

**Abstract 53 – Paper ID: 072****Isolation, Identification & Characterisation of *Bacillus* species from Peruyaana**

Thoudam Anandibala Devi<sup>1</sup>, Potsangbam Kumar Singh<sup>2</sup>, Thangjam Anand Singh<sup>3</sup>

<sup>1</sup>Department of Biotechnology, Manipur International University, MIU Palace, Airport Road, Ghari, Imphal, Manipur-795140, India

<sup>2</sup>Department of Botany, Manipur International University, MIU Palace, Airport Road, Ghari, Imphal, Manipur-795140, India

<sup>3</sup>AICRP on PHET, College of Agriculture, Central Agricultural University, Imphal, Manipur-795004, India

*Email: anandi.ningthouja@gmail.com*

**Abstract**

Peruyaana, a traditional fermented soybean product of Arunachal Pradesh, India, contains a diverse microbial community dominated by *Bacillus* species that drive its biochemical transformation and functional attributes. Understanding the taxonomy and physiology of these strains is essential for developing standardized starter cultures and improving the nutritional and therapeutic value of fermented foods. This study focused on the isolation, identification, and characterization of *Bacillus* spp. associated with Peruyaana using a polyphasic approach. Fresh samples were collected from local markets and processed through serial dilution and selective plating. Distinct isolates were purified and identified using 16S rRNA gene sequencing. Phylogenetic analysis confirmed the prevalence of *Bacillus subtilis*, *B. amyloliquefaciens*, and *B. licheniformis*, aligning with earlier findings from other fermented soybean foods of Northeast India. Biochemical and enzymatic profiling showed high protease, amylase, and fibrinolytic activities, indicating their role in substrate degradation and bioactive peptide formation. Several isolates also demonstrated antioxidant and antimicrobial properties against common enteric pathogens, supporting the functional food potential of *Bacillus*-fermented soybeans. The study further highlights that *Bacillus*-mediated fermentation enhances nutritional components such as isoflavone aglycones, peptides, vitamins, and poly- $\gamma$ -glutamic acid ( $\gamma$ -PGA), as reported in related fermented soybean systems. Overall, these findings suggest that indigenous *Bacillus* strains from Peruyaana possess strong biotechnological value for controlled fermentations, functional food development, and enzyme production, while providing deeper insight into the microbial ecology of this traditional product.

**Keywords:** *Bacillus* species, Peruyaana, Fermented soybeans, 16S rRNA identification, Enzymatic characterization, Functional foods