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Original Article

Coleus aromaticus Benth act as an immunostimulant in *Channa marulius* Hamilton

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Abstract

Channa marulius is commonly called giant murrels and a have well known taste, high nutritive value, recuperative and medicinal quality. Epizootic ulcerative syndrome (EUS) or 'red-spot' is an ulcerative syndrome caused by *Aphanomyces invadens* which affects *Channa marulius*. EUS had a serious effect on this fish resulting heavy economic losses. To overcome this problem in *Channa marulius*, we have prepared herbal paste of *Coleus aromaticus* leaves, which acts against EUS in fish. The herbal paste was applied on the lesions it showed complete healing of wound in *Channa marulius* on the seventh day. The results clearly indicate the disease resistance properties of *Coleus* leaf extraction and so its potential to be used as an immunostimulant in murrel culture.
Keywords: EUS, *Channa marulius*, Immunostimulant, *Coleus aromaticus* Benth

Introduction

The intensive culturing of fish generates a stressful environment to them and the consequent suppression of the immune system, rendering the fish susceptible to the infectious diseases. To prevent financial losses due to diseases, fish farmers must take sufficient preventive measures. Antibiotics and other chemotherapeutics used to control these diseases can result in the development of drug resistant pathogens, environmental pollution and accumulation of residues in fish. Though vaccination is an effective prophylactic method for controlling fish diseases, vaccines are relatively expensive and since they are very specific to particular pathogens (Sakai, 1999), there is a need for developing and using number of vaccines against corresponding number of microbial diseases against which the fish have to be protected. But the use of immunostimulants for the disease prevention in fish is considered as a promising alternative to vaccines. (Anderson, 1992;Secombes,1994) because of its broad spectrum activity and so its cost effectiveness. Recently, growing interest has been paid to the immune stimulating function of medicinal herbs in aquaculture.

Channa marulius is widely distributed in almost all the states of India. *C.marulius* is commonly called giant snakeheads or large murrel (Vernacular name – avuri). Body colour is grayish green on the dorsal side and lighter on both dorsal and ventral sides with several dark irregular bells. It is usually found in large rivers and occur in lakes and swamps but always in Fresh water. Among all the murrels it shows the fastest growth It is sold in large numbers in fish markets. The fish is well known for its taste, high nutritive value, recuperative and medicinal quality it is sometimes recommended as a diet during convalescence (Fuller, 2003).

Epizootic ulcerative syndrome (EUS) or 'red-spot' as it is known colloquially, is an ulcerative syndrome of fish which affects a range of native species caused by a highly invasive aseptate and specific slow-growing fungus originally described as *Aphanomyces invadens* (Willoughby *et al.*,1995). It begins as a small area of reddening over a single scale, which subsequently spreads to involve a number of adjacent scales, giving a deep ulcer, which sometimes extends into the abdominal cavity. Some cases of EUS heal spontaneously, especially juveniles, die (Pradhan *et al*., 2007). EUS has been reported from 24 countries on four continents. More than 100 fish species have been affected by EUS. When EUS spreads into a fish culture pond such as air breathing snakehead fish pond. EUS occurs mostly during periods of low temperatures or 18-22°C and after periods of heavy rainfall. These conditions favour sporulation of *A. invadans* (Lumanlan Mayo *et al.*, 1997) and low temperatures have been shown to delay the inflammatory response of fish to Oomycete infection (Catap and Munday,

1998; Chinabut *et al*., 1995).In some countries, outbreaks occur in wild fish first and then spread to fish ponds.

The uses of medicinal plants in traditional medicine are widespread and still serve as leads for the development of novel pharmacological agents. Many such medicinal plants have hepatoprotective, neuroprotective, anti-inflammatory and also antioxidant or radical-scavenging properties (Perry *et al.*, 1999; Lin and Huang, 2000). Therefore, in recent years in the field of curing fish diseases, major emphasis is being placed on the use of immunostimulant mainly for intervening and for treating several fish ailments. *Coleus aromaticus* Benth, belongs to the family Laminaceae (Local name: Omavalli in Tamil and Navarapachilai in Malayalam) is one such Indian medicinal plant used extensively to treat a spectrum of ailments. It is a small herb, 30-90cm in height with fleshy leaves and cultivated throughout India. It is used as medicinal properties like antilithiotic, chemopreventive, anti-oxidant and antiepileptic potential. Other folk uses include treatment of ulcers, boils, swellings, urogenital and wound healing properties. It is used by almost all local people for its therapeutical efficacy against common cold, cough, fever, headache and indigestion. The leaves are said to have specific action on the bladder and to be very useful in urinary disease and vaginal discharges (Satish Rao *et al*., 2006). In the present study *Channa marulius* affected by EUS was treated with *Coleus aromaticus* which is having immunostimulant properties.

Materials and Methods

Collection and Rearing

Diseased giant murrels *(Channa marulius)* average length 28 cm and weight 250g were collected from the Bhavanisagar reservoir. The infected fish were separated and transported to CARE Aquafarm. They showed lesions and deformed fins at the dorsal side and showed reddish spots on the ventral side. These diseased murrels were reared in cement tanks (3m×1m×1m) and fed with semi moist formulated feed (Haniffa *et al*., 1999).

The plant materials of *Coleus aromaticus* leaves collected from green house in St. Xavier's College, Palayamkottai, and above material of 15gms of leaves ground finely using Pestle and Motor with 7ml glycerine using sufficient amount of distilled water for the preparation of herbal paste. Fifteen diseased giant murrels with moderate lesions were taken from the cement tanks and divided into three groups each with five individuals. The herbal paste was applied tropically on the lesions of the fish in all the three tanks. They were kept undisturbed in plastic troughs (Capacity: 50 litres) for 15 minutes. After that they were introduced into the cement tanks (3m×1m×1m). The treatment was given twice per day and continued for 7 days. Everyday fishes were taken from the rearing tanks and observed for wound healing and after that the treatment was repeated. Meanwhile the rearing tanks were cleaned and supplied with well oxygenated water from a nearby bore well. Water quality parameters were recorded: pH (7.83 ± 0.28), salinity oxygen (9.4 ± 0.02ppt), dissolve oxygen (9.5 ± 0.30ml/litre) and ammonia (0.26 ± 0.02ppm).

Results and Discussion

It was observed that *Coleus aromaticus* is more effective medicinal herb for wound healing properties. The herbal paste was applied over the surface of the wound of the fish and introduced in to the tank after 10 minutes. This process was continued for 10 days. The 2nd, 3rd and 4th day after the application of the herbal paste the fish showed no sign of healing, but at the 5th day, symptoms of healing was observed at the surface of the wound. It was noticed that the 7th day, the wound was healed. At 10th day it was noticed, there was no sign of wound in the fish. It was completely cured (Plate-1; Table-1).

Table-1: Wound healing activity of *C. aromaticus* on relative percentage in *C. marulius*

Days	% of wound healing by *C. aromaticus*	Grading of external symptoms /days
1.	0	+++
2.	0	+++
3.	0	+++
4.	10	++
5.	20	++
6.	40	++
7.	60	+
8.	90	-
9.	100	-
10.	100	-

+++ = Eroded lesions; ++ = Slight lesions
\+ = Blanching with or without swelling
\- =Complete cured

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The overall consequences of an immunostimulant administration are presumably reflected in their ability to resist infection. In the present study showed significant protection in EUS affected fishes. Thus, some of the active principles may be acted as present in *Coleus* are possibly, immunostimulatory in *Channa marulius*.

A: EUS affected *Channa marulius*; **B**: *Coleus aromaticus* **C**: Preparation of Coleus *aromaticus* paste;
D&E*:* Application of *Coleus aromaticus* paste to treat EUS affected *Channa marulius***;**
F: Healing of wound in *Channa marulius*
Plate-1: Herbal paste of *C. aromaticus* treatment to healing of EUS affected wound in *C. marulius*

A number of wound healing techniques viz., spraying chemicals into ponds and adding antibiotics in the feed had been used Rehulka ,(2000) treated rainbow trout while Harikrishnan

et al., (2003). Similar work was carried out using neem paste (*Azaridacta indica*) and aloe paste (*Aloe Vera*) in *Channa striatus* and *Channa punctatus*. Neem paste treated individuals showed complete wound healing on the 6th day of the treatment and the aloe paste treated murrels showed slower recovery in the 8th day of treatment by Haniffa *et al*.,(2006). Anon, (1993) observed that the application of neem leaves and turmeric paste prevented the spread of infection and promoted the survival and growth of the fish.

Earlier studies the enhancement of non-specific immune responses and perhaps the consequent disease resistance confirm the immunostimulatory activity of water-soluble fraction of *T. cordifolia* leaves. The immunostimulatory activity of the fraction was presumably due to some active principles present in it (Catherine Alexander *et al.,* 2010), and the related work hematological and biochemical parameters in common carp, *Cyprinus carpio*, following herbal treatment for Aeromonas hydrophila infection was done by Harikrishnan *et al.,* (2003)

Conclusion

The present study revealed that *Coleus aromaticus* play vital role in treating fish diseases especially EUS. This is one of the simple technique and any one can practice. No skill is needed, low cost, no side effect to the consumers. *Coleus aromaticus* is one of the most commonly available medicinally important plant. Using this technique we can subject more medicinally important plants for treating EUS in fish and to increase the production of *Channa marulius* against EUS. Herbal medicines employed to external treatment on lesion of fish against EUS typically contains active components, which may generate protective immune responses. Application of herbals in aquaculture may also reduce cost disease management by obviating the expenses incurred by the use of antibiotics, chemicals and vaccinations in the future. Our findings results provide a useful approach for protecting cultured murrels against infectious diseases.

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