

Environmental Research, Technology Demonstration and Conference Project

ECF Project:	ECF 2020-142
Project Title:	Hybrid grouper impact: an analysis of dietary DNA metabarcoding
Principal Investigator:	Dr Celia Schunter, School of Biological Sciences, The University of Hong Kong
Total Approved Grant:	\$497,300
Duration:	1/4/2021 to 30/9/2023
Project Status/Remarks:	Completed
Project Scope:	<p>The man-made hybrid grouper (also known as Sabah grouper) has gained in important economic value due to its fast growth and resilience. However, these features also allow this hybrid to outcompete other grouper species in the wild, possibly endangering the survival of local native groupers. Over the last year we have recorded the distribution of Sabah hybrid grouper in the wild and found that it is widespread across Hong Kong waters. To determine the impact of these now ‘wild’ hybrid groupers we will study the diets of this hybrid as well as local grouper species via gut content DNA metabarcoding analysis to ascertain if they compete for the same food sources. This novel approach will enable us to evaluate the complete diet of these fish and allow a direct comparison of food resources between natural and hybrid grouper. The results can be used to assess the potential for the hybrid groupers to become an invasive alien species and to predict the impacts these hybrids may have on native species and, therefore, can inform management decisions to preserve Hong Kong’s fish biodiversity and local grouper fish populations.</p>
Summary of the Findings/Outcomes:	<p>Anthropogenic activities have been considerably changing trophic interactions in marine ecosystems. The hybrid grouper (TGGG), also named Sabah grouper, is an artificial man-made crossbred aquaculture product between <i>Epinephelus fuscoguttatus</i> and <i>E. lanceolatus</i>. Releasing of TGGG into the wild through religious activities, together with its carnivorous diet and large body size make it a candidate to pose significant impacts to the native marine ecosystems. Yet, little is known about the diet composition of TGGG upon release into the natural environment, and any competition with native fauna, which may be revealed by dietary overlap or partition with closely related species. Here, we deploy genetic analysis of gut content to determine the diet of wild caught TGGG and compare with four native grouper species living in HK waters (<i>Epinephelus awoara</i>, <i>E. bleekeri</i>, <i>E. coioides</i> and <i>E. quoyanus</i>). For the first time we show that TGGG can successfully feed in the wild. TGGG exhibited six unique prey taxa including teleost, crustaceans and cephalopods, and showed significant lower number of preys. Such significantly differences in diet composition may indicate new feeding behaviour.</p> <p>This study provides a comprehensive analysis with high taxonomic resolution on the diet of TGGG in the wild, highlighting the ecological impacts and possibility of introduction success brought by continuously introduction of a large carnivorous aquaculture product. Lastly, these</p>

	findings provide new information on how local trophic dynamics are impacted by under-investigated religious practice.
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