



First name/Surname: Navaprakaash Velusamy

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Nationality: India

Date of birth: 01/07/1999

Place of birth: Tamil Nadu, India

Education:

- PhD student in Animal and Food Science (2025-)
- Grant Researcher: “Molecular Investigations on Phytophagous Populations and their Biological Control Agents of Importance in Viticulture and Fruit growing”, University of Padua (October 2024-September 2025)
- Research Fellowship: “Function of Actin-binding Proteins (Profilin, Porin) in Leishmania Donovanii”, IBAB (May 2023-August 2024)
- Master student in Biotechnology (Six-year Integrated course), Bharathidasan University, India (2016-2022)

Research areas:

- Plant Genomics and transcriptomics
- Molecular Biology
- Genetic Engineering
- Bioinformatics

Brief description of Ph.D project:

The Ph.D. project aims to elucidate the genetic and physiological determinants of root vigor in *Beta vulgaris* (sugar beet), a key trait influencing crop establishment, nutrient uptake, and stress resilience under changing climatic conditions. Root vigor will be assessed through an integrated phenomic and genomic framework combining high-throughput physiological phenotyping and molecular analyses.

Phenotypic evaluations will be conducted on segregating F3 families using non-destructive imaging and sensor-based measurements to characterize root architecture, nutrient composition, and canopy traits. Enzyme activity profiling of carbohydrate metabolism will further clarify the biochemical processes underlying root vigor.

At the genomic level, genome-wide association studies (GWAS) will be performed using AgriSeq SNP genotyping to identify markers associated with root vigor and climate adaptability. Significant SNPs will be validated through qPCR-based assays for potential use in marker-assisted selection (MAS).

This research will provide a comprehensive understanding of the genetic and metabolic mechanisms driving early root establishment and resource efficiency in sugar beet. The expected outcome is the identification of elite parental lines with enhanced root vigor, supporting the breeding of climate-resilient and high-yielding sugar beet varieties for sustainable agriculture.

Supervisor:

Professor Piergiorgio Stevanato

Publications: Google Scholar link

https://scholar.google.com/citations?hl=en&view_op=list_works&gmla=AKzYXQ17JyJA4PgX_NNEhdOIFMr6TrzvkwWAVE3lqaU3Qt2xWvvOoPXAPajGN-BLUltLxEXm-l3oVB0IXGaxxw&user=T9otVncAAAAJ