



B33 Seasonal Variation of Phosphatase and Sulfatase Levels in Soil and Their Potential Use in the Comparison of Evidentiary Soil Samples

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After attending this presentation, attendees will understand the possible utilization of enzyme activity in the comparison of soil samples.

This presentation will impact the forensic community and/or humanity by helping with the development of a screening method for the comparison of soil samples.

Enzyme activity in soil may vary according to geographical location and may be useful as a comparative tool in forensic geology. The type of location, weather conditions, and the season may influence the variability of enzyme activity.

Thorton and McLaren (1) were the first to propose enzymatic characterization to differentiate soil. Their study, however, is somewhat limited since seasonal variation was not accounted for. This study is designed to examine the role of seasons and to better assess the use of enzymatic analysis for comparative purposes in soil.

Soil samples were collected from four areas of differing topography and geography and assayed spectrophotometrically for the presence of two specific enzymes: phosphatase and sulfatase. Samples were taken from a location near water, an open field, a wooded area, and a sample from a hillside. Samples were collected during the spring, summer, fall, and winter. During each collection, five samples were taken fifty feet from a central point and mean values for enzyme activity determined.

Statistical analysis using one way-analysis of variance at 95% confidence was conducted to determine significant differences in enzyme concentration among the sites. Greater variation exists between collection sites than within samples from the same site for each individual season. Results indicate that variation in enzyme concentration does exist between sites but the extent of the variation changes with season. Sample locations show greater differences in the spring and summer than in the fall or winter.

The application of the method as a screening method used in conjunction with soil color comparison and particle size distribution will also be discussed.

1. Thorton JI, McLaren AD. Enzymatic characterization of soil evidence. *J. of Forensic Sci.* 1975; 20: 674-92.

Soil, Phosphatase, Sulfatase