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Notice for the PhD Viva-Voce Examination

Ms Thejaswi Bhandary (Registration Number: 1840092), PhD scholar at the School of Sciences, CHRIST (Deemed to be University), Bangalore will defend her PhD thesis at the public viva-voce examination on Thursday, 14 March 2024 at 12.00 pm in Room No. 044, Ground Floor, R & D Block, CHRIST (Deemed to be University), Bengaluru - 560029.

Title of the Thesis	:	**Isolation, Identification and Characterization of a Potential Probiotic Bacteria and its Application in Aquaculture**
Discipline	:	**Biotechnology**
External Examiner (Outside Karnataka)	:	**Dr J Pathma** Associate Professor Department of Agricultural Science Dhanalakshmi Srinivasan University Trichy-Chennai Trunk Road Samayapuram Trichy-621112, Tamil Nadu
External Examiner (Within Karnataka)	:	**Dr Ravi Kiran** Professor Department of Biotechnology Jnanabharathi Campus, Bangalore University 36 Lalbagh Road Bengaluru - 560027 Karnataka
Supervisor	:	**Dr Paari K A** Assistant Professor Department of Life Sciences School of Sciences CHRIST (Deemed to be University) Bengaluru – 560029 Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva-voce examination.

Registrar

Place: Bengaluru
Date: 12 March 2024

ABSTRACT

In the current study, *Bacillus subtilis PKB1* was isolated from dried anchovies and identified using morphological and biochemical analysis followed by 16S rRNA sequencing and phylogenetic analysis. The antibacterial and anti-haemolytic properties of the bacteria were also examined. Probiotic qualities were assessed by measuring the isolated strain's tolerance to artificial gastric juice. To assess the isolated strain's capacity for stress tolerance, additional exposure to varied pH, temperature, and organic solvent concentrations was given. *Bacillus subtilis* in MRS medium produced exopolysaccharide (EPS) which was purified and a maximum yield of 1928mg/L was achieved. The novel exopolysaccharide was purified and characterized to be a heteropolysaccharide.

The polysaccharide present had a molecular weight of about 20 kDa overall. FTIR spectroscopy revealed the presence of carboxyl, hydroxyl, and methylene groups in the EPS. The extremely cross-linked structure of the EPS with lumps that resembled spikes was revealed by atomic force microscopy. Scanning Electron Microscopy (SEM) revealed that it possessed rough, asymmetrical lumps. Emulsification activity was also observed in the EPS. The current study's findings suggested that this EPS might make a good candidate for further applications. Further, the role of the isolated probiotic in promoting growth performance in Nile tilapia was examined using growth and challenge studies. The experiment was conducted for a duration of 30 days. Weight gain, histology and mortality rates were studied in the presence and absence of pathogenic microbes. *Bacillus subtillis PKB1* supplementation for Nile tilapia helped to maintain the integrity of gill filaments and improved survivability and weight gain when used at a concentration of $1x10^4$ CFU/ml.

Keywords: Probiotic, Exopolysaccharide, aquaculture, histology

Publications:

1. Bhandary, Thejaswi and Paari, KA; Assessment of bioactivity of the novel exopolysaccharide secreted by Bacillus subtilis isolated from the gut of marine Anchovies, Journal of Applied Biology & Biotechnology - Accepted for publication
2. Bhandary, T; Riyaz, Ali L; Paari, KA; Probiotic properties of Bacillus subtilis isolated from dried anchovies (stolephorus indicus) and evaluating its antimicrobial, antibiofilm and growth-enhancing potential in danio rerio J. Anim. Health Prod 9 3 205-212 2021
3. Bhandary, Thejaswi; Kurian, Christine; Muthu, Magesh; Anand, Asha; Anand, Thirunavukarasou; Paari, Kuppusamy Alagesan; Exopolysaccharides Derived from Probiotic Bacteria and their Health Benefits. Journal of Pure & Applied Microbiology 17 1 2023
4. Bhandary, Thejaswi; Monisha, M; Vickraman, Ilavarasan; Paari, KA; Probiotics as an Alternative Food Therapy: A Review on the Influence of Microbial Nutraceuticals in Disease Management Research Anthology on Recent Advancements in Ethnopharmacology and Nutraceuticals 543-565 2022 IGI Global