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Research Article

Variation in individual phenolics pattern in wilt infected chickpea

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ABSTRACT

Phenolic compounds have been most renowned secondary products in determination of resistance in plants. The study with six different cultivars suggests that increase of phenolics are resistant molecules of plant with preformed as well as due to the pathogen or biotic involvement in plant growth. In present experiment over all data of individual phenolics did not show any consistent prototype in all the chickpea cultivars. Doubtless, a single individual phenolic may have limited role in wilt disease resistance. Among the individual phenolics, only hydroquinone showed reverse trend except in cultivar JCP-27 and GG-4 where the contents were increased from infectional (S_2)to post infectional (S_3) stage. Some cultivars did not show any change in their phenolic content from S_2 to S_3 in root tissue obtained from normal plot. The levels of ferulic and salicylic acids remained same from S_2 to S_3 stage, and cultivar WR-315 for umbeliferon and vanillic acid for cultivar GG-1.However, it visualized from the data that instead of single individual phenolic. It may have synergistic effect of all individual phenolics in controlling the inflectional process in all the cultivars under investigation.

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INTRODUCTION

Chickpea crop is very important crop Junagadh district of Gujarat and it suffers due to infection of wilt which is most destructive in field condition. The wilt caused by *Fusarium oxysporum* f. sp. *ciceris* (Foc) is an important disease of chickpea (*Cicer arietinum* L.) worldwide (Trapero-Casas and Jimenez-Diaz, 1985). Most of the cultivars are susceptible to this disease. Since little is known about the phenolics content in root tissue of varying degrees of susceptibility. In many experiments, it has been reported that correlation exists between degree of resistance and phenol level in healthy plants induced significant increase in the activity of several defense-related enzymes such as peroxidases and polyphenoloxidases and in the accumulation of phenolic compounds (Arfaoui *et al*., 2005). Penetration of infected hyphae and spore germination is also inhibited by phenolic acids. So, attempts were made to generate information in phenolics constituent of healthy roots well as diseased roots excavated from normal plot grown plants and sick plot grown plant.

Phenolic acid metabolism is activated through phenyl propanoid pathway during infection which gives rise to suberin, lignin and wall bound phenolics as described below (Hahlbrock and Scheel, 1989). Amongst the secondary plant products, phenolic compounds are the most important group implicated in both constitutive and induced resistance. Presence of phenols and their oxidation products in plant tissues is considered to be potentially toxic to the growth and development of pathogens.

MATERIALS AND METHODS

Chickpea (*Cicer arietinum L*) seeds of six cultivars *viz.*, WR-315 (resistant) JCP-27 (resistant), GG-1(tolerant), GG-2 (tolerant) GG-4 (susceptible) and JG-62 (highly susceptible) were grown in two plots using split plot design and cultivars taken as 2nd factor where as 1st factor was plot *i.e.* one was healthy plot (normal plot) and other one was sick plot where soil was inoculated with *Fusarium oxysporium* f.sp. *ciceris* race-2 . Recommended package of practices were followed to raise plants in normal plot. Each cultivar grown in five raws with one yard stick of JG-62 for bordering each cultivar. Roots