

I. INTRODUCTION

1.1 Background

Insects are the most diverse animal group which include more than a million described species and represent more than a half of all known living organisms (Chapman, 2006). Insects have existed much longer than human being. They influence human livelihood since the very beginning and continuously affect many of our daily activities. Therefore, we need to understand them in order to be able to deal with them. In exception of the deep of the ocean and frozen earth polar, insects can be found live in almost every habitable place on earth. Insects play major roles as plant consumers, predators for other pest insects, detritivore for decaying organic matters, as well as become prey for animals (Pedigo, 1999)

Hymenoptera is an order of insects with variety of members, comprising sawflies, wasps, bees, and ants. Over 150,000 extant Hymenopterans have been described (Mayhew, 2007; Janke, 2013). This order is also considered to have the most benefits for human live. This consideration is based on Hymenopterans' activities in pollinating plants, producing honey and wax, as well as eradicating pest insects. In contrary, certain sawflies, ants, and other Hymenopterans are destructive pests (Pedigo,1999). Formicidae is one among families under Hymenoptera order.

Ants (Hymenoptera: Formicidae) are widespread and recognized even by the novice. Ants are among most diverse, abundant, ecologically significant organisms on earth. All ants are social insects, living together in colonies and are found in all kinds of terrestrial habitats from subarctic tundra to equatorial rain forests, from marshes to deserts, from sea coastline to great elevations and from deep underground to the apex of the tallest trees (Brian, 1978;

Bolton, 1994). However, they are completely absent in some extreme regions such as Iceland, Greenland and Antarctica (Holldobler and Wilson, 1990).

Ant's diversity in the tropics is generally influenced by factors such as predation, humidity, nesting sites, availability of food sources, topographical structures and vegetation composition (Wilson, 1971). In this region, ants play an important ecological role in both natural and agricultural habitats (Delabie *et al.*, 2007). They show a wide range of multitrophic interactions with plants and other insects, ranging from parasitism to mutualism (Holldobler and Wilson, 1990). Their wide distribution and dominating existence in various climates make ants potentially beneficial as well as detrimental to other organisms. Therefore, the diversity of ants at different habitats is crucial to be studied.

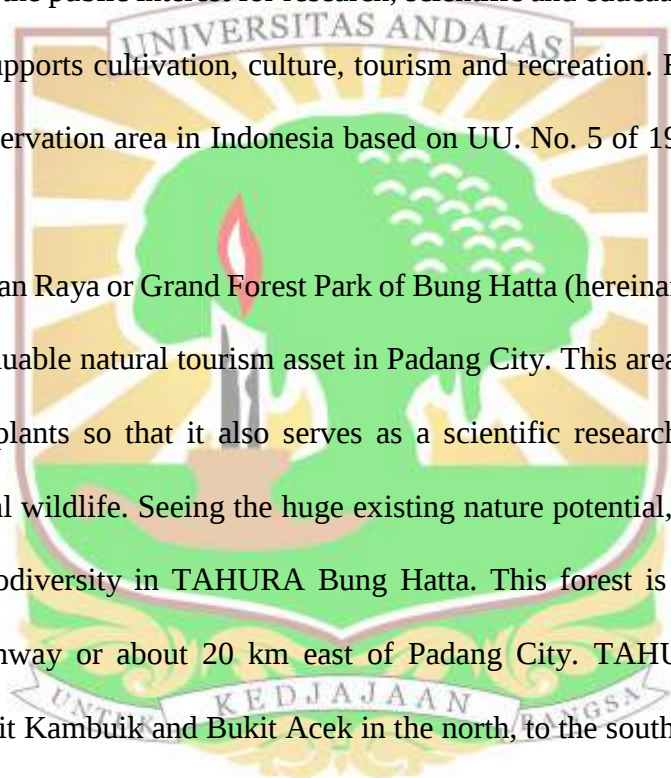
Research on ants has been carried out in various countries, such as the impacts of Argentine ants on avian nesting success in southern California (Suarez, 2005), in which the argentine ants (*Linepithema humile*) is believe to negatively impact on the success of bird nest construction. In Indonesia, in general, there is a handful of research on ants. Ito *et al.* (2001), for instance, conducted a study at Bogor Botanical Garden using seven sampling methods and resulted in finding 216 species from nine subfamilies. Meanwhile, specific research on ants that interact with birds is still lacking. One research collected ants in the bird nests from Andalas University area (Anita, 2018). This study reported the collection of 2,741 ant individuals of 13 species, 12 genera, 8 tribes and 4 subfamilies. In addition, bird nests also served as nesting site for *Euprenolepis procera* ants despite the impact of ant colony toward nest and nesting birds remain unknown.

The nature of relationships between dwelling ants with bird nests and the nesting birds is still understudied, hence it requires further researches in this field. The variability of

forms and types of bird nests in relation to their feasibility as habitat for ants wait to be identified. Publications about this research topic is still lacking and limited. This study needs to be done as a starting point to examine the diversity, as well as their dynamics, of ants dwelling the bird nests in West Sumatera.

Taman Hutan Raya or Grand Forest Park is a nature conservation area for the purpose of collecting natural or non-natural plants and or animals, native and or non-native species, which are used for the public interest for research, scientific and educational purposes. Also as a facility that supports cultivation, culture, tourism and recreation. Forest parks are part of the type of conservation area in Indonesia based on UU. No. 5 of 1990. (Atlas Nasional Indonesia, 2008)

Taman Hutan Raya or Grand Forest Park of Bung Hatta (hereinafter TAHURA Bung Hatta) is a very valuable natural tourism asset in Padang City. This area is known to harbor rare animals and plants so that it also serves as a scientific research site related to the diversity of tropical wildlife. Seeing the huge existing nature potential, it is very necessary to preserve the biodiversity in TAHURA Bung Hatta. This forest is located in between Padang-Solok highway or about 20 km east of Padang City. TAHURA Bung Hatta is bordered with Bukit Kambuik and Bukit Acek in the north, to the south with Bukit Karang, Mount Sugirik, Bukit Jirek, Bukit Sigurapai, Bukit Gajabuih and Mount Gadut as the highest peaks (1800 m). Meanwhile in the east, it is bordered with Solok Regency, while in the west with community land in Koto Baru and Indarung Villages. According to the Office of Cultural and Tourism of Padang City, the total area reaches 70 thousand hectares. In general, this area comprises mountainous and hilly area located at an altitude of 300-700 m above



sea level and is part of the Bukit Barisan Range that stretches from north to south (Office of Cultural and Tourism of Padang City, 2021)

The temperature in the TAHURA Bung Hatta area ranges from 19-26°C. Meanwhile, the average rainfall in this area is quite high, reaching 6,000-7,000 mm per year with humidity between 52-89%. TAHURA Bung Hatta area has been studied for its ant diversity, where the finding consisted of 42 ant species (Februri, 2011). As this research solely based on ants from ground surface, the taxonomy and diversity of ants from other habitat types such bird nests still possess high possibility for gaining more unrecorded and unknown species. This area has been studied also for its bird diversity, where the finding consisted of 52 bird species of 24 families and 8 orders (Wiraldy, 2008)

1.2 Research Problem

Based on the background detailed above, the research problem can be formulated as what diversity of ants (Hymenoptera: Formicidae) inhabit the bird nests in TAHURA Bung Hatta of Padang City and what are their possible roles for the owner birds?

1.3 Research Objectives

The purposes of this research are to determine the diversity of ants (Hymenoptera: Formicidae) inhabit the bird nests in TAHURA Bung Hatta of Padang City and their presumptive roles for the bird life.

1.4 Research Significance

The results of this research are expected to be useful as information regarding the wildlife diversity in TAHURA Bung Hatta of Padang City, as well as to help decision making related to the management of natural biodiversity therein

