Interaction of Gut Flora and Bacterial Pathogens of Cultured Common Dentex (Dentex dentex)

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Abstract

This study was carried out to determine the population of gut flora and investigate the source of the pathogenic bacteria recovered from moribund dentex (Dentex dentex). Transmission electron microscopy (TEM) was used to monitor the translocation of bacterial pathogens which can enter the host through the gut. A total of 260 samples from larvae at different feeding stages were examined, 15 healthy and 50 moribund juvenile dentex were sampled over a 2-year period. Bacterial isolates (n=433) from healthy and moribund fish and their environments were identified by biochemical methods; 75% of them were identified as Gram-negative (mainly Vibrio spp.) and 25% as Gram-positive. *Vibrio scophthalmi* and other *Vibrio* species were recovered from moribund fish samples. Some bacteria were recovered from diseased fish reared in hatcheries, introduced mainly from sea water. Among anaerobic bacteria, *Eubacterium tarantellae* was recovered from larval gut flora while *Clostridium botulinum* was recovered from juvenile gut flora. TEM also showed that bacterial endocytosis first occurs when fish are fed granulated dry feeds and becomes more prevalent in the juvenile stages when many bacteria are present in the microvilli. TEM also revealed that the bacteria enter the larvae via the mouth and gills before the granulated feeding stage, after which they begin to penetrate the gut and finally also contaminate the marine rearing stage. The results of this study showed that the granulated feeding stage is critical for pathogen invasion in common dentex.

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