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Assessing the Antimicrobial Susceptibility of *Vibrio* Species Obtained from Captive Beluga Whales (*Delphinapterus leucas*) and Aquatic Animals in Taiwan

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The therapeutic and prophylactic use of antimicrobial agents in aquaculture and the prosperity of the aquatic industry has led to high antimicrobial resistance of aquatic animals in recent decades, which may cause concern in veterinary therapeutic programs. This study investigates *Vibrio* spp. and their antimicrobial resistance among beluga whales (*Delphinapterus leucas*) and other aquatic animals (such as sea turtles, shrimps, and their water environment). The beluga whales and sea turtles were admitted to the National Museum of Marine Biology and Aquarium (NMMBA), while the shrimps were from shrimp farms in South Taiwan. A total of 51 *Vibrio* isolates were collected and identified using *Vibrio* selective medium and polymerase chain reaction. The *Vibrio* sp. isolates were identified to the species level as *Vibrio alginolyticus* (29.4%), *Vibrio harveyi* (19.6%), and *Vibrio parahaemolyticus* (7.8%) in this study. 12 antimicrobial agents have been used to assess antimicrobial susceptibility tests which were carried out by a standard disc diffusion method including cefuroxime, amoxicillin, amikacin, and azithromycin. Among the various antimicrobial agents, the highest resistance (62.7 to 76.4%) was observed against amoxicillin and cefuroxime. The resistance against cefuroxime was mostly shown by *V. alginolyticus* (93.3%), followed by *V. harveyi* (90 %) and *V. parahaemolyticus* (75%). A percentage of 96.3% (49/51) was found to be resistant to at least one antimicrobial agent. When the percentage of multiple antimicrobial resistance (MAR) strains were calculated, 35.3% of all the isolates were categorized as MAR. In addition, 45.4% of shrimps and water environment isolates were both categorized as MAR, while beluga whales' isolates were 33.3%. The data of resistance patterns may be a reference for the therapeutic programs in the veterinary field.

Keywords: *Vibrio* spp., antimicrobial resistance, beluga whales, disc diffusion method