

Bacterial Wilt of Papaya Caused by *Pseudomonas solanacearum*

K. SESHADRI¹, K. MOHAMMED USMAN², T. K. KANDASWAMY³ and K. SEETHARAMAN¹

A new wilt disease of papaya (*Carica papaya* L.) was found to be caused by *Pseudomonas solanacearum* E. F. Smith. The symptoms consist of epinasty and yellowing of lower leaves followed by upper leaves, and defoliation. The root system is extensively damaged due to rotting. It is believed that this is the first record of the disease.

The occurrence of a bacterial wilt disease of papaya (*Carica papaya* L.) was noticed for the first time, during the rainy season of 1975 in the orchard of Tamil Nadu Agricultural University, Coimbatore. The disease manifested in a severe form and has been responsible for the loss of stand of the crop, increased number of small, weak plants and death of older plants. Yields were generally reduced by 10 to 20 per cent.

SYMPTOMS

The disease is easy to recognise since the infected plants appear wilted and defoliated. The root system decays. Often the first symptom of the disease is that there is epinasty of the lower leaf petioles and yellowing of lower leaves which become chlorotic and eventually die and fall down. Similar symptoms develop in younger leaves too. Gradually the entire plant wilts and dies. A slight disturbance at this stage or even the flow of the irrigation water will dislodge the plants as the root system is extensively damaged with a mushy, slimy decay. Slight vascular browning has also been observed.

ISOLATION OF THE PATHOGEN

The plants exhibiting the symptoms were collected from different fields. Pieces of tissue from each collar or root region of the plant, dissected from advancing margin of the rot, were either plated directly on nutrient agar, or were individually suspended in sterile water and aliquots of suspension streaked on to nutrient agar. The isolates were purified by streak plate method and were maintained on sterile distilled water throughout the study.

PATHOGENICITY TESTS

Pathogenicity of the isolate was determined by puncturing the collar and the roots of 40-day old plants of papaya with moist needles, followed by dipping the plants up to the collar region in bacterial suspension made from two-day old nutrient broth cultures. The plants were placed in the green house. Appropriate control plants were punctured with moist sterile needles. All pathogenicity tests were repeated at least twice. In all cases, the bacterium was reisolated from the ino-

1-4: Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore - 641003

culated wilted plants and pathogenicity was proved again. The bacterium caused wilting within 48 hr after inoculation. The control plants remained healthy. The cross inoculation experiments carried out with solanaceous plants, viz. *Capsicum annuum* L., *Solanum melongena* L., and *Lycopersicon esculentum* Mill. showed that they are susceptible.

CHARACTERISATION OF THE PATHOGEN

The morphological, cultural and biochemical characteristics of the bacterium were studied. The bacterium is a short rod, measuring $0.5 \times 1.5 \mu$, motile with a single polar flagellum, non-spore forming, Gram negative and aerobic. Colonies on nutrient agar are small, irregular, smooth, flat, wet shiny white, and produce a diffusible pigment in the medium, which is fluorescent under ultraviolet light. In liquid media growth is turbid with no distinct pellicle formed. On steamed potato plugs, the growth is at first wet, shining and dirty white, turning brown after a few days and finally black. No gas or acid is formed from lactose. The bacterium can utilise asparagine, glutamic acid, peptone, potassium nitrate, sodium

nitrate, ammonium nitrate, sodium nitrate and urea. Starch is not hydrolysed and gelatine is not liquefied. Milk is cleared. Indole and hydrogen sulphide are not produced. The bacterium is very sensitive to polymixin B. It shows the characteristics of *Pseudomonas solanacearum* in its appearance on tetrazolium medium (Kelman, 1954).

In its morphological, cultural and biochemical characters, the pathogen is identical with *Pseudomonas solanacearum* E. F. Smith as reported in the manuals by Elliot (1951) and Breed *et al.*, (1957).

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