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Association analysis and identification superior segregants for resistance to *Sclerotium rolfsii* and yield component traits in groundnut (*Arachis hypogaea* L.)

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ABSTRACT

Evaluation of 165 groundnut genotype along with parent (TAG 24 and R 9227) under artificial inoculation condition for stem rot, *Sclerotium rolfsii* indicated the significant difference among genotype, season and genotype x season interaction for disease, yield and yield related parameters. Significant positive correlation of plant population, primary branches, test weight, shelling percentage, oil content exhibited positive significant association with pod weight per plant and negatively correlated with disease at 30, 60, 90 days and was negatively correlated with plant population, And pod weight per plant was negatively correlated with plant population, plant height and disease at harvest. None of the genotypes was completely free from the disease. However, six genotypes, *i.e.* line number 21, 77,199, 25,165and 36 were resistant compared to resistant parent *i.e.*, R 9227. Among parent R 9227 showed resistance to stem and pod rot and TAG 24 showed susceptible to stem and pod rot and six genotype showed resistance to stem and pod rot compared to both parent.

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Key words : *Sclerotium rolfsii*, Groundnut, Association analysis, Superior segregants, Yield and yield component traits

INTRODUCTION

Groundnut or peanut (*Arachis hypogaea* L.) is one of the important economic oilseed crops of the world. Groundnuts contain more protein than meat-about two and a half times more than eggs, and far more than any other vegetable food except soybean and yeast. The proteins in groundnut are well balanced, except for slight deficiency in some of the essential amino acids. As it happens, these amino acids are, abundant in milk which can be combined with groundnut products for better results. Groundnut oil primarily used in the manufacture of vegetable oil (vanaspati ghee). Groundnut seed contains about 45 per cent oil and 26 per cent protein. In addition to this, it contains 18 per cent carbohydrates. It is also very good source of mineral (calcium, magnesium and iron) and vitamins (B_1, B_2 and Niacin). Obviously, poor soil fertility, abiotic and biotic stress factors limit groundnut crop growth and yield to many ways. Among biotic stresses stem and pod rot disease caused by *Sclerotium rolfsii* Sacc. is one of the significant factors contributing to yield loss. Only limited resistance screening of germplasm has been attempted. There are very few reports of clear varietal differences for resistance to stem and pod rots. Although, no genotype was known to be immune or even highly resistant to *Sclerotium rolfsii*, several genotypes and advanced breeding lines have shown field resistance (Smith *et al.*, 1989; Grichar and Smith, 1992 and Shokes *et al.*, 1993).

As in the case of many other diseases, breeding for disease resistance is the best way of controlling the *S. rolfsii* to initiate breeding programme for resistance to any of the disease, understanding of the basic mechanism of disease resistance and its inheritance are pre-requisite. It is desirable to have a variety resistance to the disease, combined with other desirable economic characters. The knowledge of mode of inheritance, variability of resistance/ susceptibility is essential to have effective selection programme. Estimate of gene effects will help in predicting the effectiveness of selection. The relative variance will decide the breeding procedure to be followed through lot of information is available on the quantitative characters but less information is available about the inheritance of *S. rolfsii* resistance as well as its association with other morphological traits.

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