



PRELIMINARY RESPONSE OF A NEW FEED SOLUTION TO IMPROVE RESISTANCE OF WHITE SHRIMP *Penaeus vannamei* POST LARVAE AGAINST *Enterocytozoon hepatopenaei* (EHP) DISEASE

Stephane Frouel*, Julie Castier, Thomas Pierrot and Maxime Hugonin

Mixscience
2, Avenue de Ker Lann
CS 17228
35172 BRUZ CEDEX
stephane.frouel@mixscience.eu

Aquaculture industry is highly challenged by diseases outbreaks, introduction and spread of specific new pathogens like parasites. This pathogenic pressure significantly impacts the economics of the farmers. In recent years, chemical solutions have been applied. However the massive use of chemicals in aquaculture is nowadays a high public health concern and dramatic effects on environment appeared. The current research works aimed to develop a specific solution against parasites in aquaculture, in particular against endoparasites.

Enterocytozoon hepatopenaei (EHP) is a microsporidian parasite that was first characterized and named from the giant or black tiger shrimp *Penaeus monodon* from Thailand in 2009. It was discovered in slow growing shrimp but was not statistically associated with slow growth at that time. EHP is restricted to the shrimp hepatopancreas (HP) and its occurrence is usually not heeded because of the overwhelming focus on Acute HepatoPancreatic Necrosis Disease (AHPND) commonly referred as Early Mortality Syndrome (EMS). However, although EHP does not appear to cause mortality, feedback from shrimp farmers indicates that it is associated with severe growth retardation in *Penaeus vannamei* leading (sometimes) to early harvest meaning economical losses for the producers.

An experimental 64-days trial has been conducted at lab facilities in Vietnam to evaluate the potential of a new feed solution (supplied by MiXscience, France) to improve the response of white shrimp *Penaeus vannamei* post larvae (average initial weight 0.5g) challenged by EHP. Shrimp were challenged under a standardized cohabitation method.

Three groups were compared:

1. Non Challenged Control (NC)
 2. Positive Challenged Control (PC)
 3. Experimental group (EXP)
- Each group had 5 replications.

Growth performance parameters (Bodyweight gain, FCR) as well as final survival and final EHP load were monitored during the trial.

The trial results indicated that the experimental product (applied at 3.5 Kg/tonne of feed) expressed some positive effects on growth performance and a significant reduction of EHP load in HP of the infected shrimp was observed (Table 1). Survival was also enhanced even if there was no statistical difference with PC (p>0.05).

Table 1: White shrimp performance after EHP exposure (a, b: ANOVA p<0.05)

	NC	PC	EXP
iIBW (g)	0.54a	0.54 a	0.51a
fIBWG (g)	8.83a	7.52b	8.85 a
FCR	1.16a	1.60b	1.38ab
Survival rate (%)	90a	80b	82ab
Final EHP load	0a	5964b	254a

iIBW : initial Individual BodyWeight (g)

fIBWG: final Individual BodyWeight Gain (g)

FCR: Feed Conversion Ratio

EHP Load expressed at 10e5 copies/g of shrimp hepatopancreas

These preliminary results demonstrated that this new feed solution seems to counteract the EHP's effects on the host's performance and can be considered as a promising preventive product for shrimp farmers who are impacted by microsporidians and the associated economical losses.