

### **Peroxidase Activity and Isoenzyme Pattern in Maize Inbred Lines Contrasting in Their Resistance to Potyvirus-induced-mosaic**

The potyvirus-induced-mosaic, is one of the most important diseases in maize due to its ubiquity and imposed grain yield losses. It has been suggested that resistance to virus infection is often associated with increased peroxidase activity and expression of specific isoenzymes. However, studies designed to verify these hypothesis using genotypes contrasting in their resistance to potyvirus-induced-mosaic are rare. Therefore, the objectives of this study were: (1) to determine the effect of potyviruses infection on the activity and expression of peroxidase isoenzymes in maize leaves and, (2) to determine the activity and expression of specific isoenzymes of peroxidase in inbred lines contrasting in their resistance to these viruses. In a first experiment, leaves from 7 day old seedlings from resistant and susceptible lines were submitted to the following treatments: inoculation, rubbing with carborundum and non-inoculation. Peroxidase activity and zymograms were determined 8 days later. In a second experiment, peroxidase activity and zymograms were performed in 15 resistant and 18 susceptible inbred lines. Resistant and susceptible inbred lines were previously selected through inoculation. Rubbing with carborundum did not affect either peroxidase activity or isoenzyme patterns. Inoculation significantly increased peroxidase activity but did not influence isoenzyme patterns. Most resistant inbred lines, without inoculation, showed activity above 0.3 A470. min<sup>-1</sup>.mg<sup>-1</sup> leaf fresh weight. These results suggest that increased peroxidase activity is one of the mechanisms conferring resistance to potyvirus infection in maize.

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Isabel R. P. de Souza, Alves, VMC, Parentoni, SN, Teixeira, FF, Paiva, E, Purcino, AAC  
Embrapa/CNPMS  
C.P.151 - Sete Lagoas, 35701-97008, Brazil

### **Peroxidase Activity along the Main Root Apex of Aluminum Tolerant and Sensitive Maize Inbred Lines**

Aluminum is a major factor limiting crop yield in acid soils. It has been reported to influence the expression of peroxidase isoenzymes in several plant systems, with the root apex being the site of the primary Al lesion. The objective of this work was to determine the effect of Al on peroxidase activity in the root apex of maize inbred lines contrasting in their tolerance to this mineral. Seeds of Cateto237 (tolerant) and L36 (sensitive) were pre-germinated for 7 days and then transferred to nutrient solution. After 5 days, half of the seedlings were transferred to the same nutrient solution containing 250  $\mu$ M Al for 80 minutes and the other half kept as control. Peroxidase activity and zymogram of its isoenzymes were performed along the first 20 mm of the main root apex, segmented at 2 mm intervals. The highest total soluble protein contents were observed in the first 2 mm of the root apex in both inbred lines, independent of Al treatment. Aluminum significantly decreased peroxidase activity in the first 6 mm of the root apex in the sensitive inbred line, but had no effect on the activity of segments located above this zone. Aluminum treatment did not affect peroxidase activity in any root segment from the tolerant inbred line. A constitutive peroxidase isoenzyme with pI 4.79 was observed in the tolerant but not in the sensitive genotype.