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## **Immuno Modulatory Effect of *Auricularia Polytrichain* Freshwater Prawn *Macrobrachium Rosenbergii*.**

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### **ABSTRACT**

*Auricularia polytricha* (Black fungus) is widely distributed in moist-deciduous to wet evergreen forests of the Western Ghats, Kerala, India. This species occurs in clusters on rotting branches and twigs and on decaying stumps and logs. This is also known as cloud ear; tree ear; wood fungus, mouse ear, and jelly mushroom. It grows rapidly on a variety of woods including mango and is very similar to another fungus called Jew's ear (*A. auricula*).

In the present experiment 1% black fungus powder is added in shrimp feed and its impact is studied in controlling various bacteriological diseases. When compared to control the disease occurrence in fungus treated shrimp is less. The percent survival of prawns was increased by 39 percent. In the present study an attempt is made to know the effect of *Auricularia polytricha* on growth and development of fresh water prawn *Macrobrachium rosenbergii*. The body weight, percent weight gain, amount of food consumed, food conversion ratio were increased. These mushrooms are known for their  $\beta$ -glucan molecules. The  $\beta$ -glucan molecule are composed of repeating D-glucose units linked with  $\beta$ -glycosidic bonds at one position like starch, but have branching glucose side-chains attached to other positions on the main D-glucose chain. These smaller side- chains can branch off the  $\beta$ -glucan "backbone" (in the case of starch, the backbone would be D-glucose chains linked at the (1,4) position) at other positions like that of the 3 and 6 position.  $\beta$ -Glucans are known as "biological response modifiers" because of their ability to activate the immune system. Immunologists have discovered that receptors on the surface of innate immune cells called *dectin-1* and complement receptor 3 (CR3 or CD11b/CD18) are responsible for binding to  $\beta$ -glucans, allowing the immune cells to recognize them as "non- self. Large scale field trials are needed to arrive at comprehensive conclusions.

**KEY WORD:** *Auricularia polytricha*, Medicinal plants, aquaculture; immunomodulatory effect

### **INTRODUCTION:**

There is no need to emphasize the importance of aquaculture. Bacterial infections are considered the major cause of mortality in aquaculture. Treatments of bacterial diseases with various herbs have been safely used widely in aquaculture. Plant-derived phytomedicines provide a cheaper source for treatment and greater accuracy than chemotherapeutic agents in the field. The herbs/herbal drugs are used not only against diseases but also as growth promoters, stress resistance boosters and preventatives of infections. Herbs can also act as Immuno-stimulants, conferring the non-specific defense mechanisms of fish and elevating the specific immune response (Pandy et al 2012). *Auricularia auricula-judae* has been used as a medicinal mushroom by many herbalists. It was used as a poultice to treat inflammations of the eye (Mabay 1984) as well as a palliative for throat problems. Fungi like *Auricularia* produce many different polysaccharides, which have a variety of functions. These polysaccharides are sometimes found to stimulate the immune system in humans or in some cases cause the production of interferon and interleukins that then stop the proliferation of cancer cells. It was also found to have antitumor, cardiovascular and hyper-cholesterolemia, antiviral, antibacterial and ant parasitic effects (Wasser & Weis 1999).

In the present study an attempt is made to elucidate the effect of ear mushrooms on the survival and growth promoting effect of prawn.

## MATERIAL

*Auricularia polytricha* (Black fungus) is widely distributed in moist-deciduous to wet evergreen forests of the Western Ghats, Kerala, India. This species occurs in clusters on rotting branches and twigs and on decaying stumps and logs. This is also known as cloud ear; tree ear; wood fungus, mouse ear, and jelly mushroom. It grows rapidly on a variety of woods including mango and is very similar to another fungus called Jew's ear (*A. auricula*). The dried ear-shaped cap is medium sized, dull in texture, and dark brown to black. It was collected from the Local timber depots and dried in shade and powdered and preserved.

## METHOD:

This work was carried out at Prasad Aqua forms, Chellayapalem Village of Bucchireddypalem mandal of SPSR Nellore district. A.P. Fresh water prawn *Macrobrachium rosenbergii* was used in the present study.

### Experimental design

Two Aquacultural ponds having same size, shape and structure were selected for the study. In the control ponds no treatment was given. Normal feeding was given. In the experimental ponds for prawn 1% *Auricularia polytricha* (Black fungus) powder was added to standard prawn feed.

Various growth rates, such as initial weight, final weight, average weight, Feed conversion ratio (FCR) =  $F / (W_f - W_0)$ , where F is the weight of feed supplied to the prawn during the trial were calculated according to Ziaei-Nejad, 2006.

## RESULTS:

The data regarding the growth and development of freshwater prawn *Macrobrachium rosenbergii* was presented in the table. The data reveals that there was an increase in survival percent. There was an increment of percentage of survival of prawn to an extent of 39%. This shows reduction of mortality due to various reasons. Food consumption was increased drastically (+142%) which ultimately reflected in the weight gain of prawn. There was an improvement of weight gain (61.13%). The food conversion ratio was increased to 48%.

### TABLE:

**Effect of *Auricularia polytricha* on the growth and development of *Macrobrachium rosenbergii*. Values are mean of 100 observations. +/- indicate percent increase or decrease over control. ± denotes standard deviation and N.S. Non significance. P denotes level of significance.**

S.No	Parameter	Control	Experimental	% change over Control
1	Initial weight (g)	0.50 ±0.23	0.50 ±0.1.6	0 NS
2	Final weight(g)	0.60 ±0.12	0.65 ±0.23	+8.33 (P<0.001)
3	Average weight gain	0.10 ±0.002	0.15 ±0.003	50.0 (P<0.001)
4	Percent weight gain	19.00	30.60	61.13 (P<0.001)
5	Weight of food consumed	0.14 ±0.013	0.34 ±0.011	142.8 (P<0.001)
6	Food conversion ratio	1.50	2.22	48.00 (P<0.001)
7	Food conversion efficiency	0.67	0.45	- 32.83 (P<0.001)
8	Survival rate	64.20 ±0.1	89.30 ±0.1	+39.1 (P<0.001)

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## DISCUSSION:

In recent times, the research has been initiated to evaluate the feasibility of herbal drugs in body development and diseases of shrimp (Ramudu and Dash, 2013). The studies have proved that herbal feed supplements enhance the growth of shrimp and protect them from diseases. The inclusion of herbal feed supplements often provides cooperative action to various physiological functions.

Beta glucans are sugars that are found in the cell walls of bacteria, fungi, yeasts, algae, lichens, and plants, such as oats and barley. Rich amount of B glucans are present in *Auricularia polytricha*. Beta glucans are also used to boost the immune system in people whose body defenses have been weakened by conditions such as chronic fatigue syndrome, or physical and emotional stress; or by treatments such as radiation or chemotherapy. Beta glucans are also used for colds (common cold), flu (influenza), H1N1 (swine) flu, allergies, hepatitis, Lyme disease, asthma, ear infections, aging, ulcerative colitis and Crohn's disease, fibromyalgia, rheumatoid arthritis, and sclerosis. Healthcare providers sometimes give beta glucans by IV (intravenously) or by injection into the muscle to treat cancer and to boost the immune system in people with HIV/AIDS and related conditions. Beta glucans are also given by IV to prevent infection in people after surgery. Healthcare providers sometimes give beta glucans by a shot under the skin (subcutaneously) for treating and reducing the size of skin tumors resulting from cancer that has spread. Beta-1,3-glucans improve the body's immune system defense against foreign invaders by enhancing the ability of macrophages, neutrophils and natural killer cells to respond to and fight a wide range of challenges such as bacteria, viruses, fungi, and parasites. Finally, there is renewed interest in the potential usefulness of beta-glucan as a radioprotective drug for chemotherapy, radiation therapy and nuclear emergencies, particularly because glucan can be used not only as a treatment, but also as a prophylactic.

## CONCLUSION:

In the present study the immunomodulatory effect of *Auricularia polytricha* was established.

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