

Allium sativum and Terminalia catappa as a Medicinal Herb for Fish Ectoparasitic Infection Treatment

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ABSTRACT

Fish frequently come into contact with water-borne pathogens. Fish are susceptible to several illnesses caused by macro and microorganisms. As a result of ectoparasite Trichodina's widespread early infestation, significant financial losses have occurred. Currently, it appears that formalin is worthless for treating ectoparasitic diseases in freshwater fish. Furthermore, formalin may leave hazardous residues in the fish flesh and the environment that are ultimately damaging to consumers. But this problem can also be resolved by using medicinal plants. The therapeutic herbs can work as immunostimulants, providing fish with activating non-specific defensive mechanisms and enhancing their specialised immune response. Indian almonds and garlic have been used to cure Trichodina sp. for an ectoparasite of tilapia fish.

INTRODUCTION

Drugs and chemicals are among the environmental toxins to which fish are exposed. Other diseases, such as bacteria or parasites, can potentially infect or harm the fish. Columnaris, gill disease, ick (ich), dropsy, lymphocytes, marine velvet, neon-tetra

disease, tail and fin rot, and fin and tail rot are the most prevalent fish diseases, especially in freshwater tanks are all diseases caused by poor water quality. The treatment for ectoparasitic diseases in freshwater fish with formalin seems at present to be effective. Furthermore, formalin

may leave hazardous residues in the fish flesh and the environment that are ultimately damaging to consumers. Using conventional medicinal plants is a different approach that can be taken to remedy this issue (Chitmanat et al. 2005).

Tilapia (*Oreochromis niloticus*) is one of the numerous affordable freshwater fish that are cultured all over the world. Ectoparasites of the tilapia fish include *Trichodina* sp. and be treated by the plant's garlic (*Allium sativum*) and Indian almond (*Terminalia catappa*) (Chitmanat et al. 2005). Regrettably, a key limiting element for aquaculture firms is the parasite epidemic (Madsen et al. 2000a).

Producing clean food items is necessary because food safety is a huge concern worldwide. Antiparasitic compounds screened from plants are becoming increasingly popular as chemical and antibiotic treatment alternatives. Many reports suggest that these herbs have anti-ectoparasite properties. For instance, a variety of microorganisms, including bacteria, fungi, protozoa, and viruses, have been proven to be sensitive to crushed garlic formulations (Chitmanat et al. 2005).

Garlic as an antimicrobial agent

Aquaculture could benefit from using a treatment method involving medicinal herbs with antibacterial properties. Many adverse effects of synthetic antimicrobials are lessened by these plants. In addition, compared to chemotherapeutic drugs, plant-derived phytochemicals offer a more affordable and precise source of treatment. Since the dawn of medicine, people have employed plants to treat bacterial, viral, and fungal illnesses. The viability of using herbal medicines for fish ailments has

recently been the subject of research. From these plants, vaccination adjuvants can be produced.

Garlic also strengthens the immunological and cardiovascular systems (Harris et al. 2001), and current research has focused on its alleged ability to fight cancer. Garlic has attracted interest as an immunostimulant for use in aquaculture due to its usage in human medicine and agriculture as a recognised preventative and therapeutic agent (Amagase et al. 2001).



Figure 1. Garlic (*Allium sativum*)

Indian almond as an antifungal agent

The medicinal plants can stimulate the immune system, giving fish non-specific defence mechanisms early activation and boosting their specific immunological response. The herbs have a variety of immunologically active substances like polysaccharides, organic acids, alkaloids, glycosides, and volatile oils that can improve immune responses (Madhuri et al. 2012b; Pandey et al. 2012a; Ravikumar et al. 2010). The ability of several herbs in aquaculture to stimulate the immune system has recently attracted more attention. Moreover, bacterial infections are thought to be the main cause of mortality in aquaculture, and in recent years, medicinal plants and their derivatives have

become important in fish culture (Ravikumar et al. 2010).

In vitro, antifungal activities were present in Terminalia catappa crude extracts against Pythium ultimum, Rhizoctonia solani, Sclerotium rolfsii, and Aspergillus fumigatus(Goun et al., 2003).In Tilapia fungal infection-infected eggs, treatment with 200 ppm water extract from Indian almond had the strongest antifungal activity(O. niloticus) (Chitmanat et al., 2005).A lot of effort needs to be done to optimise the dose and course of treatment against the most prevalent diseases even though Indian almond leaves contain the qualities of herbal medicines.

Figure 2.Indian almond(Terminalia catappa)



Anti-parasitic effect

There have been reports(Chitmanat et al., 2005)of using the anti-parasitic Indian almond (Terminalia catappa) to cure Trichodina sp., an ectoparasite of tilapia fish. The sick fish grow listless, produce copious mucus, and eventually stop feeding, which causes a significant number of deaths. It was noticed that Trichodina sp. infections in tilapia were considerably removed by the crude extracts of Indian almond at 800 mg/L. After a 2-day treatment, these researchers claim that Indian almond at 800 ppm was

successful in eliminating Trichodina sp. from tilapia.

Within 24 hours of exposure, the leaf extracts can cure black tiger post-larva shrimp of Zoothamnium spp. infection. They may help lessen goldfish infections with Gyrodactylus and Dactylogyus.

CONCLUSION

Fish can contain a variety of infections and parasites, which causes them to suffer from various ailments. Viral infections, bacteria, fungi, protozoa, water moulds, and other pathogens can cause diseases in fish. Aquaculture could benefit from using a treatment method involving medicinal herbs with antibacterial properties.

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Infections caused by ectoparasites, such as Trichodina sp., can be treated with garlic and Indian almond as natural alternatives to pesticides in fish like tilapia. Although the medicinal plants may only elicit generalised immune responses, they can also be employed as adjuvants in vaccines, and their vaccines may offer a more effective means of preventing fish diseases.

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