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Dual properties of seaweed *Enteromorpha intestinalis* on the growth and disease resistance in *Etroplus suratensis*

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ABSTRACT

Seaweeds have been used as fodder for cattle and aquatic animals like fishes. The average length and weight of fishes fed with E. intestinalis reached a mean total length of 77.7mm and a mean weight of 20.4g and the fish fed with E. clatherata is reported to posses mean length of 82.5mm and mean weight of 23.7g. Whereas the fish fed with artificial feed mean length was 76.3mm and a mean weight was 18.5g.

Key Words: *E. clatherata, E. intestinalis,* Fish feed, Seaweed.

INTRODUCTION

Aquaculture is gaining commendable momentum from all quarters of the globe. Deviating from the conventional methods of fish farming, many methods have evolved to boost the production within a stipulated time. In aquaculture production feed play a prominent role. Seaweed was used as feed for fish culture. Many seaweeds serve as a good fodder for cattle and aquatic animals like fishes. But the green algae *viz.*, *Caulerpa*, *Cupvessoides*, *C. Peltata*, *C. taxifola*, *Ulva fasciata*, and *U. lactuca* were found to inhibit the gram positive S. aureus and all the vibrio spp. [1]. Moreover, several active principles have been isolated from marine algae *E. intestinalis* [2] and *U. lactuca* [3] .These algae are reported to produce dimethyl sulphide and acrylic acid which are antimicrobial in nature. So it is evident that the seaweeds posses antimicrobial compound . Forty-five crude methanolic extracts from 23 marine halophytes were screened against five bacterial and two fungal saprophytic pathogens of diseased silkworm *Bombyx mori* [2]. Hence, feeding the fishes with seaweed helps to prevent the occurrence of disease to a certain extent. Seaweeds contain plenty of protein, vitamin, minerals *etc.*, [4].

As part of development in aquaculture, new fast growing species and delicious fishes are identified for aquaculture production. Some well known but less cared fishes are brought to the culture streams considering their local preference. One such species is the pearl spot, *Etroplus suratensis*, which are extensively available in estuaries and fresh waters of southern Indian. *Etroplus suratensis* an estuarine cultivable fish generally feed on filamentous algae like *Enteromorpha* and *Spirogyra* [5,6] So the present study was designed to utilize *Enteromorpha intestinalis* and *E. clatherata* to improve the growth of fish and the possibility of controlling vibriosis in *E. suratensis*.

MATERIALS AND METHODS

Fishes were transported from their points of capture to the laboratory, where the feeding experiments were conducted. Control fishes were fed with artificial feed prepared from maida, rice bran, groundnut oil cake, wheat bran and agar [7] (Tacon, 1988) and experimental fishes were fed with sea weeds *Enteromorpha intestinalis* and *E. clatherata*. Five fishes with an average weight of 11.6 gm were fed with these feed. One group was fed with standard feed other two groups feed with E. intestinalis and E. clatherata respectively. On an average 10 g of feed either pellet or seaweed was given to each set of fish once in a day.

RESULTS

The average length and weight of fishes fed with various feed after 21 days of the experiment reveals that, fish fed with *E. intestinalis* reached a mean total length of 77.7 mm and a mean weight of 20.4 g (Table 1) and the fish fed with *E. clatherata* is reported to have mean length of 82.5 mm and mean weight of 23.7 g (Table 1) whereas the fish fed with artificial feed mean length was increased by 76.3 mm and a mean weight of 18.5g. Weekly increment of length ranged from 2.2 mm to 3.1 mm and the weight ranged from 1.5 g to 2.9 g. The average length and weight was reported as 2.65 mm and the length ranged from 2.5 g respectively in group I. In group II the length ranged from 2.9 mm to 3.4 mm the weight was ranged from 2.7 g to 3.1g. The average length is 3.15 mm and average weight is 2.9 g. In Group III the length increased from 4.4 to 5.2 mm and the weight was increased from 3.9 g to 4.3 g with the average length of 4.8 mm and weight of 4.19 g respectively. The highest growth rate was reported in fishes on first two weeks from third week onwards. Survival rate of this was found to be 80% in Group I, 100% in Group II and III. So the production rated was moderately occurring in fish fed with algae especially with the feed of *E. clatherata*. But fish fed with artificial feed and *E. clatherata* showed vibriosis like symptoms of fin erosion, red spot in outer skin. But the fish fed with *E. intestinalis* does not have no such symptoms.

DISCUSSION

The growth rate of *E. suratensis* fed with E. clatherata was higher when compared to that of other feeds. *E. suratensis, E. maculates, Siganus javus* inhabited in seagrasses beds posses more filamentous algae than seagrasses in their stomachs [8]. The nutrient content and assimilation of seaweed viz., *Caulerpa, curpressoides, C. peltata, C. taxifola, Codium adherans, E. intestinalis, Ulva fasciata* and *U. lactuca* were reported to inhibit the gram positive *S. aureus* and all the *Vibrio spp*. Moreover, several active principles have been isolated from marine algae *E.*

intestinalis (Ravikumar *et.al.* 2009) and *U. lactuca* [3]. The seaweed can produce dimethyl sulphide and acrylic acid which act as antimicrobial compounds. Either as bacteriostatic or bactericidal agents, besides, nutritive nature of possessing vitamins and minerals [4]. So the nutritive deficiency syndrome in fishes can be prevented. Hence, feeding the fish with seaweed for fish culture is one of the best methods. In Ireland and Scotland seaweed is used for fish culture.

The present study proved that, the pearlspot, *E. suratensis* is a successful candidate to be considered for commercial fish culture. Hence, the fish can easily be cultured with readily available natural seaweed feed like *E. intestinalis* for disease free fish production.

Table 1: Weekly increment of length (mm) and weight (g) of E. suratensis fed with artificial feed (Group I)

Treatement days	Mean Length	Length increment	Mean Weight	Weight increment
0th day	68.5	-	11.7	-
7th day	71.2	2.7	13.2	1.5
14th day	74.1	3.1	16.1	2.9
21st day	76.3	2.2	18.5	2.4

Table 2: Length (mm) and weight (g) of *E. suratensis* fed with *Enteromorpha intestinalis* (Group II)

Date of observation	Mean Length	Length increment	Mean Weight	Weight increment
0th day	68.3	-	11.6	-
7th day	71.2	2.9	14.6	3.0
14th day	74.6	3.4	17.7	3.1
21st day	77.7	3.1	20.4	2.7

Table 3: Length (mm) and weight (g) of *E. suratensis* fed with *Enteromorpha clatherata* (Group III).

Date of observation	Mean Length	Length increment	Mean Weight	Weight increment
0th day	68.2	-	11.4	-
7th day	72.6	4.4	15.3	3.9
14th day	77.3	4.7	19.4	4.1
21st day	82.5	5.2	23.7	4.3

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