Check for updates
Full Article
Revista Actualidades Biológicas
Actual. Biol. 47(123): e4711, 2025 | Jul-Dec| Medellin DOI:10.17533/udea.acbi/v47n123a11

Contribution to the knowledge of diurnal butterflies (Lepidoptera: Papilionoidea) of the Uruki - El Manantial Community and Ecotourism Nature Reserve, Florencia (Colombia)

Aporte al conocimiento de las mariposas diurnas (Lepidoptera: Papilionoidea) de la Reserva Natural Comunitaria y Ecoturística Uruki – El Manantial, Florencia (Colombia)

Kimberly I. Nieto-Morea[1], Esneider Hernández-Ramírez[1], Jonathan Ramos-Artunduaga[2]

Abstract

In the Neotropics, butterfly diversity is threatened by the loss and transformation of natural habitats, mainly due to deforestation and the expansion of human activities. Diurnal butterflies, recognized as bioindicators of habitat quality, allow for the evaluation of ecosystem conditions. The objective of this article was to determine the diversity of diurnal butterflies in the RNCE Uruki-El Manantial, located in the municipality of Florencia, Caquetá, to provide useful information for their conservation. Sampling was conducted over 15 days in December 2022, across 10 stations. At each station, a Van Someren-Rydon trap was installed, alternately baited with fermented fruit and decomposing fish, and complemented by active searching with an entomological net. A total of 1,210 specimens were collected, belonging to six families, 17 subfamilies, and 95 species. The family Nymphalidae was the most diverse (47.3%). Species richness varied with vegetation cover, being higher at forest edges and pastures, whereas conserved forests harbored a more specialized composition. A total of 54.7% of the species recorded were rare or uncommon. The most representative were *Hermeuptychia hermes* (28.4%), *Eurema daira*, and *Anartia jatrophae* (8.5% each), associated with habitats under anthropogenic pressure. Additionally, species indicative of well-preserved environments were recorded, including *Callicore cynosura*, *Kolana ligurina*, *Bungalotis milleri*, *Morpho achilles*, and *Archaeoprepona demophon* (7%). These results highlight the importance of implementing conservation strategies that integrate the biocultural and ecotourism value of butterflies in the Colombian Amazon.

Keywords: Andean-Amazon piedmont, Caquetá, diversity, lepidopterofauna, neotropics

Resumen

En el Neotrópico, la diversidad de mariposas se encuentra amenazada por la pérdida y transformación de hábitats naturales, principalmente debido a la deforestación y la expansión de actividades humanas. En este contexto, las mariposas diurnas, reconocidas como bioindicadoras de calidad del hábitat, permiten evaluar el estado de los ecosistemas. El objetivo de este artículo fue determinar la diversidad de mariposas diurnas en la RNCE Uruki-El Manantial ubicada en el municipio de Florencia, Caquetá, con el fin de aportar información útil para su conservación. El

[1] Universidad de la Amazonia, Florencia, Colombia.

[2] Investigador Independiente - Caquetios Butterflies, Florencia, Colombia

* Corresponding author: jo.ramos.bio@gmail.com

Received: October 10, 2024; accepted: September 3, 2025; published: September 17, 2025.

muestreo se realizó durante 15 días en diciembre de 2022, en 10 estaciones de muestreo. En cada estación se instaló una trampa Van Someren-Rydon, activada alternadamente con fruta fermentada y pescado en descomposición, complementada con búsqueda activa mediante red entomológica. Se recolectaron 1.210 especímenes, pertenecientes a seis familias, 17 subfamilias y 95 especies. La familia Nymphalidae fue la más diversa (47,3%). La riqueza de especies varió según la cobertura vegetal, siendo mayor en bordes de bosques y pastizales, mientras que los bosques conservados albergaron una composición más especializada. Se registró un 54,7% de especies raras o poco comunes. Entre las más representativas estuvieron *Hermeuptychia hermes* (28,4%), *Eurema daira* y *Anartia jatrophae* (8,5% cada una), asociadas a ecosistemas con presiones antrópicas. También se registraron especies indicadoras de buen estado de conservación, como *Callicore cynosura*, *Kolana ligurina*, *Bungalotis milleri*, *Morpho achilles* y *Archaeoprepona demophon* (7%). Estos resultados destacan la importancia de implementar estrategias de conservación que integren el valor biocultural y ecoturístico en la Amazonia colombiana.

Palabras clave: piedemonte Andino-Amazónico, Caquetá, diversidad, lepidopterofauna, neotrópico

INTRODUCTION

In some regions of the Neotropics, alterations in the composition and distribution of butterfly species have been observed (Ahumada et al., 2022; Quintero-Gallego, 2014). The main cause lies in changes in vegetation cover and land use, which impact the natural dynamics of fauna and flora populations, specifically on the biodiversity associated with forests located near cities or areas specialized in activities promoted by land occupation for the establishment of illicit crops, agribusiness, extensive livestock farming, and the construction of irregular roads, mainly in the Amazon (Mateus, 2019). In Colombia, 174,103 hectares of forest were deforested in 2021, representing an increase of 1.5% compared to 2020. The main departments involved in this phenomenon are Antioquia, Meta, Putumayo, Guaviare, and Caquetá, the latter with a deforestation rate that led to a 7% decrease in its primary rainforests and a 9.1% decrease in its tree cover by 2022 (FCDS, 2022).

Research focused on the study of the distribution, ecology, diversity, and behavioral patterns of butterflies is essential for interpreting the health of an ecosystem. Some butterfly taxa have been classified as bioindicators of ecosystem quality, highlighting the importance of this biological group as a model for analysis (Carabalí-Banguero & Carabalí, 2019; Henao-Bañol & Gantiva, 2020). Additionally, butterflies are susceptible to variations in temperature, microclimate, humidity, and lighting, which express changes when ecosystems have been disturbed or modified (Kremen et al., 1993). In addition to these attributes, butterflies demonstrate a strong ecological connection to the plants that serve as their hosts and food sources (Camero & Calderón, 2007). This relationship has led several researchers to assert that the decline in forest cover has a negative impact on the diversity of butterflies (Brown & Freitas, 2000; Brown & Freitas, 2002; Huertas & Ríos, 2006).

Consequently, nature reserves play a fundamental role in a solid strategy for the care and preservation of biodiversity. They act as regulatory entities, supervising human activity and its impact on biodiversity (David-Rodríguez, 2023). The Uruki–El Manantial Community and Ecotourism Nature Reserve, RNCE Uruki–El Manantial, is located in the municipality of Florencia, department of Caquetá. This reserve is constantly committed to creating spaces that promote social and economic inclusion. This is achieved through activities focused on research, documentation, education, and dissemination of its biological assets, such as butterflies of ecotourism interest, mammals such as *Aotus vociferans* and *Cabassous unicinctus*, and the ethnobotanical diversity of native plants and orchid repopulation, among others, to move towards a sustainable economic model (Uruki-El Manantial, 2024). The objective of this research was to determine the diversity of diurnal butterflies in the Uruki-El Manantial Community and Ecotourism Nature Reserve (RNCE Uruki-El Manantial), located in Florencia, Caquetá. The results obtained will serve as input for future research and for strengthening strategies aimed at conserving regional biodiversity.

Actual. Biol. 47(123): e4711, 2025 | Jul-Dec| Medellin DOI:10.17533/udea.acbi/v47n123a11

MATERIALS AND METHODS

Study area

The Uruki–El Manantial RNCE is located in the village of El Manantial, northeast of the urban area of the city of Florencia, department of Caquetá, Colombia (1°37´53.14" N 75°35´14.081" W) (Figure 1). It has an altitude of 490 m above sea level, an average annual temperature of 25 °C, and average annual precipitation of 3790 mm. It covers an area of 45 hectares, 80% of which is forested, with two types of vegetation cover: secondary forests and grasslands (Rodríguez et al., 2016). The area corresponds to a tropical rainforest–bhT (Holdridge et al., 1971). Within the reserve, there are 35 water sources, including the La Perdiz stream, an important water tributary that crosses the city of Florencia from north to south. Within the boundaries of the reserve, there is a population of 236 inhabitants distributed across small plots of land, with a notable presence of Huitoto indigenous communities. The predominant economic activities are linked to poultry, fish, and goat farming (Rodríguez & Rodríguez, 2020).

Field sampling

Butterflies were collected for 15 consecutive days during the rainy-dry transition period in December 2022. Ten sampling stations were set up at a distance of 200 meters from each other in three types of vegetation cover: forest, forest edge, and pasture. At each station, a Van Someren-Rydon (VsR) trap was installed 1.5 meters above the ground, which was baited alternately with fermented fruit and rotting fish, distributed across 5 stations with fruit and 5 stations with fish (DeVries, 1988; Díaz-Urbina et al., 2021; Rueda et al., 2020; Velasco et al., 2021). In addition, two field workers actively searched for butterflies between 8:00 a.m. and 5:00 p.m. using entomological nets (Figure 2).

All butterfly specimens collected were sacrificed and stored in parchment paper envelopes following the protocols of Andrade et al. (2013) and Villareal et al. (2004). For taxonomic determination, the guides proposed by D'Abrera (1981, 1987a, 1987b), Le Crom et al. (2002; 2004), the BioButterfly Database by Garwood et al. (2022), Vélez and Salazar (1991), and reports from previous studies

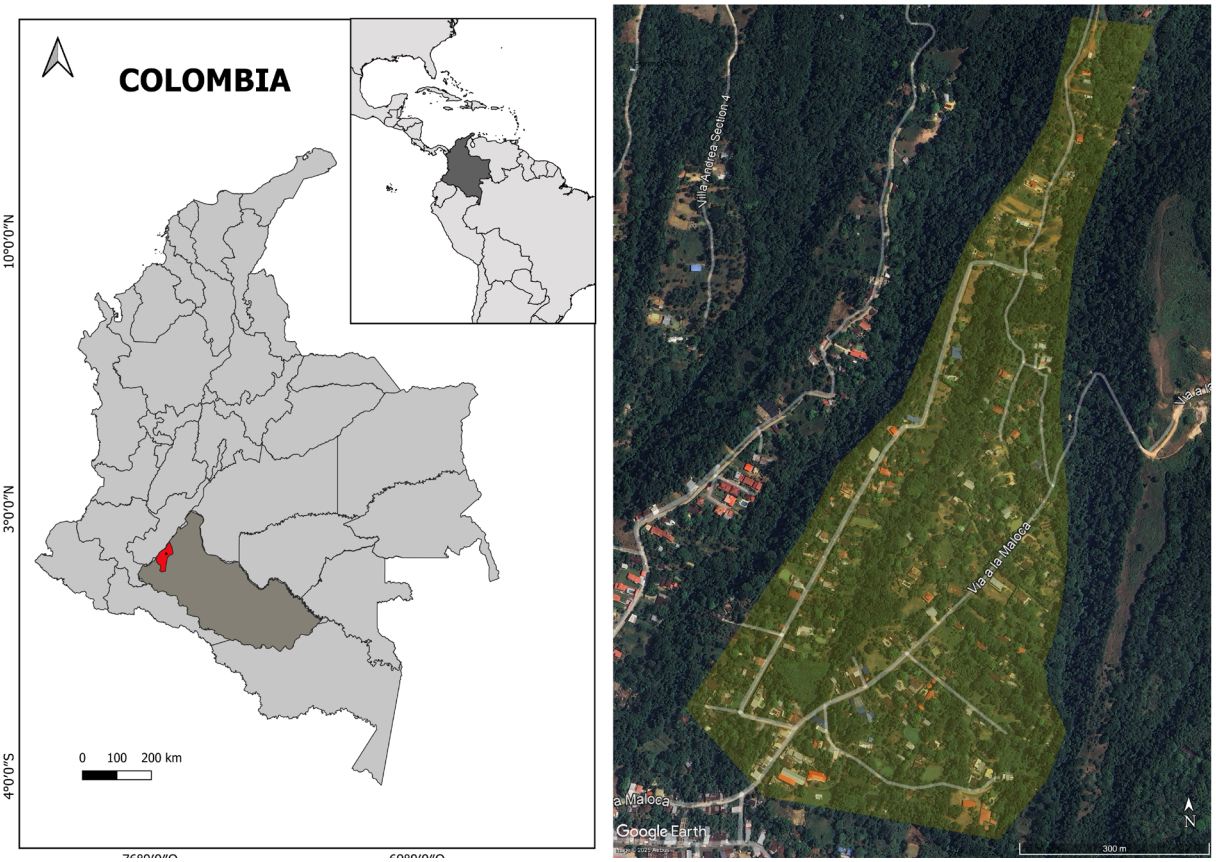

Figure 1. Location of the Uruki-El Manantial RNCE in the municipality of Florencia, Caquetá, Colombia.

by Ramos-Artunduaga et al. (2021a, 2021b, 2024) and Henao-Bañol et al. (2022). The taxonomy according to Butterflies of America (Warren et al., 2024) was followed.

RESEARCH DATA

The data used in this research contains structured information on diurnal butterflies (Lepidoptera: Papilionoidea) collected in the Uruki–El Manantial RNCE in Florencia, Colombia. This data was collected during a 15-day sampling period in December 2022 and is organized by family, subfamily, genus, species, and abundance at ten sampling stations. This set includes a list of species distributed across six families. In addition, the richness and distribution of butterfly species in the reserve were evaluated, identifying patterns of abundance and diversity, and the correlation with vegetation cover using the Jaccard similarity index.

Currently, the complete data are stored in the personal collection of Kimberly Ivonne Nieto Morea (KNM-LEP), where they can be accessed by prior communication to nietomoreak@gmail.com. The specimens collected in this study are covered by specimen collection permit No. 01140 of 2016, issued by the University of the Amazon – Ministry of Environment and Sustainable Development.

RESULTS AND DISCUSSION

A total of 1,210 specimens were collected, belonging to six families, 17 subfamilies, and 95 species. The distribution of richness was mainly represented by the families Nymphalidae, with 51.4% (45 spp., 622 individuals), Hesperiidae, 17.4% (21 spp., 210 individuals), and Pieridae, 19% (11 spp., 230 individuals). The least represented families were Lycaenidae, 10.8% (9 spp., 131 individuals), Riodinidae 0.7% (6 spp., 9 individuals), and Papilionidae 0.7% (3 spp., 8 individuals) (Figure 3).

The fact that the Nymphalidae family has the highest number of specimens and the greatest species richness is consistent with various studies conducted in Colombia (Boom-Urueta et al., 2013; Domínguez et al., 2019; Gaviria-Ortiz & Henao-Bañol 2011; Henao et al., 2018, Millán et al., 2009; Orozco et al., 2010; Ramos-Artunduaga et al., 2021a). Nymphalidae represents a high morphological, biological, ecological, and adaptive

Figure 2. Methods and work areas in the Uruki-El Manantial RNCE, municipality of Florencia, Caquetá, Colombia. **A.** Review of VSR traps. **B.** Active search for butterflies with an entomological net. **C.** and **D.** Ecological trails in the reserve.

diversity able to colonize different ecosystems, as its species are characterized by wide distribution ranges and variability in the use of the resources offered by the ecosystem, why Nymphalidae are better represented in tropical regions (Bonebrake et al., 2010).

The record of species grouped in the genera *Parides*, *Eunica*, *Morpho*, *Archaeoprepona*, *Callicore*, *Electrostrymon*, *Lyropteryx*, *Taygetis*, *Zaretis*, *Mechanitis*, *Philaethria*, and *Napeogenes* may indicate that the ecosystem is in good conservation status or undergoing optimal ecological restoration processes, since they require dense tree cover for their biological dynamics to develop (Bonebrake et al., 2010; Kodandaramaiah et al., 2010; Orta et al., 2022; Rueda & Andrade, 2016; Seminario-Córdova & Baquero, 2022; Vélez et al., 2015). In addition, species belonging to the genus *Heliconius*, such as *H. erato*, *H. numata*, and *H. ismenius*, have high ecological specificity and are characteristic of secondary forests, distributed specifically in the understory (Merrill et al., 2015, Palacios et al., 2018; Rodríguez & Rodríguez, 2020). These genera were represented by fewer than ten individuals during the sampling, highlighting the need to increase strategies within the nature reserve to enhance the presence of species that further diversify the ecosystem structure and thus ensure greater benefits for the region.

In relation to the species' preference for attractants and the response of capture methods, it was recorded that the highest proportion of species (72 spp.) was exclusive to the net capture method, suggesting its high efficiency in active search. In addition, more species were recorded as being attracted solely by fermented fruit (6 spp.) than by decomposing fish (5 spp.), which could indicate that the availability of fruit in the environment and alternative sources of nutrients such as salts and proteins are not accessible, with most species being nectarivorous (DeVries, 1988). Meanwhile, there were two species that showed greater trophic plasticity, namely *Hermeuptychia hermes* and *Paryphthimoides terrestris* (Figure 4).

Thus, it was determined that the most representative species in the sample were *Hermeuptychia hermes* (Nymphalidae: Satyrinae) with 28.4% of the

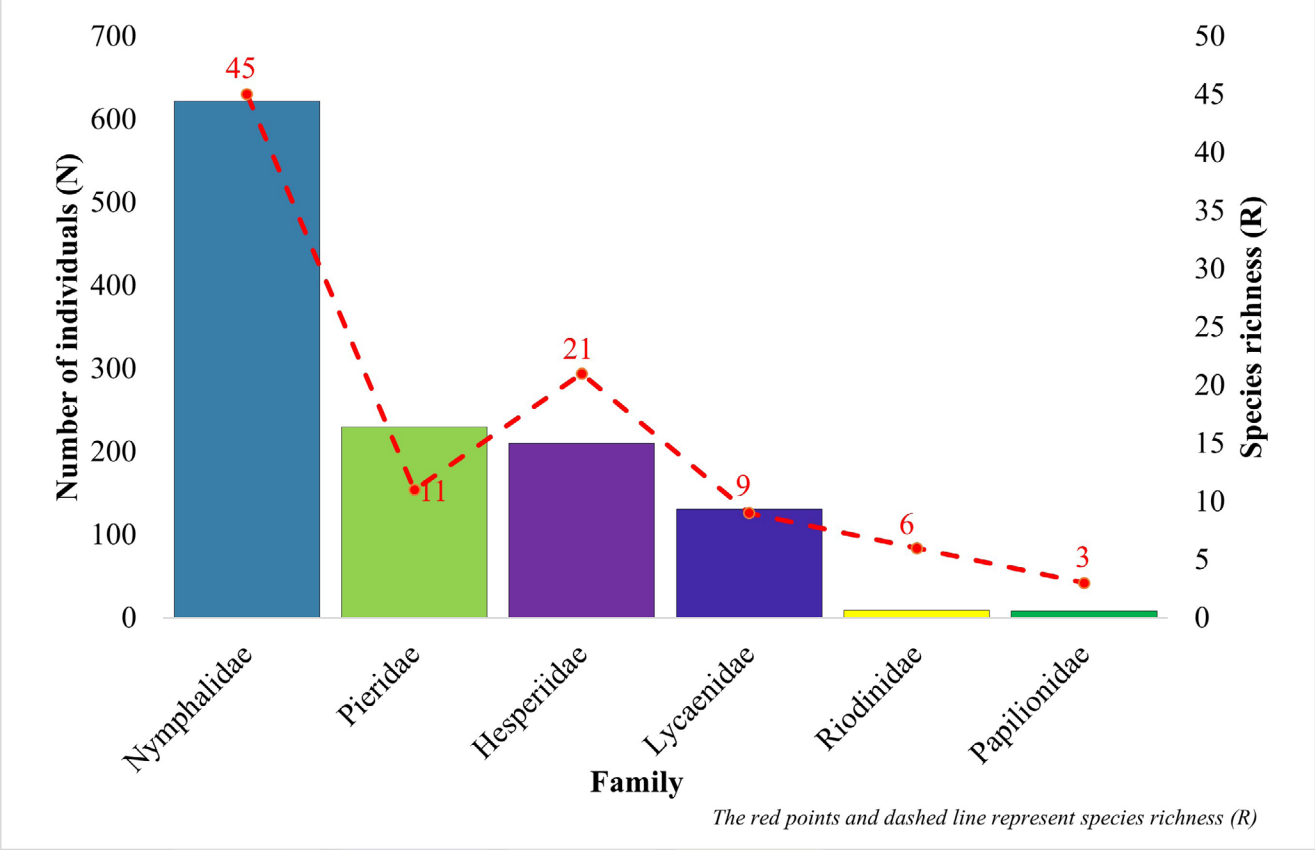

Figure 3. Representativeness of butterflies recorded in the Uruki-El Manantial RNCE, municipality of Florencia, Caquetá, Colombia.

richness, followed by *Eurema daira* (Pieridae: Coliadinae) and *Anartia jatrophae* (Nymphalidae: Nymphalinae), each with 8.5% of the species (Table 1). These species are notable for their broad tolerance and preference for disturbed ecosystems associated with secondary forests, roadside edges, open areas, and areas near settlements (Montero et al., 2009; Orozco et al., 2010; Palacios et al., 2018; Villalobos-Moreno et al., 2020).

Similarly, *Callicore cynosura*, *Kolana ligurina*, and *Bungalotis milleri* stand out with 1.05% of the total richness (1 sp.) each, and *Morpho achilles* and *Archaeoprepona demophon* with 2.1% (2 spp.) each (Figure 5), as species of ecological and tourist importance since they are visually striking in terms of their coloration patterns and size (Constantino, 2006), which is an ideal attribute for suggesting the establishment of biotrade models within the reserve. Furthermore, these species are restricted to conserved forests, indicating that the ecosystem is undergoing natural regeneration and ecosystem restoration (Flores-Pacheco et al., 2021).

The composition of species recorded in the sampled areas reinforces these results, given that

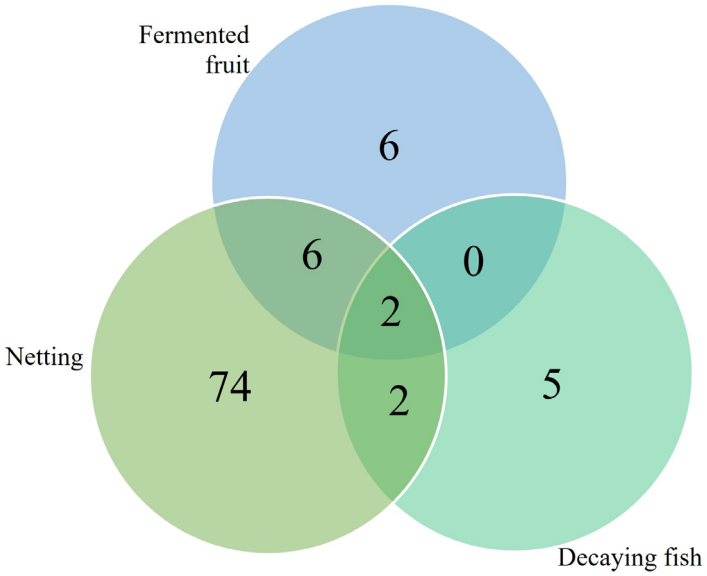

Figure 4. Venn diagram of species according to collection method in the Uruki-El Manantial RNCE.

the Jaccard similarity analysis (Figure 6) shows that the pasture and forest edge have the highest similarity value (0.4). This affinity can be explained by the presence of shared structural elements, such as secondary vegetation, greater canopy openness, and the influence of anthropogenic activities (Jaramillo-Castillo et al., 2023). These conditions favor species that are tolerant to disturbance and adapted to open habitats, including *Hermeuptychia hermes*, *Anartia jatrophae*, and *Eurema daira*, which were dominant in the sampling.

This grouping suggests that forest and pasture edges, although functionally different, support similar biological communities (Neumann et al., 2016), highlighting the importance of landscape heterogeneity in the RNCE–El Manantial. In contrast, the forest (0.25) reflects a more distant grouping, evidencing a specific composition with species indicative of preserved habitat quality and greater structural integrity, such as *Morpho achilles*, *Callicore cynosura*, *Archaeoprepona demophon*, and *Philaethria dido*, which depend on stable microclimatic conditions, dense forest canopy, ecosystems in ecological succession, and specialized trophic resources (Castro-González, 2023).

The diversity of butterflies recorded in the RNCE–El Manantial is directly influenced by its structural heterogeneity. The mosaic of land uses, which includes areas of agroecological production, areas of regenerating forest, water bodies, and community infrastructure (indigenous maloca, ecological trails, roads, and human settlements), generates a variety of available microhabitats. In addition, the proximity of the reserve to the urban center of Florencia makes it a buffer zone between

Revista Actualidades Biológicas
Actual. Biol. 47(123): e4711, 2025 | Jul-Dec| Medellin DOI:10.17533/udea.acbi/v47n123a11

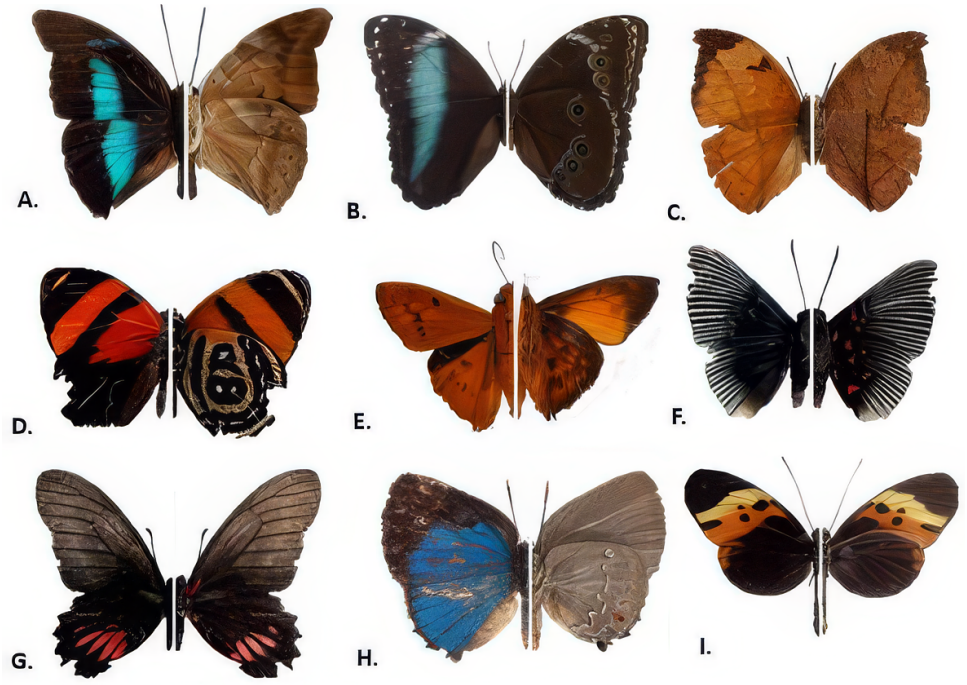

Figure 5. Some butterflies of interest in the Uruki-El Manantial National Nature Reserve. **A.** *Archaeoprepona demophon*. **B.** *Morpho achilles*. **C.** *Zaretis itys*. **D.** *Callicore cynosure*. **E.** *Bungalotis milleri*. **F.** *Lyropteryx lyra*. **G.** *Heraclides torquatus*. **H.** *Kolana ligurina*. **I.** *Heliconius numata*.

the urban environment and the forest edge of the Amazon Forest Reserve (Ley 2ª de 1959). This configuration not only allows the coexistence of species with different ecological requirements, but also favors the presence of rare or uncommon butterflies, which represent 54.7% of all samples, reinforcing the value of the reserve as a key nucleus for conservation and urban-rural ecological connectivity through a functional heterogeneous landscape.

CONCLUSIONS

This study reveals the diversity of butterflies in the Uruki–El Manantial National Conservation Area, highlighting the Nymphalidae family as the most representative, accounting for 51.4% of the sample. Likewise, the presence of rare or uncommon butterflies was recorded, representing 54.7% of the entire sample, which highlights the value of the Uruki–El Manantial RNCE as a refuge for species of conservation interest. The low representation of certain genera, such as *Archaeoprepona*, *Morpho*, *Zaretis*, *Callicore*, *Bungalotis*, *Lyropteryx*, and *Kolana*, among others, points to the need to establish measures adapted to the local context to protect specific habitats and promote connectivity between forest fragments, since these taxonomic

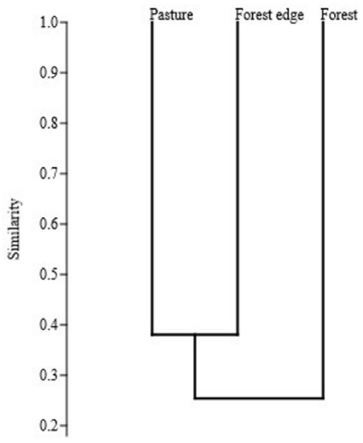

Figure 6. Dendrogram of the Jaccard similarity index for the sampled vegetation cover.

Table 1. Richness and composition of butterflies recorded in the Uruki-El Manantial RNCE in Florencia (Caquetá), Colombia.

Species	Coverage			Attractant		Captura con red	Relative Abundance %	Total	Category
	Forest edge	Forest	Pasture	Fruit	Fish				
Hesperiidae									
Autochton bipunctatus Gmelin, [1790]	2	0	1	0	0	3	0.2	3	NE
Bungalotis astylos Cramer, 1780*	1	0	0	0	1	0	0.1	1	NE
Bungalotis milleri Freeman, 1977*	1	0	0	0	0	1	0.1	1	NE
Burnsius orcus Stoll, 1780	34	0	27	0	0	61	5.0	61	NE
Callimormus juventus Juventus, 1872*	1	0	0	0	0	1	0.1	1	NE
Cecropterus dorantes Linnaeus, 1758	2	0	3	0	0	5	0.4	5	NE
Chioides catillus Evans, 1952	13	1	12	0	0	26	2.1	26	NE
Cogia calchas Herrich-Schäffer, 1869	11	0	5	0	0	16	1.3	16	NE
Cogia troilus Mabille, 1898*	1	0	0	0	0	1	0.1	1	NE
Epargyreus aspina Evans, 1952*	1	0	0	0	0	1	0.1	1	NE
Euriphellus euribates Stoll, 1782*	1	0	0	0	1	0	0.1	1	NE
Heliopetes arsalte Linnaeus, 1758	6	0	5	0	0	11	0.9	11	NE
Hyalothyrus neleus Linnaeus, 1758*	1	0	0	0	0	1	0.1	1	NE
Pompeius pompeius Latreille, [1824]*	1	0	0	0	0	1	0.1	1	NE
Spicauda procne Plötz, 1880	11	4	8	0	1	22	1.9	23	NE
Spicauda simplicius Stoll, 1790*	2	0	0	0	1	1	0.2	2	NE
Spicauda teleus Hübner, 1821	11	0	11	0	0	22	1.8	22	NE
Urbanus esmeraldus Butler, 1877	6	0	0	0	0	6	0.5	6	NE
Vernia verna Edwards, 1862	9	0	10	0	0	19	1.6	19	NE
Vidius fraus Godman, 1900*	0	0	1	0	0	1	0.1	1	NE
Zariaspes mys Hübner, [1808]	4	1	2	0	0	7	0.6	7	NE
Lycaenidae									
Calycopis isobeon Butler & H. Druce, 1872	6	1	2	0	0	9	0.7	9	NE
Cupido comyntas Godart, [1824]	34	0	39	0	0	73	6.0	73	NE
Cyanophrys herodotus Fabricius, 1793*	0	0	1	0	0	1	0.1	1	NE
Electrostrymon hugon Godart, [1824]	4	0	1	0	0	5	0.4	5	NE

Revista Actualidades Biológicas

Actual. Biol. 47(123): e4711, 2025 | Jul-Dec| Medellin DOI:10.17533/udea.acbi/v47n123a11

Species	Coverage			Attractant		Captura con red	Relative Abundance %	Total	Category
	Forest edge	Forest	Pasture	Fruit	Fish				
Hemiargus hanno Fabricius, 1793	18	1	20	0	0	39	3.2	39	NE
Kolana ligurina Hewitson, 1874*	1	0	0	0	0	1	0.1	1	NE
Leptotes cassius Cramer, 1775*	1	0	0	0	0	1	0.1	1	NE
Ministrymon una Hewitson, 1873*	0	0	1	0	0	1	0.1	1	NE
Tmolus echion Linnaeus, 1767*	0	0	1	0	0	1	0.1	1	NE
Nymphalidae									
Adelpha cocala Cramer, 1779	4	3	1	0	0	8	0.7	8	NE
Adelpha cytherea Linnaeus, 1758	2	1	2	1	0	4	0.4	5	NE
Adelpha donysa Hewitson, 1847*	1	0	0	0	0	1	0.1	1	NE
Adelpha thessalia C. Felder & R. Felder, 1867*	1	0	0	0	1	0	0.1	1	NE
Amiga arnaca Fabricius, 1776	4	2	1	0	0	7	0.6	7	NE
Anartia amathea Linnaeus, 1758	14	0	9	0	0	23	1.9	23	NE
Anartia jatrophae Linnaeus, 1763	66	0	37	0	0	103	8.5	103	NE
Archaeoprepona demophon Linnaeus, 1758*	1	0	1	2	0	0	0.2	2	NE
Callicore cynosura Doubleday, [1847]*	1	0	0	1	0	0	0.1	1	NE
Cissia penelope Fabricius, 1775	7	2	4	1	0	12	1.1	13	NE
Cissia proba Weymer, 1911*	0	0	1	0	0	1	0.1	1	NE
Colobura dirce Linnaeus, 1758	3	3	1	6	0	1	0.6	7	NE
Dione juno Cramer, 1779*	0	0	2	0	0	2	0.2	2	NE
Dryas iulia Fabricius, 1775*	0	0	1	0	0	1	0.1	1	NE
Dynamine pebana Staudinger, [1885]*	1	0	0	0	1	0	0.1	1	NE
Eresia clio Linnaeus, 1758*	1	0	0	0	0	1	0.1	1	NE
Eueides aliphera Godart, 1819*	0	1	0	0	0	1	0.1	1	NE
Eueides tales Cramer 1775*	0	0	1	0	0	1	0.1	1	NE
Eunica malvina Fabricius, 1775*	0	0	1	0	0	1	0.1	1	NE
Eunica mygdonia Godart, 1824*	1	0	0	1	0	0	0.1	1	NE
Euptychia mollis Staudinger, 1876*	0	0	1	0	0	1	0.1	1	NE

Species	Coverage			Attractant		Captura con red	Relative Abundance %	Total	Category
	Forest edge	Forest	Pasture	Fruit	Fish				
Heliconius erato Linnaeus, 1758	2	1	4	0	0	7	0.6	7	NE
Heliconius ismenius Latreille, 1817	3	0	0	0	0	3	0.2	3	NE
Heliconius numata Cramer, 1780	3	0	0	0	0	3	0.2	3	NE
Hermeuptychia hermes Fabricius, 1775	273	3	68	3	2	339	28.4	344	NE
Historis odius Fabricius, 1775*	1	0	0	1	0	0	0.1	1	NE
Hypothyris euclea Godart, 1819	3	0	1	0	0	4	0.3	4	NE
Junonia genoveva Cramer, 1780	30	0	7	0	0	37	3.1	37	NE
Magneuptychia libye Linnaeus, 1767	3	1	0	1	0	3	0.3	4	NE
Mechanitis menapis Hewitson, 1856*	1	0	0	0	0	1	0.1	1	NE
Mechanitis polymnia Linnaeus, 1758	2	1	0	0	0	3	0.2	3	NE
Melinaea marsaeus Hewitson, 1860	3	0	0	0	0	3	0.2	3	NE
Metamorpha elissa Hübner, 1819	4	1	4	0	0	9	0.7	9	NE
Methona confusa Butler, 1873*	1	0	0	0	0	1	0.1	1	NE
Morpho achilles Linnaeus, 1758*	1	0	1	1	0	1	0.2	2	NE
Napeogenes sylphis Guérin-Méneville, [1844]*	1	0	0	0	1	0	0.1	1	NE
Opsiphanes cassina Felder, 1862*	0	1	0	0	0	1	0.1	1	NE
Pareuptychia ocirrhoe Fabricius, 1776	4	0	0	0	0	4	0.3	4	NE
Pareuptychia summandosa Gosse, 1880*	2	0	0	1	0	1	0.2	2	NE
Paryphthimoides terrestris Butler, 1867	3	1	0	1	1	2	0.3	4	NE
Philaethria dido Linnaeus, 1763*	2	0	0	0	0	2	0.2	2	NE
Taygetis thamyra Cramer, [1779]*	0	1	0	0	0	1	0.1	1	NE
Tegosa pastazena Bates, 1864*	1	0	0	0	0	1	0.1	1	NE
Temenis laothoe Maza & Turrent, 1985*	1	0	0	1	0	0	0.1	1	NE
Zaretis itys Cramer, [1777]*	1	0	0	1	0	0	0.1	1	NE
Papilionidae									
Heraclides paeon Boisduval, 1836	2	0	4	0	0	6	0.5	6	NE
Heraclides torquatus Crámer, 1777*	0	0	1	0	0	1	0.1	1	NE

Revista Actualidades Biológicas
Actual. Biol. 47(123): e4711, 2025 | Jul-Dec| Medellin DOI:10.17533/udea.acbi/v47n123a11

Species	Coverage			Attractant		Captura con red	Relative Abundance %	Total	Category
	Forest edge	Forest	Pasture	Fruit	Fish				
Parides aeneas Linnaeus, 1758*	0	0	1	0	0	1	0.1	1	LC
Pieridae									
Abaeis albula Cramer, 1775	5	1	1	0	0	7	0.6	7	NE
Aphrissa schausi Avinoff, 1926*	1	0	0	0	0	1	0.1	1	NE
Aphrissa statira Cramer, 1777*	1	0	0	0	0	1	0.1	1	NE
Ascia monuste Linnaeus, 1764	6	0	2	0	0	8	0.7	8	NE
Eurema daira Godart, [1819]	75	3	25	0	0	103	8.5	103	NE
Eurema elathea Cramer, 1777	43	0	18	0	0	61	5.0	61	NE
Eurema phiale Cramer, 1775	4	0	0	0	0	4	0.3	4	NE
Ganyra phaloe Godart, 1819*	0	0	1	0	0	1	0.1	1	NE
Phoebis sennae Linnaeus, 1758	5	0	8	0	0	13	1.1	13	LC
Phoebis trite Linnaeus, 1758*	0	0	1	0	0	1	0.1	1	NE
Pyrisitia venusta Boisduval, 1836	23	0	7	0	0	30	2.5	30	NE
Riodinidae									
Amarynthis meneria Cramer, 1776	0	1	2	0	0	3	0.2	3	NE
Juditha azan Westwood, [1851]*	1	0	0	0	0	1	0.1	1	NE
Juditha caucana Stichel, 1911*	1	0	0	0	0	1	0.1	1	NE
Lyropteryx lyra Saunders, 1859*	1	0	0	0	0	1	0.1	1	NE
Nymphidium caricae Linnaeus, 1758*	2	0	0	0	0	2	0.2	2	NE
Theope publius Felder & R. Felder, 1861*	1	0	0	0	0	1	0.1	1	NE

* Rare species ≤ 2 individuals.

groups are a good indicator of the natural regeneration processes that have been developing within the reserve.

Although the most representative species in the sample were *Hermeuptychia hermes*, *Eurema daira*, and *Anartia jatrophae*, species that are indicators of ecosystems under anthropogenic pressure, species that are indicators of good conservation status were also recorded, such as *Callicore cynosura*, *Kolana ligurina*, *Bungalotis milleri*, *Morpho achilles*, *Archaeoprepona demophon*, among others, which suggest the importance of protecting and restoring forests, and thus developing conservation strategies, some proposals such as: i) implementing programs to plant plants that feed and shelter butterflies, ii) establishing strategic gardens with native plants to attract butterflies and facilitate connectivity between habitats, and iii) promoting community initiatives to create and care for biological corridors. In addition, potential species should be identified as tourist attractions to serve as a strategy for promoting sustainable biotrade practices. Therefore, it is suggested that further studies be conducted on butterflies using different approaches in order to monitor and expand knowledge of the surrounding diurnal butterflies in the Uruki–El Manantial RNCE.

ACKNOWLEDGMENTS

We would like to express our gratitude to the community of the Uruki–El Manantial RNCE in Florencia for their willingness and support in ensuring that the fieldwork was carried out in optimal conditions. We would also like to thank Fernando Hoyos (Florencia, Colombia), who has carried out previous work in the reserve and acted as a liaison to manage access to the community. Likewise, we would like to thank Mario Marín Uribe (Medellín, Colombia) and Clemencia Serrato (Florencia, Colombia) for their comments and observations during the course of the research. The English version was translated by *Actualidades Biológicas* Journal.

AUTHOR CONTRIBUTIONS

KNM: consolidated the research from the methodological structuring, field execution, laboratory analysis, and final drafting of the article. EHR: participated in the execution of the field and laboratory work and contributed to the drafting of the article. JRA: made significant contributions to the structuring of the methodological framework and contributed to the drafting, review, and final correction of the article.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

REFERENCES

Ahumada-C, D., Borja-Arrieta, R., Carpio-Díaz, Y. M., Sandoval-Bernal, A., Ríos-Guzmán, G., Jotty-Arroyo, K. & Gómez-Estrada, H. (2022). Mariposas (Lepidoptera: Papilionoidea) del archipiélago Islas del Rosario, Caribe colombiano, un estudio de caso en Isla Grande. *Boletín Científico Centro de Museos Museo de Historia Natural, 26*(2), 179–193. https://doi.org/10.17151/bccm.2022.26.2.9

Andrade-C., M. G., Henao-Bañol, E. R. & Triviño, P. (2013). Técnicas y procesamiento para la recolección, preservación y montaje de mariposas en estudios de biodiversidad y conservación. (Lepidoptera: Hesperioidea-Papilionoidea). *Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales, 37*(144), 311-325. https://doi.org/10.18257/raccefyn.12

Bonebrake, T. C., Ponisio, L. C., Boggs, C. L. & Ehrlich, P. R. (2010). More than just indicators: a review of tropical butterfly ecology and conservation. *Biological conservation, 143*(8), 1831-1841. https://doi.org/10.1016/j.biocon.2010.04.044

Boom-Urueta, C., Seña-Ramos, L., Vargas-Zapata, M. & Martínez-Hernández, N. (2013). Mariposas Hesperioidea y Papilionoidea (insecta: lepidoptera) en un fragmento de bosque seco tropical, Atlántico, Colombia. *Boletín Científico Centro de Museos Museo de Historia Natural, 17*(1), 149–167. https://revistasojs.ucaldas.edu.co/index.php/boletincientifico/article/view/4529

Brown, K. S. & Freitas, A. V. L. (2000). Atlantic Forest butterflies: indicators for landscape conservation. *Biotropica, 32*(4B), 934-956. https://doi.org/10.1111/j.1744-7429.2000.tb00631.x

Brown, K. S. & Freitas, A. V. L. (2002). Butterfly communities of urban forest fragments in Campinas, São Paulo, Brazil: structure, instability, environmental correlates, and conservation. *Journal of Insect Conservation. 6*(3), 217–231. https://doi.org/10.1023/A:1024462523826

Camero, É. & Calderón, A. M. (2007). Comunidad de mariposas diurnas (Lepidoptera: Rhopalocera) en un gradiente altitudinal del cañón del río Combeima-Tolima, Colombia. *Acta Biológica Colombiana, 12*(2), 95-110. https://revistas.unal.edu.co/index.php/

actabiol/article/view/27198

Carabalí-Banguero, D. J. & Carabalí, M. C. (2019). Las mariposas como estrategia didáctica en el aprendizaje de la taxonomía básica y reconocimiento de la biodiversidad. *Revista Interamericana de Investigación Educación y Pedagogía RIIEP, 12*(1), 285–293. https://doi.org/10.15332/s1657-107X.2019.0001.05

Castro-González, L. (2023). Cambio en las coberturas de la tierra y su relación con la riqueza de mariposas diurnas del Parque Natural Regional Serranía de las Quinchas. [Tesis de pregrado, Universidad Pedagógica y Tecnológica de Colombia] https://repositorio.uptc.edu.co//handle/001/9205

Constantino, L. M. (2006). Biocomercio sostenible de insectos: Estado actual, perspectivas y dificultades del mercado en Colombia con especial referencia en Coleóptera y Lepidóptera. En E. M. Cenicafé (Ed.), *Memorias del XXXIII Congreso de la Sociedad Colombiana de Entomología SOCOLEN* (pp. 35–49). Manizales, Colombia. https://doi.org/10.13140/RG.2.1.3373.2009

D'Abrera, B. (1981). *Butterflies of the Neotropical region. Part 1 Papilionidae and Pieridae*. Lansdowne Editions.

D´Abrera, B. (1987a). *Butterflies of the Neotropical region. Part III* (pp. 385-525). Hill House.

D´Abrera, B. (1987b). *Butterflies of the Neotropical region. Part IV* (pp. 527-678). Hill House.

David-Rodríguez, M. (2023). La importancia de las reservas naturales urbanas como espacios de identidad ecológica de los territorios. *Cienciamatria, 9*(17), 207-222. https://doi.org/10.35381/cm.v9i17.1134

DeVries, P. J. (1988). Stratification of fruit-feeding nymphalid butterflies in a Costa Rican rain forest. *The Journal of Research on the Lepidoptera, 26*(1-4), 98-108. https://doi.org/10.5962/p.266706

Díaz-Urbina, P., Andrade-C., M. G. & Vásquez-Ramos, J. M. (2021). Diversidad de mariposas (Lepidoptera: Hesperioidea- Papilionoidea) en dos zonas del departamento del Vaupés, Colombia. *Revista De La Academia Colombiana De Ciencias Exactas, Físicas Y Naturales, 45*(177), 1175–1191. https://doi.org/10.18257/raccefyn.1402

Domínguez, R., León, M., Samaniego, J., Sunkel, O. & Sánchez, J. (2019). *Recursos naturales, medio ambiente y sostenibilidad: 70 años de pensamiento de la CEPAL* (Libros de la CEPAL, N.° 158; LC/PUB.2019/18-P). Comisión Económica para América Latina y el Caribe (CEPAL). https://hdl.handle.net/11362/44785

Fundación para la Conservación y el Desarrollo Sostenible [FCDS]. (2022). *Calor récord e incendios forestales en la Amazonía colombiana en enero*. https://fcds.org.co/

Flores-Pacheco, J. A., Saldivar-Solano, D. J., Rigby-Omier, K. K. & Murillo-Gaitán, Y. (2021). Inventario de mariposas diurnas en agroecosistemas tropicales como bioindicadores de la calidad ambiental. *Revista Torreón Universitario, 10*(27), 92–107. https://doi.org/10.5377/torreon.v10i27.10843

Garwood, K., Huertas, B., Ríos-Málaver, I. C. & Jaramillo, J. G. (2022). *Mariposas de Colombia. Lista de chequeo* (2ª ed.) BioButterfly Database. http://www.butterflycatalogs.com

Gaviria-Ortiz, F. G. & Henao-Bañol, E. R. (2011). Diversidad de mariposas diurnas (Hesperioidea-Papilionoidea) del Parque Natural Regional El Vínculo (Buga-Valle del Cauca). *Boletín Científico Centro de Museos Museo de Historia Natural, 15*(1), 115–133. https://revistasojs.ucaldas.edu.co/index.php/boletincientifico/article/view/4432

Henao-Bañol, E. R., Páez, A. & Rodríguez-M, J. V. (2018). Inventario de mariposas diurnas (Lepidoptera: Hesperioidea-Papilionoidea) de la reserva forestal productora protectora de la cuenca alta del río Bogotá (RFPP-CARB). *Boletín Científico Centro de Museos Museo de Historia Natural, 22*(2), 144–171. https://doi.org/10.17151/bccm.2018.22.2.11

Henao-Bañol, E. R., Rodriguez-Chilito, E. P. & Velásquez-Valencia, A. (2022). Caracterización entomológica (mariposas, escarabajos coprófagos y abejas de las orquídeas) en la vereda Peregrinos en el marco de las expediciones Caquetá-Bio. *Revista de la Facultad de Ciencias, 11*(1), 108–135. https://doi.org/10.15446/rev.fac.cienc.v11n1.98935

Henao-Bañol, E. R. & Gantiva-Q, C. H. (2020). Mariposas (Lepidóptera: Hesperioidea-Papilionoidae) del bosque seco tropical (BST) en Colombia. Conociendo la diversidad en un ecosistema amenazado. *Boletín Científico Centro de Museos Museo de Historia Natural, 24*(1), 150–196. https://doi.org/10.17151/bccm.2020.24.1.10

Holdridge, L. R., Grenke, W. C. Hatheway, W. H., Liang, T. & Tosi, J. A. (1971). *Forest environments in tropical life zones: a pilot study*. Pergamon Press.

Huertas, B., & Ríos-C, J. (2006). Estudio de las mariposas diurnas de la serranía de los Yariguíes y su conservación (Lepidóptera: Papilionoidea) En Huertas B. & Donegan T. (Eds.). *Proyecto YARÉ: Investigación y evaluación de las especies amenazadas de la Serranía de los Yariguíes, Santander, Colombia* (pp. 44-55). BP Conservation Programme.

Jaramillo-Castillo, D., Amarillo-Suárez, A. R. & Suarez-Guacaneme, J. F. (2023). Efecto de las áreas perturbadas y la precipitación en las redes ecológicas de mariposas (Lepidoptera: Papilionoidea y Hesperoidea) y Angiospermas en Bosque Seco Tropical Colombiano. *Caldasia, 45*(1), 98-112. https://doi.org/10.15446/caldasia.v45n1.95320

Kodandaramaiah, U., Lees, D. C., Müller, C. J., Torres, E.,

Karanth, K. P. & Wahlberg, N. (2010). Phylogenetics and biogeography of a spectacular Old World radiation of butterflies: the subtribe Mycalesina (Lepidoptera: Nymphalidae: Satyrini). *BMC Evol Biol, 10*, 172. https://doi.org/10.1186/1471-2148-10-172

Kremen, C., Colwell, R. K., Erwin, T. L., Murphy, D. D., Noss, R. F. & Sanjkayan, M. A. (1993). Terrestrial arthropod assemblages: Their use in Conservation Planning. *Conservation Biology. 7*(4), 796-808. https://doi.org/10.1046/j.1523-1739.1993.740796.x

Le Crom, J. F., Constantino, L. M. & Salazar, J. A. (2002). *Mariposas de Colombia. Tomo I: Papilionidae*. Carlec Ltda.

Le Crom, J. F., Llorente, J., Constantino, L. M. & Salazar, J. A. (2004). *Mariposas de Colombia. Tomo II: Pieridae*. Carlec Ltda.

Mateus, Y. S. (2019). La deforestación en Colombia - propuestas para la mitigación de sus efectos. [Tesis de posgrado, Universidad Militar Nueva Granada]. https://hdl.handle.net/10654/35851

Merrill, R. M., Dasmahapatra, K. K., Davey, J. W., Dell'Aglio, D. D., Hanly, J. J., Huber, B., Jiggins, C. D., Joron, M., Kozak, K. M., Llaurens, V., Martin, S. H., Montgomery, S. H., Morris, J., Nadeau, N. J., Pinharanda, A. L., Rosser, N., Thompson, M. J., Vanjari, S., Wallbank, R. W. R. & Yu, Q. (2015). The diversification of Heliconius butterflies: what have we learned in 150 years?, *Journal of Evolutionary Biology, 28*(8)1417–1438. https://doi.org/10.1111/jeb.12672

Millán, C., Chacón, P. & Giraldo, A. (2009). Estudio de la comunidad de lepidópteros diurnos en zonas naturales y sistemas productivos del municipio de Caloto (Cauca, Colombia). *Boletín Científico Centro de Museos Museo de Historia Natural, 13*(1), 185–195. https://revistasojs.ucaldas.edu.co/index.php/boletincientifico/article/view/5328

Montero-A., F., Moreno-P., M. & Gutiérrez-M., L. C. (2009). Mariposas (Lepidoptera: Hesperioidea y Papilionoidea) asociadas a fragmentos de bosque seco tropical en el departamento del Atlántico, Colombia. *Boletín Científico Centro de Museos Museo de Historia Natural, 13*(2), 157–173. https://revistasojs.ucaldas.edu.co/index.php/boletincientifico/article/view/5302

Neumann, J. L., Griffiths, G. H., Foster, C. W. & Holloway, G. J. (2016) The heterogeneity of wooded-agricultural landscape mosaics influences woodland bird community assemblages. *Landscape Ecology, 31*(8), 1833-1848. https://doi.org/10.1007/s10980-016-0366-x

Orozco, S., Muriel, S. B. & Palacio, J. (2010). Diversidad de lepidópteros diurnos en un área de bosque seco tropical del occidente antioqueño. *Actualidades Biológicas, 31*(90), 1–11. https://doi.org/10.17533/udea.acbi.4727

Orta-S, C., Reyes-Agüero, J. A., Luis-Martínez, M. A., Muñoz-Robles, C. A. & Méndez-C., H. (2022). Mariposas bioindicadoras ecológicas en México. Artículo de revisión. *Acta Zoológica Mexicana (n.s.), 38*(1), 1–33. https://doi.org/10.21829/azm.2022.3812488

Palacios-Mayoral, V. D., Palacios-Mosquera, L. & Jiménez-Ortega, A. M. (2018). Diversidad de mariposas diurnas (Lepidoptera: Papilionoidea) asociadas con tres hábitats en el corregimiento de Pacurita, municipio de Quibdó, Chocó, Colombia. *Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales, 42*(164), 237–245. https://doi.org/10.18257/raccefyn.607

Quintero-Gallego, M. E. (2014). Proceso de fragmentación de las coberturas vegetales en la reserva natural la Montaña del Ocaso y las zonas aledañas, entre los años 1954 a 2009. *Revista de la Asociación Colombiana de Ciencias Biológicas, 1*(26). https://revistaaccb.org/r/index.php/accb/article/view/13

Ramos-Artunduaga, J., García, M., Gutiérrez-Galindo, K., Nieto-Morea, K. & Renis-Cogollo, Y. (2024). *Mariposas diurnas del piedemonte andino y la llanura amazónica en Caquetá, Colombia*. Field Guides – Field Museum. https://science.fieldmuseum.org/fieldguides/guides/guide/1639

Ramos-Artunduaga J., Velasquez-Valencia, A. & Salazar-E, J. A. (2021b) *Mariposas diurnas del Parque Natural Regional Miraflores y Picachos, Puerto Rico, Caquetá, Colombia*. Field Guides – Field Museum. https://science.fieldmuseum.org/fieldguides/guides/guide/1421

Ramos-Artunduaga, J., Londoño-Carvajal, C. A. & Marín-Uribe, A. (2021a). Mariposas asociadas a bosques en Solano, Caquetá, Amazonia Colombiana (Lepidoptera: Papilionoidea). *Biota Colombiana, 22*(2), 56-69. https://doi.org/10.21068/c2021.v22n02a03

Rodríguez-Cardozo, N. R., Arriaga, N. C. & Díaz-Ricauter, J. C. (2016). Diversidad de anuros en la Reserva Natural Comunitaria El Manantial, Florencia, Caquetá, Colombia. *Revista Biodiversidad Neotropical, 6*, 212-220. https://doi.org/10.18636/bioneotropical.v6i2.328

Rodríguez-G, G. & Rodríguez-G, C. (2020). Una nueva subespecie de Morpho cypris Westwood, 1851, descubierta en la zona norte de la cordillera central de Colombia (Lepidoptera, Nymphalidae). *Boletín Científico Centro de Museos Museo de Historia Natural, 24*(1), 89-100. https://doi.org/10.17151/bccm.2020.24.1.6

Rueda-M. N., Gantiva, Q. C. & Andrade-C, M. (2020). Mariposas de la Reserva Natural Bojonawi y zonas adyacentes (Escudo Guayanés), Orinoquia, Vichada, Colombia. En C. A. Lasso, F. Trujillo, & M. A. Morales-Betancourt (Eds.), *Biodiversidad de la Reserva Natural Bojonawi, Vichada, Colombia: río Orinoco y planicie de inundación* (pp. 169-190). Instituto de Investigación de Recursos Biológicos Alexander von Humboldt. http://

hdl.handle.net/20.500.11761/35764

Rueda-M, N. & Andrade-C, M. G. (2016). El género Heliconius Kluk, 1708 en dos hábitats de diferente grado de conservación en la Amazonia colombiana y aportes para su conservación. *Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales, 40*(157), 653–663. https://doi.org/10.18257/raccefyn.382

Seminario-Córdova, R. & Baquero, E. (2022). Lista preliminar de los lepidópteros diurnos (Lepidoptera: Papilionoidea) presentes en el bosque El Pelejo, San Martín, Perú. *Revista Chilena De Entomología, 48*(1). https://www.biotaxa.org/rce/article/view/73656

Uruki-El Manantial (2024). *Reserva Natural Comunitaria y Ecoturística Uruki-El Manantial*. https://www.urukielmanantial.org/etnoturismo/

Velasco-Rojas, G. D., Gallego-Cotazo, K. N., Becoche-Mosquera, J. M. & Bolaños-Martínez, I. A. (2021). Mariposas (Lepidoptera: Papilionoidea) de Tierradentro, San Andrés de Pisimbalá, Cauca, Colombia. *Actualidades Biológicas, 43*(115), 1–16. https://doi.org/10.17533/udea.acbi/v43n115a04

Vélez, D. M., Gallego-Ropero, M. C. & Riascos-Forero, Y. (2015). Diversidad de mariposas diurnas (Insecta: Lepidóptera) de un bosque subandino, Cajibío, Cauca. *Boletín Científico Centro de Museos Museo de Historia Natural, 19*(1), 263–285. https://doi.org/10.17151/bccm.2015.19.1.20

Vélez, J. & Salazar, J. (1991). *Mariposas de Colombia* (1ª ed.). Villegas Editores.

Villalobos-Moreno, A., Cepeda-Olave, N., Salazar-E, J. A. & Agudelo-Martínez, J. C. (2020). Mariposas de la familia Pieridae (Lepidoptera: Papilionoidea) de la cuenca del río Frío, Andes nororientales de Santander, Colombia. *Revista Chilena De Entomología, 46* (3). https://www.biotaxa.org/rce/article/view/64653

Villareal, H., Álvarez, M., Córdoba, S., Escobar, F., Fagua, G., Gast, F., Mendoza, H., Ospina, M. & Umaña, A., (2004). *Manual de métodos para el desarrollo de inventarios de biodiversidad*. Instituto de Investigación de Recursos Biológicos Alexander von Humboldt. 236 pp. http://hdl.handle.net/20.500.11761/31419

Warren, A. D., Davis, K. J., Stangeland, E. M., Pelham, J. P., Willmott, K. R. & Grishin, N. V. (2024). *Illustrated Lists of American Butterflies*. Butterflies of America. https://www.butterfliesofamerica.com/