Freshwater parasite diversity along a gradient of habitat degradation: a case study from Cambodia, South-Est Asia

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Résumé

The tropics are recognized as biodiversity hotspots, harbouring an extraordinary diversity of species. These regions are known to be more resilient to environmental stressors such as global warming or anthropogenic land use compared to temperate regions. High levels of biodiversity are linked with a wide range of ecological interactions, including competition, predation, and parasitism. Despite the ecological importance of digenean parasites, our comprehension of their true diversity, host associations, and life cycle strategies remains far from complete, especially in biodiversity hotspot environments. Herein, we characterized the larval trematode diversity in freshwater snail hosts across a gradient of anthropogenic habitat modification in Cambodia at the regional and local/site-level scales. Utilizing multiple genetic markers, we conducted molecular characterization of the larval trematodes to infer species identities and construct family-wide phylogenies. Based on molecular characterisation of the insolates recovered we revealed a total of 13 trematode species. Matching sequence data enabled us to elucidate the life cycles for four species. We found a higher overall trematodes richness in heavily urbanized and rural areas compared to urbanized and fragmented rural sites. Furthermore, we found higher trematode richness in highly modified sampling sites. This study presents the first detailed characterization of larval digenean diversity along an anthropogenic gradient in a biodiversity hotspot, providing crucial insights into the disease dynamics and potential parasite outbreaks. These findings have significant implications for the prevention of zoonotic disease emergence and contribute to our understanding of the role of biodiversity in mitigating infectious disease risks. This study was supported by The University Agency of the Francophonie (AUF), the H2020 Biodiversity Conservation to Mitigate the risks of emerging infectious diseases (BCOMING HORIZON-CL6-2021-BIODIV-01-11) and PREZODE (CZZ3222AfriCam) projects

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