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Article

The dung beetles (Coleoptera: Scarabaeinae) registered for the State of Rondônia (Brazil), Southwestern Amazon

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Abstract: Although biodiversity in the Amazon is high, different aspects of this biodiversity are unknown for several taxa. To fill in the gap in the distribution of dung beetle species (Coleoptera: Scarabaeidae, Scarabaeinae) in southwestern Amazonia and identify the conservation status of the species, we compiled records of scarab beetles for the state of Rondônia (Brazil) available in the literature. Additionally, online databases and biological collections were also used to complement the information on the distribution of these species. The conservation status of dung beetles was based on the IUCN Red List of Threatened Species. We recorded 106 species that are divided into 23 genera and distributed in the diverse types of landscapes. Our results also demonstrate the enormous potential for discovering new species in a region still little explored in studies with Scarabaeinae and which coexist with constant environmental threats.

Keywords: Rondônia, insects, geographic distribution, southwest of the Amazon, southwest of the Brazilian Amazon.

Resumo: Embora a biodiversidade na Amazônia seja elevada, diferentes aspectos desta biodiversidade são desconhecidos para vários táxons. Para preencher a lacuna sobre a distribuição das espécies de besouros rola-bostas (Coleoptera: Scarabaeidae, Scarabaeinae) no sudoeste da Amazônia e identificar o estado de conservação das espécies, compilamos os registros dos besouros escarabeíneos para o estado de Rondônia disponíveis na literatura. Adicionalmente, bancos de dados online e coleções biológicas também foram utilizados para complementar as informações sobre a distribuição dessas espécies. O estado da conservação dos besouros rola-bostas foi baseado na lista vermelha de espécies ameaçadas da IUCN. Registramos 106 espécies que estão divididas em 23 gêneros, e distribuídas nos mais diversos tipos de paisagens. Nossos resultados também demonstram o

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enorme potencial para descoberta de novas espécies de uma região ainda pouco explorada nos estudos com Scarabaeinae e que vive com constantes ameaças ambientais.

Palavras-chave: Rondônia, insetos, distribuição geográfica, sudoeste da Amazônia, sudoeste da Amazônia brasileira.

1. Introduction

Scarabaeinae beetles (Coleoptera: Scarabaeidae) are popularly known as dung beetles due to the peculiar habit that most species have; they use animal excrement for food and reproduction (Vaz-de-Mello, 2000; Philips, 2011; Vaz-de-Mello *et al*., 2017). The species of this subfamily are easily captured by pitfall traps and flight interceptors (FIT) (Spector, 2006; Puker *et al*., 2020), are easy to identify to the genus level and have a vast specialized taxonomic literature (e.g., Costa, 2000; Vaz-de-Mello, 2000; Vaz-de-Mello *et al*., 2011). These species are also known for their rapid response to environmental changes (Nichols *et al*., 2007; Silva *et al*., 2022).

For example, taxonomic diversity may be reduced in areas without tree cover, such as grasslands (Sarmiento-Garcés and Hernández 2021). Additionally, secondary forests and plantations have communities of dung beetles as fewer species, and with individuals of lower body mass, which probably negatively influences the ecosystem services provided by these organisms (Gardner *et al*., 2008); like other groups of insects, it maintains an intimate relationship with the natural resources they use (e.g., Brown Jr, 1997). These characteristics make the beetles of this subfamily a possible model organism that could be used as an instrument for decision-making that includes subjects such as conservation planning and biodiversity monitoring (Nichols *et al*., 2007; *Pessôa et al*., 2023).

The study of the scarab beetle fauna in the Southwest of the Amazon represents a knowledge gap. Located in this region, the state of Rondônia has few studies carried out so far (Silva *et al*., 2014; Castro *et al*., 2015; Castro, 2017; Puker *et al*., 2020; Puker *et al*., 2021; Silva *et al*., 2022), and coexists with the constant environmental mischaracterization (Assis *et al*., 2019). The state has one of the highest increases in deforestation of the states included in the Amazon biome from 2008 to 2021; and in the best-case scenario for the next 28 years (2050), the remaining forests will decline due to increased landscape fragmentation (Piontekowski *et al*., 2019). Areas of natural vegetation will only be found in protected and indigenous areas.

Therefore, our goal is to fill the gap in the distribution of dung beetle species in the southwest of the Amazon and identify the conservation status of the species. The information generated and shared could be used as subsidies for public policies and future studies, because dung beetles serve as effective indicators within an ecosystem due to their sensitivity to environmental changes, enabling them to swiftly adjust their assemblage composition in response to such changes (e.g., Salomão et al. 2022).

2. Material and Methods

The compilation of records of dung beetle species in the state of Rondônia was carried out in three different ways. The first one was through scientific articles. The keywords used to search in Google Scholar for articles were: dung beetles, Rondônia and

Scarabaeinae, combined as Scarabaeinae AND Rondônia, dung beetles AND Rondônia, in Portuguese and English. Only scientific articles of any type of study were considered, as long as they presented species collected in the State of Rondônia. There was no temporal cut in the searches and the last year analyzed was 2022. The second one was based on the records of the species deposited in the main collections for the subfamily: the Entomological Collection of the Federal University of Rondônia (UFRO-ECOL) and the Zoological Collection of the Federal University of Mato Grosso (CEMT). The third, was considered the information available in the Global Biodiversity Information Facility - GBIF (www.gbif.org), SpeciesLink (http://www.splink.org.br, Information system that integrates in real time, primary data of scientific collections), and the Brazilian Biodiversity Information System – SIBBR (www.sibbr.gov.br). Through these three different sources of information, we hope to minimize the effect of sampling on our results.

The conservation status of dung beetle species was based on the IUCN Red List of Threatened Species, available at www.iucnredlist.org. According to the IUCN, the species can be categorized as: "Least Concern", when the species is abundant and has a wide distribution; "Critically Endangered", indicating that the species has a high degree of being extinct; "Endangered", species that have a chance of becoming extinct in the future; "Vulnerable", species that also have a chance of becoming extinct in the future, but this chance can be reduced if preservation actions are carried out; "Near Threatened", species that are not yet in any of the categories mentioned above; and "Data Deficient", species that still do not have enough data to define their conservation status.

3. Results

Through our searches, 13 scientific articles were found that contained records of species collected in the state or that used a specimen collected in systematic and taxonomic studies (Table 1).

Table 1. List of species of dung beetles (Scarabaeidae: Scarabaeinae) in the state of Rondônia, based on literature review and the searches on the records of the species deposited in the Entomological Collection of the Federal University of Rondônia (UFRO-ECOL), Zoological Collection of the Federal University of Mato Grosso (CEMT), Global Biodiversity Information - GBIF, SpeciesLink, and the Brazilian Biodiversity Information System – SIBBR.

Species	Source	Habitat	County	Deposit Collection	Status IUCN
Anomiopus sp. 1	Silva *et al*. (2022); UFRO-ECOL	Forest	Itapuã do Oeste, Pimenta Bueno	UFRO-ECOL	-
Anomiopus sp. 10	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	-
Ateuchus aeneomicans (Harold, 1868)	UFRO-ECOL	Native Forest, Agrofores,	Itapuã do Oeste, Nova Mamoré, REBIO Jaru, Rolim de Moura	UFRO-ECOL	-

Ateuchus aff. *candezei*	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Porto Velho, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Ateuchus aff. *murrayi*	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Porto Velho, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Ateuchus aff. *striatulus*	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Ateuchus connexus (Harold, 1868)	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Ateuchus frontalis (Boucomont, 1928)	UFRO-ECOL	Native Forest	REBIO Jaru	UFRO-ECOL	-
Ateuchus murrayi (Harold, 1868)	UFRO-ECOL	Native Forest	Porto Velho	UFRO-ECOL	Least Concern
Ateuchus pygidialis (Harold, 1868)	Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest, Agroforest	Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Ateuchus sp. 1	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Nova Mamoré, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Ateuchus sp. 2	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Ateuchus sp. 3	UFRO-ECOL	Native Forest, Forest, Agroforest	Itapuã do Oeste, Nova Mamoré, Porto Velho, REBIO Jaru, Rolim de Moura	UFRO-ECOL	-
Ateuchus sp. 4	UFRO-ECOL	Native Forest, Forest, Agroforest	Itapuã do Oeste, Nova Mamoré, REBIO Jaru, Rolim de Moura	UFRO-ECOL	-

Ateuchus sp. 5	UFRO-ECOL	Native Forest, Forest	Pimenta Bueno, REBIO Jaru	UFRO-ECOL	-
Ateuchus sp. 6	UFRO-ECOL	Forest, Agroforest	Rolim de Moura	UFRO-ECOL	-
Ateuchus substriatus (Harold, 1868)	Puker *et al.* (2020); SIBBR (2020); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Agrofores, Cupuaçu orchard, Pasture	Itapuã do Oeste, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura, Vilhena	CZM-CEMT; MPEG-HCO; UFRO-ECOL	-
Besourenga horacioi (Martínez, 1969)	UFRO-ECOL	Native Forest, Forest, Agroforest	Nova Mamoré, Pimenta Bueno, Rolim de Moura	UFRO-ECOL	Least Concern
Besourenga sp. 1	Silva *et al*. (2014)	Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Canthidium aff. *ardens*	Silva *et al*. (2014)	Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Canthidium aff. *bokermanni*	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Canthidium aff. *cupreum*	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest, Pasture	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Canthidium aff. *dohrni*	Puker *et al*. (2020)	Forest	Porto Velho	UFRO-ECOL	-
Canthidium aff. *funebre*	Silva *et al*. (2022)	-	Pimenta Bueno	-	-
Canthidium aff. *gerstaeckeri*	Silva *et al*. (2014)	Forest, Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Canthidium aff. *lentum*	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest, Pasture, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthidium aff. *melanocephalum*	UFRO-ECOL	Native Forest,	Itapuã do Oeste, Nova Mamoré, REBIO Jaru, Rolim de Moura	UFRO-ECOL	-

		Forest, Agroforest			
Canthidium gerstaeckeri Harold, 1867	UFRO-ECOL	Native Forest, Forest, Forest edge, Agroforest	Itapuã do Oeste, Nova Mamoré, REBIO Jaru, Rolim de Moura	UFRO-ECOL	-
Canthidium miscellum Harold, 1883	Puker, 2020	Forest, Cupuaçu orchard	Porto Velho	UFRO-ECOL	-
Canthidium sp. 1	Puker *et al.* (2020); Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Agroforest Cupuaçu orchard	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthidium sp. 11	UFRO-ECOL	Native Forest, Agroforest	Nova Mamoré, Rolim de Moura	UFRO-ECOL	-
Canthidium sp. 12	UFRO-ECOL	Agroforest	Rolim de Moura	UFRO-ECOL	-
Canthidium sp. 13	UFRO-ECOL	Native Forest, Forest, Agroforest	Nova Mamoré, REBIO Jaru, Rolim de Moura	UFRO-ECOL	-
Canthidium sp. 14	UFRO-ECOL	Native Forest, Forest, Agroforest	Itapuã do Oeste, Pimenta Bueno, REBIO Jaru, Rolim de Moura	UFRO-ECOL	-
Canthidium sp. 16	UFRO-ECOL	Native Forest, Forest, Agroforest	Itapuã do Oeste, Pimenta Bueno, REBIO Jaru, Rolim de Moura	UFRO-ECOL	-
Canthidium sp. 17	UFRO-ECOL	Native Forest	Nova Mamoré, Porto Velho, REBIO Jaru	UFRO-ECOL	-
Canthidium sp. 18	UFRO-ECOL	Native Forest	Porto Velho	UFRO-ECOL	-
Canthidium sp. 19	UFRO-ECOL	Native Forest, Forest	Pimenta Bueno, REBIO Jaru	UFRO-ECOL	-

Canthidium sp. 2	Puker *et al*. (2020); Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Forest, Cupuaçu orchard	Guajará-Mirim, Nova Mamoré, Pimenta Bueno, Porto Velho, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthidium sp. 20	UFRO-ECOL	Forest, Agroforest	Itapuã do Oeste, Rolim de Moura	UFRO-ECOL	-
Canthidium sp. 23	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	-
Canthidium sp. 24	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	-
Canthidium sp. 25	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	-
Canthidium sp. 3	Puker *et al*. (2020); Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Cupuaçu orchard, Pasture	Guajará-Mirim, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthidium sp. 4	Puker *et al*. (2020); Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Cupuaçu orchard, Pasture	Guajará-Mirim, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthidium sp. 5	Puker *et al*. (2020); Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Canthidium sp. 6	Silva *et al*. (2014); Silva *et al*., (2022); UFRO-ECOL	Native Forest, Forest, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Rolim Moura	CZM-CEMT; UFRO-ECOL	-
Canthidium sp. 7	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Forest, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Rolim Moura	CZM-CEMT; UFRO-ECOL	-
Canthidium sp. 8	Silva *et al*. (2014); Silva *et al*., (2022); UFRO-ECOL	Forest	Guajará-Mirim, Nova Mamoré, Pimenta Bueno, Rolim Moura	CZM-CEMT; UFRO-ECOL	-

Canthidium sp. 9	UFRO-ECOL	Native Forest, Forest, Agroforest	REBIO Jaru, Rolim Moura	UFRO-ECOL	-
Canthidium sp.	SIBBR, (2020); UFRO-ECOL	Native Forest	Ouro Preto D'Oeste, Porto Velho	MPEG-HCO; UFRO-ECOL	-
Canthidium stofeli Carvalho De Santana, Pacheco & Vaz-De-Mello, 2019	Carvalho de Santana *et al*. (2019)	Forest	Guajará-Mirim	CZM-CEMT	-
Canthon aff. *angustatus*	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Canthon aff. *brunneus*	UFRO-ECOL	Native Forest, Agroforest	Nova Mamoré, Rolim de Moura	UFRO-ECOL	-
Canthon aff. *chalybaeus*	Silva *et al*. (2014); Silva *et al.* (2022)	Pasture	Guajará-Mirim, Nova Mamoré, Pimenta Bueno	CZM-CEMT	-
Canthon aff. *rufocoeruleus*	UFRO-ECOL	Forest, Agroforest	Itapuã do Oeste, Rolim de Moura	UFRO-ECOL	-
Canthon aff. *sericatus*	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Canthon aff. *simulans*	Puker *et al*. (2020); Silva *et al*. (2014)	Forest, Cupuaçu orchard, Pasture	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Canthon bimaculatus Schmidt, 1922	Silva *et al.* (2022)	Native Forest	Pimenta Bueno	CZM-CEMT	-
Canthon bipunctatus Burmeister, 1873	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Canthon brunneus (Schmidt, 1922)	Silva *et al.* (2022)	Native Forest	Pimenta Bueno	CZM-CEMT	-

Canthon chalybaeus Blanchard, 1846	Puker *et al*. (2020)	-	Porto Velho	CZM-CEMT	-
Canthon coloratus Schmidt, 1922	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	Data Deficient
Canthon conformis Harold, 1868	UFRO-ECOL	Forest, Agroforest	Itapuã do Oeste, Rolim de Moura	UFRO-ECOL	-
Canthon delpontei Martínez & Halffter, 1972	Silva *et al.* (2022); UFRO-ECOL	Native Forest, Agroforest	Nova Mamoré, Pimenta Bueno, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthon fulgidus Redtenbacher, 1867	Puker *et al*. (2021); UFRO-ECOL	Native Forest, Amazon forest fragments	Porto Velho	UFRO-ECOL; CZM-CEMT; CERPE	-
Canthon histrio (LePeletier e Serville, 1828)	SIBBR, (2020); Silva *et al*. (2014); UFRO-ECOL	Agrofores, Pasture	Guajará-Mirim, Rolim de Moura, Nova Mamoré, Vilhena,	CZM-CEMT; MPEG-HCO; UFRO-ECOL	-
Canthon lituratus (Germar, 1813)	Puker *et al*. (2020); Silva *et al*. (2014); UFRO-ECOL	Forest, Agrofores, Cupuaçu orchard e Pasture	Guajará-Mirim, Nova Mamoré, Porto Velho, Rolim de Moura	CZM-CEMT; UFRO-ECOL	Least Concern
Canthon luteicollis Erichson, 1847	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Canthon mutabilis Lucas, 1857	Puker *et al.* (2020); Silva *et al*. (2014)	Forest, Cupuaçu orchard, Pasture	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT	Least Concern
Canthon nitidicolle Lucas, 1857	UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Porto Velho	UFRO-ECOL	-

Canthon quadrimaculatus Schmidt, 1922	UFRO-ECOL	Native Forest	Guajará-Mirim, Itapuã do Oeste	UFRO-ECOL	-
Canthon semiopacus Harold, 1868	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthon septemmaculatus (Latreille, 1811)	Silva *et al*. (2022)	-	Pimenta Bueno	-	-
Canthon simulans (Martínez, 1950)	UFRO-ECOL	Forest	Itapuã do Oeste	UFRO-ECOL	Data Deficient
Canthon sp. 1	Puker *et al.* (2020); UFRO-ECOL	Forest, Agrofores, Cupuaçu orchard, Pasture	Porto Velho, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthon sp. 2	Puker *et al.* (2020); UFRO-ECOL	Forest, Agrofores, Pasture	Porto Velho, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthon sp. 3	Puker *et al.* (2020); UFRO-ECOL	Agrofores, Cupuaçu orchard, Pasture	Porto Velho, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Canthon sp. 4	Puker *et al.* (2020)	Forest, Cupuaçu orchard, Pasture	Porto Velho	CZM-CEMT	-
Canthon triangularis (Drury, 1770)	UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Porto Velho	UFRO-ECOL	Least Concern
Canthon unicolor Blanchard, 1843	SIBBR, (2020)	-	Vilhena	MPEG-HCO	Least Concern
Canthonella sp.	UFRO-ECOL	Agroforest	Rolim de Moura	UFRO-ECOL	-

Canthonella sp. 1	Silva *et al*. (2014)	Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Coprophanaeus aff. *callegarii*	UFRO-ECOL	Native Forest	Porto Velho	UFRO-ECOL	-
Coprophanaeus degallieri Arnaud, 1997	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Nova Mamoré, Pimenta Bueno, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Coprophanaeus jasius (Olivier, 1789)	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT; UFRO-ECOL	-
Coprophanaeus lancifer (Linnaeus, 1767)	Puker *et al.* (2020); Silva *et al*. (2014); Silva *et al*. (2022); SpeciesLink, (2020); UFRO-ECOL	Native Forest, Forest, Agrofores, Cupuaçu orchard, Pasture, City	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru	CZM-CEMT; MCT-INSETOS; UFRO-ECOL	-
Coprophanaeus telamon (Erichson, 1847)	Cupello and Vaz-de-Mello,, (2013); Puker *et al.* (2020); Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest, Agrofores, Pasture	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Ouro Preto D'Oeste, Pimenta Bueno, Porto Velho, Rolim de Moura	CZM-CEMT; MNRJ; UFRO-ECOL	-
Cryptocanthon peckorum Howden, 1973	Silva, 2014	Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Deltochilum aff. *granulatum*	Puker *et al.* (2020)		Porto velho	CZM-CEMT	-
Deltochilum amazonicum Bates, 1887	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Nova Mamoré, Porto Velho, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-

Deltochilum carinatum (Westwood, 1837)	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno	CZM-CEMT; UFRO-ECOL	Least Concern
Deltochilum enceladus Kolbe, 1893	Silva *et al*. (2022); UFRO-ECOL	Native Forest, Agroforest	Pimenta Bueno, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Deltochilum orbiculare Van Lansberge, 1874	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Deltochilum orbignyi (Blanchard, 1846)	UFRO-ECOL	Native Forest	Nova Mamoré, Porto Velho, REBIO Jaru	UFRO-ECOL	-
Deltochilum schefflerorum Silva, Louzada & Vaz-de-Mello, 2015	UFRO-ECOL	Native Forest	Nova Mamoré, REBIO Jaru	UFRO-ECOL	-
Deltochilum sp.	Puker *et al.* (2021)	Amazon forest fragments	Porto Velho	CZM-CEMT; CERPE	-
Deltochilum sp. 1	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Porto Velho, Pimenta Bueno, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Deltochilum sp. 2	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Porto Velho, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Deltochilum sp. 3	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Deltochilum sp. 4	UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Nova Mamoré, Porto Velho	UFRO-ECOL	-

Deltochilum sp. 6	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	-
Deltochilum sp. 7	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	-
Deltochilum sp. 8	UFRO-ECOL	Native Forest	Guajará-Mirim	UFRO-ECOL	-
Deltochilum sp.	SIBBR, (2020)		Ouro Preto D'Oeste	MPEG-HCO	-
Deltorhinum batesi Harold, 1867	Génier, (2010); Montoya-Molina and Vaz-de-Mello, (2019)	Forest	Ji-Paraná, Porto Velho	CZM-CEMT	-
Dendropaemon angustipennis Harold, 1869	Puker *et al.* (2020); UFRO-ECOL	Native Forest	Itapuã do Oeste, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Dendropaemon ater (Laporte, 1832)	Puker *et al.* (2020)	Forest, Cupuaçu orchard, Pasture	Porto Velho	CZM-CEMT	-
Dendropaemon attalus Génier & Arnaud, 2016	Génier and ARNAUD, (2016)	Forest	Candeias do Jamari, Guajará-Mirim	CZM-CEMT	-
Dendropaemon larseni Génier & Arnaud, 2016	UFRO-ECOL	Native Forest	REBIO Jaru	UFRO-ECOL	-
Dendropaemon lydiae Génier & Arnaud, 2016	Silva *et al*. (2022)	Native Forest	Pimenta Bueno	CZM-CEMT	-
Dendropaemon renatii Olsoufieff, 1924	Génier and ARNAUD, (2016)	Forest	Vilhena	CZM-CEMT	-
Dendropaemon sp. 1	UFRO-ECOL	Forest	Itapuã do Oeste	UFRO-ECOL	-
Diabroctis mimas (Linné, 1758)	Silva *et al*. (2014)	Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-

Dichotomius aff. *batesi*	Puker *et al*. (2021); UFRO-ECOL	Native Forest, Forest, Amazon forest fragments	Itapuã do Oeste, Nova Mamoré, Porto Velho, REBIO Jaru	UFRO-ECOL; CZM-CEMT; CERPE	-
Dichotomius aff. *cuprinus*	Silva *et al*. (2022)	-	Pimenta Bueno	-	-
Dichotomius aff. *globulus*	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Dichotomius aff. *lucasi*	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Dichotomius aff. *zikani*	Silva *et al*. (2022)	-	Pimenta Bueno	-	-
Dichotomius apicalis (Luederwaldt, 1931)	UFRO-ECOL	Native Forest	Porto Velho	UFRO-ECOL	Least Concern
Dichotomius bos (Blanchard, 1829)	Silva *et al*. (2022)	Native Forest	Pimenta Bueno	CZM-CEMT	-
Dichotomius carinatus (Luederwaldt, 1925)	Puker *et al*. (2020); Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest, Agrofores, Cupuaçu orchard	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Dichotomius cuprinus (Felsche, 1901)	SpeciesLink, (2020)	Pasture	Costa Marques	DZUP-COLEOPTERA	-
Dichotomius gandinii Rossini & Vaz-de-Mello, 2015	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	-
Dichotomius longiceps	Silva *et al*. (2014)	Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-

(Taschenberg, 1870)					
Dichotomius mamillatus (Felsche, 1901)	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Dichotomius melzeri (Luederwaldt, 1922)	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Dichotomius nimuendaju Luederwaldt, 1925	UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Porto Velho, Rolim de Moura	UFRO-ECOL	Least Concern
Dichotomius nisus (Olivier, 1789)	Puker *et al*. (2020); Silva *et al*. (2022)	Native forest, Forest, Savannah, Monoculture, Pasture, Open area	Pimenta Bueno, Porto Velho	CZM-CEMT	-
Dichotomius ohausi (Luederwaldt, 1923)	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Dichotomius podalirius (Felsche, 1901)	UFRO-ECOL	Native Forest	Porto Velho	UFRO-ECOL	Least Concern
Dichotomius prietoi Martínez & Martínez, 1982	Puker *et al*. (2021)	Amazon forest fragments	Porto Velho	CZM-CEMT; CERPE	
Dichotomius pseudocuprinus Gandini & Aguilar, 2009	UFRO-ECOL	Forest, Agroforest	Rolim de Moura	UFRO-ECOL	-
Dichotomius robustus	Silva *et al*. (2014); UFRO-ECOL	Native Forest,	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré,	CZM-CEMT;	-

(Luederwaldt, 1935)		Forest, Agroforest	Pimenta Bueno, Rolim de Moura	UFRO-ECOL	
Dichotomius sp. 1	UFRO-ECOL	Forest	Rolim de Moura	UFRO-ECOL	-
Dichotomius sp. 2	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	-
Dichotomius sp.	Puker *et al.* (2020); Species-Link, (2020); UFRO-ECOL	Native Forest, Forest, Pasture	Costa Marques, Porto Velho, Rolim de Moura	CZM-CEMT; DZUP-COLEOPTERA; UFRO-ECOL	-
Dichotomius worontzowi (Pereira, 1942)	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Agroforest, Pasture	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	Least Concern
Digitonthophagus gazella (Fabricius, 1787)	Génier and Moretto, (2017); Puker *et al.* (2020); Silva *et al*. (2014)	Forest, Cupuaçu ochard, Pasture	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT	-
Eurysternus arnaudi Génier, 2009	Puker *et al.* (2020); Silva, 2014; UFRO-ECOL	Native Forest, Forest, Agroforest, Cupuaçu orchard	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Eurysternus atrosericus Génier, 2009	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Eurysternus caribaeus (Herbst, 1789)	Puker *et al.* (2020); Silva, 2014;; Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest, Agroforest, Monoculture, Cupuaçu	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-

		orchard, Pasture			
Eurysternus cayennensis Castelnau, 1840	Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Eurysternus foedus Guérin-Méneville, 1844	Silva *et al*. (2022); UFRO-ECOL	Native Forest, Agroforest, Secundary Forest, Monoculture	Nova Mamoré, Pimenta Bueno, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Eurysternus gracilis Génier, 2009	UFRO-ECOL	Native Forest	REBIO Jaru	UFRO-ECOL	-
Eurysternus hamaticollis Balthasar, 1939	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest, Agroforest, Pasture	Guajará-Mirim, Nova Mamoré, Pimenta Bueno, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Eurysternus harlequin Génier, 2009	Silva *et al*. (2022); UFRO-ECOL	Native Forest	Pimenta Bueno, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Eurysternus howdeni Génier, 2009	Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest, Agroforest, Monoculture	Itapuã do Oeste, Pimenta Bueno, Porto Velho, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Eurysternus hypocrita Balthasar, 1939	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Eurysternus strigilatus Génier, 2009	Puker *et al.* (2020); Silva, 2014	Forest, Cupuaçu ochard	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT	-

Eurysternus uniformis Génier, 2009	UFRO-ECOL	Native Forest, Forest, Agroforest	Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Rolim de Moura	UFRO-ECOL	-
Eurysternus vastiorum Martínez, 1988	UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Porto Velho	UFRO-ECOL	-
Eurysternus ventricosus Gill, 1990	Silva *et al*. (2022)	Native Forest	Pimenta Bueno	CZM-CEMT	-
Eurysternus wittmerorum Martinez, 1988	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Eutrichillum sp. 1	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Gromphas aeruginosa (Perty, 1830)	Cupello and Vaz-de-Mello,, (2015); Puker *et al.* (2020)	Pasture	Guajará-Mirim, Porto Velho	BMNH; CZM-CEMT	Least Concern
Hansreia peugeoti Valois, Vaz-De-Mello & Silva, 2015	Silva *et al*. (2022); UFRO-ECOL; Valois *et al.* (2015)	Native Forest, Forest, Agroforest, River bank, Pasture, Undergrowth	Alto Paraíso, Ariquemes, Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Hansreia sp.	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Isocopris imitator (Felsche, 1901)	Rossini and Vaz-de-Mello, (2017); Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Agroforest	Guajará-Mirim, Nova Mamoré, Pimenta Bueno, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Ontherus appendiculatus	Silva *et al*. (2022)	Native Forest, Savannah	Pimenta Bueno	CZM-CEMT	-

(Mannerheim, 1829)					
Ontherus azteca Harold, 1869	Silva *et al*. (2014); UFRO-ECOL	Forest	Guajará-Mirim, Nova Mamoré, Rolim de Moura	CZM-CEMT; UFRO-ECOL	Least Concern
Ontherus pubens Génier, 1996	Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest, Agroforest, Monoculture, Pasture	Pimenta Bueno, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Ontherus sp. 1	Silva *et al*. (2022)	-	Pimenta Bueno	-	-
Onthophagus aff. *bidentatus*	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Onthophagus aff. *buculus*	Silva *et al*. (2014)	Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Onthophagus aff. *clypeatus*	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest, Pasture	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré	CZM-CEMT; UFRO-ECOL	-
Onthophagus aff. *digitifer*	Silva *et al*. (2014)	Forest, Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Onthophagus aff. *haematho-pus*	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Onthophagus aff. *hirculus*	Silva *et al*. (2014)	Forest, Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Onthophagus aff. *onorei*	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Forest, Pasture	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Onthophagus aff. *osculatii*	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest, Pasture	Guajará-Mirim, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	-

Onthophagus aff. *rubrescens*	Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Agroforest	Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, REBIO Jaru, Rolim de Moura	UFRO-ECOL	-
Onthophagus haematopus Harold, 1875	UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Nova Mamoré, Porto Velho, REBIO Jaru	UFRO-ECOL	-
Onthophagus onthochromus Arrow,1913	Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Pimenta Bueno, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Onthophagus osculatii Guérin-Méneville,1855	Rossini *et al.* (2018); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Onthophagus ptox Erichson, 1847	Puker *et al.* (2020); UFRO-ECOL	Forest, Cupuaçu orchard, Pasture	Itapuã do Oeste, Porto Velho	CZM-CEMT; UFRO-ECOL	-
Onthophagus sp. 1	UFRO-ECOL	Native Forest	Porto Velho	UFRO-ECOL	-
Onthophagus sp. 2	UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Porto Velho, REBIO Jaru	UFRO-ECOL	-
Onthophagus sp. 3	UFRO-ECOL	Native Forest	Porto Velho	UFRO-ECOL	-
Onthophagus sp.	UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Nova Mamoré, Rolim de Moura	UFRO-ECOL	-
Oxysternon conspicillatum (Weber, 1801)	Puker *et al.* (2020); SIBBR, (2020); Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest, Agroforest, Cupuaçu orchard	Ariquemes, Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Porto Velho, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Oxysternon lautum MacLeay, 1819	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Oxysternon macleayi	Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest	Pimenta Bueno, REBIO Jaru	CZM-CEMT;	Least Concern

Nevinson, 1892				UFRO-ECOL	
Oxysternon silenus Castelnau, 1840	Puker *et al.* (2020)	Cupuaçu orchard	Porto Velho	CZM-CEMT	-
Oxysternon silenus zikani Pereira, 1943	UFRO-ECOL	Native Forest	Porto Velho	UFRO-ECOL	-
Oxysternon sp. Castelnau, 1840	SIBBR, (2020); SpeciesLink, (2020)	City	Porto Velho, Vilhena	MPEG-HCO; MCT-INSETOS	-
Oxysternon spiniferum Laporte, 1840	Silva *et al*. (2022)	Native Forest	Pimenta Bueno	CZM-CEMT	-
Oxysternon sp. 1	Silva *et al*. (2022)	-	Pimenta Bueno	-	-
Phanaeus alvarengai Arnaud, 1984	Silva *et al*. (2014)	Forest	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-
Phanaeus bispinus Bates, 1868	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Porto Velho	CZM-CEMT; UFRO-ECOL	Least Concern
Phanaeus cambeforti Arnaud, 1982	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest	Guajará-Mirim, Nova Mamoré, Porto Velho, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Phanaeus chalcomelas (Perty, 1830)	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest, Agroforest	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, REBIO Jaru, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Phanaeus sororibispinus Edmonds & Zidek, 2012	UFRO-ECOL	Native Forest, Forest	Itapuã do Oeste, Nova Mamoré	UFRO-ECOL	Least Concern
Pseudocanthon aff. *xanthurus*	Silva *et al*. (2014)	Pasture	Guajará-Mirim, Nova Mamoré	CZM-CEMT	-

Pseudocanthon sp. 1	UFRO-ECOL	Native Forest	Nova Mamoré	UFRO-ECOL	-
Pseudocanthon sp.	UFRO-ECOL	Forest	Rolim de Moura	UFRO-ECOL	-
Scybalocanthon sp. 1	UFRO-ECOL	Forest	Itapuã do Oeste, Pimenta Bueno	UFRO-ECOL	-
Scybalocanthon uniplagiatus (Schmidt, 1922)	Silva *et al*. (2022)	Native Forest	Pimenta Bueno	-	-
Sulcophanaeus faunus (Fabricius, 1775)	Puker, 2020; Silva *et al*. (2022); UFRO-ECOL	Native Forest, Agroforest, Pasture	Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru	CZM-CEMT; UFRO-ECOL	-
Sylvicanthon attenboroughi Cupello & Vaz-de-Mello, 2018	Puker *et al*. (2020)	Forest, Cupuaçu orchard	Porto Velho	CZM-CEMT	-
Sylvicanthon aff. *bridarollii*	Silva *et al*. (2022)	-	Pimenta Bueno	-	-
Sylvicanthon proseni (Martínez, 1949)	Silva *et al*. (2014); Puker *et al*. (2020); Puker *et al*. (2021); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Forest, Secundary Forest, Agroforest; Amazon forest fragments	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, Pimenta Bueno, Porto Velho, REBIO Jaru	CZM-CEMT; CERPE; UFRO-ECOL	-
Sylvicanthon sp. 1	Silva *et al*. (2014); Puker *et al*. (2021); UFRO-ECOL	Native Forest, Forest, Agroforest, Amazon forest fragments	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré, REBIO Jaru, Rolim de Moura	CZM-CEMT; CERPE; UFRO-ECOL	-
Sylvicanthon sp. 2	Puker *et al*. (2021); UFRO-ECOL	Native Forest, Forest, Agroforest,	Itapuã do Oeste, Nova Mamoré, Rolim de Moura	CZM-CEMT; CERPE;	-

		Amazon forest fragments		UFRO-ECOL	
Trichillum externepunctatum Preudhomme de Borre, 1880	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Native Forest, Agroforest, Pasture	Guajará-Mirim, Nova Mamoré, Pimenta Bueno, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Trichillum sp.	UFRO-ECOL	Forest, Agroforest	Pimenta Bueno, Rolim de Moura	UFRO-ECOL	-
Uroxys sp. 1	Silva *et al*. (2014); Silva *et al*. (2022); UFRO-ECOL	Forest, Agroforest, Pasture	Guajará-Mirim, Nova Mamoré, Pimneta Bueno, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-
Uroxys sp. 2	Silva *et al*. (2014); UFRO-ECOL	Native Forest, Forest, Pasture	Guajará-Mirim, Itapuã do Oeste, Nova Mamoré	CZM-CEMT; UFRO-ECOL	-
Uroxys sp.	SIBBR, (2020); UFRO-ECOL	Forest, Agroforest	Ariquemes, Rolim de Moura	CZM-CEMT; UFRO-ECOL	-

The spatial coverage of Scarabaeinae species records is summarized by sample sites in Figure 1. In the present review, the presence of 106 species was recorded for the Southwest Amazon, divided into 23 genera, and distributed in the most diverse types of landscapes (Table 1). Of the records, 35 have identification only by affinity (i.e., aff.) with the mentioned epithet. It is important to mention the registration of 58 morphotypes (i.e., spp.) distributed in the genera *Anomiopus*, *Ateuchus*, *Canthidium*, *Canthon*, *Canthonella*, *Deltochilum*, *Dendropaemon*, *Dichotomius*, *Onthophagus*, *Pseudocanthon*, *Scybalocanthon*, *Sylvicanthon*, *Trichillum* and *Uroxys* that are deposited in the collection of the Federal Foundation University of Rondônia On the IUCN Red List of Threatened Species (2022), only 16 are registered and all are considered "Least Concern" according to IUCN criteria. Two species are considered "Data Deficient". More details on the spatial coverage of the Scarabaeinae species records can be found in Figure S1 and Table S1.

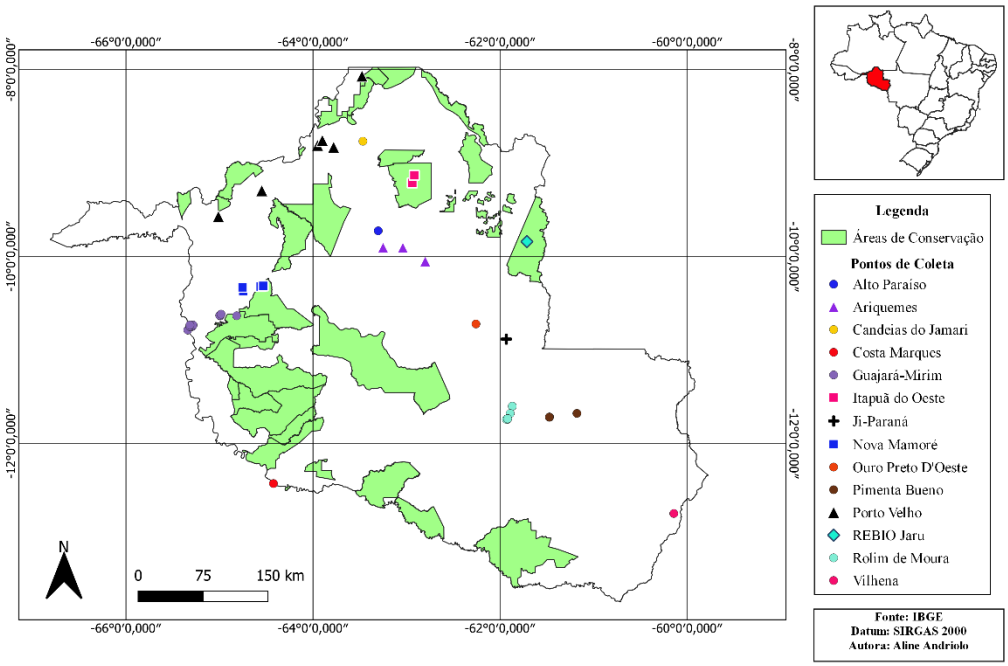

Figura 1. Location map and collection points of Scarabaeinae species records.

4. Discussion

Our results highlight the urgency of cataloging Scarabaeinae biodiversity in a region that lives with constant environmental threats. There are 49% of species (102 spp.) with identification only to the genus level, or that having affinity (i.e., aff.) with the mentioned epithet.

The most recorded species was *Onthophagus* aff. *rubrescens* (Blanchard, 1846); *Canthon* aff. *simulans* (Martínez, 1950); *Ateuchus* aff. *candezei* (Harold, 1868) and *Dichotomius* aff. *lucasi* (Harold, 1869). These species were mainly recorded in forested areas, except *Canthon* aff. *simulans*, which is found in grassland areas. *Onthophagus* aff. *rubrescens* is the most abundant species in most forests in southwestern Amazonia, in primary and *Várzea* (floodplain) forests; it is also common in secondary and bamboo forests, dry forests and in small clearings (Larsen, 2015). According to Silva *et al.* (2014), these species may not withstand climate variation, such as changes in luminosity, humidity and type of available food resource, becoming more restricted to a type of habitat.

The species *Ateuchus murrayi* (Harold, 1868), *Besourenga horacioi* (Martínez, 1969), *Canthon lituratus* (Germar, 1813), *Canthon mutabilis* Lucas, 1857, *Canthon triangularis* (Drury, 1770), *Canthon unicolor* Blanchard, 1843 , *Deltochilum carinatum* (Westwood, 1837), *Dichotomius apicalis* (Luederwaldt, 1931), *Dichotomius nimuendaju* Luederwaldt, 1925, *Dichotomius worontzowi* (Pereira, 1942), *Dichotomius podalirius* (Felsche, 1901), *Gromphas aeruginosa* (Perty, 1830), *Ontherus azteca* Harold, 1869, *Oxysternon macleaynon* Nevinson, 1892, *Phanaeus bispinus* Bates, 1868, *Phanaeus sororibispinus* Edmonds & Zidek, 2012, listed on the IUCN Red List of Threatened Species (2022), are considered "Least Concern" according to IUCN criteria. The species *Canthon coloratus* Schmidt, 1922, and *Canthon simulans* (Martínez, 1950) are considered "Insufficient data.; information that our study intends to fill in.

The others species presented in this study do not have any mentions in the IUCN red list, suggesting that the conclusions and studies about the risks of extinction of the majority of the species of dung beetles in the southwest of the Amazon are still incipient.

5. Conclusion

In conclusion, our results registered 106 species in the state of Rondônia. Of the few studies carried out in this region that measured the number of species (Silva *et al.*, 2014, 82 spp.; Puker *et al.*, 2020, 35 spp.; Puker et al., 2021, 7 spp.; Silva *et al.*, 2022, 58 spp.), the current study represents a complement relevant to understanding the distribution of dung beetles in the Southwest Amazon. Future studies should incorporate diverse methodologies, sources of information, and consider various environmental factors. This is important because the Amazon is characterized by a heterogeneous landscape, and organisms such as dung beetles exhibit specific environmental affinities that influence their distribution and occurrence (Salomão et al., 2022). By expanding our understanding in this regard, we can gain insights into the presence of dung beetles in specific areas. Additionally, the potential for discovering new species could enhance our understanding of biodiversity, guide conservation efforts, and work towards preserving and sustainably managing ecosystems for future generations.

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References

Assis, L. F. F. G., Ferreira, K. R., Vinhas, L., Maurano, L., Almeida, C., Carvalho, A., Rodrigues, J., Maciel, A., & Camargo, C. (2019). TerraBrasilis: A Spatial Data Analytics Infrastructure for Large-Scale Thematic Mapping. *ISPRSInternational Journal of Geo-Information* , 8,513. doi: https://doi.org/10.3390/ijgi8110513

Brown, K. S. Jr. (1997). Diversity, disturbance, and sustainable use of Neotropical forests: insects as indicators for conservation monitoring. *Journal of Insect Conservation*, 1, 25-42.

Carvalho De Santana, E. C., Pacheco, T. L., & Vaz-De-Mello, F. Z. (2019). Taxonomic revision of the Canthidium Erichson, 1847 species of the gigas group. European journal of Taxonomy, 530, 1-24. doi: 10.5852/ejt.2019.530

Castro, D. C., Souza, A. A., Lemke, C. M., & Silveira, M. A. P. A. (2015). Scarabaeinae (Coleoptera: Scarabaeidae) from Cuniã Ecological Station, Porto Velho, Rondônia. *III Symposium CENBAM and PPBIO Western Amazon.* Manaus, Amazonas. p. 69.

Castro, D. C. (2017). Community of Scarabaeinae *(*Coleoptera*:* Scarabaeidae*)* in Agroforestry Systems in the Zona da Mata Rondoniense. Dissertation (Master in Environmental Sciences) – Federal University of Rondônia, Rondônia, 59f. (Accessed on 4/29/2020).

Costa, C. (2000). State of knowledge of Neotropical Coleoptera. In: Martin Piera, F., Morrone, J. J. & Melic, A. (Ed.). *Create a CYTED project for the inventory and estimation of entomological diversity in Iberoamerica*: PrIBES-2000. Zaragoza, Sociedad Entomológica Aragonesa (SEA), pp. 99-114.

Cupello, M., & Vaz-De-Mello, F. Z. (2013). Taxonomic revision of the South American dung beetle genus *Gromphas* Brullé, 1837 (Coleoptera: Scarabaeidae: Scarabaeinae: Phanaeini: Gromphadina). *Zootaxa*, 3722(4), 439-482. doi: 10.11646/zootaxa.3722.4.2

Cupello, M., & Vaz-De-Mello, F. Z. (2013). New evidence for the validity of *Coprophanaeus* (*C.*) *terrali* Arnaud, 2002 (Coleoptera: Scarabaeidae: Scarabaeinae: Phanaeini), a dung beetle from Brazil. *Zootaxa,* 3717(3), 359-368. doi: 10.11646/zootaxa.3717.3.5

Cupello, M., & Vaz-De-Mello, F. Z. (2016). A new species and the phylogeny of the South American genus *Gromphas* Brullé, 1837 (Coleoptera: Scarabaeidae: Scarabaeinae: Phanaeini). *Journal of Natural History*5 (15), 1-27. doi: 10.1080/00222933.2015.1091099

Gardner, T. A., Hernández, M. I. M., Barlow, J., & Peres, C. A. (2008). Understanding the biodiversity consequences of habitat change: the value of secondary and plantation forests for Neotropical dung beetles. *Journal of Applied Ecology*, 45, 883-893. doi: https://doi.org/10.1111/j.1365-2664.2008.01454.x

Génier, F. (2010). A review of the Neotropical dung beetle genera *Deltorhinum* Harold, 1869, and *Lobidion* gen. nov. *Zootaxa,* 2693,35-48. doi: 10.11646/zootaxa.2693.1.3

Génier, F., & Arnaud, P. (2016). *Dendropaemon* Perty, 1830: taxonomy, systematics and phylogeny of the genus of the most morphologically derived phanaeae (Coleoptera: Scarabaeidae, Scarabaeinae, Phanaeini). *Zootaxa*, 4099(1), 001-125. doi: 10.11646/zootaxa.4099.1.1

Génier, F., & Moretto, P. (2017). *Digitonthophagus* Balthasar, 1959: taxonomy, systematics, and morphological phylogeny of the genus revealing an African species complex (Coleoptera: Scarabaeidae: Scarabaeinae). *Zootaxa*, 4248(1): 1-110. doi: 10.11646/zootaxa.4248.1.1

IUCN. (2020). *The IUCN Red List of Threatened Species*. Version 2020-1. Retrieved from https://www.iucnredlist.org (Accessed on 6/25/2020).

Larsen, T. (2015). *Onthophagus* aff. *rubrescens*. Scarabaeinae Dung Beetles 2015. Retrieved from https://scarabaeinae.myspecies.info/taxonomy/term/18327/descriptions (Accessed on 10/10/2022)

Montoya-Molina, S., & Vaz-De-Mello, F. Z. (2019). Notes on the taxonomy of *Deltorhinum* Harold 1869 (Coleoptera: Scarabaeidae: Scarabaeinae) with description of a new updated species, updated identification key and the species transfer *D. robustum* for *Ateuchus*. *Journal Of Natural History*, 53(13), 749-760. doi: https://doi.org/10.1080/00222933.2019.1606359

Nichols, E., Larsen, T., Spector, S., Davis, Al, Escobar, F., Favila, M., & Vulinec, K. (2007). Global dung beetle response to tropical forest modification and fragmentation: A quantitative literature review and meta-analysis. *Biological Conservation*, 1(137), 1-19. doi: https://doi.org/10.1016/j.biocon.2007.01.023

Philips, T. K. (2011). The evolutionary history and diversification of dung beetles. In: Simmons, L. W. & Ridsdill- Smith, T. J. (Eds.), *Ecology and evolution of dung beetles*. Oxford: Blackwell Publishing, pp. 22-46.

Piontekowski, V. J., Ribeiro, F. P., Matricardi, E. A. T., Lustosa, I. M., Bussinguer, P., & Gatto A. (2019). Modeling deforestation in the state of Rondônia. *Ambient Forest*, 26(3), e20180441. doi: https://doi.org/10.1590/2179-8087.044118

Puker, A., Silva, K. K. G., Santos, D. C., Correa, C. M. A., & Vaz-De-Mello, F. Z. (2020). Dung beetles collected using flight intercept traps in an Amazon rainforest fragment and adjacent agroecosystems. *International Journal of Tropical Insect Sciense*, 40(4), 1085-1092. doi: https://doi.org/10.1590/2179-8087.044118

Puker, A., Correa, C. M. A., Butzske, L. S., & Pacheco, R. A. (2021). Using aerial fruit-baited traps with different naturally fermented baits to survey scarab beetles in the Amazon rainforest. *Studies on Neotropical Fauna and Environment*, 56(3), 238-243. doi: https://doi.org/10.1080/01650521.2020.1786921

Rossini, M., & Vaz-De-Mello, F. Z. (2017). A taxonomic review of the genus *Isocopris* Pereira and Martínez, 1960 (Coleoptera: Scarabaeidae: Scarabaeinae), with description of a new Brazilian species. *Journal of Natural History*, 19-20(51), 1091-1117. doi: 10.1080/00222933.2017.1319517

Rossini, M., Vaz-De-Mello, F. Z., & Zunino, M. (2018). A taxonomic revision of the New World *Onthophagus* Latreille, 1802 (Coleoptera: Scarabaeidae: Scarabaeinae) of the *osculatii* species-complex, with description of two new species from South America. *Journal Of Natural History*, 09-10(52),541-586. doi: 0.1080/00222933.2018.1437230

Rossini, M., & Vaz-De-Mello, F. Z. (2020). Taxonomic review of the *Dichotomius mamillatus* group (Coleoptera: Scarabaeidae), with a description of a new species, *Dichotomius* (*Dichotomius*) *gandinii* sp. nov., from Western Amazonia. *Austral Entomology*, 59, 52-73. doi: 10.1080/00222933.2018.1437230

Salomão, R. P., Pires, D. De A., Baccaro, F. B., Schietti, J., Vaz-De-Mello, F. Z., Lima, A. P., & Magnusson, W. E. (2022). Water table level and soil texture are important drivers of dung beetle diversity in Amazonian lowland forests. *Applied Soil Ecology*, 170, 104260. doi: https://doi.org/10.1016/j.apsoil.2021.104260

Sarmiento-Garcés, R., & Hernández, M. I. M. (2021). A decrease in taxonomic and functional diversity of dung beetles impacts the ecosystem function of manure removal in altered subtropical habitats. *PLoS One*, 16(1), e0244783. doi: 10.1371/journal.pone.0244783

SIBBR. (2022). Brazilian Biodiversity Information System (SIBBR). Retrieved from SIBBR website: http://www.sibbr.gov.br/

SIBBR. (2020)a. Atlas of Living Australia occurrence download at https://ala-hub.sibbr.gov.br/ala-hub/occurrences/search?&q=collection_uid%3Aco107&fq=family%3A%22Scarabaeidae%22 (accessed 03/02/2020).

SIBBR. (2020)b. Atlas of Living Australia occurrence download at https://ala-hub.sibbr.gov.br/ala-hub/occurrences/search?&q=collection_uid%3Aco212&fq=family%3A%22Scarabaeidae%22 (accessed 03/02/2020).

Silva, R. J., Coletti, F., Costa, D. A., & Vaz-De-Mello, F. Z. (2014). Dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) of forests and pastures of southwestern Brazilian Amazon: Survey of species and feeding guilds. *Acta Amazonica*., 44(3), 345-352. doi: https://doi.org/10.1590/1809-4392201304472

Silva, R. S. A., Machado, A. F., Costa, D. A., Silva, R. J., Correa, C. M., & Vaz-de-Mello, F. Z. (2022). Contributions to the knowledge of the dung beetles (Scarabaeidae: Scarabaeinae) of southwestern Brazilian Amazon: list of species and conservation implications. *Studies on Neotropical Fauna and Environment*. doi: 10.1080/01650521.2022.2076983

Specieslink: Coleção Entomológica Pe. Jesus Santiago Moure (Coleoptera) (DZUP-Coleoptera), Coleção de Insetos (MCTP-Insetos) disponível na rede speciesLink (http://www.splink.org.br). (accessed 03/27/2020).

Spector, S. (2006). Scarabaeine Dung Beetles (coleoptera: Scarabaeidae: Scarabaeinae): An Invertebrate Focal Taxon for Biodiversity Research and Conservation. *The Coleopterists Bulletin* , 5, 71-83. doi: 10.1649/0010-065X(2006)60[71:SDBCSS]2.0.CO;2

Valois, M., Vaz-de-Mello, F. Z., & Silva, F. A. B. (2015) A taxonomic review of the Neotropical genus *Hansreia* Halffter & Martínez, 1977 (Coleoptera: Scarabaeidae, Scarabaeinae). *Zootaxa,* 4027(2), 205-226. doi: 10.11646/zootaxa.4027.2.2

Vaz-de-Mello, F. Z. (2000). Current state of knowledge onScarabaeidae s. str. (Coleoptera: Scarabaeoidea) from Brazil. In: Martín-Piera, F., Morrone, J. J. & Melic, A. (Eds.). Towards a CYTED Project for the Inventory and Estimation of Entomological Diversity in Latin America. Zaragosa, PrIBES-SEA, pp.183-195.

Vaz-De-Mello, F. Z., Bavutti, L. L. O., Flechtmann, C. A. H., Puker, A., & Correa, C. M. A. (2017). Listof Scarabaeinae (Coleoptera, Scarabaeidae) species from the state of Mato Grosso do Sul, Brazil. *Iheringia, Série Zoologia.*, 107 (supl.): e2017120. doi: https://doi.org/10.1590/1678-4766e2017120