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RESEARCH ARTICLE

Biochemical changes in greengram leaves due to infection by anthracnose pathogen

■ SUNIL KULKARNI[1] AND V.I. BENAGI[2]

[1]Department of Plant Pathology, Krishi Vigyan Kendra (U.A.S.) BIDAR (KARNATAKA) INDIA
[2]Department of Plant Pathology, University of Agricultural Sciences, DHARWAD (KARNATAKA) INDIA

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*Corresponding author:
kvksunil@gmail.com

ABSTRACT

Changes in chlorophyll, sugar and phenolic compounds in resistant and susceptible genotypes of greengram were studied. The chlorophyll and sugar content were found to decrease due to the infection of *Colletotrichum truncatum* and the rate of decrease was more in susceptible genotypes (Chinamung, Yellowmung and S-4) than resistant genotypes (TM-96-2 and TARM-18). However, phenol content was found increased due to infection and the rate of increase was higher in resistant genotypes. Comparatively lesser sugar and higher phenol content were observed in resistant and moderately resistant genotypes than in susceptible genotypes.

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INTRODUCTION

Anthracnose caused by *Colletotrichum truncatum* (Schw.) Andrus and Moore, is one of the most important fungal diseases of greengram [*Vigna radiata* (L.) Wilczek]. Though, there are fungicides that can reduce disease development, they are not economical and cause environmental pollution. Development of resistant varieties is the most appropriate approach to control the disease. Generally, resistance in plants against various diseases has been correlated with phenolic compounds. Carbohydrates and mineral elements also play an important role in inducing disease resistance (Sindhan and Parashar, 1996). However, information on relationship between resistance to anthracnose and biochemical changes in greengram is not available. The present investigations deals with some biochemical alterations which occur due to anthracnose pathogen in resistant and susceptible genotypes of greengram.

MATERIALS AND METHODS

Thirty greengram genotypes obtained from AICRP (MuLLARP), Dharwad were screened against *Colletotrichum truncatum* under artificial condition in greenhouse during 2007. To carryout the screening work, 60 earthen pots were taken with sterilized soil and kept in greenhouse. Twenty seeds of each genotype were sown in each pot and two such pots were maintained for each genotype. Later, five healthy seedlings per pot were maintained for screening purpose. Conidial suspension of *C. truncatum* (10^5 conidia/ml) was prepared and spray inoculation was done to 30 days old seedlings. The inoculated seedlings were covered with polythene hood for 48 hours to create high humidity. Observations on anthracnose incidence were recorded on 20th day of inoculation by following 0 to 9 scale given by Mayee and Datar (1986).

Healthy and diseased leaves from genotypes TM-96-2, TARM-18 resistant, BGS-9, TM-97-55 moderately resistant and Sel-4, Chinamung, Yellowmung, susceptible to anthracnose were collected 20 days after inoculation and fresh leaves were extracted in 80 per cent ethanol separately. The extracts were analysed for total chlorophyll, chlorophyll 'a' and chlorophyll 'b' (Arnon, 1949), total phenols (Swain and Hills, 1959), ortho-dihydroxy phenols (Johnson and Schaal, 1952), total sugars (Dubois *et al.*, 1956) and reducing sugars