

ETIOLOGY OF MARBLED DISEASE OF PINEAPPLE (*ANANAS COMOSUS* L. MERR.)

Pineapple (*Ananas comosus* L. Merr.) a hitherto neglected crop, grown for its fresh fruits in homesteads, is extensively cultivated in the recent years in many parts of Kerala. It is utilized world wide as fresh fruit and also in canning industry. Although the crop was found to be free from any serious diseases, its intensive cultivation invites many disease problems. Marbled fruit disease, was first noticed in the Pineapple Research Station of the Kerala Agricultural University, Vellankkara, Thrissur, in the variety Kew during the period of April to August. The farmers called this disease as *karimkuthu*. The disease makes its appearance only during monsoon season when heavy rainfall is followed after a hot summer. The disease was first described by Linford (1952) in pineapple growing regions of Mexico. Although the disease was prevalent in the pineapple growing tracts of Thrissur district, it was considered as a physiological disease as it coincides with the rainy season.

The name marbled fruit itself gives an indication of the symptom of the disease. The disease appears in extra ordinarily large fruits as it matures, without showing any external symptoms. The symptoms are visible only when they are cut open (Fig. 1). Hence, the diseased fruits are discarded in the canning factory. Immature fruits are free from the disease even in the heavy rainy season. The most common symptom is brown or dull brown discolouration of internal fruit tissue. Infected tissues become hardened, brittle and speckled with colour variation from light brown to dark brown giving a marbling appearance. Slight bitter taste is also noticed for the diseased fruitlets. The disease may affect multiple fruitlets or the entire fruit, but occasionally single fruitlets are involved. The speckled appearance occurs in vascular tissue and extends to the core of the fruit. Symptoms develop during the last month of fruit maturation. In most cases the fruitlet core rot caused by fungal infection is found associated with marbled symptoms. Infection is reported to occur through open flowers and cracks in

the fruit. Bacteria may be vectored to the flowers by insects and remain latent in the flower and developing fruit until approximately one month before fruit maturity (Ploetz *et al.*, 1994). The disease could be produced in the Mauritius variety of pineapple also upon artificial inoculation, even though under field condition it was reported only in the Kew variety.

The disease causing bacteria were isolated on PDA giving non-pigmented round colonies. The isolate was subjected to two cycles of purification in the same media. On King's B medium they produced excellent fluidal or mucoid growth. They were gram negative, motile, catalase positive and grew in 5 % sodium chloride solution. They liquefied gelatin, grown at high temperature (36°C) and turned skimmed milk acidic, but recorded a negative reaction with respect to hydrolysis of arginine, tyrosinase activity and indole production.

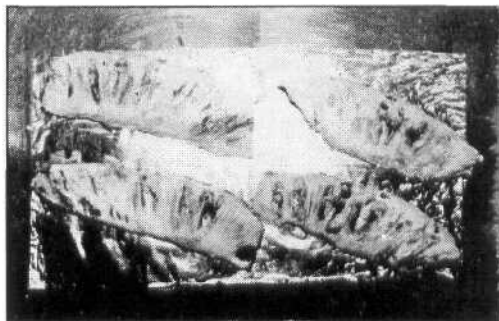


Fig. 1. Diseased fruit showing symptoms when cut open

They utilized acetate and citrate as carbon and energy sources, but not benzoate. The bacterial suspension in sterile distilled water was inoculated into the half-matured fruit. Symptoms appeared in the inoculated matured fruits at the time of harvest after 21 days of inoculation. If inoculations were done on fruits nearing maturity, the symptom could develop within a week after inoculation. The bacteria could be re-isolated from the inoculated diseased fruit tissue proving its pathogenicity. Based on the morphological and physiological

characteristics and the pathogenicity tests conducted the organism could be identified as *Erwinia herbicola* var. *anas* (Serrano) Dye.

This is the first authentic report of *E. herbicola* var. *anas* causing marbled disease on pineapple from India.

Kerala Agricultural University
Vellanikkara, Thrissur 680 654, India

T. Sheela Paul, K. Nandini
S. Ramachandran Nair, James Mathew

REFERENCES

- Linford, MB. 1952. Pineapple disease and pest in Mexico. *Plant Prod. Bull.*, U.S.F.A.D. 1: 21-25
- Ploetz, R.C., Zentmyer, G.A., Nishijima, W.T., Rohrback, K.G. and Ohr, H.D. 1994. *Compendium of Tropical Fruit Disease*. American Phytopathological Society, U.S.A.