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Probiotics in Aquaculture: A small Review of Benefits, Applications, and Future Directions

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ABSTRACT:

By enhancing fish nutrition, health, and environmental sustainability, probiotics have completely transformed aquaculture. The advantages, uses, and potential future prospects of probiotics in aquaculture are outlined in this paper.

Introduction:

A few of the major issues facing aquaculture are feed inefficiency, water contamination, and disease susceptibility. By encouraging the growth of advantageous bacteria in aquatic environments, probiotics present a viable remedy.

Benefits of Probiotics in Aquaculture:

Increased immunological response and decreased susceptibility to disease are two benefits of improved fish health (Suzer et al., 2008).

Benefits to nutrition include increased growth rates, feed efficiency, and nutrient utilization (Hoseinifar et al., 2017).

Management of Water Quality: Lower levels of nitrite, nitrate, and ammonia (Buentello et al., 2010)

Reduced oxidative stress and enhanced osmoregulation are two ways to mitigate stress (Cerezuela et al., 2012).

Probiotic Strains Used in Aquaculture:

1. Bacillus spp. (Hoseinifar et al., 2017)
2. Lactobacillus spp. (Suzer et al., 2008)
3. Saccharomyces cerevisiae (Cerezuela et al., 2012)
4. Psychrobacter spp. (Merrifield et al., 2010)

Applications of Probiotics in Aquaculture:

- Probiotic-enriched feeds are one type of feed supplement (Hoseinifar et al., 2017)
- Water additives: water treatments based on probiotics (Buentello et al., 2010)
- Biofloc Technology: Systems with probiotics to improve biofloc (Avnimelech, 2009)

Future Directions:

- Merrifield et al. (2010) discuss the isolation and use of local probiotics
- Omics Technologies: Utilizing proteomics, metabolomics, and genomes to study probiotics (Wang et al., 2017)

- Probiotics in integrated multi-trophic aquaculture (IMTA) systems: An overview of integrated aquaculture (Chopin et al., 2012)

Conclusion:

Probiotics have revolutionized aquaculture by encouraging the production of healthy, productive, and sustainable fish. Novel probiotic strains, uses, and interaction with other aquaculture techniques require more investigation.

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