

I. Introduction

1.1 Background

The order Lepidoptera includes a group of insects known as butterflies. Lepidopterans, particularly the colorful butterflies, have been recognized for their delicate beauty throughout history (Naing et al., 2019). Several species of butterflies were heavily hunted and traded as collections due to their exquisite color patterns; as a result, they were classified as endangered species (Coote, 2000; Koneri and Nanjoy, 2019). They also play a significant role in literature and art as symbols of independence, originality, and the splendor of nature. The majority of butterflies worldwide are always under danger as a result of urbanization. Reduced butterfly species richness, diversity, and abundance are correlated with increased urban features including roads, buildings, and relocated lawns. Degradation caused by urbanization also includes a decline in the variety of plant species, a decline in water quality, and a rise in air and soil pollutants. Natural biodiversity suffers as a result of the quantity and quality of natural habitat being reduced as a result of urban development (Ranjagopal et al., 2011; Naing et al., 2019).

Butterflies are the insects with the greatest diversity, living in lowlands as well as high elevations between 1500 and 1800 meters above sea level (Kunte, 2000; Komala, Wiyati and Suryanda, 2018). Only about 10% of the 17000 species of lepidopteran in the world are butterflies; the rest are moths (Peggie, Amir and Sc, 2006; Amanda et al., 2021). In Indonesia, there are thought to be 2,500 different species of butterflies (Peggie, 2011; Komala, Wiyati and Suryanda, 2018). In the current classification of butterflies, there are two superfamilies: Hesperioidea, which includes

all skippers, and Papilionidea, which comprises the remaining real butterflies. Papilionidea includes four families, including Papilionidae (Swallowtails), Pieridae (Whites and Yellows), Nymphalidae (Brush-footed Butterflies), and Lycaenidae, but Hesperioidea only has one family, Hesperiiidae (skippers) (Kehimkar, 2008; Naing et al., 2019).

In the forest ecosystems, butterflies are significant players. As herbivores, pollinators, hosts of parasitoids, and prey of predators, they contribute to the stability of the food chains (Dahelmi, 2000; Rusman, Atmowidi and Peggie, 2016). More than 50 species of agricultural crops with considerable economic value can be pollinated by them (Koneri and Maabuat, 2016). Butterflies are holometabolous insects, which means they undergo a complete metamorphosis. The existence of food plants for caterpillars and adults is essential to the survival of butterflies (Dahelmi, 2000; Mevischutz and Erhardt, 2005; Rusman, Atmowidi and Peggie, 2016). Almost every kind of ecosystem is home to butterflies. It will depend on a number of key elements that are favorable for the occurrence of butterflies in a particular ecosystem, including the availability of plants for adult butterfly feeding and larval foraging (Baskoro, Kamaludin and Irawan, 2018; Amanda et al., 2021). Butterfly food sources include plants in the families Annonaceae, Fabaceae, Leguminosae, and Asteraceae (Priyono and Abdullah, 2013; Amanda et al., 2021). The existence of butterflies can also show how butterfly communities and their environmental interactions can be utilized to evaluate an ecosystem's functioning and conservation efforts (Salmah, Abbas and Dahelmi, 2001).

Indonesia possesses a significant diversity of animal and plant species, including a large diversity of butterflies, making it one of the major biodiversity countries in the world. Almost 2,000 species of butterflies were thought to exist in Indonesia (Amir and Kahono, 2003; Amanda et al., 2021). Indonesian butterflies are constantly under danger due to habitat loss brought on by land change, which has a negative impact on their fragmented, deteriorated, and reduced habitat. In addition, the loss of plants that provide to larvae can result in the extinction of butterflies (Dunn, 2004; Posa and Navjot, 2006; Bibas et al., 2021). In the tropics, abiotic elements like temperature, humidity, and light intensity have a significant impact on the diversity of butterflies. The diversity, quantity, and distribution of butterflies are positively impacted by increasing temperatures and light levels (Sparrow et al., 1994; Bibas et al., 2021). Butterfly puddling is influenced by light intensity and humidity, with more butterflies compiling as these two conditions rise (Phon, Kirton and Yusoff, 2017; Bibas et al., 2021). Butterflies are often used as models by scientists to estimate and predict biodiversity due to the effect of local and climate change, environmental damage, distribution of plants and animals and forest management on the natural ecosystem (Vu et al., 2015; Koneri and Nagoy, 2019).

The diversity and habitats of butterflies can be preserved by implementing conservation management that is designed after assessing diversity, abundance, and distribution (Bibas et al., 2021). In addition, before beginning conservation efforts, it is crucial to understand the habitat's state and the butterflies' bioecology (Bibas et al., 2021; Kremel et al., 1993; New et al., 1995). Butterfly populations in specific places should be maintained for a variety of reasons, including study, education, tourism, and

conservation (Amanda, Herwina and Janara, 2021). Ecotourism is currently one of the best options for local governments and communities for preserving biodiversity and enhancing local welfare, as well as natural resources, where an abundance of resources can generate economic support and boost social power. The process of resource and environmental conservation as well as increasing the expansion of an ecosystem's resources can both benefit from this support (Spanou, Tesgenidi and Georgiadis, 2012).

Ecotourism is a form of tourism that respects the environment and has benefits for local economies because it can attract more visitors without depleting the environment's natural resources (Kilipiris and Zardava 2012). Ecotourism benefits forest preservation (Mensah 2017) and serves as a role model for protecting the environment and natural resources (Bashar 2018). Both wealthy and developing nations can profit from and experience the positive effects of tourism (Uysal et al. 2016; GURSOY and NUNKOO, 2019). The current study will be conducted in a number of tourism areas that are supposed to have an abundance of different butterfly species in the West Sumatra area.



1.2 Formulation of the Problem

Based on the background detail above, the formulation of the problem in this research are:

1. What kind of butterfly species composition in ecotourism areas, West Sumatera?
2. How is the diversity index and similarity index of butterflies in each study areas in West Sumatera?

3. What are the perceptions and attitudes of local communities towards butterflies and ecotourism in the study sites?

1.3 Purpose of the Research

The purposes of this research are:

1. To identify the butterfly species in each ecotourism areas in West Sumatera
2. To analyze the diversity indices and similar indices of butterfly species in each ecotourism areas in West Sumatra.
3. to investigate the perceptions and attitudes of local communities towards butterflies and ecotourism in study sites.

1.4 Significance of the Research

The significance of this research is expected to be useful as information to determine the species of butterfly in West Sumatera; and this research can contribute to the conservation of butterfly species and promote sustainable ecotourism, and raise awareness among local communities about the importance of biodiversity conservation.

1.5 Hypothesis

The hypotheses of this research are:

1. Each ecotourism area in West Sumatera will have a unique butterfly species composition
2. The diversity indices of butterfly species will vary among different ecotourism areas in West Sumatera, with some areas having high diversity than others. However, the similarity indices of butterfly species may be relatively similar across all areas due to the presence of common species.



3. The perceptions and attitudes of local communities towards butterflies and ecotourism in study sites will be positive.

