I-INTRODUCTION

Pear is grown in all temperate areas in the world, as it took the second rank after apple in production. Pears may be consumed either fresh, cooked, dried or preserved (**Rehder, 1967**). Egypt climate is more suitable for pear trees since its chilling requirements are less than apple trees.

Communis pear is the most valuable and compatible rootstock for pear under Egyptian conditions. It is mainly propagated by seeds, imported from abroad. Consequently, high costs for transportation, agricultural quarantine, and relatively low seed viability are the main problems facing the use of communis pear seeds. Thus, micropropagation may be the basic alternative method to overcome all these problems. Moreover, micropropagated plantlets have many defects in relation to those resulted from conventional propagation methods which upset down their planting directly in open climate conditions. From these, lacking of guard cells mechanisms and missing of any layer of protection (pectin or cellulose) in the developed leaves resulted in excessive transpiration rate. In-addition, low nutrients and water transportation and absorption due to trachea (transportation vessels) not well developed besides root hairs were not establised during *in vitro* stages. In this concern, gradual adaptation (acclimatization) must be

carried out before transplanting to the open climate for overcoming the *in vitro* plantlets defects, which appear in vegetative growth and rooting (root hairs).

Successful gradual acclimatization (weaning) must pass through three phases (laboratory, greenhouse and nursery). In this respect laboratory phase, which includes both *in vitro* and *in vivo* procedure were most effective phases and they should be done with great care. Thus, *In vitro* steps induced partial hardening for leaves (stomatal mechanism), stems (shoot length, shoot thickness, and transportation trachea), and rooting (length and number). Meanwhile, *In vivo* steps of laboratory acclimatization intensified hardening of vegetative growth (leaf and stem) and induced root hairs formation. Further acclimatization phases (greenhouse and nursery) qualified the micropropagated plants to the open climate condition, which include temperature, humidity, and irrigation. Transferring of rooted shoots to Jiffy-7_s supplemented with biological plant protectant and fertilizer, and incubated in plastic humid trays for 2 to 3 weeks then transferred to pots and covered with plastic bags to facilitate acclimatization. This technique has resulted in 70-100% of selected *in vitro* apple shoots to produce vigorously growing, healthy plants in the greenhouse **(Bolar *et al.*, 1998).** Plantlets size was the most important parameter for successful transplanting in the soil **(Omar, 1988)**. Hence, plantlets with 10-15cm length with

2-3 leaves and possessed a well developed adventitious root system could be invariably transplanted successfully in the soil with survival rate close to 100% (**Tisserat, 1984** and **Al-Jibouri, *et al.*, 1988**).

Concisely, the ultimate goal of this investigation is to throw some light on the best possibilities for acclimatizing micropropagated communis pear plantlets and determining the importance of laboratory phase in the acclimatization process. Also, evaluating different procedures required to achieve successful laboratory acclimatization phase and in turn maximizing survival percentages and reducing losses occurred in plants during this phase, which leads to increase tissue culture industry profitability.