World Academy of Science, Engineering and Technology
International Journal of Marine and Environmental Sciences
Vol:12, No:11, 2018

Development of Monoclonal Antibodies against the Acute Hepatopancreatic Necrosis Disease Toxins

Authors : Naveen Kumar B. T., Anuj Tyagi, Niraj Kumar Singh, Visanu Boonyawiwat, Shanthanagouda A. H., Orawan Boodde, Shankar K. M., Prakash Patil, Shubhkaramjeet Kaur

Abstract : Since 2009, Acute Hepatopancreatic Necrosis Disease (AHPND) outbreaks have increased rapidly, and these have led to the major economic losses to the global shrimp industry. In comparison to other treatments, passive immunity and monoclonal antibody (MAb) based farmer level kit have proved their importance in controlling and treating the diseases in the shrimp industry. In the present study, MAbs were produced against the recombinant PirB protein Vibrio parahaemolyticus strain causing AHPND. Briefly, Balb/C mice were immunized with rPirB at 15 days interval, and antibody titer was determined by ELISA. Spleen cells from mice showing high antibody titer were fused with SP2O myeloma cells for hybridoma production. Among 130 hybridomas, four showed high antibody titer and positive reactivity in an immunoblot assay. In Western blot assay, three out of four MAbs (4C4, 2C2 and 4G3) showed reactivity to rPirB protein. However, in the natural host, only Mab clone 4G3 show strong reactivity (with a strain of V. parahemolyticus causing EMS/AHPND). These clones also showed reactivity with less than 20 kDa proteins in AHPND free V. parahaemolyticus (Thailand stain). Further, on from MAb 4G3 clone, four panels of single cell MAbs clones (G3F5, G3B8, G3H2, and G3D6) were produced of which three showed strong positive reactivity to rPirB protein in the Western blot. These MAbs have potential for controlling and prevention of the AHPND through passive immunity and development of filed level rapid diagnostic kits.

Keywords : shrimp, economic loss, AHPND, MAb
Conference Title : ICFAT 2018 : International Conference on Fisheries and Aquaculture Technology
Conference Location : Tokyo, Japan
Conference Dates : November 12-13, 2018