# 臺灣白蝦新興細菌性疾病之檢測

生物研究組

魯懿萍 副研究員

## 摘要

可感染白蝦之細菌性病原包括世界動物衛生組織所表列的蝦類急性肝胰腺壞死綜(AHPND)和壞死性肝胰腺炎(NHP)病原體外，其他弧菌症(如非 AHPND 之 *V. parahaemolyticus*、*V. harveyi*、*V. campbellii*、*V. vulnificus*、*V. alginolyticus* 等弧菌)、*Streptococcus* spp.、*Lactococcus garvieae*、*Aeromonas* spp.、*Shewanella* spp.、*Photobacterium damselae* subsp. *damselae* 等細菌亦會感染白蝦造成損失。其中透明後期幼體症(玻璃苗)(TPD)或稱高致死弧菌病(HLVD)，以及美人魚發光桿菌已成為繼 AHPND 之後引起注意之新興白蝦細菌性病原。本研究從白蝦病灶中分離細菌後，利用 PCR 檢測細菌 16S rRNA、PirA/PirB、Idh、toxR 及 VHVP 等基因，以建立分析白蝦細菌性病原品種與致病性檢測方法。這些病原菌可自白蝦後期幼體至成蝦階段造成感染，病蝦常見臨床症狀包括鰓部明顯變黑、肝胰腺萎縮或壞死、以及腹部至尾部肌肉變白等。這類疾病常與環境壓力有關，包括水中有機物質過高、鹽度和溫度劇烈變化、捕撈或移池等機械性刺激，這些因素會使蝦體變得虛弱或受傷，進而提高感染風險。此外，病原也可能透過水平傳播由帶菌親蝦傳染給幼蝦。從感染案例中分離出的細菌性病原通常具有表現型複雜、毒力基因分布相似與遺傳多樣性高等特徵。未來需透過更多的全基因體定序資料，以進一步釐清致病基因與疾病發生之間的關聯。

114.07.23 修

# Detection of emerging bacterial diseases in Taiwan *Litopenaeus vannamei*

Yi-Ping Lu

## Abstract

The bacteria that cause acute hepatopancreatic necrosis syndrome (AHPND) and necrotizing hepatopancreatic hepatitis (NHP), as listed by the World Organisation for Animal Health, can infect *Litopenaeus vannamei*. Other forms of vibriosis (including non-AHPND *V. parahaemolyticus*, *V. harveyi*, *V. campbellii*, *V. vulnificus*, *V. alginolyticus*), *Streptococcus* spp., *Lactococcus garvieae*, *Aeromonas* spp., *Shewanella* spp., and *Photobacterium damselae* subsp. *damselae* can also infect white shrimp and cause significant losses. Among these, translucent post-larvae disease (TPD), also known as highly lethal Vibrio disease (HLVD), and *Photobacterium damselae* subsp. *damselae* have emerged as major bacterial pathogens of *Litopenaeus vannamei*, attracting increasing attention following the outbreak of AHPND. After isolating bacteria from shrimp lesions, polymerase chain reaction (PCR) was used to detect 16S rRNA, PirA/PirB, Idh, toxR, and VHVP genes to establish methods for bacterial pathogen identification and pathogenicity analysis in white shrimp. These bacterial pathogens can cause infections from the late larval stage to adulthood. Infected shrimp exhibit clinical signs such as pronounced gill blackening, atrophy and necrosis of the hepatopancreas, and whitening of the posterior abdominal and tail muscles. These diseases are often associated with environmental stress factors, including high organic matter in the water, sudden changes in salinity and temperature, and physical stress from harvesting or pond relocation, all of which can weaken or injure shrimp and increase susceptibility to infection. In addition, pathogens may be transmitted horizontally from carrier broodstock to juvenile shrimp. Complex phenotypic traits, similar virulence gene profiles, and high genetic diversity are common features of bacterial pathogens isolated from diseased shrimp. Further whole-genome sequencing will be necessary to confirm the relationships between specific pathogenic genes and disease development.