

MANAGEMENT OF VASCULAR-STREAK DIEBACK OF COCOA

Zainal Abidin Mior Ahmad

Faculty of Agriculture
Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor,
Malaysia

Keywords: oncobasidium, cocoa, dieback, disease resistance.

Introduction

oncobasidium theobromae Talbot and Keane is the causal pathogen of vascular-streak dieback (VSD), a serious threat to cocoa in Asia and Papua New Guinea. Disease resistance is the best long term control measure since chemical and cultural control were ineffective. The research objective was to develop in vitro techniques for producing basidiospores of oncobasidium and artificial methods for mass screening cocoa for resistance against VSD.

Materials and Methods

In vitro production of basidiospores was achieved by exposing colonies of *O. theobromae* to saturated moist air blown from a cool moisture humidifier. Basidiospores were inoculated on young cocoa seedlings using pipette or alternatively using agar plugs. Inoculations were done during late evening in the laboratory or glasshouse. Visual observations of VSD symptoms were made up to 6 months after inoculation. Some basidiospores were stored in suspending medium in liquid nitrogen in an attempt to cryopreserve them. This method is useful for synchronising presence of susceptible cocoa host and infective inocula during screening.

Results and Discussion

The humidifier method yielded viable quantities of basidiospores for inoculating cocoa plants. Inoculation in the glasshouse gave negative results. However, inoculation in the laboratory were positive. 33% of seedlings inoculated with spores and 75% using agar plugs were infected with VSD. Typical VSD symptoms were observed 2 to 3 months after inoculation. Failure to induce infection in the glasshouse could be due to high temperature conditions during and after inoculation. The study showed that post inoculation maintenance was vital to successful infectivity (Ganesan et al. 1998). This finding is essential in the development of methods for mass screening of cocoa for resistance against VSD. The studies undertaken confirmed the viability of *O. theobromae* basidiospores after storage in liquid nitrogen for up to 8 weeks using a suitable suspending medium (Zainal and Ganesan, 1999). The ability to cryopreserving spores is an important step in making inoculation procedures more efficient.

Conclusions

The research has succeeded in developing a method for artificially inoculating cocoa with in vitro produced basidiospores of *O. theobromae* to yield positive VSD infections. Basidiospores were found to remain viable when stored in a suitable suspending medium in liquid nitrogen for up to 8 weeks.

References

- Ganesan, V., Zainal Abidin, M.A. and Tan, Y.H. (1998). Positive VSD infection of cocoa seedlings with in vitro produced basidiospores. Paper presented at Malaysia International Cocoa Conference 1998, 26-27 November, Kuala Lumpur.
- Zainal Abidin, M.A. and Ganesan, V. (1999). Cryopreservation of in vitro produced basidiospores of oncobasidium theobromae Talbot and Keane. 5th International Conference on Plant Protection in the Tropics, 15-18th March 1999, Kuala Lumpur.