

# Effects of the Antibiotics Kanamycin, Cefotaxime and Carbenicillin on the Differentiation of Flax Hypocotyls

(Received: 01/09/1998)

Mohamed Koronfel

Agronomy Department, Faculty of Agriculture, Cairo University,  
Giza, Egypt.

E. Mail: Koronfel@USA.net

## ABSTRACT

Preliminary experiments showed that untransformed flax tissues did not contain genes conferring NPTII activity, which gave resistance to kanamycin. Thus, kanamycin seems to work well as an *in vitro* selective agent in fiber and dual use Egyptian flax cultivars as well as Canadian oilseed cultivars at a concentration of 200 ppm. This made it possible to use the kanamycin selection scheme to separate transformed from untransformed cells. Also, 250 ppm cefotaxime and 500 ppm carbenicillin used in flax transformation system to suppress *Agrobacterium* growth, were found to be effective and safe for using, since their effects on regeneration were found negligible.

**Key words:** Biotechnology, Flax, *Linum usitatissimum*, Kanamycin, Cefotaxime, Carbenicillin.

## INTRODUCTION

When gene transfer is attempted using explants, it is convenient to have a selection scheme whereby transformed cells can be separated from untransformed cells. Drug resistance is usually the marker of first choice in plant transformation experiments (Fraley *et al.*, 1986). The *nptII* gene provides resistance to kanamycin or gentamicin (G418) and is useful as a selectable marker in many plant species (Fraley, *et al.*, 1986) and was also effective in *Linum* (Jordan and McHughen, 1988; Zhan *et al.*, 1988; McHughen, 1989; McHughen and Jordan, 1989; Dong and McHughen 1991; Dong and McHughen, 1993; Koronfel, 1994). Kanamycin is a milder selection agent than G418 (Dong and McHughen 1993).

Kanamycin resistance does not spontaneously appear in flax (McHughen, 1989; McHughen *et al.*, 1989). The results of Gao *et al.*, (1991) suggested that the presence of kanamycin in the medium did not significantly affect the stability of foreign protein production in genetically engineered plant cells. Generally, kanamycin is added to the growth medium in a concentration previously shown to be inhibitory for regeneration of untransformed flax cells.

However, the sensitivity of plant cells to the selection agent depends upon the genotype, the explant type, the developmental stage, and the tissue culture conditions and should, therefore, be determined under the actual conditions of the transformation and regeneration process. The objective of this study was to investigate the effect of the