

GREEN AQUACULTURE WITH HERBAL DRUGS

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Aquaculture is the fastest growing industry around the world, but there are various problems associated with aqua-cultural production. Due to the intensification of rearing methods and systems, diseases and pathogens have been an integral part and formidable obstacle to aquaculture industry worldwide. Many of the antibiotics and other synthetic drugs have serious side effects in biological system and therefore, natural products are safer because they are more in harmony with the biological system. Habitual use of antibiotics can lead to problems with bacteria resistance and with unacceptable residues in aquaculture products and environment. Resistant bacterial strains could have a negative impact on the therapy of fish diseases or human diseases and the environment of the fish farms. On the other hand, in regarding to executive program of export of aquaculture products to other points of the world, the use of natural chemical agents in aquaculture is necessary to establish the market. Different medicinal plants and herbs and/or combinations of them are known to have properties such as anti-viral, anti-bacterial, anti-fungal, physiological systems (immune system, digestive system) supporting, hormonal balancing and many other properties. Moreover, these substances are nontoxic, biodegradable and biocompatible. No herbal resistance immunity has been found by any pathogen to date. It is well known and documented that medicinal herbs have strong antibacterial effects. Polysaccharides, flavonoides, phenolics and proteoglycans are known to play important role in preventing and/or controlling bacterial infections. Several plant products have been found to have potent antiviral activity against fish and shrimp viruses (IPN, VSH, and IHN). In aquaculture several infectious diseases are reported that mainly belongs to species of *Pseudomonas*, *Aeromonas*, *Streptococcus* and *Vibrio* species and a few parasitic organisms like Protozoan, Helminthes and Arthropods. Bacterial species causes high mortality and severe economic loss during its outbreak in cultured fish. Many plant-derived compounds have been found to have non-specific immune stimulating effects, growth promoter and of antioxidant activity in aquatic animals, and also fertility enhancer in female brood stock, increasing fecundity and gonadal weight, effective on sperm quality of broodstock. Now, various medicinal plants have been evaluated in Iran to control fish diseases and have produced satisfactory results. Finally, we introduce new herbal drug with trade mark of "AVISHIT" instead of malachite green and without any side effect for human safety and environment. AVISHIT, as an antimicrobial agent, derived from extract of "*Zataria multiflora*" was approved and established in Iranian veterinary pharmacopeia. Its dosage is 50 ppm for disinfection of incubatory period of trout eggs.

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