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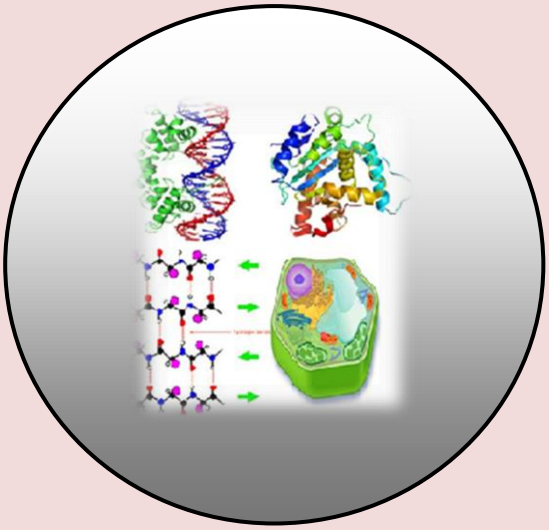
ISSN 2319-3077 Online/Electronic
ISSN 0970-4973 Print

UGC Approved Journal No. 62923
MCI Validated Journal
Index Copernicus International Value
IC Value of Journal 82.43 Poland, Europe (2016)
Journal Impact Factor: 4.275
Global Impact factor of Journal: 0.876
Scientific Journals Impact Factor: 3.285
InfoBase Impact Factor: 3.66



J. Biol. Chem. Research
Volume 36 (1), 2019 Pages No. 348-351

Journal of Biological and Chemical Research

An International Peer Reviewed / Referred Journal of Life Sciences and Chemistry

Indexed, Abstracted and Cited in various International and National Scientific Databases

Published by Society for Advancement of Sciences®

J. Biol. Chem. Research. Vol. 36, No 1, 348-351, 2019
(An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry)
Ms 36/01/4090/2019

ISSN 2319-3077 (Online/Electronic)
ISSN 0970-4973 (Print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RESEARCH PAPER

Received: 04/04/2019 Revised: 02/06/2019 Accepted: 03/06/2019

Use of Probiotics to raise Economy of Rural Fish Farming in Local Pond of Beawar (Ajmer District)

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ABSTRACT

India is a growing nation and one of the most populous nations. A variety of metrics that reflect the physical, chemical, and biological makeup of water are frequently used to evaluate the quality of water. A certain fish population is affected by pollutants in a number of different ways. Probiotics are formulations with active microorganisms and compounds derived from microbes that have a beneficial effect on the physiological, metabolic, and immunological responses of the host body. EMO-301 probiotics were utilized in our experiment to increase the population of fish in Makereda Pond in Beawer. Our findings also demonstrated that employing probiotics enhanced the physiochemical characteristics of water for aquatic species to survive and fish counts increased in 2018 compared to 2017.

Keyword: Pollutants, Probiotics, Physiochemical properties and Aquatic animals.

INTRODUCTION

Reduced "water pollution" is attainable on all levels, from "personal level" to "national and planetary level." The management of safe water supplies is everyone's duty. Even as electro-dialysis, reverse osmosis, ion exchange, orthophosphate addition, adsorption on activated carbon, electro-deposition, nano-filtration, sequestration, and electro-deposition are some of the other processes, environmental education/enlightenment, product and process regulation, limiting the discharge of hazardous materials, and proper treatment of industrial, commercial, and domestic (sewage) wastes are some other measures that can improve the quality of water. Aeration, boosting spontaneous bioremediation carried out by indigenous organisms, and the addition of microorganisms are the basic strategies of bio-remediate (APHA, 1999). Other strategies have also been developed and implemented, including aquaponics, recirculation of aquaculture systems, and biofoc technology (Arvanitakis et al., 2018).

Probiotics have the ability to considerably boost aquaculture productivity in this situation by improving the prevention of widespread infections and offering clean water sources (Coates, 2002). Anaerobic bacteria and sporogenous aerobic bacteria, which play different parts in the processes of water purification and precipitation treatment, are frequently found in probiotics. Anaerobic bacteria such as *Bifidobacterium* and *Lactobacillus,* for instance, might affect mechanical techniques of water treatment. Aerobic bacteria that make up probiotics, such as *Bacillus subtilis*, *Bacillus Licheniformis, Pumilus* and *Megaterium*, among others, can affect biological purification (Dey et al., 2021).

Some of the elements that affect the antibacterial activity of pond probiotics include the synthesis of bacteriocins, siderophores, lysozyme, protease, hydrogen peroxide, pH fluctuations and the creation of organic acids and ammonia.

Although it is believed that their usage as pond water additions is more appropriate as it may be administered to fish at all phases, few research have been conducted to study the use of probiotics as water additives in fish production systems.

MATERIAL AND METHODOLOGY

the Makereda Pond is situated approximately 60 kilometers from Beawar city. for It once served as a vital source of supplies for the neighboring farmers for irrigation, agricultural, and fish farming requirements. Due to industrialization dangerous wastes and chemical waste began to poison the water. The sewage from the Beawar has made irrigation and fish aquaculture more difficult. As a result, the water in this pond is unsafe to drink and is also not suitable for farming or raising fish.

Probiotics: To enhance the quality of the culture water and soil, EMO-301 Multi Enzyme Probiotics was specifically created for fish aquaculture systems. It has probiotic-containing bacterial strains that may consume sludge and other residues, keeping the water clear and enhancing fish health. It has the capacity to control and dissolve the oxygen levels needed for aquatic species to breathe properly.

Ingredients of Probiotics: *Streptococcus faecium, Bifidobacterium Longum, Bifibacterium themophilus, Lactobacillus acidophilus, Oligosaccharides.*

Sample Collection: The Indian Standard Methods IS 3025 and the American Public Health Association, 23rd edition was used to collect 400 cc of water samples from the two pond locations. At each location, water samples were taken at a depth of around 1 m below the surface. Standard techniques were utilized to analyses materials in the laboratory (APHA, 1998).

Fish Record: The fish department documented the fish in the pond as a specified unit of work in accordance with Coates' instructions (2002). The quantity of the daily catch was then frequently sold to the neighborhood market in Beawar City. Additionally, the fisherman was expected to keep a daily catch log that detailed the variety of nearby species. The fisherman's record was then compiled using a monthly trip to the pond.

The usefulness of probiotics in the management of aquaculture water quality is the subject of several investigations (Khan and Jain 2011).

Numerous studies have focused on the capacity of particular microorganisms to breakdown and absorb toxic chemicals in waste waters in recent years. When in anaerobic conditions, many bacteria destroy the highly electrophilic azo link in the dye molecule by non-specific enzymatic activity.

Fish depend on the specific water quality parameter DO level, as do all living things probiotic treatments given daily demonstrated the ability to maintain a healthy environment for shrimp and prawn larvae in the improved green water system, with increases in water temperature, pH, dissolved oxygen, and NH3.

OBSERVATIONS

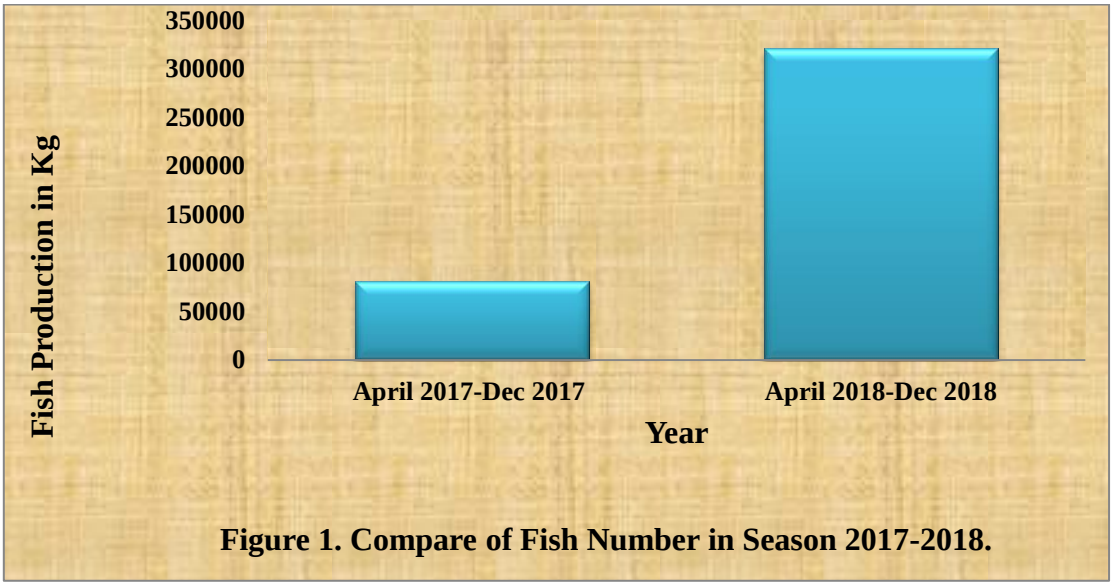

Figure 1. Compare of Fish Number in Season 2017-2018.

RESULTS AND DISCUSSION

By stabilizing and optimizing the host organism's normal microflora activities, probiotics, which are live microorganisms and compounds of microbial origin, when naturally supplied, have a good effect on the host organism's physiological, biochemical, and immunological responses. The usefulness of probiotics in the management of aquaculture water quality is the subject of several biochemical investigations (Khan, 2017).

Numerous studies have focused on the capacity of particular microorganisms to breakdown and absorb toxic chemicals in waste waters in recent years. When in anaerobic conditions, many bacteria destroy the highly electrophilic azo link in the dye molecule by non-specific enzymatic activity. Fish depend on the specific water quality parameter DO level, as do all living things probiotic treatments given daily demonstrated the ability to maintain a healthy environment for shrimp and prawn larvae in the improved green water system, with increases in water temperature, pH, dissolved oxygen, and NH3.

Fish Record Analysis: According to the study's findings, the amount of fish in the study region is declining as water pollution rises. Due to their slow decline year after year in the contaminated section of the Makereda pond, fish and other species are thought to be threatened by rising water pollution. This analysis would serve as the foundation for developing a plan to reduce water pollution and protect the Makereda pond's fish species. According to the Fish Department in Ajmer, the total weight of fish was 81359 kg in the season from April to December 2017, however after utilizing probiotics EMO-301, the weight of fish increased significantly and reached 321348 kg in the season from April to December 2018.

CONCLUSION

As a result, we may draw the conclusion that water pollution is a serious issue with serious implications for individuals (Jahangiri and Esteban, 2018). Population levels have significantly expanded over time, which has driven industrialization, urbanization, and other developments that have severely strained the natural resources that are still readily available. The increasing population has increased both the consumption of food grains as well as the use of fertilizers and pesticides. Similar result was found in (Khan et. al 2011).

Because of this, using probiotic preparations with a high concentration of probiotic microorganisms and enzymes made for quickly destroying organic materials in wastewater enables the acceleration of their decomposition, which is accompanied by the release of toxic gases and unpleasant odors and ultimately has an impact on the diversity of aquatic fauna.

ACKNOWLEDGEMENTS

I am very thankful from the bottom of my heart to my Supervisor Dr. S. Khan SPCGCA, Ajmer, Prof. A. Ahmed, FDO of Fishery Department of Ajmer and research scholars of department for their continuous support and guidance.

REFERENCES

APHA (1998). Standard methods for the Examination of Water and Wastewater: Biochemical Oxygen demand. American Public Health Association, American Water Works Association, Water Environment Federation.

Arvanitakis, G., Temmerman, R. and Spoke, A. (2018). Development and use of microbial-based cleaning products (MBCPs): Current issues and knowledge gaps, *J. Food and Chemical Toxicology*, 116 pp 3–9.

Coates, D. (2002). Inland capture fishery statistics of Southeast Asia: Current status and information needs. Asia-Pacific Fishery Commission, Bangkok, Thailand. RAP Publication 2002/11.

Ilyin, V.K., Smirnov, I.A., Soldatov, P.E., Korniushenkova, I.N., Grinin, A.S., Lykov, I.N. and Safronova, S.A. (2004). Microbial Utilization of Natural Organic Wastes. *Acta Astronautica*, 54, 357-361.

Jahangiri, L. and Esteban, M.A. (2018). Administration of probiotics in the water in fnfsh aquaculture systems: A review. *Fishes* 3: 30–33.

Khan, S. and Jain, S. (2011). Impact of sewage effluents on soil variable of some non-drainable fish pond of Ajmer district, AJM I, Vol. 3 (1).

Khan, S. (2017). Changes in the dehydrogenase level of Lebistes reticulates at 30*C WJPPS Volume 6, Issue 7, Pg 2162-2166.

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