



SPEECH INFORMATION (For Conference Program Book)

Topic	Application of Functional Probiotics in Aquaculture
<p>Abstract (No more than 350 words)</p>	<p>The vibriosis caused by pathogenic <i>Vibrio</i> species has long been one of the major threats to the aquaculture industry. There is an urgent need to develop microbial control strategies to control vibriosis outbreaks in aquaculture industries. The work was devoted to screening for aquatic pathogenic <i>Vibrio</i> spp. antagonistic bacteria in marine fishes and shrimp. A total of 84 isolates were isolated from four samples. All the isolates were tested against pathogenic <i>Vibrio</i> spp., including <i>V. alginolyticus</i>, <i>V. parahaemolyticus</i>, and <i>V. harveyi</i>. Among the isolates, the strain D5, isolated from white shrimp, showed high antagonistic abilities toward pathogenic <i>Vibrio</i> spp. The strain D5 was identified as <i>Bacillus pumilus</i> by 16S rRNA sequences, and named <i>B. pumilus</i> D5. White shrimp (<i>Litopenaeus vannamei</i>) were fed a diet supplemented with <i>Vibrio</i>-antagonistic <i>B. pumilus</i> D5 at concentration of 10^7 CFU/g for 8 weeks. The results of this study indicated that <i>B. pumilus</i> D5 can decrease the numbers of <i>Vibrio</i> spp. in the tank water and hepatopancreas of white shrimp and enhance immune response and resistance to vibriosis infection in white shrimp. Although most aquaculture farmers recognize the effectiveness of probiotics, aquatic probiotics over the years has largely relied on individual farmers manually adding probiotics to feed before feeding, which is time-consuming and labor-intensive. To address this, our research team has developed aquaculture feeds with incorporated probiotic additives, which have been applied to key cultured species and shown to significantly improve farming performance. <i>Bacillus pumilus</i> D5 was added to nine types of aquaculture feed, and in most cases, the bacterial count of <i>B. pumilus</i> D5 remained at the targeted level of 10^{5-6} CFU/g, even after storage at 50°C for three months. In outdoor trials with white shrimp, feeding with <i>B. pumilus</i> D5-supplemented probiotic feed (10^6 CFU/g) for 181 and 134 days resulted in improved survival rates, with increases ranging from 13.0% to 22.5%. In on-site trials with tilapia, fish fed <i>B. pumilus</i> D5-supplemented probiotic feed (10^6 CFU/g) for 132 and 318 days achieved significantly higher net profits, with an increase of approximately NT\$40,000 to NT\$100,000 per hectare compared to the control group.</p>

