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Advances in the use of heterotrophic and mixotrophic media in aquaculture

In Brazil, aquaculture activity has reached, in 2016, production of approximately 600 thousand tons (IBGE, 2016). Much of this production is in semi-intensive farming systems, with regular water changes and less biosecurity. However, in recent years the cultivation of marine shrimp has experienced viral outbreak problems such as IMNV (Infectious Myonecrosis Virus) and WSSV (White Spot Syndrome Virus) and consequently reduced productivity, for this reason it is necessary to use new production systems as the cultures in heterotrophic medium with zero exchange of water, where the development of the biofloc system (BFT) occurs through the manipulation of the carbon: Nitrogen ratio in the growing environment, stimulating the growth of microbial community formed by different microorganisms, these flocs constitute as alternative food to the cultivated animals, providing an increase in growth and participating in the regulation of water quality. However, some studies with bioflocs indicate a deficiency in polyunsaturated fatty acids as EPA and DHA.

Thus, the planktonic and microbial communities found in *Litopenaeus vannamei* intensive cultivation systems play an important role in the recycling of nutrients, assimilating the nitrogen compounds and maintaining the water quality of these systems, thus promoting the incorporation of microalgae and rotifers to have a mixotrophic medium. The diatoms are outstanding because they have a high nutritional content and can contribute mainly with highly unsaturated fatty acids. In this context, the studies using *Navicula sp.* and *Brachionus plicatilis* in biofloc systems gave good results regarding the nutritional contribution of these live foods on the growth of *Litopenaeus vannamei*. Finally it is concluded that a mixotrophic culture with the inoculation of diatoms and rotifers in BFT systems has benefits for the development of post-larvae of *L. vannamei*, since it presented higher values in the performance variables for final mean weight, productivity, biomass gain, specific growth rate and increase of lipid contents in both the biofloc and shrimp body.

Biography

Alfredo Olivera Galvez is currently working as Professor at the Federal Rural University of Pernambuco (UFRPE). He received his Doctoral degree on Biology of Aquatic organisms from the Sao Paulo State University (UNESP). He completed Post-doctoral stay on Biofloc Technology (BFT) in Waddell Mariculture Center at South Carolina - USA and Post-doctoral stay on Biotechnology of microalgae in Almeria University - Spain. He has authored several publications in various journals and books. His publications reflect his research interests in Sustainable aquaculture, seaweeds and microalgae production, bioremediation and Shrimp production. He is serving as a member or fellow in National Council for Scientific and Technological Development (CNPq - Brazil).

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