ICAR-CIBA - a nodal R&D agency working in brackishwater aquaculture for the past three decades with a vision of environmentally sustainable, economically viable and socially acceptable aquaculture technologies, system interventions, technology backstopping and policy inputs by the institute, contributing to economic benefits of the sector which has already recorded annual export revenue of ₹ 23,000 crores apart from domestic consumption.

CIBA-Nodavac-R

An experimental recombinant monovalent viral nervous necrosis vaccine for finfish

The disease

Viral nervous necrosis (VNN) or viral encephalopathy and retinopathy (VER) is an acute viral disease affecting several species of marine, brackishwater and freshwater fishes. The disease causes up to 100% mortality in larval and early juvenile stages. Adult fish when infected, is asymptomatic, but can transmit the virus to the offspring through eggs and gonadal fluids.

The virus

The disease is caused by an RNA virus, nervous necrosis virus (NNV) belonging to the genus *Betanodavirus*. There are four different genotypes of NNV viz., striped jack NNV (SJNNV), tiger puffer NNV (TPNNV), barfin flounder NNV (BFNNV), and red-spotted grouper NNV (RGNNV). RGNNV is the most prevalent genotype affecting highest number of species in both tropical and temperate regions. RGNNV is the only genotype prevalent in India and most other tropical countries.

Diagnosis

Clinical signs: Erratic swimming, hyperinflation of swim bladder, belly up, skin darkening

Histology: Vacuolation in brain and retina

Virus Detection: RT-PCR, qPCR, ELISA

Control

Vaccination is the practical strategy to build immunity and prevent vertical transmission of NNV.

The Vaccine

CIBA-Nodavac-R is a recombinant vaccine against VNN caused by RGNNV. The vaccine consists of recombinant capsid protein of RGNNV expressed in *Escherichia coli*. The purified recombinant capsid protein is emulsified with adjuvant in the ratio 3:7.

Indications: The vaccine can be used to prevent VNN in fingerling and adult finfish of all susceptible species and to prevent vertical transmission of the virus from brooders to offspring.

Administration*: The vaccine can be administered intraperitoneally to fingerlings and brooders on the midline posterior to the pelvic fin.

Dose: 0.1 ml/ fish weighing >20 g intraperitoneally. A booster dose is recommended for brooders at 2 months interval followed by annual vaccination.

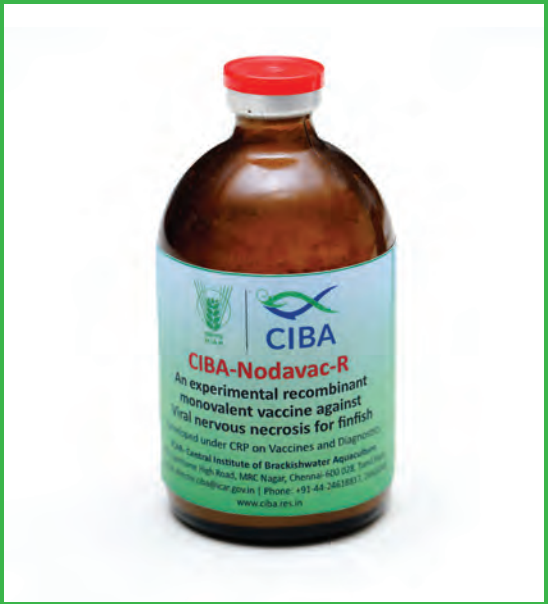
Efficacy: Onset of immunity is 2 weeks post immunization. The vaccine reduces mortality up to 6 months post-vaccination. Larvae produced by vaccinated brooders are free of virus and possess maternal antibodies against NNV.

Safety: The vaccine is safe to fish even at 3 times the recommended dose (0.3 ml).

Storage and shelf life: Store the vaccine under refrigeration (2-8°C). Do not freeze. The vaccine is stable for 6 months at 4°C.

Pack size: 100 ml

* Oral vaccine for administration through feed and immersion vaccine are under development.



Instructions for use:

- Shake well before use.
- Allow the vaccine to reach room temperature before injection
- To be injected intraperitoneally on the midline posterior to the pelvic fin
- It is recommended to starve the fish 24 h before vaccination

Developed under Consortium Research Platform on Vaccines and Diagnostics

"Brackishwater Aquaculture for Food, Employment and Prosperity"

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