Studies on Methods of controlling postharvest bean and bea diseases

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L. var. saccharatum) are two of the most important economic vegetable crops in Egypt for both local consumption and export for Europe and other countries.An important results of the present study can be summarized as follows:I. Different locations interested with snap bean and snow pea production were surveyed during 2004/2005 growing seasons for the causal of white and grey moulds of snap bean or snow pea pod rots. All isolated fungi belonged five different genera: Allernaria spp.. Botrytis cinerea, Fusarium spp., Penecillium spp. and Sclerotinia sclerotiorum with different frequency rates according the locations.2.Pathogenicity test demonstrated that only Botrytis cinerea and Sclerotinia sclerotiorum the main causing for grey and white rots on snap bean and snow pea, which recorded 93 and 75% on snap bean cv. Paulista, respectively.3.Most common commercial snap bean cultivars (i.e., Bronco, Paulista, Ogzyra and Emy) were evaluated for susceptibility to infection with Botrytis cinerea and Sclerotinia sclerotiorum under laboratory conditions. All tested cultivars showed some tolerant under artificial infection to S. sclerotiorum more than to B. cinerea.4.The activity profiles of the cell wall hydrolytic enzymes polygalacturonase (PG), cellulose (Cx) and pectin methyl esterase (PME) were studied in vitro. All three enzymes were active production in the culture filtrates of B. cinerea than in those of S. sclerotiorum. Positive correlation between the enzyme product and the culture age of the two pathogenic fungi was found.5.Positive correlation was found between all the enzyme activities in the infected snap bean or snow pea pods and the storage periods as well as the time of reaction. PG enzyme activity was high in theStuturuvtit 108snap bean pods inoculated with B. cinerea followed by those inoculated with S. sclerotiorum compared with healthy pods. Contrary, cellulase Cx enzyme activity was high in healthy pods or those inoculated with S. sclerotiorum compared with those inoculated with B. cinerea. PME enzyme activity was high exhibited in the inoculated pods with B. cinerea followed by S. sclerotiorum then healthy pods only after 15 days from storage.6.PG, generally, activity in the inoculated snow pea pods with two pathogens was higher than those in healthy pods either after 15 or 30 min reaction or 7 and 15 days. On the other hand, cellulase (Cx) activity was lower in pods inoculated with B. cinerea except after 15 days and 30 min, than healthy pods, while was higher in pods inoculated with S. sclerotiorum than inoculated with B. cinerea or in healthy pods after 15 or 30 min reaction, or 7 and 15 days incubation. PME was not detected in the snow pea pods.7.Efficacy of some salts at different concentrations on the mycelial growth reduction of B. cinerea and S. sclerotiorum were investigated. Max Guard and sodium bicarbonate gave the highest efficacy against S. sclerotiorum (100%) and B. cinerea (88.15%), in addition they completely prevent sclerotial formation of two pathogens, followed by Sanosil and Bafry. Meanwhile, calcium sulphate, calcium chloride and calcium carbonate were only effective against S. sclerotiorum. Calcium chloride and potassium sulphate allow to produce little amount of B. cinerea sclerotia, whereas calcium carbonate and calcium sulphate in the media allow to produce the highest amount of sclorotia. Highest yield of sclerotia (number and weight, g) produced in the S. sclerotiorum medium contained calcium sulphate, calcium carbonate, Meanwhile, the lowest number were recorded using Bafry and potassium sulphate, respectively.8.Some organic acids (i.e., ascorbic, boric, citric, palmitic and salicylic) were used in the culture medium at different 109 Suounatiiconcentrations to study their effect on the mycelial growth of B. cinerea and S. sclerotiorum. Salicylic acid only caused completely

inhibition of mycelial growth and scleroia formation of B. cinerea and S. sclerotiorum at all concentrations. Meanwhile, boric acid was the least ,effective on growth and sclerotia of S. sclerotiorum. On the other hand, ascorbic, citric and palmitic acids were not effective on the growth or sclerotia formation of the two pathogenic fungi at all concentrations.9.Efficacy of the increase of carbon dioxide CO2 and nitrogen N with decease in oxygen 02 than the fresh air in the three levels, as atmosphere modified, was studied on the mycelial growth of the pathogens. All treatments were decreased the growth of B. cinerea and S. sclerotiorum, especially with the more increase of 02.10.Six salts (Le., Bafry, Sanosil, Max Guard, sodium bicarbonate, calcium carbonate and calcium sulphate) were studied for their effect on the disease severity on snap bean pods after artificial inoculation or natural infection with B. cinerea and S. sclerotiorum. Max Guard was the most effective in this concern especially at 3000 ppm. Also, Sanosil and calcium carbonate at 3000 ppm were highly effective in the reduce of disease severity caused by B. cinerea than those by S. sclerotiorum.11.All organic acids showed highly reduction in the disease severity of snap bean pods artificially inoculated or natural infection by the two pathogens compared with the control. Boric and palmitic acids were highly effective in these concern when used at 3000 ppm on bean pod rots. Citric acid came in the next at 3000ppm, followed by salicylic acid at 2000 ppm on B. cinerea and S. sclerotiorum.12.On the other hand, sodium bicarbonate, Sanosil and Max Guard were superior in the reduction of snow pea pods disease severity after infected artificially or naturally by B. cinerea when used at 3000ppm. Meanwhile, Max guard and sodium bicarbonate were the best salts for control S. sclerotiorum on snow pea. In this&alumni, 110concern, calcium carbonate and calcium sulphate were least effective in the disease severity reduction caused by B. cinerea and S. sclerotiorum on snow pea pods.13.Also, ascorbic and citric acids resulted highly reduction in the disease severity caused artificially or naturally by the two pathogenic fungi when both used at 3000 ppm on snow pea pods. Boric acid came in the next in this concern on snow pea pods. Meanwhile, palmitic acid was more efficacy on S. sclerotiorum than B. cinerea when used at 3000ppm on snow pea pods.14.The three levels of modified atmosphere were applied to study their effect on the disease severity of B. cinerea and S. Sclerotiorum on snap bean pods. Result indicated that, using atmosphere level contained 3% Q, 10% CO2 and N 82% was more effective on reducing disease severity on bean pod rots with B. cinerea and S. sclerotiorum compared with control. Meanwhile the level 3% 02, 15% CO2 and 82% N was the least effective.15.Five of certain salts (i.e., calcium chloride, calcium sulphate, calcium carbonate, potassium chloride and potassium sulphate) and two acids (i.e., salicylic and boric acids) were applied as a pre-harvest treatments on snap bean and snow pea plants, during growing seasons 2005 and 2006, to study their effect on disease severity caused by B. cinerea and S. sclerotiorum after storage for 15 days. All treatments were effective for reduction the disease severity under storage condition. In general, organic acids were more effective than salts under the inoculation and natural infection with S. sclerotiorum, meanwhile, no trend was notice in case of B. cinerea inoculation during the two seasons, respectively. Concerning the salts, calcium sulphate and potassium sulphate were more effective in decreasing disease severity and showed highly significance efficacy than other salts under inoculation with B. cinerea and S. sclerotiorum especially in high concentrations. Meanwhile, the least effects was obtained when snap bean plants sprayed with calcium carbonate and Sturuniva,potassium chloride to control S. sclerotiorum under storage condition during the two seasons. While, potassium chloride was the less effective to control B. cinerea infection on snow pea pods under storage conditions. On the other hand, salicylic acid was more effective in the reduction of disease severity that caused by B. cinerea than boric acid during the two seasons in snap bean and snow pea pods. Under the natural infection, all treatments, salts and acids were effective on reduction of disease severity on the same crops.