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## ***In vitro* effect of specific culture medium containing potato and banana extracts as prebiotics on the growth of yeast (*Saccharomyces cerevisiae*)**

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### **Abstract**

The aim of this study was to determine the effect of prebiotic properties of potato and banana on the growth of *Saccharomyces cerevisia* yeast. To perform this experiment, *S. cerevisia* was prepared as lyophilized and after culturing in Sabouraud dextrose broth medium, it was cultured on agar culture medium; the obtained colonies inoculated to the free-glucose media containing concentrations of 2, 6.25, 12.5, 25, 50, 75 and 100 percent of banana and potato extractions; then, the growth rate of *S. cerevisia* was measured according to the growth curve and optical density was read by spectrophotometer at a wavelength of 600 nm. The results showed that the growth of *S. cerevisia* in both media containing banana and potato extracts at a concentration of 100% had a significant increase compared to other treatments; Also, the highest growth rate of treatments containing banana and potato extract with 100% concentration were significantly different from each other. According to the results of this study, banana and potato extract can be used as a prebiotic substance for the growth of *Saccharomyces cerevisiae*.

**Keywords:** Bananas, Potatoes, Prebiotic, *Saccharomyces cerevisiae*, Yeast

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## Effects of different levels of dietary pectin on some immune parameters, antioxidant defense system of white leg shrimp (*Litopenaeus vannamei*)

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### Abstract

The aim of this study was to investigate the effects of pectin extracted from orange peel as a natural prebiotic on hemolymph indices, nonspecific immune parameters, antioxidant defense system, and digestive function of *Litopenaeus vannamei*. For this purpose, white leg shrimp with an average weight of 3 grams in four treatments; Control (without pectin), and three treatments of 0.5, 1 and 1.5% pectin were examined. Shrimps were fed with experimental diets for 2 months. Pectin consumption improved the number of total homocytes in all groups fed with pectin, hyaline homocytes in the group fed with 1% pectin and large granular homocytes in the group fed with 1.5% pectin level ( $P<0.05$ ). However, it had no significant effect on shrimp survival and lysozyme level, total protein and glucose ( $P<0.05$ ). Enzymatic studies in the present study showed an increase in catalase and superoxide dismutase activity in 0.5 and 1.5% pectin treatments. There was no statistically different in the activity of catalase and superoxide dismutase enzymes in the treatment with 1% pectin and the control treatment ( $P<0.05$ ). The highest phenol oxidase activity was in the group fed with 1% pectin. However, the activity of this enzyme in the two treatments of 0.5 and 1.5% were not significantly different from the control group ( $P<0.05$ ). The results showed that the addition of pectin to the diet improved the immunity and antioxidant defense system of leg white shrimp and the activity of antioxidant enzymes (such as catalase, superoxide dismutase and phenol peroxidase) increased significantly.

**Keywords:** Diet, Enzyme, Immunity, Pectin, White Leg shrimp

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## **Investigation of shape, structure and function of scales in some fish species**

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### **Abstract**

In the present study, the methods and tools of studying the structures and the surface microstructures of the scales, the ecophysiological structures of the scales and the species diversity of the scales have been investigated in sharks, rays, eels and catfishes. The scales on the fish shield was typically found only as a few rows of large teeth on the body of the fish and sometimes deformed and become thorns. A placoid scales typically consist of a broad, rectangular base plate that sinks into the top layer of the dermis and a sharp point or spike that protrudes posteriorly from the surface of the epidermis. Although some eels do not have distinct scales, many eels have small, elliptical cycloid scales that attach to the skin. Catfish generally do not have clear, uniform scales and their bodies are often naked. In some species, the skin is covered with mucus, which is covered in skin respiration, and in some, the skin is covered with bone plates called scute. Finally, except for catfish, the existence of clear structure of skin scales was confirmed in all of studies species.

**Keywords:** Aquatic, Biodiversity, Physiology, Scales, Skin

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## **The effect of automatic and manual feeding methods on growth and survival indices of western white shrimp**

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### **Abstract**

60% of production costs of shrimp belongs to nutrition. Therefore, feed type and feeding management are very important in shrimp growth and reduction of production costs. Feeding should be based on the nutritional needs of the shrimp. The number of feedings per day and the percentage of feeding depends on the breeding species, weight and amount of natural water production and climatic conditions of the region. In this study, shrimp growth and survival indices were compared in two methods: manual and automatic feeder. The results of this study showed the specific growth indices, daily, final growth and survival of shrimp that were fed by automatic feeder method. It showed a significant increase ( $P < 0.05$ ). The feed conversion ratio decreased ( $P < 0.05$ ). This study showed that automatic feeders are always available in the required amount of shrimp. Shrimp grow better and produce more economically than manual feeding.

**Keywords:** Automatic feeder, Feeding management, Shrimp

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## The effects of probiotic AQUALASE on growth, survival and hematological parameters of Benni, *Mesopotamichthys sharpeyi*

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### Abstract

Yeasts have been used as food additive containing protein and vitamins of group B for fish nutrition. The present study was aimed to investigate the effects of probiotic, AQUALASE on growth, immunity and hematological parameters of Benni, *Mesopotamichthys sharpeyi*. Fish were assigned to 12 experimental tanks (with stocking rate of 30 fish per tank) as 3 experimental treatments with three replicates. The treatments were: T1: 0.05% probiotic, T2: 0.1% probiotic, T3: 0.15% probiotic. Also, one group fed with probiotic -free diet was considered as control. After 60 days feeding with experimental diets, it was recognized that probiotic improves the growth indices including: weight, specific growth rate, daily growth rate, feed and protein efficiency and also decreases feed conversion ratio. In this regard, the best results obtained in fish fed with 0.15% probiotic (T3). Survival rate values showed no significant differences among experimental groups. The values of hemeoglobin, MCH and MCHC increased only in T3. In conclusion, with regard to positive effects of AQUALASE on growth and hematology of Benni, this probiotic can be as a growth enhancer for this species.

**Keywords:** AQUALASE, Growth, Hematological parameters, *Mesopotamichthys sharpeyi*

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## **Performance of polypropylene and cotton sheet, as bacterial substrata, on water quality, growth and survival of common carp (*Cyprinus carpio* Linnaeus, 1758) larvae in a recirculating culture system**

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### **Abstract**

An experiment was conducted to determine the efficiency of two kinds of substrata (Polypropylene and cotton sheet), as bacterial biofilter media on removal of N-compounds and fish growth in a recirculating culture system for a 6-week period. Rates of survival was significantly different between treatments ( $P<0.05$ ). The mean ( $\pm$  SD) initial individual weight of fish was  $3.4 \pm 0.20$  g and the fish attained to  $9.19 \pm 0.53$  and  $7.79 \pm 0.38$  g in treatments with cotton sheet and polypropylene, respectively at the end of experimental period. Concentration of total nitrogen, total ammonia-n and nitrate were significantly different ( $P<0.05$ ) between treatments at the end of the experiment. Concentration of total ammonia-n reached to  $0.050 \pm 0.0021$  and  $0.054 \pm 0.0039$  mg L<sup>-1</sup> in cotton sheet and propylene treatments, respectively. The electro-conductivities were significantly different and attained to  $970 \pm 0.32$  and  $900 \pm 51.3$   $\mu$ mos/cm in treatments with cotton sheet and propylene, respectively, at the end of experiment ( $P<0.05$ ). It was concluded that cotton sheet, can be used as an efficient bacterial substrate or medium in a recirculating carp culture system.

**Keywords:** Bacterial biofilter, Cotton, Recirculating system, Substrate, Water quality

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## The effect of different thawing methods on some quality indices of *Otolithes ruber*

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### Abstract

In present study, the effect of different thawing methods on the quality of *Otolithes ruber* was studied. For this purpose, freshly caught fish were transferred to Chabahar Pasabandar fish processing plant. After transferring, they were frozen at -36 °C and stored at -18 °C for four months. After that, the chemical (pH, trimethylamine, thiobarbitic acid and volatile nitrogen bases), physical (water loss, water loss after cooking) and microbial (mesophilic and psychrophilic) indices during thawing by water, air, refrigerator and microwave were examined. According to the results, the amount of volatile nitrogen bases and thiobarbitic acid in all methods of thawing showed a significant difference with the control group ( $P<0.05$ ) and the highest amount was related to thawing by microwave method. The lowest amount of trimethylamine was observed by refrigeration thawing method and there was a significant difference among various treatments with each other and also in the control group ( $P<0.05$ ). The pH of different thawing methods increased significantly compared to the control group ( $P<0.05$ ). The highest amount of water loss and water loss after cooking was observed in microwave thawing, which had a significant difference with other treatments ( $P<0.05$ ). The number of mesophilic bacteria during different methods of thawing except for thawing method by air was significantly reduced compared to the control group ( $P<0.05$ ) and the lowest amount of mesophilic bacterial load was observed in microwave thawing method. Psychrophilic bacteria load was significantly increased compared to other methods during refrigeration thawing method ( $P<0.05$ ). Overall, the results showed that the appropriate method for defrosting fish is the thawing method in water and refrigerator.

**Keywords:** Freshness, *Otolithes ruber*, Quality evaluation, Thawing

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