

Screening of cocoa types against *Phytophthora* pod rot disease

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ABSTRACT

The reaction of 225 different cocoa types maintained at Cadbury-Kerala Agricultural University Co-operative Cocoa Research Project, College of Horticulture, Vellanikkara against *Phytophthora* pod rot was evaluated by artificial inoculation of the pathogen *Phytophthora palmivora* on detached cocoa pods. Observations on the per cent pod area infection recorded eight days after inoculation revealed that, none of the cocoa types screened were immune to the disease. However, the cocoa types differed with each other in the percentage of pod area infection. Based on this eight cocoa types viz., G VI 14, G VI 73, G VI 77, G VI 124, G VI 138, G VI 154, G VI 279, G VI 284 which showed less than 50 per cent pod area infection were categorized as moderately resistant to the disease. Moderately susceptible reaction was recorded with 64 cocoa types and the rest were susceptible.

Key words: Cocoa, *Phytophthora palmivora*, Pod rot.

INTRODUCTION

Cocoa (*Theobroma cacao* L.), a beverage crop, is mainly grown as a mixed crop in the existing arecanut and coconut gardens in Kerala, Karnataka and Tamil Nadu states of India. Cocoa is prone to the attack of many diseases. Among the various diseases, *Phytophthora* pod rot (PPR) is the most serious one inflicting heavy crop losses during rainy periods. Though, the use of chemicals offers satisfactory control of the disease, their indiscriminate use possesses many environmental problems. Hence, it is necessary to locate a source resistance to be used in the integrated management practice of the disease to reduce the crop losses. Screening of cocoa types for PPR resistance using detached cocoa pods was carried out by many workers which resulted in the identification of moderately resistant types like EET 59, EET 376, SCA 6, SCA 12, DR 16, ICS 6, C 78 (Lawrence, 1978; Chandramohan, 1982; Sri-Sukamoto and Mawardi, 1986). Abraham *et al.* (2001) evaluated the reaction of 166 cocoa types to PPR and reported moderately resistant reaction in four cocoa types. The Cadbury-Kerala Agricultural University Co-operative Cocoa Research Project, College of Horticulture, Vellanikkara is collecting and maintaining a large number of cocoa types from the place of origin of crops and other cocoa growing countries of the world. Thus, the present investigation was carried out for locating a source of resistance against PPR among the available genetic resources of cocoa maintained in the project.

MATERIALS AND METHODS

Detached cocoa pods of half maturity from 225

cocoa types maintained at the Cadbury-Kerala Agricultural University Co-operative Cocoa Research Project, College of Horticulture, Vellanikkara were used for the screening by artificial inoculation with a virulent *Phytophthora palmivora* isolate. Pods were collected and a well of 10mm diameter was made on the middle portion of the pod using a sterile cork borer to a depth of 3 mm. Mycelial discs of 10 mm diameter of the pathogen grown on Carrot Agar medium were taken from seven day old culture and were placed in the well and covered with cotton moistened with sterile water. The inoculated pods were incubated in polythene bags with a pad of cotton wetted with sterile water in order to provide high humidity. Three replications were maintained for each cocoa type. Observations on the length and breadth of lesion developed were recorded daily for eight days. The per cent pod area infection was calculated as given below.

$$\text{Percentage of pod area infection} = \frac{\text{Length} \times \text{breadth of lesion}}{\text{Length} \times \text{breadth of pod}} \times 100$$

Based on the percentage of pod area infection, the cocoa types were grouped into four categories.

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| R – Resistant | - < 25 per cent pod area infected |
| MR – Moderately resistant | - > 25 to < 50 per cent pod area infected |
| MS – Moderately susceptible | - > 50 to < 75 per cent pod area infected |
| S – Susceptible | - > 75 per cent pod area infected |

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