J Aquac Res Development 2016, 7:8 (Suppl)
http://dx.doi.org/10.4172/2155-9546.C1.009

Application of new medicinal plant as prophylactic treatment for epizootic ulceration syndrome

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Epizootic Ulcerative Syndrome (EUS), causes by the fungus *Aphanomyces invadans* is one of the OIE-listed diseases which imposed huge economic losses in fish industry in the world during the recent decades. While control of EUS in infected fish population is most likely impossible; hitherto, there has been no vaccine available for prevention of this destructive infection. In the other hand, traditional disease management strategies with application of antibiotics and chemotherapy continue to cause undesirable effects such as antibiotic resistance, environmental pollution and food security issues. Therefore, an alternative strategy is to use medicinal plants as immunostimulants for EUS treatments. It is known that more than 400,000 species of tropical plants have medicinal properties. Plant extracts or their byproducts contain several active compounds such as phenols, polyphenols, alkaloids, quinones, terpenoids, lectines and polypeptides that have been shown to be effective alternatives to traditional chemotherapies and vaccines. Also they are biodegradable, environment friendly, inexpensive, renewable and locally available which can be easily prepared. Some plants such as *Mikania cordata, Rauvolfia tetraphylla, neem (Azadirachta indica),* akand *(Calotropis gigantea), turmeric (Curcuma longa), Curcuma zedoaria, Indian sorrel (Oxalis corniculata)* and Nigella sativa have been proved to enhance disease resistance against EUS. Our scientific group, for the first time is working on new tropical herbal extract that expecting to enhance EUS-susceptible fish innate immunity system. This new finding could be applied to develop prophylactic strategies in EUS prevention for sustainable world's aquaculture in near future.

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Histopathology of the liver of three-spotted Gourami, *Trichogaster trichopterus*, exposed to malachite green, a commonly used medicine in Aquaria

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With the intensification of aquaculture and the heightened interest in ornamental fishes and fish keeping, use of medicaments has considerably increased. These agents are heavily bio accumulated by fish. In spite of this importance of drugs/therapeutic agents in fishery science, no serious attempt has been made to assess their effects on fishes, especially the histopathological changes brought about by them. Liver is the chief metabolic and detoxification organ in vertebrates and it is highly susceptible to metabolic disturbances and a variety of toxicants to which the animal is exposed. Results of controlled exposure of fishes in the laboratory to toxicants such as pesticides and related chemicals suggest that liver is the organ in which the highest residues of such toxicants accumulate and it is this organ that suffers the greatest damage and impairments following such episodes. The present study was, therefore, aimed at assessing the histopathological effects of therapeutic level of malachite green on the liver of a common aquarium fish, the three spotted (blue) Gourami, *Trichogaster trichopterus.* The drug selected for the present study was malachite green, a chemical recommended for treatment of fishes against several infections, especially fungal infection of eggs. Malachite green is used at concentrations of 0.05-0.15 ppm in fish disease therapy. Healthy fishes of about 70.0±5 mm TL purchased from a local aquarist were used for the present study. Fish were exposed to malachite green for a period of 48 h in all-glass aquarium tanks. The exposure concentration of malachite green was 0.15 ppm. The procedures for histological studies were basically in accordance with the commonly practiced histological methods.

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