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Recent Knowledge on the Probiotic *Saccharomyces cerevisiae* in Aquaculture

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INTRODUCTION & AIM

Aquaculture is a significant food production sector, responsible for addressing the nutritional requirements of a rapidly expanding global population (FAO, 2019). However, the emergence of disease outbreaks has become a major challenge for the aquaculture industry, resulting in significant economic losses. The utilization of costly and toxic antibiotics in therapeutic interventions has deleterious consequences for the aquatic environment. Consequently, there has been a growing interest in probiotics as a non-antibiotic approach to managing disease outbreaks and improving fish performance. The utilization of the yeast probiotic *Saccharomyces cerevisiae* has demonstrated significant advantages in the context of aquaculture.

METHOD

- ✓ In February 2025, a systematic search was conducted based on the Web of Science (WoS) database for the period 2015-2025 to identify relevant studies investigating the beneficial effects of *S. cerevisiae* in aquaculture (SA). After searching on WoS database, 644 documents were found and prepared for further analysis.
- ✓ The obtained metadata were subjected to the bibliometric analysis using R-Studio (PBC, Boston, MA, USA, 2023). The analysis aimed to identify research trends, significant topics, international collaboration, geographical distribution of SA research
- ✓ The most recent (2024-2025) and relevant articles were reviewed, summarized and discussed to know the probiotic potential of *Saccharomyces cerevisiae*.

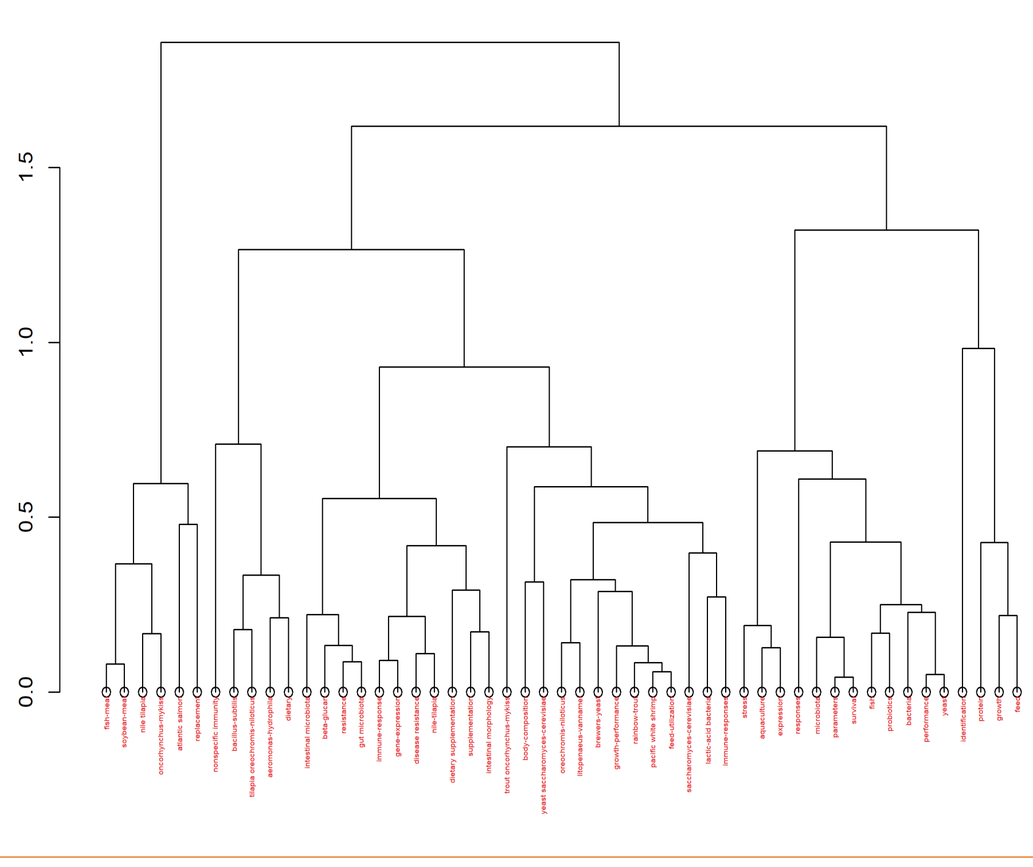
RESULTS & DISCUSSION

The bibliometric dendrogram (Figure A) showed the significant role of probiotic research of SA. The positioning of *S. cerevisiae* among key terms such as "immune response," "growth performance," and "feed utilization" is indicative of its diverse functionality as a probiotic agent. The potential use of *S. cerevisiae* as an effective and sustainable feed additive is supported by its multi-functional properties, digestive enzyme activity, and compatibility with a wide range of aquatic species.
Figure B showed a remarkable international scientific collaboration in the field of SA. The co-authorship map reveals the geographical distribution of research activity and the interconnectedness among countries contributing to this area. The intensity of color serves as an indicator of the publication volume, while the connecting lines represent co-authorship links that transcend national borders.

RESULTS & DISCUSSION

Notably, China, the United States, and several European countries such as Spain, Italy, and the United Kingdom emerge as the most prominent hubs of collaboration.

A



B

FUTURE PRESPECTIVE

more comprehensive investigations are needed to optimize the use of *S. cerevisiae* across diverse aquatic species. Although studies have shown promising results in various aquatic species, the physiological responses to yeast-based probiotics can vary among species. This highlights the need for tailored feeding trials that consider species, developmental stage, environmental conditions, and local pathogen profiles. Secondly, the mechanisms of action of *S. cerevisiae*, particularly at the molecular and microbiome levels, remain insufficiently understood.