



Research project of counterparts funded at IPB

| Name | Counterpart | Title |
|--|-------------|---|
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Background and Objectives

The increasing human population is leading to an increase of natural habitat transformation into monocultural agriculture land. CRC990-EForTS subproject Z02 has monitored aboveground animal diversity in transformed land in Jambi (Drescher et al 2016). The sampling was conducted in 2013/2014 from May-October (dry season) and November-March (rainy season). The result of this research shows that the greatest amount of parasitoid wasp abundance was from the Braconids family. Braconidae is one of Hymenoptera's family with the highest species richness. It plays an essential role in controlling herbivore population in the ecosystem due to its diversity and capability to parasitize specific hosts (Quicke 1997).

Even when Braconids play an important role as natural enemy in the ecosystem, information about diversity of Braconids in Indonesia is still lacking. The lack of information of its diversity may be caused by the minimum information of guides to identify Braconids, especially the species in Indonesia. Establishing the taxonomic key of Braconids is necessary to share information more transparently among EForTS research members. Not only that, giving updates to the identification key, obtaining morphological photographs, measurement and also abundance data in each land use type, will actually provide a good practical guide to other Hymenopterist and researchers all around the world. Therefore, this research aims to (1) verify species ID of Braconidae, (2) photograph documentation of whole bodies and measure the size of key morphological features in the University of Göttingen, and (3) prepare wasps guide identification key.

Methodology

We used all Braconids sample that were already collected by canopy fogging methods in 2013, including dry and rainy season samples. Some samples ID were already identified and checked by a well-known Hymenoptera taxonomist and an expert of parasitoid wasp, Prof Donald Quicke (Chulalongkorn University, Thailand). The identified sample ID were stored in the University of Göttingen, Germany. The unidentified samples were stored in IPB University, Indonesia. The unidentified samples were prepared to be brought to the University of Göttingen for further verification using the identified samples. Trainings were planned to be conducted both in Germany and Bangkok, Thailand, where Prof Donald Quicke resides.

The identified Braconids species were photographed using a microscope, especially their key morphological features (head, antenna, legs, etc.). The size of key morphological characteristics were also measured. All data were compiled and the Braconids wasps guide identification was developed.

Results and Conclusion

In total, there are 309 morphospecies of Braconids wasps from the 2013 samples. The result so far showed that Bukit Duabelas landscape has a higher species richness and abundance compared to Harapan. Forests also has a much higher number of species richness and abundance compared to other land use types (Table 1). The number of samples that were identified by Prof. Donald Quicke was 198 species. There are 3577 individuals braconids in the Bogor Laboratory, consisting of 293 morphospecies. These samples were prepared to be brought to Göttingen University to be further verified by the expert. In total, we have 111 species that have not yet been identified and confirmed. Unfortunately, the planned proposal for identification in Bangkok could not be conducted due to a serious illness suffered by Prof. Donald Quicke. Therefore, all identifications are diverted to be done in Göttingen. The work in Göttingen will consist of verification of the the species ID of Braconidae, photograph documentation and measuring size of morphological key feature of Braconids wasp. Identification training with experts are going to be conducted in Germany also. All the work will start from March and continue to September 2020.

Table 1. Braconid wasp diversity on various land-use type, landscape, and seasonal

| Season | Bukit Duabelas | | | | | | | | Harapan | | | | | | | |
|--------------|----------------|-----|------|-----|-----|----|-----|----|---------|-----|------|-----|-----|----|-----|-----|
| | F | | J | | O | | R | | F | | J | | O | | R | |
| | N | S | N | S | N | S | N | S | N | S | N | S | N | S | N | S |
| Dry | 931 | 193 | 553 | 139 | 73 | 44 | 116 | 56 | 452 | 146 | 358 | 126 | 105 | 48 | 172 | 71 |
| Rainy | 662 | 185 | 470 | 167 | 44 | 25 | 86 | 57 | 362 | 141 | 662 | 176 | 93 | 44 | 276 | 115 |
| Total | 1593 | 245 | 1023 | 223 | 117 | 61 | 202 | 98 | 814 | 207 | 1020 | 212 | 198 | 70 | 448 | 146 |

Note: F: Forest; J: jungle rubber; O: oil palm; R: rubber; N: species abundance; S: species richness

References

- Drescher J, et al. 2016. Ecological and socio-economic functions across tropical land use systems after rainforest conversion. *Phil. Trans. R. Soc. B.* <http://doi.org/10.1098/rstb.2015.0275>.
- Quicke DLJ. 1997. *Parasitic Wasps*. London (GB): Chapman & Hall.