

甲魚分離之類炭疽仙人掌桿菌群

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摘要

自民國 103 年起陸續收到台灣南部地區甲魚病例，臨床症狀為脖子扭轉與突然死亡，病變為喉部充血，腸系膜水腫與肝脾腫大，切片下可於肝腎發現細胞外的細菌團塊。以血液培養基隔夜培養分離出細菌，菌落為完全溶血之白色蠟質大型菌落，為革蘭氏陽性長桿菌，以生化性狀鑑定與 16s rDNA 序列比對鑑定為仙人掌桿菌群 (*Bacillus cereus* group, BCG)。仙人掌桿菌群 (*Bacillus cereus* group, BCG) 包含許多種細菌，如 *B. cereus*、*B. thuringiensis*、*B. anthracis*、*B. mycoides* 與 *B. weihenstephanensis* 等，其生化性狀與 16s rDNA 序列大致無法區別。仙人掌桿菌群細菌可以引起食物中毒，為台灣重要的食媒性疾病，且可以自水產檢體中分離，但幾乎不會在動物引起疾病。分析毒力因子發現甲魚分離株帶有 BL 溶血素 (hemolysin BL) 與非溶血型腸毒素 (nonhemolytic enterotoxin)，而其他水產動物分離株則帶有 T 腸毒素 (enterotoxin T)，但似乎無法解釋其致病性。以 WOA (World Organisation for Animal Health) 鑑定炭疽所用兩組 PCR primer (pXO1 與 pXO2 質體) 檢驗，發現甲魚分離株的帶有 pXO1 質體，故此為甲魚感染類炭疽仙人掌桿菌群病例。

Isolates of Anthrax-like *Bacillus cereus* group from diseased soft-shelled turtles

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Abstract

Since 2014, several sample cases from soft-shelled turtles (SST) have been submitted to the Animal Health Research Institute from southern Taiwan. The clinical symptoms of the submitted cases included neck torsion and sudden death, with lesions caused by hyperemia in the laryngopharyngeal mucosa, edemas in the mesentery, and enlargements of the liver and spleen. Intracellular bacterial clusters were noted in the liver and kidney microscopically. Large whitish and waxy colonies with beta-hemolysis were obtained by bacterial overnight culture with blood agar plates and the bacterial isolates were determined to be Gram-positive bacilli. Biochemical characterization and comparison of 16s rRNA gene sequences, identified the isolates as belonging to the *Bacillus cereus* group, BCG. The *Bacillus cereus* group of microorganisms contains several species of *Bacillus*, including *B. cereus*, *B. thuringiensis*, *B. anthracis*, *B. mycoides*, and *B. weihenstephanensis*. BCGs are known to cause food poisoning outbreaks and are thus an important pathogen of food-borne disease in Taiwan. Moreover, they can be isolated from aquatic specimens. However, BCGs rarely cause severe infections in animals resulting in disease. Detection of virulence factors by the polymerase chain reaction (PCR) revealed the presence of genes encoding for the hemolysin BL and the non-hemolytic enterotoxin among SST isolates, as well as enterotoxin T among the fish isolates. To further investigate potential pathogenesis mechanisms, detection of the plasmids encoding the production of anthrax toxin and capsule in *B. anthracis*, pXO1 and pXO2, respectively, was conducted via PCR detection, according to the WOAHA Terrestrial Manual 2018, and resulted in the positive detection of pXO1 in SST isolates. It therefore seems likely that anthrax-like BCG caused infections among SST in Taiwan.