

OLTISAN ACTION ON SOME CULTIVATED SPECIES

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Abstract: Our study is focused on the effect of a common pesticide – Oltisan, on two cultivated species *Vicia faba* and *Lycopersicum aesculentum*.

INTRODUCTION

Oltisan is a common systemic pesticide, very useful in industrial agriculture. Is used as herbicide for annual and perennial dicots and is produced by Oltchim S.A. Ramnicu Valcea Romania and Sandoz Agro, Suisse. This pesticide belong to aromatic carboxylic derivatives and is a mixture of 2,4 – D and Dicamba. Is not harmful for cereals (monocots).

THE AIMS OF INVESTIGATION

Our study intends to determine mutagenic effects of Oltisan on *Vicia faba* and *Lycopersicum aesculentum*.

MATERIALS AND METHODS

Plants seeds and Oltisan extra: from Podu Iloaiei Seed Center. We used two *Vicia cultivars* (A and B) and also two *Lycopersicum cultivars* (Vidra and Dacia). For mutagenic treatments we used Oltisan 50µl/l for both *Vicia cultivars* and two concentrations (50µl/l – V1, and 10µl/l – V2) for each *Lycopersicum cultivars*.

Laboratory phase: one of the first investigations concerned the capacity of germination and the mitotic division of these two species seeds embryonary roots. Seeds from every variant (control and mutagenized variants) were germinated in Petri dishes, on distilled water, at 25°C, in the dark. The germination is followed by the Oltisan treatment. Roots of 1 – 1,5 cm were fixed with Battaglia fixator prior to be submitted to cytological investigations. We also investigated the mutagenic effects of Oltisan on biological materials, doing cytogenetic study of chromosomal aberrations in mitosis ana-telophase of embryonary roots mutagenic treatment consequently. All determinations were performed according literature protocols (Tudose et al., 1996; Grama et al., 2003; Grama and Bara, 2003).

RESULTS AND DISCUSSIONS

Investigations on mitotic division in radicular meristems of *Vicia faba*

One of the first goals of our study is the investigation on the mitotic division in embryonary roots of *Vicia faba*. As we can observe in Figure 1, 2 the division rate does exhibit a slight decrease in the variants of Oltisan treatment, especially on cultivar B, comparative to the control.

There are of course differences between different mitotic division phases (Figure 3), with a very similar decrease from prophase to telophase pattern in each experimental variants.

Investigations on mitotic division in radicular meristems of *Lycopersicum aesculentum*

As we can observe in Figure 4, 5 the division rate does exhibit a slight decrease in the variants of Oltisan treatment, especially on high concentration of Oltisan, comparative to the control. Dacia cultivar seems to be more sensitive to Oltisan action.

There are of course differences between different mitotic division phases (Figure 6), with a very high proportion of prophase in each experimental variants.

Investigations on chromosomal aberrations in mitotic ana-telophase

The amounts of chromosomal aberrations were increase comparative with control in every experimental variant, as it can be observed in Figure 7 and Figure 8 for *Vicia* and in Figure 9 and 10 for *Lycopersicum*. These results indicate that Oltisan has mutagenic effects on the investigated species.

We found differences between the different sorts of chromosomal aberrations, with a specific high level of micronuclei, probably due to these species characteristic response to Oltisan.

CONCLUSIONS

Oltisan, a powerful pesticide agent, exhibit mutagenic capacity on *Vicia* and *Lycopersicum* cultivars.

Oltisan has mutagenic effects in any of the used concentrations, but the cultivar and the high concentrations seem to be critical parameter, that induces specific increase chromosomal aberration proportion.

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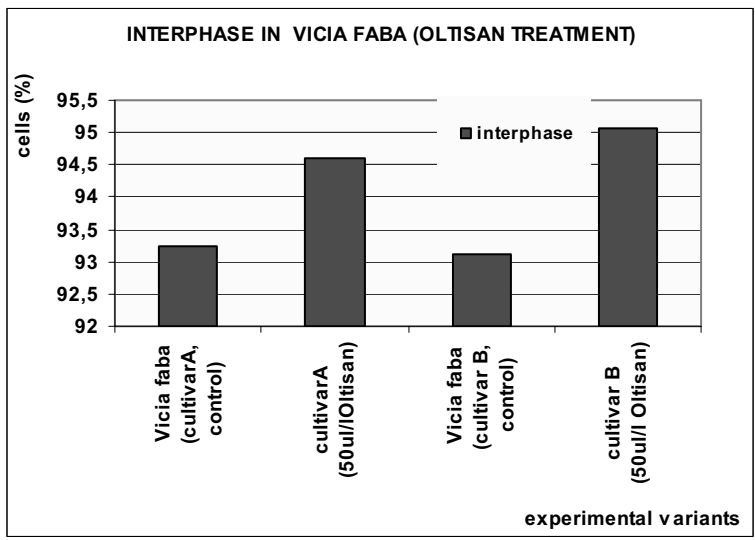


Figure 1

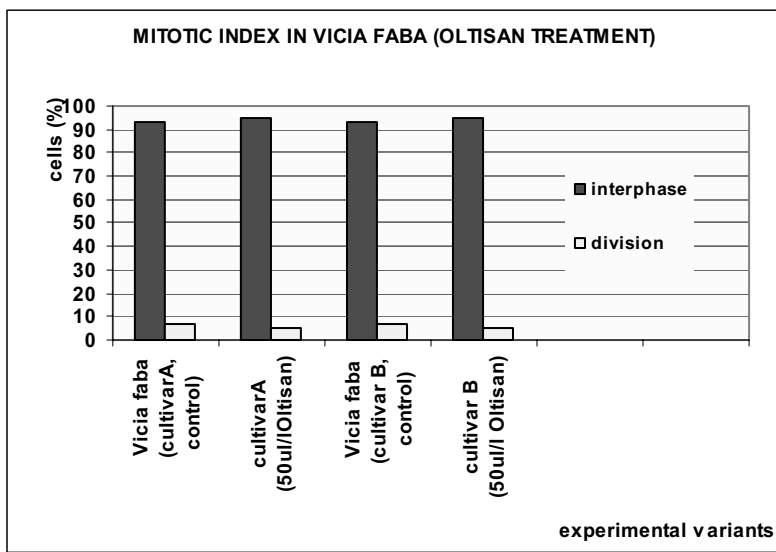


Figure 2

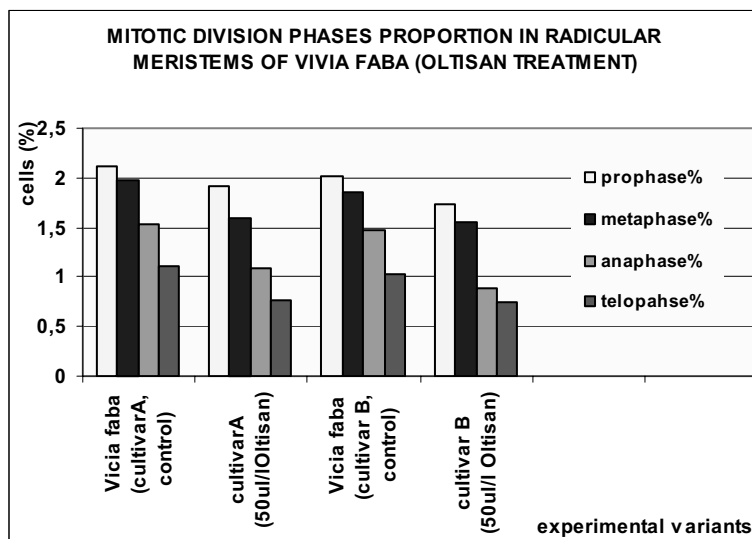


Figure 3

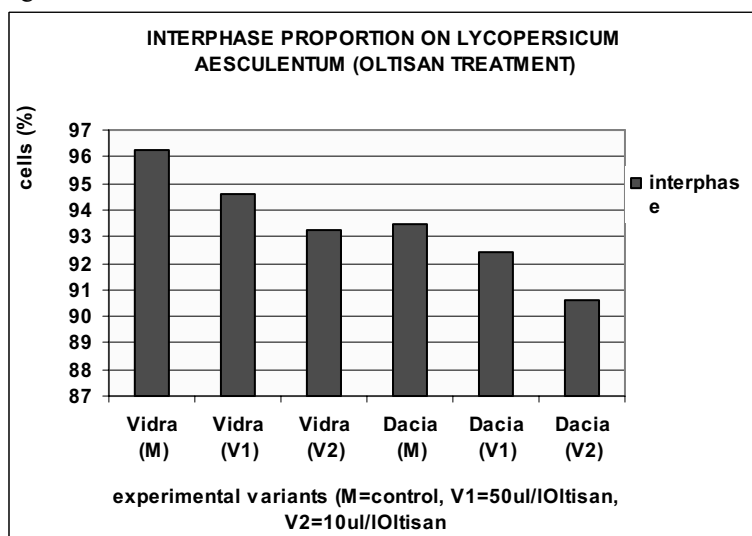


Figure 4

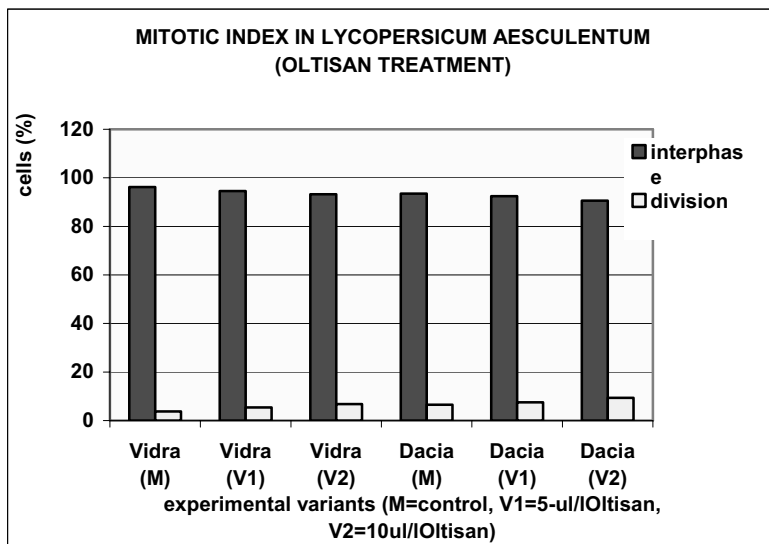


Figure 5

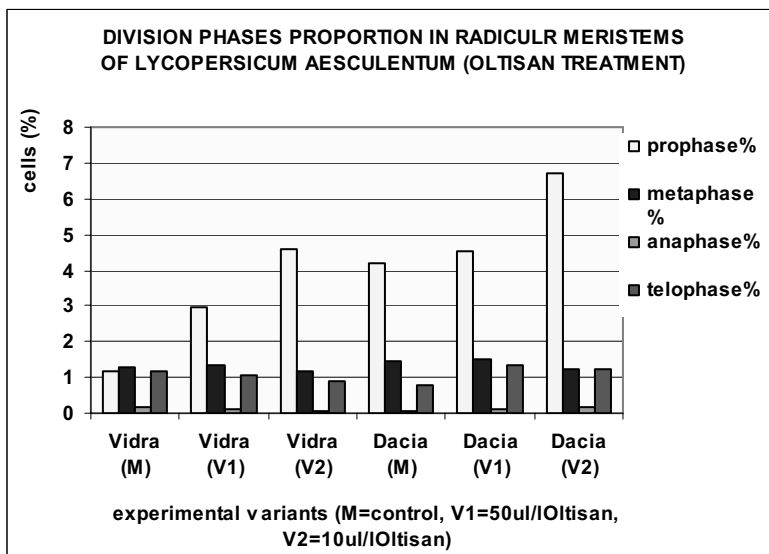


Figure 6

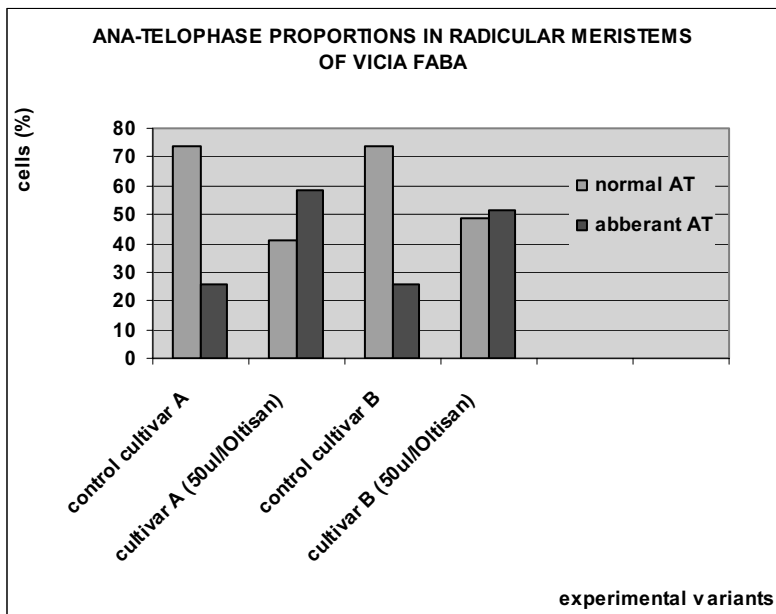


Figure 7

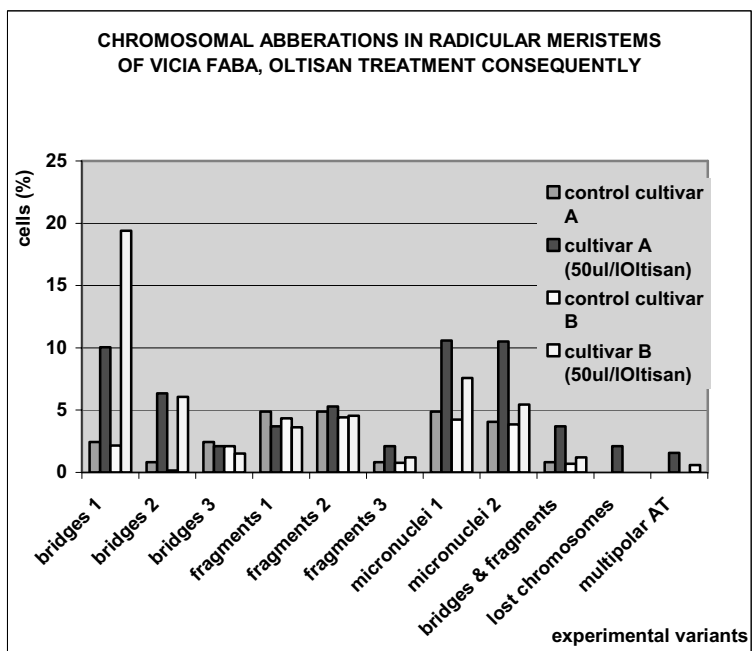


Figure 8

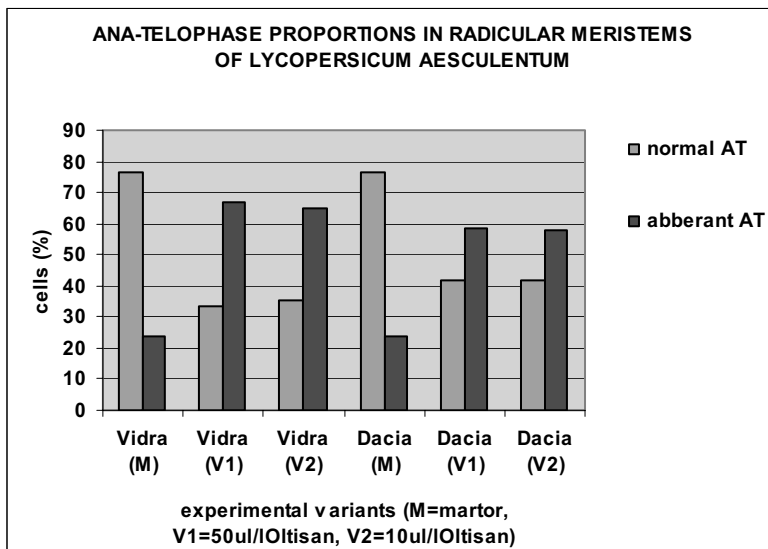


Figure 9

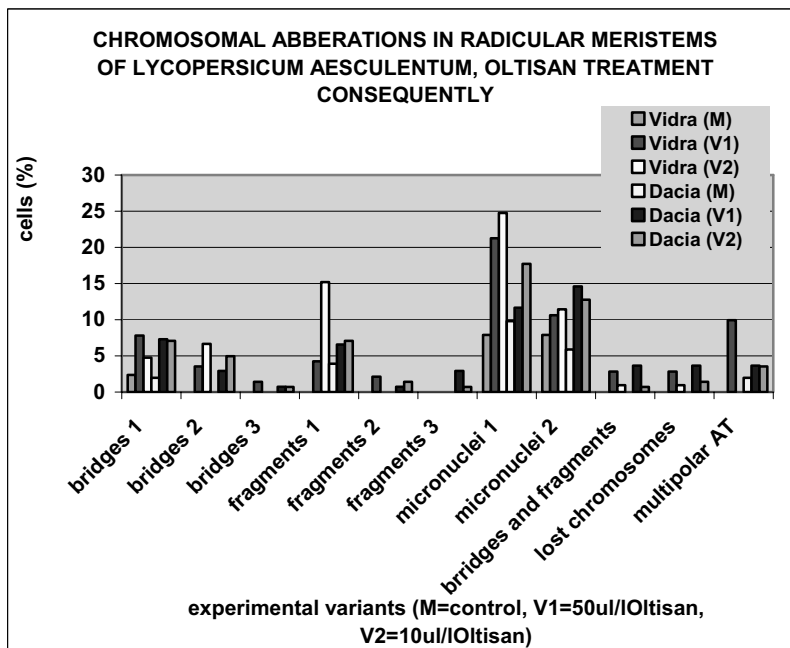


Figure 10