

whereas the vesicles and arbuscules showed dark red stain against a contrasting background of green to blue coloured host tissues. Even the mycelial strands were clearly discernible from host tissues due to differential staining. This dual stain (toluidine blue-O-acid fuchsin) system was better than the acid fuchsin alone, where it was comparatively difficult to differentiate thin mycelial strands from host tissues due to light to medium red colour of both. Differential staining of the mycelium is essential for the study of mechanism of root colonization by the VAM fungus.

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A NEW VIRULENCE 104-1(21R31-1) OF *Puccinia recondita tritici* IN INDIA

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PREVALENCE and distribution of virulences of *Puccinia recondita* f. sp. *tritici* Rob. Ex. Desm, the causal agent of leaf rust of wheat, is being continuously monitored in India for well over five decades. A constant vigil is kept by analysing and identifying the frequency of leaf rust pathogenic forms. Uptil now 29 virulences of *P. recondita tritici* have been reported. Here we present the occurrence of yet another new virulence designated as 104-1(21R31-1).

Virulence 104(17R23) was recorded in 1972¹ and later two variants 104-A(21R31) in 1975² and 104B(29R23) in 1983³ were detected. During 1985 a leaf rust sample from Kalyansona collected from Rajasthan yielded a virulence similar to 104-A(21R31) but had additional pathogenicity on IWP 94, a line in Set-O of the currently used set of differentials⁴.

Table 1 Comparative reactions of various pathotypes of 104 group on differentiating lines

Virulence Name		Year recorded	Differentiating Lines			
Old	New		Lr13	Lr18	Lr20	IWP 94
104	17R23	1972	O;-2	O;-2	O;-1	O;
104-A	21R31	1975	O;-2	4	4	O;-2
104-B	29R23	1980	2-3	4	O;-1	4
104-1	21R31-1	1985	O;-1	4	4	4

Lr13 = Egret, Lr18 = Timvera, Lr20 = Thew.

As the major pathogenicity difference is on Set-O comprising the lines with unknown specific genes so the new pathotype is denoted by a subscript as -1. Isolations from IWP-94 were multiplied on Agra local and used to inoculate the set of differential to confirm the identity of the sample.

On Set-A and Set-B there was no perceptible difference between the new isolate and 104A(21R31) but on Set-O, IWP-94 was susceptible, while it was resistant to virulence 104-A(21R31).

The major difference between 104-1(21R31) and 104B(29R23) that is also virulent on IWP 94 is given in table 1. The avirulence/virulence formula of the new virulence 104-1(21R31) is: Lr9, Lr10, Lr13, Lr15, Lr18 (Sabikei), Lr19, Lr24, Lr25, Lr26, Lr28, Lr29/Lr1, Lr2a, Lr2b, Lr2c, Lr2d, Lr3, Lr11, Lr12, Lr14a, Lr14b, Lr16, Lr17, Lr18 (Timvera), Lr20, Lr21, Lr22, Lr23, Lr27 and Lr30.

Gene Lr2a (Webster), a line in Set-B, showed temperature sensitivity against virulences of the 104 group. The reaction types tended to change towards susceptibility with increase in temperature⁵. This fact is to be considered when recordings are done in cooler months.

During 1984-85 the new virulence 104-1(21R31-1) was detected in 5 samples out of 453 analysed and in 1986-87 in 22 out of 748 evaluated for pathogenicity test. The wheat lines hitherto resistant to leaf rust at seedling stage were tested against 104-1(21R31-1). Of these, CPAN 1800, CPAN 1874, CPAN 1946, CPAN 1961, CPAN 1962, CPAN 1967, CPAN 1973, HNP 8643, HP 1452, HUW 37, HUW 117, HUW 199, HUW 202, M 13, M 14, Raj 1865, Raj 2232 and WG 2109 were still resistant and can be used as donor lines. Also the genes that accord immunity to leaf rust infection such as Lr9, Lr18 (Sabikei), Lr19, Lr24, Lr25, Lr28 and Lr29 can be used in the breeding programme

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HIGH PEG STRENGTH DONORS IN GROUNDNUT (*ARACHIS HYPOGAEA* L.)

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IN India, spreading groundnut is harvested by working a blade harrow driven by either bullocks or tractor. Harvest losses in the soil due to this method are estimated¹ to range between 21 and 26%. The characters associated with pod losses are inherent weakness of pegs, damage of pegs by insect and fungi, besides the edaphic factors^{2,3}. Peg strength and susceptibility of pegs to biotic damage are heritable².

Fortyeight cultivars belonging to the subspecies *hypogaea* Krap. et Rig. (21 virginia bunch, 27 virginia runner) and 43 belonging to subspecies *fastigiata* Waldron (36 spanish bunch, 7 valencia) were grown in randomized block design with 3 replications. Peg strength in Newtons (N = 102.04 g

force) was measured in 10 freshly dug mature pods from each treatment, using a tensile tester (model 1-3D, Kamal Metal Industries, Ahmedabad), fitted with specially designed clamps. Based on confidential limits around the mean⁴, the cultivars were grouped into 4 different classes for peg strength low : 5.69-8.44 N; medium : 8.45-13.96 N; high : 13.97-16.72 N; very high : more than 16.72 N).

None of the cultivars belonging to subspecies *hypogaea* Krap. et Rig. was found to possess high peg strength whereas in 10 cultivars of the subspecies *fastigiata* Waldron, the peg strength was high to very high (table 1). The mean peg strength for valencia was the highest (14.87 N) followed by spanish bunch (12.97 N) and virginia bunch (9.62 N), whereas it was the lowest (9.14 N) for virginia runner.

Inter subspecific differences for peg strength hitherto not reported have been established. Work is in progress for improving peg strength in the popular high yielding spreading varieties through hybridization using the sources identified to possess very high peg strength under the subspecies *fastigiata* Waldron.

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OCCURRENCE OF PAS-GL CELLS, THE PRECURSOR OF MAST CELLS, AROUND *GLUGEA ANOMALA* (MICROSPORIDIA)

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ALTHOUGH the mast cell is unique and distributed widely, it is not clear from which precursor this cell is derived¹. In fish, it responds to the damage of brain, gills² and skin^{2,3}. A clear difference in nature of the mast cells has been shown not only in different animals but in different tissues of the same animal⁴.

Table 1 High peg strength cultivars in groundnut

Habit group	Class of peg strength	
	Very high	High
Subspecies <i>fastigiata</i> Waldron	Cross derivative of Co-1 x NCAc 17090, NRGs-1,	Cross derivative of JL-24 x NCAc 17121, Pollachi-1
Spanish bunch	VR-27, CGC-4018	
Valencia	PI 393523, NCAc 17494, PI 314817	NCAc 17090