

Ecological Factors and Anthropogenic Disturbance Influence the Skin Microbiota of Maoershan Hynobiids (*Hynobius maoershanensis*)

Huiqun Chen¹, Yingying Huang¹, Guangyan Pang¹, Zhenzhen Cui¹, ZHENGJUN WU¹, and HUAYUAN HUANG¹

¹Guangxi Normal University

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Abstract

Abstract Information on the skin microbiota of amphibians can provide a solid basis for exploring the interactions between symbiotic microorganisms and hosts, thereby deepening our understanding of adaptation to the changing environment. Studies on the skin microbiota of amphibians in different disturbed habitats can clarify the relationships between skin microbiota composition and environmental factors and have practical implications for the conservation of endangered species. In this study, 16S rRNA high-throughput sequencing was used to profile the skin microbiota of the Maoershan hynobiid (*Hynobius maoershanensis*). Our results illustrated that the alpha diversity of the skin microbiota significantly differed between individuals in disturbed and undisturbed habitats. The diversity of the skin microbiota in forelimb bud stage tadpoles from disturbed habitats was higher than that in their counterparts from undisturbed habitats (Shannon index: 2.244 ± 0.601 vs. 1.731 ± 0.688 ; Simpson index: 0.230 ± 0.129 vs. 0.407 ± 0.205). The richness of the skin microbiota in hindlimb bud stage tadpoles was greater in disturbed habitats than in undisturbed habitats (ACE: 366.303 ± 186.993 vs. 148.357 ± 66.579 ; Chao: 355.946 ± 177.974 vs. 146.026 ± 65.794). Furthermore, stepwise regression analysis indicated that the skin microbiota diversity and relative abundance of dominant bacteria decreased with both increasing temperature and pH; conversely, skin microbiota richness increased with increasing humidity. In addition, the diversity and richness of the skin microbiota increased with increasing anthropogenic disturbance, and the relative abundance of dominant bacteria was influenced by anthropogenic disturbance. We conclude that the skin microbiota of Maoershan hynobiids is affected by ecological factors and anthropogenic disturbance, highlighting the importance of the skin microbiota in response to habitat alteration and the need to develop more efficient measures to protect Maoershan hynobiids.

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