

**DIVERSITY AND ABUNDANCE OF BUTTERFLY TYPES
AROUND IN CIRAHAB SUMBER AREA CURUGGOONG
VILLAGE PADARINCANG DISTRICT SERANG REGENCY**

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Abstract

This research aims to determine the diversity and abundance of butterfly species (Lepidoptera) in the Cirahab Sumber area. The method used in this research is quantitative descriptive methods. In this study, samples were taken from the Cirahab Sumber area, several families were obtained, including the Nymphalidae, Pieridae, Papilioidea, Lycaenidae, Hesperidae families. The most frequently obtained family was Nymphalidae, with 10 types of butterflies obtained and the least was from the family Lycaenidae, Hesperidae with only 2 species. The calculation results of the H' or diversity index value in this study obtained a value of 2.940142703, this value shows the "Medium" category. where the diversity of butterflies in the Cirahab Sumber area shows that they are evenly distributed.

Keywords: Diversity, Butterflies, Cirahab Area

1. INTRODUCTION

Biodiversity or what is called biodiversity is the totality of living things in the miniature world which includes plants, animals, humans, fungi, living microorganisms as well as various types of genetic material and the diversity of their ecological systems (Uryu et al., 2008). Biodiversity also includes the genetic diversity of organisms originating from habitats, whether land, sea or aquatic habitats (Mittermeier et al., 2011; Staudinger et al., 2013).

Butterflies are also a group of insects that have an important role in the ecosystem, namely as helpers in the pollination process of plants (Gilbert, 2021). Apart from that, butterflies also have a function as bioindicators of changes in the quality of the environment because butterflies are sensitive to changes in the ecosystem and environment. Apart from that, butterflies have many beautiful and beautiful characteristics and have many colors so that butterflies have economic value and are used as collections (Peggie et al 2006).

Butterflies are a group of insects whose presence in an area has been greatly reduced, because their habitat has been changed by human activities. Butterflies are also insects that belong to the order Lepidoptera or insects that have scaly wings. Butterflies also have many types and colors depending on the habitat they live in (Kaur & Singh Kaleka, 2022).

Butterflies also usually have beautiful and brilliant colors and a variety of colors and variations in shape or color patterns on their wings, in contrast to moths which are dull and tend not to have color variations on their bodies. Explanation from, Peggie & Harmonis (2014) that butterflies include the families *papilionidae*, *riodinidae*, *nymphalidae*, *hesperiidae*. Butterflies are also flying insects which have perfect

morphology. It has a life cycle, namely adult-egg-larva (caterpillar)-pupa (cocoon) and becomes a beautiful and varied butterfly.

There are also many butterflies in various habitats and according to the type of butterfly too, there are also types of butterflies that are endemic to one area only and other areas do not have these butterflies, this can also be caused by the location geographical and genetic isolation which makes the butterfly only exist in one area (Peggie & Harmonis, 2014).

The diversity of butterfly types varies greatly according to each region, butterflies also usually have unique characteristics according to the habitat they live in. Butterflies in the Cirahab area also have a varied diversity, some are plain yellow, some are eye-shaped, some are red, orange and so on. You must know the species and color variations of these butterflies.

2. LITERATURE REVIEW

2.1. Introduction To Biodiversity

Biodiversity, or biological diversity, encompasses the full spectrum of life forms on Earth, including plants, animals, fungi, microorganisms, and the genetic variations within these organisms. It also covers the diversity of ecosystems, whether terrestrial, marine, or freshwater. Biodiversity is crucial as it contributes to ecosystem stability, resilience, and provides essential services such as pollination, nutrient cycling, and climate regulation (Peggie et al 2006).

2.2. Butterflies And Their Ecological Roles

Butterflies, belonging to the order Lepidoptera, play significant roles in various ecosystems. They are renowned for their role in plant pollination, which is vital for the reproduction of many flowering plants. This ecological function makes them key contributors to ecosystem health and plant biodiversity. Additionally, butterflies serve as bioindicators of environmental change. Their sensitivity to habitat alterations and environmental shifts makes them effective markers for monitoring ecosystem health (Peggie et al 2006).

2.3. Butterfly Diversity And Characteristics

Butterflies are known for their remarkable diversity and visual appeal. They are characterized by their scaly wings, which come in a myriad of colors and patterns. This vibrant coloration not only aids in their role as pollinators but also provides aesthetic value, leading to their use in collections and as subjects of study (Peggie & Harmonis, 2014).

The diversity among butterflies extends across different families within the order Lepidoptera, such as Papilionidae, Riodinidae, Nymphalidae, and Hesperidae. Each family includes species with distinct morphological and behavioral traits adapted to their specific habitats. Butterflies exhibit a complete metamorphosis with four life stages: egg, larva (caterpillar), pupa (cocoon), and adult butterfly, which contributes to their complex life cycle and diverse appearances (Peggie & Harmonis, 2014).

2.4. Impact Of Habitat Change On Butterfly Populations

Human activities have significantly impacted butterfly populations by altering their natural habitats. Urbanization, deforestation, and agricultural expansion have led to habitat loss and fragmentation, resulting in declines in butterfly diversity and abundance. Many butterfly species are now restricted to smaller, isolated areas due to these environmental changes, leading to increased vulnerability and potential extinction risks (Peggie et al., 2006).

2.5. Geographic And Genetic Isolation

Butterflies exhibit a wide range of diversity depending on their geographic locations. Some species are endemic to specific regions due to geographic and genetic isolation. This isolation can result in unique species that are found only in particular areas, contributing to the overall biodiversity of those regions. For instance, butterflies in the Cirahab area demonstrate varied coloration and patterns, reflecting adaptations to their local environment and ecological niches (Peggie & Harmonis, 2014).

3. RESEARCH METHODS

This research also uses a quantitative descriptive method, a method that describes the research results of the types of butterflies that were obtained and calculated using formulas and the help of mic, excel. The tools and materials used in this research are very simple, including insect nets, thermometers, stationery, cameras, label paper, pins, specimen boxes, measuring tape and stakes. Butterflies are caught using an insect net and then the butterflies obtained are stored in an insect box for further identification.

The formula used in calculating the diversity of butterfly species uses the formula from Shannon Wiener Diversity Index or (H') for each plot:

$$H' = -\sum (ni/N) \log (ni/N)$$

Information :

H' = Diversity Index.

ni = Number of individuals of each type.

N = Number of individuals of all species.

The criteria used to interpret Shannon - Wiener diversity (Magurran, 1988), are:

H' < 1, meaning that diversity is low

H' = 1-3 means diversity is classified as moderate

H' > 3, meaning diversity is high

The results of the calculations from the data obtained will then be analyzed using the help of Microsoft Excel to see the type of insect diversity (butterflies) in the Cirahab area.

4. RESULTS AND DISCUSSION

The results of this research showed that from the identified samples, 32 species from 5 families were obtained. The families obtained included the Nymphalidae family, Pieridae family, Lycaenidae family, Hesperidae family and Papilionidae family. The Nymphalidae family is a family with diversity. the largest types and number of individuals at various research locations.

Table 1. Types Of Butterflies Obtained

No	Family	Latin Name	Amount	Location
1	Nymphalidae	<i>Acraea terpsicore</i>	1	Cirahab
		<i>Cupha erymanthis</i>	2	
		<i>Elymnias hypermnestra</i>	1	
		<i>Euploea Eunice</i>	1	
		<i>Euploea Mulciber</i>	3	
		<i>Hypolimnas bolina</i>	1	
		<i>Ideopsis vulgaris</i>	2	
		<i>Mycalesis horsfieldi</i>	1	
		<i>Mycalesis janardana</i>	3	
		<i>Neptis hylas</i>	1	
2	Pieridae	<i>Appias olferna</i>	2	Cirahab
		<i>Catoptilia pyranthe</i>	1	
		<i>Eurema blanda</i>	3	
		<i>Eurema brigitta</i>	1	
3	Papilioidae	<i>Graphium antiphates</i>	1	Cirahab
		<i>Pachliopta aristolochiae</i>	1	
4	Lycaenidae	<i>Cheritra freja</i>	2	Cirahab
		<i>Lampides boeticus</i>	2	
		<i>Zizzeria karsandra</i>	1	
5	Hesperiidae	<i>Udaspes folus</i>	1	Cirahab
		<i>Psolos fuligo</i>	1	
Amount			32	

From Table 1 above, the results show that the most abundant ones were found in the Nymphalidae order with 10 species, while the fewest were found in the Papilioidae and Hesperiidae orders, only 2 species were obtained. Meanwhile, according to Lamatoa, et al (2013), the Nymphalidae family is found in very large numbers, because this family is also the largest family in the lepidoptera order.

This family of Nymphalidae is also one of the families whose numbers are quite large or more numerous than other families, which are in Cirahab area. The Nymphalidae family also has varied color patterns, and has the ability to fly quickly and strongly compared to other families.

In general, the Nymphalidae family has a wide distribution and likes moist and bright places, such as fields, plantations, bright areas and has temperatures that are said to be still cold or tropical temperatures. The calculation data regarding the Diversity Index (H') can be seen in Table 2 below.

Table 2. Results Of Diversity Index Values (H') In Butterflies

No	Family	Latin Name	Amount	Diversity Index (H')
1	Nymphalidae	<i>Acraea terpsicore</i>	1	-0.108304247
		<i>Cupha erymanthis</i>	2	-0.173286795
		<i>Elymnias hypermnestra</i>	1	-0.108304247
		<i>Euploea Eunice</i>	1	-0.108304247
		<i>Euploea Mulciber</i>	3	-0.221917839
		<i>Hypolimnas bolina</i>	1	-0.108304247
		<i>Ideopsis vulgaris</i>	2	-0.173286795
		<i>Mycalesis horsfieldi</i>	1	-0.108304247
		<i>Mycalesis janardana</i>	3	-0.221917839
		<i>Neptis hylas</i>	1	-0.108304247
		2	Pieridae	<i>Appias olferna</i>
<i>Catoptilia pyranthe</i>	1			-0.108304247
<i>Eurema blanda</i>	3			-0.221917839
<i>Eurema brigitta</i>	1			-0.108304247
3	Papilioidae	<i>Graphium antiphates</i>	1	-0.108304247
		<i>Pachliopta aristolochiae</i>	1	-0.108304247
4	Lycaenidae	<i>Cheritra freja</i>	2	-0.173286795
		<i>Lampides boeticus</i>	2	-0.173286795
		<i>Zizzeria karsandra</i>	1	-0.108304247
5	Hesperiidae	<i>Udaspes folus</i>	1	-0.108304247
		<i>Psolos fuligo</i>	1	-0.108304247
Amount			32	2.940142703

Table 2 above shows the results of calculations using the formula from Shannon Wiener with the result that the diversity index value is 2.940142703. This value also shows that in the "Medium" category, it can also be said that the diversity of butterflies in Cirahab is evenly distributed.

The butterflies found in Cirahab are very diverse, however, due to the large number of human activities, from bathing, washing and holidays, the diversity has decreased slightly compared to the previous situation when there was still a large diversity of butterflies there.

Apart from human activities, the existence of butterflies can also be influenced by environmental conditions in terms of temperature, humidity, the number of butterfly predators and so on, which causes butterflies to decrease. Therefore, protecting the environment is also highly recommended so that the sustainability and biodiversity of each environment can be maintained.

The existence of butterflies in an environment is also very important because butterflies have a function in the environment as pollinators for flowering plants, apart from that, butterflies are also a barometer of the ecosystem where butterflies in the environment tend to decrease or even not exist at all. is polluted or dirty, and vice versa,

if there are lots of butterflies in the environment, the environment can be said to be still good from waste or other polluting materials.

5. CONCLUSION

Based on the results of research conducted on the diversity and abundance of butterflies (*Lepidoptera*), the results obtained were 32 types of butterflies, and the most butterflies were obtained from the *Nymphalidae* family, namely 10 types, and the least in the *Papilioidea* family and the *Hesperiidae* family were 2 types. As for the calculation results using the formula from Shannon Wiener, namely getting a diversity index (H') value of 2.940142703, this value shows the "Medium" category. This category shows that the butterflies in the Cirahab area are distributed evenly.

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