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ECOLOGICAL AND EPIDEMIOLOGICAL STUDIES ON
BACTERIAL BLIGHT DISEASE OF PEAR

By

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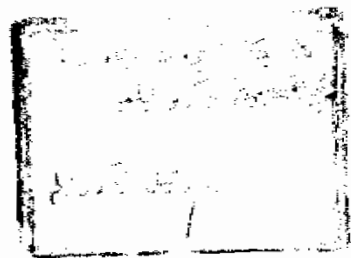
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ABSTRACT

Pear bacterial blight disease caused by *Erwinia amylovora*
(fire blight disease) and *Pseudomonas syringae* (pear blast



disease). The disease was found in Alexandria, Beheara and Kafr El-Shiekh Governorates, while Dakahlia and Kalubia Governorates were free from the disease. The disease was found to be in just some regions at Gharbia Governorate.

Disease severity greatly increased and the yield decreased with increasing number of cankers and infected clusters per tree, during autumn period and late blooming, especially after 20th of March.

E. amylovora and *Ps. syringae* were detected in all tested samples, except cankers which were free from *Ps. syringae*. High percentages of infected samples and high population of *E. amylovora* were found in cankers, which could be considered as the main source of infection in the following season. Chemical control treatments (Kocide 101 with addition of streptomycin sulfate) significantly decreased the percentage of infected samples as well as populations of the two pathogens.

A definite relationship between weather conditions and occurrence of pear bacterial blight disease in Egypt was found. Temperature was the major factor for initiation of blight epidemic. High relative humidity and rainfall were important for initial infection and dissemination of the disease.

Population of both pathogens isolated from bees and wood minors insects were relatively high as compared with those from leaf hopper and ants insects.

There was a relationship between appearance of streptomycin-resistant isolates and the number of seasons where streptomycin was included in the spray program. Using Kocoid

101 with addition of streptomycin sulfate in the spray program greatly decreased the appearance of streptomycin-resistant isolates. Combination between chemical control treatments and fertilizers (organic and mineral) greatly decreased the severity of bacterial blight disease and increased yield of pear.

Total sugars and amino acids content of the infected tissues decreased, while total phenols increased as compared with healthy tissues. Flowers and immature fruits of pear were susceptible to bacterial blight disease, due to the high amounts of total amino acids and low amounts of total sugars and phenols. Meanwhile, mature fruits were resistant to the disease, due to the decreasing in amounts of total amino acids and the high amounts of total sugars and phenols.

Phenolic compounds inhibited the growth of both pathogens and capsule formation of *E. amylovora*. However, some sugars and amino acids increased the growth of both pathogens and stimulated capsule formation of *E. amylovora*.

KEY WORDS

- The theoretical development period (D)
- Potential bacterial blight activity (PBA)
- Potential doublings (PD)
- Extracellular polysaccharids (EPS)
- Colony forming unites (CFU)
- Nutrient agar meldium (NA)
- Nutrient broth medium (NB)
- Kado and Heskett medium (D3)
- King's medium B (KBA)
- Sterile distilled water (SDW)
- Streptomycin resistant strains (Str^r)
- Streptomycin sensitive strains (str^s)
- Ammonium nitrate (N)
- Calcium superphosphate (P)
- Potassium sulfate (K)
- NPK-mixture

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