

ABSTRACT

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Many problems have faced pear growers in Egypt during the last years. Such as fire-blight disease which caused by *Erwinia amylovora*. The present investigation was conducted from 2002 to 2005 seasons to producing low susceptible strain to fire-blight disease from Le-Conte pear cultivar through inducing mutant from intraspecific hybridization with both irradiated Le-Conte pollen with gamma rays (0, 20, 80 and 120gy) and pollen of new selected pear. Also, production mutant from Le-Conte microcutting using different doses of gamma rays (0, 20, 30, 40 and 50gy). Moreover, evaluate the physical and biochemical genetic behavior of two pear rootstocks (*pyrus betulifolia* and *pyrus communis*) in relation to severity of fire-blight disease and its effect on Le-Conte pear cultivar. Results indicated that the best germination of pollen grains found in control, new strain and 5 gy (30.9, 24.3 and 20.3 %) respectively. Moreover, the pollen tube growth of both new selected strain as well as open pollination reached to 2/3 length of the style 7 and 6 days from pollination. Whereas, the high doses (80 and 120 gy) were the lethal doses. Most of pollen was empty and degenerated. Also, the effect of irradiation on pollen tube growth through the style showed different degree of callose along the tube. On the other hand, the production of mutants from irradiated microcutting of Le-Conte pear showed varied from dose to another in disease severity. The effective doses were 20 and 30gy the produced irradiated microcutting of Le-Conte (moderate susceptible to fire-blight). On the other hand, vegetative bud opening of both *pyrus betulifolia* and Le-

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Conte/ *pyrus betulifolia* started early under study. Meanwhile, the date of leaf abscission of Le-Conte/ *pyrus betulifolia* was later than Le-Conte/ *pyrus communis*. Both *pyrus betulifolia* and *pyrus communis* were diseased by *Erwinia amylovora*. But, the first mentioned rootstock was moderately susceptible than the second rootstock. Moreover, the same trend Le-Conte/ *pyrus betulifolia* was moderately than Le-Conte/ *pyrus communis* under artificially inoculated conditions. The two rootstocks varied considerably in their biochemical fingerprinting, the total contain of phenol compounds and disease severity of fire-blight. SDS-PAGE electrophoresis and four isozyme systems (polyphenoloxidase, α -Esterase, peroxidase and Acid phosphatase) were applied. There are differences between all treatments in isozyme systems under study. The band with molecular weights 0.277 KDa was found in *pyrus betulifolia* and so in Le-Conte/ *pyrus betulifolia*, whereas disappeared in *pyrus communis* and Le-Conte/ *pyrus communis*. This band may be marker to low susceptible from *pyrus betulifolia*. Moreover, this band was found in production mutants at 20 and 30 gy from in vitro microcutting of Le-Conte.

Key wards: Intraspecific hybridization - new selected pear strain - production of pear mutant- Irradiated Le-Conte pollen - *Pyrus betulifolia* - *Pyrus communis* - SDS- PAGE Isozyme.

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