronotum subquadrate, surface with three grooves (two lateral, one median); posterolateral margin sometimes with a denticle. Elytra with 4–5 setiferous pores in third stria. First protarsomere as long as following four combined. Tibiae as wide or wider than femora. Claws simple.

Global distribution: The genus *Camptodontus* is exclusively Neotropical, occurring in South America from Panama to Argentina, including French Guiana and Suriname.

Chaco distribution: Argentina: Chaco Province, Formosa Province, Salta Province, Santa Fé Province. Paraguay: Cordillera, San Pedro.

Diversity: *Camptodontus* has 15 described species, of which three occur in the Chaco: *C. anglicanus*, *C. cayennensis*, and *C. crenatus*.

Camptodontus anglicanus (Stephens, 1827): 38.

Oxygnathus anglicanus Stephens, 1827: 18.

Camptodontus lacordairei Putzeys, 1861: 140.

Comment: New record for Argentina.

Distribution: Argentina: Formosa Province, Bermejo, Laguna Yema. (Fig. 8).

Camptodontus cayennensis Dejean, 1826: 477; Putzeys, 1866: 139; Blackwelder, 1944: 25.

Comment: New record for Argentina.

Distribution: Argentina: Formosa Province, Laishi, Misión San Francisco de Laishi. Paraguay: Cordillera, Piribebuy; San Pedro, San Estanislao, Arroyo Guasu, 174 m. (Fig. 8).

Camptodontus crenatus Brullé, 1837: 41; Putzeys, 1866: 20; Blackwelder, 1944: 25.

Distribution: Argentina: Corrientes Province, Itatí, 50 m; Mburucuyá, Manantiales, 72 m; Formosa Province; Chaco Province. (Fig. 8).

Material examined: 3 individuals: MNHNP, Paraguay: Concepción, Estancia Chaparral, Retiro San José, 16.xi.2002, B. Garcete leg., MNP 313. MHNNKM, Bolivia: Santa Cruz, Ichilo, Buenavista, 1.vi.1990, P. Betella leg., MNB001-002.

Subtribe Ardistomina Putzeys, 1867

Genus *Ardistomis* Putzeys

(Fig. 2C, 5C).

Ardistomis Putzeys, 1846: 636.

Type species: *Ardistomis fasciolata* Putzeys, 1846: 638, designated by Chenú, 1851:102.

Differential diagnosis: Body pedunculate, uniformly black, greenish, or bronzed. Mandibles falcate. Mentum with median carina extending distally as an apendiform keel. Clypeus fused with frons, with two pairs of supraorbital setiferous punctures. Antennal pedicel shorter than third antennomere. Pronotal disc oval to subglobose, with two lateral setiferous punctures; central groove distinct and continuous. Proepisternum smooth, lacking stridulatory line; anterior margin of prosternum with marked groove. Elytral striae punctate, fading posteriorly.

Ventrite VI with bilateral projections fitting into elytral fold. Protibia with two projections (subapical long, apical short); ventral face with basal setal group. Tarsi short; claws simple.

Global distribution: Species of the genus *Ardistomis* are restricted to the Western Hemisphere, encompassing the Nearctic and Neotropical regions, from the United States to Argentina, including the Antilles.

Chaco distribution: Argentina: Chaco Province, Santa Fé Province. Paraguay: Presidente Hayes.

Diversity: The genus *Ardistomis* includes 49 described species (Anichtchenko et al., 2025), of which two species are recorded in the Chaco: *A. fasciolatus* Putzeys, 1846 and *A. arechavaletae* Putzeys, 1866.

Ardistomis fasciolatus Putzeys, 1846: 638; 1866: 201; Blackwelder 1944: 27.

Distribution: Argentina: Santa Fe Province, Garay, Saladero Mariano Cabal. Paraguay: Presidente Hayes, Fortín General Bruguez (Fig. 9).

Ardistomis arechavaletae Putzeys, 1866: 204: 224; Blackwelder 1944: 27.

Ardistomis curta Putzeys, 1866: 205

Distribution: Argentina: Chaco Province, Resistencia, 65 m. (Fig. 9).

Genus *Semiardistomis* Kult

(Fig. 2D, 5D).

Semiardistomis Kult, 1950: 301

Ardistomis (*Semiardistomis*) Kult, 1950: 301.

Clivina labialis Chaudoir, 1837, designated by Kult 1950: 301.

Ardistomis (*Ardistomiellus*) Kult, 1950: 303. Type species: *Ardistomis viridis* Say, 1823, designated by Kult 1950: 303. Synonymy established by Whitehead (Reichardt 1977: 392).

Semiardistomis Kult. Nichols 1988b: 98; Ball and Bousquet 2001: 45, 74; Bousquet 2006: 10; Valdés 2007: 24; Erwin 2011: 233.

Type species: *Clivina labialis* Chaudoir, 1837, designated by Kult 1950: 301

Differential diagnosis: Body pedunculate, uniformly black, greenish, or bronzed. Mandibles falcate. Mentum with median carina extending distally as an apendiform keel. Clypeus fused with frons, bearing two pairs of supraorbital setiferous punctures. Antennal pedicel shorter than third antennomere. Pronotal disc oval to subglobose, with two lateral setiferous punctures; central groove evident and continuous. Proepisternum smooth, without stridulatory line; anterior margin of prosternum with distinct groove. Elytral striae punctate, fading posteriorly. Ventrite VI with bilateral projections fitting into elytral fold. Protibia with two projections (subapical long, apical short) and ventral setae in basal half. Tarsi short; claws simple.

Global distribution: Species of *Semiardistomis* are restricted to the Western Hemisphere, occurring from the United States to Argentina, including the Antilles.

Chaco distribution: Argentina: Córdoba, Chaco, Formosa, Jujuy, Salta, San Luis, Santa Fé, Santiago del Estero, Tucumán provinces. Bolivia: Santa Cruz, Ichilo Province. Paraguay: Central, Presidente Hayes, Paraguari.

Diversity: The genus *Semiardistomis* currently comprises 21 described species in the Americas (Anichtchenko et al., 2025), of which six occur in the Chaco: *S. deletus*, *S. flavipes*, *S. glabratus*, *S. maindroni*, *S. semipunctatus*, and *S. subglabra*.

Semiardistomis deletus (Putzeys, 1846): 648.

Ardistomis deleta Putzeys, 1846: 648; 1866: 213.

Ardistomus deletus Putzeys: Csiki 1927: 548; Blackwelder 1944: 27.

Ardistomis deletus Putzeys: Lorenz 2005: 146.

Ardistomis (*Semiardistomis*) *deletus* Putzeys: Kult 1950: 314, 316.

Ardistomis (*Semiardistomis*) *emdeni* Kult, 1950: 314.

Semiardistomis deletus (Putzeys); Erwin 2011: 234.

Distribution: Argentina: Córdoba Province, Capital, Argüello; Punilla, Los Gigantes. Santa Fé Province, Garay, Colonia Macias. Santiago del Estero Province, Figueroa, Río Salado, Ruta 92. Chaco Province. Formosa Province. Salta Province. Tucumán Province (Fig. 9).

Semiardistomis flavipes (Dejean, 1831): 510.

Ardistomis flavipes (Dejean): Putzeys 1846: 646; Lorenz 2005: 146.

Ardistomis flavipes (Dejean): Csiki 1927: 548; Blackwelder 1944: 27.

Clivina flavipes Dejean, 1831: 510.

Ardistomis (*Semiardistomis*) *brittoni* Kult, 1950: 316.

Ardistomis (*Semiardistomis*) *marani* Kult, 1950: 315.

Ardistomis aeneus Putzeys, 1866: 212.

Semiardistomis flavipes (Dejean); Erwin 2011: 234.

Distribution: Argentina: Chaco Province, San Fernando, Resistencia; Santa Fé Province, Garay, Colonia Macias; San Luis Province, La Capital, Potrero de Los Funes; Salta Province, General José de San Martín, Sierra Tartagal; Jujuy Province. Bolivia: Santa Cruz, Ichilo Province, Buenavista. Paraguay: Central, Asunción; Presidente Hayes, Río Confusa (Fig. 9).

Semiardistomis glabratus (Putzeys, 1866): 213.

Ardistomis glabrata Putzeys, 1866: 213.

Ardistomis glabratus Putzeys: Csiki 1927: 548; Blackwelder 1944: 27.

Ardistomis glabratus Putzeys: Lorenz 2005: 146.

Ardistomis (*Semiardistomis*) *glabratus* Putzeys: Kult 1950: 310.

Ardistomis (*Semiardistomis*) *balthasari* Kult, 1950: 309.

Semiardistomis glabratus (Putzeys); Erwin 2011: 235.

Distribution: Argentina: Córdoba Province, Capital, Argüello; Santiago del Estero Province, Figueroa, Río Salado, Ruta 92 (Fig. 9).

Semiardistomis maindroni (Kut, 1950): 312

Ardistomis (*Semiardistomis*) *maindroni* Kult, 1950: 312.

Semiardistomis maindroni (Kult, 1950): Lorenz 1998: 136.

Distribution: Argentina: Córdoba Province, Punilla, Sierras de Córdoba; Capital, Argüello; Chaco Province, Sargento Cabral, Capitán Solari; Tucumán Province (Fig. 9).

Semiardistomis semipunctatus (Dejean, 1831): 509; Blackwelder 1944: 27.

Ardistomis semipunctatus (Dejean, 1831): 509.

Ardistomis semipunctata (Dejean): Putzeys 1846: 648.

Ardistomus semipunctatus (Dejean): Csiki 1927: 549; Blackwelder 1944: 27.

Ardistomis semipunctatus (Dejean): Lorenz 2005: 146.

Ardistomis (Semiardistomis) semipunctatus (Dejean): Kult 1950: 316.

Clivina semipunctata Dejean, 1831: 509.

Semiardistomis semipunctata (Dejean); Erwin 2011: 238.

Distribution: Argentina: Tucumán Province, Capital, San Miguel de Tucumán; San Luis Province, Coronel Pringles, Ruta 41, Río de Cañada Honda; Corrientes Province, Ituzaingó, Ituzaingó; Córdoba Province, Capital, Argüello; Chaco Province (Fig. 9).

Semiardistomis subglabra (Van Emden, 1949)

Ardistomis subglaber Emden, 1949

Ardistomis vlastae Kult, 1950: 310

Semiardistomis vlastae (Kult, 1950): 310

Distribution: Argentina: Formosa Province, Bermejo, Pueblo Laguna Yema; Pilcomayo, Pilcomayo. Paraguay: Cordillera, Caacupé, Arroyo Yagua-Res-a; Paraguari, La Rosada, Ybycui National Park. Brazil: Mato Grosso do Sul State, Corumbá (Fig. 9).

Material examined: 17 individuals from MNHNP. (9) Paraguay: Concepción, Paso Bravo National Park, Santa Sofia, 22.x.2002. B. Garcete leg. MNP561-569. (1) Río Apa, 23.x.2002, B. Garcete leg. MNP575. (1) Estancia Chaparral, Retiro San José, xi.2002, B. Garcete leg. MNP430. (1) San Pedro, Estancia Cororó, Retiro Chahá, 2.viii.2003. B. Garcete leg. MNP699. (1) Central, Asunción, 23.iv.1988. C. Aguilar leg. MNP083. MNHNP-HX2174. (4) Alto Paraguay, Defensores del Chaco National Park, Laguna Agua Rica, 11.x.1998. C. Aguilar leg. MNP086-89. MNHNP-HX2190, 2193, 2200, 2204. 4 individuals from MHNNKM. (1) Bolivia: Santa Cruz, Ichilo, Amboró National Park, Río Saguayo, 23.x.1984, B. Garcete leg. MNB021.

(1) Florida, Pampagrande, 4.v.2005, G.E. Ball & B. Dozier leg. MNB024. (2) Andrés Ibañez, Potreillo de Guenda, G.E. Ball & B. Dozier leg. MNB023.

Genus *Aspidoglossa* Putzeys

(Figure 3A, 6A).

Aspidoglossa Putzeys, 1846: 626

Type species: *Aspidoglossa submetallica* Putzeys, 1846:627, designated by Desmarest 1851: 102; Chenú 1851: 102; Lacordaire, 1854: 205; LeConte 1861: 13; Horn 1881: 121; Blatchley, 1910: 53, 61; Bradley 1930: 22; Kult 1950: 300, 318; Ball 1960: 71, 109; Reichardt 1977: 392

Differential diagnosis: Body pedunculate, black and shiny. Mandibles triangular, arcuate, and short. Clypeus with prominent anterolateral lobes, outer margin continuously convex. Head with two pairs of supraorbital setigerous punctures; frons without carinae. Antennal pedicel subequal to and as long as the third antennomere. Pronotum globose with distinct median sulcus. Proepisternum without stridulatory line. Elytra with marked, punctate striae; surface glabrous with preapical rufous spots in some species. Metacoxae moderately separated. Ventricle VI with bilateral projections fitting into the elytral fold. Protibia with a longitudinal row of denticles, each bearing a setae at its base. Male protarsi triangular, broader apically than basally.

Global distribution: Species of the genus *Aspidoglossa* occur in the Western Hemisphere, ranging from the United States to Argentina, including the Antilles, across the Nearctic and Neotropical regions.

Chaco distribution: Argentina: Catamarca, Córdoba, Formosa, Jujuy, La Rioja, Salta, Santa Fé, Santiago del Estero, Tucumán, Chaco Provinces. Paraguay: Central, Presidente Hayes, Ñeembucú (Arroyo “Aguapey” Nature Reserve).

Diversity: The genus *Aspidoglossa* currently includes 25 described species (Anichtchenko et al., 2025), of which six are recorded from the Chaco: *A. intermedia*, *A. korschefskyi*, *A. latiuscula*, *A. oglobini*, *A. schah*, and *A. szessyi*.

Aspidoglossa intermedia (Dejean, 1831): 507; Blackwelder, 1944: 28.

Clivina intermedia Dejean, 1831

Distribution: Argentina: Tucumán Province, Simoca, Simoca. Paraguay: Central, Asunción. (Fig. 10)

Aspidoglossa korschefskyi Kult, 1950: 318.

Distribution: Argentina: Tucumán Province, Trancas, San Pedro de Colalao; Trancas; Ticucho; La Calera, Río La Calera. Leales, Tacanas. Graneros, El Durazno. Chicligasta, Alpachiri. Capital, Capital. Burruyacú, Río Nio. La Candelaria, Candelaria. Rosario de La Frontera, El Naranjo. General José de San Martín, Caraparí. Catamarca Province, El Alto, Guayamba. Chaco Province. Jujuy Province. (Fig. 10).

Aspidoglossa latiuscula Putzeys, 1867: 217; Blackwelder, 1944: 28.

Distribution: Argentina: Chaco Province, San Fernando, Resistencia. Tucumán Province, Tañi Viejo, Tañi Viejo; Simoca, Simoca; Leales, Encrucijada; Chicligasta, Alpachiri; Capital, Capital. Santa Fe Province, Rosario, Rosario; Garay, Colonia Macias. Salta Province, Metán, Pocitos; Orán, Martínez del Tineo; Anta, Nuestra Señora de Talavera. La Rioja Province, General Belgrano, Iliar. Formosa Province, Matacos; Bermejo, Laguna Yema. Córdoba Province, San Javier, Villa Dolores; Río Segundo, Los Chañaritos; Cruz del Eje, Tuclame; Cruz del Eje, Bañado de Soto. Catamarca Province, Ancasti, Anquincila. Paraguay: Presidente Hayes, Teniente Primero Moisés Galeano Bueno, Papaiku. (Fig. 10).

Aspidoglossa ogloblini Kult, 1950: 319.

Distribution: Argentina: Santa Fé Province, Chaco Province.

Aspidoglossa schach (Fabricius, 1792).

Carabus schach Fabricius, 1792.

Distribution: Argentina: Argentina: Santiago del Estero Province, Banda, El Cercado. Santa Fe Province, San Justo, Vera y Punto; Garay, Colonia Macias. Jujuy Province. Tucumán Province. Formosa Province. Corrientes Province. (Fig. 10).

Aspidoglossa szekessyi Kult, 1950: 321.

Distribution: Argentina: Chaco Province.

Comment: New record for Argentina.

Material examined: 8 specimens from MNHNP. (2) Paraguay: Alto Paraguay, Puerto Lidia, 7–8.ix.1997, B. Garcete leg., MNP306–307. (5) San Pedro, Estancia Cororó, Retiro Chahá, 2.viii.2003, B. Garcete leg., MNP694–695; 700–702. (1) Concepción, Estancia Chaparral, Retiro San José, 18.xi.2002, B. Garcete leg., MNP429. 9 specimens from MHNNKM. (3) Bolivia, Santa Cruz, Andrés Ibáñez, Potrerillo de Guenda, Terebinto, 3–4.x.1994, P. Betella leg., MNB004–008. (2) El Torno, 9.xii.1989, P. Betella leg., MNB022; 029. (2) Florida, Pampagrande, 23.ix.1995, F.L. Langer leg., MNB007–008. (2) Ignacio de Warnes, Warnes, Viru Viru, 1.xii.1992, P. Betella leg., MNB009–010. (Fig. 10).

Subtribe *Schizogeina* Dostal, 2017

Genus *Schizogenius* Putzeys

(Figure. 3B, 6B).

Schizogenius Putzeys, 1846: 650.

Type species: *Schizogenius strigicollis* Putzeys, 1846: 650, designated by Lindroth, 1961:164; LeConte 1857:82; Putzeys 1863:24; Putzeys 1866:222; LeConte 1879:34; Blackwelder, 1944:27; Kult 1950:139; Lindroth 1961:164. Whitehead, 1972:142–143; Whitehead & Reichardt, 1977:240; Martinez, 2005:151.

Differential diagnosis: Body pedunculate, black to dark brown, iridescent. Mandibles short, curved. Frons with 8–10 longitudinal carinae between eyes. Clypeus with arcuate, irregular lateral margins; anterior margin with two paramedian teeth. Labrum bi-emarginate, seven setiferous punctures, median and lateral punctures larger. Antennal pedicel glabrous, ventrally setose, bisetose or plurisetose in some species. Mentum deeply medially emarginate; lateral lobes long. Pronotum subquadrate, posterior angles denticulate. Elytra with last stria starting at humerus. Last abdominal ventrite with two pairs of setiferous punctures. Protibiae with outer teeth; mesotibiae triangular with row of setae; metatibiae with terminal spine.

Global distribution: *Schizogenius* with Nearctic and Neotropical distribution, ranging throughout the Americas from Canada to Argentina, including species in the Antilles.

Chaco distribution: Argentina: Catamarca Province, Salta Province, San Luis Province, Santiago del Estero Province, Tucumán Province. Bolivia: Santa Cruz. Brazil: Mato Grosso do Sul State.

Diversity: The genus *Schizogenius* currently includes 75 described species, grouped into three subgenera: *Schizogenius* (*Schizogenius*) Putzeys, 1846; *Schizogenius* (*Listropus*) Putzeys, 1861; and *Schizogenius* (*Genioschizus*) Whitehead, 1972. In the Chaco, eight species are recorded.

Schizogenius (*Schizogenius*) *costiceps* Steinheil, 1869: 242; Blackwelder, 1944: 27; Whitehead, 1972: 188.

Distribution: **Argentina:** San Luis Province, Juan Martín de Pueyrredón, San Luis. (Fig. 11).

Schizogenius (*Schizogenius*) *negrei* Whitehead, 1972: 186.

Distribution: Argentina: Tucumán Province, Chicligasta, Concepción; Burruyacu, Río Nío. Salta Province, La Candelaria, Candelaria. (Fig. 11)

Schizogenius (*Schizogenius*) *elongatus* Kult, 1950: 146; Whitehead, 1972: 188.

Distribution: Brazil: Mato Grosso do Sul State, Corumbá. (Fig. 11).

Schizogenius (Schizogenius) capitalis Putzeys, 1861: 198; 1866: 223; Blackwelder, 1944: 27

Distribution: Argentina: Tucumán Province, Leales, Tacanas; Burruyacú, Villa Padre Monti. (Fig. 11)

Schizogenius (Schizogenius) banningeri Kult, 1950: 148; Whitehead, 1972: 201

Distribution: Brazil: Mato Grosso do Sul State, Corumbá. (Fig. 11)

Schizogenius (Listropus) brevicornis (Brullé, 1837): 39; Whitehead & Reichard, 1977: 244

Listropus brevicornis (Brullé, 1837)

Scarites brevicornis Brullé, 1837: 39

Listropus brevipennis (Putzeys, 1863): 13-16

Schizogenius brevipennis (Putzeys, 1861): 10

Comment: New record for Argentina.

Distribution: Argentina: Tucumán Province, Capital, San Miguel de Tucumán; Salta Province, Metán, Río Piedras; Santiago del Estero Province. (Fig. 11).

Schizogenius (Listropus) xanthopus (Brullé, 1837); Putzeys 1846: 654; Whitehead & Reichardt, 1977: 244

Clivina xanthopus Brullé, 1837: 39

Schizogenius grossus Whitehead, 1966: 3

Listropus discophorus Chaudoir, 1863: 118

Listropus xanthopus Putzeys, 1866: 11; Blackwelder 1944: 25

Distribution: Argentina: Tucumán Province, Trancas, Ticucho; Salta Province, Metán, Río Piedras; Salta Province, Orán, Aguas Blancas, Río Bermejo. Bolivia: Santa Cruz, Ichilo Province, Santa Cruz de la Sierra. (Fig. 11).

Schizogenius (Genioschizus) szekessyi Kult, 1950: 144; Whitehead, 1972: 155

Distribution: Argentina: Salta Province, Orán, San Román de la Nueva Orán. (Fig. 11).

Material examined: 1 individual from MHNNKM. Bolivia: Santa Cruz, Andrés Ibañez, Potrerillo de Guenda, Terebinto, 3–4.x.1994, P. Betella leg. MNB026.

Comment: The geographic coordinates do not match the locality; the nearest city is El Hondo, Santa Cruz.

Subtribe *Clivinina* Rafinesque, 1815

Genus *Clivina* Latreille

(Figure 3C, 6C).

Clivina Latreille, 1802: 96; Putzeys, 1845: 577; Blackwelder, 1944: 26; Reichardt, 1977: 483. *Tenebrio fossor* Linnaeus, 1758: 417, designated by monotypy (Lorenz 1998: 66).

Type species: *Scarites arenarius* Fabricius, 1792: 96; Putzeys, 1845: 577.

Differential diagnosis: Body pedunculate, black to reddish-brown. Mandibles short and curved. Frons without longitudinal carinae, rugose or with tubercles between eyes. Last labial and maxillary palpomeres fusiform apically. Lateral lobes of mentum not reaching upper half of median mentum tooth. Pronotum subquadrate, lateral margins angular, fused to basal margin. Proepisternum without stridulatory line. Elytra with bicolored pattern in some species; intervals III–IV with setiform pores. Abdominal ventrite VI with paired projections fitting into elytral fold. Metacoxae medially contiguous.

Global distribution: The genus *Clivina* occurs in the Holarctic and Neotropical regions. In the Americas, it is found in the United States, the Antilles, and Argentina.

Chaco distribution: Argentina: Catamarca Province, Córdoba Province, Jujuy Province, La Rioja Province, Salta Province, San Luis Province, Santa Fe Province, Santiago del Estero

Province, Tucumán Province, Chaco Province. Bolivia: Santa Cruz. Brazil: Mato Grosso do Sul State. Paraguay.

Diversity: *Clivina* is widely represented on all continents except Antarctica, with 630 described species (Anichtchenko et al., 2025), of which 83 occur in the Neotropical region and nine in the Chaco.

Clivina (Clivina) bicolor Putzeys, 1867: 152; Blackwelder, 1944: 26

Distribution: Argentina: Tucumán Province, La Cocha, San Ignacio, Represa Los Pizarros; Santiago del Estero Province, Figueroa, La Ramada; La Rioja Province, Independencia, Patquía. (Fig. 12).

Clivina (Clivina) laeta Putzeys, 1867: 165; Blackwelder, 1944: 26

Distribution: Argentina: Tucumán Province, Famaillá, Fronterita. (Fig. 12).

Clivina (Clivina) macularis Putzeys, 1867: 153; Blackwelder, 1944: 26

Distribution: Argentina: Chaco Province, San Fernando, Resistencia; General Güemes, La Fidelidad, El Impenetrable National Park. San Luis Province, Juan Martín de Pueyrredón, San Gerónimo; La Capital, El Volcán. La Rioja Province, Rosario Vera Peñaloza, Chepes. (Fig. 12).

Clivina (Clivina) media Putzeys, 1846: 619; Blackwelder, 1944: 26

Distribution: Argentina: Tucumán Province, Capital, Capital; Burruyacú, Río Nío; Burruyacú, Gobernador Garmendia. Santiago del Estero Province, Figueroa, La Ramada; General Taboada, Añatuya, Río Salado; Avellaneda, Icaño. San Luis Province, Chacabuco, Papagallos. Salta Province, Rosario de La Frontera, Los Baños. Córdoba Province, Tulumba, Isla de San Antonio, Salinas Grandes; Alto de Flores. Río Cuarto, Alpa Corral; Universidad de Río Cuarto. Cruz del Eje, Cruz del Eje. Calamuchita, Villa Yacanto; Santa Rosa de Calamuchita, El Sauce; San Ignacio. (Fig. 12).

Clivina (Paraclivina) burmeisteri Putzeys, 1867: 161; Blackwelder, 1944: 26.

Distribution: Argentina: Tucumán Province, Capital, Capital; Burruyacú, Río Nío; Farallón Blanco; Gobernador Garmendia. San Luis Province, Ayacucho, San Francisco; Ayacucho, Quines; Libertador General San Martín, Villa Praga, San Martín. San Juan Province, Valle Fértil, Río Usna. Salta Province, Orán, Martínez del Tineo; Guachipas, Coronel Moldes; Anta, Nuestra Señora de Talavera. La Rioja Province, General Belgrano, Cortaderas; Independencia, Patquía. Córdoba Province, Santa María, Alta Gracia; Colón, Unquillo; Colón, La Granja. Catamarca Province, Ancasti, Cañada de Paez. (Fig. 12).

Clivina (Paraclivina) fassatii Kult, 1947: 35

Distribution: Argentina: Chaco Province, San Fernando, Resistencia. Salta Province, Orán, Aguas Blancas; General José de San Martín, Aguaray. Corrientes Province, Concepción, Concepción. Brazil: Mato Grosso do Sul State, Corumbá. (Fig. 12).

Clivina (Paraclivina) obscuripennis Putzeys, 1867: 163; Blackwelder, 1944: 26

Comment: New record for Argentina

Distribution: Argentina: Tucumán Province, Burruyacú, Río Nío. (Fig. 12).

Clivina (Paraclivina) transversicollis Putzeys, 1867: 159; Blackwelder, 1944: 26

Comment: New record for Argentina

Distribution: Argentina: Chaco Province, Pampa del Infierno. Brazil: Mato Grosso do Sul State, Corumbá. (Fig. 12).

Clivina (Paraclivina) tuberculata Putzeys, 1846: 615; Blackwelder, 1944: 26

Comment: New record for Argentina

Distribution: Argentina: Tucumán Province, Tañi Viejo, Siambón; Capital, San Miguel de Tucumán; Burruyacú, Villa Padre Monti; Tala Pozo, La Virgina. Catamarca Province, El Alto, La Huerta, camino al Alto. (Fig. 12).

Examined material: 6 specimens from MNHNP. (2) Paraguay: Central, Asunción, 1.v.1993. C. Aguilar leg. MNP080; 082. MNHNP-HX2163; 2142. (1) Alto Paraguai, Capitán Mayor Pablo Lagerenza, 15.x.1998. C. Aguilar leg. MNP074. MNHNP-HX2217. (1) Paraguay, Central, Villeta, 1.ix.1981. J. A Kochalka leg. MNP078. MNHNP-HX2195. (1) Concepción, Estancia Chaparral, Retiro San José, 16.xi.2002, B Garcete leg. MNP309. (1) Concepción, Estancia Chaparral, Retiro San José, xi.2002, B. Garcete leg. MNP428. 6 specimens from MHNNKM. (1) Bolivia: Santa Cruz, Florida, Pampagrande, 13.xi.1995. F. A Langer leg. MNB014. (5) Andrés Ibañez, Potrerillo de Guenda, Terebinto, 3-4.x.1994, P. Betella leg. MNB017; 019-020; 067; 068.

Genus *Semiclivina* Kult

(Figures 3D, 6D).

Semiclivina Kult, 1947: 31

Clivina Subgenus *Semiclivina* Kult 1947: 31–32; Reichardt 1977: 391; Nichols 1988a: 154; 1988b: 91; Ball 2001: 136; Lorenz 2005: 145; Baehr 2008: 23; Bousquet 2009: 41.

Type species: *Clivina dentipes* Dejean, 1825, designated by Kult, 1947: 31

Differential diagnosis: Body pedunculate, black to dark brown. Mandibles short, arcuate. Frons without longitudinal carinae. Last labial and maxillary palpomere fusiform apically. Lateral lobes of mentum not reaching upper half of median tooth. Some species with a denticle on posterior eye margin and an incision on anterior pronotal margin. Pronotum subquadrate, surface with striae. Proepisternum with stridulatory groove. Abdominal ventrite VI without lateral projections fitting into elytral fold. Profemur with stridulatory ridge on inner side; small dentiform projection near apex. Mesotibia with distal spine-like projection on outer margin.

Global distribution: Species of *Semiclivina* are restricted to the Western Hemisphere, particularly South America, ranging from French Guiana to central Argentina.

Chaco distribution: Argentina: Córdoba Province, Chaco Province, Formosa Province, Jujuy Province, Salta Province, San Luis Province, Santa Fe Province, Santiago del Estero Province, Tucumán Province. Brazil: Mato Grosso do Sul State. Paraguay: Central, Presidente Hayes.

Diversity: The genus *Semiclivina* currently includes 17 species in two subgenera: *Semiclivina* (*Semiclivina*) with 12 species, and *Semiclivina* (*Uroclivina*) with five species, of which 12 occur in the Chaco.

Semiclivina (*Semiclivina*) *antennaria* (Putzeys, 1866): 177; Blackwelder, 1944: 26. comb. nov.

Comment: New record for Argentina. Transferred from *Clivina* Latreille, 1802 due to the presence of a stridulatory line on the proepisternum, a diagnostic feature of the genus *Semiclivina* (Kult 1947; Dostal 2011).

Distribution: Argentina: Formosa Province, Bermejo, Laguna Yema. (Fig. 13).

Semiclivina (*Semiclivina*) *bidentata* (Putzeys, 1846): 612; Blackwelder, 1944: 26. comb. nov.

Comment: New record for Argentina. Transferred from *Clivina* Latreille, 1802 due to the presence of a stridulatory line on the proepisternum, a diagnostic feature of the genus (Kult 1947; Dostal 2011).

Distribution: Argentina: Tucumán Province, La Cocha, San Ignacio, Represa Los Pizarros; Tañí Viejo, Tañí Viejo; Burruyacú, Río Nío. Formosa Province, Pirané, Pirané; Pilcomayo, Laguna Blanca; Bermejo, Pueblo Laguna Yema, RN Formosa. (Fig. 13).

Semiclivina (*Semiclivina*) *carbonaria* (Putzeys, 1866): 174; Blackwelder, 1944: 26. comb. nov.

Comment: New record for Argentina. Transferred from *Clivina* Latreille, 1802 due to the presence of a stridulatory line on the proepisternum, a diagnostic feature of the genus (Kult 1947; Dostal 2011).

Distribution: Argentina: Chaco Province, San Fernando, Resistencia. (Fig. 13).

Semiclivina (Semiclivina) cruralis (Putzeys, 1866): 172; Blackwelder, 1944: 26. comb. nov.

Comment: New record for Argentina. Transferred from *Clivina* Latreille, 1802 due to the presence of a stridulatory line on the proepisternum, a diagnostic feature of the genus (Kult 1947; Dostal 2011).

Distribution: Argentina: Santa Fe Province, Rosario, Rosario; Garay, Colonia Macias. Brazil: Mato Grosso do Sul, Corumbá. (Fig. 13).

Semiclivina (Semiclivina) longipennis (Putzeys, 1861): 57; Blackwelder, 1944: 26. comb. nov.

Comment: Transferred from *Clivina* Latreille, 1802 due to the presence of a stridulatory line on the proepisternum, a diagnostic feature of the genus (Kult 1947; Dostal 2011).

Distribution: Argentina: Santa Fe Province, Rosario, Rosario; Chaco Province; Tucumán Province; San Luis Province; Córdoba Province. (Fig. 13).

Semiclivina (Semiclivina) nitidula (Putzeys, 1866): 169; Blackwelder, 1944: 26

Comment: Transferred from *Clivina* Latreille, 1802 due to the presence of a stridulatory line on the proepisternum, a diagnostic feature of the genus (Kult 1947; Dostal 2011).

Distribution: Argentina: Tucumán Province, La Cocha, San Ignacio, Represa Los Pizarros; Burruyacú, Río Nío; Gobernador Garmendia; Salta Province, Rosario de La Frontera, El Naranjo. (Fig. 13).

Semiclivina (Semiclivina) parvula (Putzeys, 1866): 175; Blackwelder, 1944: 26.

Comment: Transferred from *Clivina* Latreille, 1802 due to the presence of a stridulatory line on the proepisternum, a diagnostic feature of the genus (Kult 1947; Dostal 2011).

Distribution: Argentina: Tucumán Province, Capital, San Miguel de Tucumán; Burruyacú, Gobernador Garmendia; Santa Fe Province, Rosario, Rosario; Chaco Province. (Fig. 13).

Semiclivina (Semiclivina) platensis (Putzeys, 1866): 175; Blackwelder, 1944: 26.

Comment: Transferred from *Clivina* Latreille, 1802 due to the presence of a stridulatory line on the proepisternum, a diagnostic feature of the genus (Kult 1947; Dostal 2011).

Distribution: Argentina: Santa Fe Province, Rosario, Rosario; Santa Fe Province, General Obligado, Villa Guillermina. (Fig. 13).

Semiclivina (Semiclivina) putzeysi (Csiki, 1927): 510; Blackwelder, 1944: 26

Clivina puncticollis Putzeys, 1867: 178. Homonímia junior

Comment: New record for Argentina. Transferred from *Clivina* Latreille, 1802 due to the presence of a stridulatory line on the proepisternum, a diagnostic feature of the genus (Kult 1947; Dostal 2011).

Distribution: Argentina: Tucumán Province, Leales, Encrucijada. (Fig. 13).

Semiclivina (Semiclivina) vespertina Putzeys, 1866: 176; Blackwelder, 1944: 26

Clivina vespertina Putzeys, 1867: 176

Distribution: Argentina: Santiago del Estero Province, Jujuy Province, Córdoba Province.

Semiclivina (Uroclivina) bergeri Dostal, 2011: 40-44.

Clivina (Semiclivina) marquardti Van Emden 1949: 861–863

Distribution: Argentina: Santiago del Estero Province, Avellaneda, Herrera; Santa Fe Province, General Obligado, Villa Ana; Salta Province, Metán, Coronel Moldes; Chicoana, El Carril; Macapillo, Río Salado; Corrientes Province, Capital, Rivera Paraná. Brazil: Mato

Grosso do Sul State, Corumbá. Paraguay: Presidente Hayes, Bufalo Bill, Estancia Rio Verde; Central, Asunción, San Antonio. (Fig. 13).

Semiclivina (Uroclivina) urophthalmoides (Kult, 1947): 34-35; Dostal, 2011: 47-48.

Clivina urophthalmoides Kult, 1947 34-35; Van Emden 1949: 861–863; Lorenz 2005: 145; Bousquet 2009: 41

Distribution: Argentina: Chaco Province, San Fernando, Resistencia; Santa Fe Province, General Obligado, Villa Ana. Brazil: Mato Grosso do Sul State, Corumbá. (Fig. 13).

Material examined: 14 specimens from MNHNP. (2) Paraguay: Central, Areguá, 23.xii.2005, S. Aguilar leg. MNP286-287. (1) Presidente Hayes, Cruce Pioneros, 10.xii.2001, C. Aguilar leg. MNP227. (1) Alto Paraguay, Puerto Leda, 7-8.ix.1997, B. Garcete leg. MNP308. (1) Concepción, Estancia Chaparral, Retiro San José, 16.xi.2002, B. Garcete leg. MNP314. (9) San Pedro, Estancia Cororó, Retiro Chahá, 2.viii.2003, B. Garcete leg. MNP696;698;703-705;707-710. 4 specimens from MHKNNM. (2) Bolivia: Santa Cruz, Andrés Ibañez, Potreillo de Guenda, Terebinto, 3-4.x.1994, P. Betella leg. MNB015-016. (2) Cordillera, Palmar de las Islas, 2-10.viii.2006, T. Vidaurre leg. MNB065-066.

Genus *Whiteheadiana* Perrault

(Figures 4A, 7A).

Whiteheadiana Perrault, 1994: 688

Type species: *Whiteheadiana stenocephala* (Brullé, 1837): 40

Clivina stenocephala Brullé, 1837: 40

Stratiotes stenocephalus (Brullé, 1837): 40; Blackwelder, 1944: 25

Differential diagnosis: Body pedunculate, black to light or dark brown. Head longer than wide. Dorsal surface smooth. Two carinae on the anterior part of the eyes extending to the posterior supraorbital setae. Clypeus with rounded anterior angles. Labrum with 2–3 setae. Mandibles small, thin, sabre-shaped, curved, asymmetric, apex bent. Lingua elongate and setose. Antennal scape as long as the following 4–5 antennomeres. Elytra with four setiferous punctures in the

third stria. Meso- and metatibiae with a longitudinal row of spines dorsally and scattered ventrally. First tarsi longer than tarsi 2–5. Claws simple.

Global distribution: The genus *Whiteheadiana* is currently Neotropical, specifically in South America, ranging from the Amazon basin to Argentina.

Chaco distribution: Argentina: Corrientes Province, Tucumán Province.

Diversity: The genus *Whiteheadiana* currently includes five described species, of which only two are recorded from the Chaco: *W. stenocephala*, *W. minor*.

Whiteheadiana stenocephala (Brullé, 1837): 40; Blackwelder, 1944: 25; Perrault, 1994: 688

Clivina stenocephala Brullé, 1837: 40; Perrault, 1994: 688

Stratiotes stenocephalus (Brullé, 1837): 40

Distribution: Argentina: Corrientes Province, Tucumán Province.

Whiteheadiana minor (Putzeys, 1867): 13; Perrault, 1994: 689

Stratiotes minor Putzeys, 1867: 13; Blackwelder, 1944: 25

Distribution: Argentina: Tucumán Province, Burruyacú, Río Nío. (Fig. 14).

Genus *Mesus* Chevrolat

(Figure. 4B, 7B).

Mesus Chevrolat, 1858: 317; Blackwelder, 1944: 26.

Type species: *Mesus rugatirfrons* Chevrolat, 1858: 317

Differential diagnosis: Body pedunculate, dark brown to reddish-brown. Head slightly longer than wide, narrower than pronotum. Mandibles asymmetrical, long, flat, curved at the base. Labrum with three setiferous punctures; lateral margins with flat setae on each side. Clypeus with a trapezoid- or rounded-shaped elevation between two setiferous punctures; clypeal suture

present. Gena not developed behind eyes. Pronotum subquadrate; posterior angles rounded. Elytra with four dorsal setiferous punctures on the third stria. Abdominal ventrites III–VI with transverse edges. Protibia with four triangular teeth on the outer margin, slightly rounded at apex.

Global distribution: The genus *Mesus* is Neotropical, specifically in South America, currently recorded from Argentina, Brazil, Paraguay, Uruguay, and Venezuela.

Chaco distribution: Argentina: Province of Córdoba, Province of Chaco, Province of Formosa, Province of Santa Fe, Province of Salta, Province of Tucumán. Brazil: State of Mato Grosso do Sul. Paraguay: Boquerón.

Diversity: The genus *Mesus* currently includes 12 described Neotropical species, of which four occur in the Chaco: *M. rugatifrons*, *M. pseudogigas*, *M. sp. nov. 1*, and *M. sp. nov. 2*.

Mesus rugatifrons Chevrolat, 1858: 317; Blackwelder, 1944: 26

Distribution: Argentina: Chaco Province, Primero de Mayo, Colonia Benítez; San Fernando, Resistencia. Santa Fe Province, San Justo, Vera y Pintado, Five Ville; Rosario, Rosario; Santa Fe de la Vera Cruz, Piquete; Garay, Helvecia; Colonia Macias; Castellanos, San Vicente. Formosa Province, Bermejo, Laguna Yema, Pueblo Laguna Yema; Capital, Ciudad de Formosa; Pilcomayo, Laguna Blanca; La Paz, La Paz. Corrientes Province, Mburucuyá, Manantiales. Córdoba Province, Calamuchita, Santa Rosa de Calamuchita, El Sauce; General San Martín, Villa María. (Fig. 14).

Mesus pseudogigas Vieira & Bello, 2004: 243-244

Distribution: Brazil: State of Mato Grosso do Sul, Corumbá. (Fig. 14).

Mesus sp. 1

Comment: New record for Argentina

Distribution: Argentina; Santa Fe

Mesus sp. 2

Comment: New record for Argentina.

Distribution: Argentina: Formosa Province, Formosa, Formosa; Pilcomayo, Laguna Blanca. Santa Fe Province; Chaco Province. Paraguay: Boquerón. (Fig. 14)

Genus *Nyctosyles* Putzeys

(Figure. 4C, 7C).

Nyctosyles Putzeys, 1867: 30; Blackwelder, 1944: 26

Type species: *Nyctosyles quadraticollis* (Reiche, 1843): 376; Putzeys, 1867: 30

Clivina quadraticollis Reiche, 1843: 376

Dyschirius quadraticollis (Reiche, 1843): 376

Differential diagnosis: Body pedunculate, black to reddish-brown. Mandibles short, broad at base, with some surface wrinkles. Labrum emarginate medially, anterior margin with seven setae. Eyes prominent. Strong carinae present between eyes. Pronotum subquadrate, convex to slightly flattened; anterior angles acute, posterior angles rounded. Elytra convex; third interval with two setiferous punctures; last stria beginning above the humerus. Protibia with a ventral carina terminating in a projection. Abdominal ventrites punctate, punctures scattered laterally. Last abdominal ventrite with three setiferous punctures; two paramedian and one median.

Global distribution: *Nyctosyles* is a Neotropical genus restricted to South America and the Antilles; recorded from Haiti and Trinidad and Tobago, Venezuela, French Guiana, and the Amazon Basin in Brazil and Bolivia.

Chaco distribution: Bolivia: Santa Cruz.

Diversity: The genus *Nyctosyles* currently includes three described species: *N. quadraticollis*, *N. planicollis*, and *N. laticollis*. The specific species recorded for the Chaco remains uncertain; however, this represents a new record of the genus *Nyctosyles* for the biogeographic province.

***Nyctosyles* sp.**

Comment: New record of the genus for Bolivia

Distribution: Bolivia: Santa Cruz, San Ramón. (Fig. 14)

Material examined: 1 specimen from MHNNKM. Bolivia: Santa Cruz, San Ramón, 2.iii.1987, P. Betella leg. MNB013.

Genus *Pyramoides* Bousquet

(Figure. 4D, 7D).

Pyramoides Bousquet, 2002; Putzeys, 1846: 576; Putzeys, 1857: 25; Blackwelder, 1944: 26.

Type species: *Pyramoides crassicornis* Putzeys, 1846: 576-577.

Differential diagnosis: Body pedunculate, black to reddish-brown. Head with strongly impressed longitudinal grooves. Mentum with a median tooth variable in size, keel shaped. Mandibles curved apically with 2–3 inner teeth. Maxilla with the last segment short, truncated. Ligula with two apical setae. Gena poorly developed dorsoventrally, ventral impression rugose or smooth. Elytral striae punctate or deeply impressed, partially or fully. Elytral surface glabrous, without setiferous punctures. Protibia with projecting external teeth, rounded apically.

Global distribution: *Pyramoides* is a Neotropical genus, restricted to South America, from Colombia to Argentina.

Chaco distribution: Argentina: Chaco Province, Jujuy Province, Santa Fe Province, Tucumán Province. Brazil: Mato Grosso do Sul State. Paraguay: Paraguari.

Diversity: The genus *Pyramoides* currently has two described species and nine new species (in description), of which two are recorded for the Chaco: *P. oblongicollis* and *P. sp.*

Pyramoides oblongicollis (Putzeys, 1861): 40; Blackwelder, 1944: 26

Clivina oblongicollis Putzeys, 1861

Pyramis oblongicollis (Putzeys, 1861)

Distribution: Argentina: Chaco Province, San Fernando, Resistencia; Jujuy Province, Doctor Manuel Belgrano, San Salvador de Jujuy; Formosa Province, Bermejo, Poncho Quemado; Tucumán Province; Santa Fe Province. Brazil: Mato Grosso do Sul State, Corumbá, Passo do Lontra. Paraguay: Paraguari, Ybycuí, Ybycuí National Park. (Fig. 14).

Pyramoides sp.

Comment: New record for Brazil

Distribution: Brazil: Mato Grosso do Sul State, Corumbá. (Fig. 14)

4. DISCUSSION

The current knowledge about Clivinini in the Neotropical region, particularly in the Chaco biogeographic province, is limited and shows significant gaps in various aspects, including biology, distribution, and taxonomy. This study represents an effort to consolidate scattered information and expand the understanding of this group, while also highlighting the need for more in-depth investigations.

The genus *Semiclivina* Kultz, 1947 has a distribution restricted to South America. Within this genus, the species *S. bergeri* stands out for its broad range in the Chaco province, including Mato Grosso do Sul in Brazil, Paraguay (Central and Presidente Hayes), and several Argentine provinces (Salta, Santiago del Estero, Santa Fe, Corrientes, and Chaco) (Dostal 2011). In contrast, the species *S. vespertina* (Putzeys, 1867) is recorded for the first time in the Chaco biogeographic province, extending its presence to the Argentine provinces of Córdoba, Jujuy, and Santiago del Estero, as well as Brazil. This record redefines its previous status as endemic to the Pampean province (Cicchino 2013).

Additionally, nine nomenclatural changes are reported, transferring species from *Clivina* to *Semiclivina*. The genus *Semiclivina*, described by Kult (1947) with eight species, was initially considered a subgenus within *Clivina*. However, Dostal (2011) elevated it to genus level within Clivinini, distinguishing it by the presence of a stridulatory line impressed on the proepisternum, which extends along the basal margin of the proepisternum (Dostal, 2011).

Different authors have interpreted this structure as a carina, a groove, or very fine ridges (Baehr, 2008; Bousquet, 2009). The differences observed in these nine species, previously not included in *Clivina*, justify their assignment to *Semiclivina*, raising the total number of species in this genus to 17. These changes highlight the need for a comprehensive taxonomic revision of *Clivina*, the most diverse genus within Clivinini, to clarify its evolutionary history and biogeographic patterns.

The species *Clivina bicolor* Putzeys, 1867, stands out for its adaptation to sandy soils and habitats near bodies of water (Cicchino, 2013), conditions that the Chaco provides with its xerophilous vegetation and seasonal rainfall. Its distribution includes Argentine provinces such as La Rioja, Catamarca, Tucumán, Santiago del Estero, and Corrientes, reaching the boundaries with other biogeographic provinces such as Yungas, Monte, and Puna (Morrone, 2002; Arana et al., 2017).

The distribution of the species *Mesus rugatifrons* Chevrolat, 1858 includes much of the Chaco region, spanning Brazil and Paraguay, with limits reaching the Pampean province. In contrast, *M. pseudogigas* Vieira & Bello, 2004 is currently restricted to Mato Grosso and Mato Grosso do Sul. However, given that the phytophysiognomic conditions at the collection sites are similar to those of the Chaco, it is likely that this species may have a broader geographic distribution.

Thus, several distribution records of these species are located outside or at the limits of the Chaco province. Specific examples include *Obadius* sp. (Fig. 8), *S. subglabra* (Fig. 9), *S. elongatus*, *S. banningeri* (Fig. 11), *C. tuberculata* (Fig. 12), *S. cruralis*, *S. bergeri*, *S.*

urophthalmoides (Fig. 13), *M. pseudogigas*, *P. oblongicollis* and *Pyramoides* sp. (Fig. 14). Considering that at least one record occurs within the Chaco, it is understood that these species may present a broader distribution, using the boundaries between provinces as ecotonal zones. Furthermore, according to Morrone (2022), these species are also found in the province of Rondônia, which belongs to the South Brazilian dominion and corresponds to the Pantanal biome. However, given the characteristics and conditions mentioned, the species may be using both provinces as transitional zones without abrupt barriers that limit their distribution. For this study, we consider the Pantanal as an extension of the Chaco province, also known as the Brazilian Chaco.

Similarly, species of the genus *Schizogenius* Putzeys, 1846 (Fig. 11) show a comparable pattern. In most records, they are found at the boundaries between the Chaco province, the Yungas province, and, to the north, the Rondônia province, except for *S. capitales*, *S. negrei*, and *S. costiceps*, which present records within the Chaco. This situation may be attributed to several reasons, such as the possibility that the species perceive the Chaco as an abrupt or difficult-to-access ecotonal zone, or that these ecotonal boundaries provide essential elements such as refuges, nesting sites, or resources that favor their presence. Nevertheless, it is evident that the distribution records are limited, preventing the establishment of robust conclusions.

Similarly, the genus *Nyctosyles* Putzeys, 1867, which currently comprises three described species, has type localities originating from the Amazon (Putzeys, 1867: 30–31) and includes a record of *N. planicollis* (Reiche, 1842) from Peru (Erwin & Pfuno 1992). Thus, the new record from Bolivia represents an expansion of the genus' distribution. This record (Fig. 14), which corresponds to the Rondônia province according to Morrone (2022), allows us to infer that the genus may also occur in the Chaco province, highlighting the need to intensify collecting efforts in the region. This scenario once again emphasizes the existing knowledge gaps, since both its diversity and distribution remain poorly understood.

Camptodontus crenatus Brullé, 1837, previously recorded from the Argentine Mesopotamia (Zotta 1930), in this study has its distribution extended to the biogeographic province of the Chaco. For the genus *Semiardistomis*, species such as *S. flavipes* (Dejean, 1831) and *S. deletus* (Putzeys, 1846) showed wide distributions encompassing Central and South America, covering different biogeographic provinces such as the Chaco, Pampeana, and part of the Brazilian Atlantic Forest (Valdés 2012).

Many species of the tribe Clivinini remain undescribed, and several original descriptions lack sufficient detail, illustrations, and useful taxonomic keys. Priority should be given to revisions of Neotropical genera such as *Obadius* and *Camptodontus* (Forcipatorina),

Nyctosyles, *Climax* Putzeys, 1861, *Cryptomma* Putzeys, 1846, *Lachenus* Putzeys, 1846, *Clivina* (*Clivina*) Latreille, 1802, *Clivina* (*Paraclivina*) Kult, 1947, and *Semiclivina* Kult, 1947 (*Clivinina*), which have never been revised before.

The lack of essential collection data, such as method and habitat, hinders and limits our understanding of the species. Therefore, it is crucial to intensify collecting efforts in the Chaco region to obtain a more comprehensive understanding of species distribution patterns. In addition, access to international collections and museums, along with collaboration between curators and researchers from different institutions, is fundamental to completing records and advancing knowledge of the group's taxonomy. The records presented here significantly expand the known distributions of several species across different biogeographic provinces. This highlights, first, the importance of the Chaco as a biogeographic refuge for Clivinini, and second, the need for studies integrating biogeography and phylogeny to better understand diversification patterns.

5. CONCLUSIONS

This study emphasizes the importance of future research to fill knowledge gaps regarding Clivinini in the biogeographic province of the Chaco and the Neotropical region more broadly. A focus on integrative taxonomic studies will be essential for achieving a more comprehensive understanding of this group of beetles.

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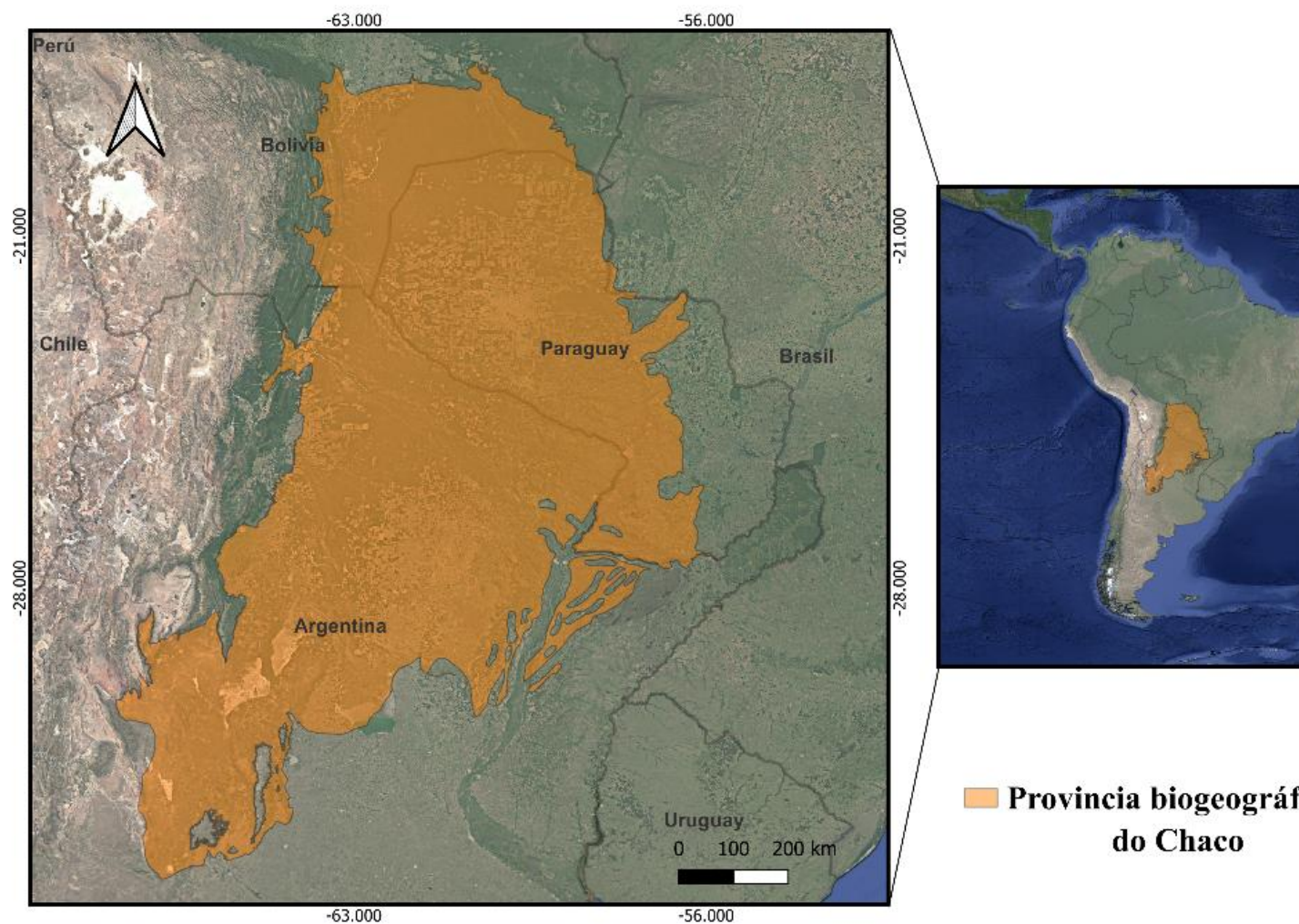
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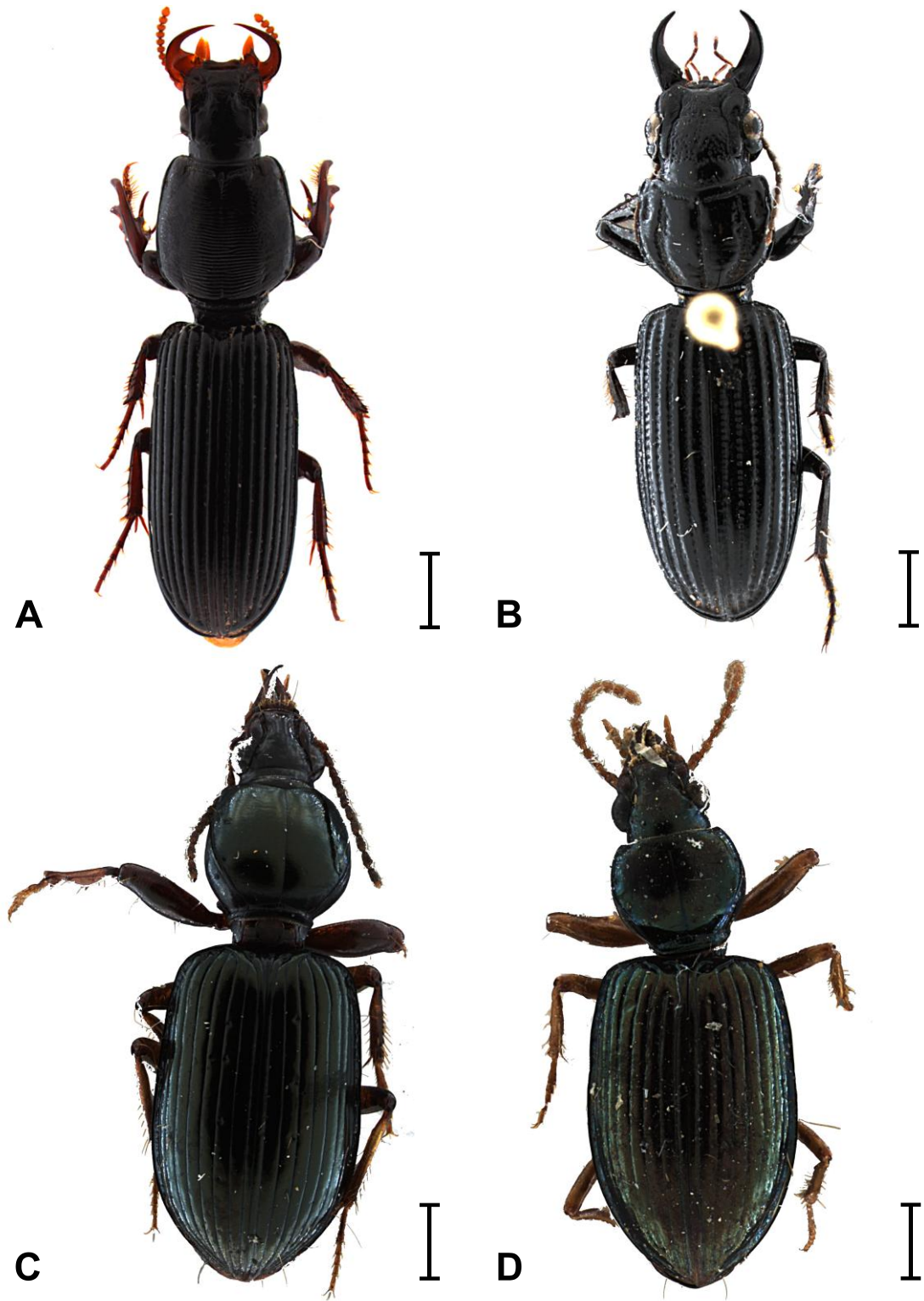
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1 ANNEXES



2
3 **Figure 1.** Map of the Chaco biogeographic province (Morrone 2001, 2014; Morrone,
4 Escalante, Rodríguez-Tapia et al. 2022).



1

2 **Figure 2.** Dorsal view of Clivinini genera. A. *Obadius*, B. *Camptodontus*, C. *Ardistomis*, D.3 *Semiardistomis*. Scale = 1.0 mm.



1
2 **Figure 3.** Dorsal view of Clivinini genera. A. *Aspidoglossa*, B. *Schizogenius*, C. *Clivina*, D.
3 *Semiclivina*. Scale = 1.0 mm.

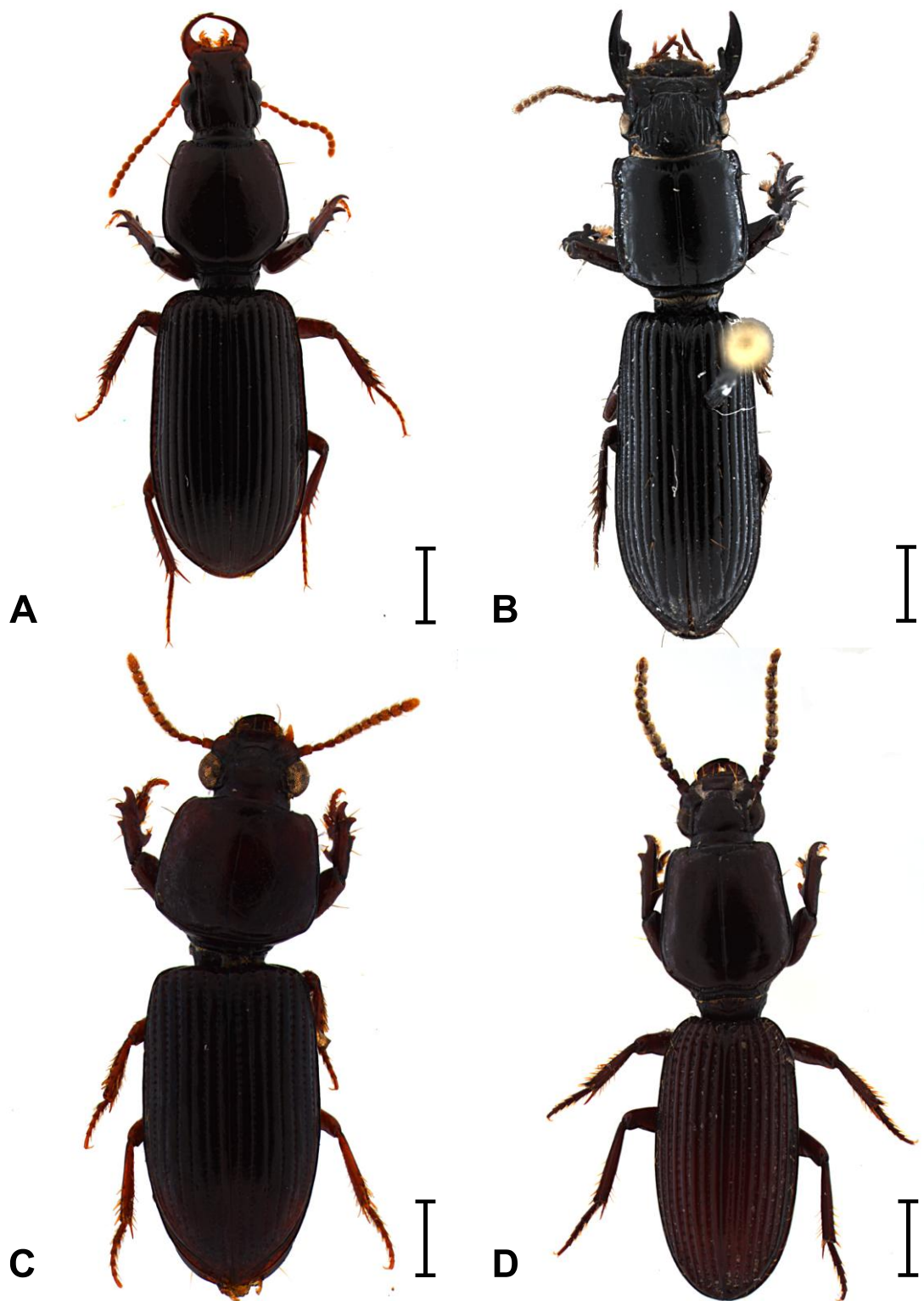


Figure 4. Dorsal view of Clivinini genera. **A.** *Whiteheadiana*, **B.** *Mesus*, **C.** *Nyctosyles* e **D.** *Pyramoides*. Scale = 1.0 mm.



Figure 5. Ventral view of Clivinini genera: **A.** *Obadius*, **B.** *Camptodontus*, **C.** *Ardistomis*, **D.** *Semiardistomis*. Scale = 1.0 mm.



Figure 6. Ventral view of Clivinini genera. **A.** *Aspidoglossa*, **B.** *Schizogenius*, **C.** *Clivina*, **D.** *Semiclivina*. Sclae = 1.0 mm.



Figure 7. Dorsal view of Clivinini genera. **A.** *Whiteheadiana*, **B.** *Mesus*, **C.** *Nyctosyles*, **D.** *Pyramoides*. Scale = 1.0 mm.

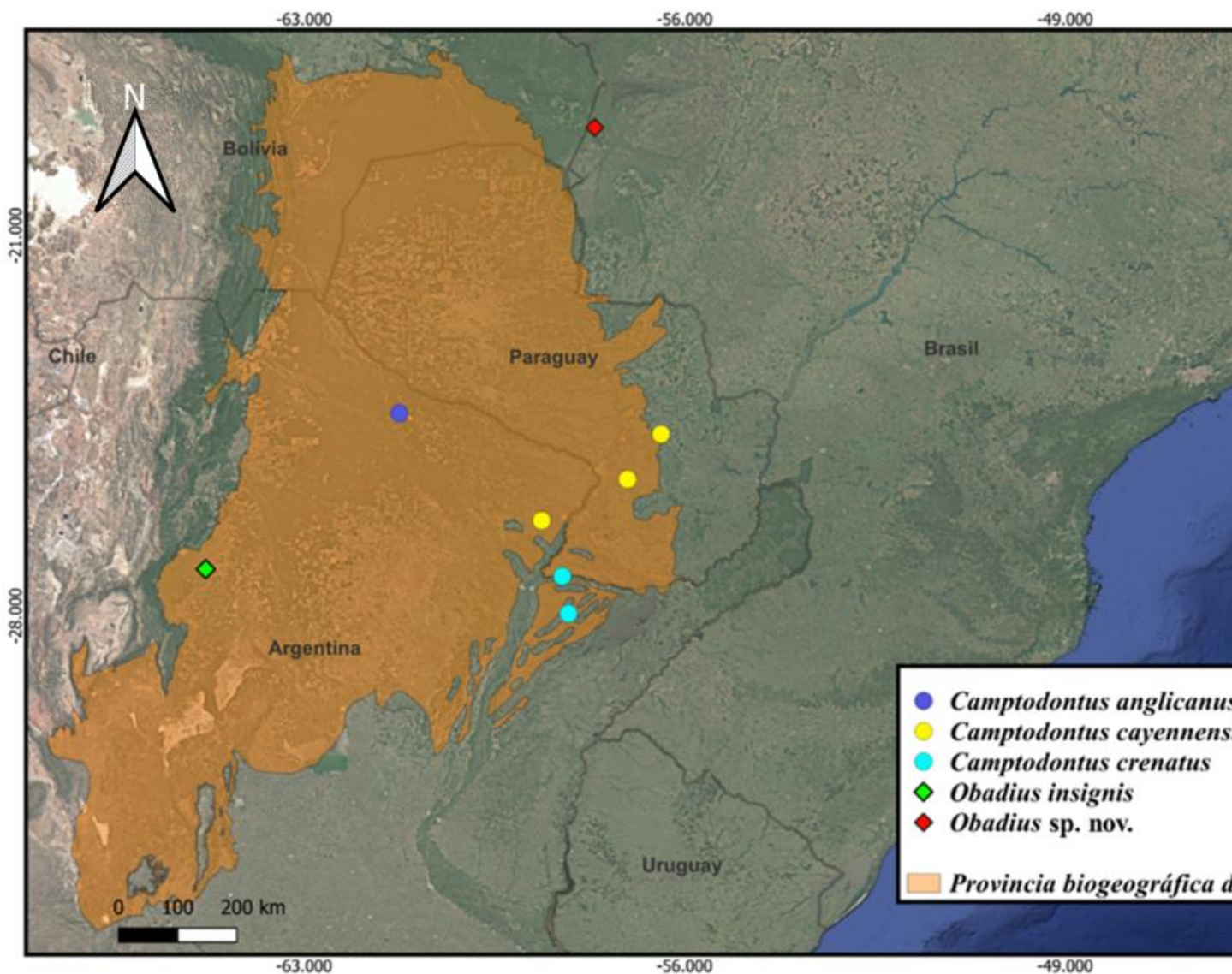


Figure 8. Distribution map of species of the genera *Obadius* and *Camptodontus* in the Chaco province.

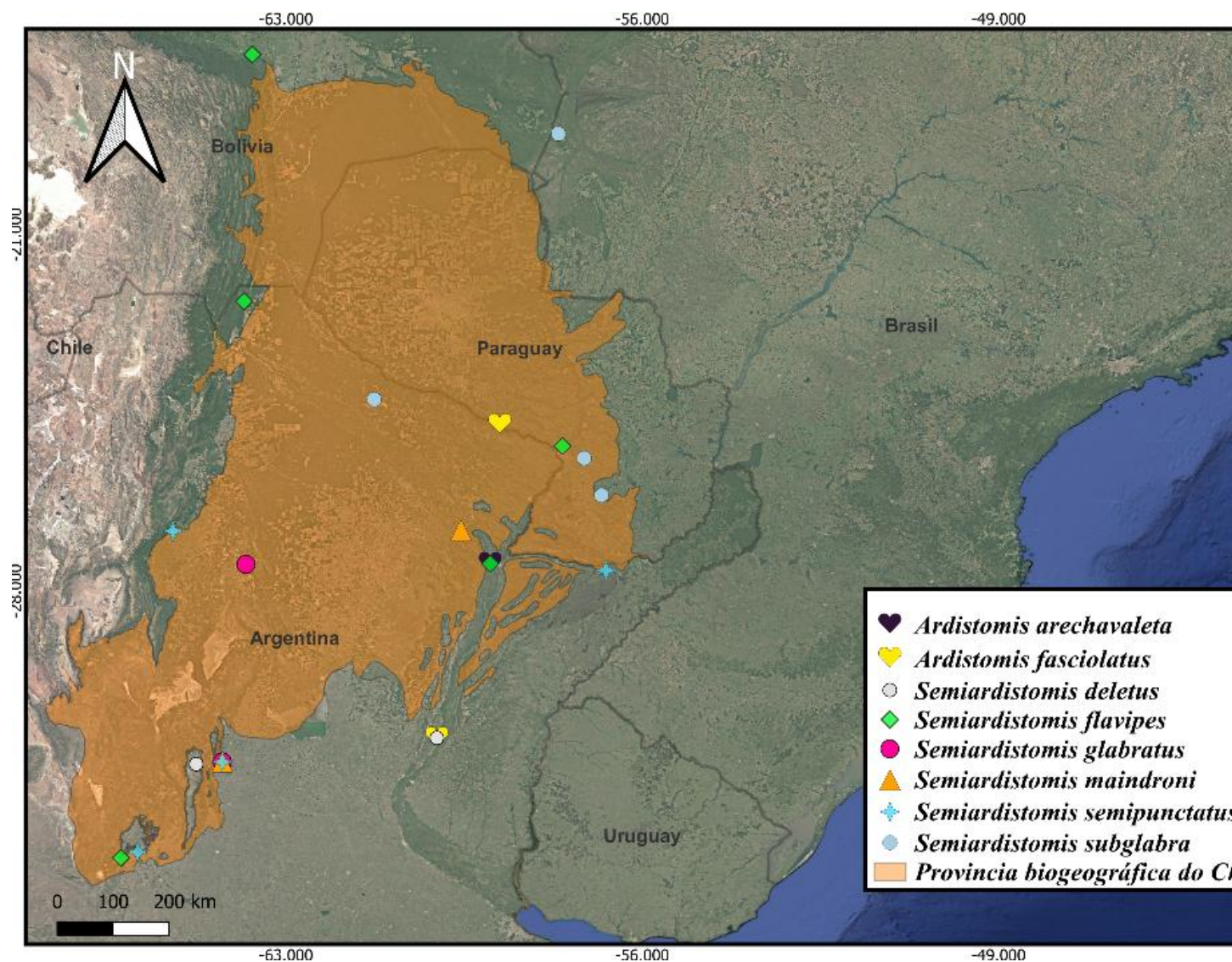


Figure 9. Distribution map of species of the genera *Ardistomis* and *Semiardistomis* in the Chaco province.

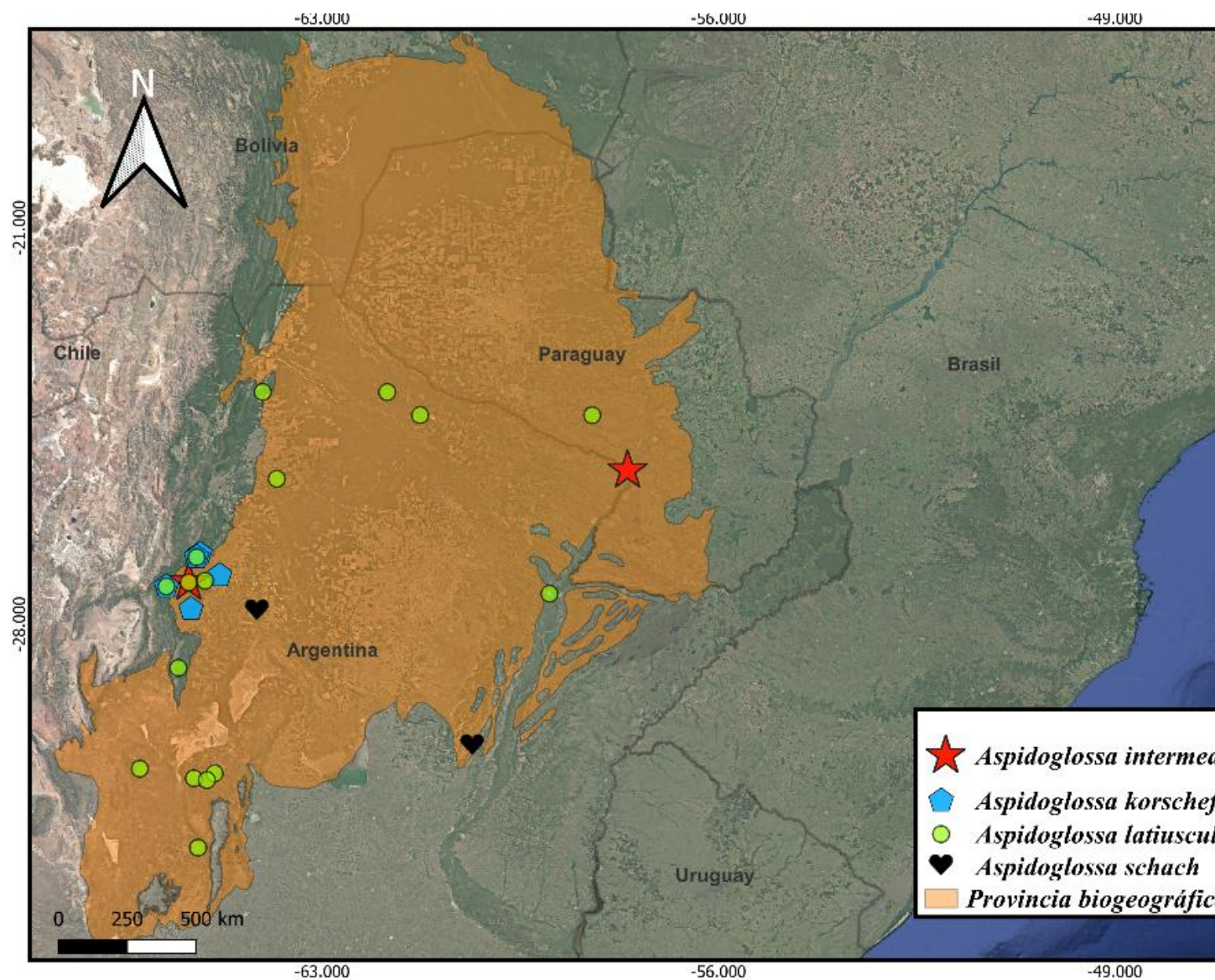


Figure 10. Distribution map of species of the genus *Aspidoglossa* in the Chaco province.

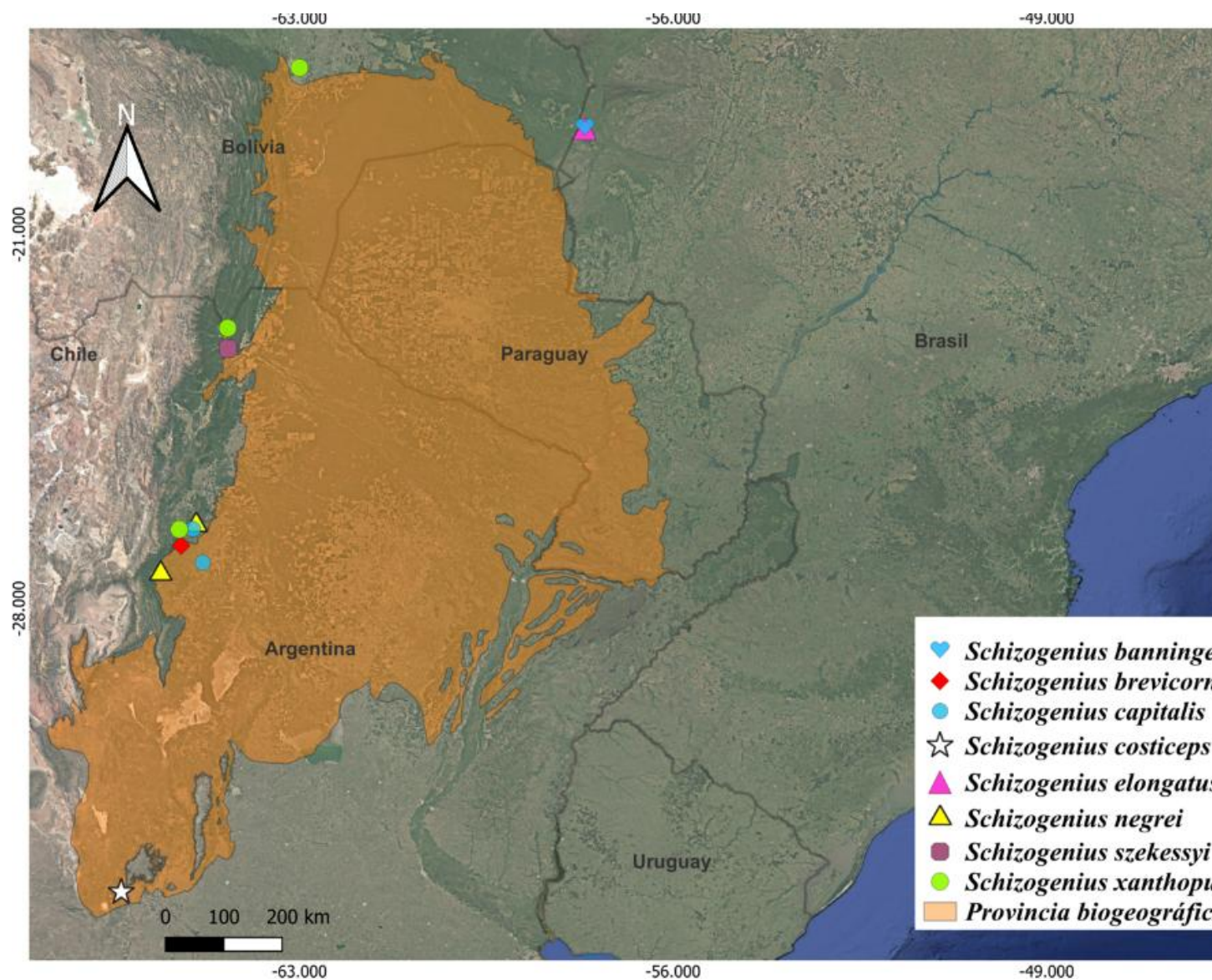


Figure 11. Distribution map of species of the genus *Schizogenius* in the Chaco province.

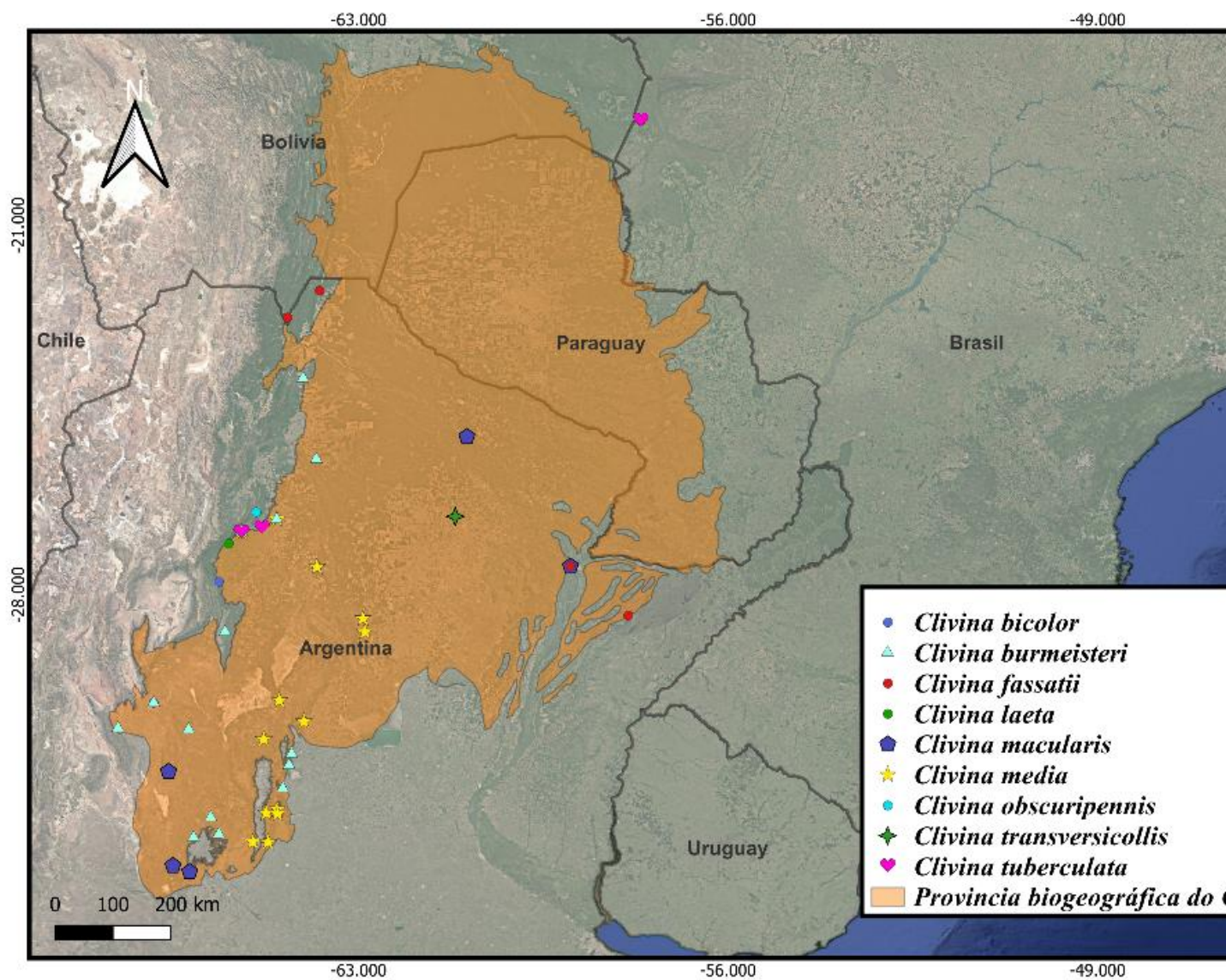
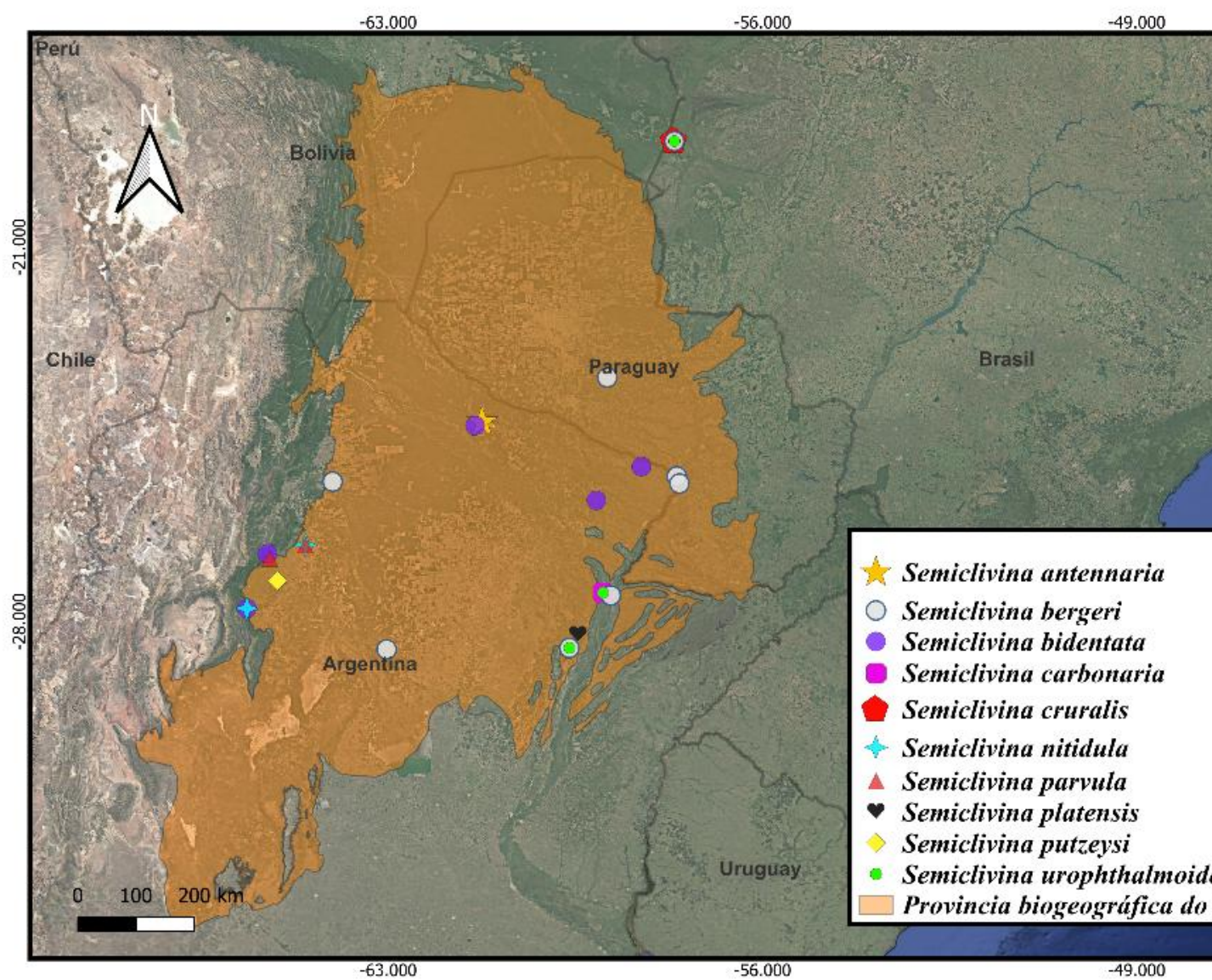


Figure 12. Distribution map of species of the genus *Clivina* in the Chaco province.



1

2 **Figure 13.** Distribution map of species of the genus *Semiclivina* in the Chaco province.

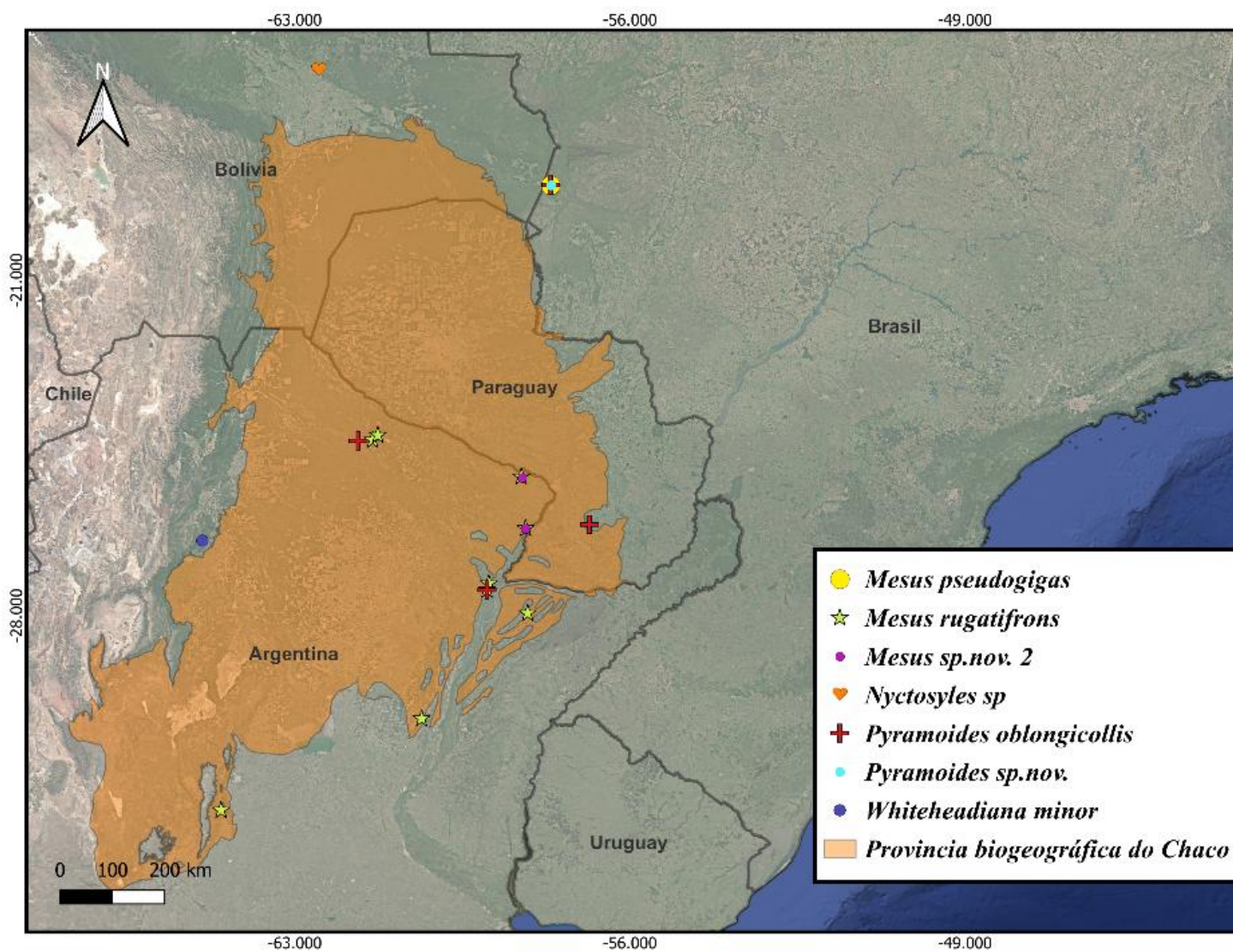


Figure 14. Distribution map of species of the genera *Whiteheadiana*, *Mesus*, *Nyctosyles*, and *Pyramoides* in the Chaco province..

ARTICLE II

Systematic review of the Neotropical genus *Pyramoides* Bousquet, 2002 (Scaritinae: Clivinini)**Normas NEOTROPICAL ENTOMOLOGY (versão preliminar)****Luis Felipe Libreros Hernández^{1,2}, Sergio Roig-Juñent³, Letícia Vieira^{1,2,4}**

1 Programa de Pós-graduação em Entomologia, Universidade Federal de Lavras (UFLA), 37203–202, Lavras, MG, Brasil.

2 Centro de Biodiversidade e Patrimônio Genético, Laboratório de Sistemática e Biologia de Insetos, Universidade Federal de Lavras, 37203–202, Lavras, MG, Brasil.

3 Laboratório de Entomologia, Instituto Argentino de Investigaciones de las Zonas Áridas (IADIZA, CRICYT), CC 507. 5500 Mendoza, Argentina.

4 Departamento de Ciências Florestais, Laboratório de Ecologia Florestal, Universidade Federal de Lavras (UFLA), 37203–202, Lavras, MG, Brasil.

Corresponding author:

Luis Felipe Libreros Hernández

E-mail: felipe.librerosh@gmail.com

Abstract

The subtribe Clivinina Rafinesque, 1815 comprises 772 known species distributed across 30 genera, 11 of which are Neotropical, many still requiring revision. One such example is the genus *Pyramoides* Bousquet, 2002, which currently includes two species described: *P. crassicornis* (Putzeys, 1846) and *P. oblongicollis* (Putzeys, 1861). However, numerous specimens from different localities remain unidentified. In this study, the genus *Pyramoides*

was redescribed and revised, and new species were described through the analysis of specimens deposited in various collections and museums across South America. A total of 82 morphological characters from the head, thorax, legs, abdomen, and male and female genitalia of adults were examined. Specimens were photographed, measured, and their geographic locations were used to generate distribution maps. Additionally, a phylogenetic analysis based on external adult characters was performed, and a taxonomic key was developed. In total, 145 *Pyramoides* specimens were analyzed, distributed across 10 species. The genus *Pyramoides* is primarily distinguished by the presence of a keel-shaped median tooth on the mentum. The phylogenetic analysis confirmed that *Pyramoides* is a monophyletic genus. Nine new species were described, and *P. oblongicollis* was revised and redescribed, expanding its known geographic distribution. The revision and redescription of the genus *Pyramoides*, along with the description of new species, provide a taxonomic foundation and a better understanding of the genus's phylogeny, as well as valuable information for species and ecosystem conservation.

Key words: Coleoptera, Fossorial, Predatory, Phylogeny, Diversity

Resumo

A subtribo Clivinina Rafinesque, 1815 compreende 772 espécies conhecidas e distribuídas em 30 gêneros, dos quais 11 são neotropicais, muitos dos quais necessitam de revisão. Um exemplo é o gênero *Pyramoides* Bousquet, 2002, que atualmente inclui duas espécies descritas: *P. crassicornis* (Putzeys, 1846) e *P. oblongicollis* (Putzeys, 1861). No entanto, exemplares de diferentes localidades permanecem sem identificação formal. Neste estudo o gênero *Pyramoides* foi redescrito e revisado e novas espécies foram descritas, por meio da análise de exemplares depositados em diferentes coleções e museus da América do Sul. Oitenta e dois caracteres morfológicos da cabeça, tórax, pernas, abdômen e genitália masculina e feminina dos adultos foram analisados. Os espécimes foram fotografados, medidos e suas localidades geográficas utilizadas para gerar mapas de distribuição. Além disso, foi realizada uma análise filogenética baseada em caracteres externos de adultos e elaborada uma chave taxonômica. Ao todo, foram analisados 108 exemplares de *Pyramoides*, distribuídos em 10 espécies. O gênero *Pyramoides* distingue-se principalmente por apresentar um dente mediano no mento em forma de quilha. A análise filogenética confirmou que *Pyramoides* é um gênero monofilético. Foram descritas nove novas espécies e revisada e redescrita *P. oblongicollis*, ampliando sua

distribuição geográfica. A revisão e redescrição do gênero *Pyramoides*, juntamente com a descrição de novas espécies, fornece uma base taxonômica e compreensão da filogenia do gênero *Pyramoides*, assim como subsídios para a conservação de espécies e ecossistemas.

Palavras-chave: Coleoptera, Fossorial, Predador, Filogenia, Diversidade

1. INTRODUCTION

The tribe Clivinini Rafinesque, 1815, is one of the constituent groups of the subfamily Scaritinae (Coleoptera: Carabidae), currently comprising 1,302 species distributed across 79 genera and five subtribes. Among these, the subtribe Clivinina Rafinesque, 1815, stands out as a highly diverse lineage, encompassing approximately 772 known species in 30 genera, of which 11 are endemic to the Neotropical region (Reichardt 1977; Dostal & Vieira 2018). This group has been primarily studied by Putzeys (1846, 1863, 1866) and is characterized by predatory, fossorial species that occupy a wide variety of habitats (Hogan 2012).

The subtribe Clivinina can be distinguished from other Clivinini subtribes by the presence of a subapical seta on the antennal scape, a ligula bearing at least one apical seta and usually moderately elongated, a penultimate labial palpomere with two setae (except in *Mesus* Reichardt, 1974), gula with parallel sides or posteriorly widened, and a clypeus with a single seta on each side (Reichardt 1977; Erwin & Sims 1984; Perrault 1994; Ball 2001; Hogan 2012).

Despite advances in the taxonomy and systematics of Clivinina (Kult 1947, 1950; Reichardt 1974, 1977; Erwin & Sims 1984; Nichols 1988a, 1988b; Bousquet & Laroche 1993; Perrault 1994; Ball 2001; Vieira & Bello 2004; Martínez 2005; Baehr 2008; Bousquet 2009, 2012; Dostal 2011, 2016; Erwin 2011; Hogan 2012; Bousquet & Skelley 2012; Balkenohl 2016, 2017; Benjumea-Hoyos, Ferreira & Vieira 2023), many genera described by Putzeys have not been revised since their original descriptions, complicating the taxonomic identification of their constituent species. Although some of these genera may ultimately prove to be invalid, detailed studies are likely to reveal the existence of previously unrecognized genera (Reichardt 1977). Moreover, a substantial number of specimens remain without formal species-level assignments (L. Vieira, pers. comm.), highlighting the critical need for comprehensive taxonomic revisions and an integrative reassessment of multiple genera within the subtribe. One

such case is the genus *Pyramoides* Bousquet, 2002 (Scaritinae: Clivinini: Clivinina), formerly known as *Pyramis* Putzeys, 1846. The change in name corresponds to a nomenclatural act by Bousquet (2002) due to junior homonymy with the genus *Pyramis* previously described by Boulton (1798).

This genus currently includes only two described species: *Pyramoides crassicornis* (Putzeys, 1846), recorded from Colombia, and *Pyramoides oblongicollis* (Putzeys, 1861), recorded from Brazil and Argentina. *Pyramoides* can be morphologically distinguished from other Clivinina genera by the median mentum tooth, which is keel-shaped and longer than the lateral lobes, and by the elytral striae, which are relatively deeply punctate (Dostal & Vieira 2018).

However, many specimens attributed to this genus remain formally unidentified, originating from collections and museums throughout South America. This taxonomic gap underscores the need for detailed revisions to clarify the genus boundaries and expand knowledge of *Pyramoides* diversity within the tribe Clivinini. Accordingly, the present study aims to conduct a taxonomic and systematic revision of the genus *Pyramoides* Bousquet, 2002, as well as to describe new species, thereby contributing to a better understanding of its diversity and distribution in the Neotropical region.

2. MATERIAL AND METHODS

2.1 Data Collection

The material examined, as well as the method of access (through loans, photographs, or direct examination of specimens in situ), originates from the following institutions:

MNHNP - Museo Nacional de História Natural de Paraguay, Paraguay.

MJHN - Museo Javeriano de Historia Natural, Bogotá, Colombia.

INPA – Instituto Nacional de Pesquisas da Amazonia, Brazil.

CEMT - Coleção Entomológica da Universidade Federal do Mato Grosso, Brazil.

- 1 **CEUFLA** - Coleção Entomológica da Universidade Federal de Lavras, Brazil.
- 2 **MZSP** - Coleção de Coleoptera (Carabidae) do Museu de Zoologia da Universidade de São
- 3 Paulo, Brazil.
- 4 **AMBC** - Ayr de Moura Bello Collection, Coleção privada, Rio de Janeiro, Brazil.
- 5 **CEI** - Colección Entomológica del Instituto Argentino de Investigaciones de las Zonas Áridas
- 6 (IADIZA), Mendoza, Argentina.
- 7 **RBINS** - Institute of Natural Sciences, Brussels, Belgium.
- 8 **Outras coleções e museus consultados:**
- 9 **MPEG** - Museu Paraense Emílio Goeldi, Belém, Brazil.
- 10 **CE-UFPE** - Coleção Entomológica da Universidade Federal de Pernambuco, Brazil.
- 11 **MNRJ** - Coleção de Coleoptera no Museu Nacional do Rio de Janeiro, Brazil.
- 12 **DZ-UFRGS** - Coleção Entomológica da Universidade Federal de Rio Grande do Sul, Brazil.
- 13 **MHNNKM** - Museo de Historia Natural Noel Kempff Mercado; Santa Cruz, Bolivia.
- 14 **CIUQ** - Colección de Insectos de la Universidad del Quindío, Colombia.
- 15 **ICN-MHN-En** - Colección de Entomología del Instituto de Ciencias Naturales, Colombia
- 16 **CEBUC** - Colección Entomológica del Programa de Biología de la Universidad de Caldas,
- 17 Colombia.
- 18 **MUSENUV** - Colección del Museo de Entomología de la Universidad del Valle, Colombia.
- 19 **CEUA** - Colección Entomológica Universidad de Antioquia, Colombia.

20 **2.2. Taxonomic Identification**

21 Specimens were examined using a Zeiss Stemi 305 stereomicroscope equipped with a
 22 2.0× auxiliary lens. The genus *Pyramoides* Bousquet, 2002 was identified based on the original
 23 description by Putzeys (1846), formerly known as *Pyramis*, as well as subsequent works by
 24 Reichardt (1977) and Dostal & Vieira (2018). Following the revision, a key to the *Pyramoides*

species was constructed based on an analysis of the external morphology of the examined specimens.

2.3. Dissection of Genitalia

Male and female genitalia were dissected following the procedures described by Liebherr and Will (1998). The abdomens of the specimens were removed using pins and entomological forceps and then treated in a 10% aqueous potassium hydroxide (KOH) solution for 24 hours. The reproductive structures were rinsed with filtered water and placed in glycerin for manipulation and observation. Subsequently, the structures were stained in a chlorazol black solution diluted in 70% ethanol for 30 minutes. Genitalia were photographed using a ZEISS Stemi 508 stereomicroscope equipped with an Axiocam 105 Color camera, and images were stacked using Helicon Focus software, version 8.2.18.

2.4. Measurements

Body measurements (mm) were taken using ImageJ 1.50i from photographs obtained with a ZEISS Axio Scope A1 stereomicroscope equipped with DIC contrast and an Axiocam 105 Color camera. Measurements follow the protocol proposed by Dostal & Vieira (2018): L = Maximum body length; W = Maximum body width; HL = Head length; HW = Head width; HL/HW = Head index; PL = Pronotum length; PW = Pronotum width; PL/PW = Pronotum index; EL = Elytra length; EW = Elytra width; EL/EW = Elytra index; AL = Abdomen length; AW = Abdomen width.

2.5. Photography and Image Editing

Specimens were photographed using a ZEISS Axio Scope A1 stereomicroscope with DIC contrast and an Axiocam 105 Color camera, as well as a Leica M205 stereomicroscope with automatic handling via Leica Application Suite software. All images were subsequently prepared, arranged into plates, and edited using CorelDRAW® X7.

2.6. Morphological Characters and Terminology

The terminology adopted for descriptions is based on morphological characters, following Perrault (1994) and Balkenohl (2017) for external morphology. Most terms used for describing male and female genitalia follow Deuve (1993) and Balkenohl (2017), including: SM = maxillary palps; SL = labial palps; A1–A11 = antennomeres; V1–V6 = abdominal ventrites; T1–T5 = tarsomeres. Male genitalia: lma = median lobe of the aedeagus; pd = right paramere; pe = left paramere. Female genitalia: gs = gonostyle; bc = bursa copulatrix; sp = spermatheca; ga = accessory gland; lt = laterotergite.

2.7. Phylogenetic analysis

The phylogenetic analysis was conducted using both the previously described species of the genus *Pyramoides* Bousquet, 2002 and the new species described in this study. Additionally, the following species were included as an ingroup: *Forcipator grandis* (Perty, 1830) (Clivinini: Forcipatorina), *Mesus pseudogigas* Vieira & Bello, 2004, *Whiteheadiana thaisae* Hoyos-Benjumea, Ferreira & Vieira, 2023, *Clivina (Paraclivina) fassatii* Kult, 1947, *Semiclivina bergeri* Dostal, 2011, and *Ancus depressifrons* Putzeys, 1867 (Clivinini: Clivinina). These species were included to test the hypothesis of the monophyly of the genus *Pyramoides*. *Scarites paraguayensis* Bänninger, 1928 was used as the outgroup, which means that all resulting trees were rooted between this species and the remaining terminals.

The character matrix was constructed using WinClada-Asado version 1.89 (Nixon, 2004). All characters were treated as non-additive. Terminals with unobserved states were coded as “-”, and states that were not applicable were also coded as “-”.

2.8. Cladistic Analysis

Two characters weighting methods were applied: equal weights and implied weights (Goloboff, 1993; Goloboff et al., 2008). To identify the most parsimonious trees, TNT version 1.5 was used, employing the New Technology algorithms (Goloboff & Catalano, 2016).

The parameters used included: *Sectorial Search* (Goloboff, 1999) in its standard mode; 100 iterations of the *Ratchet* algorithm (Nixon, 1999) with the perturbation phase set to 8 for both up- and down-weighting; 20 rounds of *Drift* and 10 rounds of *Tree Fusing* (Goloboff, 1999). This process was repeated until the minimum tree length was reached 100 times, applying both weighting approaches. The *Random seed* was set to 0.

This analysis employed a TNT script (*propk.run*) created by Salvador Arias to calculate the appropriate value of the constant k (see Goloboff et al., 2008). The script output provided a k value of 4.7656, which was used in the analysis. In Figure 2, unique character changes are represented by black rectangles, whereas homoplasies are shown as white rectangles on the cladogram, displaying only unambiguous character states.

2.9. Distribution Maps

Localities were extracted from the labels of the examined specimens. Some coordinates were obtained through searches in Google Earth Pro. Based on this information, geographic and altitudinal distribution maps were generated for each species of the genus *Pyramoides* using QGIS version 3.40.2 (QGIS 2025).

3. RESULTS

3.1. Taxonomy

Redescription of the genus and species of *Pyramoides* Bousquet, 2002

Pyramoides Bousquet, 2002

Pyramoides Putzeys, 1846: 576.

Type species: *Pyramoides crassicornis* (Putzeys, 1846): 576-577.

Two species are currently known for the genus: *P. crassicornis* and *Pyramoides oblongicollis* (Putzeys, 1861).

Differential diagnosis. Based on Putzeys (1845) and Dostal & Vieira (2018).

Pyramoides Bousquet, 2002 is a genus within the subtribe Clivinina, distinguished by the following external characters: median mentum tooth keel-shaped, acute at the apex, longer than the lateral lobes of the mentum; head with strongly impressed facial sulci; mandibles curved at the apex with 2–3 internal teeth; maxilla with the last segment slightly visible, truncated; ligula elongated, truncated, with two apical setae; antennae submoniliform, with the last antennomere drop-shaped; gena poorly developed dorsoventrally, with a ventral depression and surface smooth or rugose; elytra glabrous, with umbilical setiferous punctures; elytral striae punctate, either deeply impressed or superficially punctured; protibiae with strongly projected external teeth, rounded at the apex.

Genus description

Body pedunculate; coloration black, dark brown, or reddish-brown; length ($L = 8.82\text{--}19.98$ mm), width ($W = 2.34\text{--}5.64$ mm).

Head. Hexagonal to rounded, narrower than pronotum; labrum with anterior margin sinuose, bearing 5–7 short setae of similar size; clypeus with transverse groove, clypeal wings rounded or acute, with median depression or flat, surface smooth or rugose; supraocular plate marginate, with supraocular fovea; facial sulci strongly impressed, close to lateral eye margins; compound eyes well developed, lateral margin projecting or not; two supraocular setiferous punctures present; posterior margin of head smooth or punctate; neck glabrous and smooth. Mandibles

flat, curved, asymmetrical, apex rounded, lateral groove absent, with 2–3 internal teeth. Labium and labial palps well developed; labial palp with four segments: SL2 narrower basally, expanded apically, longer than SL3, with two apical setae; SL3 oval, wider medially, raised apically; SL4 small, barely visible, truncated; ligula elongated, truncated apically, with two apical setae. Maxilla with galea and lacinia well developed; maxillary palp with four segments: SM1 globose, subequal to following segment; SM2 nearly twice as long as SM1, strongly constricted basally; SM3 subcylindrical, equal in length to sum of first two segments, sides parallel and apically narrow; SM4 smaller, barely visible, truncated. Mentum with micro-sculpturing and irregularly distributed punctures; posterior with a pair of paralateral setiferous punctures; median tooth keel-shaped, acute apically, longer than lateral lobes, lateral projection present, two basal setae; anterior margin of lateral lobes truncated or rounded; transverse groove impressed; submentum with micro-sculpturing, bearing two pairs of paramedian and paralateral setiferous punctures; gula broad posteriorly, with micro-sculptures and furrows; postgena glabrous, with micro-sculptures and furrows; gena with deep ventral depression, surface smooth or rugose. Antennae submoniliform, short, not reaching posterior pronotum, 11 antennomeres, golden-yellow pubescence; scape with micro-sculpturing, imbricate apically, longer than antennomeres, apical setiferous puncture present; pedicel narrow basally, with median seta; A3 pubescent apically; A4 with denser pubescence on apical two-thirds; A5–A11 densely pubescent from base, with apical setae; A11 drop-shaped; antennomere junctions glabrous.

Thorax. Pronotum subquadrate to rectangular, longer than wide, usually wider at posterior third; surface with micro-sculpturing; anterior and posterior angles rounded; pronotal disc glabrous, smooth or with furrows; anterior margin of pronotum continuous to anterior angle or projecting ventrally; carinae may connect to anterior groove at anterior margin or not; anterior groove continuous or sinuous, close to central groove; anterior portion of central groove drop-shaped, narrowing posteriorly, may or may not reach posterior channel; posterior channel broad or narrow; lateroposterior channel continuous or fading at posterior setiferous puncture; lateral channel relatively impressed, broad posteriorly, extending from anterior setiferous puncture to slightly before posterior setiferous puncture. Mesothorax pedunculate with oval scutellum. Prosternum glabrous and shiny, with isodiametric micro-sculptures; furrows central or irregularly distributed; anterior margin carinate or not. Proepisternum with micro-sculptures, glabrous and shiny, punctate or rugose, furrows occasionally reaching hypomerion. Prosternal process glabrous and smooth, punctate or rugose, bearing one or two setiferous punctures. Proepimeron glabrous and smooth, punctate or rugose. Mesosternum glabrous, smooth,

punctate or rugose. Metepisternum smooth or punctate, with deep or superficial depressions. Metasternum glabrous, smooth or furrowed, with metapleural suture.

Legs. Coloration black, dark brown, or reddish-brown. Procoxae shiny and rugose, with setae on anterior surface. Meso- and metacoxae with two distal setiferous punctures. Protrochanter with two setae; meso- and metatrochanter with a single setiferous puncture. Profemur swollen, with micro-sculpturing; dorsal and ventral surfaces smooth or with furrows. Mesofemur slightly swollen, with micro-sculpturing, bearing three ventral setae; smooth, furrowed, or rugose; inner dorsal margin with a row of 6–11 short setae. Metafemur slightly swollen; ventral surface with a single median seta on posterior margin. Protibia slightly flattened; dorsal surface with two grooves, central groove prominent, fading basally, reaching up to apical third or fading basally; ventral surface smooth or rugose; outer margin with one or two projections; two or three rounded apical teeth, apical tooth ventrally projected; inner margin with a row of 3–6 short setae; cleaning incision on distal portion of flexor side; with apical and subapical spurs; antennal cleaner emarginate, with two longitudinal grooves and one apical seta. Meso- and metatibiae elongated, with a row of setae, thicker apically; dorsal and ventral surfaces with longitudinal carinae; two apical spurs on outer margin. Tarsi with five segments; T1 longer than T2–T4, bearing a row of setae; T1–T4 with an apical crown of setae; T5 with two apical setae; claws simple, with arolium.

Elytra. Ellipsoid or rectangular; convex; covering the abdomen entirely dorsally; longer than wide; slightly narrower than the pronotum; generally widest at the median portion or with parallel margins; narrowing posteriorly. Humerus rounded; with para-scutellar stria and anterior scutellar pore on the second interval; eight complete and continuous striae, reaching the posterior margin; striae punctate, punctured, or continuous, deep or superficially impressed, extending posteriorly; first elytral intervals generally wider and more elevated than the others; 7th stria starting at or just after the humerus, narrowing posteriorly; 8th stria with umbilical setae, reaching the elytral suture.

Abdomen. Black, dark brown, or reddish; with six visible ventrites, entirely glabrous. V2 with a relatively impressed paramedian carina; surface smooth or punctate. V3–V5 with two paramedian setiferous punctures; smooth or with irregular punctures, decreasing toward the central portion or covering the entire surface; irregularly scattered or concentrated laterally. The last two ventrites with a continuous or anteriorly punctate transverse groove; V6 smooth or punctate mainly anteriorly, with two pairs of paramedian and paralateral setiferous punctures.

Distribution. South America: Argentina, Brazil, Colombia, and Paraguay.

***Pyramoides crassicornis* (Putzeys, 1846)**

Type material. Holotype: desconhecido. 1 ind. Coll. La Ferté / Nouvelle-Grenade.

Nouvelle-Grenade. Coll of Chaudoir. Putzeys (1867): 25.

Differential diagnosis. *Pyramoides crassicornis* is like *P. oblongicollis*, but differs by having shorter elytra, elytral striae punctate; anterior pronotal angles not depressed; head more convex; and fore tibiae strongly dentate externally.

Description. Based on Putzeys (1845). Length 9.00 mm; width unknown. Coloration. Shiny black, with a slight bluish tint.

Head. Head hexagonal, narrower than pronotum (HL = unknown; HW = unknown). Eyes well developed, without lateral projection. Labrum with setiferous punctures. Clypeus with transverse groove; clypeal wings rounded; surface smooth. Frontal sulci strongly impressed. Supraocular plate margined and elevated, with supraocular fovea. Mentum with microsculpture, irregular punctures, and a pair of paralateral setiferous punctures; median tooth keel-shaped, acute at apex, longer than lateral lobes, with lateral projection and two basal setae. Transverse groove impressed. Submentum with microsculpture, with two pairs of paramedian and paralateral setiferous punctures. Gula broad posteriorly, with microsculpture. Gena with depression; postgena glabrous. Antennae short, submoniliform, not reaching posterior margin of pronotum; with 11 antennomeres; pubescence yellowish-golden. Scape with microsculpture, apically imbricated, longer than following antennomeres, with apical setiferous puncture. Pedicel narrow basally, with median seta. Antennomere 3 with apical pubescence; antennomere 4 with denser pubescence on apical two-thirds; antennomeres 5–11 with dense pubescence from base, with apical setae; antennomere 11 drop-shaped. Junctions between antennomeres glabrous.

Thorax. Pronotum subquadrate, longer than wide (PL = unknown; PW = unknown); widest at posterior third; with microsculpture; anterior and posterior angles rounded. Pronotal disc

glabrous, smooth or with irregular striations. Anterior portion of median sulcus drop-shaped, narrowing posteriorly. Lateral channel impressed, slightly wider posteriorly, extending from anterior angle to just before posterior setiferous puncture. Prosternum glabrous and shiny, with isodiametric microsculpture; median striations present; anterior margin carinate and rounded; with anterior grooves. Proepisternum glabrous and shiny, with microsculpture and striations occasionally reaching hypomeron; prosternal process with setiferous puncture. Proepimeron with microsculpture. Mesosternum glabrous, punctate laterally with punctures decreasing toward central portion. Metepisternum with microsculpture. Metasternum smooth.

Legs. Legs black. Procoxa shiny and rugose, with anterior setae. Meso- and metacoxae each with two distal setiferous punctures. Protrochanter with two setae. Meso- and metatrochanter each with one setiferous puncture. Profemur swollen, with microsculpture; dorsal and ventral surfaces with striations. Mesofemur slightly swollen, with microsculpture, striations, and ventral setae. Metafemur slightly swollen; ventral surface with one median seta on posterior margin.

Protibia slightly flattened; dorsal surface with two grooves; outer margin with two rounded teeth at the apex; apical tooth projected ventrally; cleaning incision on the distal portion of the flexor side; with apical and subapical spurs; antennal cleaner emarginate; with two longitudinal grooves and an apical seta. Meso- and metatibiae elongate; with setae, thicker at the apex; ventral and dorsal surfaces with longitudinal carinae; with two apical spurs on the outer margin. Tarsi with five segments; T1 longer than T2–T4, with a row of setae; T1–T4 with an apical crown of setae; T5 with only two apical setae; claws simple, with arolium.

Elytra cylindrical, margins curved; longer than wide (EL = 4.13; EW = unknown), completely covering the abdomen dorsally; narrowing posteriorly. Humeri rounded. With a parascutellar stria and a scutellar pore on the second interval. With eight complete striae reaching the posterior margin; elytral striae punctate, deeper on the posterior third than on the median portion; 8th stria with umbilicate setae reaching the sutural margin.

Abdomen (AL = unknown; AW = unknown). Black, with six visible ventrites, glabrous. V2 with a paramedian carina. V2–V5 with irregular punctures, concentrated at the base and laterally, decreasing towards the middle portion; with two paramedian setiferous punctures. Last two ventrites with a transverse groove. V6 mainly punctate on the anterior portion; with

two paralateral and two paramedian setiferous punctures. Male genitalia: unknown. Female genitalia: unknown.

***Pyramoides oblongicollis* (Putzeys, 1861)**

(Figs. 1A, 4A) //

Type material. Holotype (Fig. 1A): 1♂ / *Pyramis* / *oblongicollis* / Brazil / Minas Gerais.

Brazil, Minas Gerais, **Belgium**. Société entomologique de Belgique. /

Paratypes: 10♂Brazil. Mato Grosso. Barão de Melgaço, SESC. Pantanal. 16°39'25"S 56°14'07"W/16°42'19"S 56°10'28"W/16°43'44"S 56°20'35"W/16°43'46"S 56°20'37"W. 124-128 mm. vii-ix-x-2021. Col: Vicente & Arruda. Q.Tardio-Trat, B1PFP1. Q. Modal-Trat, B3PFP8. Q. Precoce-Cont. B2AFP4. 1♂ Mato Grosso do Sul. Porto Murtinho. 21°41'56"S 57°52'58"W. 79 mm. 28-29.i.2008. Col: F.R. Fernandes. Pit fall com isca. MZSP48108. 2♂ Mato Grosso do Sul. Corumbá. 19°00'28"S 57°39'05.5"W/ 19°00'28"S 57°39'05.5"W. 154 m. ii.1999. Col: J. Razer. 1♂ Rio Grande do Sul. São Jeronimo. 29°57'32"S 51°43'19"W. 17 m. 13.i.1989. Col: A. Ferreira. 1♂ Rio Grande do Sul. Santana do Livramento. 30°53'27"S 55°31'58"W. 212 m. 11-12.v.2014. Col: SISBIOTA. 4♂ São Paulo. Rio Claro. Universidade Estadual Paulista-Campus. 22°23'46"S 47°32'33"W. 619 m. 23.iii.2022. Col: B. Nogueira. (CM151M33) -Pit fall. 1♂ São Paulo. São Paulo. Universidade de São Paulo-Campus. 23°33'41"S 46°43'51"W. 761 m. 18.iv.1993. Col: Jesus. B.M.V. 9♀ Mato Grosso. Barão de Melgaço, SESC. Pantanal. 16°42'19"S 56°10'28"W/ 16°43'46"S 56°20'37"W. 126 m. vii-xii.2021. Col: Vicente, Arruda & Pereira. Q. Precoce-Cont, B2AFP3. 1♀ Mato Grosso do Sul. Corumbá. Passo do Lontra. 19°00'28"S 57°39'05.5"W. 154 m. xi.2000. Col: J. Raizer. 2♀. São Paulo. Primavera. Usina Hidrelétrica Engenheiro- Porto. 22°28'31"S 52°57'30"W. 257 m. 11.xii.1998. Col: A. Brescovit et al. 2♀ São Paulo. Leme. Taquari. 22°11'08"S 47°23'25"W. 625 m. 16.v.1946. Col: Araújo. MZSP 48173. 1 **Paraguay:** Paraguari. Ybycuí. Parque Nacional Ybycuí. 26°05'51.9"S 56°50'28.15"W. 112 m. 29.vi.1984. Col: C. Ferreira. MNP077. MNHNP-HX2092.

Differential diagnosis. *Pyramis oblongicollis* differs from *P. crassicornis* by having longer elytra, elytral striae distinctly punctate, and the anterior angles of the pronotum more depressed.

It can be distinguished from the remaining species of the genus by the ventral surface of the profemur rugose; the anterior margin of the prosternum slightly carinate; the metepisternum punctate, with a narrow impression; and by the morphology of the male genitalia, with the left paramere of the aedeagus arched and broad at the base, bearing four apical setae (two apical and two subapical).

Description (Figs 1A, 4A). Length (L = 12.95 mm); width (W = 3.37 mm). Coloration. Black, reddish-brown.

Head. Hexagonal, narrower than pronotum (HL = 1.74 mm; HW = 2.22 mm). Eyes well developed, without lateral projection. Labrum with five setiferous punctures and anterior margin sinuate. Clypeus with a slightly sinuate transverse groove; clypeal wings rounded; median portion with slight depression, surface smooth. Frontal grooves strongly impressed. Supraocular plate marginate and elevated, with a supraocular fovea. Posterior margin usually punctate. Neck glabrous and smooth. Mentum with microsculpture; irregular punctures with one pair of paralateral setiferous punctures; median tooth keel-shaped, acute at apex, longer than lateral lobes, with lateral projection and two basal setae. Anterior margin of lateral lobes truncate; transverse sulcus impressed. Submentum with microsculpture, bearing two pairs of paramedian and paralateral setiferous punctures. Gula wide posteriorly, with microsculpture and striae. Gena with deep depression, surface rugose; postgena glabrous, rugose and striate.

Antennae. Submoniliform, short, not reaching posterior margin of pronotum; with 11 antennomeres; pubescence yellow-golden. Scape with microsculpture, apically imbricate, longer than following antennomeres, with one apical setiferous puncture. Pedicel with a seta medially and narrowed basally. Antennomere III with apical pubescence; antennomere IV with denser pubescence on apical two-thirds; antennomeres V–XI with dense pubescence from base, with apical setae. Antennomere XI drop-shaped. Junctions of antennomeres glabrous.

Thorax. Pronotum subquadrate, longer than wide (PL = 3.68 mm; PW = 3.09 mm); widest at posterior third; with microsculpture; anterior and posterior angles rounded. Pronotal disc glabrous, smooth or with irregular striae. Anterior margin projected ventrally. Carina connecting groove to anterior margin; anterior grooves continuous and usually punctate, not reaching median groove. Anterior portion of median groove drop-shaped, narrowing posteriorly, reaching posterior channel. Posterior channel wide. Lateroposterior channel not reaching posterior setiferous puncture. Lateral channel impressed, slightly wider posteriorly, extending from anterior angle to just before posterior setiferous puncture. Prosternum glabrous

and shiny, with isodiametric microsculpture; with central striae; anterior margin slightly carinate; anterior grooves usually transversely punctate. Proepisternum glabrous and shiny, surface punctate, with microsculpture; striae occasionally reaching hypomerion; posterior third rugose. Prosternal process glabrous and rugose, with one setiferous puncture. Proepimeron rugose. Mesosternum glabrous, punctate laterally, punctures diminishing toward central portion. Metepisternum punctate, with two deep depressions. Metasternum smooth.

Legs black to dark brown. Procoxa shiny and rugose, with anterior setae. Meso- and metacoxae with two distal setiferous punctures. Protrochanter with two setae; meso- and metatrochanter with one setiferous puncture each. Profemur swollen, with microsculpture; dorsal and ventral surfaces striate. Mesofemur slightly swollen, with microsculpture; ventral surface striate with setae; dorsal inner margin bearing a row of 9–12 short setae. Metafemur slightly swollen, ventral surface with one median seta on posterior margin. Protibia slightly flattened; dorsal surface with two grooves, central groove distinct but fading toward base; ventral surface rugose; outer margin with projection or flat; apex with three rounded teeth, apical tooth projecting ventrally; inner margin with a row of five short setae; cleaning incision present distally on flexor side; with apical and subapical spurs. Antennal cleaner emarginate, with two longitudinal grooves and one apical seta. Meso- and metatibiae elongated, bearing setae denser at apex; dorsal and ventral surfaces with longitudinal carinae; outer margin with two apical spurs. Tarsi with five segments; tarsomere I longer than II–IV, with a row of setae; tarsomeres I–IV with an apical crown of setae; tarsomere V with only two apical setae. Claws simple, with arolium.

Elytra. Rectangular, with parallel margins; longer than wide ($EL = 7.03$; $EW = 1.75$), completely covering the abdomen dorsally; narrowing posteriorly. Humeri rounded. With parascutellar stria and scutellar pore on second interval. Eight complete striae reaching the posterior margin; striae punctate, deeper in the posterior third than in the median portion. Intervals 2–4 wider and more elevated; seventh stria originating near the humerus; eighth stria bearing umbilicate setae, reaching the elytral suture.

Abdomen ($AL = 2.92$; $AW = 4.15$). Black to dark brown; with six visible ventrites, glabrous. V2 smooth, with a paramedian carina, rounded anteriorly; median portion smooth. V2–V5 with irregular punctures, concentrated laterally and decreasing toward the median region; two paramedian setiferous pores present. Last two ventrites with a transverse groove, punctate anteriorly. V6 punctate mainly in the anterior portion; with two paralateral and two paramedian setiferous pores. **Male genitalia** (Fig. 17A). Median lobe of aedeagus arcuate from the base,

lateral margins curved; apex elongate and rounded; phallobase straight. Parameres subequal. Right paramere curved and apically narrow; with seven apical setae: two terminal and five subapical; subequal in length. Left paramere arcuate, wide at base; with four apical setae: two terminal and two subapical. **Female genitalia** (Fig. 17B). Gonostyli robust, wider at base; inner margin slightly curved, with a basal tooth; truncate at apex; setae distributed along inner and outer margins of gonostyli. Bursa copulatrix wider medially; spermatheca elongate, broader at apex, rounded distally.

***Pyramoides lispectorae* sp. nov. Libreros-Hernández & Vieira**

(Figs. 1B, 4B).

Type material. Holotype (Fig. 1B): ♂, **Brazil.** Mato Grosso. Barão de Melgaço, SESC. Pantanal. 16°39'06"S 56°14'41"W. 125 mm. vii-ix-x-xii.2021. Col: Vicente & Arruda / Q. precoce-Cont. B1PFP1.

Paratypes: 20♂ Brazil. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°39'06"S 56°14'41"W, 124 m, ix. 2021. Col: Vicente. Q. Modal-Cont, B1PFP2. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal. 16°39'18"S 56°14'18"W, 125 m, ix. 2021. Col: Vicente, Q. Modal-Trat, B1PFP7. 2. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°39'18"S 56°14'18"W, 125 m, ix.2021. Col: Vicente. Q. Modal-Trat, B1PFP5. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col: Vicente & Arruda. Q. Precoce-Cont, B2PFP3. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col: Vicente & Arruda. Q. Precoce-Cont, B2PFP1. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°39'18"S 56°14'18"W, 125 m, ix.2021. Col: Vicente. Q. Modal-Trat, B1PFP6. 2. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col: Vicente & Arruda. Q. Precoce-Cont, B2PFP2. 2. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°43'44"S 56°20'35"W, 124 m, vii.2021. Col: Vicente & Arruda. Q. Precoce-Cont, B3AFP8. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col: Vicente & Arruda. Q. Precoce-Cont, B2AFP8. 2. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col: Vicente & Arruda. Q. Precoce-Cont, B2PFP6. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°43'44"S 56°20'35"W, 124 m, vii.2021. Col: Vicente & Arruda.

- 1 Q. Precoce-Cont, B3PFP9. 3. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°39'25"S
 2 56°14'07"W, 125 m, x.2021. Col: Vicente. Q.Tardio-Trat, B1PFP1. 1. Mato Grosso, Barão de
 3 Melgaço, SESC, Pantanal, 16°39'25"S 56°14'07"W, 125 m, x.2021. Col: Vicente. Q.Tardio-
 4 Trat, B1PFP2. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°43'46"S 56°20'37"W,
 5 126 m, ix.2021. Col: Vicente. Q. Modal-Trat, B3PFP6.
- 6 **20♀ Brazil.** 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°39'25"S 56°14'07"W, 125
 7 m, x.2021. Col: Vicente. Q. Tardio-Trat, B1PFP2. 1. Mato Grosso, Barão de Melgaço, SESC,
 8 Pantanal, 16°39'25"S 56°14'07"W, 125 m, x.2021. Col: Vicente. Q.Tardio-Trat, B1PFP8. 1.
 9 Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m, ix. 2021.
 10 Col: Vicente. Q. Modal-Cont, B2PFP3. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal,
 11 16°42'19"S 56°10'28"W, 128 m, ix.2021. Col: Vicente. Q. Model-Cont, B2AFP3. 3. Mato
 12 Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col:
 13 Vicente & Arruda. Q. Precoce-Cont, B2PFP1. 1. Mato Grosso Barão de Melgaço, SESC,
 14 Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col: Vicente & Arruda. Q. Precoce-Trat,
 15 B2PFP7. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m,
 16 vii.2021. Col: Vicente & Arruda. Q. Precoce-Cont, B2PFP3. 1. Mato Grosso, Barão de
 17 Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col: Vincent & Arruda.
 18 Q. Precoce-Cont, B2PFP4. 1. Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128
 19 m, vii.2021. Col: Vincent & Arruda. Q. Precoce-Cont, B2PFP7. 1. Mato Grosso, Barão de
 20 Melgaço, SESC, Pantanal, 16°43'52"S 56°20'48"W, 122 m, vii.2021. Col: Vicente & Arruda.
 21 Q. Precoce-Trat, B3AFP9. 2. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°39'06"S
 22 56°14'41"W, 124 m, ix.2021. Col: Vicente Q. Model-Cont, B1AFP4. 2. Mato Grosso, Barão de
 23 Melgaço, SESC, Pantanal, 16°39'18"S 56°14'18"W, 125 m, ix.2021. Col: Vicente. Q. Modal-
 24 Trat, B1AFP4. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°39'18"S 56°14'18"W,
 25 125 m, ix.2021. Col: Vicente. Q. Modal-Trat, B1PFP2. 1. Mato Grosso, Barão de Melgaço,
 26 SESC, Pantanal, 16°39'18"S 56°14'18"W, 125 m, ix.2021, Col: Vicente. Q. Modal-Trat,
 27 B1PFP6. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°43'44"S 56°20'35"W, 124 m,
 28 vii.2021. Col: Vicente & Arruda. Q. Precoce-Cont, B3PFP6. 1. Mato Grosso, Barão de
 29 Melgaço, SESC, Pantanal, 16°43'44"S 56°20'35"W, 124 m, ix.2021. Col: Vicent. Q. Modal-
 30 Cont, B3AFP1.
- 31 **Additional material: 14 ♂ Brazil.** 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal,
 32 16°39'06"S 56°14'41"W, 124 m, ix.202. Col: Vicente. Q. Modal-Cont, B1AFP4. 1. Mato

- 1 Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'58"S 56°10'35"W, 127 m, ix.2021. Col:
 2 Vicente. Q. Modal-Trat, B2AFP9. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal,
 3 16°42'58"S 56°10'35"W, 127 m ix.2021. Col: Vicente. Q.Modal-Trat, B2AFP4. 1. Mato
 4 Grosso, Barão de Melgaço, SESC, Pantanal, 16°39'18"S 56°14'18"W, 125 m, ix.2021. Col:
 5 Vicente. Q. Modal-Trat, B1AFP4. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal,
 6 16°43'52"S 56°20'48"W, 122 m, vii. 2021. Col: Vicente & Arruda. Q. Precoco-Trat, B3AFP9.
 7 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii. 2021.
 8 Col: Vincent & Arruda. Q. Precoco-Cont, B2PFP7. 1. Mato Grosso, Barão de Melgaço, SESC,
 9 Pantanal, 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col: Vincent & Arruda. Q. Precoco-Cont.
 10 B2AFP4. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°43'44"S 56°20'35"W, 124
 11 m, vii.2021. Col: Vincent & Arruda. Q. Precoco-Cont, B3AFP5. 1. Mato Grosso, Barão de
 12 Melgaço, SESC, Pantanal, 16°41'19"S 56°10'28"W, 130 m, vii. 2021. Col: Vicente & Arruda,
 13 Q.Precoco-Cont, B2PFP7. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal. 16°42'58"S
 14 56°10'35"W, 127 m, ix. 2021. Col: Vicente, Q. Modal-Trat, B2PFP6. 1. Mato Grosso, Barão
 15 de Melgaço, SESC, Pantanal, 16°43'44"S 56°20'35"W, 124 m, ix. 2021. Col: Vicente, Q.
 16 Modal-Cont, B3PFP4. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°43'46"S
 17 56°20'37"W, 126 m, x.2021. Col: Vicente, Q. Modal-Trat, B3AFP7. 2. Mato Grosso, Barão de
 18 Melgaço, SESC, Pantanal. 16°42'19"S 56°10'28"W, 128 m, vii.2021. Col: Vicente & Arruda,
 19 Q. Precoco-Cont, B2PFP5.
- 20 **5♀ Brazil.** 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°43'44"S 56°20'35"W, 124
 21 m, ix.2021. Col: Vicente. Q. Modal-Cont, B3AFP3. 1. Mato Grosso, Barão de Melgaço, SESC,
 22 Pantanal, 16°43'44"S 56°20'35"W, 124 m, vii.2021. Col: Vicente & Arruda. Q. Precoco-Cont,
 23 B3AFP5. 1. Mato Grosso, Barão de Melgaço, SESC, Pantanal, 16°43'44"S 56°20'35"W, 124
 24 m, vii.2021. Col: Vicente & Arruda. Q. Precoco-Cont, B3PFP9. 1. Mato Grosso, Barão de
 25 Melgaço, SESC, Pantanal, 16°43'44"S 56°20'35"W, 124 m, vii.2021. Col: Vicente & Arruda.
 26 Q. Precoco-Trat, B3AFP2. 1. Mato Grosso, Vila Bela da Santíssima Trindade, Mineração
 27 Apoená, P. São Francisco, 14°49'09.3"S 59°40'12.0"W, 683 m, 1-6.iii.2013. Col: R.AK.
 28 Ribeiro, manual collection.
- 29 **Differential diagnosis.** *Pyramis lispectorae* sp. nov. is like *P. matogrossensis* sp. nov.;
 30 however, it differs by having elytral striae punctate and deeper in the apical third, a smooth
 31 metepisternum with two shallow depressions, the right paramere of the aedeagus with eight

apical setae, the left paramere broader at midlength with only two setae, and a spermatheca curved from the base, narrow at midlength and broad apically.

Description (Figs. 1B, 4B). Length ($L = 12.32$ mm), width ($W = 3.34$ mm). Coloration. Black, reddish-brown.

Head. Hexagonal, narrower than pronotum ($HL = 1.57$ mm; $HW = 2.25$ mm). Eyes well developed, without lateral projection. Labrum with five setiferous punctures, anterior margin sinuate. Clypeus with a slightly sinuate transverse groove; clypeal wings rounded; median portion with deep depression, surface smooth. Frontal grooves strongly impressed. Supraocular plate marginate and elevated, with supraocular fovea. Posterior margin smooth. Neck glabrous and smooth. Mentum with microsculpture; irregular punctures with one pair of paralateral setiferous punctures. Median tooth keel-shaped, acute at apex, longer than lateral lobes, with lateral projection and two basal setae. Anterior margin of lateral lobes truncate; transverse sulcus impressed. Submentum with microsculpture, bearing two pairs of paramedian and paralateral setiferous punctures. Gula wide posteriorly, with microsculpture and striae. Gena with deep depression, surface smooth. Postgena glabrous, rugose and striate. **Antennae.** Submoniliform, short, not reaching posterior margin of pronotum; 11 antennomeres; pubescence yellow-golden. Scape with microsculpture, apically imbricate; longer than following antennomeres; with apical setiferous puncture. Pedicel with medial seta, narrowed basally. Antennomere III with apical pubescence; antennomere IV with denser pubescence on apical two-thirds; antennomeres V–XI with dense pubescence from base, with apical setae. Antennomere XI drop-shaped. Intersegmental junctions glabrous.

Thorax. Pronotum subquadrate, slightly longer than wide ($PL = 3.61$ mm; $PW = 3.15$ mm), with microsculpture; anterior and posterior angles rounded. Pronotal disc glabrous, smooth or with irregular striae. Anterior margin projected ventrally. Carina connecting groove to anterior margin; anterior grooves continuous, not reaching median groove; anterior portion of median groove drop-shaped, narrowing posteriorly, not reaching posterior channel. Posterior channel wide. Lateroposterior channel continuous, fading at posterior setiferous puncture. Lateral channel superficial, wider posteriorly, extending from anterior angle of pronotum to just before posterior setiferous puncture. Prosternum glabrous and shiny, with isodiametric microsculpture; central striae present; anterior margin carinate; anterior grooves continuous transversely. Proepisternum glabrous and shiny, surface smooth with microsculpture; striae occasionally reaching hypomeron; posterior third striate. Prosternal process glabrous; smooth, punctate or

1 rugose; with one setiferous puncture. Proepimeron rugose. Mesosternum glabrous, punctate
 2 laterally, punctures diminishing toward central portion. Metepisternum smooth, with two
 3 shallow depressions. Metasternum smooth.

4 **Legs** black to reddish-brown. Procoxa shiny and rugose, with anterior setae. Meso- and
 5 metacoxae with two distal setiferous punctures. Protrochanter with two setae; meso- and
 6 metatrochanter with one setiferous puncture each. Profemur swollen, with microsculpture;
 7 dorsal surface striate, ventral surface smooth. Mesofemur slightly swollen, with microsculpture;
 8 smooth or striate; ventral surface with three setae; inner margin of dorsal surface with a row of
 9 6–11 short setae. Metafemur slightly swollen, ventral surface with one median seta on posterior
 10 margin. Protibia slightly flattened; dorsal surface with two grooves, central groove extending
 11 to apical one-third, not reaching base; ventral surface smooth; outer margin with one or two
 12 projections; apex with two rounded teeth, apical tooth projecting ventrally; inner margin with
 13 a row of four short setae; cleaning incision on distal flexor side; with apical and subapical spurs;
 14 antennal cleaner emarginate, with two longitudinal grooves and one apical seta. Meso- and
 15 metatibiae elongated, with rows of setae, denser at apex; dorsal and ventral surfaces with
 16 longitudinal carinae; outer margin with two apical spurs. Tarsi with five segments; tarsomere I
 17 longer than II–IV, with a row of setae; tarsomeres I–IV with an apical crown of setae; tarsomere
 18 V with two apical setae. Claws simple, with arolium.

19 **Elytra.** Elliptical, convex; longer than wide (EL = 6.47 mm; EW = 1.68 mm), longest at median
 20 portion, completely covering the abdomen dorsally, narrowing posteriorly. Humeri rounded.
 21 With parascutellar stria and scutellar pore on the second interval; eight complete striae reaching
 22 posterior margin; elytral striae punctate, deeper in the posterior third than in the median portion.
 23 Elytral intervals 1–4 wide and slightly elevated; seventh stria arising after humerus; eighth stria
 24 bearing umbilicate setae, reaching elytral suture.

25 **Abdomen** black to reddish-brown (AL = 3.73 mm; AW = 2.24 mm); with six visible ventrites,
 26 glabrous. V2 with a paramedian carina, acute or rounded anteriorly, median portion smooth.
 27 V3–V5 irregularly punctate, punctures concentrated laterally and decreasing medially; two
 28 paramedian setiferous punctures present. Last two ventrites with a transverse groove, punctate
 29 anteriorly; V6 punctate mainly in anterior portion; two pairs of paramedian and paralateral
 30 setiferous punctures. **Male genitalia** (Fig. 17C). Median lobe of aedeagus slightly arcuate at
 31 midlength; apex narrow and rounded; phallobase straight; endophallus glabrous. Parameres
 32 subequal in length: right paramere with eight apical setae arranged longitudinally, the last two

longer and thicker than subapical setae; left paramere broader at midlength with only two apical setae. **Female genitalia** (Fig. 17D). Gonostyli elongate, apically curved, acute at apex; inner margin convex; anterior basal angles rounded; setae distributed medially, longer and thicker along outer margin. Bursa copulatrix broad medially; spermatheca curved from base, narrow at midlength and broad apically, apex rounded; accessory gland slender at base, expanded medially, dilated apically.

Etymology. The specific epithet *Pyramoides lispectorae* sp. nov. honors the Brazilian writer Clarice Lispector, one of the most influential and inspiring literary figures in Latin America during the 20th century. Renowned for her intense prose, C. Lispector explored human psychology, inspiring generations of readers. This name celebrates her contribution to Brazilian literature.

***Pyramoides matogrossensis* sp. nov. Libreros-Hernández & Vieira**

(Figs. 1C, 5C)

Type material. Holotype (Fig. 1C): ♂, **Brazil:** Mato Grosso. Cotriguaçu. Fazenda, São Nicolau (matinha). 09°50'25"S 58°15'31"W. 237 mm. 28-30-x-2021. Col: J. Mariano et al. Hum fec, AF04P2.

Paratypes: 1♀ **Brazil:** Mato Grosso. Cotriguaçu. Fazenda, São Nicolau. 09°49'09"S 58°15'31"W. 230 mm. 21-x-2018. Col: V. Costa-Silva et al. **1♂.** Mato Grosso, Cotriguaçu, Faz, São Nicolau (Talhão 30), 09°51'16"S 58°15'00"W. 219 mm. 27-29.x.2021. Col: J. Mariano et al. Hum fec, AT30P1.

Differential diagnosis. *Pyramoides matogrossensis* sp. nov. is very similar to *P. lispectorae* sp. nov.; however, it can be distinguished by having elytral striae punctate with uniform depth along the elytra, a metepisternum with two deep depressions, the right paramere of the aedeagus with seven apical setae, and the left paramere broader at midlength with only two apical setae.

Description (Figs. 1C, 5C). Total length (L = 14.00 mm), total width (W = 3.66 mm). Coloration. Black, dark brown.

Head. Hexagonal, narrower than pronotum (HL = 2.00 mm; HW = 2.36 mm). Eyes normally developed, without lateral projection. Labrum with five setiferous punctures, anterior margin

sinuate. Clypeus with a slightly sinuate transverse groove; clypeal wings rounded; median portion with shallow depression, surface smooth. Frontal grooves strongly impressed. Supraocular plate marginate and elevated, with supraocular fovea. Posterior margin smooth. Neck glabrous and smooth. Mentum with microsculpture; irregular punctures; one pair of posterior paralateral setiferous punctures. Median tooth keel-shaped, acute at apex, longer than lateral lobes; with lateral projection; with two basal setae. Anterior margin of lateral lobes truncates or rounded; transverse sulcus impressed. Submentum with microsculpture, bearing two pairs of paramedian and paralateral setiferous punctures. Gula broad posteriorly, with microsculpture; posterior striae present. Gena with deep depression, surface smooth. Postgena glabrous, rugose, and striate. **Antennae.** Submoniliform, short, not reaching posterior margin of pronotum; 11 antennomeres; pubescence yellow-golden. Scape with microsculpture, apically imbricate; longer than following antennomeres; with apical setiferous puncture. Pedicel with medial seta, narrowed basally. Antennomere III with apical pubescence; antennomere IV with denser pubescence on apical two-thirds; antennomeres V–XI with dense pubescence from base, with apical setae. Antennomere XI drop-shaped. Intersegmental junctions glabrous.

Thorax. Pronotum subquadrate, longer than wide (PL = 4.00 mm; PW = 3.45 mm); anterior and posterior angles rounded. Pronotal disc glabrous, smooth or with irregular striae. Anterior margin projected ventrally. No carina connecting groove to anterior margin; anterior grooves continuous, not reaching median groove; anterior portion of median groove drop-shaped, continuous, not reaching posterior channel. Posterior channel narrow. Lateroposterior channel continuous to posterior setiferous puncture. Lateral channel superficial, wider posteriorly, extending from anterior angle of pronotum to just before posterior setiferous puncture. Prosternum glabrous and shiny, with isodiametric microsculpture; central striae present; anterior margin carinate and rounded; anterior grooves continuous transversely. Proepisternum glabrous and shiny, surface smooth; striae occasionally reaching hypomeron; posterior third smooth. Prosternal process glabrous; smooth, punctate or rugose; with one setiferous puncture. Proepimeron glabrous and shiny; punctate or rugose. Mesosternum glabrous, punctate laterally, punctures decreasing toward central portion. Metepisternum smooth, with two deep depressions. Metasternum smooth.

Legs. Black to dark brown. Procoxa shiny and rugose, with anterior setae. Meso- and metacoxae with two distal setiferous punctures. Protrochanter with two setae; meso- and metatrochanter with a single setiferous puncture. Profemur swollen, with microsculpture; dorsal surface smooth

or striate; ventral surface smooth. Mesofemur slightly swollen, with microsculpture; smooth or striate; ventral surface with three setae; inner margin of dorsal surface with a row of 6–8 short setae. Metafemur slightly swollen, ventral surface with one median seta on posterior margin. Protibia slightly flattened; dorsal surface with two grooves, central groove extending to apical one-third, not reaching base; ventral surface smooth; outer margin with one projection; apex with two rounded teeth, apical tooth projecting ventrally; inner margin with a row of four short setae; cleaning incision on distal flexor side; with apical and subapical spurs; antennal cleaner emarginate, with two longitudinal grooves and one apical seta. Meso- and metatibiae elongated, with rows of setae, denser at apex; dorsal and ventral surfaces with longitudinal carinae; outer margin with two apical spurs. Tarsi with five segments; tarsomere I longer than II–IV, with a row of setae; tarsomeres I–IV with an apical crown of setae; tarsomere V with two apical setae. Claws simple, with arolium.

Elytra. Elliptical, convex; longer than wide (EL = 7.22 mm; EW = 1.80 mm), longest at median portion, completely covering the abdomen dorsally, narrowing posteriorly. Humeri rounded. With parascutellar stria and scutellar pore on the second interval. Eight complete striae reaching posterior margin; elytral striae punctate continuously, uniformly deep. Elytral intervals of equal width and flat; seventh stria arising after humerus; eighth stria bearing umbilicate setae, reaching elytral suture.

Abdomen (AL = 4.32 mm; AW = 3.42 mm). Black, dark brown; with six visible ventrites, glabrous. V2 with paramedian carina, rounded anteriorly; median portion smooth. V3–V5 irregularly punctate, punctures concentrated laterally, decreasing medially; two paramedian setiferous punctures present. Last two ventrites with a transverse groove, punctate anteriorly; V6 punctate mainly anteriorly, with two pairs of paramedian and paralateral setiferous punctures. **Male genitalia** (Fig. 18A). Median lobe of aedeagus arcuate in apical third; apex elongate and rounded; phallobase straight; endophallus glabrous. Parameres subequal: right paramere with seven apical setae arranged longitudinally, last two longer and thicker than subapical setae; left paramere broader at midlength with only two apical setae. **Female genitalia.** Unknown.

Etymology. The specific epithet *Pyramoides matogrossensis* sp. nov. is derived from the name of the state of the type locality. This designation recognizes the rich biodiversity of the region, which harbors a variety of ecosystems and unique species, including numerous beetles that contribute to environmental balance.

***Pyramoides amazonensis* sp. nov. Libreros-Hernández & Vieira**

(Figs. 1D, 4D)

Type material. Holotype (Fig. 1D): 1♀ **Brazil.** Amazonas. Coari. Lago do Uauaçu. 4°13'37"S 62°22'36"W. 47 m. 27.x.2018. Col: JBR AIencar. Armadilha: Pitfall. Terra firme. TF1A10.

Differential diagnosis. *Pyramoides amazonensis* exhibits characters like *P. paraensis* but can be distinguished by the rounded shape of the head; median portion of the clypeus without depression; abdominal ventrites with punctures distributed laterally; prosternal process and proepimeron punctate.

Description (Figs. 1D, 4D). Total length (L = 10.97 mm), total width (W = 3.24 mm). Coloration. Black, dark brown.

Head. Rounded (HL = 1.44 mm; HW = 2.03 mm). Eyes well developed, without lateral projection. Labrum with five setiferous punctures, anterior margin sinuose. Clypeus with slightly sinuose transverse groove; clypeal wings rounded; median portion smooth, without depression. Frontal grooves strongly impressed. Supraocular plate marginate and elevated, with supraocular fovea; posterior margin smooth. Neck glabrous, smooth. Mentum with microsculpture; irregular punctures; one pair of posterior paralateral setiferous punctures. Median tooth keel-shaped, acute at apex, longer than lateral lobes; with lateral projection; two basal setae. Anterior margin of lateral lobes truncate; transverse sulcus impressed. Submentum with microsculpture, bearing two pairs of paramedian and paralateral setiferous punctures. Gula parallel-sided, glabrous, with microsculpture and basal striae. Gena with deep depression, surface smooth. Postgena glabrous, striate. **Antennae.** Submoniliform, short, not reaching posterior margin of pronotum; 11 antennomeres; yellow-golden pubescence. Scape with microsculpture, apically imbricate; longer than following antennomeres; apical setiferous puncture present. Pedicel with medial seta, basally narrow. Antennomere III with apical pubescence; antennomere IV with denser pubescence on apical two-thirds; antennomeres V–XI with dense pubescence from base, with apical setae. Antennomere XI drop shaped. Intersegmental junctions glabrous.

Thorax. Pronotum subquadrate, longer than wide (PL = 3.20 mm; PW = 3.07 mm), widest at posterior third; with microsculpture. Anterior and posterior angles rounded. Pronotal disc glabrous, with irregular striae. Anterior margin projected ventrally. Carina connecting groove to anterior margin; anterior grooves continuous, not reaching median groove; anterior portion of median groove drop-shaped, continuous, fading posteriorly, not reaching posterior channel. Posterior channel narrow. Lateroposterior channel continuous, fading at posterior setiferous puncture. Lateral channel impressed, wider posteriorly, extending from anterior pronotal angle to just before posterior setiferous puncture. Prosternum glabrous, shiny, with isodiametric microsculpture; central striae present; anterior margin slightly carinate, rounded; anterior grooves continuous transversely. Proepisternum glabrous, shiny, surface smooth; microsculpture present; striae occasionally reaching hypomeron; posterior third striate. Prosternal process glabrous, punctate, with one setiferous puncture. Proepimeron punctate. Mesosternum glabrous, punctate laterally, punctures decreasing toward central portion. Metepisternum smooth, with two deep depressions. Metasternum smooth.

Legs. Black, dark brown. Procoxa shiny, rugose, with anterior setae. Mesocoxa and metacoxa with two distal setiferous punctures. Protrochanter with two setae. Meso- and metatrochanters with one setiferous puncture each. Profemur swollen, with microsculpture; dorsal surface with striae; ventral surface smooth. Mesofemur slightly swollen, with microsculpture; striate; three ventral setae; dorsal inner margin with a row of 11 short setae. Metafemur slightly swollen; ventral surface with a median seta on posterior margin. Protibia slightly flattened; dorsal surface with two grooves, central groove marked, fading basally; ventral surface rugose; outer margin with a projection; apex with two rounded teeth, apical tooth projected ventrally; inner margin with a row of four short setae; cleaning notch on distal flexor side; with apical and subapical spurs; antennal cleaner emarginate, with two longitudinal grooves bearing one apical seta. Meso- and metatibiae elongated; with rows of spines, thicker apically; dorsal and ventral surfaces with longitudinal carinae; two apical spurs on outer margin. Tarsi with five segments; T1 longer than T2–T4, with one row of setae; T1–T4 with apical crown of setae; T5 with only two apical setae; claws simple, with arolium.

Elytra. Ellipsoid, convex; longer than wide (EL = 5.71 mm; EW = 1.70 mm), widest at median portion; covering entire dorsal abdomen, narrowing posteriorly. Humerus rounded. With parascutellar stria and scutellar pore in the second interval; eight complete striae reaching posterior margin; elytral striae punctate, deeper in posterior third than in median portion. Elytral intervals

1 1–6 more elevated than the others; 7th stria originates after humerus; 8th stria with umbilicate
2 setae, reaching the elytral suture.

3 **Abdomen.** Black (AL = 5.75 mm; AW = 4.05 mm); six visible ventrites, glabrous. Ventrite II
4 with paramedian carina, rounded anteriorly; median portion punctate. Ventrites II–V irregularly
5 punctate, concentrated laterally, decreasing toward median portion; two paramedian setiferous
6 punctures. Last two ventrites with a transverse sulcus, punctate anteriorly. Ventrite VI punctate
7 mainly anteriorly; with two pairs of paralateral and paramedian setiferous punctures. **Male**
8 **genitalia.** Unknown. **Female genitalia** (Fig. 19A): Gonostyli broad, narrowing apically, apex
9 rounded; base of gonostyli wider, setae distributed longitudinally. Bursa copulatrix wider at
10 median portion; spermatheca curved at base, apex rounded; accessory gland long and slender.
11 Vagina broad apically.

12 **Etymology.** The specific epithet *Pyramoides amazonensis* sp.nov. refers to the state of the type
13 locality. This designation highlights the remarkable biodiversity and ecological significance of
14 Amazonas as a unique ecosystem, renowned for its wide range of flora and fauna. This biome
15 harbors countless species and plays a vital role in climate regulation and the maintenance of
16 global ecological balance.

17 ***Pyramoides colombiaensis* sp. nov. Libreros-Hernández & Vieira.**

18 **(Figs. 2A, 5A).**

19 **Type material. Holotype (Fig. 2A):** 1♂ **Colombia:** Meta. Puerto López. Remolino. 4°17'18"N
20 72°36'15"W, 165 m. 12-15-x-2012. Col: O Caro.

21 **Paratype:** 1♂ **Colombia:** Meta. Puerto Gaitán. Altamira-Club los Llaneros. 4°8'31.79"N
22 73°38'48.45"W. 140 m. 23-x-2006. Col: Salazar et al.

23 **Differential diagnosis.** *P. colombiaensis* sp. nov. resembles *P. pantanensis* sp. nov. in having
24 laterally projected eye margins; however, it differs by the labrum with six or more setiferous
25 punctures, continuous elytral striae with punctures deeper in the posterior third, anterior margin
26 of the lateral lobes of the mentum curved, and smooth abdominal ventrites.

27 **Description** (Figs. 2A and 5A). Total length (L = 15.22 mm); width (W = 4.08 mm).
28 Coloration: black, dark brown.

Head. Hexagonal, as wide as the anterior portion of the pronotum (HL = 2.05 mm; HW = 2.63 mm). Eyes well developed, laterally projected. Labrum with 6–7 setiferous punctures, anterior margin sinuate. Clypeus with a transverse sulcus, slightly sinuate; clypeal wings rounded; median portion with a shallow depression, surface smooth. Facial sulci strongly impressed. Supraocular plate margined and elevated; with supraocular fovea. Posterior margin smooth. Neck glabrous and smooth. Mentum with micro-sculptures; punctures irregular; with a pair of lateral setiferous punctures. Median tooth keel-shaped, acute apically, longer than lateral lobes, with lateral projection, and two basal setae. Anterior margin of lateral lobes curved. Transverse sulcus impressed. Submentum with micro-sculptures; with two pairs of paramedian and paralateral setiferous punctures. Gula wide posteriorly, with micro-sculptures and grooves. Gena with deep depression, surface smooth. Postgena glabrous, rugose with grooves. Antennae submoniliform, short, not reaching posterior pronotum; with 11 antennomeres. Pubescence yellow-golden. Scape with micro-sculptures, apically imbricate; longer than following antennomeres; with apical setiferous puncture. Pedicel with medial seta, basally narrow. A3 with apical pubescence; A4 with denser pubescence on apical two-thirds; A5–A11 with dense pubescence from base, with apical setae. A11 drop-shaped. Intersections of antennomeres glabrous.

Thorax. Pronotum rectangular, longer than wide (PL = 4.75 mm; PW = 3.84 mm), wider in the posterior third; with micro-sculptures. Anterior and posterior angles rounded. Pronotal disc glabrous; with irregular grooves. Anterior margin continuous to anterior angle. Carina connecting the sulcus to the anterior margin. Anterior sulci continuous, sinuate, not reaching the central sulcus; anterior portion of central sulcus drop-shaped, narrowing posteriorly, reaching posterior channel. Posterior channel wide. Lateroposterior channel continuous to just before posterior setiferous puncture. Lateral channel impressed, wide posteriorly, fading anteriorly; extending from anterior setiferous puncture to just before posterior setiferous puncture. Prosternum glabrous and shiny; with isodiametric micro-sculptures; central grooves present; anterior margin smooth; anterior sulci continuous transversely. Proepisternum glabrous and shiny; surface smooth, with micro-sculptures; grooves sometimes extending to the hypomeron; smooth in posterior third. Prosternal process glabrous and rugose; with one setiferous puncture. Proepisternum rugose. Mesosternum glabrous, laterally punctate, punctation decreasing toward center. Metepisternum smooth, with two deep depressions. Metasternum smooth.

Legs. Black, dark brown. Procoxa rugose and shiny; with anterior setae. Meso- and metacoxae with two distal setiferous punctures. Protrocanter with two setae. Meso- and metatrochanters with a single setiferous puncture. Profemur swollen; with micro-sculptures; dorsal surface smooth, ventral surface with grooves. Mesofemur slightly swollen; with micro-sculptures; with grooves and ventral setae; dorsal inner margin with a row of nine short setae. Metafemur slightly swollen, ventral surface with one median seta on posterior margin. Protibia slightly flattened; dorsal surface with two grooves, fading toward apical third, not reaching tibial base; ventral surface smooth; external margin with a projection; with three rounded teeth at apex; apical tooth projected ventrally; internal margin with a row of five short setae; cleaning incision on distal flexor side; with apical and subapical spurs; antennal cleaner emarginated; with two longitudinal grooves bearing one apical seta. Meso- and metatibiae elongated; with rows of spines, thicker at apex; ventral and dorsal surfaces with longitudinal carinae; with two apical spurs on external margin. Tarsi with five segments; T1 longer than T2–T4, with a row of setae; T1–T4 with a crown of apical setae; T5 with two apical setae; claws simple, with arolium.

Elytra. Ellipsoid, convex; longer than wide ($EL = 7.63$; $EW = 2.06$), widest at the median portion, completely covering the abdomen dorsally; narrowing posteriorly. Humerus rounded. With para-scutellar stria and scutellar pore in the second interval; eight complete striae, reaching the posterior margin; elytral striae continuous; punctures in the apical third deeper. Elytral intervals 2–4 elevated. Seventh stria originates after the humerus; eighth stria with umbilical setae, reaching the elytral suture.

Abdomen. Black, dark brown ($AL = 6.79$; $AW = 4.92$); with six visible ventrites, glabrous. V2 with a paramedian carina, acute anteriorly; median portion smooth. V2–V5 smooth; with a pair of paramedian setiferous punctures; last two ventrites with a continuous transverse sulcus. V6 smooth; with two pairs of paralateral and paramedian setiferous punctures. **Male genitalia** (Fig. 18B): median lobe of the aedeagus broader and slightly arcuate, apex short and rounded; phallobase straight. Parameres subequal: right paramere arcuate medially, apex rounded, with seven apical setae arranged longitudinally, the last two setae longer and thicker than the subapicals; left paramere broad at base, narrowing apically, with only two apical setae. **Female genitalia:** unknown.

Etymology. The specific epithet of *Pyramoides colombiaensis* sp. nov. derives from the name of the country of the type locality. This designation highlights the country's rich biodiversity,

globally recognized for its varied ecosystems ranging from mountains to tropical regions, which host a wide array of species essential for ecological balance and nature conservation.

Note. Specimen with an additional seta on V6.

***Pyramoides martinae* sp. nov. Libreros-Hernández & Vieira**

(Figs. 2B, 5B)

Type material. Holotype (Fig. 2B): 1♀ **Brazil:** Santa Catarina. Rio Vermelho. São João do Rio Vermelho. 27°29'29"S 48°24'58"W. 16 m. Sem Data. Col: Dirings.

Differential diagnosis. *Pyramoides martinae* can be distinguished from other species by the transverse sulcus of the clypeus fading medially without an apparent depression, and by the outer margin of the protibia being flat, without a projection. The species exhibits short gonostyles, truncated at the apex; the spermatheca is fully curved, arched in the middle, and broad and rounded at the apex; the accessory gland is slender and longer than the spermatheca.

Description (Figs. 2B and 5B). Total length (L = 13.24); total width (W = 3.40). Coloration: black, dark brown.

Head. Hexagonal, narrower than the pronotum (HL = 1.80; HW = 2.29). Eyes well developed, without lateral projection. Labrum with five setiferous punctures; anterior margin sinuose. Clypeus with transverse sulcus, fading medially; clypeal wings rounded; median portion smooth, without depressions; facial sulci deeply impressed. Supraocular plate margined and elevated, with supraocular fovea. Posterior margin punctate. Neck glabrous and smooth. Mentum with micro-sculptures; irregular punctures with a pair of parallel-lateral setiferous punctures. Median tooth keel-shaped, sharp at apex, longer than lateral lobes, with lateral projection; two setae at the base. Anterior margin of lateral lobes truncated. Transverse sulcus impressed. Submentum with micro-sculptures; two pairs of paramedian and parallel-lateral setiferous punctures. Gula broad posteriorly; with micro-sculptures and grooves. Gena with deep depression; surface rugose. Postgena glabrous; rugose with grooves. Antennae submoniliform, short, not reaching posterior pronotum; with 11 antennomeres. Pubescence golden-yellow. Scape with micro-sculptures, apically imbricated; longer than following

antennomeres; with apical setiferous puncture. Pedicel with medial seta, narrow basally. A3 with pubescence at apex; A4 with denser pubescence in distal two-thirds; A5–A11 with dense pubescence from base, with apical setae. A11 drop-shaped. Antennomere intersections glabrous.

Thorax. Pronotum subquadrate, slightly longer than wide (PL = 3.69; PW = 3.31), widest at posterior third; with micro-sculptures. Anterior and posterior angles rounded. Pronotal disc glabrous; smooth or with irregular grooves. Anterior margin projecting ventrally. No carina connecting sulcus to anterior margin. Anterior sulci continuous, sinuous, not reaching central sulcus. Anterior part of central sulcus drop-shaped, continuous, fading posteriorly, not reaching posterior channel. Posterior channel broad. Lateroposterior channel continuous, ending just before posterior setiferous puncture. Lateral channel impressed, broad posteriorly, extending from anterior angle of pronotum to just before posterior setiferous puncture. Prosternum glabrous and shiny; with isodiametric micro-sculptures; smooth, without grooves; anterior margin smooth, not carinate; anterior sulci transversely punctate. Proepisternum glabrous and shiny; surface punctate, with micro-sculptures; grooves sometimes reaching hypomeron; rugose at posterior third. Prosternal process glabrous and smooth, with one setiferous puncture. Proepimeron rugose. Mesosternum glabrous; punctures lateral, diminishing toward central portion. Metepisternum punctate, with two deep depressions. Metasternum smooth.

Legs. Black to dark brown. Procoxa shiny and rugose, with anterior setae. Meso- and metacoxa each with two distal setiferous punctures. Protrochanter with two setae; meso- and metatrochanter each with one setiferous puncture. Profemur swollen, with micro-sculptures; dorsal and ventral surfaces smooth. Mesofemur slightly swollen, with micro-sculptures and grooves; three ventral setae; dorsal internal margin with a row of 11 short setae. Metafemur slightly swollen; ventral surface with a median seta on posterior margin. Protibia slightly flattened; dorsal surface with two grooves, central groove distinct but fading at base of protibia; ventral surface rugose; outer margin flat, with three rounded apical teeth; apical tooth projected ventrally; inner margin with a row of five short setae; cleaning notch present distally on flexor side; with apical and subapical spurs; antennal cleaner emarginate, with two longitudinal grooves and an apical seta. Meso- and metatibiae elongate, with a row of spines, thickened apically; dorsal and ventral surfaces with longitudinal carinae; outer margin with two apical spurs. Tarsi with five segments; T1 longer than T2–T4, with a row of setae; T1–T4 with an apical crown of setae; T5 with two apical setae; claws simple, with arolium.

Elytra. Ellipsoidal, convex; longer than wide ($EL = 6.88$; $EW = 1.66$); widest at median portion, completely covering the abdomen dorsally; gradually narrowing posteriorly. Humeri rounded. With parascutellar stria and scutellar pore in the second interval. With eight complete striae reaching posterior margin; elytral striae punctate, deeper in posterior third. Elytral intervals 2–4 broader and elevated; 7th stria originating after humerus; 8th stria with umbilicate setae, reaching the elytral suture.

Abdomen. Black to dark brown ($AL = 3.34$; $AW = 2.12$); with six visible ventrites, glabrous. V2 smooth, with paramedian carina rounded anteriorly; median portion smooth. V2–V6 with irregular punctures laterally, decreasing toward median portion; with a pair of paramedian setiferous punctures. V5–V6 with a complete transverse sulcus, punctate anteriorly. V6 mostly punctate anteriorly; with two pairs of setiferous punctures, paralateral and paramedian. **Male genitalia.** Unknown. **Female genitalia** (Fig. 19B). Gonostyli short, apically truncate; inner and outer margins nearly parallel, base broad. Bursa copulatrix broad medially. Spermatheca completely curved, arched medially, broad and rounded apically. Accessory gland slender, longer than spermatheca.

Etymology. The specific epithet *Pyramoides martinae* sp. nov. is dedicated to my father, Martin Libreros López. This name reflects not only the deep admiration and respect I hold for him, but also acknowledges the significant role he played during my childhood. Moreover, it honors his constant presence as a source of support and inspiration throughout my life.

***Pyramoides garciae* sp. nov. Libreros-Hernández & Vieira**

(Figs. 2C, 5C)

Type material. Holotype (Fig. 2C): 1♂ **Brazil:** Piauí. Floriano. Buriti Sol. 08°06'36"S 42°56'40"W. 372 m, 5-12. xi. 1991. E.M. Cancelllo & N.T. Ponte.

Differential diagnosis. *Pyramoides garciae* differs from the other species by having the transverse clypeal sulcus convex. Elytral intervals 2–4 more elevated, forming ridges only on the basal third; body length less than 10 mm.

Description (Figs. 2C, 5C). Length ($L = 8.82$); width ($W = 2.34$). Coloration. Black, dark brown.

1 **Head.** Hexagonal, narrower than pronotum ($HL = 1.24$; $HW = 1.49$). Eyes well developed,
 2 without lateral projection. Labrum with five setiferous punctures and anterior margin sinuate.
 3 Clypeus with a transverse groove, convex; clypeal wings rounded; median portion slightly
 4 depressed, surface smooth. Frontal grooves strongly impressed. Supraocular plate margined
 5 and elevated; with a supraocular fovea. Posterior margin punctate. Neck glabrous and smooth.
 6 Mentum with microsculpture; irregularly punctate with a pair of paralateral setiferous
 7 punctures. Median tooth keel-shaped, acute at apex, longer than lateral lobes; with a lateral
 8 projection; two setae at base. Anterior margin of lateral lobes truncate. Transverse sulcus
 9 impressed. Submentum with microsculpture; with two pairs of paramedian and paralateral
 10 setiferous punctures. Gula broad posteriorly; with microsculpture and rugae. Gena with deep
 11 depression, surface rugose. Postgena glabrous, rugose and rugulose. Antennae submoniliform,
 12 short, not reaching posterior margin of pronotum; with 11 antennomeres. Pubescence
 13 yellowish-golden. Scape with microsculpture, apically imbricate; longer than following
 14 antennomeres; with a setiferous puncture at apex. Pedicel with median seta, basally constricted.
 15 A3 with apical pubescence; A4 with denser pubescence on apical two-thirds; A5–A11 densely
 16 pubescent from base; with apical setae. A11 drop-shaped. Antennomere junctions glabrous.

17 **Thorax.** Pronotum subquadrate, slightly longer than wide ($PL = 2.61$; $PW = 2.13$), widest at
 18 posterior third. With microsculpture. Anterior and posterior angles rounded. Pronotal disc
 19 glabrous, smooth. Anterior margin projected ventrally. Carina connecting anterior sulcus with
 20 anterior margin. Anterior sulci continuous, not reaching median sulcus; anterior portion of
 21 median sulcus drop-shaped, narrowing posteriorly, reaching posterior channel. Posterior
 22 channel broad. Lateroposterior channel continuous, fading near posterior setiferous puncture.
 23 Lateral channel impressed, narrow anteriorly, broad posteriorly; extending from anterior
 24 pronotal angle to slightly before posterior setiferous puncture. Prosternum glabrous and shiny,
 25 with isodiametric microsculpture; median region rugulose; anterior margin carinate; anterior
 26 sulci transversely punctate. Proepisternum glabrous and shiny, surface punctate; with
 27 microsculpture; rugae occasionally reaching hypomeron; punctures irregular, fading
 28 posteriorly; smooth on posterior third. Prosternal process glabrous and rugose; with one
 29 setiferous puncture. Proepimeron glabrous and shiny, rugose. Mesosternum glabrous; laterally
 30 punctate, punctures decreasing toward median region. Metepisternum smooth, with two deep
 31 depressions. Metasternum smooth.

32 **Legs.** Black, dark brown. Procoxae shiny and rugose; with anterior setae. Meso- and metacoxae
 33 with two distal setiferous punctures. Protrochantor with two setae. Meso- and metatrochanters

with one setiferous puncture. Profemora swollen; with microsculpture; dorsal and ventral surfaces smooth. Mesofemora slightly swollen; with microsculpture; three setae on ventral surface; ventral surface with rugae; smooth; inner margin of dorsal surface with a row of 6–8 short setae. Metafemora slightly swollen; ventral surface with one median seta on posterior margin. Protibia slightly flattened; dorsal surface with two grooves; central groove pronounced, fading basally; ventral surface smooth; outer margin with a projection; with three rounded apical teeth; apical tooth projected ventrally; inner margin with a row of three short setae; antennal cleaner emarginated on distal flexor side; with two longitudinal grooves and one apical seta. Meso- and metatibiae elongated; with a row of spines, thicker at apex; dorsal and ventral surfaces with longitudinal carinae; with two apical spurs on outer margin. Tarsi with five segments; T1 longer than T2–T4, with one row of setae; T1–T4 with apical crown of setae; T5 with two apical setae; claws simple, with arolium.

Elytra rectangular, convex; longer than wide ($EL = 4.67$; $EW = 1.35$), widest at median portion. Covering entire dorsal surface of the abdomen; narrowing posteriorly. Humerus rounded. With para-scutellar stria and scutellar pore on the second interval; with eight complete striae, reaching posterior margin; elytral striae punctate, deeper in the posterior third; elytral intervals 2–4 elevated, forming ridges; 7th stria originating posterior to humerus; 8th stria with umbilical setae, reaching the elytral suture.

Abdomen ($AL = 3.31$; $AW = 1.92$). Black, dark brown; with six visible abdominal ventrites, glabrous. V2 smooth; with a paramedian carina, sinuose anteriorly, smooth medially. V2–V5 irregularly punctate, concentrated laterally, decreasing medially; two paramedian setiferous punctures; last two ventrites with a transverse sulcus, punctate anteriorly. V6 punctate mainly anteriorly; with two pairs of paramedian and paralateral setiferous punctures. **Male genitalia** (Fig. 18C): median lobe of the aedeagus arcuate from base, narrowing apically, apex rounded; phallobase straight; parameres subequal. Right paramere rounded at apex, with three setae (two long apical, one subapical); left paramere wider at base, narrowing apically, with three setae at apex (two apical, one subapical). **Female genitalia**: unknown.

Etymology: The specific epithet *Pyramoides garciae* sp. nov. is dedicated to Andrea Lorena García Hernández, professor and researcher at the Universidad del Quindío, Colombia. She has been a fundamental mentor in my academic formation and a significant influence on my passion for entomology and the study of beetles.

1 ***Pyramoides merianae* sp. nov. Libreros-Hernández & Vieira**

2 **(Figs. 3A, 6A).**

3 **Type material. Holotype (Fig. 3A): 1♀ Brazil.** Rio Grande do Sul. Santana do Livramento.
4 30°53'27"S 55°31'58"W. 212 m. 11-12.v.2014. Col: SISBIOTA.

5 **Differential diagnosis.** *Pyramoides merianae* sp. nov. differs from *P. oblongicollis* by the
6 presence of a deep depression in the median portion of the clypeus, a rugose anterior surface,
7 acute clypeal wings, and reddish-brown legs and appendages.

8 **Description** (Figs. 3A, 6A). Total length (L = 13.30), width (W = 3.34). Coloration: reddish-
9 brown.

10 **Head.** Hexagonal, narrower than the pronotum (HL = 1.89; HW = 2.23). Eyes well developed,
11 without lateral projection. Labrum with five setiferous punctures; anterior margin sinuose.
12 Clypeus with transverse sulcus, sinuose; clypeal wings acute; median portion with deep
13 depression, surface rugose. Facial sulci strongly impressed. Supraocular plate margined and
14 elevated, with supraocular fovea. Posterior margin of head punctate. Neck glabrous and smooth.
15 Mentum with micro-sculpturing; irregular punctation; with one pair of lateral setiferous
16 punctures. Median tooth keel-shaped; apex sharp; longer than lateral lobes; with lateral
17 projection; two setae at base. Anterior margin of lateral lobes truncated; transverse sulcus
18 impressed. Submentum with micro-sculpturing; with two pairs of paramedian and paralateral
19 setiferous punctures. Gula broad posteriorly; with micro-sculpturing and grooves. Gena with
20 deep depression, surface rugose. Postgena glabrous, rugose, with grooves. Antennae
21 submoniliform, short, not reaching posterior margin of pronotum; with 11 antennomeres.
22 Pubescence golden-yellow. Scape with micro-sculpturing, apically imbricate; longer than
23 following antennomeres; with setiferous puncture at apex. Pedicel with median seta, basally
24 narrow. A3 with apical pubescence; A4 with denser pubescence on apical two-thirds; A5–A11
25 with dense pubescence from base; with apical setae. A11 drop-shaped. Intersections of
26 antennomeres glabrous.

27 **Thorax.** Pronotum subquadrate, slightly longer than wide (PL = 3.80; PW = 3.31), widest at
28 posterior third; with micro-sculpturing. Anterior and posterior angles rounded. Pronotal disc
29 glabrous, with irregular furrows. Anterior margin continuous to anterior angles. Carina
30 connecting sulcus to anterior margin. Anterior sulci sinuose, not reaching the central sulcus;

1 anterior part of central sulcus drop-shaped, continuous, reaching posterior channel. Posterior
 2 channel broad. Lateroposterior channel continuous, fading just before posterior setiferous
 3 puncture. Lateral channel impressed, narrow anteriorly, broad posteriorly; extending from
 4 anterior angle of pronotum to just before posterior setiferous puncture. Prosternum glabrous,
 5 shiny; with isodiametric micro-sculptures; central furrows present; anterior margin carinate;
 6 anterior sulci transversely punctate. Proepisternum glabrous, shiny; surface punctate; with
 7 micro-sculpturing; furrows occasionally reaching the hypomerion; rugose on posterior third.
 8 Prosternal process glabrous, rugose; with one setiferous puncture. Proepimeron rugose.
 9 Mesosternum glabrous; laterally punctate, decreasing toward central region. Metepisternum
 10 punctate, with two deep depressions. Metasternum with furrows.

11 **Legs.** Reddish-brown. Procoxae shiny and rugose, with anterior setae. Meso- and metacoxae
 12 with two distal setiferous punctures. Protrocanter with two setae. Meso- and metatrochanters
 13 with a single setiferous puncture. Profemora swollen; with micro-sculpturing; dorsal and
 14 ventral faces with furrows. Mesofemora slightly swollen; with micro-sculpturing; three setae
 15 and furrows on ventral face; inner margin of dorsal face with a row of eight short setae.
 16 Metafemora slightly swollen; ventral face with one median seta on posterior margin. Protibia
 17 slightly flattened; dorsal face with two sulci, central sulcus fading basally; ventral face rugose;
 18 outer margin forming a projection; apex with three rounded teeth, apical tooth projecting
 19 ventrally; inner margin with a row of five short setae; distal flexor side with cleaning notch;
 20 with apical and subapical spurs; antennal cleaner emarginate; with two longitudinal sulci, each
 21 bearing an apical seta. Meso- and metatibiae elongate; with rows of spines, thicker at apex;
 22 dorsal and ventral faces with longitudinal carinae; with two apical spurs on outer margin. Tarsi
 23 five-segmented; T1 longer than T2–T4, with a row of setae; T1–T4 with apical crown of setae;
 24 T5 with two apical setae; claws simple, with arolium.

25 **Elytra.** Rectangular, with parallel margins, longer than wide ($EL = 7.02$; $EW = 1.90$), widest
 26 at the median portion. Covering the entire dorsal abdomen, narrowing posteriorly. Humerus
 27 rounded. With para-scutellar stria and scutellar pore on the second interval. Eight complete
 28 striae, reaching the posterior margin. Elytral striae punctate, deeper in the posterior third;
 29 intervals 2–4 broad and elevated; 7th stria originating near the humerus; 8th stria with umbilical
 30 setae, reaching the elytral suture.

31 **Abdomen.** ($AL = 4.62$; $AW = 2.95$) Reddish-brown; with six visible ventrites, glabrous. V2
 32 with a paramedian carina, rounded anteriorly; median portion punctate. V2–V5 irregularly
 33 punctate, punctures concentrated laterally, decreasing toward the median portion; two

paramedian setiferous punctures. Last two ventrites with a transverse sulcus, punctate anteriorly. V6 punctate mainly anteriorly; with two pairs of paramedian and paralateral setiferous punctures. Male genitalia: unknown. Female genitalia (Fig. 19C): Gonostyles elongate, apically curved; internal margin convex, apex rounded; setae distributed mostly at the base, longer and thicker on the outer margin; base with rounded outer angles.

Etymology. The specific epithet of *Pyramoides merianae* sp. nov. honors Maria Sibylla Merian, a German entomologist and artist recognized for her studies on insect metamorphosis. Merian laid the foundations of modern entomology, inspiring future generations of scientists and naturalists. This name reflects her legacy and enduring impact on both science and art.

***Pyramoides paraensis* sp. nov. Libreros-Hernández & Vieira**

(Figs. 3B, 6B)

Type material. Holotype (Fig. 3B): 1♀, Brazil: Pará. Paragominas. Fazenda; Cachoeira do Rio Vermelho. 2°57'40.38" S 46°44'51.66" W. 68 m, 15.i.1991. Col: P. Tadeu. MPEG_01052994.

Paratype: 1♀ Brazil. Pará. Paragominas. Fazenda; Cachoeira do Rio Vermelho. 2°57'40.38"S 46°44'51.66"W. 68 m. W. 15.i.1991., Col: P. Tadeu. MPEG_01052995.

Differential diagnosis. *Pyramoides paraensis* sp. nov. can be distinguished from other species by the abdominal ventrites with irregularly distributed punctures covering the surface; total body length greater than 18–19 mm; spermatheca elongated, narrowing apically.

Description (Figs. 3B, 6B). Total length (L = 19.98 mm); width (W = 5.64 mm). Coloration: black, dark brown.

Head. Hexagonal, narrower than the pronotum (HL = 3.07 mm; HW = 3.57 mm). Eyes well developed, without lateral projection. Labrum with five setiferous punctures; anterior margin sinuose. Clypeus with a slightly sinuose transverse groove; clypeal wings rounded; median portion with a shallow depression, surface smooth. Facial sulci strongly impressed. Supraocular plate margined and elevated, with supraocular fovea. Posterior margin smooth. Neck glabrous and smooth. Mentum with micro-sculptures; punctation irregular, with a pair of parallel lateral

1 setiferous punctures. Median tooth keel-shaped, acute at apex, longer than lateral lobes, laterally
 2 projected, with two basal setae. Anterior margin of lateral lobes truncated; transverse groove
 3 impressed. Submentum with micro-sculptures; with two pairs of paramedian and paralateral
 4 setiferous punctures. Gula broad posteriorly, with micro-sculptures and grooves. Gena with
 5 deep depression, surface smooth. Postgena glabrous, rugose with grooves. Antennae
 6 submoniliform, short, not reaching posterior margin of pronotum; 11 antennomeres.
 7 Pubescence golden-yellow. Scape with micro-sculptures, apically imbricate; longer than
 8 following antennomeres; with apical setiferous puncture. Pedicel with median seta, narrow at
 9 base. A3 with apical pubescence; A4 with denser pubescence on apical two-thirds; A5–A11
 10 densely pubescent from base, with apical setae. A11 drop-shaped. Intersegmental junctions
 11 glabrous.

12 **Thorax.** Pronotum rectangular, slightly longer than wide (PL = 5.95 mm; PW = 5.17 mm),
 13 widest at posterior third; with micro-sculptures; anterior and posterior angles rounded; pronotal
 14 disc glabrous, with irregular grooves; anterior margin ventrally projected; carina not connecting
 15 the groove to anterior margin. Anterior grooves continuous, not reaching the central groove;
 16 anterior part of central groove drop-shaped, narrowing posteriorly, reaching posterior channel;
 17 posterior channel narrow; posterolateral channel continuous, fading at posterior setiferous
 18 puncture. Lateral channel shallow, narrow anteriorly, wide posteriorly, extending from anterior
 19 angle of pronotum to just before posterior setiferous puncture. Prosternum glabrous and shiny,
 20 with isodiametric micro-sculptures; irregular grooves; anterior margin carinate; anterior
 21 grooves continuous transversely. Proepisternum glabrous and shiny; surface smooth, with
 22 micro-sculptures; grooves reaching hypomeron; smooth in posterior third. Prosternal process
 23 glabrous, rugose, with a setiferous puncture. Proepimeron rugose. Mesosternum glabrous;
 24 laterally punctate, decreasing toward median portion. Metepisternum punctate, with two
 25 superficial depressions. Metasternum smooth.

26 **Legs.** Black, dark brown. Procoxae shiny and rugose, with anterior setae; meso- and metacoxae
 27 with two distal setiferous punctures. Protrochanter with two setae. Meso- and metatrochanter
 28 with a single setiferous puncture. Profemur swollen, with micro-sculptures; dorsal and ventral
 29 surfaces smooth. Mesofemur slightly swollen, with micro-sculptures; ventral surface with three
 30 setae and striae; dorsal inner margin with a row of 11–12 short setae. Metafemur slightly
 31 swollen, ventral surface with a median seta on posterior margin. Protibia slightly flattened;
 32 dorsal surface with two grooves, central groove distinct but fading basally; ventral surface
 33 rugose; outer margin with a projection; apex with two rounded teeth, apical tooth ventrally

projected; inner margin with a row of four short setae; distal flexor side with cleaning notch; apical and subapical spurs present; antennal cleaner emarginate, with two longitudinal grooves and an apical seta. Meso- and metatibiae elongated; with a row of spines, thicker apically; ventral and dorsal surfaces with longitudinal carinae; two apical spurs on outer margin. Tarsi five-segmented; T1 longer than T2–T4, with a row of setae; T1–T4 with apical crown of setae; T5 with two apical setae; claws simple, with arolium.

Elytra. Ellipsoid, convex; longer than wide ($EL = 9.71$; $EW = 2.86$), widest at the median portion; covering the abdomen dorsally; narrowing posteriorly; humerus rounded; with parascutellar stria and scutellar pore on the second interval; with eight complete striae reaching the posterior margin; elytral striae punctate, deeper in the posterior third than in the median portion; intervals 1–4 broad, elevated along the length, flattening apically; 7th stria originating near the humerus; 8th stria with umbilicate setae, reaching the elytral suture.

Abdomen. ($AL = 5.65$; $AW = 3.95$) Black; with six visible, glabrous ventrites; V2 with a paramedian carina, rounded anteriorly, median portion punctate. V2–V5 irregularly punctate, covering the surface; with two paramedian setiferous pores; last two ventrites with a complete transverse sulcus, punctate anteriorly. V6 irregularly punctate; with two pairs of paralateral and paramedian setiferous pores. **Male genitalia:** unknown. **Female genitalia:** (Fig. 19D) Gonostyli elongate, apically curved, inner margin convex, setae mainly on median portion, longer and thicker on outer margin; bursa copulatrix broad medially; spermatheca elongate, narrowing apically.

Etymology. The specific epithet of *Pyramoides paraensis* sp. nov. derives from the name of the state of the type locality. This designation honors the state of Pará, highlighting its biological and cultural richness, with unique ecosystems such as the Amazon rainforest that harbor a wide diversity of flora and fauna. Additionally, it recognizes the region's cultural identity. The name emphasizes the importance of Pará for biodiversity conservation and the advancement of entomological knowledge in the Neotropical region.

***Pyramoides pantanensis* sp. nov. Libreros-Hernández & Vieira**

(Figs. 3C, 6C)

Type material. Holotype (Fig. 3C): 1♂ **Brazil.** Mato Grosso do Sul. Corumbá. $19^{\circ}1'44.96''S$ $57^{\circ}38'4.27''W$. 379 m. xii. 2007, Col: C. Aoki.

Paratype: 1♀ **Brazil.** Mato Grosso do Sul. Corumbá. 19°1'44.96" S 57°38'4.27" W. xii. 2007.
379 m, Col: C. Aoki.

Differential diagnosis. *Pyramoides pantanensis* sp. nov., like *P. colombiaensis* sp. nov., has eyes with laterally projected margins; however, it can be distinguished by the labrum bearing five setiferous punctures, a subquadrate pronotum, elytral striae punctate, abdominal ventrites with few punctures, an elongated spermatheca that is wider medially and rounded at the apex, and a thin, short accessory gland.

Description (Figs. 3C and 6C). Total length (L = 9.70 mm); total width (W = 2.58 mm). Coloration: black, dark brown.

Head. Hexagonal, narrower than the pronotum (HL = 2.35 mm; HW = 2.34 mm). Eyes well developed, with laterally projecting margins. Labrum with five setiferous punctures and sinuate anterior margin. Clypeus with transverse sulcus, sinuate; clypeal wings rounded; median portion with shallow depression, surface smooth. Facial sulci strongly impressed. Supraocular plate margined and elevated; with supraocular fovea. Posterior margin smooth. Neck glabrous and smooth. Mentum with micro-sculptures; irregular punctation; with a pair of paralateral setiferous punctures; median tooth keel-shaped, acute at apex, longer than lateral lobes; with lateral projection; with two basal setae. Anterior margin of lateral lobes truncated; transverse sulcus impressed. Submentum with micro-sculptures; with two pairs of paramedian and paralateral setiferous punctures. Gula broad posteriorly, with micro-sculptures and grooves. Gena with deep depression, surface smooth. Postgena glabrous; rugose and grooved. Antennae submoniliform, short, not reaching posterior pronotal margin; 11 antennomeres. Pubescence golden-yellow. Scape with micro-sculptures, apically imbricate; longer than following antennomeres; with apical setiferous puncture. Pedicel with medial seta, basally narrow. A3 with apical pubescence; A4 with denser pubescence on apical two-thirds; A5–A11 densely pubescent from base, with apical setae. A11 drop-shaped. Intersections of antennomeres glabrous.

Thorax. Pronotum subquadrate, slightly longer than wide (PL = 2.59 mm; PW = 2.44 mm), widest at posterior third. With micro-sculpturing; anterior and posterior angles rounded; pronotal disc glabrous, with irregular furrows; anterior margin ventrally projected; carina not connecting sulcus to anterior margin; anterior sulci continuous, not reaching central sulcus; anterior part of central sulcus drop-shaped, narrowing posteriorly, reaching posterior channel. Posterior channel broad; posterolateral channel continuous, fading near posterior setiferous

puncture. Lateral channel impressed, broad posteriorly, extending from anterior pronotal angle to just before posterior setiferous puncture. Prosternum glabrous and shiny; surface smooth, with isodiametric micro-sculptures; without furrows; anterior margin carinate; anterior sulci continuous transversely. Proepisternum glabrous and shiny; surface smooth, with micro-sculptures; furrows occasionally reaching the hypomerion; smooth on posterior third. Prosternal process glabrous and rugose, with a setiferous puncture. Proepimeron rugose. Mesosternum glabrous; punctate and rugose laterally, decreasing toward the central region. Metepisternum smooth, with two superficial depressions. Metasternum smooth; with micro-sculptures and metapleural suture.

Legs. Black to dark brown. Procoxa shiny and rugose, with anterior setae. Meso- and metacoxae with two distal setiferous punctures. Protrochanter with two setae; meso- and metatrochanter with a single setiferous puncture. Profemur swollen, with micro-sculpturing; dorsal and ventral faces with furrows. Mesofemur slightly swollen, with micro-sculpturing; dorsal face smooth with a row of 5–7 short setae on the inner margin; ventral face with three setae and furrows. Metafemur slightly swollen; ventral face with a median seta on the posterior margin. Protibia slightly flattened; dorsal face with two grooves, central groove fading apically; ventral face smooth; outer margin with a projection; apex with two rounded teeth, apical tooth ventrally projected; inner margin with a row of three short setae; cleaning incision on distal flexor side; with apical and subapical spurs; antennal cleaner emarginate, with two longitudinal grooves each bearing an apical seta. Meso- and metatibiae elongated, with a row of setae, thicker apically; dorsal and ventral faces with longitudinal carinae; two apical spurs on outer margin. Tarsi five-segmented; T1 longer than T2–T4, with a row of setae; T1–T4 with an apical crown of setae; T5 with two apical setae; claws simple, with arolium.

Elytra. Ellipsoid, convex; longer than wide ($EL = 5.18$; $EW = 1.31$), widest at the median portion; covering the entire dorsal surface of the abdomen; narrowing posteriorly; humerus rounded. With a para-scutellar stria and scutellar pore on the second interval; eight complete striae reaching the posterior margin; elytral striae punctate, deeper in the posterior third than in the median portion. Elytral intervals 1–4 broad and elevated; 7th stria originating near the humerus; 8th stria with umbilical setae, reaching the elytral suture.

Abdomen. ($AL = 4.59$; $AW = 3.23$). Black; with six visible, glabrous abdominal ventrites. V2 with a paramedian carina, rounded anteriorly, median portion smooth. V2–V5 with a pair of paramedian setiferous punctures, smooth; last two ventrites with a complete transverse sulcus,

punctate anteriorly. V6 with two pairs of setiferous punctures, paralateral and paramedian.

Male genitalia (Fig. 17E): Median lobe of the edeagus arcuate from the base; apex long and rounded; phalobase straight; parameres subequal. Right paramere curved from the base, apically broad, apex rounded, six setae longitudinally distributed; two apical setae long and thick, four subapical setae short. **Female genitalia** (Fig. 17F): Gonostyli thicker and broader at the base; inner margin slightly parallel without basal tooth; setae distributed along inner and outer margins of gonostyli; bursa copulatrix broad medially; spermatheca elongate, widest medially, rounded apically; accessory gland thin and short.

Etymology. The specific epithet *Pyramoides pantanensis* sp. nov. is dedicated to the Pantanal, one of the largest wetlands on the planet and recognized as a UNESCO World Natural Heritage site. Its vast biodiversity plays a crucial role in species conservation and ecosystem regulation.

Key to species of *Pyramoides* Bousquet, 2002

1 Elytra punctate along the striae (Fig. 7A). Proepisternum punctate; with longitudinal furrows, occasionally reaching the hypomeron. Protibia with three teeth on the external margin. (inclu. *P. colombiaensis* sp.nov.) (Fig. 8B) 2.

1' Elytral striae punctate or continuous (Figs. 7B–D). Proepisternum smooth. Protibia with two teeth on the external margin. (Fig. 8A) 5.

2(1) Base of elytral intervals 2–4 elevated, forming ridges (Fig. 9A). Transverse groove of clypeus convex. Body length less than 10 mm. Distribution: Brazil (Piauí, Floriano) *P. garciae* sp. nov.

2' Base of elytral intervals normal, flat, not forming ridges (Fig. 9B). Body length greater than 10 mm.....3.

3(2') Transverse clypeal sulcus fading medially (Fig. 10A); surface rough and opaque; body length greater than 13 mm. Brazil (Santa Catarina, Rio Vermelho) *P. martinae* sp.nov.

3' Transverse clypeal sulcus continuous (Fig. 10B); elytra shape rectangular, with parallel margins; inner margin of protibia with a row of five short setae..... 4.

- 1 **4(3')** Median portion of clypeus with deep depression, anterior surface rugose; clypeal wings
2 acute; anterior pronotal grooves sinuose; body length greater than 13 mm. Brazil (Rio Grande
3 do Sul, Santana do Livramento) *P.*
4 *merianae* sp.nov.
- 5 **4'** Median portion of clypeus with a shallow depression, anterior surface smooth; clypeal wings
6 rounded; body length greater than 12 mm. Argentina, Brazil, Paraguay..... *P. oblongicollis*
7 (Putzeys, 1861).
- 8 **5(1')** Coloration glossy black, with a slight bluish hue on the appendages; body length not
9 exceeding 9 mm..... *P. crassicornis* (Putzeys,
10 1846).
- 11 **5'** Coloration matte black or reddish-brown on the appendages; body length greater than 9
12 mm..... **6.**
- 13 **6(5')** Ventral surface of the protibia rugose (Fig. 11A); dorsal groove of the protibia extending
14 to the
15 base..... **7.**
- 16 **6'** Ventral surface of the protibia smooth, without ornamentation (Fig. 11B); dorsal groove of
17 the protibia extending to the apical third or fading
18 apically.....**8.**
- 19 **7(6)** Head rounded; abdominal ventrites with punctures mostly distributed laterally (Fig. 12A);
20 proepimeron punctate; body length 10–11 mm. Brazil (Amazonas, Coari)
21*P.* *amazonensis*
22 **sp.nov.**
- 23 **7'** Head hexagonal; abdominal ventrites with punctures irregularly distributed, covering the
24 surface (Fig. 12D); proepimeron rugose; body length greater than 18–19 mm. Brazil (Pará,
25 Paragominas) *P.*
26 *paraensis* sp.nov.
- 27 **8(5')** Eyes with laterally projected margins (Fig. 13C-D) **9.**
- 28 **8'** Eyes with normal margins, not laterally projected (Fig. 13A-B) **10.**
- 29 **9(7)** Anterior margin of the lateral lobes of the mentum curved (Fig. 15A); labrum with six or
30 more setiferous punctures (Fig. 13C); pronotum rectangular; elytral striae continuous (Fig. 7B),

without punctation; body length greater than 15 mm. Colombia (Meta, Puerto López)..... *P. colombiaensis*
sp.nov.

9' Anterior margin of the lateral lobes of the mentum truncate (Fig. 16C); labrum with five setiferous punctures (Fig. 13D); pronotum subquadrate; elytral striae punctate (Figs. 7C, D), deeper in the apical third; body length less than 10 mm. Brazil (Mato Grosso do Sul, Corumbá)*P. pantanensis*
sp.nov.

10(7') Punctures of the elytral striae equally deep; metepisternum with two deep depressions; body length greater than 14 mm. Brazil (Mato Grosso, Cotriguaçu)..... *P. matogrossensis*
sp.nov.

10' Punctures of the elytral striae deeper in the apical third; metepisternum with two shallow depressions; body length less than 14 mm. Brazil (Mato Grosso, Barão de Melgaço)..... *P. lispectorae*
sp.nov.

3.2 Phylogeny

Below is the mapping of characters based on the analyzed specimens. A total of 82 characters were considered, all derived from the external morphology of adult specimens. The character matrix is available in Table 2.

Head

0. Eye size: 0. Normally developed; 1. Laterally projected.

1. Shape of the anterior margin of the labrum: 0. Sinuate; 1. Triangular; 2. Convex; 3. Concave; 4. Straight.

2. Transverse groove of the clypeus: 0. Absent; 1. Present.

3. Shape of the transverse clypeal groove: 0. Slightly sinuate; 1. Concave; 2. Convex; 3. Straight; 4. Faint.

4. Projection of the anterior margin of the clypeus: 0. Present; 1. Absent.

5. Shape of the projection of the anterior margin of the clypeus: 0. Rounded; 1. Acute.

6. Clypeus surface: 0. Inclined; 1. Flat; 2. Depressed; 3. Elevated.

- 1 7. Shape of the clypeal elevation: 0. Rounded; 1. Trapezoidal.
- 2 8. Texture of the medio-posterior clypeal surface: 0. Rugose; 1. Rough; 2. Smooth; 3.
- 3 Punctate.
- 4 9. Clypeal depression: 0. Superficial; 1. Deep.
- 5 10. Supraocular projection: 0. Absent; 1. Present.
- 6 11. Extent of supraocular projection: 0. Reaching the outer margin of the eye; 1. Not reaching
- 7 the outer margin of the eye.
- 8 12. Infraocular projection: 0. Absent; 1. Present.
- 9 13. Frontal sulci: 0. Present; 1. Absent.
- 10 14. Frontal surface: 0. Rugose; 1. Smooth; 2. Carinate; 3. Punctate; 4. Roughened.
- 11 15. Distribution of frontal carinae: 0. Covering entire head; 1. Present laterally.
- 12 16. Arrangement of frontal carinae: 0. Straight; 1. Curved; 2. Irregular.
- 13 17. Medio-anterior portion of the frons: 0. Rugose; 1. Rough; 2. Carinate; 3. Smooth; 4.
- 14 Punctate.
- 15 18. Medio-posterior portion of the frons: 0. Rugose; 1. Rough; 2. Carinate; 3. Smooth; 4.
- 16 Punctate.
- 17 19. Antennomeres 2–4: 0. Filiform; 1. Submoniliform.
- 18 20. Antennomeres 5–10: 0. Filiform; 1. Submoniliform.
- 19 21. Apex of antenna: 0. Rounded; 1. Drop-shaped.
- 20 22. Seta on antennal scape: 0. Absent; 1. Present.
- 21 23. Posterior margin of the head: 0. Smooth; 1. Punctate; 2. Continuous.
- 22 24. Median tooth of the mentum: 0. Flat; 1. Keeled.
- 23 25. Shape of apex of median tooth of mentum: 0. Rounded; 1. Truncate; 2. Acute; 3. Bifid.
- 24 26. Relative length of median tooth: 0. Exceeding lateral lobes; 1. Equal to lateral lobes; 2.
- 25 Shorter than lateral lobes.
- 26 27. Anterior margin of lateral lobes of mentum: 0. Truncate; 1. Rounded; 2. Acute.
- 27 28. Setae on ligula: 0. Absent; 1. Present.
- 28 29. Number of setae on ligula: 0. One seta; 1. Two setae.
- 29 30. Shape of gula: 0. Narrow posteriorly; 1. Broad posteriorly; 2. Parallel-sided.
- 30 ***Torax***
- 31 31. Median line of the pronotum: 0. Ending before the anterior margin of pronotum; 1. Reaching
- 32 the anterior margin of pronotum.
- 33 32. Pronotum shape: 0. Subquadrate; 1. Rectangular; 2. Square.

- 1 33. Extension of anterior margin of pronotum: 0. Interrupted; 1. Continuous.
- 2 34. Latero-posterior groove of pronotum: 0. Absent; 1. Present.
- 3 35. Extension of latero-posterior groove of pronotum: 0. Continuous to the setiferous point; 1.
- 4 Interrupted before the setiferous point.
- 5 36. Anterior margin of prosternum: 0. Smooth; 1. With well-developed carina; 2. With poorly
- 6 developed carina; 3. Punctate.
- 7 37. Stridulatory line of prosternum: 0. Absent; 1. Present.
- 8 38. Proepisternum surface, punctate: 0. Absent; 1. Present.
- 9 39. Proepisternum surface, smooth: 0. Present; 1. Absent.
- 10 40. Proepisternum surface, rugose: 0. Absent; 1. Present.
- 11 41. Posterior third of proepisternum, granular: 0. Present; 1. Absent.
- 12 42. Posterior third of proepisternum, smooth: 0. Absent; 1. Present.
- 13 43. Posterior third of proepisternum, rugose: 0. Absent; 1. Present.
- 14 44. Posterior third of proepisternum, punctate: 0. Absent; 1. Present.
- 15 45. Proepimeron surface, granular: 0. Present; 1. Absent.
- 16 46. Proepimeron surface, smooth: 0. Absent; 1. Present.
- 17 47. Proepimeron surface, rugose: 0. Absent; 1. Present.
- 18 48. Proepimeron surface, punctate: 0. Absent; 1. Present.
- 19 49. Metepisternum surface, rugose: 0. Present; 1. Absent.
- 20 50. Metepisternum surface, smooth: 0. Absent; 1. Present.
- 21 51. Metepisternum surface, punctate: 0. Absent; 1. Present.
- 22 52. Impressions of metepisternum: 0. Absent; 1. Present.
- 23 53. Type of metepisternum impressions: 0. Superficial; 1. Deep.
- 24 54. Width of metepisternum impressions: 0. Narrow; 1. Wide.

25

26 ***Elytra***

- 27 55. Elytral shape: 0. Rectangular; 1. Ellipsoid.
- 28 56. Type of elytral striae: 0. Continuous; 1. Punctate; 2. Impressed/punctured.
- 29 57. Posterior third of elytral striae: 0. Continuous; 1. Punctate; 2. Impressed/punctured.
- 30 58. Presence of setiferous punctures on elytra: 0. Present; 1. Absent.
- 31 59. Depth of striae punctures: 0. Shallow; 1. Deep.

32 ***Legs***

- 33 60. Median part of the dorsal surface of the protibia: 0. Flat; 1. With groove; 2. With carinae.

61. Extension of the central groove on the dorsal surface of the protibia: 0. Reaching the base;
1. Reaching the last apical third; 2. Fading basally.
62. Texture of the ventral surface of the protibia: 0. Rough; 1. Rugose; 2. Punctate; 3. Smooth.
63. Ornamentation on the ventral surface of the protibia: 0. Present; 1. Absent.
64. Type of ornamentation: 0. Tubercles; 1. Carinae.
65. Number of teeth on the external margin of the protibia: 0. 3 teeth; 1. 2 teeth; 2. 4 teeth.
66. Row of setae on the internal margin of the protibia: 0. Present; 1. Absent.
67. Number of setae on the internal margin of the protibia: 0. More than 7; 1. 3 setae; 2. 4 setae;
3. 5 setae; 4. 6 setae.

Abdomen

68. Median portion of the second ventrite: 0. Rugose; 1. Smooth.
69. Paramedian carinae of the 2nd ventrite: 0. Absent; 1. Present.
70. Transverse sulci of V4–V6: 0. Absent; 1. Present.
71. Aspect of transverse sulci of the ventrites: 0. Complete; 1. Incomplete.
72. Surface of the transverse sulci of ventrites 4–6: 0. Smooth; 1. Punctate; 2. Rugose.
73. Smooth abdominal surface: 0. Present; 1. Absent.
74. Punctate abdominal surface: 0. Absent; 1. Present.
75. Rugose abdominal surface: 0. Absent; 1. Present.
76. Number of ventrites with punctures: 0. V3–V5; 1. V4–V6; 2. V3–V6; 3. V2–V6.
77. Distribution of punctures on the ventrites: 0. Laterally dispersed; 1. Grouped medially; 2.
Spread.
78. Ambulatory setae: 0. Present; 1. Absent.
79. Number of ambulatory setae on V3–V5: 0. Two pairs; 1. One pair.
80. Number of ambulatory setae on the last ventrite: 0. Two pairs; 1. One pair.
81. Extra setiferous punctures on the last ventrite: 0. Absent; 1. Present.

Equal Weights vs. Implied Weights

Analyses using equal weights resulted in two equally parsimonious cladograms, with the strict consensus topology shown in Figure 20. However, to obtain more robust phylogenetic inferences, it is advisable to adopt differential weighting schemes in parsimony analyses (Hermes et al., 2014; Barbosa, 2021). For a detailed discussion of the benefits of character weighting in morphological datasets, see Goloboff et al. (2008).

1 **Monophyly of *Pyramoides***

2 The analysis using implied weights produced a more parsimonious cladogram ($k =$
3 4.7656; Best Score = 17.32330; Consistency Index CI = 47; Retention Index RI = 52). The
4 monophyly of *Pyramoides* is confirmed in this study, supported by the following
5 synapomorphies: CI = 100: Median tooth of the mentum keel-shaped (char. 0-1), glabrous
6 elytral striae (char. 0-1); CI = 75: Number of ventrites with punctures (char. 2-3) (Fig. 20).

8 **Phylogenetic relationships of the genus *Pyramoides* and its species**

9 The phylogenetic results reveal the main relationships of *Pyramoides* and its species with
10 other Clivinini genera. The sister group of *Pyramoides* is formed by a clade including *M.*
11 *pseudogigas* and *W. thaisae*, supported by the following synapomorphies: CI = 100:
12 Antennomeres 2–4 (char. 0-1), ornamentation of the ventral surface of the protibia (char. 0-1);
13 CI = 50: Punctate surface of the proepisternum (char. 0-1) (Fig. 20).

14 Within *Pyramoides*, *Pyramoides garciae* sp. nov. is the sister group to the remaining species
15 of the genus, forming a single clade (“Clade A”), supported by one homoplastic transformation
16 and one synapomorphy: Shape of the transverse sulcus of the clypeus (char. 23-1) and extension
17 of the lateroposterior pronotal channel (char. 0-1). Clade A is composed of two subclades:
18 “Clade B” and “Clade C.”

19 Clade B is supported by five homoplastic transformations: posterior third of the
20 proepisternum smooth (char. 1-0), posterior third of the proepisternum rugose (char. 0-1),
21 metepisternum smooth (char. 1-0), metepisternum punctate (char. 0-1), and type of elytral striae
22 (char. 1-2). Within Clade B, *Pyramoides oblongicollis* (Putzeys, 1861) is the sister group to (*P.*
23 *martinae* sp. nov. + *P. merianae* sp. nov.) (Fig. 20).

24 In contrast, Clade C is supported by four homoplastic transformations and one
25 synapomorphy: posterior margin of the head (char. 0-1), proepisternum punctate (char. 1-0),
26 proepisternum smooth (char. 1-0), elytral shape (char. 0-1), and type of elytral striae (char. 0-
27 1). Clade C includes *P. amazonenesis* sp. nov. + *P. paraensis* sp. nov. as the sister group to (*P.*
28 *colombianaensis* sp. nov. + *P. pantanensis* sp. nov. + (*P. lispectarae* sp. nov. + *P. matogrossensis*
29 sp. nov.)), the latter forming a polytomy (Fig. 20).

4. DISCUSSION

The Neotropical genus *Pyramoides* exhibits a distribution extending from Colombia to the central-northern region of Argentina, encompassing territories in Paraguay and Brazil (Fig. 21). In particular, *Pyramoides colombiaensis* sp. nov. appears to be restricted to Colombia. It is noteworthy that Putzeys (1846) described and recorded the species *Pyramoides crassicornis* from the territory then known as “New Granada,” which included present-day Colombia, Panama, Ecuador, and part of Venezuela. This attribution is consistent with the historical context of the original description.

However, the holotype of *P. crassicornis* has not been located despite consultations with several major collections and museums in Colombia. In the original description, Putzeys detailed characters such as protibiae with anterior sulci and two external teeth, as well as abdominal segments with punctures on the lateral and basal regions. These characters do not match those observed in *P. colombiaensis* sp. nov., suggesting that these are distinct taxonomic entities.

In Brazil, there are currently eight recognized species of *Pyramoides*. In the North region, *Pyramoides amazonensis* sp. nov. and *Pyramoides paraensis* sp. nov. have been recorded. In the Northeast, *Pyramoides garciae* sp. nov. is restricted to the state of Piauí. In the South, *Pyramoides martinae* sp. nov. has been recorded in Santa Catarina, and *P. merianae* sp. nov. in Rio Grande do Sul, near the border with Uruguay. In the Center-West region, *P. matogrossensis* sp. nov. and *P. lispectora* sp. nov. occur in Mato Grosso, whereas *Pyramoides pantanensis* sp. nov. is recorded from Mato Grosso do Sul. A particular case is *P. oblongicollis*, which exhibits a broader distribution, ranging from the Central and Southwestern regions of Brazil (Reichardt 1977), through Paraguay, and reaching the central-northern region of Argentina. This distribution aligns with the origin of the material examined in most of the consulted museums and collections.

In contrast, in Paraguay and Argentina, only *P. oblongicollis* has currently been recorded, occurring in several departments and provinces, respectively. Based on the distribution map, it is highly likely that the genus *Pyramoides* also occurs in countries such as Bolivia, Uruguay, and possibly Venezuela. However, it is evident that intensified sampling efforts in adjacent regions, as well as visits to collections and museums in these areas, are

needed. Inclusion of these regions would significantly expand knowledge of the genus' geographic distribution, contributing to a more comprehensive understanding of the group.

Based on the results obtained, it is confirmed that the genus *Pyramoides* constitutes a monophyletic group, primarily supported by the following synapomorphies: median tooth of the mentum in the form of a keel (char. 0-1). This character, originally mentioned by Putzeys (1846, 1867) in his original descriptions, was also highlighted by Dostal & Vieira (2018) as an important trait to distinguish *Pyramoides* from other genera within Clivinini. Additionally, the glabrescent condition of the elytral striae proved significant in the phylogenetic analysis. It is noteworthy that this condition is exclusive to the genera *Pyramoides* and *Lachenus* Putzeys, 1846 within Clivinini, further reinforcing its phylogenetic relevance.

In the phylogenetic analysis, the character "Number of ventrites with punctures" achieved a consistency index (Ci) of 75. Although this value does not reach perfection (Ci = 100), it is considered a robust character that contributes positively to the phylogenetic relationships within the group. This result highlights the importance of considering this character as an integral component of the set of synapomorphies supporting the monophyly of *Pyramoides*. On the other hand, values derived from the phylogenetic analysis ($k = 4.7656$, $Ci = 47$, and $Ri = 52$) reflect moderate tolerance to homoplastic characters and moderate phylogenetic structural retention. While these values indicate a notable level of homoplasy in the data, they also suggest that the analyzed characters are informative, albeit potentially influenced by phylogenetic biases. This underscores the need for a more detailed analysis of ambiguous characters to improve phylogenetic resolution.

The phylogenetic relationships of the genus *Pyramoides* with other genera of Clivinini revealed that the clade formed by *M. pseudogigas* + *W. thaisae* constitutes the sister group of *Pyramoides*. This result is consistent with the observations of Putzeys (1866), who already considered the genus *Mesus* to be closely related to *Pyramoides*, distinguishing them by specific characters (Perrault 1994). Among the potential synapomorphies supporting this relationship are antennomeres 2–4 submoniliform and the ventral ornamentation of the protibia, both with high consistency indices ($Ci = 100$), in addition to a punctate proepisternum ($Ci = 50$). However, Putzeys highlighted important differences: the antennomeres of *Pyramoides* are thicker and shorter compared to those of *Mesus*, which are thinner and more elongated. Moreover, the shape of the anterior margin of the labrum differs, being sinuate in *Pyramoides* and convex in *Mesus*. Notably, key genera such as *Lachenus* and *Cryptomma* (Putzeys, 1846) were not included in

the analysis, emphasizing the need for future studies that incorporate additional genera of the tribe Clivinini to expand the understanding of these phylogenetic relationships.

Regarding the relationships among species within *Pyramoides*, the analysis also highlighted characters that support species recognition and are essential for their delimitation. For example, *Pyramoides martinae* sp. nov. exhibits a transverse sulcus on the clypeus that fades medially, distinguishing it from other species of the genus. Similarly, *Pyramoides oblongicollis* (Putzeys, 1861) shows a slight depression in the median portion of the clypeus and rounded clypeal wings, in contrast to *Pyramoides merianae* sp. nov. These characters were fundamental in the development of the taxonomic key for the genus.

The polytomy observed between *Pyramoides lispectorae* sp. nov. and *Pyramoides matogrossensis* sp. nov. indicates a lack of phylogenetic resolution between these species. This may be attributed to insufficient information in the analyzed data or the prevalence of ambiguous characters that do not provide clarity in species delimitation. Additionally, character homoplasy may be masking true phylogenetic relationships. Nevertheless, other informative characters allowed the inclusion of these species in the taxonomic key. For instance, *P. matogrossensis* is distinguished by having deep elytral striae along their entire length and two marked depressions on the metepisternum, whereas *P. lispectorae* presents elytral striae with deeper punctures in the apical third and two superficial depressions on the metepisternum.

Considering these phylogenetic challenges, a thorough revision of ambiguous characters is recommended, along with the exploration of complementary methods such as Maximum Likelihood and Bayesian Inference, incorporating molecular data. These statistical approaches may provide additional resolution by integrating genetic information with the analyzed morphological data.

5. CONCLUSIONS

The present study confirms the monophyly of the genus *Pyramoides* based on morphological synapomorphies, such as the median tooth of the mentum in the form of a keel and the glabrescent condition of the elytral striae. Despite significant levels of homoplasy, the analyses provided valuable information for species delimitation and for the construction of a robust taxonomic key. The polytomy observed among certain species highlights the need to reassess ambiguous characters and to complement morphological data with molecular data and

1 statistical methods. This integrated approach can improve phylogenetic resolution and provide
2 a more comprehensive understanding of the evolution and diversity of the genus *Pyramoides*
3 in the Neotropical region.

4

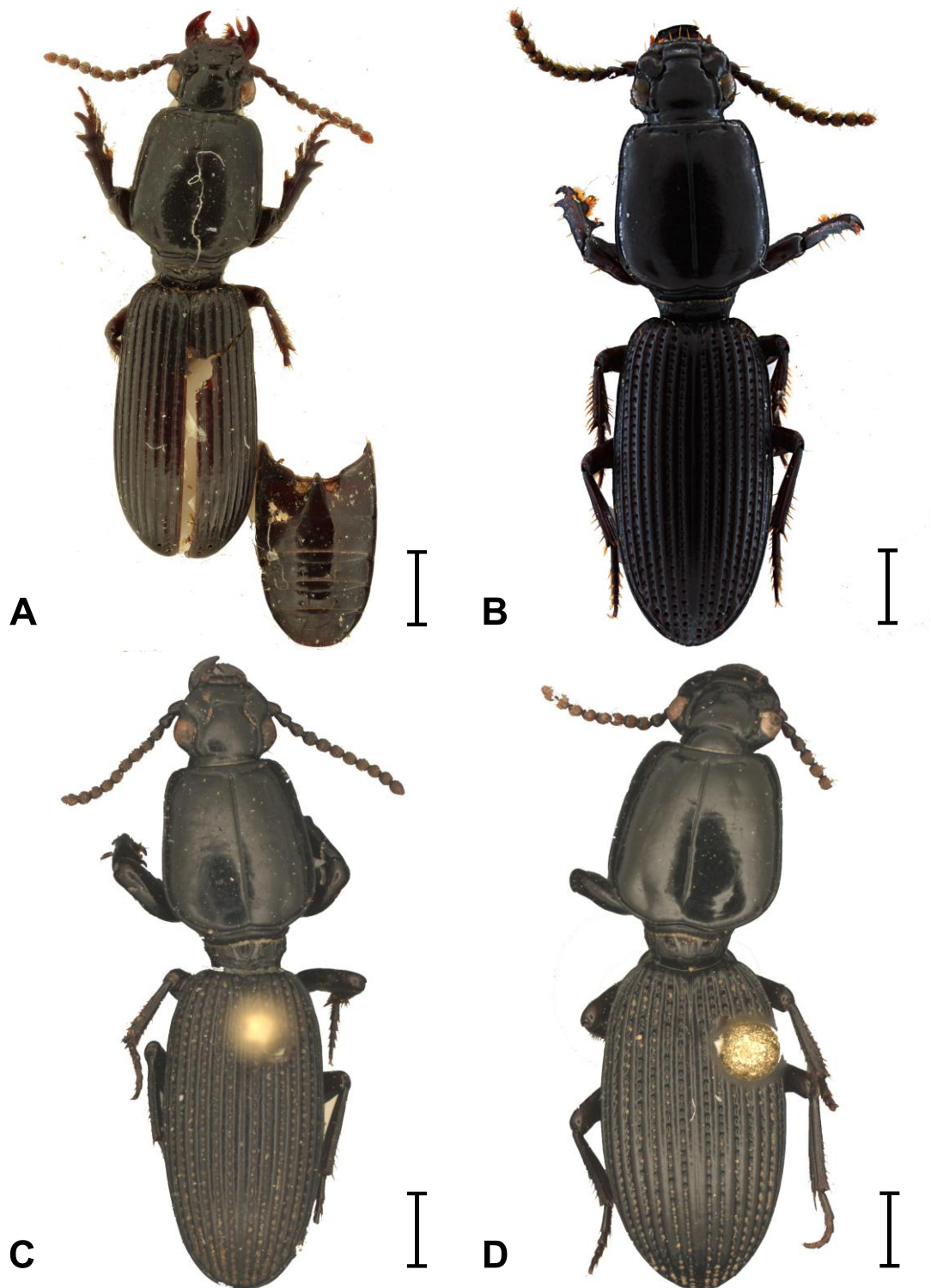
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- 5 *debilis*-, *denticollis*-, *grandiceps*-, *incerta*-, *lobata*-, *obliquata*-, *obsoleta*-, *orbitalis*-, *planiceps*-, *sulcaticeps*-,
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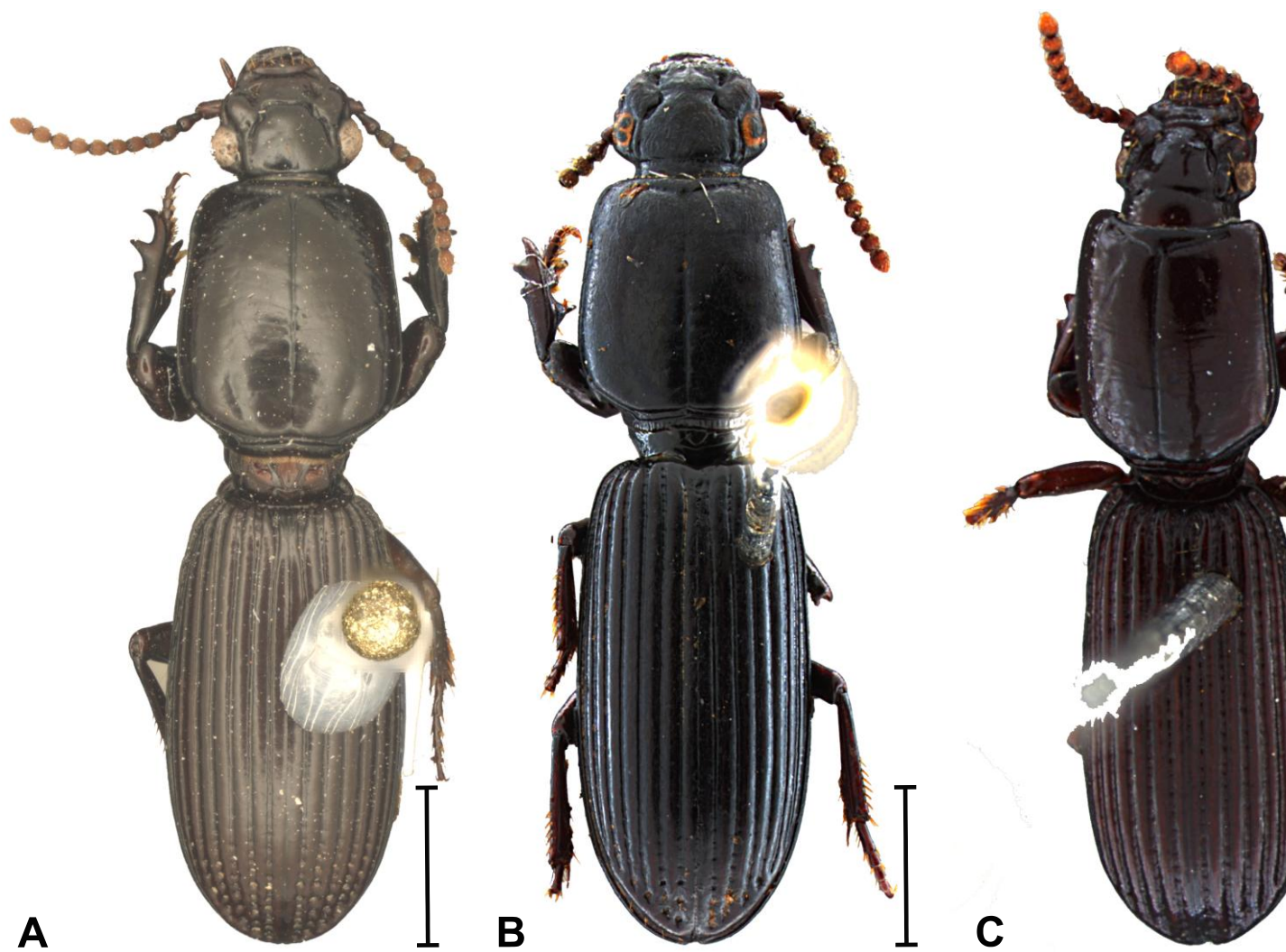
1 ANNEXES



2

3 **Figure 1.** Dorsal view of species of the genus *Pyramoides*: **A.** *P. oblongicollis*, **B.** *P. lispectorae*
 4 sp.nov., **C.** *P. matogrossensis* sp.nov., **D.** *P. amazonensis* sp.nov. Scale = 1.0 mm.

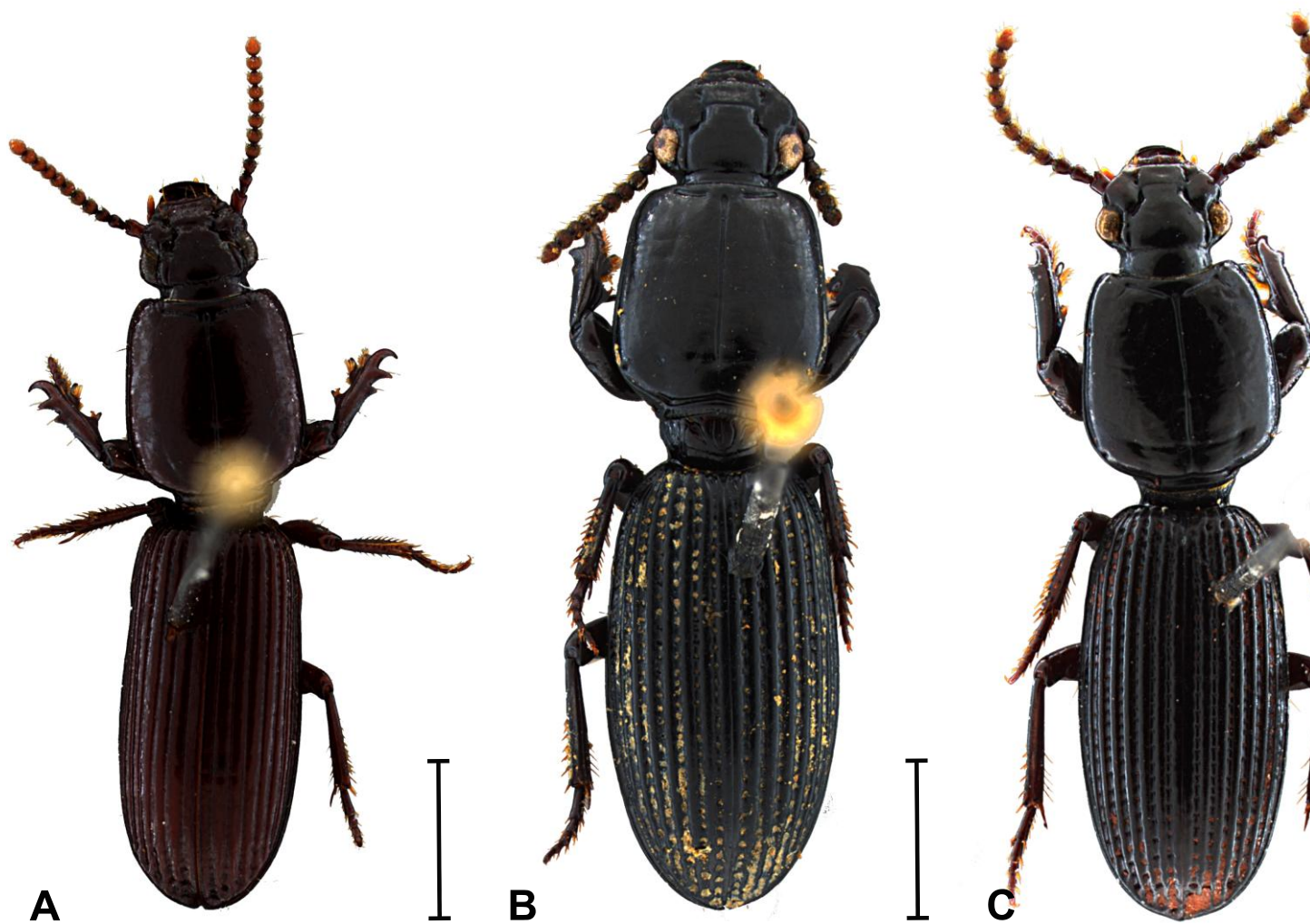
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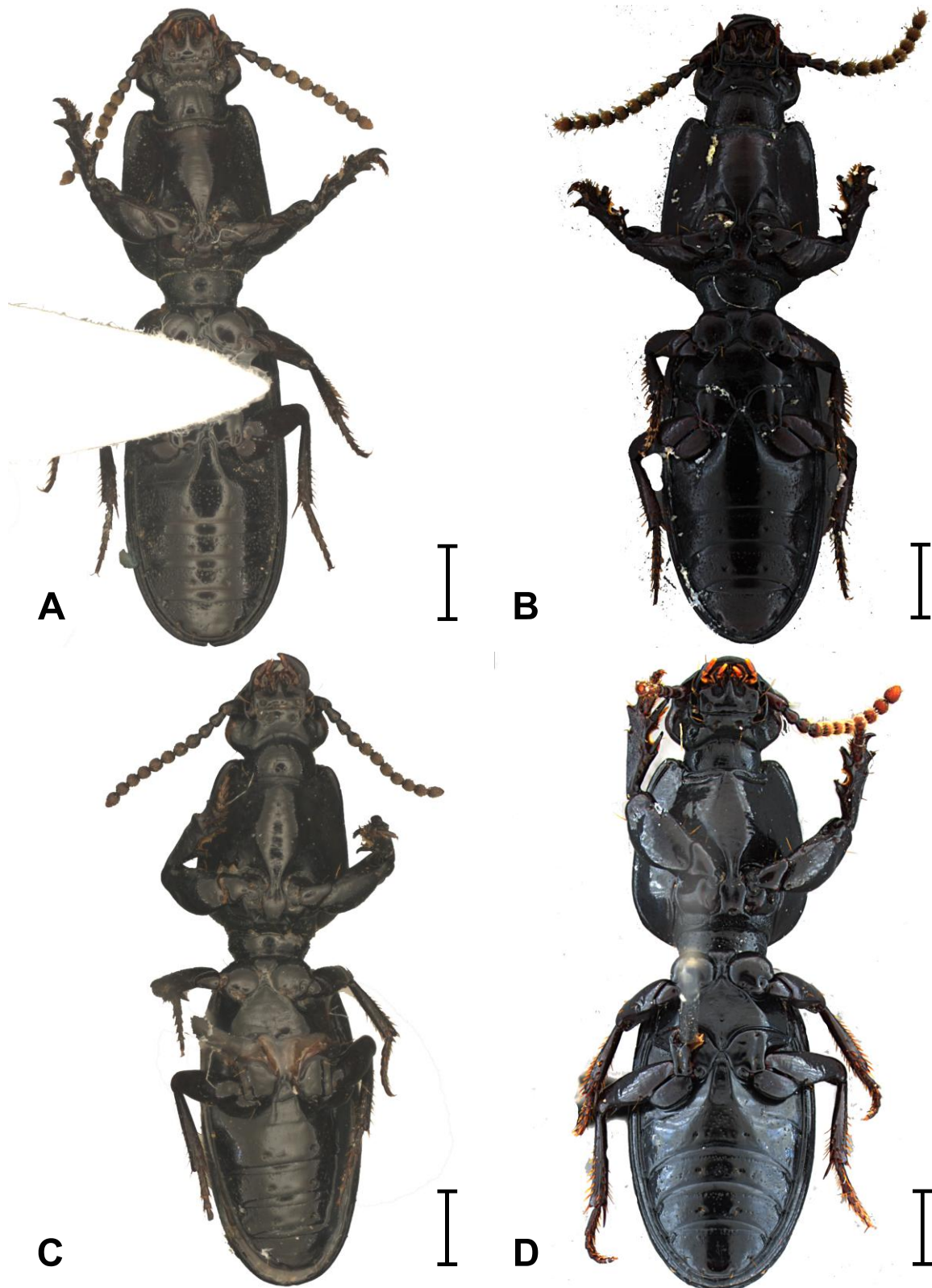
A**B****C**

3 **Figure 2.** Dorsal view of species of the genus *Pyramoides*. **A.** *P. colombiaensis* sp.nov., **B.** *P.*
4 *martinae* sp.nov., **C.** *P. garciae* sp.nov. Scale = 1.0 mm.



1

2 **Figure 3.** Dorsal view of species of the genus *Pyramoides*. **A.** *P. merianae* sp.nov., **B.** *P.*
3 *paraensis* sp.nov., **C.** *P. pantanensis* sp.nov. Scale = 1.0 mm.

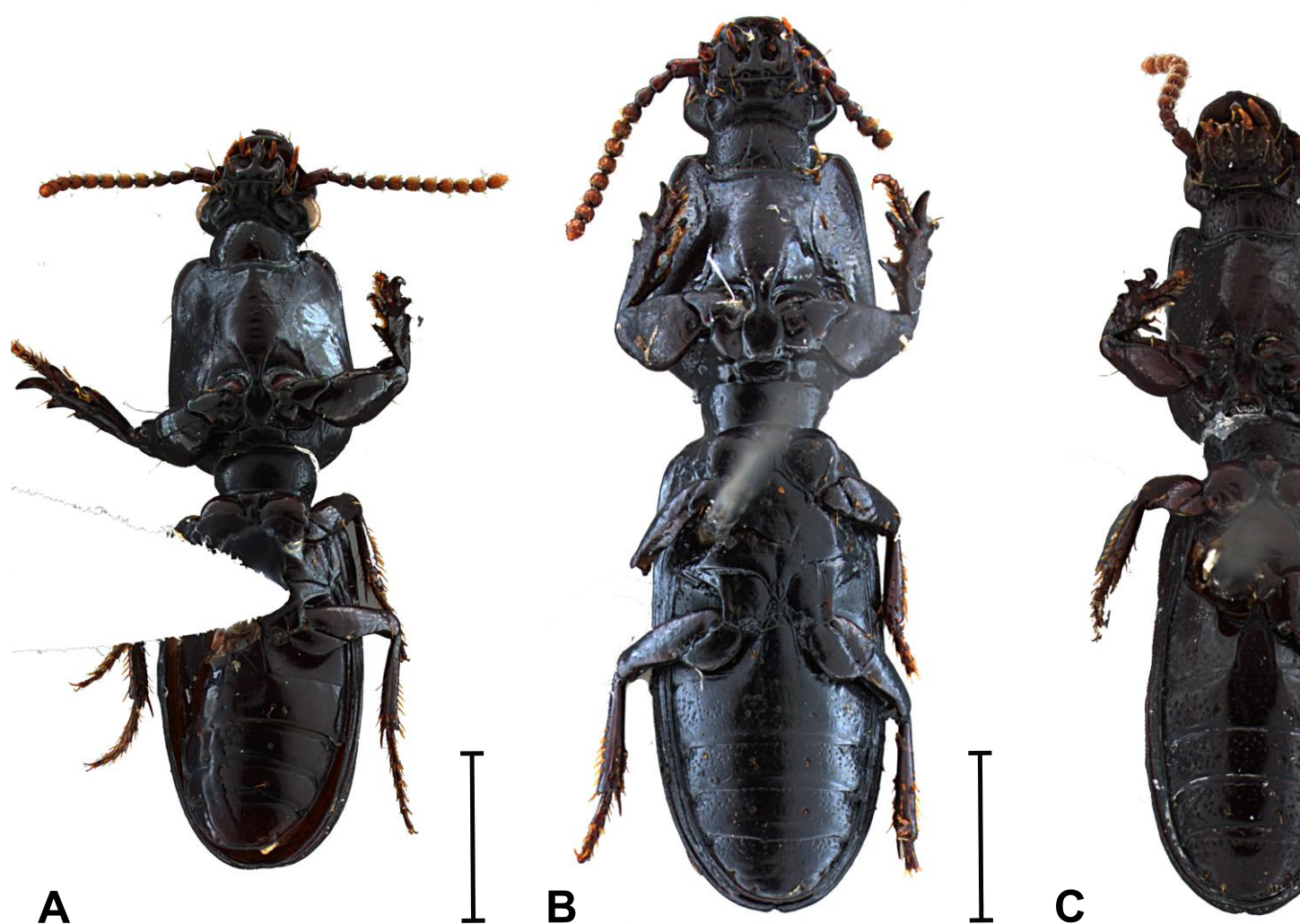


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Figure 4. Ventral view of species of the genus *Pyramoides*. **A.** *P. oblongicollis* sp.nov., **B.** *P. lispectorae* sp.nov., **C.** *P. matogrossensis* sp.nov., **D.** *P. amazonensis* sp.nov. Scale = 1.0 mm.



1

2 **Figure 5.** Ventral view of species of the genus *Pyramoides*. **A.** *P. colombiaensis* sp.nov., **B.** *P.*
3 *martinae* sp.nov., **C.** *P. garciae* sp.nov. Scale = 1.0 mm.

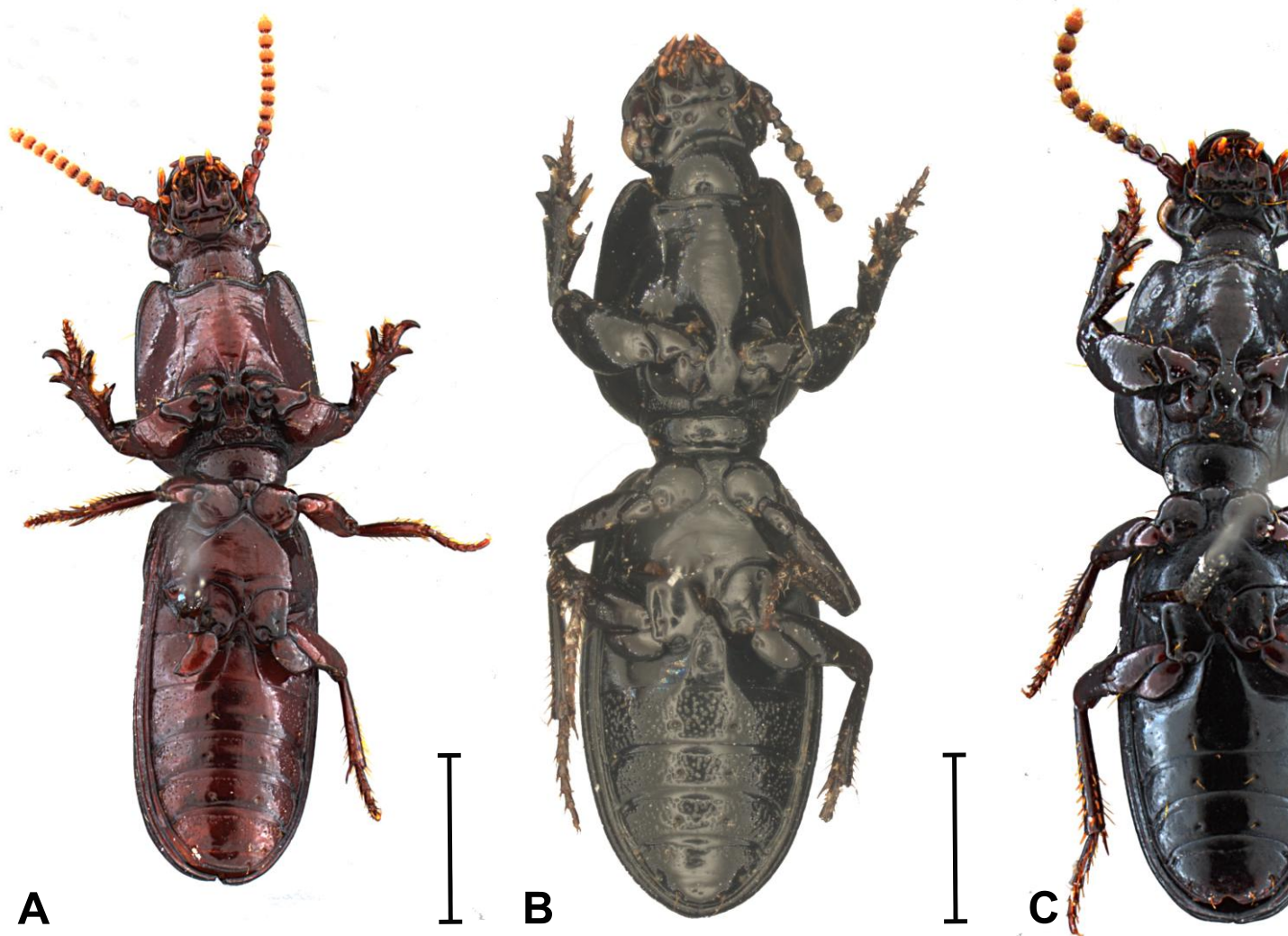


Figure 6. Ventral view of species of the genus *Pyramoides*. **A.** *P. merianae* sp.nov., **B.** *P. paraensis* sp.nov., **C.** *P. pantanensis* sp.nov., Scale = 1.0 mm.

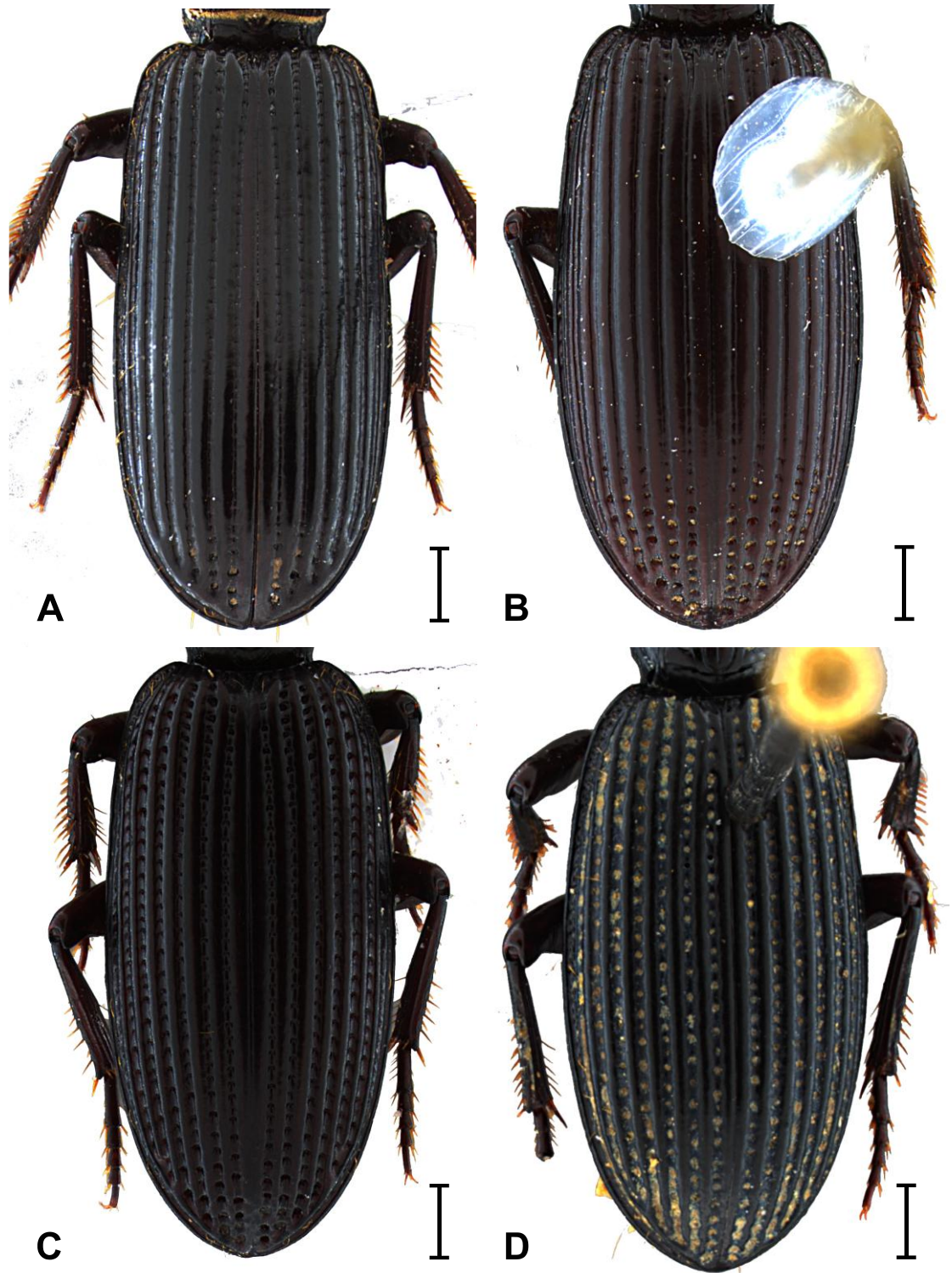


Figure 7. Dorsal view of the elytral striae of *Pyramoides*. A. Dotted, as in *P. oblongicollis*; B. Continuous, as in *P. colombiaensis* sp.nov.; C–D. Punctate, as in *P. lispectorae* sp.nov. and *P. paraensis* sp.nov. Scale = 1.0 mm.

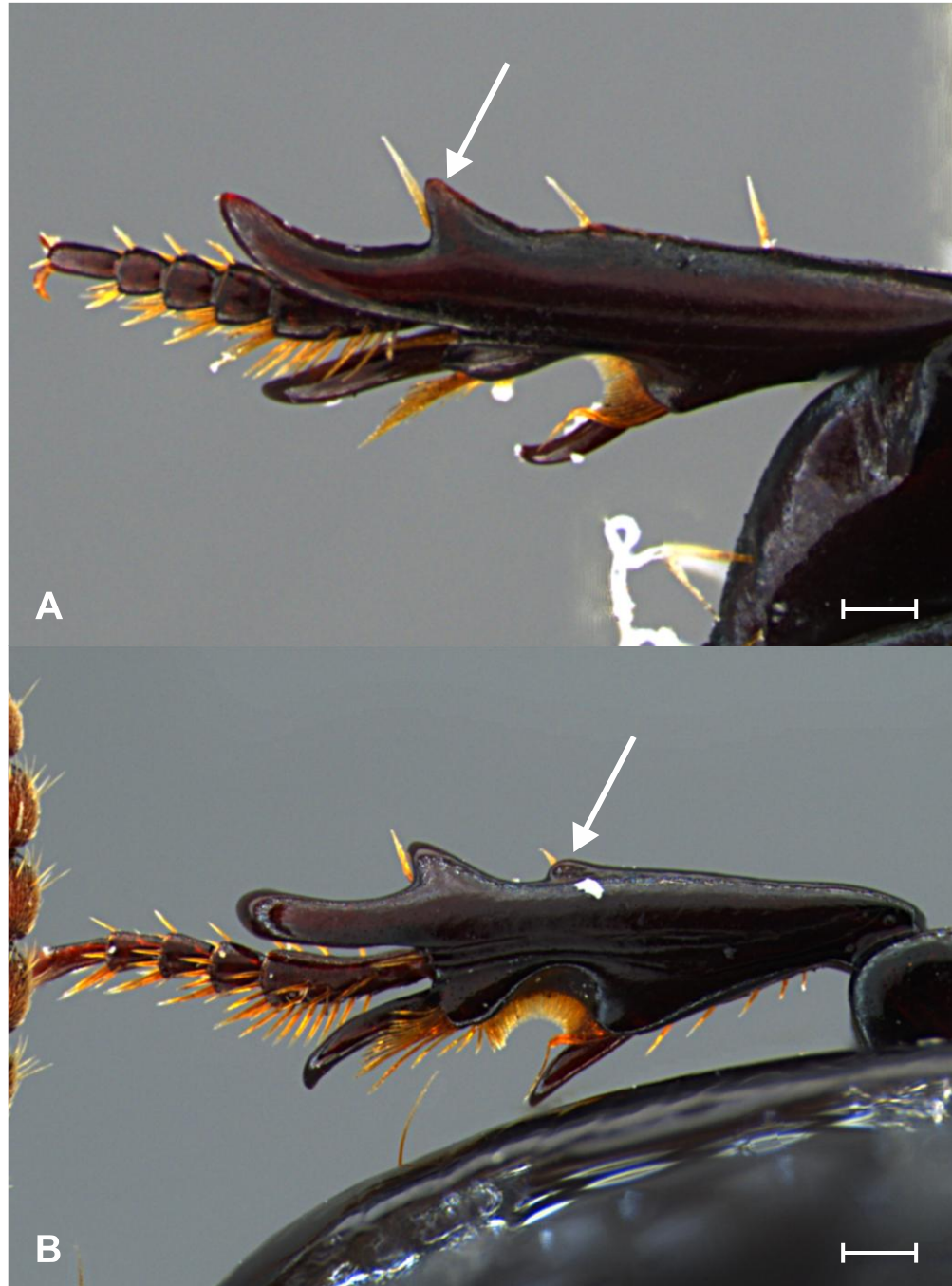
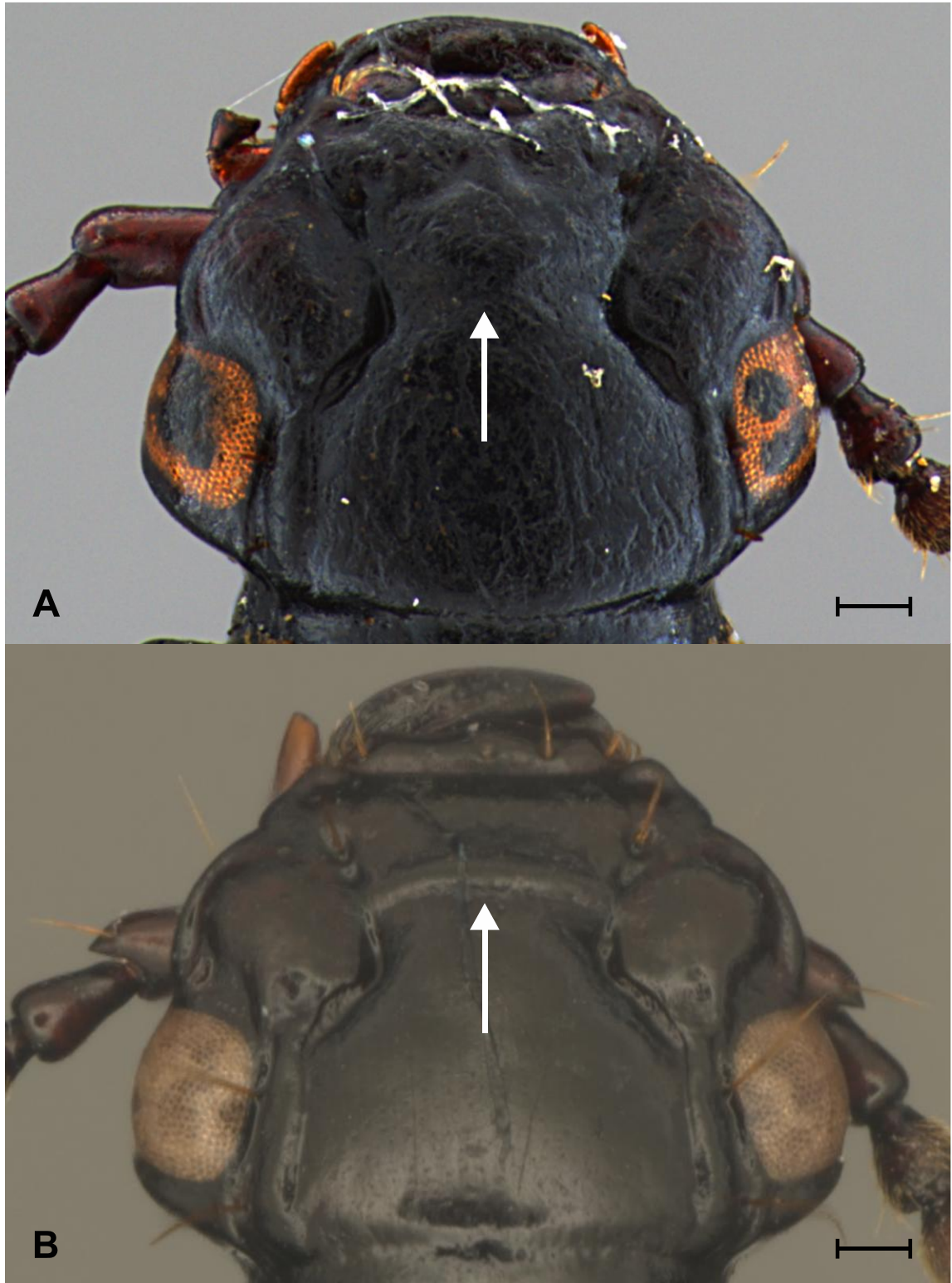


Figure 8. Protibia of *Pyramoides* species. **A.** Outer margin with two teeth, as in *P. lispectorae* sp.nov.; **B.** Outer margin with three teeth, as in *P. colombiaensis* sp.nov. Scale = 0.1 mm.

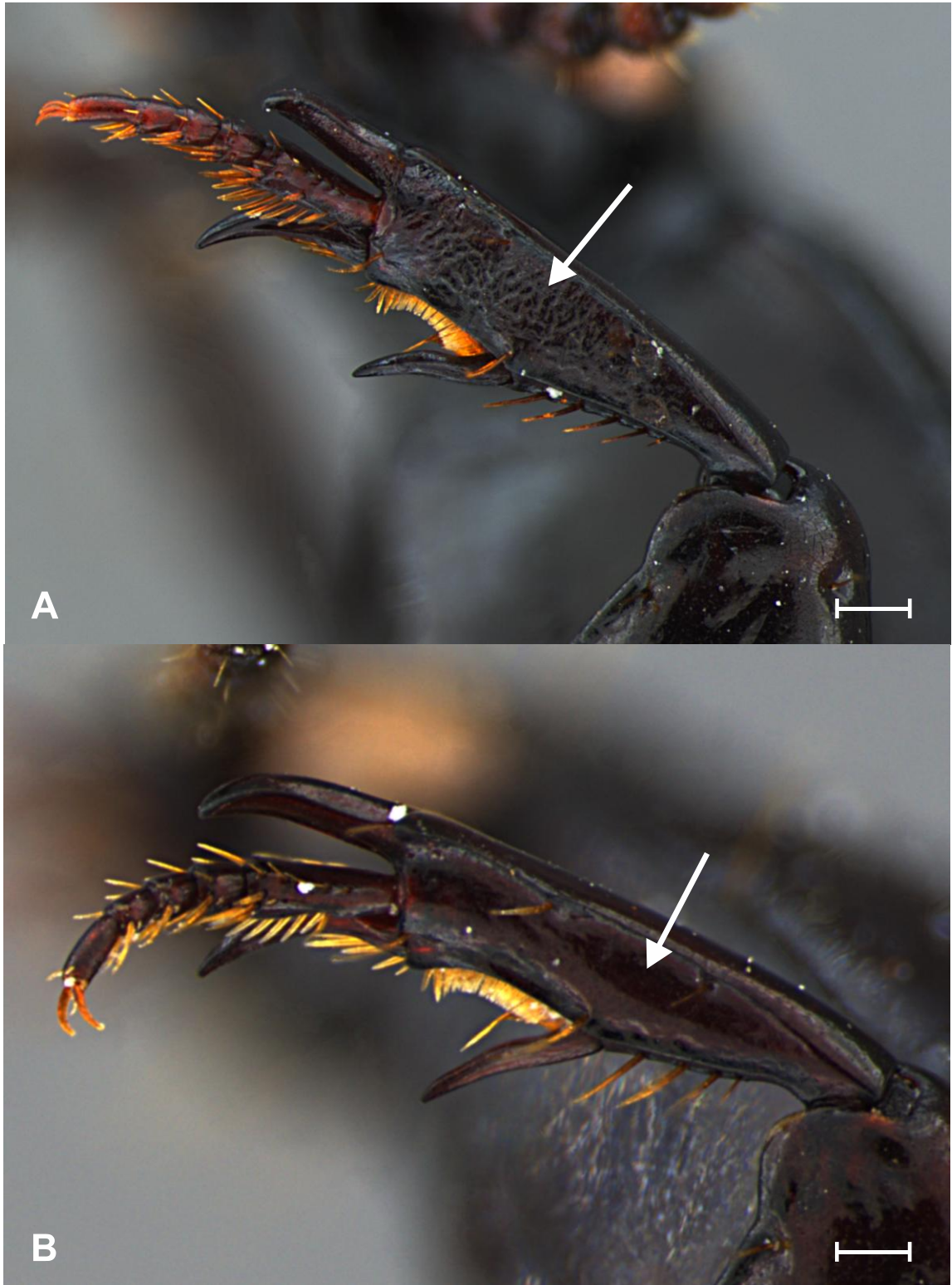


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2 **Figure 9.** Dorsal view of the elytral base. **A.** Elytral base intervals elevated forming ridges, as
3 in *P. garciae* sp.nov.; **B.** Elytral base intervals normal, flat, as in *P. oblongicollis*. Scale = 0.1
4 mm.



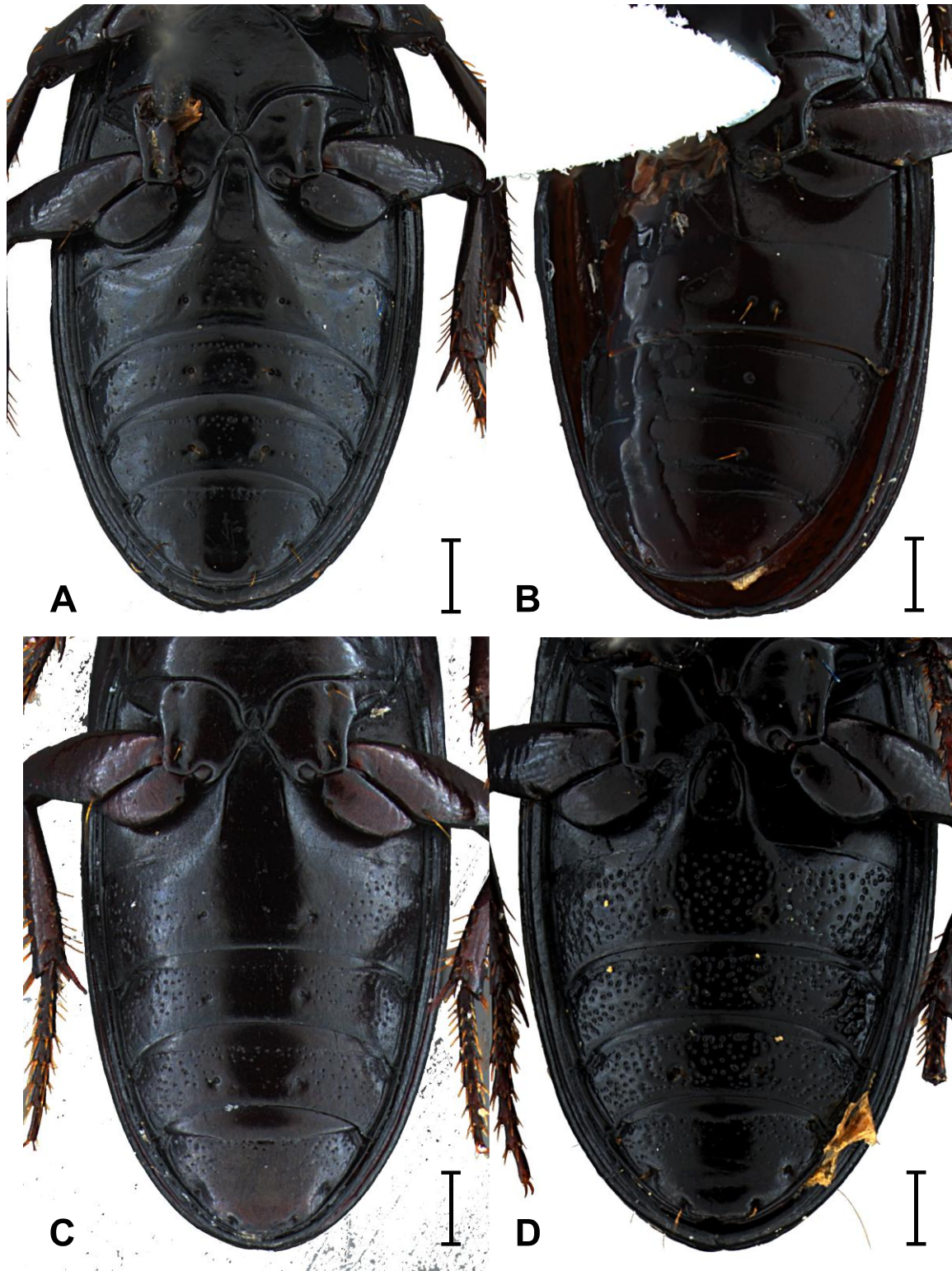
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2 **Figure 10.** Dorsal view of the head. A. Clypeal groove fading at the middle, *P. martinae*
3 sp.nov., B. Clypeal groove continuous, *P. oblongicollis*. Scale = 0.1 mm.



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2 **Figure 11.** Ventral view of the protibia. **A.** Protibia ventrally rugose, as in *P. amazonensis*
3 sp.nov.; **B.** Protibia ventrally smooth, as in *P. lispectorae* sp.nov. Scale = 0.1 mm.



1

2 **Figure 12.** Abdomen of *Pyramoides*. **A.** *P. amazonensis* sp.nov.; **B.** *P. colombiaensis* sp.nov.;3 **C.** *P. lispectora* sp.nov.; **D.** *P. paraensis* sp.nov. Scale = 1.0 mm.

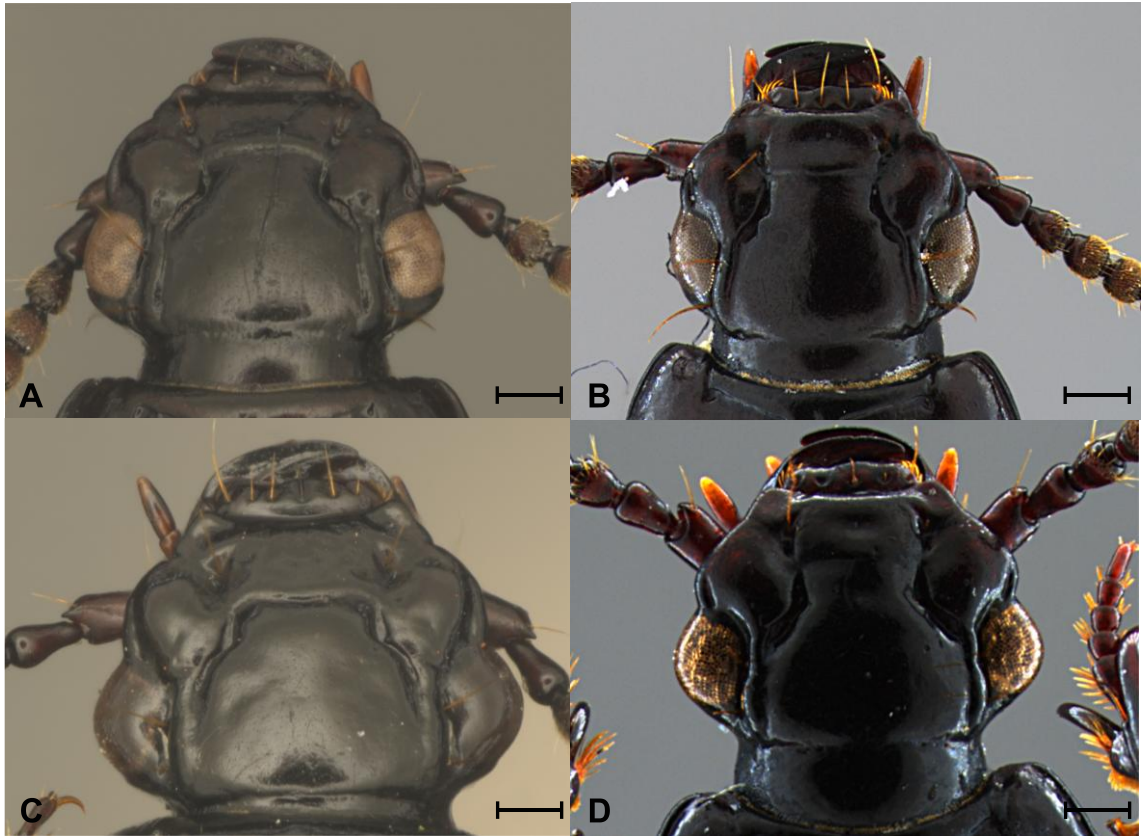
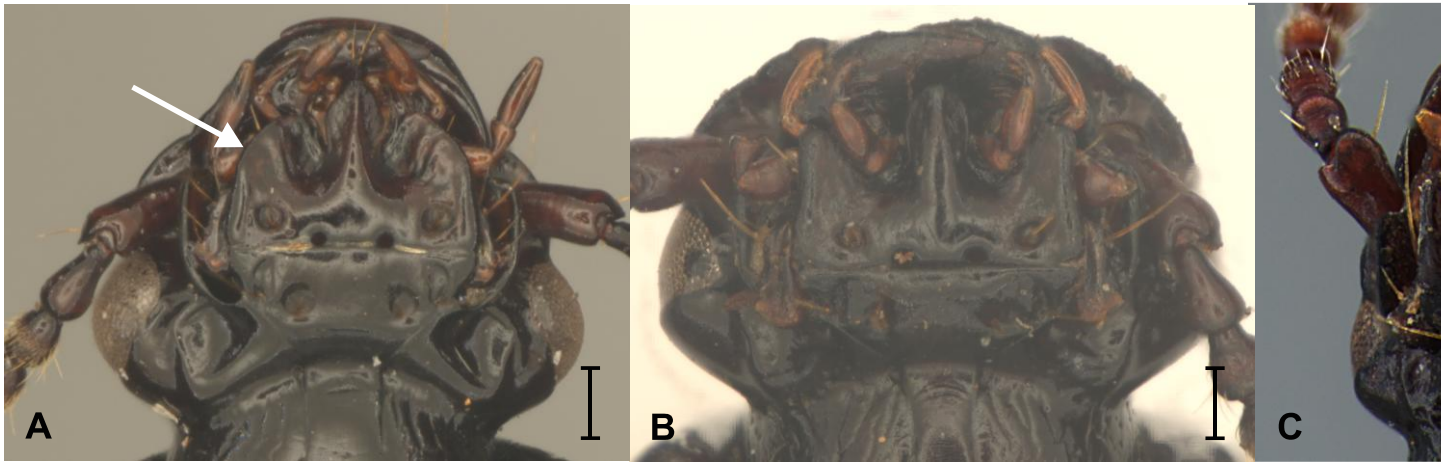


Figure 13. Dorsal view of the head of *Pyramoides* species. **A–B.** Eyes not laterally projected; labrum with five setiferous points, as in *P. oblongicollis* and *P. lispectorae* sp.nov.; **C.** Eyes laterally projected; labrum with six or more setiferous points, as in *P. colombiaensis* sp.nov.; **D.** Eyes laterally projected; labrum with five setiferous points, as in *P. pantanensis* sp.nov. Scale = 0.5 mm.

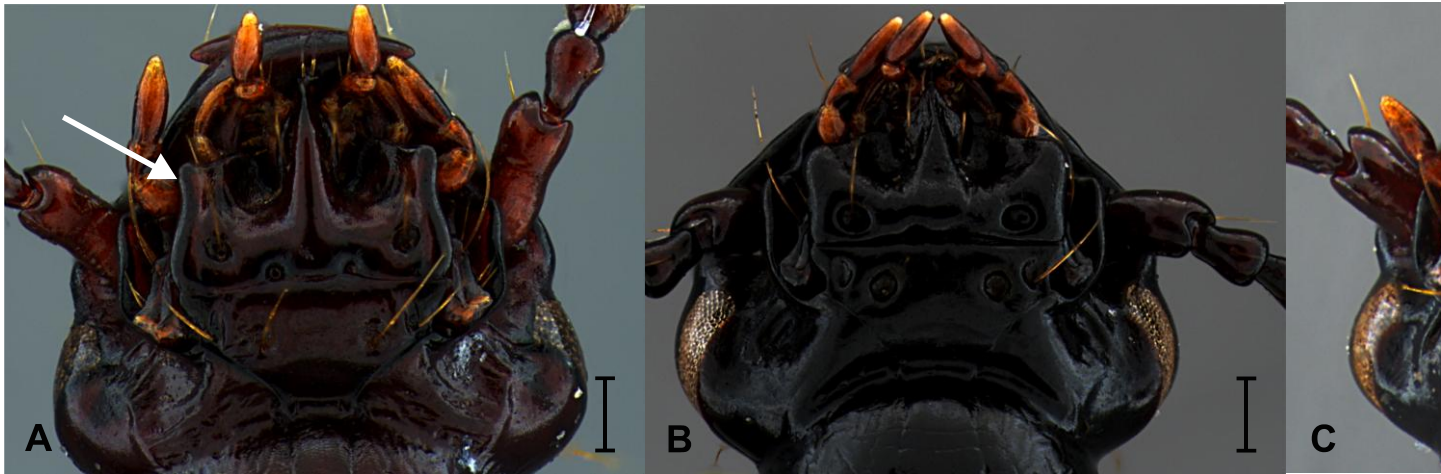


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2 **Figure 14.** Ventral view of the mentum of *Pyramoides* species. **A.** *P. oblongicollis*, **B.** *P.*
3 *lispectorae* sp.nov., **C.** *P. matogrossensis* sp.nov., **D.** *P. amazonensis* sp.nov.

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1
2 **Figure 15.** Ventral view of the mentum of *Pyramoides* species. **A.** *P. colombiaensis* sp.nov.,
3 **B.** *P. martinae* sp.nov., **C.** *P. garciae* sp.nov. Scale = 0.5 mm.



1
2 **Figure 16.** Ventral view of the mentum of *Pyramoides* species. **A.** *P. merianae* sp.nov., **B.** *P.*
3 *paraensis* sp.nov., **C.** *P. pantanensis* sp.nov. Scale = 0.5 mm.

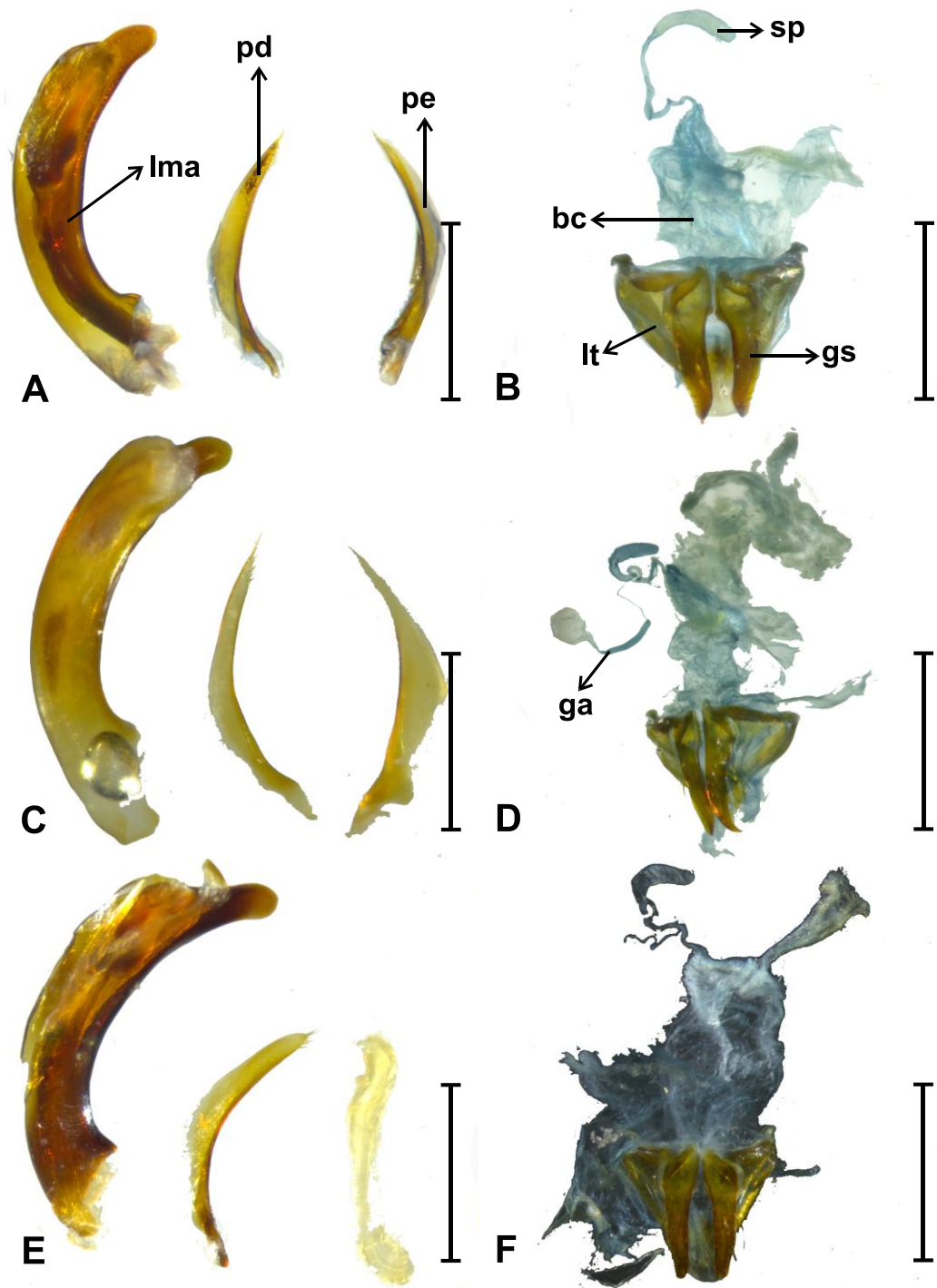
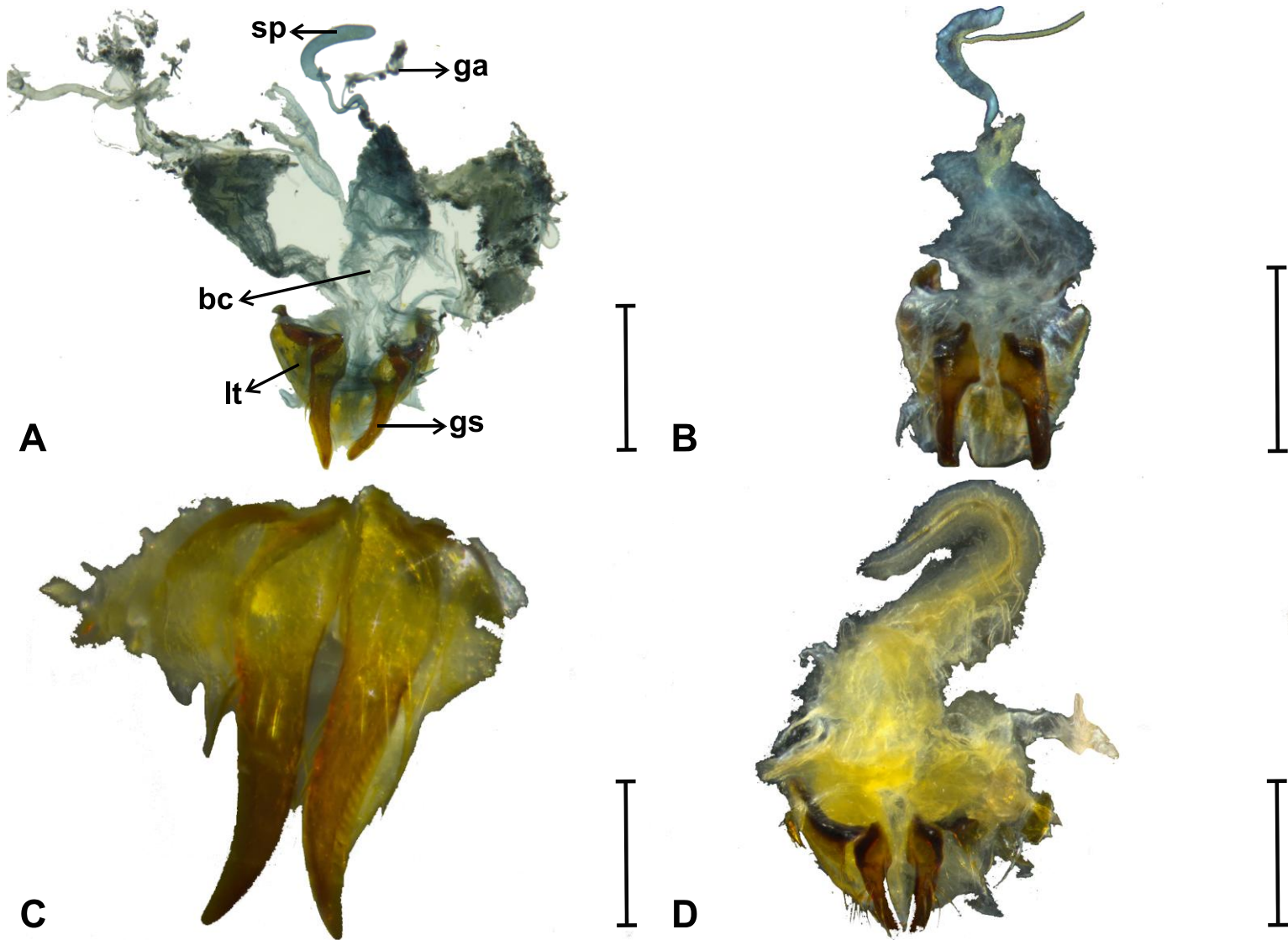


Figure 17. Male and female genitalia. **A♂-B♀.** *P. oblongicollis*, **C♂-D♀.** *P. lispectora* sp.nov., **E♂-F♀.** *P. pantanensis* sp.nov. Scale = 0.1 mm.

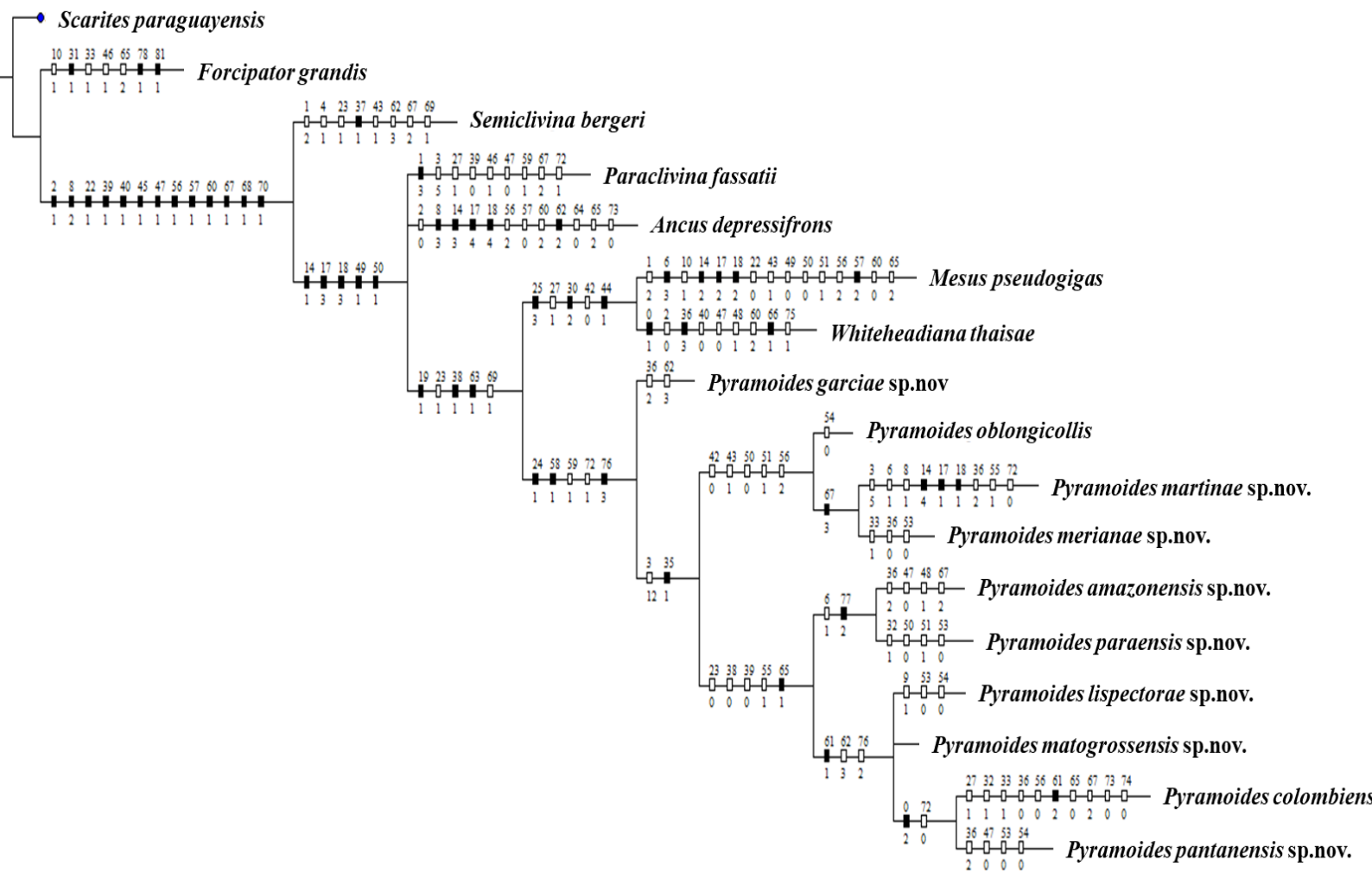


Figure 18. Male genitalia. **A.** *P. matogrossensis* sp.nov., **B.** *P. colombiaensis* sp.nov., **C.** *P. garciae* sp.nov. **lma** = median lobe of the aedeagus, **pd** = right paramere, **pe** = left paramere. Scale = 0.01 mm.



1

2 **Figure 19.** Female genitalia. **A.** *P. amazonensis* sp.nov., **B.** *P. martinae* sp.nov., **C.** *P. merianae*3 sp.nov., **D.** *P. paraensis* sp.nov. **sp** = spermatheca, **ga** = accessory gland, **bc** = bursa copulatrix,4 **lt** = laterotergite, **gs** = gonostylus. Scale = 0.01 mm.



1 **Figure 20.** Cladogram resulting from parsimony analysis under implied weighting of
 2 characters ($k = 4.7656$)

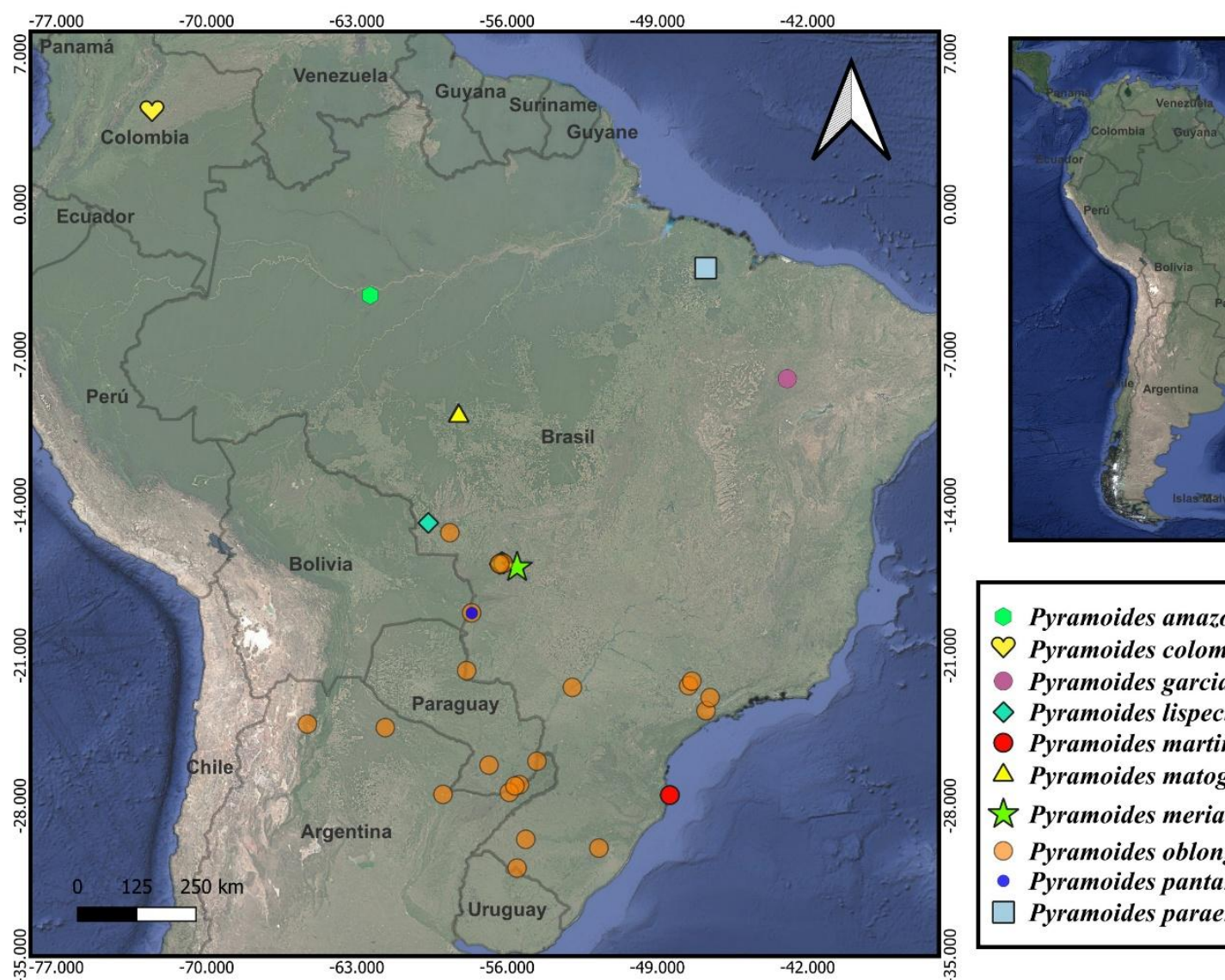


Figure 21. Distribution map of the species of the genus *Pyramoides*

Table 1. Body measurements (mm) of the examined *Pyramoides* specimens.

Type	Colecction	Species	L	W	HL	HW	HL/HW	PL	PW	PL/PW	EL
HT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.32	3.34	1.57	2.25	0.69	3.61	3.15	1.14	6.47
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.45	3.38	1.56	2.35	0.66	3.60	3.18	1.13	6.46
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.15	3.29	1.57	2.19	0.72	3.58	3.17	1.13	6.45
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.60	3.41	1.55	2.18	0.71	3.62	3.19	1.14	6.48
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.05	3.25	1.54	2.32	0.66	3.59	3.16	1.14	6.44
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.75	3.45	1.56	2.36	0.66	3.61	3.20	1.13	6.49
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.10	3.27	1.54	2.24	0.69	3.57	3.15	1.13	6.46
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.88	3.48	1.54	2.20	0.70	3.63	3.21	1.13	6.47
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.20	3.30	1.55	2.23	0.70	3.60	3.22	1.12	6.45
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.50	3.36	1.55	2.40	0.65	3.59	3.18	1.13	6.50

PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.95	3.49	1.52	2.24	0.68	3.64	3.24	1.12	6.44
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.35	3.37	1.57	2.27	0.69	3.58	3.16	1.13	6.48
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.70	3.42	1.57	2.13	0.74	3.61	3.21	1.13	6.46
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.25	3.32	1.57	2.39	0.66	3.60	3.20	1.13	6.45
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.80	3.44	1.56	2.28	0.68	3.59	3.19	1.13	6.49
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.00	3.23	1.51	2.34	0.65	3.63	3.22	1.13	6.44
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.55	3.40	1.54	2.32	0.66	3.57	3.17	1.12	6.47
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.65	3.43	1.52	2.24	0.68	3.61	3.23	1.13	6.45
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.12	3.28	1.50	2.33	0.64	3.60	3.18	1.13	6.46
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.90	3.47	1.54	2.17	0.71	3.58	3.15	1.14	6.50
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	11.98	3.22	1.55	2.14	0.72	3.64	3.23	1.13	6.44
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.42	3.35	1.55	2.15	0.72	3.57	3.16	1.13	6.47
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.78	3.46	1.52	2.23	0.68	3.62	3.21	1.13	6.45
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.30	3.34	1.55	2.33	0.67	3.59	3.17	1.13	6.48
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.68	3.43	1.53	2.38	0.64	3.63	3.24	1.12	6.46
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.07	3.26	1.58	2.28	0.69	3.58	3.19	1.12	6.49
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.85	3.48	1.56	2.14	0.73	3.60	3.20	1.13	6.44
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.22	3.31	1.60	2.31	0.69	3.59	3.18	1.13	6.47
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.53	3.39	1.51	2.17	0.70	3.61	3.21	1.13	6.45
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.96	3.49	1.56	2.11	0.74	3.57	3.15	1.13	6.50
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.40	3.36	1.54	2.20	0.70	3.64	3.22	1.14	6.44
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.74	3.44	1.53	2.39	0.64	3.58	3.16	1.13	6.48
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.18	3.29	1.54	2.21	0.70	3.60	3.19	1.13	6.46
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.92	3.48	1.50	2.19	0.68	3.62	3.21	1.13	6.45
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.08	3.27	1.57	2.38	0.66	3.59	3.18	1.13	6.49
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.63	3.42	1.50	2.17	0.69	3.64	3.25	1.12	6.44
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.48	3.37	1.56	2.17	0.72	3.57	3.16	1.13	6.47
Type	Coleccion	Species	L	W	HL	HW	HL/HW	PL	PW	PL/PW	EL
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.87	3.47	1.60	2.31	0.69	3.60	3.20	1.13	6.45
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.14	3.30	1.52	2.23	0.68	3.61	3.21	1.13	6.48
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.56	3.40	1.55	2.30	0.67	3.58	3.17	1.12	6.46
PT	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.97	3.50	1.51	2.39	0.63	3.63	3.22	1.13	6.50
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.31	3.35	1.56	2.19	0.71	3.57	3.15	1.13	6.44
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.66	3.43	1.56	2.25	0.69	3.59	3.19	1.13	6.47
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.09	3.28	1.59	2.18	0.73	3.60	3.18	1.13	6.45
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.81	3.45	1.52	2.17	0.70	3.61	3.20	1.13	6.48
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.26	3.32	1.56	2.17	0.72	3.58	3.17	1.12	6.46
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.71	3.44	1.51	2.23	0.68	3.64	3.23	1.13	6.45
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	11.94	3.21	1.58	2.40	0.66	3.57	3.16	1.13	6.49
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.44	3.37	1.56	2.27	0.69	3.60	3.21	1.13	6.44

MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.82	3.46	1.54	2.10	0.73	3.62	3.23	1.13	6.47
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.16	3.30	1.60	2.35	0.68	3.59	3.18	1.13	6.45
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.61	3.41	1.53	2.35	0.65	3.61	3.20	1.13	6.46
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.98	3.50	1.56	2.34	0.67	3.60	3.22	1.12	6.50
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.33	3.36	1.56	2.36	0.66	3.57	3.17	1.12	6.44
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.77	3.45	1.55	2.22	0.70	3.63	3.24	1.12	6.47
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.11	3.29	1.51	2.33	0.65	3.58	3.18	1.12	6.45
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.89	3.48	1.51	2.36	0.64	3.64	3.23	1.13	6.48
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.28	3.33	1.51	2.10	0.72	3.57	3.16	1.13	6.46
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.54	3.39	1.57	2.34	0.67	3.60	3.21	1.13	6.44
MA	CEUFLA	<i>P. lispectorae</i> sp.nov.	12.99	3.50	1.54	2.26	0.68	3.62	3.20	1.13	6.44
HT	RBINS	<i>P. oblongicollis</i>	9.68	2.67	1.36	1.66	0.81	2.83	2.45	1.15	5.02
PT	MNHNP	<i>P. oblongicollis</i>	12.95	3.37	1.74	2.22	0.78	3.63	3.16	1.15	6.40
PT	CEUFLA	<i>P. oblongicollis</i>	12.85	3.45	1.80	2.25	0.80	3.61	3.13	1.15	6.45
PT	CEUFLA	<i>P. oblongicollis</i>	12.72	3.58	1.68	2.20	0.76	3.62	3.19	1.13	6.42
PT	CEUFLA	<i>P. oblongicollis</i>	12.60	3.25	1.75	2.30	0.76	3.57	3.21	1.11	6.39
PT	CEUFLA	<i>P. oblongicollis</i>	12.80	3.92	1.72	2.18	0.78	3.62	3.11	1.16	6.47
PT	CEUFLA	<i>P. oblongicollis</i>	12.40	3.60	1.76	2.21	0.79	3.58	3.14	1.14	6.41
PT	CEUFLA	<i>P. oblongicollis</i>	12.90	3.80	1.78	2.26	0.78	3.64	3.19	1.14	6.46
PT	CEUFLA	<i>P. oblongicollis</i>	12.50	3.50	1.70	2.19	0.77	3.62	3.10	1.17	6.38
PT	CEUFLA	<i>P. oblongicollis</i>	12.30	3.70	1.74	2.24	0.77	3.60	3.18	1.13	6.50
PT	CEUFLA	<i>P. oblongicollis</i>	12.75	3.40	1.82	2.27	0.80	3.67	3.30	1.11	6.44
PT	CEUFLA	<i>P. oblongicollis</i>	12.60	3.90	1.66	2.15	0.77	3.56	3.11	1.14	6.37
PT	CEUFLA	<i>P. oblongicollis</i>	12.45	3.20	1.79	2.23	0.80	3.59	3.24	1.11	6.48
PT	CEUFLA	<i>P. oblongicollis</i>	12.88	3.35	1.71	2.20	0.77	3.67	3.27	1.12	6.36
PT	CEUFLA	<i>P. oblongicollis</i>	12.92	3.50	1.73	2.25	0.76	3.66	3.17	1.15	6.49
PT	CEMT	<i>P. oblongicollis</i>	12.20	3.65	1.80	2.28	0.78	3.70	3.18	1.16	6.39
Type	Colecction	Species	L	W	HL	HW	HL/HW	PL	PW	PL/PW	EL
PT	CEMT	<i>P. oblongicollis</i>	12.70	3.95	1.68	2.16	0.77	3.56	3.14	1.13	6.51
PT	CEMT	<i>P. oblongicollis</i>	12.10	3.85	1.75	2.22	0.78	3.67	3.16	1.16	6.43
PT	CEMT	<i>P. oblongicollis</i>	12.98	3.72	1.77	2.24	0.79	3.64	3.10	1.17	6.40
PT	CEMT	<i>P. oblongicollis</i>	12.55	3.30	1.69	2.18	0.77	3.62	3.19	1.13	6.37
PT	CEMT	<i>P. oblongicollis</i>	12.35	3.80	1.72	2.20	0.78	3.56	3.18	1.12	6.50
PT	CEMT	<i>P. oblongicollis</i>	12.78	3.40	1.81	2.26	0.80	3.62	3.28	1.10	6.38
PT	CEMT	<i>P. oblongicollis</i>	12.65	3.25	1.67	2.14	0.78	3.59	3.11	1.15	6.45
PT	CEMT	<i>P. oblongicollis</i>	12.33	3.60	1.78	2.23	0.79	3.68	3.26	1.13	6.41
PT	CEMT	<i>P. oblongicollis</i>	12.44	3.50	1.70	2.17	0.78	3.69	3.28	1.12	6.36
PT	CEMT	<i>P. oblongicollis</i>	12.68	3.70	1.74	2.21	0.78	3.62	3.29	1.10	6.42
PT	CEMT	<i>P. oblongicollis</i>	12.15	3.95	1.79	2.25	0.79	3.58	3.27	1.09	6.48
PT	CEMT	<i>P. oblongicollis</i>	12.87	3.55	1.76	2.20	0.80	3.65	3.24	1.13	6.47

PT	CEMT	<i>P. oblongicollis</i>	12.90	3.75	1.82	2.30	0.79	3.56	3.23	1.10	6.39
PT	CEMT	<i>P. oblongicollis</i>	12.12	3.40	1.73	2.18	0.79	3.65	3.29	1.11	6.49
PT	CEMT	<i>P. oblongicollis</i>	12.50	3.30	1.69	2.16	0.78	3.69	3.13	1.18	6.44
PT	CEMT	<i>P. oblongicollis</i>	12.80	3.85	1.80	2.27	0.79	3.62	3.16	1.15	6.40
PT	CEMT	<i>P. oblongicollis</i>	12.99	3.95	1.71	2.19	0.78	3.57	3.19	1.12	6.37
PT	CEMT	<i>P. oblongicollis</i>	12.47	3.45	1.75	2.24	0.78	3.56	3.24	1.10	6.46
PT	CEMT	<i>P. oblongicollis</i>	12.23	3.70	1.77	2.22	0.79	3.65	3.27	1.12	6.50
PT	CEMT	<i>P. oblongicollis</i>	12.95	3.38	1.74	2.22	0.78	3.58	3.20	1.12	6.51
HT	CEUFLA	<i>P. matogrossensis</i> sp.nov.	14.04	3.70	2.00	2.40	0.40	4.00	3.45	1.15	7.22
PT	CEUFLA	<i>P. matogrossensis</i> sp.nov.	14.08	3.64	1.98	2.34	0.85	4.05	3.47	1.16	7.28
PT	CEUFLA	<i>P. matogrossensis</i> sp.nov.	14.05	3.68	2.02	2.38	0.85	4.02	3.42	1.17	7.24
HT	CEUFLA	<i>P. amazonensis</i> sp.nov.	10.97	3.24	1.44	2.03	0.70	3.20	3.07	1.04	5.71
HT	MJHN	<i>P. colombiaensis</i> sp.nov.	15.22	4.08	2.05	2.63	0.77	4.75	3.84	1.23	7.63
PT	MJHN	<i>P. colombiaensis</i> sp.nov.	15.20	4.05	2.03	2.61	0.78	4.77	3.83	1.24	7.64
HT	MZSP	<i>P. martinae</i> sp.nov.	13.24	3.40	1.80	2.29	0.78	3.69	3.31	1.11	6.88
HT	MZSP	<i>P. garciae</i> sp.nov.	8.82	2.34	1.24	1.49	0.83	2.61	2.13	1.22	4.67
HT	MZSP	<i>P. merianae</i> sp.nov.	13.30	3.34	1.89	2.23	0.84	3.80	3.31	1.14	7.02
HT	INPA	<i>P. paraensis</i> sp.nov.	19.98	5.64	3.07	3.57	0.85	5.95	5.17	1.15	9.71
PT	INPA	<i>P. paraensis</i> sp.nov.	19.97	5.63	3.05	3.55	0.86	5.95	5.17	1.15	9.73
HT	AMBC	<i>P. pantanensis</i> sp.nov.	9.70	2.58	2.35	2.34	1.00	2.59	2.44	1.06	5.18
PT	AMBC	<i>P. pantanensis</i> sp.nov.	9.70	2.56	2.34	2.31	1.01	2.59	2.44	1.06	5.17

1 Legend: Body measurements in millimeters (mm). **L** = maximum body length; **W** =
2 maximum body width; **HL** = head length; **HW** = head width; **HL/HW** = head index; **PL** =
3 pronotum length; **PW** = pronotum width; **PL/PW** = pronotum index; **EL** = elytral length;
4 **EW** = elytral width; **EL/EW** = elytral index; **AL** = abdominal length; **AW** = abdominal
5 width.

6

7 **Table 2.** Morphological data matrix used for phylogenetic analyses; inapplicable or unknown
8 states are indicated by (-).

Charact ers	Species																
	Sp a	F gr	M ps	Wt h	Cf a	Sb e	Ad e	Po b	P li	P mt	Pa m	Pc o	P mr	Pg a	P me	P pr	Pp n
0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0
1	0	0	0	2	0	3	2	0	0	0	0	0	0	0	0	0	0
2	0	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1
3	-	-	-	4	-	5	1	-	1	1	1	1	1	5	3	2	1

4	0	0	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1
5	0	0	0	0	-	0	-	1	-	-	-	-	-	-	-	-	-
6	0	0	1	3	1	1	1	1	2	2	2	1	2	1	2	2	1
7	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
8	0	0	1	2	2	2	2	3	2	2	2	2	2	1	2	2	2
9	-	-	-	-	-	-	-	-	0	1	0	-	0	-	0	1	-
10	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11	-	-	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-
12	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	2	1	1	0	3	1	1	1	1	1	4	1	1	1
15	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
17	0	0	0	2	3	3	0	4	3	3	3	3	3	1	3	3	3
18	0	0	0	2	3	3	0	4	3	3	3	3	3	1	3	3	3
19	0	0	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
23	0	0	0	-	1	0	1	0	1	0	0	0	0	1	1	1	0
24	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
25	0	0	1	3	3	0	0	2	2	2	2	2	2	2	2	2	2
26	0	0	0	1	0	2	0	2	0	0	0	0	0	0	0	0	0
27	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0
28	0	0	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Charact ers	Species																
	Sp a	F gr	M ps	Wt h	Cf a	Sb e	Ad e	Po b	P li	P mt	Pa m	Pc o	P mr	Pg a	P me	P pr	Pp n
29	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	0	0	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1
31	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
33	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0

65	0	0	2	2	0	0	0	2	0	1	1	1	0	0	0	0	1
66	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	-	2	2	1	1	1	1	2	2	3	1	3	1
68	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
69	0	0	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1
70	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
71	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	-	-	-	0	0	1	0	0	1	1	1	1	0	0	1	1	1
73	0	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1
74	0	0	0	1	0	1	0	0	1	1	1	1	0	1	1	1	1
75	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
76	-	-	-	2	-	0	-	-	3	2	2	3	-	3	3	3	3
77	0	0	-	0	-	0	-	-	0	0	0	2	-	0	0	0	2
78	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1

2 Legend: **Spa** *S. paraguayensis*, **Fgr** *F. grandis*, **Mps** *M. pseudogigas*, **Wth** *W. thaisae*, **Cfa** *C.*
3 *fassatii*, **Sbe** *S. bergeri*, **Ade** *A. depressifrons*, **Pob** *P. oblongicollis*, **Pli** *P. lispectorae* sp.nov.,
4 **Pmt** *P. matogrossensis* sp.nov., **Pam** *P. amazonensis* sp.nov., **Pco** *P. colombiaensis* sp.nov.,
5 **Pmr** *P. martinae* sp.nov., **Pga** *P. garciae* sp.nov., **Pme** *P. merianae* sp.nov., **Ppr** *P. paraensis*
6 sp.nov. e **Ppn** *P. pantanensis* sp.nov.

FINAL CONSIDERATIONS

This dissertation, encompassing a synopsis of the genera and species of Clivinini in the Chaco province and the systematic revision of the genus *Pyramoides*, represents a significant advance in the taxonomic and phylogenetic knowledge of Neotropical Carabidae. On one hand, the Clivinini synopsis documented 57 species distributed across 12 genera and four subtribes, identifying new distribution records and relevant nomenclatural changes, such as the transfer of species from *Clivina* to *Semiclivina*. These records not only expand the known distribution of Clivinini in the Chaco region but also highlight the importance of this biome as a biogeographical refuge amid threats such as agricultural and livestock expansion.

On the other hand, the systematic revision of *Pyramoides* confirmed its monophyly through phylogenetic analyses based on external morphological characters and enabled the description of new species, expanding our understanding of its diversity and geographic distribution in the Neotropics. The integration of these studies underscores the complexity and rich diversity of Clivinini, emphasizing the need for integrative research that combines morphological and molecular data.

Together, these works establish a taxonomic foundation and provide essential tools for future research and conservation strategies, promoting a deeper understanding of the evolution and diversity of Carabidae in the Neotropical region. In summary, this study not only contributes to the enrichment of scientific knowledge but also carries important implications for the preservation of species and ecosystems in one of the most biodiverse and least explored areas of South America.