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Petr Vlašánek:

Population structure and dispersal of butterflies in tropical rain forests of Papua New Guinea

The PhD research by Petr Vlašánek approaches the study of rainforest butterfly communities in Papua New Guinea from both population and community perspectives, examining dispersal behaviour, population size and habitat preference of butterfly species in a lowland rainforest community, as well as species turnover in butterfly communities along a combination of succession and altitudinal gradients, starting from a lowland primary rainforest. The study applies two most widely used methodological approaches, viz. mark-recapture methods for the analysis of population structure and behaviour and butterfly community surveys along transects.

Butterflies are perhaps the most intensely studied group of insects, both in the temperate zone and the tropics. Despite ample competition in this field, the Vlasanek's research is innovative in at least two respects. The study takes the mark-recapture method based on hand collecting of butterflies, already in wide use in temperate zone studies, to the rainforest habitat. This was a logistically complex and labour-intensive exercise with uncertain results. He proved the method feasible, at least for common rainforest understorey species, and used it to estimate dispersal rates of butterfly species in a large homogeneous habitat represented by primary lowland rainforest. The results suggest that because of high dispersal ability of butterflies, their host specificity may be only rarely limited by low abundance of their potential host plant species.

The study is also unusual by using mark-recapture protocol within a large homogeneous habitat, rather than in an archipelago of habitat islands, as has been the norm in the temperate zone studies. This posed new methodological challenges since the study had to use an arbitrarily selected set of plots within the forest and ultimately led to a novel approach to the calculation of butterfly dispersal parameters, corrected for the size and spatial configuration of the study plots. As demonstrated here, the effect of plot location and size on dispersal estimates can be important, but it has been so far neglected by mark-recapture protocols. This makes the present study interesting also to the temperate zone ecologists who should read it, then go and recalculate all their results from the past 50 years using the Vlašánek's correction for plot size.

The last chapter, on altitudinal change in butterfly communities, is less innovative methodologically but brings interesting data rarely available from tropical forests, mapping species turnover along a particularly long altitudinal gradient in parallel with change along a succession gradient from secondary to primary forest habitats at each elevation. These two gradients encompass the main axes of butterfly variability within tropical rainforests.

P. Vlašánek has been an independent student able to execute highly demanding field work as well as sophisticated analysis of the field data. The quality of his dissertation is illustrated by one of the chapters having been published in *Ecological Entomology*, a leading entomological journal. At least two more papers will undoubtedly follow.

P. Vlašánek's dissertation as well as his approach to research in general have convinced me that he is ready for an independent research career. It is thus my opinion that Petr Vlašánek has clearly demonstrated the originality and independence necessary for high quality research, and should be awarded PhD degree for his dissertation.



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