

Short Communication

Composition and Diversity of Butterfly (Lepidoptera: Rhopalocera) in University of Jember

Rendy Setiawan*, Hari Sulistiyowati and Firdausi Wulandari

Department of Biology, Faculty of Mathematics and Natural Sciences, Jl. Kalimantan 37 Sumbersari, Jember 68121, East Java, Indonesia

Keywords: Diversity, Butterfly, University of Jember

Article history:
Received 18 August 2020
Accepted 27 December 2020
Published 31 December 2020

* Corresponding Author :
rendy.fmipa@unej.ac.id

Abstract

University of Jember (UNEJ) has 40% the green area covered by various plants and trees as the insect habitats, such as the butterfly. The butterflies use plants as a source of food and hostplant that support the diversity of butterfly species. This study aimed to determine the composition and diversity of butterfly species (Lepidoptera: Rhopalocera) in UNEJ. The data collect using the road sampling method at all UNEJ's faculties. The identification obtained 30 species of butterflies include to 3 families and 22 genera with a total individual of 330. The diversity of butterflies is 2826 which is included in the medium category.

INTRODUCTION

University of Jember is one of the largest institutions in East Java, located in Jember. The Tegalboto UNEJ campus area is an area of 87 ha with a green area percentage of 40% (UNEJ Academic Guidelines, 2019). Green areas were grown by various plants and trees that can be a source of food and hostplant (Shalihah et al., 2012). One of the insects that use plants as a source of food and hostplant is a butterfly (Peggie and Amir, 2006).

Butterfly (Lepidoptera) has varied hues that characterized by its wings were covered by sheets of scales (Borror *et al.*, 1992). Most of butterflies are cosmopolitan that can be found in various types of habitat (Braby, 2004). According to Clark et al. (1996), butterflies were found in non-polluted habitats (pesticides, smoke and odor). Therefore, the presence of butterflies was used as an indicator of environmental quality. The more diversity of butterflies in a habitat indicate that environmental conditions are getting better.

Ecologically, butterflies also play an important role in maintaining the balance of ecosystems, such as helping pollination in plants, known as pollinator (Achmad, 2002). Based on that, the diversity of butterfly species is supported by the presence of plant species in the UNEJ.

The presence of plant species is the most preferred habitat in butterfly larvae (Yusidha, 2016). In addition to the availability of sufficient food, butterfly larvae also use plants as a shelter from predators (Borror *et al.*, 1992). University of Jember was assumed to be able to support the composition and diversity of butterfly species, so this research is needed.

MATERIALS AND METHODS

The study was conducted in September 2019 - July 2020 at University of Jember campus area. The process of description, identification and data analysis was carried out at the Ecology Laboratory, Department of Biology, Faculty of Mathematics and Natural Science, University of Jember.

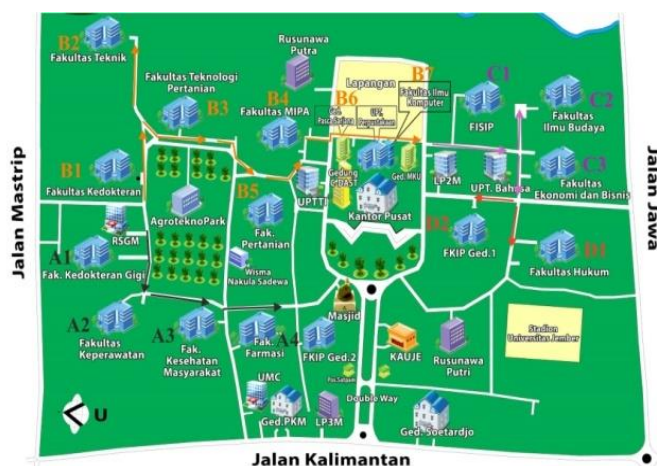


Fig 1. Butterfly catching range in the UNEJ campus environment (UNEJ Academic Guidelines, 2019).

The method used in specimen collection was the roaming method covering all faculties at UNEJ and directly taking the specimen in four parts (A, B, C, D) (Figure 1). Butterfly found perched or fly on a plant are a cruising will catch the insect nets with 40-100 cm long stick. The technique for using insect nets was swing the alternately until the butterfly is caught. The butterflies were taken representatives of each species to be identified.

Data were analyzed descriptively covering the types of butterflies found at the study site. Descriptions were made that observation on morphological structure include color and venation of the wings. Based on the morphological characteristics, it was matched with the World Insect identification book (Remington, 1975), Practical Guide to Butterflies in the Bogor Botanical Gardens (Peggie and Amir., 2006) and Lepidoptera Semarang Raya (Baskoro et al., 2018) to determine taxa. Species diversity values are determined based on the Shannon-Wiener species diversity index (Magurran, 1988).

RESULT AND DISCUSSION

The result showed that there were 30 species of butterflies in the UNEJ campus. The butterfly consists of 3 tribes and 22 genera with a total of 330 individuals (Table 1). The largest number was *Leptosia nina* that found in all areas. This was because the research area was dominated by grass which is a favorite habitat of this type. Azahra (2012) and Setiawan et. al. (2019) also stated that *L. nina* lives in open grasslands and is often found in wilderness areas. Besides, this species of butterfly had a low flying habit and is close to the substrate and its wings are weak so that the flight speed is relatively slow and easy to catch (Faika and

Sudaryadi, 2016). In the present study found *L. nina* as many as 92 individuals so that the diversity of species belongs to the medium category. According to Soegianto (1994), a community has a high diversity of species when arranged by many species with an abundance of the same or almost the same species.

Table 1. Composition of butterfly species in UNEJ

Family	Genus	Species	Individual	
Pieridae	<i>Leptosia</i>	<i>L. nina</i> F.	92	
		<i>Hebomoia</i>	<i>H. glaucippe</i> L.	16
	<i>Eurema</i>	<i>E. hecabe</i> L.	10	
		<i>Catopsilia</i>	<i>C. pomona</i> F.	14
	<i>C. scylla</i> L.		4	
	<i>C. pyranthe</i> L.		2	
	<i>Appias</i>	<i>A. olferna</i> S.	2	
		<i>A. lyncida</i> C.	7	
	Papilionidae	<i>Graphium</i>	<i>G. agamemnon</i> L.	3
			<i>Papilio</i>	<i>P. polytes</i> L.
<i>P. demoleus</i> L.				14
Nymphalidae	<i>Danaus</i>	<i>D. chrysippus</i> L.	24	
		<i>Elymnias</i>	<i>E. hypermnestra</i> L.	17
	<i>Acraea</i>	<i>A. violae</i> F.	6	
	<i>Mycalasis</i>	<i>M. horsfieldii</i> M.	4	
	<i>Ideopsis</i>	<i>I. juventa</i> C.	9	
	<i>Neptis</i>	<i>N. hylas</i> L.	2	
	<i>Euploea</i>	<i>E. tulliolus</i> F.	2	
	<i>Melanitis</i>	<i>M. leda</i> L.	2	
	<i>Phaedyma</i>	<i>P. columella</i> C.	3	
	<i>Ariadne</i>	<i>A. ariadne</i> L.	11	
	<i>Tirumala</i>	<i>T. septentrionis</i> B.	6	
	<i>Phalanta</i>	<i>P. phalantha</i> D.	8	
	<i>Amathusia</i>	<i>A. phidippus</i> L.	4	
	<i>Junonia</i>	<i>J. atlites</i> L.	4	
		<i>J. almana</i> L.	8	
		<i>J. hedonia</i> L.	23	
	<i>Hypolimnas</i>	<i>H. misippus</i> L.	18	
<i>H. bolina</i> L.		7		
Total		330		

The most number of butterfly species were Nymphalidae, consists of 15 genera with 18 species. This result was supported by some research in IPB University (Saputro, 2007), University of Indonesia (Utami, 2012). The main food sources of Nymphalidae were plants from the family Moraceae, Rubiaceae, Annonaceae and Leguminosae (Peggie and Amir, 2006).

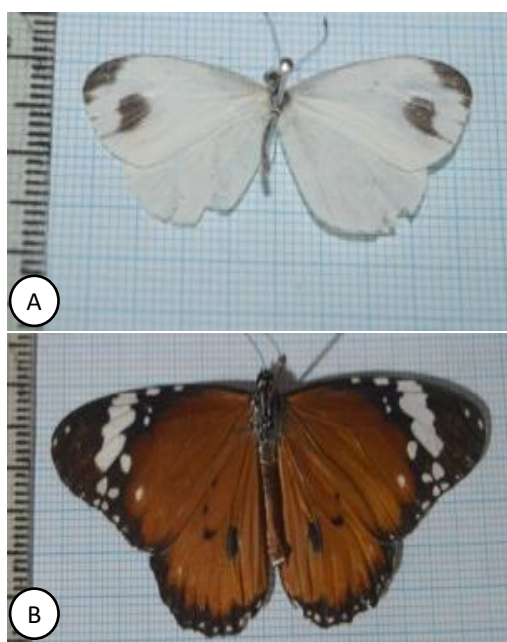


Fig 2. Two species of butterflies that are most commonly found in the study area (A) *Leptosia nina*, and (B) *Danaus chrysippus*.

The fewest types of butterflies found were Papilionidae, consists of 2 genera with 4 species (Table 1). This identification was also supported by several studies IPB University (Saputro 2007), and University of Pinang Masak Jambi (Dewi *et al.*, 2016). According to Peggie (2014), forage plants from Papilionidae include the Annonaceae, Lauraceae, Aristolochiaceae, and Rutaceae families.

Another factor that contributes to the identification of diversity was the weather. The intensity of the rain during the collection of specimens resulted in butterfly was difficult to find, and the rainy season, the butterflies were hide and unable to fly (Suantara 2000).

Conclusion

The number of butterflies found on UNEJ campus were 30 species, consisting of 3 tribes (Pieridae, Papilionidae and Nymphalidae) with a total of 330 individuals. Butterfly species diversity value of 2826 was classified as a medium category.

References

Academic Universitas of Jember. 2019. Standar Green Kampus Universitas Jember. University of Jember, Jember.

Achmad, A. 2002. Potensi Dan Sebaran Kupu-Kupu di Kawasan Taman Wisata Alam Bantimurung. Badan Penelitian dan Pengembangan Kehutanan Balai Penelitian Kehutanan Makassar, Makassar.

Azahra, S. 2012. Pengaruh Karakteristik Habitat Ruang Terbuka Hijau Terhadap Keanekaragaman Kupu-Kupu (Studi Kasus Di Kebun Raya Bogor). Skripsi. Bogor Agricultural University, Bogor.

Baskoro, K., Kamaludin, N., dan Irawan, F. 2018. Lepidoptera Semarang Raya : Atlas Biodiversitas Kupu-kupu di Kawasan Semarang. Department of Biologi FMIPA Diponegoro University, Semarang.

Borror, DJ., Triplehorn. CA., dan Johnson. NF. 1992. Pengenalan Pelajaran Serangga. Gadjah Mada University Press, Yogyakarta.

Braby, MF. 2004. The Complete Field Guide to Butterflies of Australia. CSIRO Publishing, Australia.

Clark, LR., Geigera, PW., Hugles, RD., and Morris. 1996. The Ecology of Insect Population in Theory and Practice. The English Language Book Society and Campman and Hall, Camberra.

Dewi, B., Hamidah, A., dan Siburian, J. 2016. Keanekaragaman dan Kelimpahan Jenis Kupu-Kupu (Lepidoptera; Rhopalocera) Di Sekitar Kampus Pinang Masak Universitas Jambi. Biospecies. 9(2): 32-38.

Faika, MF., dan Sudaryadi, I. 2016. Analisis Morfologi dan Morfometri Sayap Kupu-kupu *Leptosia nina* dan *Papilio polytes* Di Yogyakarta. Skripsi. Gadjah Mada University, Yogyakarta.

Magurran, AE. 1988. Ecological Diversity and Its Measurement. Princeton University Press, USA.

Peggie, D. 2014. Mengenal Kupu-kupu. Pandu Aksara Publishing, Jakarta.

Peggie, D dan Amir. 2006. Panduan Praktis Kupu-kupu di Kebun Raya Bogor. LIPI Research Center, Cibinong.

Remington, JE. 1975. Insect Of The World. The Ridge Press, New York.

Saputro, N. 2007. Keanekaragaman Jenis Kupu-Kupu Di Kampus IPB Darmaga. Skripsi. Bogor Agricultural University, Bogor.

Shalihah, A., Pamula, G., Cindy, R., Rizkawati, W., and Anwar, ZI. 2012. Kupu-Kupu Di Kampus Universitas Padjajaran Jatinangor. Department Entomology Padjadjaran University, Bandung.

Setiawan, R., Siddiq, AM., Sudarmadji, Nindy AW., and Asyari, MH. 2019. Keanekaragaman Spesies Kupu-kupu (Lepidoptera: Rhopalocera) Di Savana Pringtali Resort Bandalit Taman Nasional Meru Betiri. Biolink 5(2): 81-87

Soegianto, A. 1994. Ekologi Kuantitatif: Metode Analisis Populasi dan Komunitas. Usaha Nasional, Surabaya.

Suantara, I. 2000. Keragaman Kupu-kupu (Lepidoptera) Di Taman Nasional Gunung Halimun, Jawa Barat. Skripsi. Bogor Agricultural University, Bogor.

Utami, E. N. 2012. Komunitas Kupu-kupu (Ordo Lepidoptera: Papilionidae) di Kampus Universitas Indonesia Depok Jawa Barat. Skripsi. Indonesia University, Depok.

Yusidha, S. O. 2016. Inventarisasi Jenis Kupu-kupu (Lepidoptera: Rhopalocera) Di Kampus Universitas Jember Jawa Timur. Skripsi. University of Jember, Jember.
