REVIEW ON ROLE OF MICROBES IN CARBON SEQUSTRATION

BY

R.M.SHASHIKALA MADUWANTHI

FACULTY OF TECHNOLOGY

EASTERN UNIVERSITY, SRI LANKA

2021

ABSTRACT

The soil organic carbon (SOC) pool is the key indicator of soil health and quality which in turn plays a vital role to soil sustainability.carbon sequestration is the process of storing carbon in carbon pool.which occur throught biological ,chemical and physical process.This changes accelerated by changes in land use and agricultural practices and also specially by microorganisms. This paper reviews the current knowledge of microbial processes affecting C sequestration in agroecosystems. The microbial contribution to soil C storage is directly related to microbial community dynamics and the balance the balance between formation and degradation of microbial byproducts. Soil microbes also indirectly influence C cycling by improving soil aggregation, which physically protects soil organic matter (SOM). Crop rotations ,reduced or no-tillage practices, organic farming, and cover crops increase total microbial biomass enhancing the accumulation of MOM. A quantitative and qualitative improvement of SOM is generally observed in agro ecosystems favoring a fungal-dominated community. In the present review we focus on the greenhouse gas CO2 with relevance to its effect on plant associated beneficial and pathogenic microorganisms in terrestrial ecosystems. Role of these microorganisms in belowground nutrient cycling and soil aggregation is discussed with reference to soil C-sequestration. This review demonstrates that eCO2 influence the richness, composition and structure of soil microbial community and the influence is more on active microbial communities and in the vicinity of roots. High C:N ratio under co^2 favors fungi with wider C:N ratio and nutrient acquisition ability and biological nitrogen fixers. The ecosystems with fungal-dominated soil communities may have higher C retention than bacterial dominated soil communities. However, soil C-sequestration through plant growth, is strongly controlled by availability of nitrogen and nutrients required for biological nitrogen fixation. Nitrogenous and other chemical fertilizers show positive effect on C-sequestration but carry a carbon cost. Promotion of biological nitrogen fixers, and nutrient solubilizers and mobilizers may help in maintaining soil nutrient balance for higher C-sequestration

Key words : carbon sequestration , soil microbes , soil organic carbon , soil properties ,fertility

TABLE OF CONTENT

Contents