Assessment of Chemical and Biological Soil Composition in Cerrado Using Fourier Transform Infrared Spectroscopy

Balasso, Jose (School: Instituto Federal de Mato Grosso do Sul – Campus Nova Andradina)
Lima, Tailaine (School: Instituto Federal de Mato Grosso do Sul – Campus Nova Andradina)

The Cerrado, Brazil's second-largest biome, occupies 23% of the national territory and plays a crucial role in the agricultural economy, particularly in Mato Grosso do Sul, where pastures support livestock farming. Entomopathogenic fungi, such as those of the genus Metarhizium, offer sustainable alternatives for pest control, reducing the use of agrochemicals and fostering more eco-friendly agricultural practices. Fourier Transform Infrared Spectroscopy combined with Attenuated Total Reflectance (FTIR-ATR) has been applied in soil analysis, enabling the identification of its chemical composition and quality assessment under different management practices. This study aimed to evaluate the use of FTIR-ATR spectroscopy as a tool for identifying fungi in pastures of the southern Mato Grosso do Sul Cerrado, contributing to the sustainable management of these areas. To achieve this, soil from a 15.8-hectare pasture area located in the municipality of Nova Andradina, Mato Grosso do Sul, Brazil, was analyzed. The soil was characterized using conventional methods and FTIR-ATR spectroscopy. The results obtained through FTIR-ATR spectroscopy revealed absorption bands associated with the presence of fungi and other components in the soil matrix. Thus, it was concluded that FTIR-ATR spectroscopy is an effective technique for identifying biological materials in Cerrado soil without requiring extensive sample preparation.

Awards Won: