

A highly efficient regeneration system *via* somatic embryogenesis from immature embryos of Egyptian wheat cultivars (*Triticum aestivum* L.) using different growth regulators

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ABSTRACT

Two wheat cultivars (Giza 163 and Giza 164) were used to study the effect of three different growth regulators i.e. Thidiazuron (TDZ), Zeatin riboside (ZR) and Dicamba on regeneration efficiency. In comparing results of regeneration efficiency for the three growth regulators across the two cultivars, it is concluded that the highest regeneration efficiency was observed by using the highest TDZ concentration (0.2 mg/l) as compared with other used concentrations of the two other growth regulators. On the other hand, it was clear that ZR had higher influence on regeneration efficiency than Dicamba. Moreover, Giza 164 was better than Giza 163 in regeneration efficiency across all growth regulators and all concentrations. This highly efficient regeneration system is considered a new addition that will open the door for improving wheat crop by *in vitro* techniques.

Key words: Regeneration, immature embryo, wheat cultivars.

INTRODUCTION

Wheat is the most critical agricultural crop worldwide, where the stability of the community and regimes depends mainly on the availability of the strategic commodities. The efficient regeneration of normal and fertile plants from single cells, a basic prerequisite for molecular genetic improvement of plants, proved to be rather difficult for different wheat varieties because of their extreme recalcitrance to manipulation *in vitro*. These constraints were overcome by the culture of immature embryos at defined stage of development onto a defined nutrient medium supplemented with defined

concentrations of hormones. Establishment of a highly efficient regeneration system for the input use of efficient varieties with unique quality profiles is, however, a prerequisite. Wheat regeneration *via* tissue culture varies with the genotype (Machii *et al.*, 1998). Immature zygotic embryos of two wheat (*Triticum aestivum* L.) genotypes, known for their different ability to generate embryogenic callus, were used as initial explants to establish callus cultures (Jimenez, 2001). Thidiazuron was first reported to have cytokinin activity in 1982. It has been used successfully *in vitro* to induce shoot formation and to promote auxillary shoot proliferation. Thidiazuron is especially effective with recalcitrant woody