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## A review of betanodavirus vaccination as preventive strategy to viral nervous necrosis (VNN) disease in grouper

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### Abstract

Viral disease outbreak is the most serious issue as it may cause severe losses to farmers as well as to economy in the marine industry worldwide. Among fish viral diseases, betanodavirus is a significant pathogen that causes viral nervous necrosis (VNN) and can result in mass mortalities to fish culture especially at larval stages. In Malaysia, betanodavirus had been isolated from groupers, seabass, red snappers, and golden pomfret. Recently, inconsistent seed supply is observed due to viral infection at larval stages which limits the growth of fish culture. Therefore, seeds of grouper are often imported from neighboring countries such as Indonesia by farmers. Strict importation regulations should be practiced as the importation of fish seeds may become a possible source of the virus entering the country. It is a challenge to track farmers who are affected by the disease in order to segregate or eliminate the VNN carrier spawners. This scenario had resulted in incomplete destruction of diseased fish population and leads to re-occurrence of the disease at the early stage of grouper. This situation warrants immediate attention to develop promising prevention strategies such as a new vaccine which is very important and could work effectively with better farm management approaches. This article discusses the occurrence of viral nervous necrosis (VNN) disease in Malaysia and reviews possible preventive measures via vaccination to combat the disease.

### Keywords

**Author Keywords:** Grouper; Betanodavirus; Viral nervous necrosis (VNN); Vaccination; Fish disease  
**KeyWords Plus:** LATES-CALCARIFER BLOCH; ASIAN SEA BASS; EPINEPHELUS-SEPTEMFASCIATUS; SEVENBAND GROUPE; DICENTRARCHUS-LABRAX; PROTECTIVE IMMUNITY; MASS MORTALITIES; VIRUS NNV; FISH; NODAVIRUS

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