

Predation on multiple prey types across a disturbance gradient in tropical montane forests of Peninsular Malaysia

ABSTRACT

Predation plays a critical role in animal and plant survivorship, and can be highly sensitive to habitat loss and disturbance. Tropical montane forests in Southeast Asia are being modified rapidly by land-use change, and the consequences of this on predation likelihood are poorly understood. In Peninsular Malaysia, we conducted predation experiments at eight tropical montane forest sites along a disturbance gradient. We investigated whether (1) predation pressure in primary forests differs between different mountains; (2) predation probability is linked to habitat degradation; and (3) vegetation variables explain predation occurrence. At each forest site, we placed artificial nests with real and model quail eggs, dishes with real and artificial seeds of the cempedak (*Artocarpus champeden*), models resembling four-lined tree frogs (*Polypedetes leucomystax*) and models of the late instar caterpillar of the common Mormon (*Papilio polytes*) at points 100 m apart for three nights. Using Bayesian binomial simulations, we showed that predation likelihood in primary forests from different mountains can vary (e.g., probability of the difference in predation rate of artificial caterpillars between two primary forests was estimated at 82–100%). We also found that higher predation was not linked to habitat degradation for all artificial prey and seeds (e.g., comparing forests of varying degrees of disturbance from the same mountain, the probability that predation of an artificial caterpillar is lower at the primary forest was estimated at 2–20% only). Model selection and hierarchical partitioning showed that vegetation variables can explain predation occurrence, suggesting microhabitat characteristics may be influential. Conducting predation experiments by using artificial prey and seeds is useful for comparing predation likelihood at different sites, making ecological comparisons, and for informing conservation decisions. This novel approach of using multiple prey items also showed that predation for each can vary and thus caution against deploying a single prey type to draw broad inferences of predation in degraded systems.