by Z. mauritiana var Tikadi had high expression of most of the seed traits. Thus, the study of genetic variability and inter relationship of characters may lead to effective selection of rootstock for commercial multiplication of ber plants.

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Partial Resistance among Fastigiate Germplasm of Groundnut and their Utility in Rapid Screening for Rust

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Rust disease of groundnut caused by *Puccinia arachidis* Speg. has gained much attention because of its rapid spread to almost all the major groundnut growing countries. Efforts to find genetic resistance have been successful and several sources have been identified. Most (90%) of the resistant sources belong to only fastigiate germplasm (*Arachis hypogaea* sub-species *fastigiata).* Before exploiting resistant germplasm in breeding programmes, it becomes essential to understand the differences in the components of resistance and the nature of relationship among them. Hence, an experiment was conducted to understand the components of resistance in 15 fastigiate germplasm lines and four highly susceptible genotypes following detached leaf technique (Subrahmanyam *et al.* 1980).

The experimental material consisted of a fully expanded undamaged leaf excised with intact petiole through the pulvinous from each plant at the third node from the terminal bud of the main stem. The leaves were washed with sterile water and inserted in a layer of sterilized sand in plastic trays (45x30x14 cm). The sand was moistened with Hogland's nutrient solution and for each genotype four replications were maintained. The uredospores were collected from the diseased plants of TMV 2 using a cyclone spore collector. Suspensions of uredospores were prepared (50000 spores/ml) in sterile water containing the wetting agent Tween 80 (0.2 ml/l of water). The spore suspensions were atomized over the leaves inside the tray and covered with 250 gauge polythene sheets. The trays were then placed in plant growth chamber adjusted to 25°C and a 12 h photoperiod. Five components of rust resistance namely incubation period, infection frequency, number of pustules, pustule diameter and rust score were recorded from 10 plants selected at random from each of the four replications for a monocyclic infection.

For the purpose of comparison the genotypes were placed according to their mean field rust score as resistant (scores of 2.0-3.0), moderately resistant (3.1-7.0) and susceptible (7.1-9.0). Significant genotypic differences existed between and within the germplasm lines for each resistance component. Incubation period differed

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Table 1. Components of resistance to *Puccinia arachidis* in groundnut fastigiate genotypes

Description of genotypes		Incubation period (days)	Infection frequency (lesions/cm²)	Pustule diameter (mm)	No. of pustules/ leaf	Rust score
Identity	ICG No.					
NCAc 17090	1697	19.3	5.9	0.68	1.3	2.2
PI 476183	10053	18.3	8.1	0.63	1.3	2.4
PI 393646	7986	18.1	6.7	0.57	1.6	2.4
PI 407454	7898	18.5	4.7	0.57	1.1	2.8
EC 76446 (292)	2716	17.5	6.2	0.59	2.1	2.8
PI 314817	7882	15.2	3.2	0.49	2.4	3.0
PI 393643	7895	14.7	5.5	0.73	3.0	3.0
PI 381622	7885	13.0	6.9	0.94	3.4	3.0
PI 393517	7889	13.8	6.7	0.49	3.2	3.2
PI 393531	7893	11.4	4.5	0.51	4.0	3.4
PI 275745	1702	11.2	21.2	1.31	6	4.0
NCNc 17135	1707	10.8	22.2	1.8	8	4.5
EC 76446	2716	9.8	22.3	1.9	10	5.1
NCAc 2240	5043	9.3	23.6	1.1	11	5.8
NCAc 17133	7013	7.3	23.2	2.2	14	7.0
TMV 2	–	7.3	24.8	2.3	11	9.0
TMV 10	–	7.8	23.9	2.2	13	9.0
JL 24	–	7.2	25.1	2.1	12	9.0
Robut 33-1	–	7.8	24.6	2.2	13	9.0
LSD		0.4	1.2	0.03	1.0	0.20

markedly between resistant and moderately resistant and susceptible groups and was found to be more in case of resistant germplams (Table 1). In addition, the resistant genotypes had lesser infection frequency, number of pustules which were smaller in size in comparison to the moderately resistant and susceptible germplasm indicating the operation of partial/horizontal resistance (Vanderplank, 1968) and is similar to slow rusting reported by several investigators of cereal rust (Hooker, 1967, Parlevliet, 1976) and in leaf spot of groundnut (Aquino, 1995).

Under environmental conditions favourable for disease development, even small differences in number of lesions, incubation period and sporulation measured as number of pustules/spores may contribute to significant differences between the cultivars in disease severity and rate of disease progress (Ringer, 1995) and hence these components can be effectively used to screen large germplasm epiphytotically in a short time without the confounding effect of other diseases in the field especially the disease like leafspot.

The inter-relationship studies elicited through correlation matrix revealed that incubation period and infection frequency exhibited a negative relationship with the field rust score and can be used as an important criteria to select genotypes in the areas where disease epidemic is less or occurrence of the disease is rare. In the absence of the proper understanding on which component should be emphasized in breeding for rust resistance and in the absence of proper development of disease pressure these components may be useful.

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