

IRAL NERVOUS NECROSIS (VNN) AS EMERGING FISH DISEASE IN WORLD MARICULTURE

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Viral nervous necrosis (VNN) is a fatal and worldwide fish disease, especially in economically fish. The disease affects more than 50 species, and about 70 fish species. Also, viral carriers have lacking clinical symptoms. Infected fish exhibit clinical signs such as spiral and darting swimming, low appetite, change in pigmentation, belly up and subcutaneous bleeding. In pathological studies, the main symptoms are vacuolar lesions in the brain, eye and spinal cord. The viral aetiology has been confirmed following the identification of small, non-enveloped, RNA agents definitively assigned to the *Nodaviridae* family, genus *Betanodavirus*. The family consists of two genera, the genus of *Alphanodavirus*, which is an insect-specific nodular virus. *Alphanodavirus* can also kill baby mice and hamster, causing paralysis and death in these animals. The genus *Betanodavirus* also affects the fish. Factors belonging to the genus beta-DNA virus are small particles with a diameter of about 25 to 30 nm without capsid and have a 20-fold shape, and their genome consists of two single-stranded RNAs. The disease has recently been reported from four African countries, Senegal, Libya, Tunisia and Algeria, but has not yet been reported on South American continents. The VNN disease was isolated and confirmed for the first time by the author in the Caspian Sea in 2004. The widespread victims in this species in recent years have led to a reduction in the reservoirs of this species in the Caspian Sea and as a threat to other valuable economic species in the Caspian Sea. This complication is mainly spread through horizontal transmissions. Vertical transmission is also proposed. So far no effective commercial vaccine has been developed for control of this disease, and there is virtually no way to cure it, but its familiarity with the characteristics of this disease can be effective in preventing its transmission.

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Figure-1



Figure-2