



## Research project of counterparts funded at IPB

| Name            | Counterpart | Title   |
|-----------------|-------------|---|
| Purnama Hidayat | Z02         | Diversity of butterflies (Lepidoptera) across rainforest transformation systems in Bukit Duabelas and Harapan Rainforest, Jambi |

### Introduction and Methodology

The occurrence of butterflies is strongly correlated with the presence of the species of plants on which the adults lay their eggs. The occurrence of these host plants depends, in turn, on the habitat. Thus, transformation of the habitat will affect the biodiversity of butterflies (Nidup *et al.* 2014). Due to their host-plant specificity and the relative ease with which they can be identified, butterflies make excellent organisms for the rapid assessment of biodiversity in the field and serve as bio-indicators for environmental change. The specific role of butterflies in the old growth secondary forest in Sumatra such as on the edge of Bukit Duabelas National Park or in the restoration forests such as Harapan Rainforest / PT REKI (Origia *et al.* 2012) remains severely understudied. Furthermore, it is currently unclear to what degree butterflies thrive in cash-crop monocultures such as rubber and oil palm.

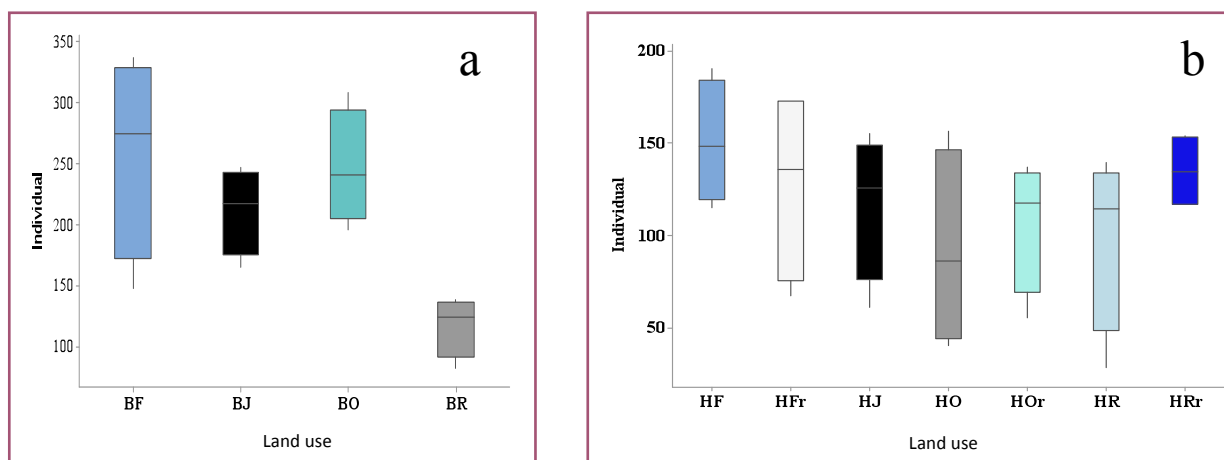
The main OBJECTIVE of this research was therefore to determine the species richness of butterfly populations across a rainforest transformation gradient in Jambi Province (EFForTS Core Plots and Riparian Sites).

The sampling of butterflies and rapid biodiversity assessment were conducted in EFForTS 32 core plots and 12 Riparian Sites in Jambi from August to October 2017. Two collection METHODS were used: (1) direct surveys and scan sampling (Martin & Bateson 1993), i.e. immediate recording of butterflies seen in the existing core plots, and (2) using bait traps to attract butterflies. The final identification and preservation of specimen was performed at the Laboratory of Insect Biosystematics, Department of Plant Protection, IPB. The identification was based on the guide books by Parsons (1999) and D'Abbrera (1990).

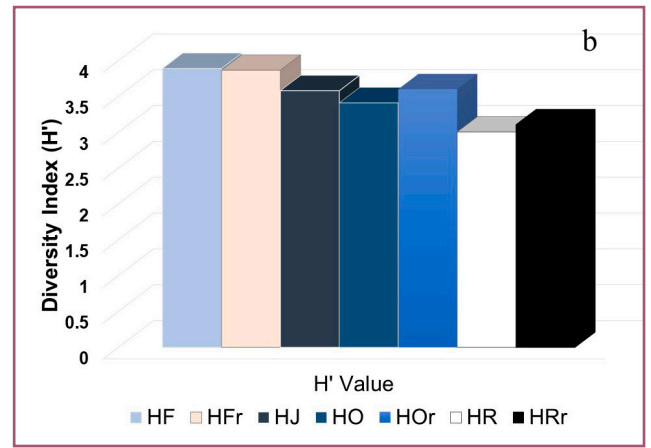
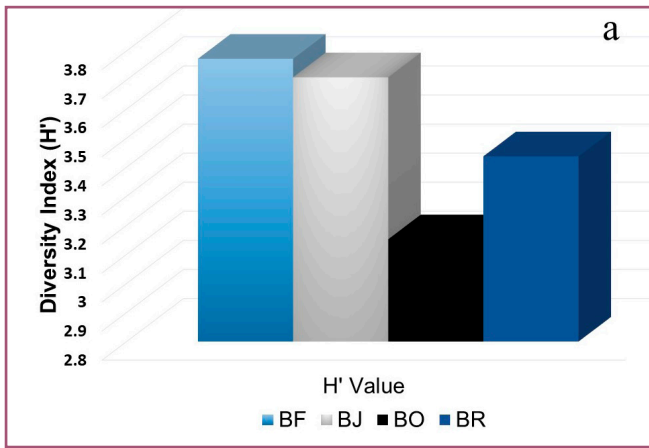
### Result and Discussion

A total of 6641 individuals falling into 209 species were collected in Bukit Duabelas and Harapan Forest. There were 3334 individuals in 145 species, collected across 16 observation plots in Bukit Duabelas and 3307 individuals in 179 species collected across 28 observation plots in the Harapan Forest. The Shannon-Wiener diversity ( $H'$ ) was higher in the Harapan Forest (4.15) than in Bukit Duabelas (3.88). Both are over 3.5 and are therefore considered high (Maguran 1988). The number of individual butterflies collected was highest in sites with heterogeneous forest type land use than elsewhere, both in the Harapan Forest and Bukit Duabelas (figure 1). The butterfly diversity (index  $H'$ ) for every type of land use is shown in figure 2. There were two species of IUCN-protected butterflies recorded in Bukit Duabelas. These were *Trogonoptera brookiana* Wallace and *Troides amphrysus* Crammer (figure 3a and 3b).

The diversity of butterflies in the rainforest transformation systems in Bukit Duabelas and and Harapan Forest was relatively high and varied. Continuous conservation effort is needed to preserve the butterflies in these areas.



**Figure 1.** Number of individual butterflies collected in Bukit Duabelas (a): heterogeneous forest (BF), jungle rubber (BJ), oil palm plantation (BO), rubber plantation (BR); and Harapan Forest (b): heterogeneous forest (HF), heterogeneous forest riparian (HF<sub>r</sub>), jungle rubber (HJ), oil palm plantation (HO), riparian oil palm plantation (HOr), rubber plantation (HR), and riparian rubber plantation (HR<sub>r</sub>).



**Figure 2.** The Shannon-Wiener Diversity Index ( $H'$ ) of butterflies in Bukit Duabelas (a): heterogeneous forest (BF), jungle rubber (BJ), oil palm plantation (BO), rubber plantation (BR); and Harapan Forest (b): heterogeneous forest (HF), heterogeneous forest riparian (HF<sub>r</sub>), jungle rubber (HJ), oil palm plantation (HO), riparian oil palm plantation (HOr), rubber plantation (HR), and riparian rubber plantation (HR<sub>r</sub>).



**Figure 3.** The IUCN-protected species of butterflies found in Bukit Duabelas Forest: *T. brookiana* (a) and *T. amphrysus* (<http://insecta.pro/gallery/41401>) (b).