

***Thielaviopsis paradoxa* (de Seynes) V. Hohnel infection and early ripening of fruits**

T.T. CHERIAN AND MANI VARGHESE

Department of Botany, Bharata Mata College, Thrikkakara, Kochi 682 021 and Department of Botany, Union Christian College, Aluva 683 102, Kerala

A study was undertaken during 1990 to 2000 to study the post-harvest fungal diseases of fruits. During the course of study, *Thielaviopsis paradoxa* (de Seynes) V. Hohnel was isolated from *Ananas sativus* Schult (pine-apple), the imperfect state of the fungus is *Ceratocystis paradoxa* (Dade) Moreau. The fungus was cultured, maintained in the stock culture collection and used to study its pathogenicity to unripe, green fruits of banana (*Musa paradisiaca* L.) and mango (*Mangifera indica* L.). These fruits when inoculated with this fungus developed pine-apple smell and showed early ripening similar to natural ripening process.

INTRO: Key words : Anamorph, Black rot, pathogenic, red rot, sett rot

INTRODUCTION

Ceratocystis was first monographed by Hunt (1956). Since then it has been studied by several authors (Mehrotra and Aneja, 1990). *Thielaviopsis paradoxa* (de Seynes) V. Hohnel, an anamorph of *Ceratocystis paradoxa* (Dade) Moreau is a weak pathogen which enters the host through wounds. Though it is a saprobe found in the soil, it is pathogenic to pine-apple, coconut and sugar-cane. In pine-apple it causes black-rot of leaves and fruits, in coconut the red-rot/stem-bleeding and in sugar cane the sett-rot/pine-apple disease (Rangaswamy, 1984). A characteristic feature of the fungus is that it produces three types of spores (two types of microspores and one type of macrospore). The diseased tissues emit produce a pine-apple smell. This paper presents the ability of *T. paradoxa* to cause early ripening of unripe fruits of banana and mango.

MATERIALS AND METHODS

The fungus was been isolated from diseased fruits of pine-apple collected from pine-apple growing areas of Ernakulam District, in Kerala, viz. Muvattupuzha, Perumbavoor and Kothamangalam. The fungus was identified with the help of early literature (Ellis, 1971, 1976; Hawksworth *et al.*, 1983; Subramanian, 1983; Upadhyay, 1984). The pathogen was cultured on PDA and maintained in

the laboratory and sub-cultured as and when required. Fresh, green, unripe fruits of banana and mango were collected locally and inoculated with the fungus under aseptic conditions. The control as well as the inoculated fruits were kept at room temperature (32 ± 2 °C) under aseptic conditions. The changes were noted at an interval of 24 hour.

RESULTS AND DISCUSSION

Banana

The control remained as green for about 7 to 10 days, without showing signs of ripening. Whereas all the inoculated samples turned yellow, emitting a ripe smell mingled with pine-apple smell at 48 hour after inoculation. The flesh became soft after 72 to 96 hour after inoculation. The samples inoculated at different parts (the center of the fruit, the stem end and stigma end) showed slight variations in the duration of ripening process. The ripened fruits decayed after 5 days (Fig. 1a).

Mango

The control remained green without showing any sign of ripening for about 10 to 12 days, whereas the inoculated samples emitted the smell of ripening and the smell of pine-apple after 48 hour of inoculation. The skin/rind remained green but the flesh became soft and pulpy after 48 hour of

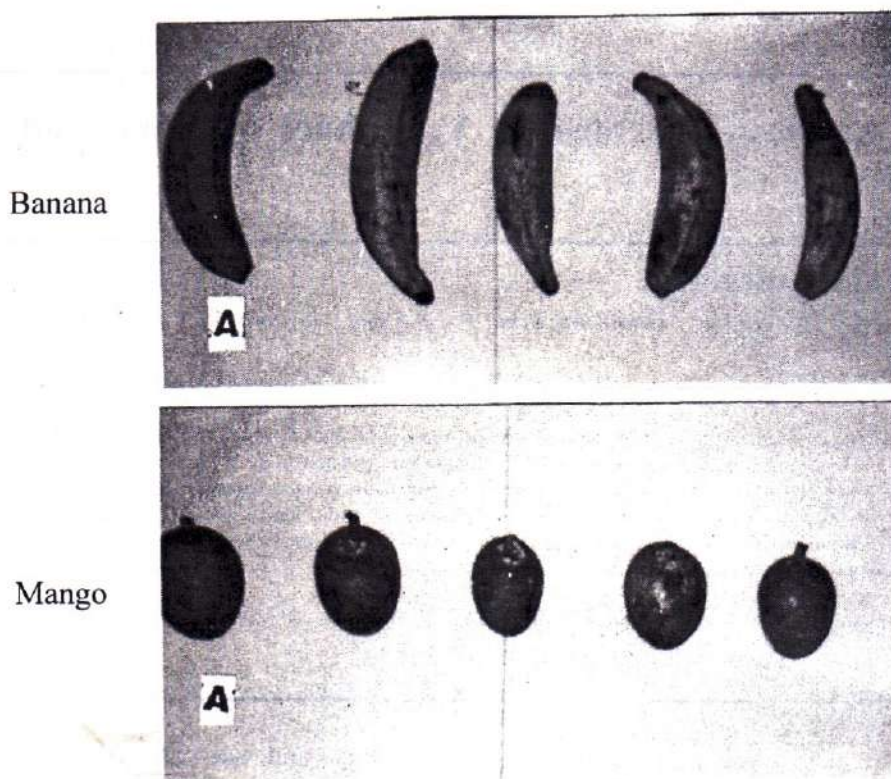


Fig. 1. (a) Photograph showing the healthy (A) and inoculated bananas; (b) Photograph showing the healthy (A) and inoculated mangos.

inoculation. The ripened fruits decayed and mummified after 72 hour of inoculation (Fig. 1b). Inoculation experiments with *T. paradoxa* reveals that this pathogen can induce ripening of immature fruits, i.e. it can produce some ripening principle during infection. Rangaswamy (1984) cited the production of ethylene during fungal infection. This phenomenon can be utilized for inducing ripening in economic crops like banana and mango and can be considered as a biological method of induction of ripening.

ACKNOWLEDGEMENTS

The first author thanks the UGC for awarding fellowship and financial assistance.

REFERENCES

- Ellis, M.B. (1971). *Dematiaceous Hyphomycetes*. Commonwealth Mycological Institute, Kew, Surrey, England. 1 - 608.
- Ellis, M.B. (1976). *More Dematiaceous Hyphomycetes*. CMI, Kew, Surrey, England. 1 - 505.
- Hawksworth, D.L., Sutton, B.C. and Ainsworth, G.C. (1983). *Ainsworth and Bisby's Dictionary of Fungi*. 7th Edition, CMI, Kew, Surrey, England. 445p.
- Rangaswamy, G. (1984). *Diseases of crop plants in India*. Printice Hall of India Pvt. Ltd. New Delhi. 520p.
- Subramanian, C.V. (1983). *Hyphomycetes. Taxonomy and Biology*. Academic Press, London. 502p.
- Upadhyay, H.P. (1981). *A monograph of Ceratocystis and Ceratocystiopsis*. Univ. of Georgia Press, Athens. 176p.

(Accepted for publication February 20, 2002)