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Reaction of different Bidi Tobacco genotypes against Tobacco Mosaic Virus in Northern Karnataka

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ABSTRACT

Tobacco mosaic virus (TMV) which causes mosaic disease in tobacco is one of the most destructive plant viruses in the world. Management through chemicals is often uneconomical and highly variable, hence an attempt was made to assess the reaction of important bidi tobacco genotypes. A total of 117 entries belonging to advanced, initial hybrid and varietal trial material and 190 germplasm lines were evaluated for TMV resistance under natural unprotected conditions. Among these, fourteen lines from advanced trial, four lines from initial trial, eight lines from hybrid trial and eleven from genetic stock recorded moderate infection under field conditions.

Key words : Bidi tobacco, Germplasm, Hybrid, Tobacco mosaic virus, Varietal trials.

Different types of tobacco are being cultivated in India under different agro-climatic conditions. Nipani area of Belgaum district in Karnataka is known for production of excellent quality bidi tobacco in India. The area under bidi tobacco is around 20,000 ha with a productivity of 2000 kg/ ha. Bidi tobacco suffers from many abnormalities caused by a wide range of pathogens viz., fungi, nematodes, bacteria, viruses, flowering plant parasites and phytoplasma (Lucas, 1975). Losses due to these diseases were estimated to be in the range of 5 to 15 per cent. Among all viral diseases, tobacco mosaic caused by tobacco mosaic virus (TMV) causes leaf mosaic resulting in severe crop losses. The infected Tobacco Plants Showed mosaic symptoms as dark green islands surrounded by light green areas and reduced leaf size. With this background, bidi tobacco genetic stock and advanced breeding lines, were screened for identifying the resistance source against the virus.

MATERIAL AND METHODS

Tobacco varieties/entries/genotypes were screened against tobacco mosaic virus under field conditions at Agricultural Research Station (ARS), Nipani. Different trial material belonging to Advanced Varietal Trial (AVT), Advanced Hybrid Trial (AHT), Initial Varietal Trial (IVT), Station Trial II (ST-II), Initial Hybrid Varietal Trail (IHVT), Station Hybrid Trail (SHT) and germplasm lines were screened for tobacco mosaic virus reaction under natural unprotected conditions. In each trial, individual gentotype was planted at an area of 4X8 sq m and replicated thrice. Recommended cultivation practices were followed for raising the crop. TMV infection was recorded at periodical intervals and were computed values later.

RESULTS AND DISCUSSION

One hundered and seventeen entries belonging to advanced varietal and hybrid trial,initial varietal and hybrid trials other trials and 190 germplasm lines were evaluated for TMV resistance under natural unprotected conditions. Of them none of the bidi tobacco genotypes showed immune reaction against TMV (Table1). The entry ABD-100 in AVT-1 recorded susceptible reaction, while remaining entries recorded mild infection. In AVT-II, NBD-134 and 147 recorded severe infection while remaining lines including popular check A-119 recorded mild infection. In IVT, the entry ABD-108 recorded severe infection. The entries ABD-105, ABD-106, ABD-107 recorded mild reaction along with checks. In IVHT three entries recorded severe infection viz., ABD-95, ABD-102 and BTH-128, while another 11 entries recorded mild infection along with checks. In station trial-I(ST-I), the entries NBD-196, 203, 205, 206, 207, 211 recorded severe

Table 1. Screening of advanced and initial varietal trial material against TMV of bidi tobacco.

Sl. No.	Trial/No. of entries	Promising entries	Reaction
1.	AVT-I (10)	ABD-100	S
		ABD-154	M
		ABD-155	M
		ABD-159	M
		ABD-96	M
		ABD-99	M
		ABD-43	M
		NPN-22	M
		A-119	M
2.	AVT-II (16)	NBD-134, 147	S
		ABD-93, 94, 95	M
		NBD-136, 138, 139, 146	M
		NBD-43, NPN-22, PL-5, A-119	M
3.	IVT (8)	ABD-108	S
		ABD-105, 106, 107, A-119, GT-5, NPN-22, NBD-43	M
4.	IHVT (21)	ABD-95, 102, BTH-128	S
		ABD-92, 93, 94, 96, 99, 100, 101, 103, 104, BTH-126, 127 GTH-1, NPN-22, NBD-43, A-119	M
5.	ST-I (32)	NBD-196, 203, 205, 206, 207, 211	S
		NBD-190, 191, 192, 193, 194, 195, 197, 198, 199, 200, 201, 202, 204, 208, 209, 210, 212, 213, 214, NBD-43, NPN-22, A-119	M
6.	ST-II (14)	NBD-180, 181, 182, 189	S
		NBD-183, 184, 185, 186, 187	M
		NBD-43, NPN-22, A-119	M
7.	SHT-I (25)	NBTH-42, 309, 801, 653, 43, 325, 44, 326, 802, 803, 118, 824	S
		NBTH-105, 652, 41, 28, 602, 43, NBD-43, NPN-22, A-119	M
8.	Genetic stock (190)	169-119-15 (88-47 Sokha), 169-119-16 (88-47 x Sokha), 169-119-17 (88-47 Sokha), 169-119-19 (88-47 x Sokha), 169-119 (Medium through A-23), K-20 (Pinle leaves), BSP (black spangle), 108-14-3 (K-20 x Sokha) x K-20, 108-14-4 (K-20 x Sokha) x K-20, 108-15-1 (K-20 x Sokha) x K-20, RPK-2, 2049-36-36 (A-2 x color)	M

S = Severe stunting and distortion of leaves M = Mild mosaic mottling

infection. Remaining twenty one entries and popular check (A-119) recorded mild infection. Among ST-II material, the entries NBD-180, 181, 182, 189 recorded severe infection. The NBD entries 183, 184, 185, 186, 187 along with checks NBD-43, NPN-22 A-119 recorded mild infection. In station hybrid trial(SHT), NBHT-105, 652, 41, 28, 602, 43 along with popular checks NBD-43, NPN-22 and A-119 recorded mild infection, whereas remaining entries recorded severe infection. In genetic stock twelve lines were found promising against tobacco mosaic disease, which recorded moderate reaction. Similar reports were observed by Krishnamurthy *et al.,* (1976), Shenoi *et al.,* (1992), Prasannasimha Rao and Nagarajan (2000), and Prasannasimha Rao *et al.,* (2002).

The present study has identified mild reaction lines from germplasm and other advanced breeding lines which can further be used in durable resistance breeding programme against TMV infections in bidi tobacco in India.

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