



Research Article

## Evaluation of rust and late leaf spot mapping RILs population in groundnut using *AhMITE1* Specific PCR

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### ABSTRACT

VL 1 is resistant to rust but susceptible to late leaf spot while its mutant derivative, M 110 is resistant to LLS but susceptible to rust and they exhibited polymorphism for *AhMITE* and hence it will be interesting to examine its usefulness as a marker for resistance to rust/LLS. Recombinant Inbred Line (RIL) population derived from their cross (VL 1 x Mutant 110) was phenotyped for these two diseases and selected lines were examined for *AhMITE* polymorphism to examine its association with resistance. Since the magnitude of variation was more and heritability was high for rust compared to LLS, an attempt was made to assess segregation of the maker *vis-à-vis* resistance to rust. 20 lines exhibiting extremely high resistance (10 RILs) and susceptibility (10 RILs) were selected and examined for *AhMITE* polymorphism. It was present in 8 out of 10 (80%) susceptible RILs; while absent in 6 out of 10 (60%) rust resistant RILs indicating a strong association with rust susceptibility.

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## INTRODUCTION

The cultivated groundnut (*Arachis hypogaea* L.) originated from hybridization between diploid female species *A. duranensis* with the A genome and *A. ipaensis* with the B genome (Kochert *et al.*, 1996). Groundnut (*A. hypogaea*) is classified into two subspecies, *viz.* ssp. *hypogaea* (Krap. and Rig.) and ssp. *fastigiata* (Wald.) based on variation in morphology. Further, the ssp. *hypogaea* is bifurcated into var. *hypogaea* (Virginia bunch/runner) and var. *hirsuta* (Peruvian runner), and likewise ssp. *fastigiata* into var. *fastigiata* (Valencia), Peruviana, aequatoriana and var. *vulgaris* (Spanish bunch) (Stalker and Simpson, 1995). Only four botanical types namely, Virginia bunch (VB), Virginia runner (VR), Valencia (VL), and Spanish bunch (SB) are exclusively cultivated by the farmers owing to their agronomic attributes and market value. Kochert *et al.* (1996) suggested that *A. hypogaea* might have arisen as the result of single polyploidization event and the dramatic shifts in the morphology of plant organ arose as a result of changes in one

or two major genes and a few modifier loci. Late leaf spot (LLS), caused by *Phaeoisariopsis personata* and rust caused by *arachis* is a serious disease leading to significant yield loss in groundnut (Subrahmanyam *et al.*, 1980). In particular, most popular and widely cultivated early maturing Spanish bunch types are highly susceptible to LLS. Several fungicides can effectively control them, but cost and environmental considerations limit their use. Some of the Valencia landraces and introgression lines from wild species are resistant. But they are associated with several undesirable attributes such as late maturity, thick shell, low productivity and poor adaptation making them unacceptable for direct utilization (Reddy *et al.*, 1991). Also the breeding programmes employing such lines have not been completely successful in breaking the undesirable associations. Miniature inverted-repeat transposable elements (*MITEs*) belonging to non-autonomous class II type (Osborne *et al.*, 2006), and commonly distributed in animal and plant genomes (Feschotte *et al.*, 2002), are activated by chemical mutagen treatment (Patel *et al.*, 2004)