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Marine Biodiversity and Ecosystems

Implications of Habitat Quality on the Resilience and Conservation of Reef Fishes Across Life Stages

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跨領域科技研究大樓一樓演講廳
Host: Dr. Tzu-Hao Lin 林子皓副研究員

[Doctoral Dissertation Defense Presentation]

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Abstract

Understanding how environmental factors shape fish communities requires deeper insight into habitat degradation—an ongoing knowledge gap. This Ph.D. research integrates biological, topographic, and acoustic indicators to assess habitat quality across reef fish life stages. I first examined the influence of live and dead corals on fish assemblages. Then, I analyzed how topographic complexity, benthic composition, and reef soundscapes affect recruitment across two islands. Finally, I evaluated reef habitat quality within Kenting National Park by combining fish abundance, benthic cover, and anthropogenic noise. Results showed that dead branching corals can offer temporary shelter for recruits, while adults relied more on live corals for structural stability, and ecological functions. Recruitment increased with complexity and declined with turf algae or soft corals, highlighting the value of hard coral cover. Recruitment richness also correlated positively with nighttime fish sounds, suggesting acoustic cues play a role in settlement. The final projects reveals an unprotected high-opportunity site and proposes management strategies for high-risk areas. Future research should integrate ecological and acoustic indicators into multifactorial approaches to better understand how habitat quality influences reef fish assemblages and to inform effective conservation strategies.

Keywords: Recruitment, Reef fish, Habitat degradation, Coral cover, Complexity, Soundscape