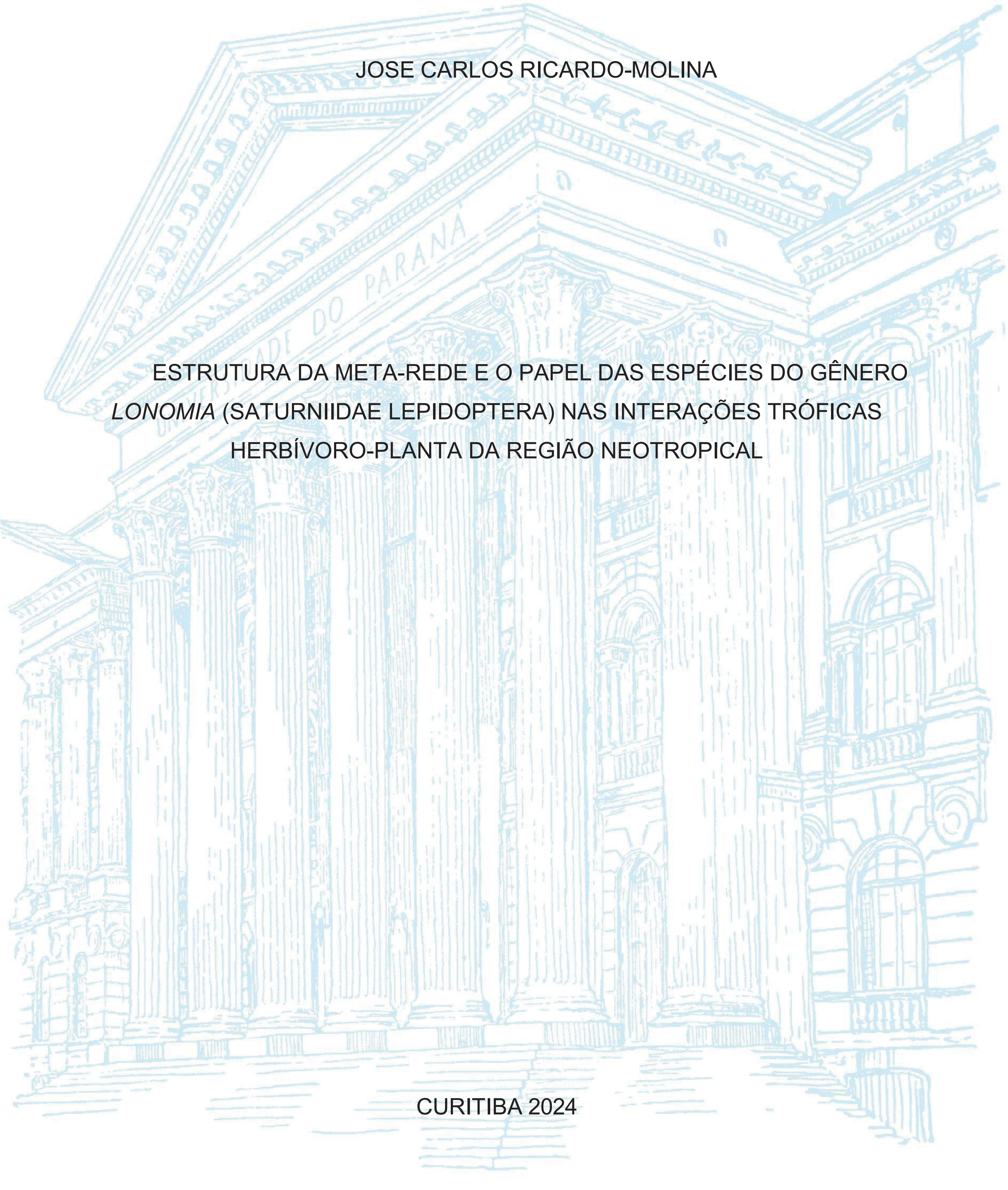
UNIVERSIDADE FEDERAL DO PARANÁ



JOSE CARLOS RICARDO-MOLINA

ESTRUTURA DA META-REDE E O PAPEL DAS ESPÉCIES DO GÊNERO *LONOMIA* (SATURNIIDAE LEPIDOPTERA) NAS INTERAÇÕES TRÓFICAS HERBÍVORO-PLANTA DA REGIÃO NEOTROPICAL

CURITIBA 2024

JOSE CARLOS RICARDO-MOLINA

ESTRUTURA DA META-REDE E O PAPEL DAS ESPÉCIES DO GÊNERO *LONOMIA* (SATURNIIDAE LEPIDOPTERA) NAS INTERAÇÕES TRÓFICAS HERBÍVORO-PLANTA DA REGIÃO NEOTROPICAL

Dissertação apresentada ao curso de Pós-Graduação em Ecologia e Conservação, Setor de Ciências Biológicas, Universidade Federal do Paraná, como requisito parcial à obtenção do título de Mestre em Ecologia e Conservação.

Orientador: Prof. Dr. Fernando de Camargo Passos

Co-orientador: Dr. Tiago Machado de Souza

CURITIBA 2024

DADOS INTERNACIONAIS DE CATALOGAÇÃO NA PUBLICAÇÃO (CIP)
UNIVERSIDADE FEDERAL DO PARANÁ
SISTEMA DE BIBLIOTECAS – BIBLIOTECA DE CIÊNCIAS BIOLÓGICAS

Ricardo-Molina, Jose Carlos.
Estrutura da meta-rede e o papel das espécies do gênero *Lonomia* (Saturniidae Lepidoptera) nas interações tróficas herbívoro-planta da região neotropical. / Jose Carlos Ricardo-Molina. – Curitiba, 2024.
1 recurso on-line : PDF.

Dissertação (Mestrado) – Universidade Federal do Paraná, Setor de Ciências Biológicas. Programa de Pós-Graduação em Ecologia e Conservação.
Orientador: Prof. Dr. Fernando de Camargo Passos.
Coorientador> Dr. Tiago Machado de Souza.

1. Herbívoro. 2. Relação inseto-planta. 3. Lagartas. 4. Taturanas. 5. Inseto – Ecologia. 6. Lepidoptera. 7. Mariposa. I. Passos, Fernando de Camargo, 1964-. II. Souza, Tiago Machado de, 1987-. III. Universidade Federal do Paraná. Setor de Ciências Biológicas. Programa de Pós-Graduação em Ecologia e Conservação. IV. Título.

Bibliotecária: Rosilei Vilas Boas CRB-9/939

MINISTÉRIO DA EDUCAÇÃO
SETOR DE CIÊNCIAS BIOLÓGICAS
UNIVERSIDADE FEDERAL DO PARANÁ
PRÓ-REITORIA DE PESQUISA E PÓS-GRADUAÇÃO
PROGRAMA DE PÓS-GRADUAÇÃO ECOLOGIA E CONSERVAÇÃO - 40001016048P6

TERMO DE APROVAÇÃO

Os membros da Banca Examinadora designada pelo Colegiado do Programa de Pós-Graduação ECOLOGIA E CONSERVAÇÃO da Universidade Federal do Paraná foram convocados para realizar a arguição da Dissertação de Mestrado de **JOSE CARLOS RICARDO-MOLINA** intitulada: **Estrutura da meta-rede e o papel das espécies do gênero Lonomia (Saturniidae Lepidoptera) nas interações tróficas herbívoro-planta da região Neotropical**, sob orientação do Prof. Dr. FERNANDO DE CAMARGO PASSOS, que após terem inquirido o aluno e realizada a avaliação do trabalho, são de parecer pela sua APROVAÇÃO no rito de defesa.

A outorga do título de mestre está sujeita à homologação pelo colegiado, ao atendimento de todas as indicações e correções solicitadas pela banca e ao pleno atendimento das demandas regimentais do Programa de Pós-Graduação.

CURITIBA, 29 de Julho de 2024.

Assinatura Eletrônica
29/07/2024 11:56:48.0
FERNANDO DE CAMARGO PASSOS
Presidente da Banca Examinadora

Documento assinado digitalmente
gov.br
ISABELA GALARDA VARASSIN
Data: 31/07/2024 14:37:31-0300
Verifique em https://validar.iti.gov.br

Assinatura Eletrônica
29/07/2024 12:04:18.0
ISABELA GALARDA VARASSIN
Avaliador Interno (UNIVERSIDADE FEDERAL DO PARANÁ)

Assinatura Eletrônica
30/07/2024 12:51:25.0
CAMILA GONZÁLES ROSAS
Avaliador Externo (UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO)

Em memória da minha mãe Irina Alexis Molina Joiro (R.I.P.) e do gato preto Atalea de Prusia. Poucos dias após a morte da minha mãe e com muita tristeza no coração enfrento a perda do meu gato. No barulho avassalador do silêncio, só encontrei consolo ao lembrar como eles costumavam ser grandes companheiros. Eu era apenas uma ligação entre a vida de Atalea e a de minha mãe, embora na vida minha mãe talvez nunca tenha percebido assim "porque ela não gostava de animais de estimação", ela nunca pensou que teria companhia fiel, ele não apenas iria com ela ao banheiro, ao quarto ou assistir novelas, também a acompanharia até em outras formas de energia.

Espero que quem me conheceu no mestrado visse quem eu sou, mas ficaria mais feliz se visse através de mim os ensinamentos da minha mãe. Obrigado mãe por ser seu embaixador no Brasil e transmitir alegria, força, amor ao território, valor da palavra e dedicação. Seu esforço pela minha formação não foi em vão e agora nos formamos como Mestres.

AGRADECIMENTOS

À Universidade Federal do Paraná e seu corpo docente e administrativo do Programa de Pós-Graduação em Ecologia e Conservação (PPGECO) em especial à secretária Juliana Leão pela dedicação, gentileza e fé para com os alunos, bem como a Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) do Ministério da Educação do Brasil, pela concessão da bolsa de estudo do Programa de Excelência Acadêmica -PROEX Código de Financiamento 001.

Ao professor orientador Prof. Dr. Fernando de Camargo Passos e ao co-orientador Dr. Tiago Machado de Souza por aceitarem a proposta do estudo e me orientarem para sua conclusão.

À Universidade de Sucre (Unisucre) na Colômbia e seu corpo docente e administrativo do Programa de Biologia pela minha formação profissional em Ciências Biológicas e ética perante a sociedade, em especial à Profa. Dra. Leidys Murillo Ramos por me apresentar e me orientar no estudo da biodiversidade das mariposas em seus estágios imaturos.

À minha família, em especial aos meus irmãos Sergio, Gioser e Iriseth como também a meus avós Plinio Ricardo, Clide Julio e Arminda Joiro pelo apoio emocional e por serem inspiração e força na minha vida.

À equipe de expedição às altas montanhas dos Montes de María; Jaime Trespalacios, Alejandra Paternina, Luisa Pérez, Irina Martínez, Oscar Prasca, Adriana Martínez e seu anfitrião Rafael Narvaez por serem professores das qualidades e habilidades para uma vida resiliente e abundante.

À Óscar Prasca e Adriana Martínez por me encorajarem a acreditar em mim mesmo e a alcançar este objetivo, pelas contribuições financeiras e por encontrar um lar em Adriana.

Aos meus amigos Camila Bortolini, Camila Lermen, Edis Sicha, Elielson Ferreira, Isabela Trentini, Josue Araldi, Julia Prade, Kaitlyn Dalrymple, Luana Meister, Lucas Andrade, Luis Olivera, Manuel Garcia, Manuela Twardowschy, María Clara Alencastro, Marina de Souza (Black), Mario Jijón pelo amor e toda ajuda no Brasil, e especialmente agradeço aos minhas compatriotas Licet Calambás e María Martha Torres, sua amizade virou uma irmandade, sem qualquer pretensão desempenharam

o papel de orientadoras da vida no exterior da Colômbia. Seres tão especiais que sua voz foi fundamental para a tomada de decisões, principalmente com María e a frase “Hermana, ayudame a pensar”, a voz guia daquelas mulheres produziu decisões sábias.

As incansáveis aventuras com a dupla Lucas Andrade e María Clara Alencastro e em outros planos Elielson Ferreira enriqueceram tanto minha vida que tenho histórias para falar para meus familiares e amigos na Colômbia.

Ao Bloco Afro Pretinhosidade no especial aos meus colegas da ala da dança e a sua querida coordenadora Chica Da Silva. Este grupo permitiu-me viver em comunidade e conhecer uma realidade diferente daquela que rodeia a universidade. Obrigado por serem família, ancestralidade, cultura e companheiros na luta pela dignidade e pelos direitos das populações afrodescendentes no Brasil através da dança como ato político.

Agradeço às professoras Dras. Camila González, Isabela Galarda e Leidys Murillo por fazerem parte da banca avaliadora deste projeto, sua experiência na área de ecologia e entomologia enriquecerá o presente estudo.

E finalmente agradeço a todos os amigos com quem posso trocar ideias para a estruturação deste projeto, especialmente Fernando Jeronimo, Mônica Piovesan, Elton Orlandin, Mauricio Moura e Eduardo Carneiro.

Alguns cientistas, senão todos, são como as árvores “lutam com todas as forças por apenas uma coisa: para construir sua própria forma, representar-se a si mesmos”. (HERMAN HESSE, 1920.)

RESUMO

As redes ecológicas são uma ferramenta que permite compreender as interações dentro de uma comunidade, como as relações tróficas entre plantas e insetos, que podem ser cooperativas ou antagônicas. Essas interações representam uma parte significativa da biodiversidade terrestre global, concentrando-se em regiões tropicais. A coexistência espacial e temporal das espécies, suas adaptações, limitações e, em alguns casos, sua abundância determinam a dinâmicas destas interações. As lagartas do gênero *Lonomia* são conhecidas por serem herbívoras generalistas que se alimentam de uma grande variedade de plantas, sendo a ecologia das suas interações antagônicas pouco entendidas. Este estudo analisa as interações tróficas entre plantas e lagartas do gênero *Lonomia* (Lepidoptera: Saturniidae) na região neotropical. Foi realizada uma revisão sistemática da literatura disponível em plataformas digitais e uma análise de meta-rede para avaliar essas interações tróficas. Foram criadas matrizes binárias de presença/ausência e a aplicação de métricas de rede e atributos funcionais das plantas hospedeiras, com o objetivo de conhecer se existe relação entre os atributos funcionais e as escolhas das espécies de *Lonomia*. Como resultado foram compilados 31 registros bibliográficos, documentando a interação de 15 espécies de *Lonomia* alimentando-se de 145 espécies de plantas pertences a 39 famílias vegetais. A representação gráfica dessas interações como uma metacomunidade corresponde a uma meta-rede bipartita com uma topologia modular. Os resultados confirmam que as espécies de *Lonomia* são herbívoras generalistas, caracterizadas por um alto número de ligações tróficas, especializadas em consumir tecidos vegetativos de plantas de hábito arbóreo e nativas da região neotropical, incluindo algumas interações com plantas exóticas. As espécies com o maior número de interações conhecidas foram *Lonomia obliqua* (41), L*onomia concordia* (20) e *Lonomia electra* (20), ocupando posições centrais dentro da rede, com assembleias significativas de plantas alimentícias compartilhadas com outras espécies de *Lonomia*. Entre as espécies de plantas*, Hampea appendiculata* e *Hevea brasiliensis* são as mais registradas como parte da dieta das lagartas, assim como as que mais parceiros herbívoros reuniram. Por outro lado, algumas espécies de lagarta como *Lonomia casanarensis* e *Lonomia orientacordillera*, apresentaram dados restritos, dificultando uma categorização definitiva em relação à sua dieta. Essas lagartas ocuparam posições periféricas na rede, com um baixo número de conexões.

Este estudo fornece uma base de dados sobre os recursos alimentares das lagartas de *Lonomia*, essencial para trabalhos futuros sobre o manejo e a conservação dessas espécies. Também, representa a primeira revisão abrangente das relações tróficas do gênero *Lonomia*, destacando seu papel como herbívoro generalista na região neotropical. Adicionalmente, as informações coletadas podem ser utilizadas e adaptadas para o manejo dessas lagartas em condições de laboratório. Nossos resultados apontam limitações de informações contrastantes para algumas espécies de *Lonomia*, o que influencia na montagem da estrutura da rede entre tipos de interação e conjuntos de espécies interagentes. Por último, há uma limitação nos dados disponíveis sobre atributos funcionais das espécies de plantas predadas pelas lagartas de *Lonomia*, o que pode ter influenciado a ausência de uma relação significativa entre as métricas de rede e dispersão funcional.

Palavras-chave: 1; Herbivoria 2; Interação ecológica 3; Lagartas de *Lonomia* 4; Meta-rede planta – inseto 5. Saturniidae.

ABSTRACT

Ecological networks serve as a tool for understanding interactions within a community, such as trophic relationships between plants and insects, which can be cooperative or antagonistic. These interactions constitute a significant part of global terrestrial biodiversity, particularly concentrated in tropical regions. The spatial and temporal coexistence of species, their adaptations, constraints, and in some cases, their abundance, determine the dynamics of these interactions. Caterpillars of the genus *Lonomia* are known as generalist herbivores that feed on a wide variety of plants, yet the ecology of their antagonistic interactions remains poorly understood. This study examines trophic interactions between plants and *Lonomia* caterpillars (Lepidoptera: Saturniidae) in the neotropical region. A systematic literature review was conducted using digital platforms, and a meta-network analysis was performed to evaluate these trophic interactions. Binary matrices of presence/absence were created, and network metrics and functional traits of host plants were applied to explore whether there is a relationship between functional traits and *Lonomia* species preferences. A total of 31 bibliographic records were compiled, documenting interactions of 15 *Lonomia* species feeding on 145 plant species belonging to 39 plant families. Graphical representation of these interactions as a metacommunity corresponds to a bipartite meta-network with a modular topology. The results confirm that *Lonomia* species are generalist herbivores characterized by a high number of trophic links, specializing in consuming vegetative tissues of arboreal and native neotropical plants, including some interactions with exotic plants. The species with the highest number of know interactions were *Lonomia obliqua* (41), *Lonomia concordia* (20), and *Lonomia electra* (20), occupying central positions within the network with significant assemblies of shared food plants among other *Lonomia* species. Among plant species, *Hampea appendiculata* and *Hevea brasiliensis* are the most recorded as part of the caterpillars' diet, as well as those that have gathered the most herbivore partners. Conversely, some caterpillar species such as *Lonomia casanarensis* and *Lonomia orientacordillera* have limited data, complicating definitive categorization regarding their diet. These caterpillars occupied peripheral positions in the network, with a low number of connections.

This study provides a database on the food resources of *Lonomia* caterpillars, essential for future work on the management and conservation of these species. It also represents the first comprehensive review of trophic relationships within the genus *Lonomia*, highlighting their role as generalist herbivores in the neotropical region. Additionally, the gathered information can be utilized and adapted for the management of these caterpillars under laboratory conditions. Our results indicate limitations in contrasting information for some *Lonomia* species, influencing the assembly of network structure between interaction types and sets of interacting species. Lastly, there is a limitation in available data on functional traits of plant species preyed upon by *Lonomia* caterpillars, which may have influenced the absence of a significant relationship between network metrics and functional dispersion.

Keywords: 1; Herbivory 2; Ecological interaction 3; *Lonomia* caterpillars 4; Plant-insect meta-network 5. Saturniidae.

LIST OF FIGURES

LIST OF TABLES

SUMMARY

1 INTRODUCTION

Ecological networks are a tool that allows for the representation and analysis of interactions between species within a community (Albertoni *et al.,* 2018; Martins *et al.,* 2020; Marquez, 2021). These networks are associated with the ecological roles of interacting species and aspects related to their niches (Aguado *et al.,* 2019; Malucelli, 2018). The general representation of the network is formed by modules composed of interacting biological groups (Aguado *et al.,* 2019; Marquez, 2021; Neff *et al.,* 2021). Indices associated with networks help to understand the characteristics of interactions and species (Dormann *et al.,* 2008), providing information on species' ecological or evolutionary aspects within a community or ecosystem (Dormann *et al.,* 2009).

Researchers like Carvajal (2018), Malucelli (2018), and Martins *et al.* (2020) indicate that the phenotypic characteristics of interacting species, such as morphological, phenological, and behavioral traits, are important for the likelihood of interaction occurrence and the structural patterns of ecological networks, as well as the relative abundance of species in specific environments. Although morphological traits and species abundance are the characteristics that most influence the construction of interactions (Pilosof *et al.,* 2017; Malucelli, 2018), these parameters are influenced by factors acting on larger scales, such as evolutionary history, historical events, dispersal, and environmental filter effects, which influence the composition and abundance of species and their traits, contributing to the determination of current interaction patterns (Delmas *et al.,* 2019; Martins *et al.,* 2020).

The variety of ecological and functional characteristics of species within a community (functional diversity) plays a crucial role in maintaining the stability and resilience of ecosystems (Tilman *et al.,* 1997; Hooper *et al.,* 2005). Functional diversity is not limited to species richness but also includes strategies influencing ecological interactions (Loreau *et al.,* 2001; Hooper *et al.,* 2005). Understanding ecological interactions within a community and their relationship with the functional diversity of species can provide insights into underlying ecological processes, species distribution, and community assembly (Leibold *et al.,* 2004; Loreau *et al.,* 2001).

On a broader geographical scale, local communities are interconnected within a metacommunity, encompassing multiple interactive communities in a landscape or region (Leibold *et al.,* 2004). The structure and dynamics of ecological networks reflect local interactions and species exchanges between different communities, thus influencing ecosystem diversity and stability (Leibold *et al.,* 2004; Loreau, 2004), and can be represented in a meta-network. This research explores these interactions in a specific context, focusing on the interaction between herbivorous insects and their host plants.

Interaction networks that describe predator-prey relationships, such as herbivory, are antagonistic (Aguado *et al.,* 2019). These interactions represent more than 40% of global terrestrial biodiversity (Ballesteros-Mejia *et al.,* 2020; Marquez, 2021), mainly concentrated in tropical regions (Marquez, 2021). The ecological role of herbivores as transformers of large quantities of plant biomass (Ricardo-Molina *et al.,* 2019) structures various interactions involving the natural history of their food plants, insectivorous predators, and parasitoids (Aizen *et al.,* 2016; Kawahara *et al.,* 2019; Ricardo-Molina *et al.,* 2019). The herbivorous feeding habit of insects results from coevolutionary processes with their food plants (Mendel *et al.,* 2009; Kawahara *et al.,* 2019). In these trophic interactions, herbivores benefit from consuming plant tissue, while plants suffer fitness losses (Andreazzi, 2016; Marquez, 2021). Depending on the intensity and duration of tissue consumption, plants may experience reduced growth rates, decreased seed production, and even death (Ruiz, 2017). However, despite the adverse effects on plants, this interaction is fundamental for ecosystem functioning due to the energy flow to higher trophic levels (Marquez, 2021).

In the evolutionary context of species involved in herbivory, plants have developed resistance, tolerance, and post-damage-induced defense mechanisms to counter their consumers' attacks (Ruiz, 2017; Marquez, 2021). In turn, herbivores strive to neutralize the mechanisms acquired by host plants, adapting and specializing in these mechanisms (Ruiz, 2017). These processes play an essential role in the diversification, distribution, and succession of terrestrial plant communities and their herbivores (Marquez, 2021).

Among herbivores, the order Lepidoptera includes butterflies and moths, playing an essential role in herbivorous interactions (Albertoni *et al.,* 2018; Alberti *et al.,* 2022). This order comprises 157,424 species distributed worldwide (Ricardo-Molina *et al.,* 2019; Alberti *et al.,* 2022). The species diversity, varied feeding habits, ease of sampling, and relatively well-known taxonomy of certain groups, such as the Saturniidae, make them model organisms for studies on biological diversity in various communities (Albertoni *et al.,* 2018). Additionally, their species are considered bioindicators of habitat quality, as their diversity is related to nutrient cycling, plant population dynamics (Bernardi *et al.,* 2011), and predator-prey relationships in ecosystems (Bernardi *et al.,* 2011; Casafús *et al.,* 2021).

The Saturniidae family comprises 2,349 species distributed across all world ecoregions (Albertoni *et al.,* 2018; Kawahara *et al.,* 2019). Adults have a short lifespan and fulfill three essential functions: reproduction, dispersal, and plant selection for oviposition and feeding of immature stages (Ballesteros-Mejia *et al.,* 2020). Researchers such as Brechlin and Meister (2008) described more than 500 saturniid species for the Neotropical ecoregion (Albertoni *et al.,* 2018), with the genus *Lonomia* belonging to this family and being endemic to that region (Malkowski *et al.,* 2018; González *et al.,* 2023).

The genus *Lonomia* was described by Walker in 1855, comprising 60 species (González *et al.,* 2023) with variable lifespans depending on the species and environmental conditions (Roodt *et al.,* 2000; Carvajal, 2018). The lifespan can reach 149-178 days for males and up to 180 days for females, which can be divided into periods such as embryonic (17-30 days) and caterpillar (59-90 days) (Rebelato; Lorini, 1998; Roodt *et al.,* 2000; Chudzinski-Tavassi; Alvarez-Flores, 2013). During this stage, the caterpillars undergo five to six molts (Carvajal, 2018) until pupating in the soil, with the pupa stage lasting from 45 to 69 days (Rebelato; Lorini, 1998; Roodt *et al.,* 2000). The pre-pupa stage settles under leaf litter or shallow soil, with development requiring specific temperature and humidity conditions as they do not produce a protective cocoon (Favalesso *et al.,* 2019). Adults emerge to mate and oviposit, with a lifespan of 15 days (Roodt *et al.,* 2000), where males live six days and females live eight days (Rebelato and Lorini, 1998).

The adult stage features wings that vary in color when viewed dorsally (Toro-Vargas *et al.,* 2023), a characteristic of sexual dimorphism (Lorini; Corseuil, 2001; Lorini *et al.,* 2007). Their caterpillars have yellow or white "U"-shaped spots on the third thoracic segment and fifth abdominal segment (Roodt *et al.,* 2000), with some species exhibiting a white "H"-shaped spot on the third thoracic segment from the fourth to sixth instar (Toro-Vargas *et al.,* 2023). In the mature phase, the caterpillars possess a system of spines of different sizes shaped like "pine trees" (scoli) in greenish-brown colors, distributed along the body in the dorsal, subdorsal, and lateral regions

(Chudzinski-Tavassi; Alvarez-Flores, 2013) (Figure 1). Generally, they measure six to seven centimeters in length and live in colonies ranging from 20 to 200 individuals (Roodt et al., 2000; Toro-Vargas *et al.,* 2023), perched on tree trunks during the day (Roodt *et al.,* 2000; Carvajal, 2018). These colonies can cover surfaces of about 0.25 m^2 on the host plant trunk (Roodt *et al.,* 2000). Their light coloration in greenish-brown tones provides mimetic characteristics that facilitate camouflage (Abella *et al.,* 1999; Chudzinski-Tavassi; Alvarez-Flores, 2013).

Figure 1. Caterpillars of *Lonomia* spp.

Source: Butantan Institute website

Lonomia species are distributed in the Neotropical region, from southern Mexico to northern Argentina (González *et al.,* 2023; Toro-Vargas *et al.,* 2023), except for Chile. Although the presence of *Lonomia obliqua* has been reported in Uruguay, there are no collection records (González *et al.,* 2023). The occurrences for the species are Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Suriname, Venezuela (Casafús *et al.,* 2021; González *et al.,* 2023), Belize, Costa Rica, El Salvador, Guatemala, Guyana, Honduras, Nicaragua, Mexico, Panama, Paraguay, and Peru, with each country presenting combinations of different *Lonomia* species (González *et al.,* 2023).

These species garner significant medical interest due to accidents caused by their caterpillars, considered a public health problem due to the hemorrhagic syndrome they can cause in humans (Abella *et al.,* 1999; Casafús *et al.,* 2021; Alberti *et al.,* 2022). These accidents, known as lonomism, occurring in stages four to six, usually happen on the trunks of fruit trees that the caterpillars use as food (Chudzinski-Tavassi; Alvarez-Flores, 2013; Moscoso, 2020). Researchers such as Diaz *et al.* (2021) indicate the possibility of 39 *Lonomia* species being capable of causing hemorrhagic syndromes in humans, highlighting the need for further studies to confirm this hypothesis. Despite the medical relevance and diversity of the genus, the literature on *Lonomia* is still limited regarding the biology and ecology of the species (Carvajal, 2018; Alberti *et al.,* 2022; Toro-Vargas *et al.,* 2023), especially concerning interactions with their host plants (Toro-Vargas *et al.,* 2023). The main investigations refer to taxonomic descriptions, venom biochemistry, medical case reports, and treatment of accidents (Moraes, 2002; Lorini, 2005), primarily for the species *Lonomia obliqua* and *Lonomia achelous* (Lorini, 2005; Carvajal, 2018; Toro-Vargas *et al.,* 2023), demonstrating the importance of the present work.

This study focuses on the immature stages of *Lonomia* species, as adults do not feed. Instead, it is the adult female that selects the host plant for oviposition, highlighting the importance of identifying and studying these plants to better understand the trophic relationships of *Lonomia* (Carvajal, 2018; Casafús *et al.,* 2021), and thus, the survival and reproduction of the species depend exclusively on the resources collected during herbivore-plant interactions in the larval stage (Carvajal, 2018). *Lonomia* caterpillars are considered polyphagous and flexible in using available plants under natural conditions (Toro-Vargas *et al.,* 2023), feeding on leaves from a high diversity of plants across the Neotropical region (Casafús *et al.,* 2021). This activity occurs at night when the caterpillars climb the branches of trees to reach their leaves (González *et al.,* 2023). Studying the antagonistic relationships of *Lonomia* is important to understand processes such as coevolution, food web dynamics, community assembly, and the configuration of networks among interacting species (Ballesteros-Mejia *et al.,* 2020).

1.1 OBJECTIVES

1.1.1 General

Describe the structure of the plant-herbivore meta-network of *Lonomia* caterpillars (Saturniidae – Lepidoptera) in the Neotropical region, to identify the species involved and their structural behavior in the assembly of this type of interaction.

1.1.2 Specifics

- Systematically analyze the available empirical evidence on the food plants described for the genus *Lonomia* (Saturniidae – Lepidoptera) in the Neotropical region, to create databases and trophic interaction matrices between the plant and *Lonomia* species richness from the available information.
- Describe the structure of metanetwork and the distribution of interactions between plant and *Lonomia* species through the matrix and the structure of the interaction meta-network.
- Identify which morphological functional traits of the food plants may influence the choice of host plants by the caterpillars of moths in the genus *Lonomia*.

2 MATERIALS AND METHODS

2.1 SYSTEMATIC REVIEW

A systematic review of the literature was conducted following the guidelines of Antman (1992), Oxman (1993), and Beltrán (2005) to design eligibility criteria for gathering and integrating secondary empirical evidence on species of the genus *Lonomia* and plants reported as food resources in the Neotropical region. The review adhered to the information organization proposal of the PRISMA 2020 method (Page *et al.,* 2021). Information was collected between June 2023 and January 2024, combining the keywords '*Lonomia*' and 'host plant' across databases including Google Scholar, PubMed, ScienceDirect, and Scopus. The search was expanded using Boolean operators “AND” and “OR” as appropriate, including the following combinations: (((Lonomia) OR Lonomia caterpillars) AND ((((((((((Host plants) OR Tree) OR Food plants) OR Herbivory) OR Diet) OR Life-history) OR Lonomism) OR Clinical cases) OR Geographical distribution) OR Ecological niche)). The studies were organized in a spreadsheet recording each platform's entries, followed by several screenings for duplicate management to eliminate redundancies between databases. Initial screenings included title and keyword analysis, along with the eligibility criteria of records.

2.1.1 Record eligibility criteria

Following the proposals of Antman (1992), Oxman (1993), and Beltrán (2005) in designing eligibility criteria:

Empirical records in various formats, such as scientific articles, scientific notes, monographs, dissertations, theses, data papers, books, book chapters, and abstracts published in English, Portuguese, and Spanish were included. Records related to the rearing of caterpillars under laboratory conditions, fed with plants previously identified as wild hosts in the same research or other studies, were also considered. The temporal coverage included documents published up to January 2024, and records reporting herbivory in crops were included.

Records involving plants with particular common or popular names of the study area were excluded, as were records involving the rearing of caterpillars in captivity and their feeding with plant species not identified under wild conditions.

2.1.2 Manual search

From the total list of records obtained after applying the eligibility criteria, records were integrated into a single spreadsheet, and the stages of "Identification," "Screening," and "Included" were applied to obtain the final list of documents for database creation (Page *et al.,* 2021):

1. Identification stage: A second filter was applied to eliminate duplicate records from the total initial search. Duplicates were removed by organizing the titles of each study alphabetically, retaining the first record of each duplicate.
2. Screening stage: After reading the title and abstract of each record, those lacking the information of interest were eliminated. A new list of eligible documents for in-depth reading was prepared, followed by the final screening.
3. Included stage: The total number of studies included in the systematic review was considered. Additionally, documents from a subsequent search using other methods related to the in-depth reading of records from the screening stage were included.

From the resulting bibliographic records, a synthesis of dispersed information was conducted on the qualitative and quantitative aspects of the documents and reported plant species, including: the number of records published per year, the number of formats of the records included in the review, type, and number of: family, genus, plant growth habit (categories: Tree, Shrub, Herb, Liana, or Palm), and origin of plant species according to the geographic area where the interaction was reported (classified as Endemic, Native or Exotic) (JBRJ, 2024; WFO, 2024) along with the country. A map of the life zones of *Lonomia* was created using records from countries where caterpillar-plant interactions were reported, utilizing QGIS software version 3.36.0 (QGIS, 2022). This was done to complement the results of this research and the biological and ecological aspects of *Lonomia* species.

2.1.1 DATABASES

The collected information was organized in spreadsheets as follows:

H1 Systematic review, includes: Bibliographic Reference, Title, Source, Document Type, Written Language, and Referenced Plant Name (Appendix **1**).

The taxonomic classification of reported plants was verified through the platforms Flora e Funga do Brasil (https://floradobrasil.jbrj.gov.br/) and World Flora Online (https://www.worldfloraonline.org/), discarding possible synonyms in taxonomic classification (Appendix **2**) and completing missing taxonomic information.

- **H2 Interaction of species of the genus *Lonomia*, Saturniidae (Lepidoptera) together with their food plants,** includes: Bibliographic Reference, Interaction Record Country, Name Code, *Lonomia* Species, No. of Associated Plant Families, Family Plant Feed, No. of Associated Plant Genus, Genus of Food Plant, No. of Associated Plant Species and Species of Food Plant (Appendix 3).

- **H3 General plants group,** includes: Name Code, Family Name, Number Plant Genus, Moth Genus Name, Number Plant Species, Name Code, Plant Species Names, Growth Habit e Origin of Plants (Appendix **4**).

2.2 META-NETWORK ANALYSIS

2.2.1 BINARY MATRIX

From the database information, binary interaction matrices were created. These matrices consist of two interaction levels, with one level represented in columns (species of the higher trophic level, *Lonomia* species) and the other in rows (species of the lower trophic level, food plant families or species) (Dormann *et al.,* 2008). The interconnected cells between columns and rows were filled with the presence or absence of interactions, following Mello *et al.* (2016), assigning a value of one (1) for the presence of interaction and zero (0) for absence. This procedure allowed the design of a bipartite metanetwork using R software version 4.2.3 (R Core Team, 2022).

2.2.2 NETWORK METRICS ANALYSIS

The bipartite metanetwork was visualized using the "plotweb" function. This graph represented two rows of rectangles at each end, symbolizing the interacting groups: the width of each rectangle was proportional to the sum of interactions involving each species. Interacting species were connected by lines (Dormann *et al.,* 2008). The term "line" refers to the interaction between a pair of species (one from the lower trophic level and one from the upper trophic level) (Dormann *et al.,* 2009). The names of the rectangles were represented by codes for *Lonomia* species (Appendix 3) and for food plant families and species (Appendix 4).

Indices associated with the bipartite metanetwork captured different network characteristics, interactions, and involved species. The functions used were "networklevel" and "specieslevel" (Dormann *et al.,* 2008; 2009; R Core Team, 2022). The "networklevel" function included indices: "Connectance," indicating the proportion of realized links to possible links in the network; "Cluster Coefficient," indicating the average number of links among all species, dividing the number of realized links by the number of possible links. This coefficient can be calculated for the entire network or each level (indicated by the suffix HL or LL, referring to the lower and upper levels, respectively); "Linkage density," indicating the weighted marginal totals of interactions per species; "Links per Species," indicating the average number of links per species; "Nestedness," representing a measure of deviation from the systematic arrangement of species by niche breadth; "Number of Compartments," indicating the number of subsets in the network not connected (through an upper or lower trophic level) to another compartment; "Specialization asymmetry," indicating asymmetry (upper vs. lower trophic level) of specialization, with positive values indicating greater specialization of the upper trophic level; and finally, the "Web Asymmetry" index, representing the balance between the numbers at the two trophic levels. Positive values indicate more species at the lower trophic level, and negative values indicate more species at the upper trophic level.

The "specieslevel" function included indices: "Degree," indicating the sum of links per species; "Normalised degree," indicating the number of possible partners per species; "Species strength," representing the sum of dependencies of each species, quantifying a species' relevance among all its partners; "Species specificity index," a measure of specialization based on the coefficient of variation of interactions, normalized to values between zero (0) and one (1), with zero indicating low variability and one indicating high variability (and thus suggesting low and high specificity); "Betweenness," describing a species' centrality in the network by its position on the shortest paths between other nodes; "Closeness," indicating a species' centrality in the network by the length of its path to other nodes; and finally, the "d" index, measuring each species' specialization based on its discrimination from random partner selection.

These ecological descriptors or network indices were selected because they do not consider unspecified aspects in constructing the presence/absence interaction matrices, such as interaction frequency between species or species abundances (Dormann *et al.,* 2008; 2009).

The meta-network interaction analysis followed guidelines proposed by Dáttilo & Rico-Gray (2018) and Aguado *et al.* (2019) to describe the meta-network structure and the roles of involved species. At the meta-network level, the structure was characterized by calculating metrics: modularity (Q), nestedness, and connectance (Aguado *et al.,* 2019).

The modularity metric was used to describe the tendency of different subsets of species within the network to interact more easily with each other than with the rest of the species (Dáttilo & Rico-Gray, 2018). This index quantitatively ranges from zero (0) when there is no modularity to one (1) when modularity is present (Blüthgen *et al.,* 2006) and qualitatively subdivides the meta-network structure into modules or compartments (Dáttilo & Rico-Gray, 2018).

Modularity (Q) values were obtained using the "computeModules" function. The components expressed in the formula are: *m*, representing the total value of interactions observed in the matrix; the modules where the caterpillar's species and their host plants are represented by *ij* in *C*. The δ function will yield a result of one (1) if species *i* and *j* are in the same module and zero (0) if they belong to different modules. *K* is the expected matrix, formed by the cross-product of the marginal totals of each species in the module divided by the sum of the number of observed interactions in the given module (Oliveira, 2018).

The Nestedness metric was used to describe the distribution of interactions among partners by overlapping the links of low-degree species with high-degree species in the interaction pairs (Dáttilo & Rico-Gray, 2018). Species with few links (specialists) interact with species with many links in the network (generalists). "NODF" values range from zero (0) to one hundred (100), with high values indicating high nestedness and low values indicating low nestedness (Blüthgen *et al.,* 2008).

The Connectance index (C) represents the proportion of interaction links in a network (the ratio between the total number of links and the theoretical maximum number of possible links) (Dáttilo & Rico-Gray, 2018; Aguado *et al.,* 2019). Values close to one (1) translate to total connectivity among species (Aguado *et al.,* 2019).

2.2.3 FUNCTIONAL ATTRIBUTE METRICS ANALYSIS

The variation in the diet of *Lonomia* caterpillars was assessed by compiling functional traits of plants that showed herbivory records. Data were obtained from the Botanical Information and Ecology Network (BIEN; Enquist *et al.,* 2016) and the TRY plant trait database (Kattge *et al.,* 2020). Selected traits included Leaf dry matter content (LDMC), Leaf thickness (LT), Leaf area (LA), and Leaf fresh mass (LFM). These traits were chosen because they directly relate to palatability (Diaz *et al.,* 2016).

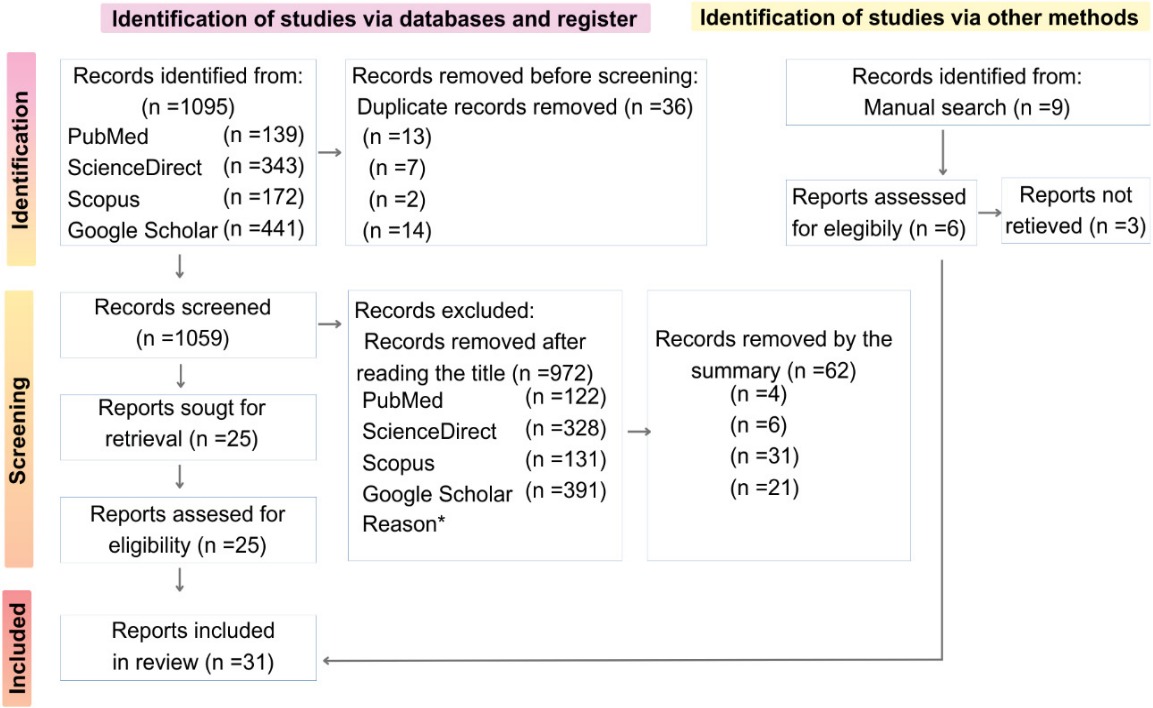
Subsequently, the functional diversity of the plants interacting with each *Lonomia* species was calculated. Functional dispersion (FDis) was calculated to measure how much species diverge in their traits relative to a centroid, analogous to a multidimensional variance. FDis was chosen because it provides a measure of functional diversity that is not directly influenced by species richness and can be interpreted in terms of how species are distributed in a functional trait space (Laliberté & Legendre, 2010). The FD package (Laliberté *et al.,* 2014) was used to compute functional dispersion, using the plant-by-caterpillar matrix as input. This matrix is analogous to a community matrix, where caterpillars are equivalent to sampling units and plants are the species composing the community, with occurrence (in this case, the occurrence of interaction) scored as zero (0) or one (1). Since most plants had few or no traits, those with fewer than three traits were excluded (Appendix 5). Consequently, *Lonomia* species interacting only with plants lacking traits were excluded from the analysis. To evaluate the relationship between functional dispersion and network metrics, a simple linear model with Gaussian distribution of residuals was used, with functional dispersion as the predictor and network metrics as response variables. Differences in the mean traits of plants interacting with each Lonomia species were also measured using the Kruskal-Wallis test (Appendix 6). In cases of significant differences between groups, Dunn's test was used to test differences between each pair of caterpillar species. Before the analyses, all variables were inspected and transformed when necessary.

3 RESULTS

3.1 SYSTEMATIC REVIEW

During the study identification stage, 1,095 records were obtained, contributed by PubMed (139 bibliographic records), ScienceDirect (343 records), Scopus (172 records), and Google Scholar (441 records). Upon merging the databases into a single dataset, 36 duplicate records were removed (Figure 2).

Figure 2. Systematic review results in Prisma 2020 flowchart.



The top part shows two columns for study identification through databases, records, and other methods, filtered through the stages of Identification, Screening, and Inclusion.

Continuing with the Screening stage, 1,034 records were eliminated after reading the titles and abstracts. From the title reading, 972 records were discarded, and another 62 records were discarded from the abstract reading. These discards occurred mainly for four reasons:

1. Focus on the biological and ecological aspects of the adult stage of the *Lonomia* genus, a life stage where the species lack functional structures for feeding.

2. Approach to the ecological, biochemical, and pathophysiological characterization of intoxication without biological aspects related to the caterpillar's host plant.

3. Restriction to clinical cases without field data on caterpillar-plant-patient

interaction or biological characterization of the area where the incident occurred, as *Lonomia* caterpillar incidents are considered a public health issue.

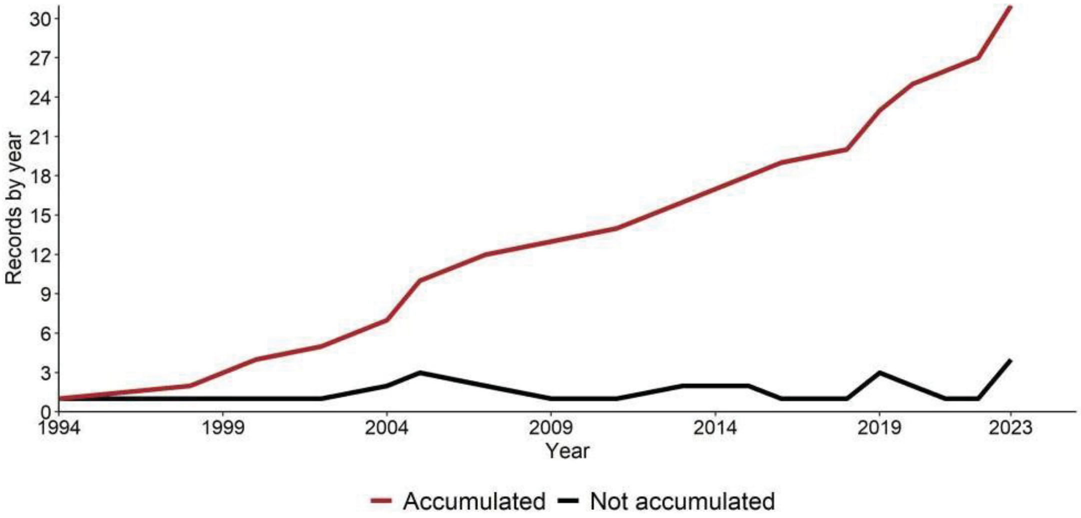
4. Distribution records of *Lonomia* species or ecological niche studies based solely on abiotic traits.

As a result of this stage, 25 records were pre-selected for the systematic review. Regarding their references, a new search for records was conducted on the Google Scholar platform. These searches revealed nine studies to be included in the review, three of which are restricted-access books referenced by Lorini (1999), Moraes (1992), and Pastrana (2004). However, the references to the food plants in these studies are cited by the studies already included in the review. This new search provided six new records, resulting in 31 documents to be included in the systematic review. They all report records of *Lonomia* species or genus-level descriptions associated with food plants (Figure 2).

After manually searching records, the Google Scholar search platform proved to be the most significant contributor of records (21) (Appendix 1), and all records generated by PubMed were discarded from the final total. In most records (14), the plants were identified by their scientific and common names, followed by 13 studies that identified the plants by their scientific names, and four opted to use common names (Appendix 1). In many cases, it was possible to transition from a common name to a scientific name based on plant references in other records, the geographical area of the study, the presence of the related caterpillar, and the popularity of common names in various regions. Some records mentioning common names were discarded due to the high specificity of the names for the study's geographical area, while others were grouped in the taxonomic genus category.

The studies were published from 1994 to 2023, with the year 2023 having the highest number of records (4), followed by the years 2005 and 2019, each contributing three bibliographic records to the review (Figure 3).

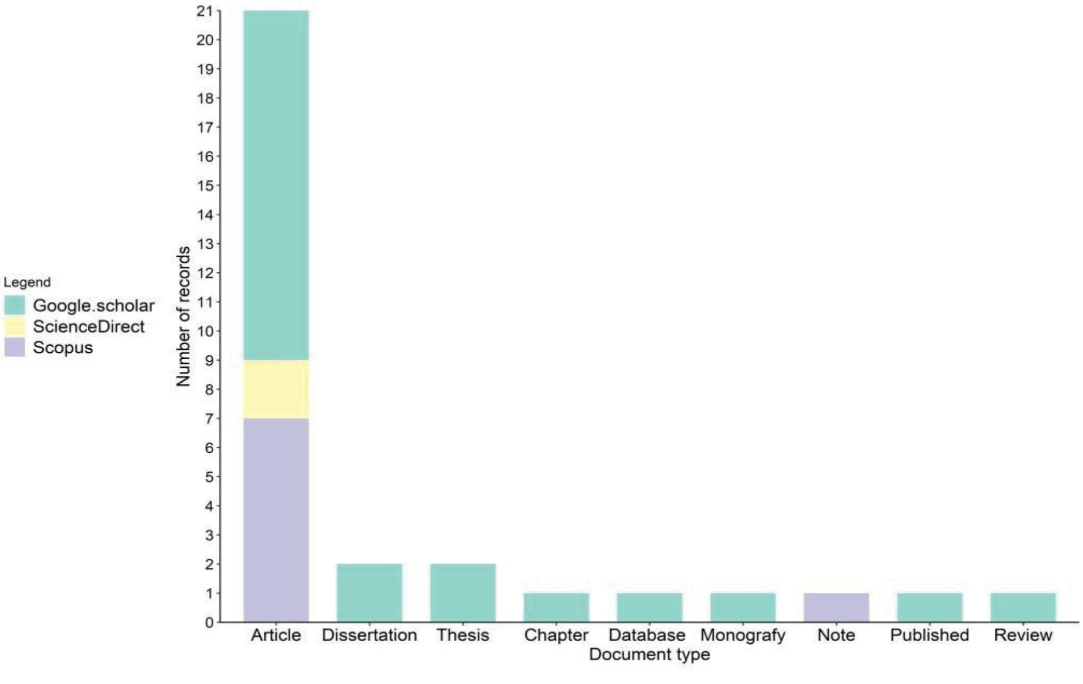
Figure 3. Number of records published by year.



The red line refers to the number of accumulated studies over the years, while the black line relates to the number of studies found each year.

The types of records found in the review were articles (21), followed by dissertations (2), thesis (2), book chapters (1), databases (1), monographs (1), scientific notes (1), published conference abstracts (1), and scientific reviews (1). The origin of the article-type records corresponds to the platforms Google Scholar (12), Scopus (7), and ScienceDirect (2) (Figure 4), in the languages: English (13 records), Portuguese (14), and Spanish (4) (Appendix 1).

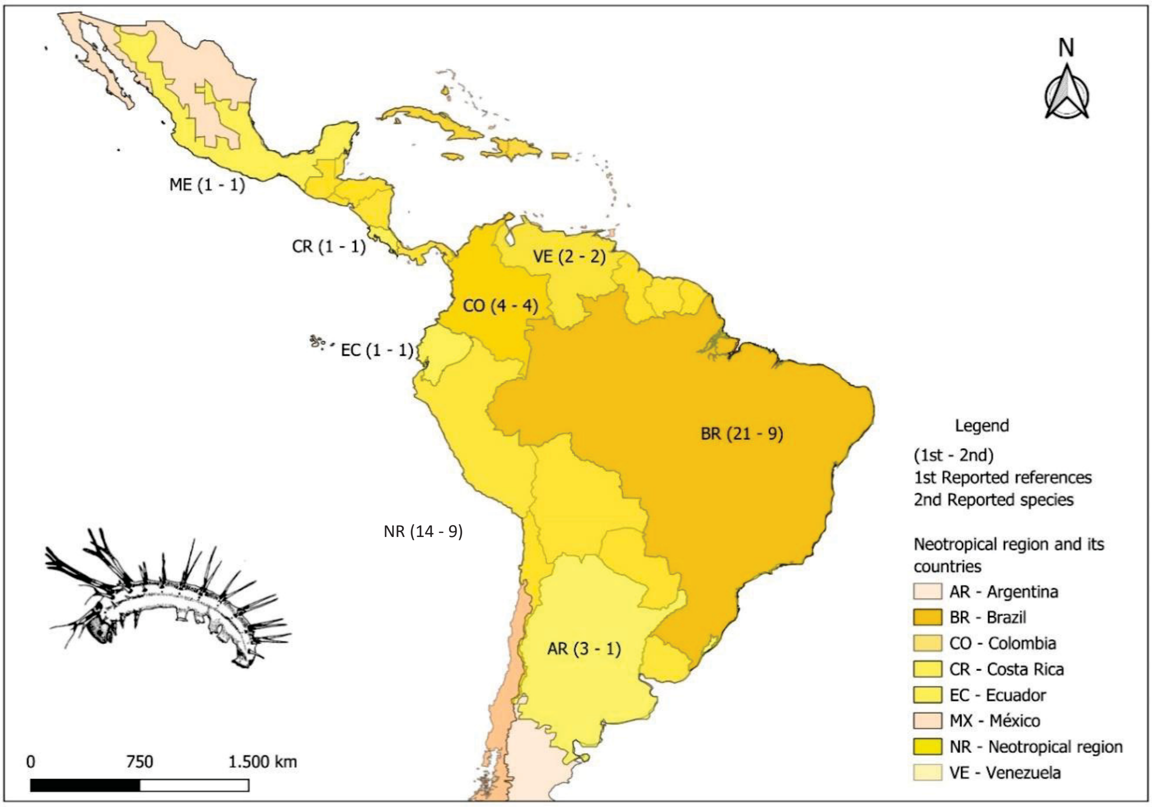
Figure 4. Types of record formats in the review.



The blue bars refer to the number of records by format type found by Google Scholar, the yellow bars refer to records found by ScienceDirect, and the purple bars refer to records found by Scopus.

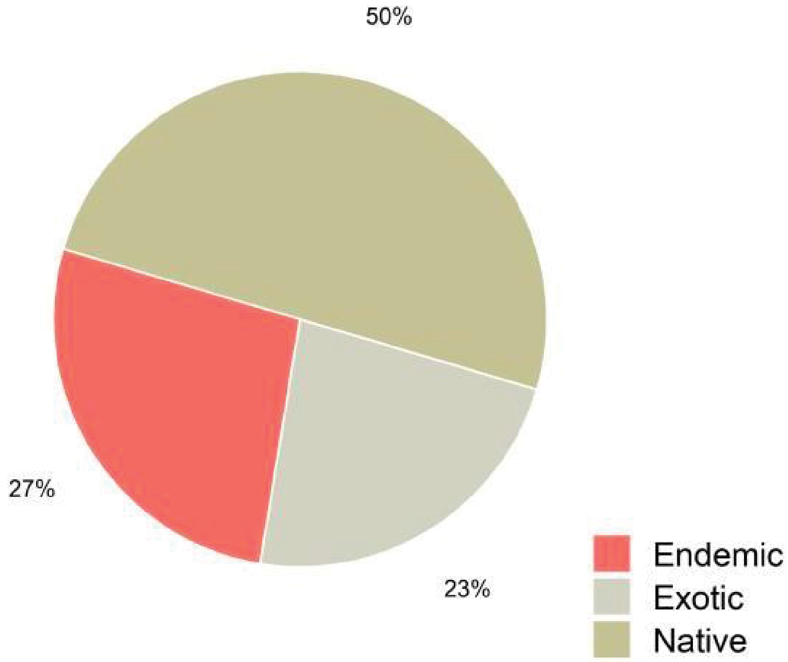
The records of caterpillar-food plant interactions were reported for seven countries (Argentina, Brazil, Colombia, Costa Rica, Ecuador, Mexico, and Venezuela), with some records documented for the Neotropical region. Brazil and the Neotropical region are the geographical areas that most report Lonomia species (9) for both zones and involve the highest number of studies (21) and (14), respectively (Figure 5).

Figure 5. Number of bibliographic records and *Lonomia* species by geographical zone.



According to the origin of plant species by the geographical area where the caterpillar-plant interaction was recorded, 72 species were considered native, 39 were considered endemic, and 34 were considered exotic (Appendix 4, Figure 6). Of the 34 exotic species, 27 (79%) are cultivated species with agricultural and ornamental interests.

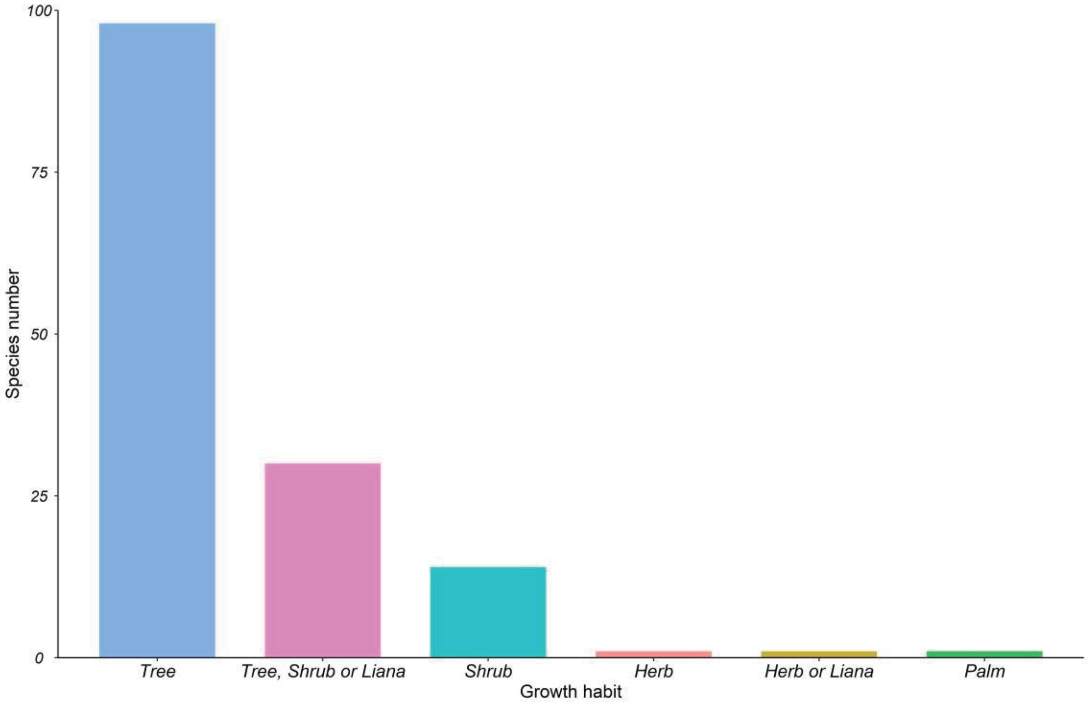
Figure 6. Origin of plant species.



50% of the plant species were of native origin and represented in green, while 27% of the species were endemic and highlighted in pink. The exotic species, which correspond to 23%, are represented in gray.

According to the growth habits of the plant species present in the diet of *Lonomia*, 98 species were classified in the "Tree" category, followed by 14 species in the "Shrub" category, and one species each in the "Herb" and "Palm" categories. Some species were grouped into combined categories due to the lack of classification to the specific epithet. These categories included "Shrub, Tree, or Liana," with a total of 30 reported species, and "Herb or Liana," with one identified species (Appendix 4, Figure 7).

Figure 7. Growth habit of plants by species.



The Tree category groups 68% of the species, represented in dark blue, followed by the categories: Shrub, Tree, or Liana with 21% of the species, represented in fuchsia, Shrub (9%) in light blue, Herb (0.7%) in pink, Herb or Liana (0.7%) in gold, and Palm (0.7%) in green.

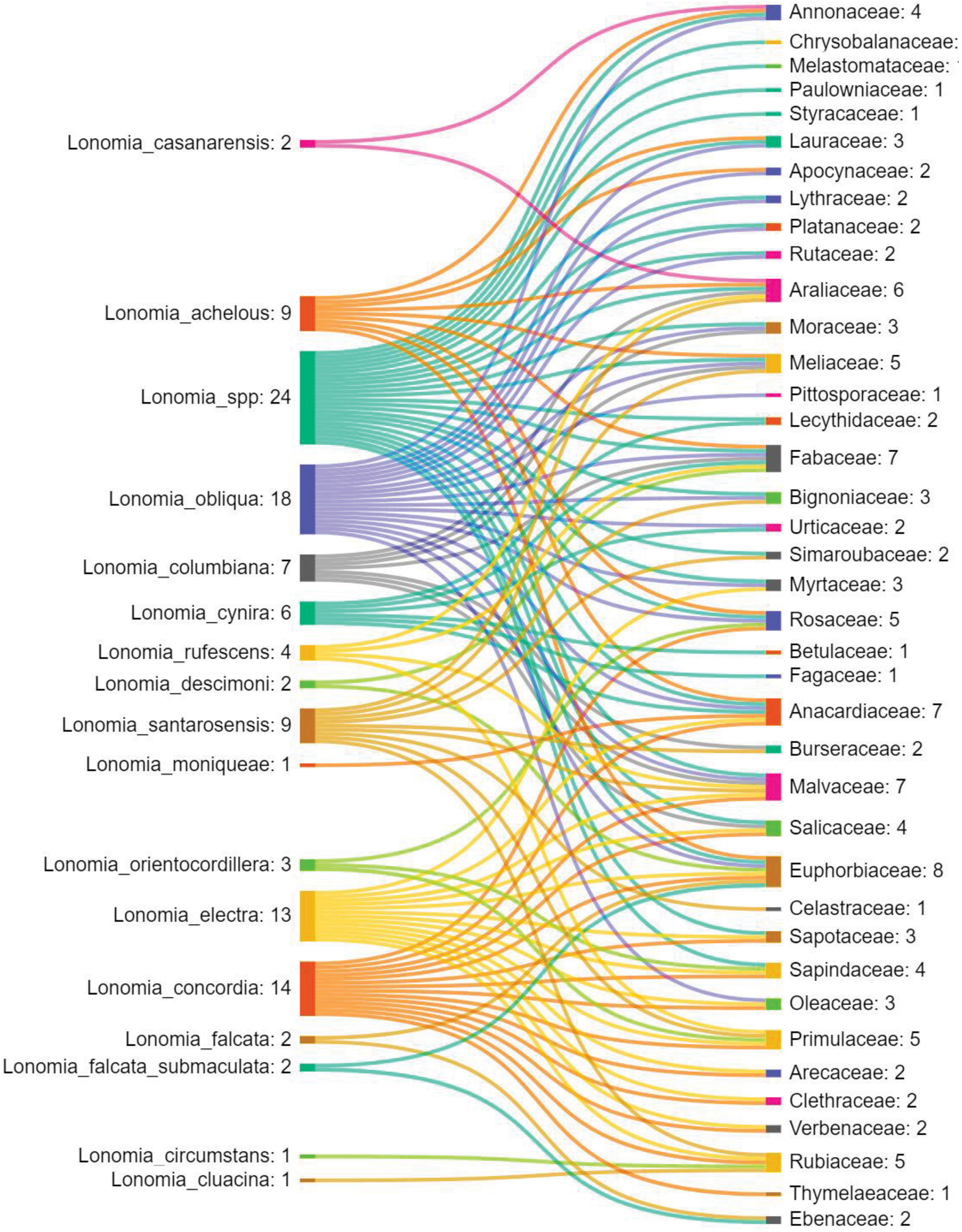
By growth habit, 31 species are documented in categories that include more than one habit, being in the "Herb or Liana" category: the species *Urtica* sp. In the "Tree or Shrub" category, the species *Alchornea* spp., *Aspidosperma* sp, *Clethra* sp, *Coffea* sp, *Eriobotrya* sp, *Eucalyptus* spp., *Hevea* spp., *Inga* sp, *Joannesia* sp, *Lagerstroemia* sp, *Lithraea* sp, *Parathesis* sp, *Persea* spp., *Prunus* sp, *Pyrus* sp, *Quassia* sp, *Sapium* sp, *Spondias* sp, *Stylogyne* sp and *Tibouchina* sp, and in the "Tree, Shrub, or Liana" category; the species *Annona* spp., *Ficus* spp., *Machaerium* sp., and *Miconia* sp. The taxa belonging to the "Tree or Shrub" and "Tree, Shrub or Liana" categories were combined into the "Tree, Shrub or Liana" category for graphical interpretation purposes (Appendix 4). *Lonomia* species primarily choose plant species with arboreal growth habits, this being the category that gathers most species (Figure 7).

The review allowed the recording of a group of 15 *Lonomia* species and one subspecies feeding on 145 plant species, belonging to 98 genera and 39 families (Appendix 3), distributed in the Neotropical region, recorded as herbivores; *Lonomia achelous* (Cramer, 1777), *Lonomia casanarensis* (Brechlin, 2017), *Lonomia circumstans* (Walker, 1855), *Lonomia cluacina* (Druce, 1877), *Lonomia columbiana* (Lemaire, 1971), *Lonomia concordia* (Druce, 1886), *Lonomia cynira* (Cramer, 1777), *Lonomia descimoni* (Lemaire, 1971), *Lonomia electra* (Druce, 1886), *Lonomia falcata* (Walker 1855), *Lonomia moniqueae* (Brechlin & Meister, 2019), *Lonomia obliqua* (Walker, 1855), *Lonomia orientocordillera* (Brechlin, Käch & Meister, 2013), *Lonomia rufescens* (Lemaire, 1972), *Lonomia santarosensis* (Brechlin & Meister, 2013), the subspecies *Lonomia falcata submaculata* (Walker 1855), and some interactions documented as *Lonomia* spp.

3.2 META-NETWORK RESULTS

The topology of the bipartite meta-network between *Lonomia* species and their host plant families displayed a modular structure. Seventeen modules representing *Lonomia* species were identified, creating 118 connections with 39 modules representing host plant families across the Neotropical region (Figure 8).

Figure 8. Meta-network of interactions between *Lonomia* larvae and their host plant families.



On the left, *Lonomia* species are grouped into modules (subgroups) along with the number of trophic interactions they have with plant families. On the right, plant families are grouped into modules, each showing the number of interactions with different *Lonomia* species.

The plant families most frequently exploited by *Lonomia* species were

Euphorbiaceae with eight species, followed by Anacardiaceae, Fabaceae and Malvaceae, each exploited by seven *Lonomia* species (Appendix 3, Figure 8). The species common to these families are: *L. obliqua* e *Lonomia* spp. and particularly for families:

1. Euphorbiaceae: *L. achelous*, *L. concordia*, *L. descimoni*, *L. electra*, *L. falcata* and *L. falcata submaculata*.

2. Anacardiaceae: *L. achelous*, *L. concordia*, *L. cynira*, *L. electra* and *L. moniqueae*.

3. Fabaceae: *L. achelous*, *L. columbiana*, *L. cynira*, *L. descimoni* and *L. rufescens.*

4. Malvaceae: *L. columbiana*, *L. concordia*, *L. electra*, *L. rufescens* and *L. santarosensis*.

The largest interaction group comprised *Lonomia* spp. and 24 plant families grouped into 44 genera, as this module pertains to the genus level rather than specific epithet, which naturally results in a higher number of interactions. The smallest interaction groups consisted of *L. circumstans* and *L. cluacina*, both associated with the family Rubiaceae and *L. moniqueae*, associated with the family Anacardiaceae (Appendix 3, Figure 8).

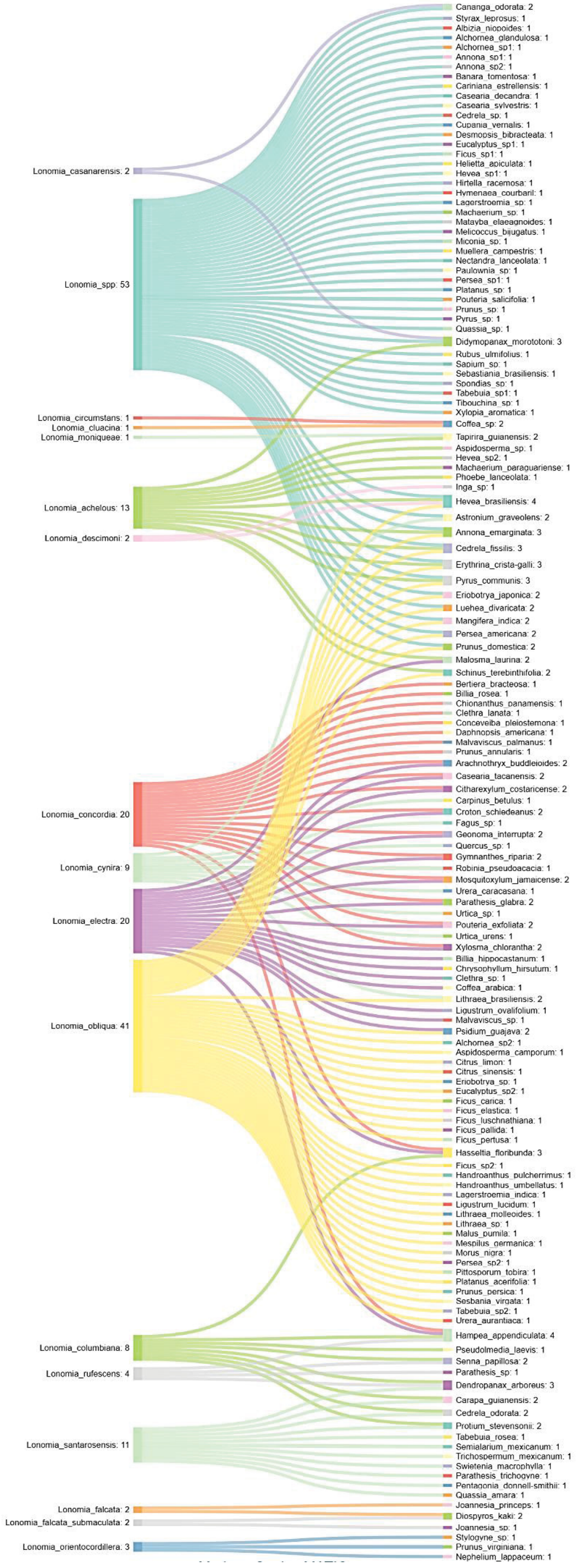
Regarding network connectivity, the realized proportion of possible connections (Connectance) between *Lonomia* caterpillars and plant families was 0.178. This value is influenced by the relationship of *Lonomia* groups associated with the 39 plant families (Figure 8), with an average of 2.107 qualitative links per species and 8.737 quantitative links per species (Linkage density). The average number of links among all species (Cluster coefficient) was 0.118, corresponding to the 118 established connections among the 56 network modules. The average number of links for plant families was 0.252 (Cluster coefficient HL), and for *Lonomia* caterpillars, it was 0.338 (Cluster coefficient LL). The Nestedness index was 14.003, indicating that generalist *Lonomia* species interact with a broad set of host plant families, while more specialist species interact predominantly as subsets within the generalists. Specialization asymmetry indicated lower specialization of the higher trophic level. The Web asymmetry index indicated more species at the lower trophic level than the upper one, representing a higher number of plant families compared to *Lonomia* species. *Lonomia* species exhibit a generalist behavior in selecting plant families for feeding (based on species richness), indicating no specialized pattern within the meta-network (Table 1).

Table 1 - Metric values of interactions between *Lonomia* caterpillars and plant families.

Metrica	Valor
Cluster coefficient	0.118
Cluster coefficient HL	0.252
Cluster coefficient LL	0.338
Connectance	0.178
Linkage density	8.737
Links per species	2.107
Nestedness	14.003
Number of compartments	1
Specialisation asymmetry	-0.131
Web asymmetry	0.393

Continuing with the topology of the bipartite meta-network between *Lonomia* species and their host plant species, a modular structure was observed. Seventeen modules representing the genus *Lonomia* created 193 connections with 145 modules representing host plant species throughout the Neotropical region (Figure 9).

Figure 9. Meta-network of interactions between *Lonomia* caterpillars and their host plant species.


Lonomia_casanarensis: 2
Lonomia_spp: 53
Lonomia_circumstans: 1
Lonomia_cluacina: 1
Lonomia_moniqueae: 1
Lonomia_achelous: 13
Lonomia_descimoni: 2
Lonomia_concordia: 20
Lonomia_cynira: 9
Lonomia_electra: 20
Lonomia_obliqua: 41
Lonomia_columbiana: 8
Lonomia_rufescens: 4
Lonomia_santarosensis: 11
Lonomia_falcata: 2
Lonomia_falcata_submaculata: 2
Lonomia_orientocordillera: 3
Cananga_odorata: 2
Styrax_leprosus: 1
Albizia_niopoides: 1
Alchornea_glandulosa: 1
Alchornea_sp1: 1
Annona_sp1: 1
Annona_sp2: 1
Banara_tomentosa: 1
Cariniana_estrellensis: 1
Casearia_decandra: 1
Casearia_sylvestris: 1
Cedrela_sp: 1
Cupania_vernalis: 1
Desmopsis_bibracteata: 1
Eucalyptus_sp1: 1
Ficus_sp1: 1
Helietta_apiculata: 1
Hevea_sp1: 1
Hirtella_racemosa: 1
Hymenaea_courbaril: 1
Lagerstroemia_sp: 1
Machaerium_sp: 1
Matayba_elaeagnoides: 1
Melicoccus_bijugatus: 1
Miconia_sp: 1
Muellera_campestris: 1
Nectandra_lanceolata: 1
Paulownia_sp: 1
Persea_sp1: 1
Platanus_sp: 1
Pouteria_salicifolia: 1
Prunus_sp: 1
Pyrus_sp: 1
Quassia_sp: 1
Didymopanax_morototoni: 3
Rubus_ulmifolius: 1
Sapium_sp: 1
Sebastiania_brasiliensis: 1
Spondias_sp: 1
Tabebuia_sp1: 1
Tibouchina_sp: 1
Xylopia_aromatica: 1
Coffea_sp: 2
Tapirira_guianensis: 2
Aspidosperma_sp: 1
Hevea_sp2: 1
Machaerium_paraguariense: 1
Phoebe_lanceolata: 1
Inga_sp: 1
Hevea_brasiliensis: 4
Astronium_graveolens: 2
Annona_emarginata: 3
Cedrela_fissilis: 3
Erythrina_crista-galli: 3
Pyrus_communis: 3
Eriobotrya_japonica: 2
Luehea_divaricata: 2
Mangifera_indica: 2
Persea_americana: 2
Prunus_domestica: 2
Malosma_laurina: 2
Schinus_terebinthifolia: 2
Bertiera_bracteosa: 1
Billia_rosea: 1
Chionanthus_panamensis: 1
Clethra_lanata: 1
Conceveiba_pleiostemona: 1
Daphnopsis_americana: 1
Malvaviscus_palmanus: 1
Prunus_annularis: 1
Arachnothryx_buddleioides: 2
Casearia_tacanensis: 2
Citharexylum_costaricense: 2
Carpinus_betulus: 1
Croton_schiedeanus: 2
Fagus_sp: 1
Geonoma_interrupta: 2
Quercus_sp: 1
Gymnanthes_riparia: 2
Robinia_pseudoacacia: 1
Mosquitoxylum_jamaicense: 2
Urera_caracasana: 1
Parathesis_glabra: 2
Urtica_sp: 1
Pouteria_exfoliata: 2
Urtica_urens: 1
Xylosma_chlorantha: 2
Billia_hippocastanum: 1
Chrysophyllum_hirsutum: 1
Clethra_sp: 1
Coffea_arabica: 1
Lithraea_brasiliensis: 2
Ligustrum_ovalifolium: 1
Malvaviscus_sp: 1
Psidium_guajava: 2
Alchornea_sp2: 1
Aspidosperma_camporum: 1
Citrus_limon: 1
Citrus_sinensis: 1
Eriobotrya_sp: 1
Eucalyptus_sp2: 1
Ficus_carica: 1
Ficus_elastica: 1
Ficus_luschnathiana: 1
Ficus_pallida: 1
Ficus_pertusa: 1
Hasseltia_floribunda: 3
Ficus_sp2: 1
Handroanthus_pulcherrimus: 1
Handroanthus_umbellatus: 1
Lagerstroemia_indica: 1
Ligustrum_lucidum: 1
Lithraea_molleoides: 1
Lithraea_sp: 1
Malus_pumila: 1
Mespilus_germanica: 1
Morus_nigra: 1
Persea_sp2: 1
Pittosporum_tobira: 1
Platanus_acerifolia: 1
Prunus_persica: 1
Sesbania_virgata: 1
Tabebuia_sp2: 1
Urera_aurantiaca: 1
Hampea_appendiculata: 4
Pseudolmedia_laevis: 1
Senna_papillosa: 2
Parathesis_sp: 1
Dendropanax_arboreus: 3
Carapa_guianensis: 2
Cedrela_odorata: 2
Protium_stevensonii: 2
Tabebuia_rosea: 1
Semialarium_mexicanum: 1
Trichospermum_mexicanum: 1
Swietenia_macrophylla: 1
Parathesis_trichogyne: 1
Pentagonia_donnell-smithii: 1
Quassia_amara: 1
Joannesia_princeps: 1
Diospyros_kaki: 2
Joannesia_sp: 1
Stylogyne_sp: 1
Prunus_virginiana: 1
Nephelium_lappaceum: 1

On the left, *Lonomia* species are grouped into modules (subgroups) along with the number of trophic interactions they have with plant species. On the right, plant species are grouped into modules, each showing the number of interactions with different *Lonomia* species.

The largest interaction group comprised *Lonomia* spp. and 53 host plant species (Degree) grouped into 24 families and 44 genera (Table 2, Figure 9). *Lonomia* spp. are genus-level descriptions, representing a group of lonómias species not taxonomically identified to the specific level. They encompassed the highest number of reported interactions with host plants as a group. The *Lonomia* species with the highest number of host plant partners were *Lonomia obliqua* with 41 associated plant species, followed by *Lonomia concordia* and *Lonomia electra*, each with 20 associated plant species (Appendix 3, Figure 9). These species form the central groups of the meta-network, interacting with the largest groups of plant species.

The plant species with the highest number of interactions were *Hampea appendiculata* of the Malvaceae family and *Hevea brasiliensis* of the Euphorbiaceae family, each with four herbivorous partners. *Hampea appendiculata* is preyed upon by *L. columbiana*, *L. concordia*, *L. electra*, and *L. rufescens*, while *Hevea brasiliensis* is preyed upon by *L. achelous*, *L. descimoni*, *L. obliqua* and *Lonomia* spp. (Appendix 3, Figure 9).

The plant families contributing the most species to *Lonomia* feeding were Euphorbiaceae with 13 species, Rosaceae with 12 species, and Anacardiaceae and Fabaceae each with 10 host plant species (Appendix 4).

The species *Lonomia obliqua*, *Lonomia concordia* and *Lonomia electra* exhibited the highest "Degree" and "Normalised degree" values for plant species partners, with values of (41 - 0.28), (20 - 0.13), and (20 - 0.13), respectively. *Lonomia obliqua* showed the highest "Species strength" (33.6) among its partners within the meta-network.

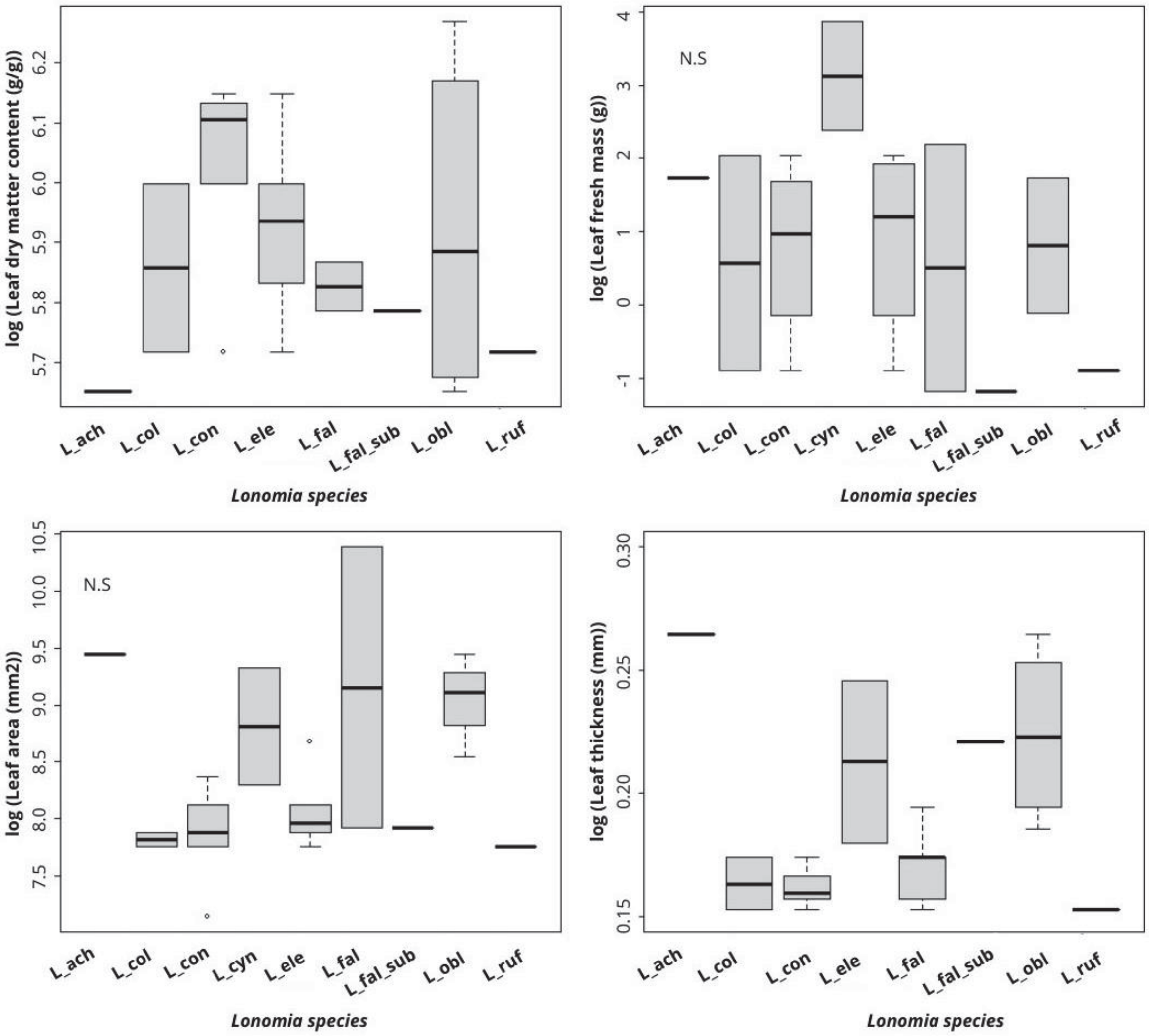
The species *Lonomia casanarensis*, *Lonomia descimoni*, *Lonomia falcata* and the subspecies *Lonomia falcata submaculata* had the highest "Species specificity" (0.70), being the species with the fewest feeding partners (1). Unlike *Lonomia descimoni*, the other species were located more peripherally within the meta-network. The "Betweenness" index, which describes species centrality in the network through their position in the shortest paths between other nodes, corresponded to *Lonomia achelous*, *Lonomia electra* and *Lonomia obliqua*, indicating a higher probability of resource sharing with other species. *Lonomia electra* exhibited the highest "Closeness" centrality value (0.096) within the meta-network, while *Lonomia orientacordillera* showed the most random partner selection behavior based on the "d’" value. These results are reflected in Table 2.

Table 2. Metric values calculated for species in the meta-network.

Espécies	**Degree**	**Normalised degree**	**Species strength**	**Species specificity index**	**Betweenness**	**Closeness**	**d'**
Lonomia spp.	53	0.368	45.417	0.109	0.033	0.076	0.612
Lonomia achelous	13	0.090	7.417	0.265	0.252	0.089	0.343
Lonomia casanarensis	2	0.014	0.833	0.704	0	0.061	0.354
Lonomia circumstans	1	0.007	0.333	1	0	0.062	0.207
Lonomia cluacina	1	0.007	0.333	1	0	0.062	0.207
Lonomia columbiana	8	0.055	3.917	0.344	0.051	0.073	0.321
Lonomia concordia	20	0.139	13.583	0.208	0	0.068	0.491
Lonomia cynira	9	0.062	8	0.324	0	0.059	0.867
Lonomia descimoni	2	0.014	1.25	0.704	0	0.066	0.5
Lonomia electra	20	0.139	11.917	0.208	0.467	0.096	0.356
Lonomia falcata	2	0.014	1.5	0.704	0	0.009	0.75
Lonomia falcata submaculata	2	0.014	1.5	0.704	0	0.009	0.75
Lonomia moniqueae	1	0.007	0.5	1	0	0.055	0.5
Lonomia obliqua	41	0.285	33.583	0.132	0.145	0.084	0.626
Lonomia orientocordillera	3	0.021	3	0.573	0	0	1
Lonomia rufescens	4	0.028	2.083	0.495	0.051	0.073	0.360
Lonomia santarosensis	11	0.076	8.833	0.291	0	0.053	0.741

Among the functional traits measured for host plants exploited by *Lonomia* species, "Leaf dry matter content" and "Leaf thickness" showed significant differences among *Lonomia* species (Appendix 5, Figure 10).

Figure 10. Functional traits of host plant species for *Lonomia* species.



Box plot evaluating: Leaf dry matter content, Fresh leaf mass, Leaf area, and Leaf thickness of plant species used as a food resource by each *Lonomia* species. Horizontal bars within the boxes indicate the mean. N.S: No significant relationship between functional traits and *Lonomia* species.

Regarding the functional dispersion measured for the caterpillars-plant interaction group in relation to network metrics, only "Normalised degree" and "Betweenness," associated with species central position within the network and their tendency to share resources, were not significant (Table 3, Appendix 6).

Table 3. Model parameters and p values estimated for the effect of functional dispersion (FDis) on different ecological network metrics.

Degree				Normalised degree			
Predictor	Estimate	Std. Error	p-value	Predictor	Estimate	Std. Error	p-value
Intercept	1.790	0.581	**0.015** *	Intercept	1.249	0.587	0.067
FDis	4.237	3.623	0.276	FDis	5.462	3.664	0.174
DF:8 Adjusted R^2: 0.039				DF:8 Adjusted R^2: 0.119			
Species strength				**Species specificity**			
Predictor	Estimate	Std. Error	p-value	Predictor	Estimate	Std. Error	p-value
Intercept	-3.178	0.581	**0.001** ***	Intercept	-0.910	0.320	**0.022** *
FDis	4.237	3.623	0.276	FDis	-2.520	1.996	0.240
DF:8 Adjusted R^2: 0.039				DF:8 Adjusted R^2: 0.062			
Betweenness				**Closeness**			
Predictor	Estimate	Std. Error	p-value	Predictor	Estimate	Std. Error	p-value
Intercept	0.120	0.070	0.116	Intercept	0.0004	0.0001	**0.021** *
FDis	-0.250	0.420	0.566	FDis	-0.0003	0.0009	0.724
DF:8 Adjusted R^2: -0.077				DF:8 Adjusted R^2: -0.106			
d							
Predictor	Estimate	Std. Error	p-value				
Intercept	-0.880	0.180	**0.001** **				
FDis	1.715	1.130	0.170				
DF:8 Adjusted R^2: 0.126							

4 DISCUSSION

4.1 SYSTEMATIC REVIEW

In this study, the information generated from the literature review met the objectives by compiling a database that includes the taxonomic identities of the plants involved in the trophic interactions with species of the genus *Lonomia*. This allowed for the projection of the meta-network structure of these interactions across the Neotropical region.

The greatest contribution of bibliographic records came from Google Scholar, unlike PubMed, ScienceDirect, and Scopus (Figure 2). This result is associated with Google Scholar's extensive bibliographic collection, its flexible publication policies, and accessibility to content in various formats (Martín-Martín *et al.,* 2018). It includes a greater number of journals from different countries and languages (López-Cózar & Repiso, 2013; Martín-Martín *et al.,* 2018), enabling Google Scholar to offer a unique citation base and an algorithm that provides a high probability of finding scientific articles present on other research platforms, as observed in this dissertation.

The elimination of duplicate citations through methodological exclusion and the application of eligibility criteria for bibliographic records favored the retention of records found via Google Scholar (Figure 2), as it provided citations with helpful information in formats such as theses, dissertations, databases, scientific notes, book chapters, and abstracts exclusively available on Google Scholar (Martín-Martín *et al.,* 2018).

Among the bibliographic evidence found, only four records provided common names of plants as food partners for the genus *Lonomia*. These were empirical investigations with research objectives focusing on 1) characterization of accidents, 2) diagnosis of poisoning, 3) treatment and seroneutralization of caterpillar venom (Abella *et al.,* 1999; Roodt *et al.,* 2000; Stanley *et al.,* 2020; Samper, 2013). These bibliographic records regularly used methodologies involving secondary information sources (interviews with residents in study areas and databases from health departments) about clinical cases involving the genus *Lonomia*, which may have influenced the recording of plants by common names.

The bibliographic evidence compiled dates from 1994 to 2023, showing a trend of increasing records towards the most recent year. This growing interest is due to the historical significance of *Lonomia* caterpillars as a public health problem since the 1960s (Roodt *et al.,* 2000). Over the past two decades, there has been an increase in the number of described species, official cases of accidents, and species officially recognized as potentially venomous (Favalesso *et al.,* 2019; Toro-Vargas *et al.,* 2023). Additionally, there have been reports of accidents in new distribution areas of Lonomia (Favalesso et al., 2019). These findings are linked to landscape fragmentation and habitat loss due to anthropogenic conflicts associated with land-use changes (Casafús *et al.,* 2021; Toro-Vargas *et al.,* 2023).

Overall, the number of bibliographic records on *Lonomia* interactions still needs to be increased, mainly in the form of articles. This scarcity is likely associated with this research´s short data collection period, the lack of information for some species (Toro-Vargas *et al.,* 2023), and the uneven effort in studying species considered venomous within the genus (Santos *et al.,* 2015). Among all the records found, Brazil has the most studies on insect-plant interaction data for *Lonomia* (Figure 5). This interest is due to the rise in accident cases since the late 1980s, primarily associated with the species *Lonomia obliqua*, explaining the number of studies on this species' biology. Brazil is also the leading producer and, so far, the only distributor of an antivenom against *Lonomia* venom since 1996 (Favalesso et al., 2019).

In the geographic areas where caterpillar-plant interactions were recorded, it was evident that *Lonomia* species select native food partners (Figure 7) (JBRJ, 2024; WFO, 2024). These results are reaffirmed by evidence from Casafús *et al.* (2021), indicating that native hosts are more common for *Lonomia* species than exotic hosts and that the exotic species found originate from cultivated trees. In our results, a low percentage of these interactions were established with exotic plants, and a high percentage of this group corresponds to plants of agricultural or ornamental interest, explained by the importance of these species to human populations (Casafús *et al.,* 2021). These relationships are supported by the loss of primary forests within the natural habitat of *Lonomia* species and the establishment of monocultures (Favalesso *et al.,* 2019), which include mainly exotic plant species as found in this study. Deforestation, favorable climatic conditions, and reduced predators in a given area allow *Lonomia* species to distribute and adapt to new geographic areas (Abella *et al.,* 1999; Lorini, 2005), which includes the exploration and inclusion of new food resources in their diet (Casafús *et al.,* 2019).

The introduction of recorded exotic species affects native communities, modifying food web structures, trophic network topology, and local biodiversity. The integration of exotic species into a food web can lead to the extinction of native species, alter trophic interactions, and change the ecological dynamics of ecosystems (David *et al.,* 2017). This hypothesis needs further exploration for *Lonomia* insect-plant interactions to understand the real effects of these species.

Among the exotic species adapted to the food web of *Lonomia* species reported in this study are: *Mangifera indica* (Mangueira), *Diospyros kaki* (Caquizeiro), *Ficus carica* (Figueira), *Ficus elástica* (Figueira-elástica), *Morus nigra* (Amoreira-negra), *Eucalyptus* spp*.* (Eucalipto), *Malus pumila* (Macieira), *Mespilus germânica* (Nespereira-europeia), *Prunus domestica* (Ameixeira), *Prunus pérsica* (Pessegueiro), *Rubus ulmifolius* (Amora-silvestre), *Coffea arábica* (Cafeeiro), *Citrus limon* (Limoeiro), *Citrus sinensis* (Laranjeira), *Nephelium lappaceum* (Rambotã), among others (Appendix **4**). These species are references for land-use conflicts due to anthropogenic actions (Favalesso *et al.,* 2019), making some of the species above common in the trophic interactions of *Lonomia* species during the 20th century

(Santos *et al.,* 2015a; Favalesso *et al.,* 2019).

The *Lonomia* species in this study are recognized in the latest taxonomic revision proposed by González and colleagues (2023). Although these researchers consider the possibility of new individuals being identified as new *Lonomia* species, this review does not include the species *Lonomia cynira* (Cramer, 1777), *Lonomia circumstans* (Walker, 1855), *Lonomia falcata* (Walker, 1855), and the subspecies *Lonomia falcata submaculata* (Walker, 1855). The similarity of *Lonomia* caterpillars to other Lepidoptera has generated a great demand for clarification on the morphology and biology of these species (Lorini, 2005).

The genus *Lonomia* has undergone several alterations, with different systematic studies described. The species *Lonomia cynira*, described by Cramer in 1777, led to numerous errors in the literature, cataloged by Draud (1933), Bouvier (1942) and Schröder (1955) as synonyms of *Lonomia electra*, *Lonomia falcata* and *Lonomia concordia*. However, the collected individuals that described *L. cynira* by Cramer were not found in collections and were considered "lost" specimens. This taxon was reclassified as a holotype of the genus *Periga* (Lemaire, 1972; D'Abrera, 1995).

The genus *Periga*, initially recognized as a subgenus of *Lonomia*, due to new descriptions related to its morphology and genetics, was reclassified as an independent genus from *Lonomia* in 1995 by D'Abrera. Consequently, the species *Periga circumstans*, *Periga falcata,* and *Periga falcata submaculata* were reclassified. The records of these species reclassified as *Periga* were valid for this study, recognized as *Lonomia* due to possible taxonomic classification errors and the lack of literature hindering knowledge advancement on these species, as Lorini (2005) indicated.

Research efforts on the trophic interactions of the genus *Lonomia* are largely directed toward species with significant medical importance for humans, particularly *Lonomia obliqua*, *Lonomia Concordia,* and *Lonomia electra* (Carvajal, 2018; González *et al.,* 2023; Mejia *et al.,* 2020). Our results demonstrate that these species had the most reported interactions, differing from the interactions of the *Lonomia* spp. module (Figure 9). Our findings corroborate a bias toward information on medically relevant species.

Studies on species considered venomous focus primarily on understanding the biochemical and physiological aspects used in caterpillar defense, as these species have historically caused the most accidents, known as "Lonomism" (Santos *et al.,* 2015), constituting a public health problem in South American countries (Carvajal, 2018; Casafús *et al.,* 2021; Ballesteros-Mejia *et al.,* 2020; Toro-Vargas *et al.,* 2023). Lonomism refers to specific accident cases caused by *Lonomia* caterpillars resulting from contact with the urticating structures covering the caterpillar’s body. These structures contain a mixture of toxic compounds that affect various components of the human hemostatic system (Carvajal, 2018; Casafús *et al.,* 2019; 2021).

Expanding information on other species within the genus is crucial to understanding aspects related to the biology, ecology, and evolution of these species (Toro-Vargas *et al.,* 2023). This is the first study to compile information on *Lonomia* interactions at the genus level. Researchers like Ballesteros-Mejía and colleagues (2020) have compiled trophic interactions for the genus *Lonomia*, focusing on the Saturniidae family taxonomic category.

4.2 META-NETWORK ANALYSIS

The results based on our meta-network of interactions reinforce the theory that *Lonomia* species are broadly considered generalist herbivores (Figure 9), a characteristic common to caterpillars in the family Saturniidae, and are specialized in the consumption of tree leaves (Santos *et al.,* 2015; Carvajal, 2018; Ballesteros-Mejia *et al.,* 2020). Saturniid caterpillars specialize in consuming slow-growing plants with high levels of large polymeric molecules (high tannin and resin content) (Ballesteros-Mejia *et al.,* 2020). However, contrasting findings by Carvajal (2018) and Casafus *et al.* (2021) indicate that *Lonomia* caterpillars can consume leaves from fast-growing and pioneer tree species like *Schefflera* and *Pyrus communis* (Figure 9). González *et al.* (2023) and Santos *et al.* (2015) support the theory that lonomia's diet is based on leaves from tree-growing plants. They add that being caterpillars with gregarious behavior and cryptic coloration, they use the color of their host trunks for camouflage, remaining inactive during the day and feeding at night (González *et al.,* 2023). These theories corroborate the findings of this study, indicating that *Lonomia* species prefer feeding on trees (Figure 9). However, our results included both slow-growing and fast-growing tree species in the diet of *Lonomia* species (JBRJ, 2024; WFO, 2024).

The families of host plants reported in this work have been recognized in the diets of Lepidoptera families (Biezanko, Ruffinelli, & Link, 1974; Ricardo-Molina *et al.,* 2019). Similarly, Specht, Corseuil, and Formentini (2005a) made this connection with the subfamily Hemileucinae (Saturniidae), including the most used families in this study, such as Anacardiaceae, Euphorbiaceae, Fabaceae, Malvaceae and Rosaceae (Specht, Corseuil, & Formentini, 2005b).

Researchers like Ballesteros-Mejia *et al.* (2020) indicate that in the Neotropics, feeding preferences are associated with plant families having tough leaves as well as younger leaves. The presence of large polymeric molecules consequently interferes with caterpillar digestion, reducing nutrient absorption per bite and increasing larval development time, leading to a longer lifespan compared to their adult state.

Lonomia species' adaptation in tropical zones shows two generations per year (Casafus *et al.,* 2021; Toro-Vargas *et al.,* 2023). Reports of *Lonomia* spp. occurrences/accidents are recorded during months with higher temperatures and precipitation (Casafus *et al.,* 2021), which are crucial for the availability of food resources. Some studies suggest that latex-producing plants suffer less from herbivory than other plant species, as latex can function as a defense mechanism against herbivorous insects. It was found that *Lonomia* caterpillars can feed on latex-producing trees such as *Hevea brasiliensis* (Casafus *et al.,* 2021; Santos *et al.,* 2015) and *Sebastiania brasiliensis* (species with the highest number of herbivore partners). Latex-producing plants suffer less herbivory than other plant species because latex can act as a defense mechanism against herbivorous insects (Casafus *et al.,* 2021). However, *Lonomia* species can overcome these plants' defensive barriers. A specific case is *L. obliqua*, which contains protease inhibitors like cysteine and serine proteases, proteins with inhibitory effects on the toxic components of latex (Casafus *et al.,* 2021).

Among *Lonomia* species, *L. obliqua*, *L. concordia* and *L. electra* had the highest number of food partners. These species integrated most plant species with different functional traits, and their central position within the meta-network allowed them to connect with other network modules. These species are fundamental for maintaining the dynamics and stability of the meta-network in the Neotropical region, as well as for preserving the functional diversity of species within ecological networks and ecosystems (Machado-De-Souza, 2018).

L. obliqua, along with other *Lonomia* species, can colonize modified ecosystems due to urbanization activities and climate change. These events have promoted the colonization of a wide range of food resources, including exotic plants (Carvajal, 2018; Casafus *et al.,* 2021). Researchers like Casafus *et al.* (2021) reported that the most common host trees for the caterpillar of *L. aquelous* and *L. obliqua* are *Schefflera morototoni* and *Platanus acerifolia*, respectively (Carvajal, 2018), species also reported in this work (Appendix 3).

The constructed meta-network is unweighted and bipartite, indicating the relationships between species from two different trophic levels: primary consumers (such as *Lonomia* species) and producers (food plants) (Blüthgen *et al.,* 2008; Dáttilo & Rico-Gray, 2018). This meta-network indicated a modular structure (Figures 8 and 9). Antagonistic relationships tend to follow a coevolutionary arms race strategy, producing module formation within the network (Corso *et al.,* 2017), which may explain the topology of the metanetworks in this study. These networks often represent a strong imbalance in their species composition, where the number of plants usually exceeds the number of animals (Corso *et al.,* 2017). The notable difference in the taxonomic heterogeneity of food resources can be explained by the diversity of species in their evolutionary history (Rohr & Bascompte, 2014).

Lonomia caterpillars interacted preferentially with well-defined groups of species, where the number of interactions was maximized within the module and minimized outside of it. The meta-network was led by the interaction of 17 modules representing *Lonomia* species. Consequently, species with a low number of links are considered specialists, while species with a high number of links are considered generalists (Dáttilo & Rico-Gray, 2018). However, due to data scarcity and low sampling effort, it is not possible to definitively state that some species like *L. casanerensis*, *L. orientacordillera,* and *L. rufecens* are generalist herbivores (Santos *et al.,* 2015; Carvajal, 2018; Ballesteros-Mejia *et al.,* 2020). Network structure metrics can be affected by variations in sampling effort for each *Lonomia* species (Blüthgen *et al.,* 2008).

The functional traits evaluated, associated with leaf palatability among plant groups and for each *Lonomia* species, do not show a common trait pattern correlated with functional diversity, except for leaf thickness and leaf dry matter content, which were the most associated traits for all plants in the study. Our results suggest that the moths, as the adult state of *Lonomia*, may select traits associated with “leaf thickness” and “leaf dry matter content”, which are the traits with significant differences among the evaluated ones.

In most cases where the compiled traits were not significant, the hypothesis is rejected. This result could be influenced by the limited information on collected functional traits and the number of plant species used for each *Lonomia* species. It is recommended to integrate more traits to reassess this hypothesis. This could also influence the relationship between network metrics and functional dispersion. Although this relationship was not significant, it is advisable to reassess the hypothesis with a greater number of functional traits and plant species.

The food plants in this study show considerable variation in growth forms, ranging from herbaceous to woody, distributed across different ecosystems in the Neotropical region, involving differences in topography, water resources, and climate within their ecological niches. This allows for developing growth, survival, and reproductive strategies based on the accessibility and abundance of resources for species, making them highly diverse (Diaz *et al.,* 2016).

5 FINAL CONSIDERATIONS

The results generated by this project provide a condensed knowledge base on the biology and ecology of *Lonomia* species in their immature stages, derived from their trophic interactions with host plants. This study organizes knowledge about these moths, for which information is particularly scarce in highly biodiverse areas such as the Neotropical region. Thus, this study represents the first comprehensive review of the trophic relationships of the genus *Lonomia*, reinforcing the idea that these species are considered generalist herbivores that consume a variety of native tree species in the Neotropical region.

The information on the diversity of food partners reported in this study can be used to formulate diets for managing *Lonomia* species in laboratory conditions and to initiate conservation programs based on the antagonistic ecological interactions between *Lonomia* and their host plants. This is important for understanding macroecological processes associated with the evolutionary history, diversification, and distribution of plant communities and their herbivores in tropical ecosystems. Although *Lonomia* species in their immature stages are biomass controllers, their adult stages are important pollinators, which may offset the damage caused at the species level. Therefore, it is recommended that multilayer ecological interaction studies on herbivory and pollination be conducted to evaluate if the species involved have corresponding ecological functions.

The presence of exotic species documented in the meta-network highlights how human activities affect food dynamics, network structure, and community assembly in *Lonomia* ecosystems. Introduced species have created new trophic links with resident species, potentially affecting their demography and abundance in the future. Studies evaluating the impact of introduced species on the *Lonomia* food web are recommended, as the interaction between exotic and native species adds new nodes and links to the food web and can alter its structure and functioning, displacing or extinguishing native species. Additionally, they can affect the response of interactions to future disturbances and the quality of ecosystem processes.

Our results show the contrasting information limitations for some *Lonomia* species, which influence the network structure assembly among interaction types and interacting species sets, as well as considering the entirety of generalist species within the genus. These results reflect the historical significance of *Lonomia* caterpillars as agents causing public health incidents, which has driven the interest in studying their biology and ecology.

Our results indicated a limitation in the number of available data on functional traits for the plant species predated by *Lonomia* caterpillars, which may have influenced the lack of a significant relationship between network metrics and functional dispersion. It is recommended to obtain and analyze as many functional traits as possible associated with the interacting species to determine which plant traits influence *Lonomia* trophic interaction choices.

REFERENCES

ABELLA, H. TORRES, J. MARQUES, M. DUARTE, A & BARROS, E. Manual de diagnóstico e tratamento de acidentes por Lonomia. Manuais Técnicos-I CIT (Centro de Informação Toxicológica do Rio Grade do Sul). p. 1-20, 1999. https://www.saude.go.gov.br/files/vigilancia/toxicologica/MANUAL-DIAGNOSTICO-E-TRATAMENTO-POR-LONOMIA.pdf

AGUADO, D. GUTIÉRREZ-CHACÓN, C & MUÑOZ, M.C. Estructura funcional y patrones de especialización en las relaciones planta-polinizador de un agroecosistema en el Valle del cauca, Colombia**. Acta bibliológica colombiana**. v. 24, n. 2, p. 331-342, 2019. DOI: http://dx.doi.org/10.15446/abc.v24n2.73177

AIZEN, M.A. GLEISER, G. SABATINO, M. GILARRANZ, L.J. BASCOMPTE, J AND VERDÚ, M. The phylogenetic structure of plant–pollinator networks increases with habitat size and isolation. **Ecology Letters**. v. 19, p. 29–36, 2016. Doi: 10.1111/ele.12539

ANDREAZZI, C. Coevolução em redes de interação antagonistas: estrutura e dinâmica. Tese apresentada para obtenção de título de doutor em Ciências na área de Ecologia. Programa de Pós-Graduação em Ecologia. Instituto de Biociências. Universidade de São Paulo. p. 1-24, 2016.

ALBERTI, A., MENDES, E., BOLLIS, E., KONFLANZ, A. L., BORDIN, S. M. S & LUTINSKI, J. A. Acidentes e plantas hospedeiras associadas a lagartas urticantes. **Ciência Plural**. v. 8, n. 2, p. 1-17, 2022.

ALBERTONI, F. MIELKE, C and DUARTE, M. Saturniid moths (Lepidoptera: Bombycoidea) from an atlantic rain forest fragment in southeastern brazil. **Anais da Academia Brasileira de Ciencias.** v. 90, n. 3, p. 2827-2844, 2018.

ANTMAN, E.M. LAU, J. KUPELNICK, B. MOSTELLER, F. CHALMERS, T.C. A comparison of results of metaanalyses of randomized control trials and recommendations of clinical experts: Treatments for myocardial infarction. **JAMA**. v. 268, p. 240-248, 1992.

BALLESTEROS-MEJIA, L. B., ARNAL, P., HALLWACHS, W., HAXAIRE, J., JANZEN, D., KiITCHING, I. J & ROUGERIE, R. A global food plant dataset for wild silkmoths and hawkmoths and its use in documenting polyphagy of their caterpillars (Lepidoptera: Bombycoidea: Saturniidae, Sphingidae). **Biodiversity Data Journal**. v. 8, e60027. p. 1-12, 2020. https://doi.org/10.3897/BDJ.8.e60027

BELTRÁN, Ó. Revisiones sistemáticas de la literatura. **Revista Colombiana de Gastroenterología**. Asociación Colombiana de Gastroenterologia. Colombia. v. 20, n. 1. p. 60-69, 2005.

BERNARDI, O., GARCIA, M. S., ELY, E. J., ZAZYCKI, L. C. F., BERNARDI, D & FINKENAUER, E. Levantamento populacional e análise faunística de Lepidoptera em *Eucalyptus* spp. no município de Pinheiro Machado, Rs. **Ciência Florestal**, Santa Maria, v. 21, n. 4, p. 735-744, 2011.

BIEZANKO, C. M. RUFFINELLI, A AND LINK, D. Plantas y otras substancias alimentícias de las orugas de los lepidópteros uruguayos. **Rev. Centro Ciências Rurais.** v.4, n.2, p. 107-148, 1974.

BLÜTHGEN, N. FRÜND, J. VÁZQUEZ, D.P & MENZEL, F. What do interaction network metrics tell us about specialization and biological traits?. **Ecology**. v. 89, n. 12, p. 3387–3399, 2008.

BLÜTHGEN, N. MENZEL, F & BLÜTHGEN, N. Measuring specialization in species interaction networks. Methodology article: **BMC Ecology.** v. 6, n. 9, p. 1-12, 2006. http://www.biomedcentral.com/1472-6785/6/9

CARDOSO, A & JUNIOR, V. Acidentes por Lepidópteros (larvas e adultos de mariposas): estudo dos aspectos epidemiológicos, clínicos e terapêuticos. **Anais Brasileiros de Dermatologia.** v. 80, n. 6, p. 571-578, 2005. https://doi.org/10.1590/S0365-05962005000700002

CARVAJAL, L. M. Modelación de la probabilidad de ocurrencia de accidentes atribuidos a orugas del género Lonomia y descripción su hábitat en el departamento de Casanare, Colombia. Monografía para optar por el título de Ecóloga. Pontificia Universidad Javeriana. p. 23, 2018.

CASAFÚS, G. M., FAVALESSO, M. M., GRITTI, M. A., CORONEL, J. M., GUIMARãES, A. T. B & PEICHOTO, M. E. A hidden deadly venomous insect: Firsteco-epidemiological assessment and risk mapping of lonomism in Argentina. **PLos Neglected Tropical Diseases**. v. 15, n. 7, e0009542. p. 1-21, 2021. https://doi.org/10.1371/journal.pntd.0009542

CASAFÚS, M. FAVALESSO, M. GUIMARÃES, A & PEICHOTO, M. Potential distribution and ecological conditions of *Lonomia obliqua* Walker 1855 (Saturniidae: Hemileucinae) in Brazil. **BSEA Boletín de la sociedad entomológica Argentina**. v. 30, n. 1, p. 07-24, 2019. https://ri.conicet.gov.ar/handle/11336/107348

CHUDZINSKI-TAVASSI, A AND ALVAREZ-FLORES, M. Chapter 6: South American *Lonomia obliqua* caterpillars: morphological aspects and venom biochemistry. Lepidoptera. Nova York: Nova Science Publishers. p. 170-179, 2013. https://www.researchgate.net/publication/236733484_Chapter_South_American_Lonomia_obliqua_caterpillars_morphological_aspects_and_venom_biochemistry

CORSO, G. CRUZ, C.P.T AND DE ALMEIDA, A.M. Animal and Plant Species in Antagonistic and Mutualistic Networks, a Multispecies Mean Field Model. **Open Journal of Ecology.** v. 7, 211-221, 2017. https://doi.org/10.4236/oje.2017.73016

D`ABRERA, B. Saturniidae mundi. Saturniid moths of the world. Part I. Automeris Press. Keltern Germany (Goecke & Evers) p. 177, 1995.

DÁTTILO, W & RICO-GRAY, V (Eds.). Ecological Networks in the Tropics: An Integrative Overview of Species Interactions from Some of the Most Species-Rich Habitats on Earth. Springer International Publishing AG, p. 207, 2018. D. Matthias Dehling. Chapter 3; The Structure of Ecological Networks, p. 29-42. https://doi.org/10.1007/978-3-319-68228-0

DAVID, P. THÉBAULT, E. ANNEVILLE, O. DUYCK, P.-F. CHAPUIS, E AND LOEUILLE, N. Impacts of Invasive Species on Food Webs: A Review of Empirical Data. **Advances in Ecological Research**. v. 56, p. 1-60, 2017. DOI:10.1016/bs.aecr.2016.10.001

DELMAS, E. BESSON, M. BRICE, M-H. BURKLE, L. RIVA, G. FORTIN, M-J. GRAVEL, D. GUIMARAES, P. HEMBRY, D. NEWMAN, E. OLESEN, J. PIRES, M. YEAKEL, J AND POISOT, T. Analysing ecological networks of species interactions. **Biological Reviews**. v, 94, p. 16–36, 2019. Doi: 10.1111/brv.12433

DIAZ, S. KATTGE, J. CORNELISSEN, J.H.C. WRIGHT, I.J. LAVOREL. S. GORNÉ LD. The global spectrum of plant form and function. **Nature. v. 529,** 2016. Doi:10.1038/nature16489.

DÍAZ, J. Evolution of the venomous caterpillars of the genus Lonomia and analysis of their toxicity using last generation molecular techniques. Monografia para optar al titulo de magister en Ciencias Biológicas. Universidad de los Andes, Bogotá- Colombia. p. 37, 2021.

DORMANN, C. GRUBER, B AND FRUEND, J. “Introducing the bipartite Package: Analysing Ecological Networks.” **R News**. v. 8, n. 2, p. 8-11, 2008.

DORMANN, C. FRUEND, J. BLUETHGEN, N AND GRUBER, B. “Indices, graphs and null models: analyzing bipartite ecological networks.” **The Open Ecology Journal**. v. 2, p. 7-24, 2009.

ENQUIST, B. J. CONDIT, R. PEET, R.K. SCHILDHAUER, M. THIERS, B.M. (2016). Cyberinfrastructure for an integrated botanical information network to investigate the ecological impacts of global climate change on plant biodiversity. PEERJ KATTGE, J., G. BÖNISCH, S. DÍAZ, S. LAVOREL, I. C. PRENTICE, P. LEADLEY. TRY plant trait database – enhanced coverage and open access. **Global Change Biology.** v. 26, p. 119– 188, 2020. https://doi.org/10.1111/gcb.14904

FAVALESSO, M. LORINI, L. PEICHOTOA, M E GUIMARÃES, A. Potential distribution and ecological conditions of *Lonomia obliqua* Walker 1855 (Saturniidae: Hemileucinae) in Brazil. **Acta Tropica.** v. 192, p. 158-164, 2019. https://doi.org/10.1016/j.actatropica.2019.01.016.

FAVALESSO, M.M. VALENTIM, M. GUIMARÃES, AND PEICHOTO, M.E. Epidemiological characterization of lonomism in South America. **Acta Tropica**. v. 238, 2023. Doi: 10.1016/j.actatropica.2022.106777.

FLORA E FUNGA DO BRASIL. Jardim Botânico do Rio de Janeiro - JBRJ. Disponível em: http://floradobrasil.jbrj.gov.br/. 2024.

GADEN, S, ROBINSON. PHILLIP, R, ACKERY. IAN, KITCHING. GEORGE, W, BECCALONI AND LUIS, M, HERNÁNDEZ. HOSTS - a Database of the World's Lepidopteran Hostplants [Data set]. Natural History Museum. 2023. https://doi.org/10.5519/havt50xw

GARCIA, C E DANNI-OLIVEIRA, I. Ocorrência de acidentes provocados por *Lonomia obliqua* Walker, no Estado do Paraná, no período de 1989 a 2001. **Revista da**

Sociedade Brasileira de Medicina Tropical. v, 40, n. 2, p. 242-246, 2007.

GONZÁLEZ, C., BALLESTEROS-MEJIA, L., DÍAZ-DÍAZ, J., TORO- VARGAS, D. M., AMARILLO-SUAREZ, A. R., GEY, D., LEÓN, C., TOVAR, E., ARIAS, M., RIVERA, N., BUITRAGO, L. S., PINTO-MORAES, R. H., MARTINS, I. S. S., DECAENS, T., GONZÁLEZ, M. A., KITCHING, I. J & ROUGERIE, R. Deadly and venomous Lonomia caterpillars are more than the two usual suspects. **PLos Neglected Tropical Diseases**. v. 17, n. 2, e0011063. p. 1-20, 2023. https://doi.org/10.1371/journal.pntd.0011063

HOOPER, D. CHAPIN, F. EWEL, J. HECTOR, A. INCHAUSTI, P. LAVOREL, S. LAWTON, J. LODGE, D. LOREAU, M. NAEEM, S. SCHMID, B. SETÄLÄ, H. SYMSTAD, A. VANDERMEER, J AND WARDLE, D. Effects of biodiversity on ecosystem functioning: a consensus of current knowledge. **Ecological Monographs**. v. 75, n. 1, p. 3–35, 2005.

KAWAHARA, A.Y. PLOTKIN, D. ESPELAND, M. MEUSEMANN, K. TOUSSAINT, E.F.A. DONATH, A. GIMNICH, F. FRANDSEN, P.B. ZWICK, A. DOS REIS, M. BARBER, J.R. PETERS, R.S. LIU, S. ZHOU, X. MAYER, C. PODSIADLOWSKI, L. STORER, C. YACK, J.E. MISOF, B & BREINHOLT, J.W. Phylogenomics reveals the evolutionary timing and pattern of butterflies and moths. **PNAS-Proceedings of the National Academy of Sciences** USA. v. 116, n. 45, p. 22657- 22663, 2019. Doi.org/10.1073/pnas.1907847116

LALIBERTÉ, E., & LEGENDRE, P. A distance-based framework for measuring functional diversity from multiple traits. **Ecology**, v. 91, n. 1, p. 299-305, 2010.

LALIBERTÉ E, LEGENDRE P, SHIPLEY B. FD measuring functional diversity from multiple traits, and other tools for functional ecology. R package version. p. 10-13, 2014.

LEIBOLD, M. HOLYOAK, M. MOUQUET, N. AMARASEKARE, P. CHASE, J. HOOPES, M. HOLT, R. SHURIN, B. LAW, R. TILMAN, D. LOREAU, M AND GONZALEZ. A. The metacommunity concept: a framework for multi-scale community ecology. **Ecology Letters**. v, 7, p. 601–613, 2004. Doi: 10.1111/j.1461-0248.2004.00608.x

LEMAIRE, C. Révision du genere Lonomia Walker (Lep. Attacidae) Par (1). **Ann. Soc. Ent. Fr.** (N. S.). v. 8, n. 4, p. 767 – 861, 1972.

LÓPEZ-CÓZAR, E & REPISO, R. The Impact of Scientific Journals of Communication: Comparing Google Scholar Metrics, Web of Science and Scopus. Comunicar; **Scientific Journal of Educommunication**. v. XXI n. 41, p. 45-52, 2013. ISSN: 1134-3478. DOI: http://dx.doi.org/10.3916/C41-2013-04

LOREAU, M. Does functional redundancy exist?. **Oikos**. v. 104, n. 3, p. 606- 611, 2004.

LOREAU, M. NAEEM, S. INCHAUSTI, P. BENGTSSON, J. GRIME, J. HECTOR, A. HOOPER, D. HUSTON, M. RAFFAELLI, D. SCHMID, B. TILMAN D AND WARDLE, D. Biodiversity and Ecosystem Functioning: Current Knowledge and Future Challenges. **Science**. v. 294, v. 5543, p. 804-808, 2001. DOI:

10.1126/science.1064088

LORINI, L. M & CORSEUIL, É. Morphological Aspects of *Lonomia obliqua* Walker (Lepidoptera: Saturniidae). **Neotropical Entomology**. v. 30, n. 3, p. 373-379, 2001. https://doi.org/10.1590/S1519-566X2001000300006

LORINI, L, M. REBELATO, G, S & BONATTI, J. Reproductive parameters of *Lonomia obliqua* Walker, 1855 (Lepidoptera: Saturniidae) in laboratory. **Brazilian Archives of Biology and Technology.** v. 47, n. 4, p. 575-577, 2004.

LORINI, L, M. ZARBIN, P, H, G & TEDESCO, C. D. Biology of laboratory- reared *Lonomia obliqua* (Lepidoptera: Saturniidae). **Florida Entomologist**. v. 90, n. 4, p. 770-771, 2007.

LORINI, L. Criação, comportamento sexual e inimigos naturais de *Lonomia obliqua* Walker, 1855 (Lepidoptera: Saturniidae). DSpace: Biblioteca Digital: Teses & Dissertações. p. 1-177, 2005. http://hdl.handle.net/1884/38113

MACHADO-DE-SOUZA, T. Determinantes das interações e a diversidade funcional de parceiros de espécies centrais em uma rede de dispersão de sementes por aves da mata atlântica. Tese apresentada ao curso de Pós-Graduação em Ecologia e Conservação, como requisito parcial à obtenção do título de Doutor em Ecologia e Conservação. Universidade Federal do Paraná. p. 115, 2018.

MALKOWSKI, S. R. SCHWARTZ-FILHO, D. L. & ZAMONER, M. Monitoramento de mariposas dos géneros *Lonomia* y *Periga*. Comfauna-Conservación y manejo de fauna silvestre LTDA, Curitiba. p. 66 – 67, 2018.

MALUCELLI, T.S. 2018. Interação entre plantas e beija-flores em diferentes escalas espaciais. Tese apresentada como requisito parcial à obtenção do título de Doutor em Ecologia e Conservação, em Ecologia e Conservação, Universidade Federal do Paraná, Brasil. p. 154, 2018.

MARQUEZ, C. Caracterización de las interacciones planta- herbívoro en un bosque esclerófilo de Chile central: el caso de los lepidópteros constructores de refugios foliares en el PNRC. Monografía como requisito para optar al Título de Bióloga Ambiental Universidad De Chile. p. 1-106, 2021.

MARTÍN-MARTÍN, A. ORDUNA-MALEA, E. THELWALL, M. & LÓPEZ -CÓZAR, E. Google Scholar, Web of Science, and Scopus: a systematic comparison of citations in 252 subject categories. **Journal of Informetrics**. v 12, n. 4, p.1160- 1177, 2018. https://doi.org/10.1016/j.joi.2018.09.002

MARTINS, L. MEDINA, A. LEWINSOHN, T AND ALMEIDA-NETO, M. The effect of species composition dissimilarity on plant–herbivore network structure is not consistent over time. **Biotropica**. v. 52, p. 664–674, 2020. DOI: 10.1111/btp.12791

MELLO, M. MUYLAERT, R. PINHEIRO, R and FERREIRA, G. Guia para análise de redes ecológicas. Edição dos autores, 1ª EDIÇÃO. Belo Horizonte. p. 112, 2016. ISBN-13: 978-85-921757-0-2.

MEDEL, R. AIZEN, M.A & ZAMORA, R. 2009. Ecología y evolución de interacciones planta-animal. Primera edición. Editorial Universitaria, S.A. Santiago de Chile. p. 399, 2009. ISBN: 978-956-11-2092-1

MILANEZ, J E CHIARADIA, L. Sistema de criação e estudo da biologia da lagarta hemorrágica *Lonomia obliqua* (Lepidoptera: Saturniidae). **Agropecuária Catarinense**. v. 17, n. 3, p. 72-74, 2004. https://publicacoes.epagri.sc.gov.br/rac/article/view/1016

MORAES, R. H. P. Identificação dos inimigos naturais de *Lonomia obliqua* Walker, 1855 (Lepidoptera, Saturniidae) e possíveis fatores determinantes do aumento da sua população. Dissertação (Mestrado em Ciências, área de concentração: Entomologia) – Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba. p. 67, 2002.

MOSCOSO, D. Destudio de la composición proteica del veneno de orugas de la especie Lonomia descimoni. Disertación presentada para optar por el título de Master en química. Universidad de los Andes. p. 159, 2020.

NEFF, F. BRANDLE, M. AMBARLI, D. AMMER, C. BAUHUS, J. BOCH, S. HOLZEL, N. KLAUS, V.H. KLEINEBECKER, T. PRATI, D. SCHALL, P. SCHÄFER, D. SCHULZE, E.-D. SELBOLD, S. SIMONS, N.K. WEISSER, W.W. PELLISSIER, L & GOSSNER, M.M. Changes in plant-herbivore network structure and robustness along land-use intensity gradients in grasslands and forests. **Science Advances**. v. 7, n. 20, p. 1-13, 2021. DOI: 10.1126/sciadv.abf3985

OLIVEIRA, R. Interações entre aves nectarívoras e cerejeiras (Prunus subg. Cerasus L.) em ambiente urbano. Monografia apresentada como requisito parcial à obtenção do título de bacharel em Ciências Biológicas, Universidade Federal do Paraná. p. 36, 2018.

OXMAN, A.D. GUYATT, G.H. The science of reviewing research. **Annals of the New York Academy of Sciences**. v. 703, p. 25-133, 1993.

PAGE MJ, MCKENZIE JE, BOSSUYT PM, BOUTRON I, HOFFMANN TC, MULROW CD, *et al.*, The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. v. 372, n. 71, 2021. doi: 10.1136/bmj.n71.

PILOSO, S. PORTER, M. PASCUAL, M AND KÉFI, S. The multilayer nature of ecological networks. **Nature Ecology & Evolution**. v. 1, n. 0101, p. 1-9. 2017. DOI: 10.1038/s41559-017-0101

QGIS D team. QGIS Geographic Information System. Open Source Geospatial Foundation Project. 2022.

R DEVELOPMENT CORE TEAM. R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna. 2022.

REBELATO, G AND LORINI, L. Duração das fases do ciclo de vida da taturana hemorrágica *Lonomia obliqua* Walker, 1855 (lepidoptera: saturniidae), em laboratório. Livro de resumos. Porto Alegre: UFRGS, 1998. http://hdl.handle.net/10183/100419

RICARDO-MOLINA J, MURILLO-RAMOS, L Y ÁLVAREZ-PÉREZ, P. Larvas y plantas nutricias de Lepidoptera en fragmentos de bosque seco tropical del departamento de

Sucre, Colombia (Insecta: Lepidoptera). **SHILAP Revista de lepidopterología.** v. 47, n. 18, p. 5-24, 2019.

ROHR, R AND BASCOMPTE, J. Components of Phylogenetic Signal in Antagonistic and Mutualistic Networks. The American Naturalist. v. 184, n. 5, p. 556-564, 2014. http://dx.doi.org/10.5061/dryad.5m0m5.

ROODT, A. SALOMON, O AND ORDUNA, T. Accidentes por Lepidopteros con especial referencia a *Lonomia sp*. **Medicina**. v. 60, n. 6, p. 964-972, 2000. https://www.researchgate.net/publication/237745721_ACCIDENTES_POR_LEPIDOPTEROS_CON_ESPECIAL_REFERENCIA_A_LONOMIA_SP

RUIZ, S. Análisis de redes de herbívoros en tres estados sucesionales en un bosque mesófilo de montaña del centro de Veracruz. Tesis como requisito para optar el título de Maestra en Ecología Tropical. Universidad Veracruzana, México. p. 99, 2017.

SAMPER, L. Caracterización y suero-neutralización del veneno de orugas del género Lonomia presentes en Casanare, Colombia. Séneca Repositorio Institucional. Universidad de los Andes Col. p. 1-40, 2013. http://hdl.handle.net/1992/25063

SANTOS, R. S AND GONÇALVES, R. C. Infestation of *Lonomia* sp. (Lepidoptera: Saturniidae) in rubber tree cultivation in the state of Acre. **Agrotrópica**. v. 27, n. 1, p. 83-86, 2015a.

SANTOS, R. S., GONÇALVES, R. C & NOGUEIRA, S. R. Ataque de *Lonomia* sp (Lepidoptera: Saturniidae) em seringueira no município de Bujari, AC. Documentos 135. ISSN 0104-9046. Empresa Brasileira de Pesquisa Agropecuária - Embrapa Acre. p. 26, 2015b.

SPECHT, A. CORSEUIL, E AND FORMENTINI, A. Lepidópteros de importância médica ocorrentes no Rio Grande do Sul. III. Saturniidae, Hemileucinae. **Biociências**. v. 13, n. 2, p. 149-162, 2005a.

SPECHT, A. AZEVEDO, J.L. DE LUNA, A. LIMA, E, A. BOLDO, J, T. MARTINS, M, K. LORINI, L, M AND BARROS, N, M. Ocorrência do fungo entomopatogênico *Isaria javanica* (Frieder. & Bally) Samson & Hywell-Jones (Fungi, Sordariomycetes) em lagartas de *Lonomia obliqua* Walker (Lepidoptera, Saturniidae, Hemileucinae). **Revista Brasileira de Entomologia**. v. 53, n. 3, p. 493-494, 2009.

SPECHT, A. CORSEUIL, E AND FORMENTINI, A. C. Lepidópteros de importância médica ocorrentes nos Rio Grande do Sul. II. Aididae e Limacodidae. **Biociências**. v. 13, n.1, p. 89-94, 2005a. _ Lepidópteros de importância médica ocorrentes nos Rio Grande do Sul. III. Saturniidae – Hemileucinae. **Biociências**. v.13, n.2, p. 149- 162, 2005b.

STANLEY, F. GORENSTEIN, J AND OLIVEIRA, M. Acidentes causados por lagartas do gênero Lonomia, em Minas Gerais, no período de 2001 a 2006. Rev Med Minas Gerais. v. 30, p. 1-8, 2020.

TONELOTTO, M. Bioprospeccao de enzimas de interesse biotecnologico em *Lonomia obliqua*. Biblioteca Digital de Teses e Dissertações da USP. p. 1-46, 2016.

TORO-VARGAS, D. M., GONZÁLEZ, C., ROUGERIE, R & AMARILLO- SUÁREZ, A. R. Characterization of morphological and biological aspects of venomous caterpillars of the genus Lonomia Walker (Lepidoptera: Saturniidae) in Colombia. **PLos Neglected Tropical Diseases**, v. 18, n. 5: e0285010, p. 1-25, 2023. https://doi.org/10.1371/journal.pone.0285010

WFO (2024): World Flora Online. Published on the Internet; http://www.worldfloraonline.org.

WOLFE, K AND BALCÁZAR-LARA, M. An illustrated description of the immature stages of *Lonomia electra* (Druce 1886) (Lepidoptera: Saturniidae, Hemileucinae). **Nachr. Entomol.** v. 15, n. 3, p. 383-392, 1994.

ZAMBONI, C, B. GIOVANNI, D, N, S. SALVADOR, V, L, R. SATO, I, M. MENDONÇA, R, Z. WEN, F, H AND SIMONS, M, S. Multielemental analyses of *Lonomia obliqua* (Lepidoptera, Saturniidae) caterpillar using EDXRF and INAA techniques. **X-Ray Spectrometry**. v. 48, n. 5, p. 465-475, 2019.

Appendix 1. Systematic review.

Bibliographic Reference	Title	Source	Document Type	Written Language	Referenced Plant Name
Abella *et al.,* 1999	Manual de diagnóstico e tratamento de acidentes por *Lonomia*	Google Scholar	Book chapter	Portuguese	Common name
Alberti *et al.,* 2022	Acidentes e plantas hospedeiras associadas a lagartas urticantes	Google Scholar	Article	Portuguese	Scientific name
Ballesteros-Mejia *et al.,* 2020	A global food plant dataset for wild silkmoths and hawkmoths and its use in documenting polyphagy of their caterpillars (Lepidoptera: Bombycoidea: Saturniidae, Sphingidae)	Google Scholar	Article	English	Scientific name
Bernardi *et al.,* 2011	Levantamento populacional e análise faunística de Lepidoptera em *Eucalyptus spp* no município de Pinheiro Machado, RS	Scopus	Article	English	Scientific name
Cardoso, A & Junior, V. 2005	Acidentes por Lepidópteros (larvas e adultos de mariposas): estudo dos aspectos epidemiológicos, clínicos e terapêuticos	Google Scholar	Article	Portuguese	Scientific name/ Common name
Carvajal, C. 2018	Modelación de la probabilidad de ocurrencia de accidentes atribuidos a orugas del género *Lonomia* y descripción su hábitat en el departamento de Casanare, Colombia	Google Scholar	Dissertation	Spanisht	Scientific name
Casafús *et al.,* 2021	A hidden deadly venomous insect: First eco-epidemiological assessment and risk mapping of lonomism in argentina	Scopus	Article	English	Scientific name
Casafús *et al.,* 2019	Recorriendo Misiones para el registro ecoepidemiológico	Google Scholar	Article	Spanisht	Scientific name

	de la oruga venenosa Lonomia spp. (Saturniidae: Hemileucinae)				
Chudzinski-Tavassi and Alvarez-Flores. 2013	Chapter 6: South American Lonomia obliqua caterpillars: morphological aspects and venom biochemistry	Google Scholar	Scientific review	English	Scientific name/ Common name
Favalesso *et al.*, 2019	Potential distribution and ecological conditions of *Lonomia obliqua* Walker 1855 (Saturniidae: Hemileucinae) in Brazil	ScienceDirect	Article	English	Scientific name
Favalesso *et al.*, 2023	Epidemiological characterization of lonomism in South America	ScienceDirect	Article	English	Scientific name
Gaden *et al.*, 2023	HOSTS - The Hostplants and Caterpillar Database at the Natural History Museum, 2021	Google Scholar	Database	English	Scientific name
Garcia e Danni-Oliveira 2007	Ocorrência de acidentes provocados por *Lonomia obliqua* Walker, no Estado do Paraná, no período de 1989 a 2001	Scopus	Article	Portuguese	Scientific name/ Common name
González *et al.*, 2023	Deadly and venomous Lonomia caterpillars are more than the two usual suspects	Google Scholar	Article	English	Scientific name/ Common name
Lorini *et al.*, 2004	Reproductive parameters of *Lonomia obliqua* Walker, 1855 (Lepidoptera: Saturniidae) in laboratory	Scopus	Article	English	Scientific name
Lorini *et al.*, 2007	Biology of laboratory-reared *Lonomia Obliqua* (Lepidoptera: Saturniidae)	Scopus	Article	English	Scientific name
Lorini, L 2005	Criação, comportamento sexual e inimigos naturais de *Lonomia obliqua* Walker, 1855 (Lepidoptera: Saturniidae)	Google Scholar	Tese	Portuguese	Scientific name/ Common name
Milanez e Chiaradia. 2004	Sistema de criação e estudo da biologia da lagarta hemorrágica *Lonomia obliqua* (Lepidoptera: Saturniidae)	Google Scholar	Article	Portuguese	Scientific name/ Common name
Moraes, R 2002	Identificação dos inimigos naturais de *Lonomia obliqua* Walker, 1855 (Lepidoptera, Saturniidae) e possíveis	Google Scholar	Dissertation	Portuguese	Scientific name/ Common name

	fatores determinantes do aumento da sua população.				
Rebelato, G and Lorini, L 1998	Duração das fases do ciclo de vida da taturana hemorrágica *Lonomia obliqua* Walker, 1855 (lepidoptera: saturniidae), em laboratório.	Google Scholar	Resumo publicado em evento	Portuguese	Scientific name/ Common name
Roodt *et al.,* 2000	Accidentes por Lepidopteros con especial referencia a *Lonomia* sp	Google Scholar	Article	Spanisht	Common name
Samper, L. 2013	Caracterización y suero-neutralización del veneno de orugas del género *Lonomia* presentes en Casanare, Colombia	Google Scholar	Monografy	Spanisht	Common name
Santos *et al.,* 2015	Infestation of *Lonomia* sp.(Lepidoptera: Saturniidae) in rubber tree cultivation in the state of Acre.	Google Scholar	Article	Portuguese	Scientific name/ Common name
Santos, R e Gonçalves, R. 2015	Ataque de *Lonomia* sp. (Lepidoptera: Saturniidae) em Seringueira no Município de Bujari, AC	Google Scholar	Article	Portuguese	Scientific name/ Common name
Specht *et al.,* 2005	Ocorrência do fungo entomopatogênico *Isaria javanica* (Frieder. & Bally) Samson & Hywell-Jones (Fungi, Sordariomycetes) em lagartas de *Lonomia obliqua* Walker (Lepidoptera, Saturniidae, Hemileucinae)	Scopus	Note	Portuguese	Scientific name/ Common name
Specht *et al.,* 2009	Lepidópteros de importância médica ocorrentes no Rio Grande do Sul. III. Saturniidae, Hemileucinae	Google Scholar	Article	Portuguese	Scientific name/ Common name
Stanley *et al.,* 2020	Acidentes causados por lagartas do gênero Lonomia, em Minas Gerais, no período de 2001 a 2006	Google Scholar	Article	Portuguese	Common name
Tonelotto. 2016	Bioprospeccao de enzimas de interesse biotecnologico em *Lonomia obliqua*	Google Scholar	Tese	Portuguese	Scientific name/ Common name

Toro-Vargas et al., 2023	Characterization of morphological and biological aspects of venomous caterpillars of the genus Lonomia Walker (Lepidoptera: Saturniidae) in Colombia	Scopus	Article	English	Scientific name
Wolfe, K and Balcázar-Lara, M. 1994	An illustrated description of the immature stages of *Lonomia electra* (Druce 1886) (Lepidoptera: Saturniidae, Hemileucinae)	Google Scholar	Article	English	Scientific name
Zamboni *et al.,* 2019	Multielemental analyses of *Lonomia obliqua* (Lepidoptera, Saturniidae) caterpillar using EDXRF and INAA techniques	Scopus	Article	English	Scientific name/ Common name

Appendix 2. Substituted scientific name for reported plant species.

Species name for record	**Name registered in Flora e Funga do Brasil /WFO 2024**
Astronium gracile Engl	*Astronium graveolens* Jacq.
Ficus prinoides	*Ficus pallida* Vahl
Ficus subtriplinervia	*Ficus pertusa* L.f.
Lonchocarpus campestris	*Muellera campestris* (Mart. ex Benth.) M.J. Silva & A.M.G.
Prunus serotina Ehrh.	*Prunus virginiana* L.
Pseudolmedia mollis Standl.	*Pseudolmedia laevis* (Ruiz & Pav.) J. F. Macbr.
Rollinia emarginata	*Annona emarginata* (Schltdl.) H.Rainer
Rollinia sp.	*Annona* sp
Rondeletia buddleioides	*Arachnothryx buddleioides* (Benth.) Planch.
Schefflera morototoni (Aubl.) Maguire et al.	*Didymopanax morototoni* (Aubl.) Decne. & Planch
Tabebuia pulcherrima	*Handroanthus pulcherrimus* (Sandwith) Mattos
Tetragastris panamensis (Engl.) Kuntze	*Protium stevensonii* (Standl.) Daly.
Trichospermum grewiifolium (A. Rich.) Kosterm.	*Trichospermum mexicanum* (D. C.) Baill.
	Synonym in TRY
Citrus sinensis	*Citrus gracilis*
Ficus subtriplinervia	*Ficus arpazusa*
Lithraea malleoides	*Lithraea molleoides*
Lonchocarpus campestris	*Muellera campestris*
Protium stevensonii	*Tetragastris panamensis*

Appendix 3. Interaction of species of the genus *Lonomia*, Saturniidae (Lepidoptera) together with their food plants.

Bibliographic Reference	Interaction Record Country	Name Code	Lonomia Species	No. of Associated Plant Families	Family Plant Feed	No. of Associated Plant Genus	Genus of Food Plant	No. of Associated Plant Species	Species of Food Plant
BALLESTEROS-MEJIA *et al.* 2020.	Neotropico	L_sp	*Lonomia* spp	24	Anacardiaceae	44	Astronium	53	*Astronium graveolens* Jacq.
CASAFÚS *et al.* 2019.	Argentina						Mangifera		*Mangifera indica* L.
CASAFÚS *et al.* 2021.									
SAMPER, L. 2013.	Colombia						Spondias		*Spondias* sp.
CASAFÚS *et al.* 2021.	Argentina				Annonaceae		Annona		*Annona emarginata* (Schltdl.) H. Rainer.
									Annona sp1.
ABELLA *et al.* 1999	Neotropico								*Annona* sp2.
CARVAJAL, L. M. 2018.	Colombia						Cananga		*Cananga odorata* (Lam.) Hook. f. & Thomson.

BALLESTEROS-MEJIA *et al.* 2020.	Neotropico						Desmopsis		*Desmopsis bibracteata* (L. Rob.) Saff.
CARVAJAL, L. M. 2018.	Colombia						Xylopia		*Xylopia aromatica* (Lam.) Mart.
CASAFÚS *et al.* 2019.	Argentina				Araliaceae		Didymopanax		*Didymopanax morototoni* (Aubl.) Decne. & Planch.
CASAFÚS *et al.* 2021.									
ABELLA *et al.* 1999	Neotropico				Bignoniaceae		Tabebuia		*Tabebuia* sp1.
BALLESTEROS-MEJIA *et al.* 2020.					Chrysobalanaceae		Hirtella		*Hirtella racemosa* var.
CASAFÚS *et al.* 2021.	Argentina				Euphorbiaceae		Alchornea		*Alchornea glandulosa* Poepp. & Endl.
MORAES, R. 2002.	Brasil								*Alchornea* sp1.
CARDOSO, A and JUNIOR, V. 2005.							Hevea		*Hevea brasiliensis* (Willd. ex A.Juss.) Müll. Arg.
CASAFÚS *et al.* 2021.	Argentina								

SANTOS, R e GONÇALVES, R. 2015.	Brasil								
SANTOS *et al.* 2015.									*Hevea* sp1.
CARVAJAL, L. M. 2018.	Colombia						Sapium		*Sapium* sp.
CASAFÚS *et al.* 2019.	Argentina						Sebastiania		*Sebastiania brasiliensis* Spreng.
CASAFÚS *et al.* 2021.					Fabaceae		Albizia		*Albizia niopoides* (Spruce ex Benth.) Burkart.
							Erythrina		*Erythrina crista-galli* L.
CARVAJAL, L. M. 2018.	Colombia						Hymenaea		*Hymenaea courbaril* L.
CASAFÚS *et al.* 2019.	Argentina						Muellera		*Muellera campestris* (Mart. ex Benth.) M.J. Silva & A.M.G.
CASAFÚS *et al.* 2021.							Machaerium		*Machaerium* sp.

					Lauraceae		Nectandra		*Nectandra lanceolata* Nees & Mart.
CASAFÚS *et al.* 2019.									
ABELLA *et al.* 1999	Neotropico						Persea		*Persea* sp1.
MORAES, R. 2002.	Brasil								*Persea americana* Mill.
CASAFÚS *et al.* 2021.	Argentina								
CASAFÚS *et al.* 2019.									
BALLESTEROS-MEJIA *et al.* 2020.	Neotropico				Lecythidaceae		Cariniana		*Cariniana estrellensis* (Raddi) Kuntze.
CASAFÚS *et al.* 2021.	Argentina				Lythraceae		Lagerstroemia		*Lagerstroemia* sp.
					Malvaceae		Luehea		*Luehea divaricata* Mart.
BALLESTEROS-MEJIA *et al.* 2020.	Neotropico				Melastomataceae		Miconia		*Miconia* sp.
							Tibouchina		*Tibouchina* sp.
ABELLA *et al.*					Meliaceae		Cedrela		*Cedrela* sp.

1999									
ROODT *et al.* 2000.	Argentina								
CASAFÚS *et al*. 2021.									*Cedrela fissilis* Vell.
ABELLA *et al.* 1999	Neotropico				Moraceae		Ficus		*Ficus* sp1.
CASAFÚS *et al*. 2021.	Argentina				Myrtaceae		Eucalyptus		*Eucalyptus* sp1.
BERNARDI *et al.* 2011.	Brasil								
MORAES, R. 2002.									
GADEN *et al.* 2023.									
CASAFÚS *et al.* 2021.	Argentina				Paulowniaceae		Paulownia		*Paulownia* sp.
ABELLA et al. 1999	Neotropico				Platanaceae		Platanus		*Platanus* sp.
ROODT *et al.* 2000.	Argentina								
MORAES, R. 2002.	Brasil				Rosaceae		Eriobotrya		*Eriobotrya japonica* (Thunb.) Lindl.
ABELLA *et al.*	Neotropico						Prunus		*Prunus* sp.

1999									
ROODT *et al.* 2000.	Argentina								
CASAFÚS *et al.* 2021.	Argentina								*Prunus domestica* L.
							Pyrus		*Pyrus communis* L.
ABELLA *et al.* 1999	Neotropico								*Pyrus* sp.
CASAFÚS *et al.* 2021.	Argentina						Rubus		*Rubus ulmifolius* Schott.
					Rutaceae		Helietta		*Helietta apiculata* Benth.
CASAFÚS *et al.* 2019.					Salicaceae		Banara		*Banara tomentosa* Clos.
CASAFÚS *et al.* 2021.							Casearia		*Casearia decandra* Jacq.
CASAFÚS *et al.* 2019.									*Casearia sylvestris* Sw.
					Sapindaceae		Cupania		*Cupania vernalis*

									Cambess
CASAFÚS *et al.* 2021.							Matayba		*Matayba elaeagnoides* Radlk.
CARVAJAL, L. M. 2018.	Colombia						Melicoccus		*Melicoccus bijugatus* Jacq.
CASAFÚS et al. 2019.	Argentina				Sapotaceae		Pouteria		*Pouteria salicifolia* (Spreng.) Radlk.
CASAFÚS *et al.* 2021.									
BALLESTEROS-MEJIA *et al.* 2020.	Neotropico				Simaroubaceae		Quassia		*Quassia* sp.
CASAFÚS *et al.* 2019.	Argentina				Styracaceae		Styrax		*Styrax leprosus* Hook. & Arn.
CASAFÚS *et al.* 2021.									
GADEN *et al.* 2023.	Neotropico	L_ach	*Lonomia achelous (Cramer, 1777)*	*9*	Anacardiaceae	12	Malosma	13	*Malosma laurina* (Nutt.) Nutt. ex Abrams
	Ecuador						Schinus		*Schinus terebinthifolia*

									Raddi
FAVALESSO *et al.* 2023.	Venezuela						Tapirira		*Tapirira guianensis* var.
BALLESTEROS-MEJIA *et al.* 2020.	Neotropico				Annonaceae		Annona		*Annona emarginata* (Schltdl.) H. Rainer.
					Apocynaceae		Aspidosperma		*Aspidosperma* sp.
GONZÁLEZ *et al*. 2023.	Brasil				Araliaceae		Didymopanax		*Didymopanax morototoni* (Aubl.) Decne. & Planch.
CARDOSO, A and JUNIOR, V. 2005.					Euphorbiaceae		Hevea		*Hevea* sp2.
SANTOS, *et al.* 2015 BALLESTEROS-MEJIA *et al.* 2020.	Neotropico								*Hevea brasiliensis* (Willd. ex A.Juss.) Müll. Arg.
GADEN *et al.* 2023.	Brasil				Fabaceae		Erythrina		*Erythrina crista-galli* L.
BALLESTERO	Neotropico						Machaerium		*Machaerium*

S-MEJIA *et al.* 2020.									*paraguariense* Hassl.
					Lauraceae		Phoebe		*Phoebe lanceolata* (Nees) Nees.
					Meliaceae		Cedrela		*Cedrela fissilis* Vell.
GADEN *et al.* 2023.	Brasil				Rosaceae		Pyrus		*Pyrus communis* L.
TORO-VARGAS *et al.* 2023.	Colombia	L_cas	*Lonomia casanarensis* (Brechlin, 2017)	*2*	Annonaceae	2	Cananga	2	*Cananga odorata* (Lam.) Hook. f. & Thomson.
					Araliaceae		Didymopanax		*Didymopanax morototoni* (Aubl.) Decne. & Planch.
MILANEZ, J. M & CHIARADIA, L. A. 2004.	Brasil	L_cir	*Lonomia circumstans* (Walker, 1855)	*1*	Rubiaceae	1	Coffea	1	*Coffea* sp.
SANTOS *et al.* 2015.									
GADEN *et al.* 2023.		L_clu	*Lonomia cluacina*	*1*		1		1	

MORAES, R. 2002.			(Druce, 1877)						
BALLESTEROS-MEJIA *et al.* 2020.	Neotropico	L_col	*Lonomia columbiana* (Lemaire, 1971)	7	Araliaceae	8	Dendropanax	8	*Dendropanax arboreus* (L.) Decne. & Planch.
					Burseraceae		Protium		*Protium stevensonii* (Standl.) Daly.
					Fabaceae		Senna		*Senna papillosa* (Britton & Rose) H.S. Irwin & Barneby.
					Malvaceae		Hampea		*Hampea appendiculata* (J.D. Sam.) Standl.
					Meliaceae		Carapa		*Carapa guianensis* Aubl.
							Cedrela		*Cedrela odorata* L.
					Moraceae		Pseudolmedia		*Pseudolmedia laevis* (Ruiz &

									Pav.) J. F. Macbr.
					Salicaceae		Hasseltia		*Hasseltia floribunda* Kunth.
		L_con	*Lonomia concordia* (Druce, 1886)	*14*	Anacardiaceae	20	Mosquitoxylum	20	*Mosquitoxylum jamaicense* Krug & Urb.
					Arecaceae		Geonoma		*Geonoma interrupta* (Ruiz & Pav.) Mart.
					Clethraceae		Clethra		*Clethra lanata* M.Martens & Galeotti.
					Euphorbiaceae		Conceveiba		*Conceveiba pleiostemona* Donn.Sm.
							Croton		*Croton schiedeanus* Schltdl.
							Gymnanthes		*Gymnanthes riparia* (Schltdl.) Klotzsch.
					Malvaceae		Hampea		*Hampea*

									appendiculata (J.D. Sam.) Standl.
							Malvaviscus		*Malvaviscus palmanus* Pittier & Donn.Sm.
					Oleaceae		Chionanthus		*Chionanthus panamensis* (Standl.) Stearn.
					Primulaceae		Parathesis		*Parathesis glabra* Donn. Sm.
					Rosaceae		Prunus		*Prunus annularis* Koehne.
					Rubiaceae		Arachnothryx		*Arachnothryx buddleioides* (Benth.) Planch.
							Bertiera		*Bertiera bracteosa* (Donn. Sm.) B. Ståhl & L. Andersson

					Salicaceae		Casearia		*Casearia tacanensis* Lundell.
							Hasseltia		*Hasseltia floribunda* Kunth.
							Xylosma		*Xylosma chlorantha* Donn. Sm.
					Sapindaceae		Billia		*Billia rosea* (Planch. & Linden) C.Ulloa & P.M.Jørg.
					Sapotaceae		Pouteria		*Pouteria exfoliata* T. D. Penn.
					Thymelaeaceae		Daphnopsis		*Daphnopsis americana* (Mill.) J. R. Johnst.
					Verbenaceae		Citharexylum		*Citharexylum costaricense* Moldenke.
GADEN *et al.* 2023.	Brasil	L_cyn	*Lonomia cynira (Cramer, 1777)*	6	Anacardiaceae	8	Astronium	9	*Astronium graveolens*

									Jacq.
MORAES, R. 2002.							Lithraea		*Lithraea brasiliensis* Marchand.
GADEN *et al.* 2023.	Neotropico				Betulaceae		Carpinus		*Carpinus betulus* L.
					Fabaceae		Robinia		*Robinia pseudoacacia* L.
					Fagaceae		Fagus		*Fagus* sp.
							Quercus		*Quercus* sp.
	Brasil				Lecythidaceae		n/a		n/a
					Urticaceae		Urera		*Urera caracasana* (Jacq.) Gaudich. ex Griseb.
							Urtica		*Urtica urens* L.
MORAES, R. 2002.									*Urtica* sp.
SANTOS *et al.* 2015.		L_des	*Lonomia descimoni* (Lemaire, 1971)	2	Euphorbiaceae	2	Hevea	2	*Hevea brasiliensis* (Willd. ex A.Juss.) Müll. Arg.

GONZÁLEZ *et al.* 2023.	Colombia				Fabaceae		Inga		*Inga* sp.
WOLFE, K and BALCÁZAR-LARA, M. 1994.	Mexico	L_ele	*Lonomia electra* (Druce, 1886)	*13*	Anacardiaceae	20	Malosma	20	*Malosma laurina* (Nutt.) Nutt. ex Abrams
BALLESTEROS-MEJIA *et al.* 2020.	Neotropico						Mosquitoxylum		*Mosquitoxylum jamaicense* Krug & Urb.
					Arecaceae		Geonoma		*Geonoma interrupta* (Ruiz & Pav.) Mart.
					Clethraceae		Clethra		*Clethra* sp.
					Euphorbiaceae		Croton		*Croton schiedeanus* Schltdl.
							Gymnanthes		*Gymnanthes riparia* (Schltdl.) Klotzsch.
					Malvaceae		Hampea		*Hampea appendiculata* (J.D. Sam.) Standl.
							Malvaviscus		*Malvaviscus*

									sp.
					Myrtaceae		Psidium		*Psidium guajava* L.
GADEN *et al.* 2023.	Costa Rica				Oleaceae		Ligustrum		*Ligustrum ovalifolium* Hassk.
BALLESTEROS-MEJIA *et al.* 2020.	Neotropico				Primulaceae		Parathesis		*Parathesis glabra* Donn. Sm.
					Rubiaceae		Coffea		*Coffea arabica* L.
							Arachnothryx		*Arachnothryx buddleioides* (Benth.) Planch.
					Salicaceae		Casearia		*Casearia tacanensis* Lundell.
							Hasseltia		*Hasseltia floribunda* Kunth.
							Xylosma		*Xylosma chlorantha* Donn. Sm.
					Sapindaceae		Billia		*Billia*

									hippocastanum Peyr.
					Sapotaceae		Chrysophyllum		*Chrysophyllum hirsutum* Cronquist
							Pouteria		*Pouteria exfoliata* T. D. Penn.
					Verbenaceae		Citharexylum		*Citharexylum costaricense* Moldenke.
GADEN *et al.* 2023.	Brasil	L_fal	*Lonomia falcata* (Walker 1855)	*2*	Ebenaceae	2	Diospyros	2	*Diospyros kaki* L. f.
					Euphorbiaceae		Joannesia		*Joannesia princeps* Vell.
MORAES, R. 2002.		L_fal_sub	*Lonomia falcata submaculata* (Walker 1855)	*2*	Ebenaceae	2	Diospyros	2	*Diospyros kaki* L. f.
					Euphorbiaceae		Joannesia		*Joannesia* sp.
GONZÁLEZ *et al.* 2023.	Venezuela	L_mon	*Lonomia moniqueae* (Brechlin & Meister, 2019)	*1*	Anacardiaceae	1	Tapirira	1	*Tapirira guianensis* var.
LORINI, L. 2005.	Brasil	L_obl	*Lonomia obliqua*	*18*	Anacardiaceae	29	Lithraea	41	*Lithraea molleoides*

LORINI *et al.* 2007.			*(Walker, 1855)*						(Well) Engl
SPECHT *et al.* 2005.									*Lithraea brasiliensis* Marchand.
SANTOS *et al.* 2015.									*Lithraea* sp.
ZAMBONI *et al.* 2019.	Neotropico								
TONELOTTO, M. 2016.	Brasil						Mangifera		*Mangifera indica* L.
ZAMBONI *et al.* 2019.									
ALBERTI *et al.* 2022.							Schinus		*Schinus terebinthifolia* Raddi
MILANEZ, J. M & CHIARADIA, L. A. 2004.					Annonaceae		Annona		*Annona emarginata* (Schltdl.) H. Rainer.
SPECHT *et al.* 2005.									
LORINI, L. 2005.									

GARCIA e DANNI-OLIVEIRA. 2007.									
CHUDZINSKI-TAVASSI and ALVAREZ-FLORES. 2013.									
TONELOTTO, M. 2016.									
ZAMBONI *et al.* 2019.	Neotropico								
MORAES, R. 2002. / BALLESTEROS-MEJIA *et al.* 2020.	Brasil / Neotropico								
SPECHT *et al.* 2005.					Apocynaceae		Aspidosperma		*Aspidosperma camporum* Müll.Arg.
CHUDZINSKI-TAVASSI and ALVAREZ-FLORES. 2013.					Bignoniaceae		Tabebuia		*Tabebuia* sp2.
ZAMBONI *et al.* 2019.	Neotropico								

MORAES, R. 2002. / BALLESTEROS-MEJIA *et al.* 2020.	Brasil / Neotropico						Handroanthus		*Handroanthus pulcherrimus* (Sandwith) Mattos
GARCIA e DANNI-OLIVEIRA. 2007.									
LORINI, L. 2005.									
SPECHT *et al.* 2005.									
TONELOTTO, M. 2016.									
LORINI *et al.* 2007.									*Handroanthus umbellatus* (Sond.) Mattos
MORAES, R. 2002.					Euphorbiaceae		Alchornea		*Alchornea* sp2.
TONELOTTO, M. 2016.									
SANTOS *et al.* 2015.							Hevea		*Hevea brasiliensis* (Willd. ex A.Juss.) Müll.

									Arg.
MORAES, R. 2002.					Fabaceae		Erythrina		*Erythrina crista-galli* L.
SPECHT *et al.* 2005.									
LORINI, L. 2005.									
SANTOS *et al*. 2015.									
LORINI *et al.* 2007.							Sesbania		*Sesbania virgata* (Cav.) Poir.
LORINI, L. 2005.					Lauraceae		Persea		*Persea americana* Mill.
SPECHT *et al.* 2005.									
MORAES, R. 2002.									
TONELOTTO, M. 2016.									
MILANEZ, J. M & CHIARADIA, L. A. 2004.									*Persea* sp2.
CARDOSO, A and JUNIOR, V.									

2005.									
GARCIA e DANNI-OLIVEIRA. 2007.									
CHUDZINSKI-TAVASSI and ALVAREZ-FLORES. 2013.									
ZAMBONI *et al.* 2019.	Neotropico								
LORINI, L. 2005.	Brasil				Lythraceae		Lagerstroemia		*Lagerstroemia indica* L.
LORINI *et al.* 2007.									
SPECHT *et al.* 2005.					Malvaceae		Luehea		*Luehea divaricata* Mart.
					Meliaceae		Cedrela		*Cedrela fissilis* Vell.
LORINI, L. 2005.									
MORAES, R. 2002.									
GARCIA e DANNI-									

OLIVEIRA. 2007.									
CHUDZINSKI-TAVASSI and ALVAREZ-FLORES. 2013.									
SANTOS *et al.* 2015.									
TONELOTTO, M. 2016.									
ZAMBONI *et al.* 2019.	Neotropico								
BALLESTEROS-MEJIA *et al.* 2020.					Moraceae		Ficus		*Ficus pallida* Vahl
SPECHT *et al.* 2005.	Brasil								*Ficus carica* L.
MORAES, R. 2002.									
TONELOTTO, M. 2016.									
LORINI, L. 2005.									*Ficus elastica* Roxb. ex Hornem.
MORAES, R. 2002.									

LORINI *et al.* 2007.									*Ficus luschnathiana* (Miq.) Miq.
LORINI, L. 2005.									*Ficus pertusa* L. f.
SPECHT et al. 2005.									
MORAES, R. 2002. / GONZÁLEZ *et al.* 2023.									
CHUDZINSKI-TAVASSI and ALVAREZ-FLORES. 2013.									*Ficus* sp2.
LORINI *et al.* 2007.							Morus		*Morus nigra L.*
SPECHT *et al.* 2005.					Myrtaceae		Eucalyptus		*Eucalyptus* sp2.
BERNARDI *et al.* 2011.									
SANTOS *et al.* 2015.									
FAVALESSO *et al*. 2019.									

BALLESTEROS-MEJIA *et al.* 2020.	Neotropico								
STANLEY *et al*. 2020.	Brasil								
MILANEZ, J. M & CHIARADIA, L. A. 2004.							Psidium		*Psidium guajava* L.
LORINI, L. 2005.									
SPECHT *et al.* 2005.									
TONELOTTO, M. 2016.									
ZAMBONI et al. 2019.	Neotropico								
MORAES, R. 2002.	Brasil								
MILANEZ, J. M & CHIARADIA, L. A. 2004.					Oleaceae		Ligustrum		*Ligustrum lucidum* Aiton.
LORINI *et al.* 2007.					Pittosporaceae		Pittosporum		*Pittosporum tobira* (Thunb.) W.T.Aiton
LORINI *et al.*					Platanaceae		Platanus		*Platanus*

2004.									*acerifolia* (Aiton) Willd.
MILANEZ, J. M & CHIARADIA, L. A. 2004.									
LORINI, L. 2005.									
LORINI *et al*. 2007.									
SPECHT *et al.* 2005.									
CHUDZINSKI-TAVASSI and ALVAREZ-FLORES. 2013.									
REBELATO, G and LORINI, L. 1998.									
MORAES, R. 2002. / GONZÁLEZ *et al*. 2023.									
SPECHT *et al*. 2009.									

MILANEZ, J. M & CHIARADIA, L. A. 2004.					Rosaceae		Eriobotrya		*Eriobotrya japonica* (Thunb.) Lindl.
SPECHT *et al.* 2005.									
TONELOTTO, M. 2016.									
MORAES, R. 2002.									*Eriobotrya* sp.
LORINI, L. 2005.							Malus		*Malus pumila* Mill.
LORINI *et al*. 2007.									
BALLESTEROS-MEJIA *et al*. 2020.	Neotropico						Mespilus		*Mespilus germanica* L.
LORINI, L. 2005.	Brasil						Prunus		*Prunus domestica* L.
CARDOSO, A and JUNIOR, V. 2005.									
CHUDZINSKI-TAVASSI and ALVAREZ-FLORES. 2013.									

GARCIA e DANNI-OLIVEIRA. 2007.									
LORINI *et al.* 2007.									
MILANEZ, J. M & CHIARADIA, L. A. 2004.									
MORAES, R. 2002.									*Prunus persica* (L.) Batsch.
MILANEZ, J. M & CHIARADIA, L. A. 2004.									
CARDOSO, A and JUNIOR, V. 2005.									
LORINI, L. 2005.									
SPECHT *et al.* 2005.									
GARCIA e DANNI-OLIVEIRA. 2007.									

TONELOTTO, M. 2016.									
CHUDZINSKI-TAVASSI and ALVAREZ-FLORES. 2013.									
ZAMBONI et al. 2019.									
MORAES, R. 2002.							Pyrus		*Pyrus communis* L.
MILANEZ, J. M & CHIARADIA, L. A. 2004.									
SPECHT *et al.* 2005.									
LORINI, L. 2005.									
LORINI *et al.* 2007.									
CHUDZINSKI-TAVASSI and ALVAREZ-FLORES. 2013.									
SANTOS *et al.* 2015.									

REBELATO, G and LORINI, L. 1998.									
LORINI, L. 2005.					Rutaceae		Citrus		*Citrus limon* (L.) Osbeck.
LORINI *et al.* 2007.									*Citrus sinensis* (L.) Osbeck.
LORINI, L. 2005.									
SPECHT *et al.* 2005.					Urticaceae		Urera		*Urera aurantiaca* Wedd.
TORO-VARGAS *et al.* 2023.	Colombia	L_ori	*Lonomia orientocordillera* (Brechlin, Käch & Meister, 2013)	*3*	Primulaceae	3	Stylogyne	3	*Stylogyne* sp.
					Rosaceae		Prunus		*Prunus virginiana* L.
					Sapindaceae		Nephelium		*Nephelium lappaceum* var. topengii (Merr.) F.C.How & C.N.Ho.
BALLESTEROS-MEJIA *et al.* 2020.	Neotropico	L_ruf	*Lonomia rufescens* (Lemaire, 1972)	*4*	Araliaceae	4	Dendropanax	4	*Dendropanax arboreus* (L.) Decne. & Planch.

					Fabaceae		Senna		*Senna papillosa* (Britton & Rose) H.S. Irwin & Barneby.
					Malvaceae		Hampea		*Hampea appendiculata* (J.D. Sam.) Standl.
					Primulaceae		Parathesis		*Parathesis* sp.
		L_san	*Lonomia santarosensis* (Brechlin & Meister, 2013)	*9*	Araliaceae	11	Dendropanax	11	*Dendropanax arboreus* (L.) Decne. & Planch.
					Bignoniaceae		Tabebuia		*Tabebuia rosea* (Bertol.) DC.
					Burseraceae		Protium		*Protium stevensonii* (Standl.) Daly.
					Celastraceae		Semialarium		*Semialarium mexicanum* (Miers) Mennega.
					Malvaceae		Trichospermu		*Trichospermu*

							m		*m mexicanum* (D. C.) Baill.
					Meliaceae		Carapa		*Carapa guianensis* Aubl.
							Cedrela		*Cedrela odorata* L.
							Swietenia		*Swietenia macrophylla* King.
					Primulaceae		Parathesis		*Parathesis trichogyne* Hemsl.
					Rubiaceae		Pentagonia		*Pentagonia donnell-smithii* (Standl.) Standl.
					Simaroubaceae		Quassia		*Quassia amara* L.

Appendix 4. General group of plant.

Name Code	**Family**	**Number Plant Genus**	**Moth Genus Name**	**Number Plant Species**	**Name Code**	**Plant Species Names**	**Growth Habit**	**Origin of Plants***
Ana	Anacardiaceae	8	Astronium	10	Ast_gra	*Astronium graveolens* Jacq.	Tree	Native
			Lithraea		Lit_bra	*Lithraea brasiliensis* Marchand.	Tree	Native
					Lit_mol	*Lithraea molleoides* (Well) Engl	Tree	Native
					Lit_sp	*Lithraea* sp.	Tree or Shrub	Native
			Malosma		Mal_lau	*Malosma laurina* (Nutt.) Nutt. ex Abrams	Tree	Native
			Mangifera		Man_ind	*Mangifera indica* L.	Tree	Exotic/Cultivated
			Mosquitoxylum		Mos_jam	*Mosquitoxylum jamaicense* Krug & Urb.	Tree	Native
			Schinus		Sch_ter	*Schinus terebinthifolia*	Tree	Native

						Raddi		
			Spondias		Spo_sp	*Spondias* sp.	Tree or Shrub	Native
			Tapirira		Tap_gui	*Tapirira guianensis* var.	Tree	Native
Ann	Annonaceae	4	Annona	6	Ann_ema	*Annona emarginata* (Schltdl.) H. Rainer.	Shrub	Native
					Ann_sp1	*Annona* sp1.	Tree, Shrub or Liana	Native
					Ann_sp2	*Annona* sp2.	Tree, Shrub or Liana	Native
			Cananga		Can_odo	*Cananga odorata* (Lam.) Hook. f. & Thomson.	Tree	Exotic/Cultivated
			Desmopsis		Des_bib	*Desmopsis bibracteata* (L. Rob.) Saff.	Shrub	Native
			Xylopia		Xyl_aro	*Xylopia aromatica* (Lam.) Mart.	Tree	Native
Apo	Apocynaceae	1	Aspidosperma	2	Asp_cam	*Aspidosperma camporum*	Tree	Endemic

						Müll.Arg.		
					Asp_sp	*Aspidosperma* sp.	Tree or Shrub	Native
Ara	Araliaceae	2	Dendropanax	2	Den_arb	*Dendropanax arboreus* (L.) Decne. & Planch.	Tree	Endemic
			Didymopanax		Did_mor	*Didymopanax morototoni* (Aubl.) Decne. & Planch.	Tree	Native
Are	Arecaceae	1	Geonoma	1	Geo_int	*Geonoma interrupta* (Ruiz & Pav.) Mart.	Palm	Endemic
Bet	Betulaceae	1	Carpinus	1	Car_bet	*Carpinus betulus* L.	Tree	Exotic
Big	Bignoniaceae	2	Handroanthus	5	Han_pul	*Handroanthus pulcherrimus* (Sandwith) Mattos	Tree	Native
					Han_umb	*Handroanthus umbellatus* (Sond.) Mattos	Tree	Endemic
			Tabebuia		Tab_sp1	*Tabebuia* sp1.	Tree	Native

					Tab_sp2	*Tabebuia* sp2.	Tree	Native
					Tab_ros	*Tabebuia rosea* (Bertol.) DC.	Tree	Native
Bur	Burseraceae	1	Protium	1	Pro_ste	*Protium stevensonii* (Standl.) Daly.	Tree	Native
Cel	Celastraceae	1	Semialarium	1	Sem_mex	*Semialarium mexicanum* (Miers) Mennega.	Tree	Endemic
Chr	Chrysobalanaceae	1	Hirtella	1	Hir_rac	*Hirtella racemosa* var.	Tree	Native
Cle	Clethraceae	1	Clethra	2	Cle_lan	*Clethra lanata* M.Martens & Galeotti.	Tree	Endemic
					Cle_sp	*Clethra sp.*	Tree or Shrub	Native
Ebe	Ebenaceae	1	Diospyros	1	Dio_kak	*Diospyros kaki* L. f.	Tree	Exotic/Cultivated
Eup	Euphorbiaceae	8	Alchornea	13	Alc_gla	*Alchornea glandulosa* Poepp. & Endl.	Tree	Native
					Alc_sp1	*Alchornea* sp1.	Tree or Shrub	Native
					Alc_sp2	*Alchornea*	Tree or Shrub	Native

						sp2.		
			Conceveiba		Con_ple	*Conceveiba pleiostemona* Donn.Sm.	Tree	Endemic
			Croton		Cro_sch	*Croton schiedeanus* Schltdl.	Tree	Endemic
			Gymnanthes		Gym_rip	*Gymnanthes riparia* (Schltdl.) Klotzsch.	Tree	Endemic
			Hevea		Hev_bra	*Hevea brasiliensis* (Willd. ex A.Juss.) Müll. Arg.	Tree	Native
					Hev_sp1	*Hevea* sp1.	Tree or Shrub	Native
					Hev_sp2	*Hevea* sp2.	Tree or Shrub	Native
			Joannesia		Joa_pri	*Joannesia princeps* Vell.	Tree	Endemic
					Joa_sp	*Joannesia* sp.	Tree or Shrub	Native
			Sapium		Sap_sp	*Sapium* sp.	Tree or Shrub	Native
			Sebastiania		Seb_bra	*Sebastiania brasiliensis* Spreng.	Tree	Native

Fab	Fabaceae	9	Albizia	10	Alb_nio	*Albizia niopoides* (Spruce ex Benth.) Burkart.	Shrub	Native
			Erythrina		Ery_cri	*Erythrina crista-galli* L.	Tree	Native
			Hymenaea		Hym_cou	*Hymenaea courbaril* L.	Tree	Native
			Inga		Ing_sp	*Inga* sp.	Tree or Shrub	Native
			Machaerium		Mac_sp	*Machaerium* sp.	Tree, Shrub or Liana	Native
					Mac_par	*Machaerium paraguariense* Hassl.	Tree	Endemic
			Muellera		Mue_cam	*Muellera campestris* (Mart. ex Benth.) M.J. Silva & A.M.G.	Tree	Native
			Robinia		Rob_pse	*Robinia pseudoacacia* L.	Tree	Endemic
			Senna		Sen_pap	*Senna papillosa* var. papillosa	Shrub	Endemic

						(Britton & Rose) Irwin & Barneby.		
			Sesbania		Ses_vir	*Sesbania virgata* (Cav.) Poir.	Shrub	Native
Fag	Fagaceae	2	Fagus	2	Fag_sp	*Fagus* sp.	Tree	Exotic/Cultivated
			Quercus		Que_sp	*Quercus* sp.	Tree	Exotic/Cultivated
Lau	Lauraceae	3	Nectandra	5	Nec_lan	*Nectandra lanceolata* Nees & Mart.	Tree	Native
			Persea		Per_ame	*Persea americana* Mill.	Tree	Native
					Per_sp1	*Persea* sp1.	Tree or Shrub	Native
					Per_sp2	*Persea* sp2.	Tree or Shrub	Native
			Phoebe		Pho_lan	*Phoebe lanceolata* (Nees) Nees.	Tree	Exotic
Lec	Lecythidaceae	1	Cariniana	1	Car_est	*Cariniana estrellensis* (Raddi) Kuntze.	Tree	Endemic
Lyt	Lythraceae	1	Lagerstroemia	2	Lag_ind	*Lagerstroemia indica* L.	Shrub	Exotic/Cultivated

					Lag_sp	*Lagerstroemia* sp.	Tree or Shrub	Exotic/Cultivated
Mal	Malvaceae	4	Hampea	5	Ham_app	*Hampea appendiculata* (J.D. Sam.) Standl.	Tree	Endemic
			Luehea		Lue_div	*Luehea divaricata* Mart.	Tree	Native
			Malvaviscus		Mal_pal	*Malvaviscus palmanus* Pittier & Donn.Sm.	Shrub	Native
					Mal_sp	*Malvaviscus sp.*	Shrub	Native
			Trichospermum		Tri_mex	*Trichospermum mexicanum* (D. C.) Baill.	Tree	Endemic
Mel	Melastomataceae	2	Miconia	2	Mic_sp	*Miconia* sp.	Tree, Shrub or Liana	Native
			Tibouchina		Tib_sp	*Tibouchina* sp.	Tree or Shrub	Native
Meli	Meliaceae	3	Carapa	5	Car_gui	*Carapa guianensis* Aubl.	Tree	Native
			Cedrela		Ced_sp	*Cedrela* sp.	Tree	Native

					Ced_fis	*Cedrela fissilis* var. glabrior C.DC.	Tree	Endemic
					Ced_odo	*Cedrela odorata* L..	Tree	Endemic
			Swietenia		Swi_mac	*Swietenia macrophylla* King.	Tree	Endemic
Mor	Moraceae	3	Ficus	9	Fic_car	*Ficus carica* L.	Tree	Exotic/Cultivated
					Fic_ela	*Ficus elastica* Roxb. ex Hornem.	Tree	Exotic/Cultivated
					Fic_lus	*Ficus luschnathiana* (Miq.) Miq.	Tree	Native
					Fic_pal	*Ficus pallida* Vahl	Tree	Native
					Fic_per	*Ficus pertusa* L. f.	Tree	Native
					Fic_sp1	*Ficus* sp1.	Tree, Shrub or Liana	Native
					Fic_sp2	*Ficus* sp2.	Tree, Shrub or Liana	Native
			Morus		Mor_nig	*Morus nigra L.*	Tree	Exotic/Cultivated
			Pseudolmedia		Pse_lae	*Pseudolmedia*	Tree	Endemic

						laevis (Ruiz & Pav.) J. F. Macbr.		
Myr	Myrtaceae	2	Eucalyptus	3	Euc_sp1	*Eucalyptus* sp1.	Tree or Shrub	Exotic/Cultivated
					Euc_sp2	*Eucalyptus* sp2.	Tree or Shrub	Exotic/Cultivated
			Psidium		Psi_gua	*Psidium guajava* L.	Tree	Endemic
Ole	Oleaceae	2	Chionanthus	3	Chi_pan	*Chionanthus panamensis* (Standl.) Stearn.	Tree	Endemic
			Ligustrum		Lig_ova	*Ligustrum ovalifolium* Hassk.	Shrub	Exotic/Cultivated
					Lig_luc	*Ligustrum lucidum* Aiton.	Tree	Exotic/Cultivated
Pau	Paulowniaceae	1	Paulownia	1	Pau_sp	*Paulownia* sp.	Tree	Exotic
Pit	Pittosporaceae	1	Pittosporum	1	Pit_tob	*Pittosporum tobira* (Thunb.) W.T.Aiton	Tree	Exotic/Cultivated
Pla	Platanaceae	1	Platanus	2	Pla_ace	*Platanus acerifolia* (Aiton) Willd.	Tree	Exotic/Cultivated

					Pla_sp	*Platanus* sp.	Tree	Exotic/Cultivated
Pri	Primulaceae	2	Parathesis	4	Par_gla	*Parathesis glabra* Donn. Sm.	Tree	Endemic
					Par_sp	*Parathesis* sp.	Tree or Shrub	Endemic
					Par_tri	*Parathesis trichogyne* Hemsl.	Tree	Endemic
			Stylogyne		Sty_sp	*Stylogyne* sp.	Tree or Shrub	Native
Ros	Rosaceae	6	Eriobotrya	12	Eri_jap	*Eriobotrya japonica* (Thunb.) Lindl.	Tree	Exotic/Cultivated
					Eri_sp	*Eriobotrya sp.*	Tree or Shrub	Exotic
			Malus		Mal_pum	*Malus pumila* Mill.	Tree	Exotic/Cultivated
			Mespilus		Mes_ger	*Mespilus germanica* L.	Tree	Exotic/Cultivated
			Prunus		Pru_ann	*Prunus annularis* Koehne.	Tree	Endemic
					Pru_dom	*Prunus domestica* L.	Tree	Exotic/Cultivated
					Pru_per	*Prunus persica* (L.) Batsch.	Tree	Exotic/Cultivated

					Pru_vir	*Prunus virginiana* L.	Tree	Native
					Pru_sp	*Prunus* sp.	Tree or Shrub	Native
			Pyrus		Pyr_com	*Pyrus communis* L.	Tree	Native
					Pyr_sp	*Pyrus* sp.	Tree or Shrub	Native
			Rubus		Rub_ulm	*Rubus ulmifolius* Schott.	Shrub	Exotic/Cultivated
Rub	Rubiaceae	4	Arachnothryx	5	Ara_bud	*Arachnothryx buddleioides* (Benth.) Planch.	Tree	Endemic
			Bertiera		Ber_bra	*Bertiera bracteosa* (Donn. Sm.) B. Ståhl & L. Andersson	Shrub	Endemic
			Coffea		Cof_ara	*Coffea arabica* L.	Shrub	Exotic/Cultivated
					Cof_sp	*Coffea* sp.	Tree or Shrub	Exotic
			Pentagonia		Pen_don	*Pentagonia donnell-smithii* (Standl.) Standl.	Tree	Endemic

Rut	Rutaceae	2	Helietta	3	Hel_api	*Helietta apiculata* Benth.	Tree	Endemic
			Citrus		Cit_lim	*Citrus limon* (L.) Osbeck	Tree	Exotic/Cultivated
					Cit_sin	*Citrus sinensis* (L.) Osbeck	Tree	Exotic/Cultivated
Sal	Salicaceae	4	Banara	6	Ban_tom	*Banara tomentosa* Clos.	Tree	Native
			Casearia		Cas_dec	*Casearia decandra* Jacq.	Shrub	Native
					Cas_syl	*Casearia sylvestris* Sw.	Tree	Native
					Cas_tac	*Casearia tacanensis* Lundell.	Tree	Endemic
			Hasseltia		Has_flo	*Hasseltia floribunda* Kunth.	Tree	Endemic
			Xylosma		Xyl_chl	*Xylosma chlorantha* Donn. Sm.	Tree	Endemic
Sapi		5	Billia	6	Bil_ros	*Billia rosea*	Tree	Native

	Sapindaceae					(Planch. & Linden) C.Ulloa & P.M.Jørg.		
					Bil_hip	*Billia hippocastanum* Peyr.	Tree	Native
			Cupania		Cup_ver	*Cupania vernalis* Cambess	Tree	Native
			Matayba		Mat_ela	*Matayba elaeagnoides* Radlk.	Tree	Native
			Melicoccus		Mel_bij	*Melicoccus bijugatus* Jacq.	Tree	Native
			Nephelium		Nep_lap	*Nephelium lappaceum* var. topengii (Merr.) F.C.How & C.N.Ho.	Tree	Exotic/Cultivated
Sap	Sapotaceae	2	Chrysophyllum	3	Chr_hir	*Chrysophyllum hirsutum* Cronquist	Tree	Endemic
			Pouteria		Pou_exf	*Pouteria*	Tree	Endemic

						exfoliata T.D. Penn.		
					Pou_sal	*Pouteria salicifolia* (Spreng.) Radlk.	Tree	Endemic
Sim	Simaroubaceae	1	Quassia	2	Qua_ama	*Quassia amara* L.	Tree	Endemic
					Qua_sp	*Quassia* sp.	Tree or Shrub	Native
Sty	Styracaceae	1	Styrax	1	Sty_lep	*Styrax leprosus* Hook. & Arn.	Tree	Native
Thy	Thymelaeaceae	1	Daphnopsis	1	Dap_ame	*Daphnopsis americana* (Mill.) J. R. Johnst.	Tree	Endemic
Urt	Urticaceae	2	Urera	4	Ure_car	*Urera caracasana* (Jacq.) Gaudich. ex Griseb.	Tree	Native
					Ure_aur	*Urera aurantiaca* Wedd.	Shrub	Native
			Urtica		Urt_ure	*Urtica urens* L.	Herb	Exotic

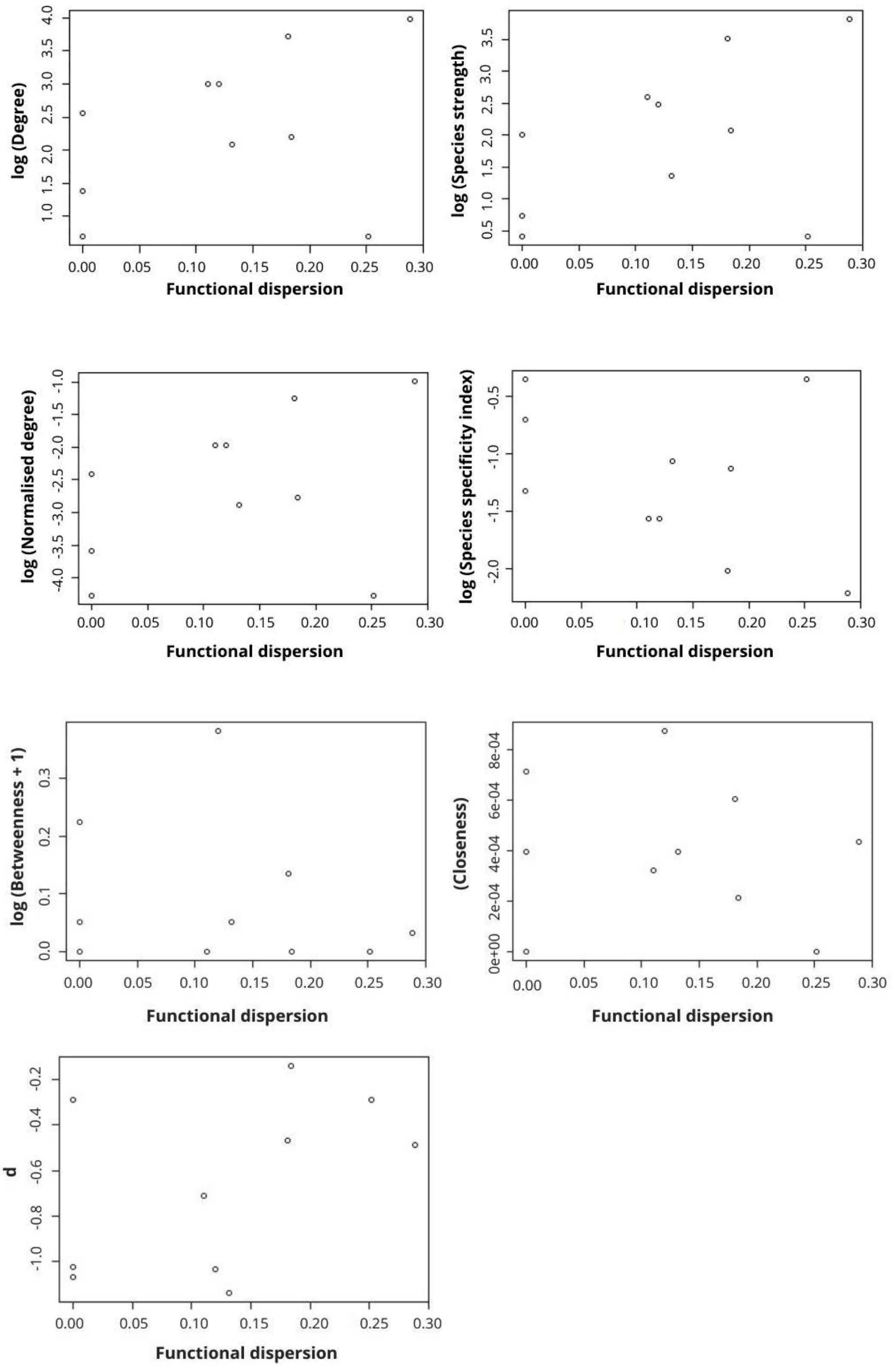
					Urt_sp	*Urtica* sp.	Herb or Liana	Exotic
Ver	Verbenaceae	1	Citharexylum	1	Cit_cos	*Citharexylum costaricense* Moldenke.	Tree	Endemic
	39 Familes		98 Genus			145 Species		

Appendix 5. Functional traits of plant species that exhibited records of herbivory.

Species	Plant	Count	La	Ldmc	Lt	Lfm
L_spp	Alc_gla	1	8.081	NA	0.159	0.424
L_spp	Ast_gra	1	9.323	NA	0.245	3.869
L_spp	Cas_syl	1	7.951	5.634	0.174	NA
L_spp	Ced_fis	1	9.449	5.652	0.264	1.737
L_spp	Hel_api	1	8.339	6.675	NA	0.311
L_spp	Hir_rac	1	9.739	5.951	0.284	NA
L_ach	Ced_fis	1	9.449	5.652	0.264	1.737
L_col	Ham_app	1	7.759	5.717	0.153	-0.899
L_col	Has_flo	1	7.878	5.997	0.174	2.037
L_con	Ara_bud	1	8.131	6.147	0.157	0.609
L_con	Bil_ros	1	8.367	6.105	0.166	1.334
L_con	Con_ple	1	7.143	6.132	0.159	NA
L_con	Ham_app	1	7.759	5.717	0.153	-0.899
L_con	Has_flo	1	7.878	5.997	0.174	2.037
L_cyn	Ast_gra	1	9.324	NA	0.245	3.869
L_cyn	Car_bet	1	8.304	NA	0.18	2.382
L_ele	Ara_bud	1	8.131	6.147	0.157	0.609
L_ele	Cof_ara	1	8.684	5.832	0.194	1.823
L_ele	Ham_app	1	7.759	5.717	0.153	-0.899
L_ele	Has_flo	1	7.878	5.997	0.174	2.037
L_ele	Lig_ova	1	7.967	5.935	0.174	NA
L_fal	Dio_kak	1	7.918	5.785	NA	-1.179
L_fal	Joa_pri	1	1.039	5.868	0.221	2.194
L_fal_sub	Dio_kak	1	7.918	5.785	NA	-1.179
L_obl	Ced_fis	1	9.449	5.652	0.264	1.737
L_obl	Cit_lim	1	9.104	5.699	0.242	NA
L_obl	Lag_ind	1	9.122	6.071	0.185	-0.109
L_obl	Lig_luc	1	8.547	6.268	0.203	NA
L_ruf	Ham_app	1	7.759	5.717	0.153	-0.899

Selected functional traits: leaf dry matter content (LDMC), leaf thickness (LT), leaf area (LA), and leaf fresh mass (LFM). The corresponding names for each code can be found in Appendix 3 for Lonomia species and in Appendix 4 for plant species. Data not applicable (NA).

Appendix 6. Model parameters and p-values estimated for the effect of functional dispersion (fdis) on different network metrics.



Each point within each graph represents *Lonomia* species and their trophic interactions with their food plants.