

8-2017-4497 | New Antibacterial Agents for Aquaculture Based on Humic Substances
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Background

Conventional antibiotics are used to treat bacterial diseases in aquaculture. The use of antibiotics is associated with harmful side effects such as resistance induction and accumulation of drugs in aquaculture products and aquatic environments. These problems have led to stringent regulation aimed at restricting the use of conventional antibiotics in aquaculture. In recent years, new **alternative strategies for bacterial disease control in aquaculture have been initiated** such as the use of medicinal plants, probiotic bacteria and bacteriophages

Our Innovation

Humic Substances HS are pigmented natural, organic compounds with highly variable molecular weights which are the end-products of the decomposition of complex organic compounds.

Our main finding can be summarized as follows:

- HS reduced the infection rate with carp erythrodermatitis in carp fish (*Cyprinus carpio*), a globally common fish pathogen
- HS had a selective bacteriostatic effect on different bacterial pathogens of fish.
- HS had an immunostimulatory effect on carp
- HS increased the survival rate of carp and tilapia following environmental stress.
- HS reduced the infection rate with monogenean parasites in guppy (*Poecilia reticulata*).

In a separate set of experiments we found support for the antibacterial properties of essential oils extracted from different plants

Opportunity

The technology enables development of full line of **antibacterial products** based on HS and essential oils agents for **aquaculture industry**. These products could be generally divided into five sub-groups based on their composition:

- Pure humic substances
- Mixture of HS and conventional antibiotics
- Mixture of plant essential oils and antibiotics
- Mixture of HS and plant essential oils
- Mixture of essential oils and antibiotics

Patent Status

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