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Assessment of Butterfly Species Diversity and Conservation Needs in Okomu National Park, Edo State

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A Boy and His Dream Foundation Study Period

Abstract
This study assessed the diversity and abundance of butterfly species in relation to environmental factors within Okomu National Park. Butterflies are widely recognized as ecological bio-indicators due to their sensitivity to environmental changes. They play essential roles in pollination, ecosystem balance, and biodiversity maintenance.
Sampling was conducted using multiple methods, including line transects, hand sweep nets, fruit bait, and organic attractants. Data collected between August 2025 and February 2026 were analyzed using descriptive statistics, diversity indices, and Pearson correlation.
A total of 137 butterfly species across five families were recorded: Nymphalidae, Papilionidae, Pieridae, Lycaenidae, and Hesperiidae. The Nymphalidae family was the most dominant, while Hesperiidae had the lowest representation.
Findings indicate that butterfly abundance is significantly higher during the wet season, highlighting the importance of seasonal variation. Overall, the butterfly population in Okomu National Park is stable, reflecting effective conservation practices and limited human disturbance.

Significance of the Study

* Environmental Indicators: Butterflies respond quickly to environmental changes, making them reliable indicators of ecosystem health.
* Biodiversity Monitoring: High butterfly diversity reflects a healthy ecosystem supporting various species.
* Scientific Research: Butterflies serve as model organisms in ecological and evolutionary studies.
* Conservation Planning: Provides data to guide habitat protection and restoration efforts.
* Educational Value: Useful for teaching ecological concepts and environmental awareness.
* Sustainable Land Use: Supports development of biodiversity-friendly agricultural and urban practices.

1 Introduction

Butterflies are diurnal insects belonging to the order Lepidoptera, characterized by slender bodies, clubbed antennae, and brightly colored wings. Beyond their aesthetic appeal, butterflies play vital ecological roles as pollinators and environmental indicators.
Globally, butterfly populations are declining due to habitat destruction, climate change, and pollution. Their sensitivity to environmental conditions—such as temperature, humidity, and vegetation—makes them important for monitoring ecological stability.
This study aims to evaluate the abundance and distribution of butterfly species in Okomu National

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Park, a protected tropical habitat in Nigeria.

The recent openings of most of the compartments which initially was difficult to access due to obstructive canopy closure for transect walk, was advantage upon this accessment.

2 Materials and Methods

Study Area

Okomu National Park is located in Ovia South-West Local Government Area of Edo State, Nigeria, covering approximately 200 km². It lies between latitude 6°20′N and longitude 5°16′E.

fig1 - Map of Okumu National Park

The study was conducted from August 2025 to February 2026, with structured weekly sampling to capture seasonal variations.

2.1 Sampling Techniques

Butterflies were sampled at different times of the day (8:30 AM – 5:00 PM) using:

* Hand sweep nets (primary method)
* Fruit bait (fermented fruits such as banana, pineapple, orange)
* Organic attractants (e.g., animal droppings, urine)
* Line transect walks

Peak butterfly activity was observed between 10:00 AM and 3:00 PM, especially during sunny conditions.

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Fig2 - Animal Dumps (preciesly monking and silvet cat)
highly attractractive to butterfly

2.2 Line Transect Method

Transects (approximately 300 meters) were established, and butterflies within a 5-meter radius were recorded. This method allowed for accurate estimation of species richness and population density.

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Fig 3 - Line Transect Walk along various compartments

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2.3 Study Locations

Sampling was conducted across multiple ecological zones, including:

* Forest edges
* Closed canopy forests
* Riparian habitats
* Grasslands
* Shrublands
* Plantation areas

These varied habitats contributed to the diversity observed.

Arakhuan Base Camp: N6°20'35.7'' E005°21'34.5'' Elevation 49m **Shooting Range:** N6°20'38.2'' E005°20'16.3'' Ele. 108m **Compartment 61**: N06°20'08.5'' E005°20'27.4'' Ele. 54m

Gravel Road: N06°22'18.0'' E005°20'53.1'' Ele. 98m **Arakhuan Gate:** N06°21'02.0'' E005°20'26.4'' Ele.75m **Compartment 74:** N06°19'54.1'' E005°20'00.4'' Ele. 75m **Compartment 73:** N06°19'52.8'' E005°19'40.9'' Ele. 63m **Compartment 96:** N06°17'38.8'' E005°19'17.3'' Ele. 35m

Oba bush junction: N06°17'14.7'' E005°19'15.7'' Ele. 32m **Okomu Oil Palm Ext. 1:** N06°23'03.9'' E005°22'30.9'' Ele. 80m

Fig 4 - Butterfly individuals feeding on mosanga Tree

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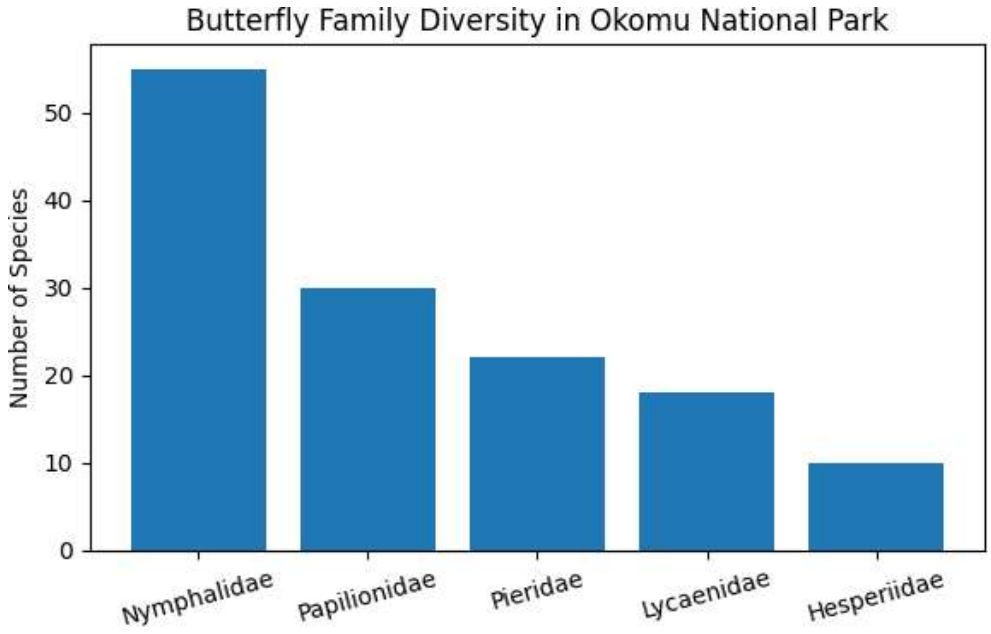
3 Results and Discussion

A total of 137 butterfly species were identified across five major families. Key findings include:

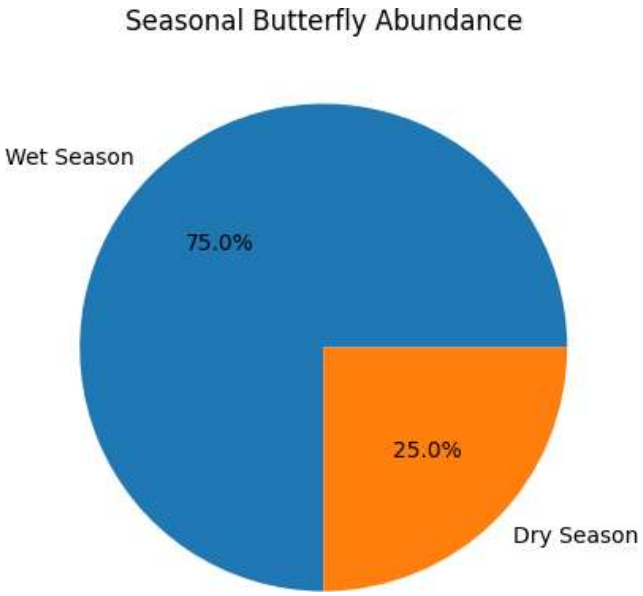
* Nymphalidae was the most dominant family
* Pieridae, Papilionidae and Lycaenidae showed moderate abundance
* Hesperiidae had the lowest representation

3.2 Data Illustration and Biodiversity Analysis

The Chart below illustrates the relative diversity of butterfly families identified during the study



Seasonal variation significantly influenced butterfly abundance, with substantially greater populations observed during the wet season.



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Papilio Dardanus, Papilio Nireus(banded green swallow tail),Charaxex brutus, Prepona Chromius, Papilio aegeus, Papilio Lormieri, Tirumala Limniace(dark blue tiger), Hypolimnas saimasis, Hypolimna anthedon, Catopsilia, Euthalia aconthea, Cymothoe caenis, Tailed pasha, Catonephele, Palla violiniteas, Nepheronia thalasina, Belenois, Mylothris chloris, Papilio cyproeopilia, Charaxex bernadus, Catuna oberthueri(pathfinder), Junonia terea, Euripus nycthlius, Melanittis leda, Phalanta Phalanta, Asota caricae, Acreaen acerata, Charaxex enpale, Cyrestis Camillus, Eurema(grass yellow), Acrea, Graphium Agamemnon, Graphium antheus, Graphium poliscene, Photogoniomarpha, Salamis pharassus, Salamis duprei, Lomographa vesteliata, Charaxex etesipe, Junonia orithya, Eupreadea thermis, Genus amauris, Hypolimnas misippus, Arhopala centaurus, Euphreadea sarcoptere, Opsipharies cassina, Udaspes folus, Enthalia acenthea, Cymothoe sangaris, Surpha erymaenthis,Divana diva, Asota heliconia, Leptosia nina, Nyctemera adversata, Limenitispopuli,Papiliomenestheus, Papiliobromium,Amauris niavius, Hypolimnas bolina, Charaxex lucretus, Danaus crisippus, Charaxes etheocles, Junonia cymodoce, Bebearia mardania, Precise arhesis, Salamis cactis, Mylothris apias, Neptis hylas, Cathosia biblis, Chlosyne necteis, Junonia oenone(dark blue pansy), Elymniosis bammakoo, Pipevine swallowtail, Acrea herta, Acrea abdera, Junonia hedonia, Papilio demodocus, Tanaecia pelea, Melanitis phedima, Myscelia ethusa, Belenois aurota, Tasta moth, Acrea terpsicore, Melanchroia chephise, Castniidae, Ariadne merione, Salamis cacti, Precis pelargy, Phelanittis, Belenoise creona, Junonia iphita, Graphium polistratus, Chocolate pansy, Papilio zarmoxis, Papilio Hesperus, Gonepterys rhamni, Julia, Monarch, Little yellow, Silver washed, Summer azure, Colias eroceus, Neozephyms quercus, Hypaurotis crysalus, Graphium angolanus, Papilio res-schultzel, Eupalamides cyparissias, Graphium illyris hamatus, Phoebis sennae, Claudless sulphur, Pieridae, Catopsilia, Papilio cyproeophita, Charaxes eupale, Papilio phorcas, Graphium liponesco, Agathine mylothris, Catopsilia florella, Catopsilia pyranthe, Antheraea yamamai, Charaxex varanes, Euphaedra ceres, Tirumala retiverana, Genus gonimbrasia Junonia lemonias, Papilio demoleus, Lycaena phlaea, Celastrina argiolus, Speyeria idalia, Aglais milberti, Erebia epiphron, Anthocharis cardamines, Abisara neophron, Epargyreus clarus,Danaus plexippus, Danaus eresimus, Asterocampa celtis, Anthocharis lanceolata, Ascia monuste, Nica flavilla.

Fig 5 - Cross Section of Butterfly Pollinating

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3.3 Key Observations

* Butterfly diversity was highest in protected and undisturbed habitats
* Rainfall significantly influenced abundance, with higher populations in the wet season
* Areas with greater plant diversity supported more butterfly species
* Open canopy areas improved visibility and sampling efficiency

Environmental factors such as rainfall, temperature, and vegetation were major drivers of species distribution

3.4 Conservation Recommendations

* Strengthen conservation policies within protected areas
* Promote ecological research and biodiversity monitoring
* Encourage eco-tourism to support conservation funding
* Expand studies to identify rare or unrecorded species
* Increase Public Environmental Education and Awareness Campaign
* Develop Long-Term Species Documentation and Biodiversity Research

4 Conclusion

The study confirms that Okumu National Park is an Ecologically important habitat supporting Butterfly Diversity and environmental stability. Protecting this habitat will contribute significantly to biodiversity conservation, ecosystem resilence, pollination, assustainable environmental management in Nigeria.

The Butterfly abundance is strongly influenced by seasonal variations, with peak activity during the wet season, A decline in butterfly populations was observed during the dry season due to reduced rainfall and increased temperature.

The presence of diverse plant species plays a critical role in sustaining butterfly populations, emphasizing the importance of habita conservation.

4 Acknowledgements

We express sincere appreciation to the management and staff of Okomu National Park for their support and collaboration throughout this study. Special recognition is given to key personnel in ecology, research, and field operations whose contributions were invaluable.

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ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Hypolimnas Salmacis
Family: Nymphalidae
Location:Okomu National Park

Name: Pieris Rape
Family: Pieridae
Location: Okomu National Park

Name: Euthalia Aconthea
Family: Nymphalidae
Location: Okomu National Park

Name: Charaxes Lucretius
Family: Nymphalidae
Location: Okomu National Park

Name: Hamadryas Laodamia
Family: Nymphalidae
Location: Okomu National Park

Name: Palla Violinitens
Family: Nymphalidae
Location: Okomu National Park

Name: Charexes Etesipe
Family: Nymphalida
Location: Okomu National Park

Name: Hamadryas Februa
Family: Nymphalidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Cymothoe Egesta
Family: Nymphalidae
Location: Okomu National Park

Name: Nepheronial Thalassina
Family: Pieridae
Location: Okomu National Park

Name: Belenois Calypso
Family: Pieridae
Location: Okomu National Park

Name:Mylothris Chloris
Family: Pieridae
Location: Okomu National Park

Name: Papilio Echerioides
Family: Papilionidae
Location: Okomu National Park

Name: Catuna Oberthueri
Family: Nymphalidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Catuna Oberthueri
Family: Nymphalidae
Location: Okomu National Park

Name: Euripus Nyctelius
Family: Nymphalidae
Location: Okomu National Park

Name: Melanitis Leda
Family: Nymphalidae
Location: Okomu National Park

Name: Phalanta Phalanta
Family: Nymphalidae
Location: Okomu National Park

Name: Acraea Cabira
Family: Nymphalidae
Location: Okomu National Park

Family: Nymphalidae
Location: Okomu National Park

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Name: Charaxes Eupale
Family: Nymphalidae
Location: Okomu National Park

Name: Eurema Hecabe
Family: Pieridae
Location: Okomu National Park

Name: Cyrestis Camilus
Family: Nymphalidae
Location: Okomu National Park

Name: Acraea Horta
Family: Nymphalidae
Location: Okomu National Park

Name: Graphium Leonidas
Family: Papilionidae
Location: Okomu National Park

Name: Danaus Crisippus
Family: Nymphalidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Lomographa Vestaliata
Family: Pieridae
Location: Okomu National Park

Name: Junonia Orithya
Family: Nymphalidae
Location: Okomu National Park

Name: Udaspes Folus
Family: Hesperiidae
Location: Okomu National Park

Name: Hypolimnas Missippu
Family: Nymphalidae
Location: Okomu National Park

Name: Euphaedra Sarcoptera
Family: Nymphalidae
Location: Okomu National Park

Name: Arhopala Centaurus
Family: Lyncaenida
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Family: Nymphalidae
Location: Okomu National Park

Family: Nymphalidae
Location: Okomu National Park

Family: Nymphalidae
Location: Okomu National Park

Family: Papilionidae
Location: Okomu National Par

Family: Papilionidae
Location: Okomu National Par

Family: Papilionidae
Location: Okomu National Par

Family: Papilionidae

Location: Okomu National Par

Family: Papilionidae

Location: Okomu National Par

10

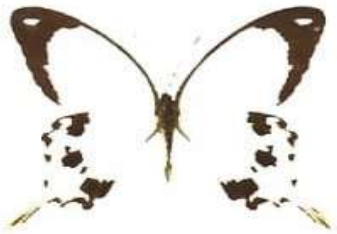
POPULAR BUTTERFLIES OF AFRICA

Papilio zalmoxis

Family: Papilionidae
Location: Okomu National Park

Papilio nireus

Family: Papilionidae
Location: Okomu National Park



Papilio dardanus

Family: Papilionidae
Location: Okomu National Park

Papilio phorcas

Family: Papilionidae
Location: Okomu National Park

Papilio rex schultzei

Family: Papilionidae
Location: Okomu National Park

Papilio demodocus

Family: Papilionidae
Location: Okomu National Park

Papilio hesperus

Family: Papilionidae
Location: Okomu National Park

Papilio bromius

Family: Papilionidae
Location: Okomu National Park

9

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Leptosia Nina
Family: Pieridae
Location: Okomu National Park

Name: Genus Amauris
Family: Pieridae
Location: Okomu National Park

Name: Opsiphanes Cassina
Family: Pieridae
Location: Okomu National Park

Name: Genus Othroeda
Family: Lycinida
Location: Okomu National Park

Name: Divana Diva
Family: Nymphalidae
Location: Okomu National Park

Name: Asota Caricae
(Tiger Moth) Asota Heliconia

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Location: Okomu National Park

Name: Euthalia Monina
Family: Nymphalidae
Location: Okomu National Park

Name: Phyciodes Tharos
Family: Nymphalidae
Location: Okomu National Park

Name: Charaxes Brutus
Family: Nymphalidae
Location: Okomu National Park

Name: Papilo Menestheus
Family: Papilionidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Limenitis Populi
Family: Nymphalidae
Location: Okomu National Park

Name: Supha Erymanthis
Family: Nymphalidae
Location: Okomu National Park

Name: Amauris Niavius
Family: Nymphalidae
Location: Okomu National Park

Name: Bebearia Mardania
Family: Nymphalidae
Location: Okomu National Park

Name: Precis Archesia
Family: Nymphalidae
Location: Okomu National Park

Name: Hypolimnas Missipus (Fm)
Family: Nymphalidae
Location: Okomu National Park

Name: Mylothris Apias
Family: Pieridae

Name: Jumonia Cymodoce
Family: Nymphalida

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Location: Okomu National Park

Name: Salamis Cacta
Family: Nymphalidae
Location: Okomu National Park

Location: Okomu National Park

Name: Charaxes Etheocles
Family: Nymphalidae
Location: Okomu National Park

Name: Cymothoe Caenis
Family: Nymphalidae
Location: Okomu National Park

Name: Melanitis Leda
Family: Nymphalidae
Location: Okomu National Park

Name: Neptis Hylas
Family: Nymphalidae
Location: Okomu National Park

Name: Cathosia Biblis
Family: Nymphalidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Elymniopsis Bammakoo
Family: Nymphalidae
Location: Okomu National Park

Name: Limenitis Arthemis (Pipevine Swallowtail)
Family: Nymphalidae
Location: Okomu National Park

Name: Acraea Horta
Family: Nymphalidae
Location: Okomu National Park

Name: Junonia Hedona (Chocolate Pansy)
Family: Nymphalidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Acraea Abdera
Family: Nymphalidae
Location: Okomu National Park

Name: Tanaecia Pelea
Family: Nymphalidae
Location: Okomu National Park

Name: Myscelia Ethusa
Family: Nymphalidae
Location: Okomu National Park

Family: Nymphalidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Papilio Demoleus
Family: Papilionidae
Location: Okomu National Park

Name: Papilo Nireus (Front View)
Family: Papilionidae
Location: Okomu National Park

Name: Papilo Nireus
Family: Papilionidae
Location: Okomu National Park

Name: Prepona (Norepa Chromus)
Family: Nymphalidae
Location: Okomu National Park

Name: Julia
Family: Nymphalidae
Location: Okomu National Park

Name: Morpho Helenor (Broken Wings)
Family: Nymphalidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Saturnia Pavonia (Moth)
Location: Okomu National Park

Name: Salamis Duprei
Family: Nymphalidae
Location: Okomu National Park

Name: Euphaedra Thermis
Family: Nymphalidae
Location: Okomu National Park

Name: Euphaedra Thermis
Family: Nymphalidae
Location: Okomu National Park

Name: Tirumala Septentrionis
(Dark Blue Tiger)
Family: Nymphalidae
Location: Okomu National Park

Name: Hypolenia Arthedom
Family: Nymphalidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Arterica Galene
Family: Nymphalidae
Location: Okomu National Park

Name: Salami Parhassus
Family: Nymphalidae
Location: Okomu National Park

Name: Junonia Terea
Family: Nymphalidae
Location: Okomu National Park

Name: Graphium Artheus
Family: Papilionidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Graphium Policene
Family: Papilionidae
Location: Okomu National Park

Name: Chlosyne Nycteis
Family: Nymphalidae
Location: Okomu National Park

Name: Acraea Terpsicore
Family: Nymphalidae
Location: Okomu National Park

Name: Gaudy Commodore
Family: Nymphalidae
Location: Okomu National Park

Name: Pieridae
Family: Nymphalidae
Location: Okomu National Park

Name: Ariadne Merione
Family: Nymphalidae
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Charaxes Jasius
Family: Nymphalidae
Location: Okomu National Park

Name: Cymothoe Hesiodotus
Family: Nymphalidae
Location: Okomu National Park

Name: Callimorpha Dominula
Scarlet Moth African
Location: Okomu National Park

Name: Melanchroia Chephise
Monarch(Geometer Moths)
Location: Okomu National Park

ISSN:2584-2706 DOI: https://doi.org/10.67317/IJMSRT26JUN104

Name: Belenois Aurota
Family: Pieridae
Location: Okomu National Park

Name: Euptera Neptunus
Family: Nymphalidae
Location: Okomu National Park

Name: Papilio Dardanus
Family: Papilionidae
Location: Okomu National Park