

# CYTOGENETIC EFFECTS INDUCED BY NITROSOGUANIDINE IN *GLYCINE MAX* (L.) MERRIL

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**Keywords:** nitrosoguanidine, *Glycine max*, mitotic division, chromosomal aberrations, ana-telophase

**Abstract:** Our study is focused on the opportunity of nitrosoguanidine (NG) use as mutagenic agent on *Glycine max* amelioration.

## INTRODUCTION

Nitrosoguanidine is known as a powerful alkylating agent, very useful in mutagenesis experiments, designed for evaluation of resistance of a particular species to its action, either for amelioration of cultivars.

### THE AIMS OF INVESTIGATION

Our study intends to determine mutagenic effects of nitrosoguanidine on *Glycine max* (L.) Merrill.

## MATERIALS AND METHODS

*Glycine max*: one cultivar from Podu Iloaiei Seed Center. This cultivar is well characterized as productivity, soil and water requirements.

*Nitrosoguanidine* (NG): 0,1; 0,05 and 0,025% in distilled water; exposure time 60' and 120'.

*Laboratory phase*: one of the first investigations concerned the capacity of germination and the mitotic division of the *Glycine max* seeds embryonic 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 mutagenic treatment, two variants of time (60' and 120', three concentration of the mutagen each). 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 NG on biological materials, doing cytogenetic study of chromosomal aberrations in mitosis ana-telophase of embryonic roots mutagenic treatment consequently. All determinations were performed according literature protocols (Tudose et al., 1991; Tudose et al., 1996, Grama et al., 2003).

## RESULTS AND DISCUSSIONS

Investigations on mitotic division in embryonic roots of *Glycine max*

One of the first goals of our study is the investigation on the mitotic division in embryonic roots of *Glycine max*. As we can observe in Figure 1, the division rate does not exhibit a specific increase in the variants of NG treatment, comparative to the control.

There are of course differences between different mitotic division phases in all experimental variants (Figure 2). The frequency of prophase and also anaphase is higher in all variants and also in control probes.

Investigations on chromosomal aberrations in mitotic ana-telophase

The amounts of chromosomal aberrations were increase from control to the experimental variants, as it can be observed in Figure 3 and Figure 4. These results indicate that NG has mutagenic effects on *Glycine max*.

We found differences between the different sort of chromosomal aberrations, with a specific high level of fragments and micronuclei, due to species characteristic response to NG.

## CONCLUSIONS

Nitrosoguanidine, a powerful mutagenic agent can be used in order to induce mutations in *Glycine max* (L.)Merril.

In the presence of NG mitotic index in the radicular meristems does not exhibit a pregnant modification.

NG has mutagenic effects in any of the used concentrations, but the exposure time seems to be a critical parameter, that induces specific increase chromosomal aberration proportion.

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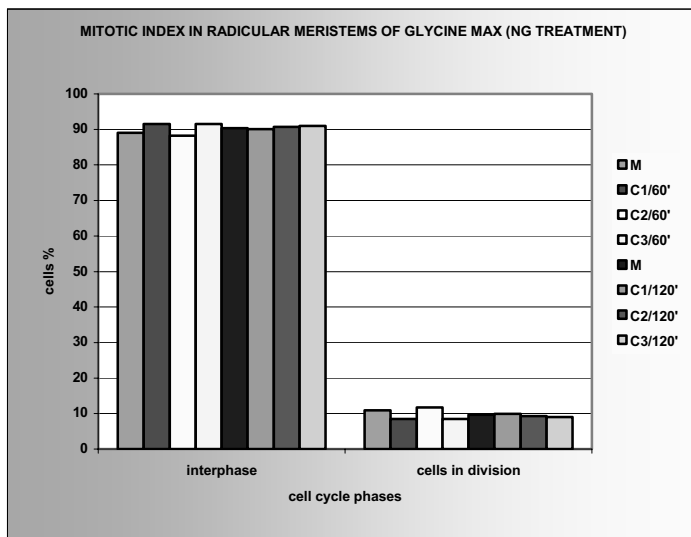


Figure 1. Comparison between mitosis interphase and dividing cells proportion in *Glycine max* embrionary roots

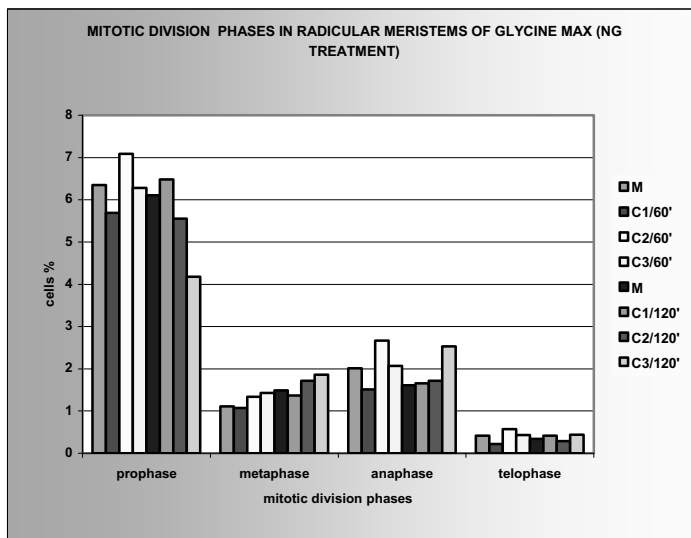


Figure 2. Mitotic phases in *Glycine max* embrionary roots

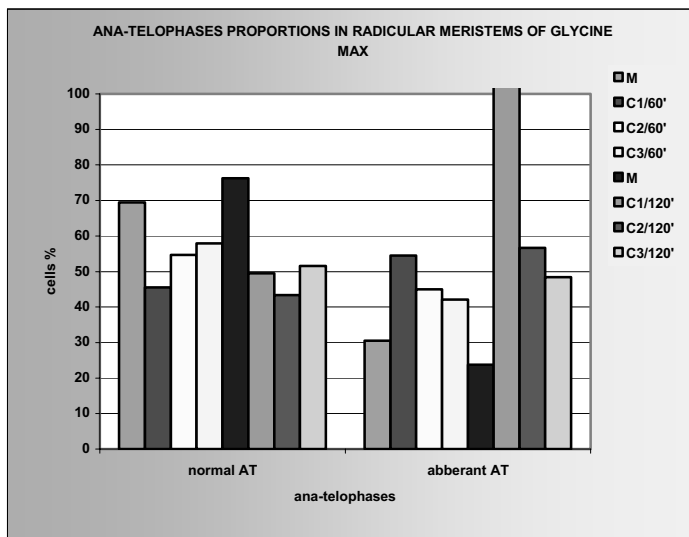


Figure 3. Normal and aberrant ana-telophase in *Glycine max* radicular meristems

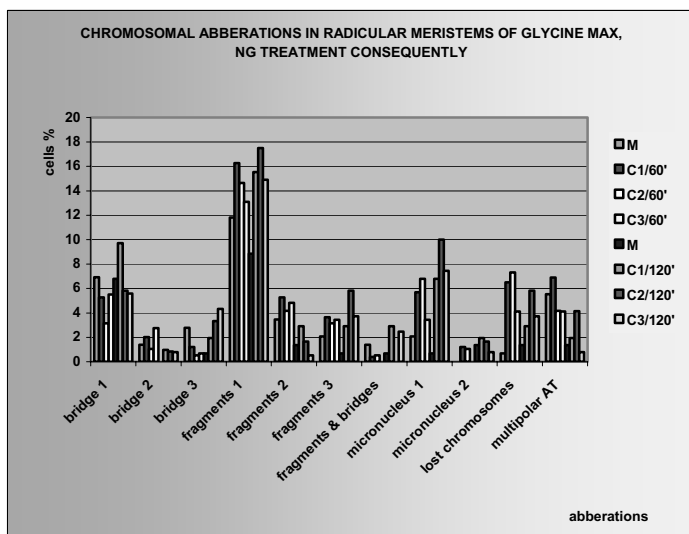


Figure 4. The amount of different ana-telophase aberrations in *Glycine max* embryony roots