Development of a Bioassay to Study Anthracnose Infection of Capsicum chinense Jacq. Fruit Caused by Colletotrichum capsici

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Abstract

A fruit inoculation bioassay was developed for studying anthracnose infection of Capsicum chinense chilli by Colletotrichum capsici. Four fruit maturity stages: immature green, mature green, color turning and ripe red; and three inoculation methods: drop, injection and wound/drop; were applied to an anthracnose susceptible variety CM022. Injection and wound/drop methods resulted in anthracnose symptoms developing at all fruit stages as early as 3-5 days after inoculation, while the drop method failed to cause any symptoms of anthracnose within 9 days after inoculation. The green chilli fruits appear to be more susceptible to anthracnose than the more mature ripe red fruit stages and fruit size does not affect the development of anthracnose symptoms. All the disease score parameters including lesion length, lesion width, lesion area and area under the disease progress curve are highly correlated indicating that any of the disease evaluation methods could be used to assess germplasm for resistance.

Key words: disease scores, fruit maturity, inoculation method

Introduction

Chilli (Capsicum sp.) is an economically important vegetable crop of Thailand with anthracnose disease being a major constraint to pre- and post-harvested chilli fruits. In Thailand, C. annuum is the major species of commercial chilli grown however, C. chinense is also grown for its high capsicin content and disease resistance. Anthracnose of chilli species is caused by either Colletotrichum capsici (Syd.) E.J. Butler & Bisby or C. gloeosporioides (Penz.) Penz. & Sacc. in Penz. C. capsici has also been reported to infect a wide range of legume species (Pring et al., 1995).

Fruit maturity stage has been shown to be important in the infection and colonisation of C. annuum chilli fruit by C. gloeosporioides with red fruit being more resistant than green fruit (Kim et al., 2001, 2002; Oh et al., 1999a, 1999b). However, (Manandhar et al., 1995) reported that both ripe and green chilli fruits reacted the same to either C. capsici or C. gloeosporioides.

Three laboratory inoculation methods (injection, drop and wound/drop) for studying anthracnose diseases of C. annuum chilli have been developed. The injection and drop methods were developed at