Influence of Yemperature and Q_{10} Values on Alkaline Phosphatase Activity in Vertisols of Andhra Pradesh

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ABSTRACT

The enzyme phosphatase plays an important role in the mineralization of organically bound P that leads to absorption of P by the plants. Alkaline phosphatase belong to the group of phosphomonoesterases play an important role in catalyzing several important reactions necessary for the life processes of microorganisms in soils and thereby stabilizing the soil structure, the decomposition of organic wastes, organic matter formation, and nutrient cycling. When the temperatures are increased due to various changes caused by global warming that have a profound influence on soil enzymes. Every enzyme has its optimum temperature below which the enzyme activity is less due to inactivation**.** Further, with increase in temperature the enzymes get denatured and results in a decreased nutrient availability and indirectly the productivity. To study the effect of temperature on soil alkaline phosphatase activity, ten Vertisol sampleswere collected and laboratory incubation studies were carried out at different temperatures ranging from 20^{o}C to 90^{o}C. The average alkaline phosphatase activity (µg of 4-nitrophenol g^{-1} soil h^{-1}) varied from 69.4 to 542.2 with the increased temperature from 20-60^{o}C and there after the activity decreased at 90 ^{o}C. Among the samples, S5 recorded higher activity of 780.4 µg of 4-nitrophenol g^{-1} soil h^{-1} followed by S8 (602.6), S7(594.5) and S1 (575.4). The temperature coefficient values (Q_{10}) werecalculated in the temperature range from 20 to 90^{o}C for alfisols and the average value varied from 0.50 to 1.74.

Key words: *Alkaline phosphatase, Incubation study,Temperature and Vertislols*