

# 大嶼山西部水域底表動物多樣性， 豐度，以及分佈

## Diversity, Abundance and Distribution of Epibenthic Fauna from Western Lantau Waters

RE-2024-22

研究項目

Research Projects

香港浸會大學

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我們進行拖網調查所使用的漁船  
The fishing boats we use for trawling surveys



我們的團隊成員正在採集環境DNA分析所需的海水樣本 Our team members are collecting seawater samples needed for eDNA analysis



我們的團隊成員正在進行潛水前的準備工作 Our team members are preparing for the dive



一盆初步分類後的漁獲  
A basin of catches after preliminary classification



我們的團隊成員正對拖網所得的漁獲進行仔細分類，細分至屬或種的層級  
Our team members are conducting detailed classification of trawl catches down to the genus or species level



我們的團隊成員正對拖網所得的漁獲進行初步分類  
Our team members are conducting preliminary classification of trawl catches



一條日本單鰭電鰻的樣本  
A specimen of *Narke japonica*

底表動物是沿海生態系統的重要組成部分，他們攝食海底的有機物質，將能量傳遞到更高營養級並參與營養循環。我們對這類動物在香港的多樣性和豐度知識甚少。由於高濁度令科學調查難以進行，這種知識差距在大嶼山西部水域尤其明顯。

我們的項目對大嶼山西部水域的底表動物群進行綜合研究。在採樣方面，我們採用了兩種採樣方法；在較淺水域採用水肺潛水，兩名潛水員在選定的30個地點沿著海岸線輪廓潛水採集具有代表性的樣本並透過拍照記錄海底和表層底棲生物；在能見較低的較深水域採用底拖網捕撈。在大嶼山西部水域的8個地點使用底拖網（網寬：2公尺；網目尺寸：2公分）進行捕撈。每次使用6張網，並以大約6公里/小時的速度移動10分鐘，總掃掠面積為0.012平方公里。我們預計採集至少100種動物，這些物種不會包括與RE-2020-22記錄的任何物種重疊。

我們應用基於形態特徵和DNA條形碼的綜合分類學方法來識別收集到的物種，確定它們的豐度和分佈，並評估這些物種的保護狀況。

此外，我們正在探索環境DNA作為生物多樣性監測工具的可行性，提取水樣品的eDNA，開發新的DNA元條形碼引物，並比較這些新的和傳統的引物以確定它們在監測底表動物多樣性方面的效率。

未來，我們會透過舉辦關於DNA條形碼的工作坊來加強該方面的教育。

Epibenthic animals are an essential component of coastal ecosystems. They feed on organic matter on the seabed, transfer energy to higher trophic levels, and participate in nutrient cycling. Our knowledge of their diversity and abundance in Hong Kong is extremely limited. This knowledge gap is particularly pronounced in the western waters of Lantau Island, where high turbidity makes scientific surveys difficult.

Our project conducted a comprehensive study of the epibenthic animals in the western waters of Lantau Island. For sampling, we employed two methods: scuba diving in shallower waters, with two divers collecting representative samples along the coastline at 30 selected locations, documenting seabed and surface benthic organisms through photography; and bottom trawls in deeper waters with lower visibility. We conducted trawling (net width: 2 meters; mesh size: 2 centimeters) at 8 locations in the western waters of Lantau Island. Six nets were used per trawl, moving at approximately 6 km/h for 10 minutes, sweeping a total area of 0.012 square kilometers. We anticipate collecting at least 100 animal species, excluding any overlapping with those recorded in RE-2020-22.

We employ a comprehensive taxonomic approach based on morphological characteristics and DNA barcoding to identify collected species. We would like to have a comparison between the results of traditional morphology identification and modern molecular identification. For DNA barcodes, we will obtain at least two sequences for each species. Besides, we will determine their abundance and distribution and assess their conservation status.

Furthermore, we are exploring the feasibility of environmental DNA (eDNA) as a biodiversity monitoring tool. We will extract eDNA from water samples, develop new DNA meta-barcoding primers (one set for the COI, 12S, and 16S genes) for marine animal groups lacking taxonomically specific barcodes, and compare these new and traditional primers to determine their efficiency in monitoring epibenthic animal diversity.



一隻絨球蟹屬的樣本  
A specimen from Genus *Doclea*



一隻口蝦蛄屬的樣本  
A specimen from Genus *Oratosquilla*

