Research Journal Parasitology 1 (1): 11-18, 2006
ISSN 1816-4943

Role of Physical Barriers and Chitinase in Conferring Blister Blight Resistance to *Camellia sinensis* (L.) O. Kuntze

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Abstract: The role played by certain physical barriers and chitinase enzyme in conferring blister blight resistance to tea was investigated. The blister blight resistance of the tea clone SA-6 was due to higher amounts of epicuticular wax and increased thickness of cuticle/epidermal layer, functioning as physical barriers to hyphal penetration of *Exobasidium vexans*. Higher quantum of chitinase in inter cellular spaces of palisade tissues was observed in the resistant clone SA-6 through immunolocalization study. Both chitinase assay as well as western blotting studies confirmed that the constitutive level of chitinase expression was higher in the resistant clone when compared with the susceptible tea clone.

Key words: Tea, inter-cellular localization, constitutive expression, inducible expression, disease resistance

Introduction

The blister blight disease of tea is by far the most serious disease of tea (Arulpragasam, 1992). A distinct relationship exists between the extent of disease incidence and amount of crop lost due to blister blight disease (Venkataram, 1968).

The pathogen *Exobasidium vexans* infects tender leaves and stems of tea. The spread of the disease is highly dependent upon weather conditions (Agnihothrudu and Chandramouli, 1990; Agnihothrudu and Chandramouli, 1991). The disease was favoured by relative humidity in the range of 60-100% (Premkumar, 1996). Recently, Sugha (1997) reported that *E. vexans* could survive on necrotic blister during offseason to restrain the disease within the economic threshold level, protectant and eradicant fungicides are sprayed at regular intervals.

Certain clones of tea plants in south India were known to manifest resistance to blister blight. Use of resistant varieties is one of the acknowledged components of Integrated Pest Management (IPM). The nature and basis of resistance in tea clones to the disease is not known. Debnath and Paul (1994) attempted to correlate some anatomical and morphological characters of 17 clones with disease severity but could not find any significant correlation. Even low levels of resistance are valuable since the need for chemical control measures can be limited. Effective infection of the host plant by the pathogen follows a complex phenomenon involving a series of events that enable or deter the pathogen to eventually cause infection. Pre- and post infectional biochemical and physical changes in the host plants play a vital role in influencing the events that impart resistance to the disease.

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