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Changes in the kinetic properties of *Zea mays* NADP- malic enzyme in response to sulphur dioxide exposure

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SUMMARY

The effect of sulphur dioxide exposure on the activity of NADP- malic enzyme was studied in the leaf extracts of control and exposed *Zea mays* plants. Ten - days old plants of *Zea mays* were exposed to different concentrations of sulphur dioxide (0.8 to 23 ppm) for 4 hours in a continuous flow exposure chamber under illumination (500W tungsten bulb). The visible injury symptoms in leaves produced due to the exposure were correlated with sulphur dioxide concentration. A concentration dependent decrease in the activity of the enzyme was observed in relation to sulphur dioxide exposure. The inhibition of NADP- malic enzyme by sulphur dioxide was found to be non-competitive with a K_i value of 52.6 ppm sulphur dioxide, with respect to $NADP^+$. The enzyme showed a partial competitive inhibition by sulphur dioxide with respect to malate, whereas the inhibition was competitive with a K_i value of 15 ppm, with respect to Mg^{2+}. The relatively low K_i value with respect to Mg^{2+} demonstrates a sensitive factor for sulphur dioxide damage. The K_m values were 26.3, 142 and 51 µM for $NADP^+$, malate and Mg^{2+}, respectively.

Key words : Sulphur dioxide, *Zea mays*, Inhibition, Chlorophyll, NADP- malic enzyme