Agriculture and Allied Sciences

Modern Concepts

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Miss Priyadarshini Sanjay Borale is a dedicated scholar in the field of Microbiology, currently preparing for the NET–SET examinations to advance her academic career. She has also appeared for the Ph.D. PET Entrance Examination, further reflecting her commitment to research and higher studies. She completed her Bachelor of Science (B.Sc.) from Jijamata Education Society's Science, Arts and Commerce College, Nandurbar. She then pursued her Master of Science (M.Sc.) in Microbiology from KBCNMU's PSGVP Mandal's Science College, Lonkheda, Shahada, Nandurbar.

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Soil Organic Matter and Humus Formation

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1. Introduction

Soil organic matter is an enigmatic substance. Its paramount importance for many aspects of soil function, such as fertility, nutrient cycling, biological activity, water retention, and response to climate change, is firmly established. Yet its definition is anything but straightforward, and understanding of the factors controlling soil organic matter dynamics remains imperfect. Soil organic matter is typically conceptualized as the net accumulation of plant, microbial, and animal residues and products. However, many soil organic matter components do not reflect the properties of these precursors, particularly in terms of molecular structure. Chemical characteristics and relations between residues, processes, and end products must therefore be elucidated. Humus, the term often used to describe the dark-colored, relatively stable fraction of soil organic matter, is perhaps the most complex substance on Earth. Its specific macromolecular composition cannot be clearly delineated, and no single model accounts satisfactorily for all its properties. A knowledge of humus composition and its formation pathways nevertheless provide a powerful means of framing and interpreting the substances and processes involved in soil organic matter formation, stabilization, turnover, and function.