Novel approaches for viral disease management in shrimp farming in Vietnam Project BL/02/V02

Project partners (+indicate coordination): Ghent University; Can Tho University, Vietnam; Research Institute for Aquaculture No2, Vietnam

(Geographic) study area : Asia

Science policy testsite (if applicable) **:**

Project period: January 1, 2004 – December 31, 2005

Funding framework:

Data used (if satellite data, specify):

Context and objectives (max 14 lines)

Disease is currently an important constraint to aquaculture growth and has impacted both socio-economic development and rural livelihoods in some countries. Addressing aquatic animal health issues has therefore become an urgent requirement for sustaining growth of aquaculture, especially through pro-active programmes. White spot syndrome virus (wssv) and yellow head virus (yhv) are considered as two of the most serious diseases and cause high mortality in many species of penaeid shrimp and other aquatic crustaceans throughout the world.
The current proposal sets out to study the prevalence of viral diseases in shrimp farms in the Mekong Delta. It furthermore aims to develop a standardised viral challenge test as a tool to study the pathogenesis of WSSV and to evaluate the effect of new neutraceuticals, immunomodulators, "vaccins", environmentally safe antiviral products and various management techniques on susceptibility of shrimp to viral diseases.

Methodology (max 10 lines)

Through questionnaires and an intensive sampling campaign, 50 intensive and 100 improved extensive shrimp farms were followed over one season in order to document prevalence of viral diseases and elucidate risk factors related to farm conditions and farm management practices.
Standardised WSSV challenge procedures through intramuscular and peroral route, using a known infectious dose and specific pathogen free shrimp were established. These were then used to study pathogenesis of the virus (for both a low and high virulent WSSV strain and a high and low infectious dose) and to document the effect of various antiviral compounds, immunomodulators and management practices on susceptibility of the shrimp.

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Results (max 16 lines)

Although more detailed data analyses is still to be performed, the epidemiological study points out a high prevalence of WSSV in shrimp farming areas in Vietnam. Several risk factors could be pinpointed.

The standardized challenge models developed proved very useful to study the effect of various factors on the outcome of a WSSV infection. Of the different factors studied, high water temperature was the most efficient in controlling WSSV infections. Even if this might not be directly applicable in the field, this technique allows to subject shrimp to a more controlled infection which is a very useful tool to study the effect of other factors.

The detailed pathogenesis study furthermore has unraveled the primary site(s) of viral replication, how WSSV spreads throughout the organs and tissues, and what is the cause of death due to WSSV infection. Pathogenesis was studied in *L. vannamei* with both a high and a low virulent WSSV strain. A similar study is underway with *P.monodon* in Vietnam.

Products and services (if applicable)

Website (with project results):
Pictures illustrating the project:

Discipline (select one or more appropriate disciplines)

Aquaculture

Publications

Escobedo-Bonilla C.M., Wille M., Alday-Sanz V., Sorgeloos P., Pensaert M.B., Nauwynck H.J. (2005) *In vivo* titration of white spot syndrome virus (WSSV) in SPF *Litopenaeus vannamei* by intramuscular and oral routes. Diseases of aquatic organisms 66, p. 163-170

Escobedo-Bonilla C.M., Audoorn L., Wille M., Alday-Sanz V., Sorgeloos P., Pensaert M.B., Nauwynck H.J. (2006) Standardized white spot syndrome virus (WSSV) inoculation procedures for intramuscular or oral routes. Diseases of aquatic organisms 68, p. 181-188

Escobedo-Bonilla C.M., Wille M., Alday-Sanz V., Sorgeloos P., Pensaert M.B., Nauwynck H.J. Pathogenesis of a Thai strain of white spot syndrome virus (WSSV) in juvenile specific pathogen-free *Litopenaeus vannamei*. Submitted.

Rahman M.M., Escobedo-Bonilla C.M., Wille M., Alday-Sanz V., Audoorn L., Neyts J., Pensaert M.B., Sorgeloos P., Nauwynck H.J. (2005) Clinical effect of cidofovir and a diet supplemented with Spirulina platensis in white spot syndrome virus (WSSV) infected specific pathogen-free Litopenaeus vannamei juveniles. Aquaculture, In Press.