

ANALYSIS COMPUTATIONAL OF CHEMICAL ELEMENTS IN SOY LEAVES INFECTED BY *PHAKOPSORA PACHYRHIZI* FUNGUS EMPLOYING EDS BY SEM TECHNIQUE

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The purpose of this work was to evaluate the amount of chemical elements in soy leaves infected by *Phakopsora Pachyrhizi* fungus, using EDS technique by SEM. Samples were normal leaves and leaves infected by *Phakopsora Pachyrhizi* fungus. Plant diseases are a limiting factor in getting high financial return from soy crop. The economic importance of each disease varies from year to year and from region to region, depending on the climatic conditions during each harvest. At present, the rust of the soy, which is caused by the *Phakopsora Pachyrhizi* fungus, has been one of the main risks to the Brazilian soy harvest. It appears on the leaves, initially in the lower parts of the plant. The first symptoms are the presence of tiny dark points (at most 1mm in diameter) on the fabric of the leaf. The samples were supplied by EMBRAPA – soy, where they were cultivated in “fitotron” cameras, maintained at 30°C and air humidity (80%). These conditions are excellent for the development of the *Phakopsora Pachyrhizi* fungus and keeping the isolation of any other fungus or external body. The samples were immersed for 60 min at 4°C in 2,5% GTA, 0,045 M cacodylate buffer, pH 7,2 and post-fixed in 1% osmium tetra oxide in the same buffer. After fixation the samples were dehydrated in ethanol, critical point-dried using CO₂ and mounted with silver paste, sputtered with carbon, and studied in a Phillips FEI – Quanta 200 SEM operated at 25 kV. A metabolic disorder was observed through this technique to the elements Silicon (Si) and Calcium (Ca) when comparing the spectra of EDS of healthy leaves in relation to the infected leaves with *Phakopsora Pachyrhizi* fungus. Results showed a high concentration of fungus on leaves which present a low concentration of Silicon (Si) element. In the leaves with high concentration of Silicon (Si) focuses of the disease were not found or its presence was remarkably small when compared with leaves with little Silicon. We believe that the presence of the fungus is directly related to the presence of Silicon (Si) element on the leaves.

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References:

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