

I. INTRODUCTION

1.1 Background

Indonesia is known as one of the countries that have a very high richness of flora and fauna species. One of the most abundant biodiversity found in Indonesia is insects. There are 250,000 insect species or about 15% of the total known main biota species in Indonesia (Shahabuddin, 2005). According to LaSalle and Gauld (1993), Hymenoptera is one of the four largest insect orders with 80 families and more than 115,000 species. One of the families belonging to the order Hymenoptera is Apidae.

Apidae is a family of insects that includes over 5.700 species of bees and more than 500 species are stingless bees (Michener, 2013). Stingless bee is a type of bee that does not have an organ to sting, thus producing propolis as a means of self-defense. The stingless bee is the smallest honey-producing bee with a body size of approximately 4 mm. They live in colonies with the number of adult individuals being more than 3000 in one colony (Free, 1982).

Stingless bees are commonly distributed in tropical and subtropical countries of the world (Michener, 2013). In South East Asia there are *Geniotrigona*, *Heterotrigona*, *Homotrigona*, *Lisotrigona*, *Platytrigona*, *Tetragonula*, and *Tetrigona* (Rasmussen and Cameron, 2010). According to Kahono, *et al.* (2018), in Indonesia there are 46 species of stingless bees with most of these occurring on Sumatra and Kalimantan belonging to the genus *Austroplebeia*, *Geniotrigona*, *Heterotrigona*, *Homotrigona*, *Lepidotrigona*, *Lisotrigona*, *Papuatrigona*, *Sundatrigona*, *Tetragonilla*, *Tetragonula*, *Tetrigona*, and *Platytrigona*.

Stingless bees build nests and look for food in forested areas, residential areas, and soil (Sihombing, 2005). Although pollen and nectar are their main food sources, they also gather items like resin, water, sap, wax, honeydew, extrafloral nectar, dirt, salts, animal protein, and fungal spores for nest-building or as food. (Roubik, 1989). The number of animal species in a habitat is determined by food and environmental availability (Triplehorn and Johnson, 2004), these considerations suggest that the stingless bee plays an important function in an ecosystem, and thus they may be useful bio-indicators for environmental conditions or habitat disturbance. Therefore, the diversity of stingless bees in a habitat is needed to be studied.

Based on the type of vegetation, vegetated habitat can be divided into three types: anthropogenic area, forest edge, and forested area. Anthropogenic habitats are settings created by humans that may resemble or even fully replicate the form and function of natural environments. A variety of species that historically utilised structurally similar natural communities may now reside in habitats created by humans. Non-native grasslands, mines, gravel pits, structures, including bridges and buildings, dredging spoil islands, and agricultural fields are a few examples of anthropogenically created ecosystems. The definition of a forest edge is the line separating two similar forms of land use, such as a forest and a meadow or a forest and a parking lot. Between various aging sections of the same forest type, there are also forest edges. However, the majority of edges are the result of human activity, such as urbanization, agriculture, or the cutting of timber. Edges naturally appear where there are abrupt changes in the soil qualities, or where fire or heavy wind

disturb forest, while forests are places with tall trees and a thick canopy (Moorman, 2014).

Lubuk Minturun area is located in Koto Tengah District, Padang City known to have an altitude of 30-105 m above sea level. It has natural potential that is suitable for the development of stingless bees because this area is in the shape of hills filled with different ornamental plants, fruits, and other annual plants in addition to residential areas. The presence of stingless bees is determined by the suitability of nesting habitats and food sources. This is in accordance by the research of Roubik (1989), which states that the presence of stingless bees is determined by the suitability of the nesting habitat and food sources. This location has a wide variety of variations in vegetation making it suitable as a research location on the diversity of stingless bees in three types of vegetated habitat.

The latest research about stingless bees in West Sumatra was done by Puteri (2021) at Batusangkar City which got five species from 44 colonies in stingless beekeeping. Research on West Sumatran Stingless Bees was done by Herwina (2021) that got seven species in stingless beekeeping adjacent to secondary forest in Lubuk Minturun. Special research on Meliponini diversity among three vegetated habitats (anthropogenic area, forest edge, and forested area) in Lubuk Minturun has never been mentioned. Publications about Meliponini in Indonesia are still lacking and limited. This study needs to be done as a starting point to examine more deeply the diversity of Meliponini.

1.2 Research Problem

Based on the background detail above, the formulation of the problem in this research is what kind of species of stingless bees (Apidae: Meliponini) among three vegetated habitats (anthropogenic area, forest edge, and forested area) in Lubuk Minturun, Koto Tangah, Padang, West Sumatra?

1.3 Research Objectives

The purpose of this research is to determine the species of stingless bees (Apidae: Meliponini) among three vegetated habitats (anthropogenic area, forest edge, and forested area) in Lubuk Minturun, Koto Tangah, Padang, West Sumatra.

1.4 Research Significance

The results of this research is expected to be useful as information to determine the species of stingless bees (Apidae: Meliponini) among three vegetated habitats (anthropogenic area, forest edge, and forested area) in Lubuk Minturun, Koto Tangah, Padang, West Sumatra.

