

# Inventory of Butterflies (Lepidoptera) Sub Ordo Rhopalocera in Kedung Kopong and Banyak Angkrem, Salaman, Magelang

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**Abstract.** Ecologically, butterflies as component in the pollination process have a role to maintain the balance of the ecosystem and enriching biodiversity. Because of that, it is important to study. It is found that the diversity of butterflies in a place is different from other places. It is because of the presence of butterflies in a habitat is closely related to environmental factors. Since there are various types of butterflies found in nature, this study was conducted to observe the type of species from the butterflies (Lepidoptera) Sub Ordo Rhopalocera that is found in Kedung Kopong and Banyak Angkrem, Salaman, Magelang. To collect the data, line transect method was applied. The length and width of the line adjusted to the topographic conditions and the stand density at the observation location. The results of this study reveals 61 species of butterflies belonging to five families. There are 9 types of Papilionidae families, 6 types of Pieridae families, 28 types of Nymphalidae families, 7 types of Lycaenidae families, and 11 types of Hesperidae families. It is found that Nymphalidae family dominates the area while Pieridae is found as the less dominance.

**Keywords:** Diversity, Inventory, Lepidoptera, Salaman

**Abbreviations:** Ordo Lepidoptera, Sub Ordo Rhopalocera (Butterflies)

**Running title:** Inventory of Butterflies in Salaman

## INTRODUCTION

Indonesia is a country that has high biodiversity and ecosystems. In fact, Indonesia ranks second after Brazil as a country with the highest biodiversity in the world (Prastyo *et al.*, 2015). The highest number of butterflies diversity is owned by Peru and Brazil with around 3,700 species. The number of butterflies spread throughout the world with a total of 17,500 species (Septianela *et al.*, 2015). The number of butterflies in Indonesia is estimated to be 2,300 species. There are only around 600 species on the islands of Java and Bali, and 40% of them are endemic species (Lestari *et al.*, 2015).

Butterflies are insects that are included in the Ordo Lepidoptera, meaning insects whose almost all body surface is covered by scales that give butterflies wings the pattern and color (Scoble, 1995). Butterflies are the type of insects that are most widely known and often encountered because of their beautiful and varied shapes and colors. According to Achmad (2002), butterflies have important values for humans and the environment, including: economic, ecological, aesthetic, educational, conservation and cultural values. Butterflies have a role as components in the pollination process (*pollinators*). Ecologically, butterflies take part in maintaining the balance of the ecosystem and enriching biodiversity in nature (Rizal 2007; Lestari *et al.*, 2015). This makes butterflies important to study.

The diversity of butterflies in one place is different from another place. The existence of butterflies in a habitat is closely related to environmental factors, both abiotic, such as sunlight intensity, temperature, humidity, and water; as well as biotic factors such as vegetation which functions as a hostplant and foodplant. Hostplant is a host plant for

laying eggs as well as larvae food, while foodplant is a plant that feeds adult butterflies (Rosnita *et al.*, 2015). According to Rahman *et al.*, (2018) butterflies can be found in places such as open areas, agricultural land and plantations, along rivers, primary and secondary forests, and residential areas. Butterflies are active in the morning (08.00 WIB - 10.00 WIB) and evening (at 14.00 WIB - 17.00 WIB).

Kedung Kopong and Banyak Angkrem are tourist attractions in Central Java Province, to be precise in Kalirejo Village, Salaman District, Magelang Regency (Saputra, 2018). In Kedung Kopong and Banyak Angkrem, there are still many habitats that are preferred by butterflies, such as open forests, shrubs, shrubs, and watercourses. Based on the search results, no one has conducted research on butterflies in Kedung Kopong and Banyak Angkrem, so it is necessary to conduct research on butterflies in these areas. The research on the inventory of butterflies in Kedung Kopong and Banyak Angkrem which was carried out could be used to complement biodiversity data in the area.

## MATERIALS AND METHODS

### Study area

Figure 1 and Figure 2 show the location and track of the survey area in Kedung Kopong and Banyak Angkrem, Salaman, Magelang. This survey was based on the several visits during February-March 2020 (February 29 - March 1, March 7-8, and March 14-15). Data collection time is carried out between 08.00-12.00 to 15.00-17.00 WIB. Kedung Kopong and Banyak Angkrem is dominated by forest with an open vegetation structure and canopy which causes the light intensity to be not too high and humid. The

observation location in Kedung Kopong is in the form of a river area and its surroundings. The water flow from Kedung Kopong is not too heavy, but it is clean so that it is widely used by local residents for their daily needs such as washing, bathing, etc. In the Banyak Angkrem area, there are several lands that have been used by the local community for gardening and raising fish. Some of locations in Banyak Angkrem have a higher light intensity than the Kedung Kopong area.



Figure 1. Location and track for collecting the data in Kedung Kopong, Salaman, Magelang.

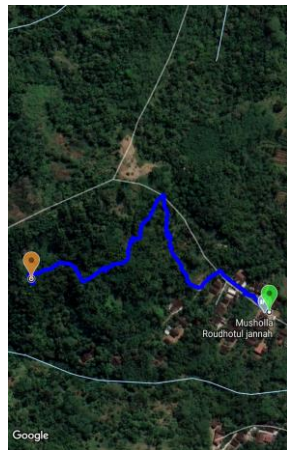


Figure 2. Location and track for collecting the data in Banyak Angkrem, Salaman, Magelang.

**Data collection and identification of butterflies**

The tools that we used for this observed included insect nets, tally sheets, stationery, camera, and some of butterflies identification books namely Kupu-Kupu di UIN Sunan Kalijaga Yogyakarta by Untung Sarmawi and Lepidoptera Semarang Raya by Karyadi Baskoro. The butterflies were observed using line transect method, the observer walked along the transect line and recorded any required data (Bismark, 2011). Using this method, observers record all types of butterflies in the Banyak Angkrem and Kedung Kopong track. The observation area is 5 meters to the right and 5 meters to the left of the predetermined path. Data collection by taking pictures of each butterflies that has been found. In this study, the identification process was carried out by matching the morphology of the butterflies using an identification book. The results of observations or identification are written on the tally sheet that was previously prepared.

**Data analysis**

The collected data were analyzed descriptively and presented in tabular form. Furthermore, the observation data is arranged based on their family.

**RESULTS AND DISCUSSION**

**Species composition**

Based on the data obtained, 61 species of butterflies from five different families were found. The five families are Papilionidae, Pieridae, Nymphalidae, Lycaenidae, and

Hesperiidae. The Nymphalidae was the more dominant family contributed 27,44% (n=28) of the total species followed by Hesperiidae 12,20% (n=11), Papilionidae 15% (n=9), Lycaenidae 11% (n=7), and Pieridae 10% (n=6) (Table 1).

Table 1. Data from butterflies observations in Banyak Angkrem and Kedung Kopong

No.	Family	Species		
1.	Papilionidae	1. <i>Graphium agamemnon</i>		
		2. <i>Graphium doson</i>		
		3. <i>Graphium sarpedon</i>		
		4. <i>Papilio demolion</i>		
		5. <i>Papilio demoleus</i>		
		6. <i>Papilio helenus</i>		
		7. <i>Papilio polytes</i>		
		8. <i>Papilio memnon</i>		
		9. <i>Troides sp.</i>		
2.	Pieridae	10. <i>Catopsilia pomona</i>		
		11. <i>Eurema blanda</i>		
		12. <i>Eurema brigitta</i>		
		13. <i>Eurema hecabe</i>		
		14. <i>Leptosia nina</i>		
		15. <i>Delias periboaea</i>		
3.	Nymphalidae	16. <i>Amathusia pidippus</i>		
		17. <i>Aridnae aridnae</i>		
		18. <i>Athyma nefte</i>		
		19. <i>Danaus genutia</i>		
		20. <i>Discophora sondaica</i>		
		21. <i>Doleschallia bisaltidae</i>		
		22. <i>Elymnias dara</i>		
		23. <i>Elymnias hypermnestra</i>		
		24. <i>Euploea camaralzeman</i>		
		25. <i>Euploea climena</i>		
		26. <i>Hypolimnas bolina</i>		
		27. <i>Ideopsis juventa</i>		
		28. <i>Junonia iphita</i>		
		29. <i>Junonia hedonia</i>		
		30. <i>Lethe europa</i>		
		31. <i>Lethe minerva</i>		
		32. <i>Lethe manthara</i>		
		33. <i>Melanitis leda</i>		
		34. <i>Melanitis zinetius</i>		
		35. <i>Mycalesis horsfieldii</i>		
		36. <i>Mycalesis janardana</i>		
		37. <i>Mycalesis mineus</i>		
		38. <i>Neptis hylas</i>		
		39. <i>Tanaesia palguna</i>		
		40. <i>Tirumala septentrionis</i>		
		41. <i>Ypthima baldus</i>		
		42. <i>Ypthima pandocus</i>		
		4.	Lycaenidae	43. <i>Acytolepis puspa</i>
				44. <i>Jamides alecto</i>
				45. <i>Loxura atymnus</i>

	46. <i>Miletus biggsii</i>
	47. <i>Prosotas dubiosa</i>
	48. <i>Surendra vivarna</i>
	49. <i>Zizina otis</i>
5.	Hesperiidae
	50. <i>Borbo cinnara</i>
	51. <i>Erionota thrax</i>
	52. <i>Halpe zema</i>
	53. <i>Hidari irava</i>
	54. <i>Notocrypta paralyos</i>
	55. <i>Matapa aria</i>
	56. <i>Oriens gola</i>
	57. <i>Parnara spp.</i>
	58. <i>Pemara pugnans</i>
	59. <i>Pirdana hyela</i>
	60. <i>Pseudocoladenia fatua</i>
	61. <i>Udaspes folus</i>

### Discussion

In the Papilionidae family, 9 species were obtained, one of which is the *Graphium agamemnon*, species this species is resident in this area, the number dominates from other species in the Papilionidae family, and has a description of the thorax, the abdomen is light brown. There is a black line extending above the thorax. Upper side of black wings, green patches. The underside of the wings is purplish brown, green patches. 3A venation rear wing folded white. There are two rows of blotches on the forewing of the forewings from basalt to marginal. Male tail wings are shorter than females (Heliaster, 2018). Furthermore, there are 6 species of the Pieridae family, one of the largest species being *Catopsilia pomona*, this species is resident and has a thoracic description, white-greenish yellow abdomen. Black antenna and red tip. wings on 6 forms: greenish yellow, green, yellow, yellow with brown patches, green with round patches on the hind edges, yellow with brown patches, and circles on the upper edges of the hind and front wings. Wing length 60- 70 mm (Heliaster, 2018). The third is the Nymphalidae family of 28 species, one of which is *Danaus genutia*, this species is resident and has a description of the black thorax with white spots. Yellow abdomen. Black thick venation orange wings. Apical black patches of wings and rows of white patches. A row of four white patches on the edge of the black wings (Heliaster, 2018). Then the fourth family of Lycaenidae, as many as 7 species, one of which is *Jamides alecto*, margin this species is resident and has a blue upper side description with a thin black. Beige under surface. The third cell spot shifted slightly. The post disk of the forewing. Black costal venation strip. One black spot with an orange or yellow crown on the rear wing tornus (Heliaster, 2018). And the Hesperiidae family of 11 species, one of which is *Halpe zema*, this species is resident and is very few found and has a description of brownish black antennae, orange tips. The thorax is greenish brown, the abdomen has black and white stripes Orange leg. Yellow brown wings, yellow costa. Two

white patches on the post disk and two patches on the forewing disc. 45 thick vertical hind wing lines. Marginal white wings with black borders (Heliaster, 2018). The family with the most species of butterflies found is the Nymphalidae family. Meanwhile, the family that was found the least was the family Pieridae.

### CONCLUSIONS

Based on the results of the inventory and identification it can be concluded that there are 61 species of butterflies (Order Lepidoptera, Sub Order Rhopalocera) that were found in the Kedung Kopong and Banyak Angkrem areas, Kalirejo Village, Salaman District, Magelang Regency. There are 9 types of the Papilionidae family, 6 types of the Pieridae family, 28 types of the Nymphalidae family, 7 types of the Lycaenidae family, and 11 types of the Hesperiidae family. The Nymphalidae family dominates the area while the Peiridae is dominated by less dominant species.

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