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**Cytological and molecular studies on the effect of
herbicides on *Rhizobium* spp. symbiotic
with *Vicia faba***

By

Sherif Edris Ahmed

B.Sc. Agric. Sci. (Genetics), Ain Shams University (1994)

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**A thesis submitted in partial fulfillment
of
the requirement for the degree of**

Master of Science

in

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2000

Approval sheet

CYTOLOGICAL AND MOLECULAR STUDIES ON THE EFFECT OF HERBICIDES ON *RHIZOBIUM* SPP. SYMBIOTIC WITH *VICIA FABA*

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ABSTRACT

Sherif Edris Ahmed "Cytological and molecular studies on the effect of herbicides on *Rhizobium* spp. symbiotic with *Vicia faba*". Unpublished Master of Science thesis, University of Ain Shams, Faculty of Agriculture, Department of Genetics, 2000.

Faba bean plays an important role in the national economy and agricultural production for its high nutritional value and various ways of utilization. This study was aimed to investigate the symbiotic relationship between faba bean and rhizobium as affected by some herbicides. Three cultivars of faba bean (Giza 2, Giza 714 and Giza 461) and one *Rhizobium leguminosarum* strain 481 were tested for symbiotic property in the presence of three herbicides (Glyphosate [Roundup], Basagran and Fusilade) at different concentrations. Different parameters such as SDS-PAGE, plasmid profiles, optical density (for rhizobium growth and % of leghaemoglobin) and inhibition zone experiment were used to determine the toxicity of these herbicides.

The effect of high dosage of herbicides was found to be more aggressive on faba bean than *Rhizobium leguminosarum* strain 481. The Basagran herbicide has a high toxicity effect on both faba bean and *Rhizobium leguminosarum* strain 481. The *Rhizobium leguminosarum* strain 481 showed the highest resistance and also recovery against Glyphosate (Roundup) herbicide, where the bacteria have biodegraded this herbicide to useful components.

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