

Press release

DEAN Professor Qiang ZHOU For immediate release

HKU Ecologists Uncover Significant Ecological Impact of Hybrid Grouper Release through Religious Practices

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Released through the religious practice of mercy release, the Tiger Grouper-Giant Grouper hybrid (TGGG), also known as the Sabah grouper, now swims in Hong Kong waters, affecting the balance of marine ecosystems. Photo credit: Arthur Chung.

Ecologists from the School of Biological Sciences (SBS) and the Swire Institute of Marine Science (SWIMS) at The University of Hong Kong (HKU) have identified significant ecological risks associated with the release of hybrid groupers into Hong Kong's coastal waters, a practice often linked to religious 'mercy release' rituals.

Their study highlights how the Tiger Grouper-Giant Grouper hybrid (TGGG), also known as the Sabah grouper, disrupts local marine ecosystems by exploiting unique ecological niches and potentially becoming a dominant predator. This research, the first to use advanced DNA metabarcoding to analyse the diet of this hybrid species, underscores the urgent need for public education and conservation measures to mitigate unintended ecological impacts. The findings have been published in the journal *Reviews in Fish Biology and Fisheries*.

Hybrid Groupers: A Popular Market Species with Hidden Ecological Threats

The TGGG is a hybrid species bred through aquaculture by crossing the Tiger Grouper (*Epinephelus fuscoguttatus*) with the Giant Grouper (*Epinephelus lanceolatus*). Valued for its large size and rapid growth, it is a common sight in Hong Kong's fish markets. Its affordability and impressive size have also made it a popular choice for local mercy release practices, where animals are released into the wild as an act of spiritual merit. However, this seemingly benevolent act has significant ecological consequences.

To explore the potential ecological effects of releasing hybrid groupers into Hong Kong's coastal waters, our research team utilised DNA metabarcoding to analyse the diet of TGGG. Becoming the first to apply this method to study the dietary habits of this hybrid species, the team extracted and sequenced DNA from the hybrid's stomach contents, allowing them to identify its prey, even when the prey was fully digested or fragmented. This innovative approach provides a detailed and accurate picture of the hybrid's dietary habits and its interactions with local marine ecosystems.



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Innovative DNA Analysis Highlights the Threat

The study found that the TGGG is a formidable predator with a distinctive diet, feeding on various prey species not typically consumed by native species—including fish, crustaceans, and cephalopods. By exploiting broader ecological niches and gaps in the ecosystem where resources or habitats are underused, the TGGG disrupts local food webs and is highly likely to thrive and establish itself as a dominant predator.

'Our findings show that the TGGG is not just another introduced species, it has the potential to significantly disrupt trophic dynamics and reshape coastal ecosystems,' said Professor Celia SCHUNTER of HKU SBS and SWIMS, the study's lead investigator.

The researchers warn that the rapid growth, large size, and absence of natural predators in Hong Kong's waters make it an exceptionally competitive species. These traits, combined with the availability of vacant ecological niches, pose a serious threat to the balance of marine biodiversity in Hong Kong's coastal ecosystems.

The study also draws attention to the role of mercy release practices in introducing non-native species like the TGGG into local waters. Dr Arthur CHUNG, the postdoctoral fellow of HKU SBS and SWIMS and co-author of the study, emphasised the importance of addressing these risks, 'This study underscores the need for careful monitoring and management to mitigate the unintended impacts of human activities on biodiversity.'

The researchers stressed that public education and stricter conservation measures are essential to minimising the ecological damage caused by mercy release and other human activities. These efforts are critical for preserving the health of Hong Kong's marine ecosystems.

About the journal paper: Chung, A., & Schunter, C. (2024). *Distinct resource utilization by introduced manmade grouper hybrid: an overlooked anthropogenic impact from a longstanding religious practice. Reviews in Fish Biology and Fisheries*. <u>https://doi.org/10.1007/s11160-024-09907-6</u>

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