

## **Temporal variation in abundance and diversity of butterflies in Bornean rain forests : opposite impacts of logging recorded in different seasons**

### **Abstract**

We used traps baited with fruit to examine how the temporal variation of butterflies within primary forest in Sabah, Borneo differed between species. In addition, we compared patterns of temporal variation in primary and selectively logged forest, and we tested the hypothesis that selective logging has different recorded impacts on species diversity of adults during the wet monsoon period and the drier remaining half of the year. Species of Satyrinae and Morphinae had significantly less-restricted flight periods than did species of Nymphalinae and Charaxinae, which were sampled mainly during the drier season, especially in primary forest. Species diversity of adults was significantly higher during the drier season in primary forest, but did not differ between seasons in logged forest. As a consequence, logging had opposite recorded impacts on diversity during wetter and drier seasons: primary forest had significantly higher diversity than logged forest during the drier season but significantly lower diversity than logged forest during the wetter monsoon season. The results of this study have important implications for the assessment of biodiversity in tropical rain forests, particularly in relation to habitat disturbance: short-term assessments that do not take account of seasonal variation in abundance are likely to produce misleading results, even in regions where the seasonal variation in rainfall is not that great.