

Lactic acid bacteria used in aquaculture
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1. Lactic acid bacteria function

(1) Improve water quality: It can be used to improve the transparency of water when watercolor become black or red with high content organic substance and many died algae.

(2) Improve bottom condition: It can be used to reduce bottom pollution to degrade residual feed, faces, dead body and organic substance.

(3) Stabilize water color : Rapid elimination of toxic substances (ammonia nitrogen, hydrogen sulfide, nitrite) in water, promotes the balance of bacteria and algae, and reduces the incidence of disease.

(4) Growth promotion: oral administration can regulate the balance of intestinal flora and promote the healthy growth of breeding animals.

(5) Feed fermentation: Feed can be fully pre-digested in vitro, eliminate anti-nutritional factors, regulate intestinal flora, make nutrient transformation more rapid and promote healthy growth of animals.

2. The advantage of Lactic acid bacteria

Since lactic acid bacteria are anaerobic bacteria, they do not cause a decrease in dissolved oxygen. In rainy days, lactic acid bacteria can be used as a good substitute in cases where other products such as Bacillus and other aerobic bacteria cannot be used.

3. Lactic acid bacteria test in India

(1) Pond situation

The farm located in the village of Tuma, 80 kilometers away from Raipur, India. The Shivnath River nearby is the main water source for the farm (Figure 1) There are 23 ponds in the farm, 8 of which are juvenile fish ponds with an area of 0.4-1 ha. The large pond area is very large, ranging from 1.3 to 4 ha. The water depth is about 1.5m-2m. There are often power outages in the field, so the field is equipped with diesel generators to maintain the daily production of electricity in the field. Frequent power failures also bring great inconvenience to the use of aerators, which may be the reason why not every pond is equipped with aerators in the farm.

The cultured fish species include pangasius, tilapia, Colossoma, grass carp and Cirrhinus mrigala. Among them, pangasius and tilapia are the main cultured species, with intensive culture as the main species.

Large number of fish, which require hundreds of kilos feeds a day. As the nitrogen and phosphorus in the feed continue to enter the pond, the pond becomes eutrophication. The



Figure.1 Fish Farm in Tuma

thick green water was unstable (Figure.2). Once it encounters rainy weather or lack of nutrients, it is easy to decay (Figure.3). Oxygen consumption and ammonia nitrogen increased with the decay of algae.



Figure.2 A1 pond
Thick green water



Figure.3 B3 Pond
decay of algae

(2) Solution

Even though Pangasius is a hypoxic-tolerant fish, fresh and clean water, a certain of DO is still required. Based on the pond situation and lack of aerator, Lactic acid bacteria was considered as the right choice to deal with the the decay of algae. A1 and B3 ponds were used as experimental ponds (Table.1).

Ponds	Fish	Size	Quantity	Area/m ²	Daily feed/kg	Density/m ²
A1	Pangasius	1kg	80,000	20000	800	3.9
B3	Pangasius	15g	200,000	6000	100	33

Table.1 A1 and B3 pond culture mode

A1 and B3 ponds were sprayed with Lactic acid bacteria liquid 6 Liter /meter, 3 time/month. Using lactic acid bacteria can prevent ammonia nitrogen from rising and gradually remove dead algae (Figure.4,5). In the pond that using lactic acid bacteria, there is no significant decrease in dissolved oxygen, which is suitable for those ponds that lack of oxygen (Figure.6).

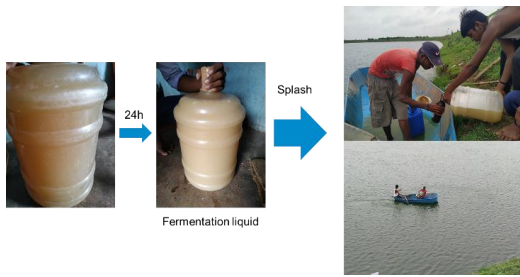


Figure.4 Applying Lactic acid bacteria



Aug 2

Aug 3

Aug 4

Figure.5 B3 pond water bloom gradually faded

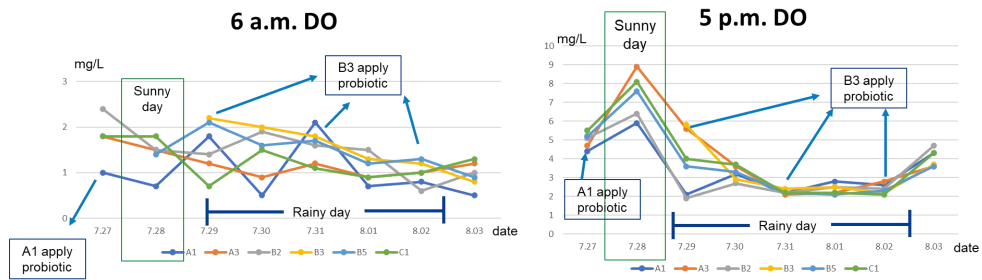


Figure.6 D.O of A1, B3 ponds