



To Study the Effect of Microorganisms on Solanaceae, Apiaceae, and Fabaceae Family to Stimulate Germination of Seeds

Patel Shreya M.¹, Shah Krishpa B.², Shah Brijesh T.³

^{1,2} Department of Microbiology, Dolat-Usha Institute of Applied Sciences and Dhiru-Sarla Institute of Management & Commerce, Valsad, Gujarat, India.

³ Department of Botany, B.K.M Science college, Valsad, Gujarat, India.

^{1,2,3} Veer Narmad South Gujarat University, Surat, Gujarat, India

Abstract: Germination is the process by which an organism grows from a seed or similar structure into a plant. The microbial inoculant was acting as a fertilizer for seeds. Fertilizer can be used as means of biological control of plant pathogens and can help to increase plant resistance. The objective of the study was to determine the effect of microorganisms on the process of seed germination of the different plant family like, Solanaceae, Apiaceae and Fabaceae. Three types of study was carried out like seeds without treatment of microbial consortium, seeds with treatment of microbial consortium and seeds treated with Microbial consortium with addition of cow dung as biofertilizers. After the sowing of seeds, sunlight and water was daily applied for seed germination. After seed germination at regular interval different parameters like number of plants, length of roots, length of shoots were measured. In the present study the use of Microbial consortium with the addition of cow dung shows the highest plant growth.

Keyword: Microorganisms, Seed germination, Biofertilizer, Solanaceae family, Apiaceae family, Fabaceae family.

I. INTRODUCTION

Environmental protection and the need to enhance agricultural output have made research in new sustainable technologies necessary. Rhizosphere is the narrow region of soil that is directly influenced by root secretions and associated soil microorganisms. Beneficial association of microbes with roots may be bacterial, *Actinomycete*, *Cyanobacterial* or fungal symbiosis. *Rhizobacteria* is a group of bacteria with plant roots habitat area (rhizosphere) which has been researched and proven to improve soil fertility, increase plant resistance and can suppress plant pathogens. *Rhizobacteria* act directly as biological fertilizer. A pre-sowing inoculation of planting material as well as the planting medium with the consortia of beneficial microorganisms is an innovative approach for production of quality and healthy seedlings in horticultural production. The Solanaceae, or nightshades, are an economically important family of flowering plants. The Fabaceae or Leguminosae, commonly known as the legume, pea, or bean family, are large and economically important family of flowering plants. Apiaceae or Umbelliferae, is a family of mostly aromatic flowering plants commonly known as the celery, carrot or parsley family. A microbial consortium is a carrier based product containing nitrogen fixing, phosphorus and potassium solubilising and plant growth promoting microorganisms in a single formulation.

The synergistic effect of the formulated microbes can help in providing healthy and vigorous seedlings and considerably reducing the cost of cultivation by reducing fertilizer requirement of vegetables. Global increases in food production achieved in recent decades have required large (15–20 times) increases in the use of synthetic pesticides to control pests, pathogens and weeds of crops (Oerke 2006) but the increasing use of synthetic pesticides is no longer sustainable. The microbial colonizing rhizosphere includes bacteria, fungi, actinomycetes, protozoa, and algae. However, bacteria are the most abundant microbial present in the rhizosphere (Kaymak, and *et al.*, 2010).

The search for alternative solutions for agriculture has prompted researchers to take a second look at the range of microorganisms long known to provide benefits to agricultural production and is driving rapid growth in markets for biopesticides (Lehr 2010) and plant growth-promoting microorganisms (Berg 2009). The aim of the presented studies was to assess the effect of the application of Effective Microorganisms on changes in contents of available forms of nutrients in the peat substrate, as well as growth, development and yielding of different family plants.