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Short Communication

NEW WHEAT GERMPLASM FROM INTERSPECIFIC CROSSES OF TRITICUM TIMOPHEEVI ZHUK. AND T. AESTIVUM LINN.

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A number of *timopheevi* derivatives, designated as Pusa *timopheevi* derivatives (PTD) developed from crosses of *T. timopheevi* with *T. aestivum* varieties and stocks have been found to be resistant against black, brown and yellow rusts. These new genetic sources were predominantly *aestivum* like in habit and other morphological characters.

A set of derivatives has been developed from interspecific crosses of *Triticum timopheevi* Zhuk and *T. aestivum* Linn. vars. and stocks (Bhowal *et al.*, 1990; 1991; 1993a) with the objective of transferring the genes for resistance to diseases, specially rusts from *T. timopheevi* to bread wheat varieties. These derivatives have been found to be resistant to black, brown and yellow rusts in multilocation tests (IRSN) conducted by Wheat Project Directorate. Seedling reaction tests against important virulent races of black, brown and yellow rusts have indicated the presence of genes, different from Sr36, Sr37 and Ir 18 already reported from *T. timopheevi* (Bhowal *et al.*, 1993 b). These derivatives have been designated as PTD (Pusa *timopheevi* derivatives) which form a set of new wheat germplasm. Morphological characterization of this new germplasm is reported in this short communication.

Twenty-two stabilised PTD lines (1, 2, 8, 11, 12, 16, 18, 28, 30, 32, 34, 40, 44, 47, 48, 49, 50, 61, 64, 65, 76, 83) were selected for this study (Table 1). Observations were recorded on growth habit, leaf, leaf hair, ear, glume, awn and kernel. The PTD lines along with two parental checks, Kalyansona and CM 108-31 (an induced semi-dwarf mutant of C 306) were grown in the field in single rows of 3m length with a spacing of 30 cm between rows and 10 cm between plants. *T. timopheevi* was not included in the field sowing as it requires photoperiodic treatment for flowering. It was grown in pots. Data on habit, leaf and hair character were recorded in mature green plants. Ear glume, awn and kernel characters were recorded after harvesting. Leaf hairs were observed under Nikon stereoscopic microscope model SMZ-10.

Table 1. Kernel characters of PTD lines

PTD No.	Kernel		Texture	Filling	Lusture
	Colour	Shape			
1	amber	longish ovate	med. hard	well-filled	-
2	"	ovate	"	"	-
8	red	longish ovate	hard	"	lustrous
11	amber	ovate	"	"	
12	"	"	"	filled	lustrous
16	"	"	"	"	dull
18	"	small ovate	"	little pitted	-
28	"	ovate	"	filled	dull
30	"	ovate	medium hard	little pitted	lustrous
32	"	longish ovate	hard	filled	"
34	"	ovate	medium hard	little pitted	"
40	"	ovate	hard	filled	"
44	red	longish ovate	"	little pitted	-
47	amber	small ovate	medium hard	"	-
48	red	"	hard	filled	dull
49	amber	narrow ovate	medium hard	little pitted	"
50	"	small ovate	hard	filled	-
61	amber	ovate	"	well filled	lustrous
64	amber	small ovate	med. hard	filled	dull
65	"	narrow ovate	med. hard	filled	lustrous
76	"	longish ovate	"	little pitted	dull
83	"	small ovate	"	filled	lustrous
Kalyansona	"	ovate	med.hard	"	-
CM108-31	"	ovate	hardm	well filled	lustrous
T. timopheevi	"	long ovate	"	filled	lustrous

T. timopheevi is characterized by having spreading winter-like habit, photo-sensitivity (very late flowering without extra photoperiod), profuse leaf and glume hair, adpressed ovate small ear. PTD lines had predominantly *aestivum* like leaves without profuse hairs, though a few derivatives had leafhairs intermediate between CM 108-31 and *T. timopheevi*. None of the PTD lines were as late as *Triticum timopheevi* or had adpressed small ovate ear unlike that of *timopheevi*. They had mostly long fusiform or oblong *aestivum*

Table 2. Morphological characters of PTD lines

Parents pedigree & Derivatives (PTD No.)	Habit	Shape	Leaf Colour	Hair caracter	Glume		Ear	Awn	
					hair	colour	type	type	colour
(CM 108-31 × timo) × KS^2									
1	Er	narrow	dark green auricle coloured	Dorsal longer upper hair, basal marginal upper hair, lower rare	nhr	w	Fusi	Fb	w
2	Spr	"	dark green	Dorsal upper more, lower sparse, ventral upper sparse, lower rare	hr	br	Fusi	Fb	bl
(CM 5B × timo) × CM 108-31									
8	Se	"	"	Dorsal upper and lower hair, ventral rare, basal marginal hair.	nhr	w	Fusi	Fb	w
11	Er	necrotic broad	green	Dorsal upper more, lower sarse, ventral rare, basal marginal hair	hr	br	Fusi	Fb	br
12	Se	broad	dark green	Dorsal upper more, lower rare, ventral upper more, lower rare, basal marginal	nhr	w	Ob	Fb	w
16	Se	narrow	"	Dorsal and ventral rare	nhr	w	Fusi	Fb	w
18	Se		narrow dark green	Dorsal upper sparse, lower rare, ventral upper and lower rare	nhr	br	Fusi	Fb	br

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Parents pedigree & Derivatives (PTD No.)	Habit	Shape	Leaf Colour	Hair caracter	Glume		Ear	Awn	
					hair	colour	type	type	colour
(CM 108-31 × timo) × CM 108-31^2									
28	Se	broad	green	Dorsal and ventral upper sparse	nhr	w	Fusi	Fb	w
30	Er	broad	dark green	Dorsal and ventral hair rare	nhr	w	Fusi lax	Fb	w
32	Er	"	green	Dorsal lower upper sparse, marginal basal, more ventral hair.	hr	w	Fusi lax	Fb	w
34	Se	necrotic broad	"	Dorsal rare,ventral upper and lower hair,no marginal hair	nhr	w	Fusi lax	Fb	w
40	Er	narrow	dark green	Dorsal ventral hair rare	hr	w	Fusi	Fb	bl
(CM 108-31 × timo) × KS^3									
44	Er	narrow	green	Dorsal upper lower sparse, ventral upper and lower rare, marginal hair	nhr	w	Fusi	Fb	w
47	Se	narrow	dark green	Dorsal upper and lower hair, basal marginal ventral upper rare, lower no hair	nhr	br	Fusi	Fb	br
(CM 108-31 × timo) × KS^2									

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Parents pedigree & Derivatives (PTD No.)	Habit	Shape	Leaf Colour	Hair caracter	Glume		Ear	Awn	
					hair	colour	type	type	colour
48	Se	narrow	dark green	orsal upper more, lower sparse, ventral lower upper sparse, basal marginal hair	hr	br	Fusi	Fb	br
49	Se	narrow	"	Dorsal and ventral rare, basal marginal hair	nhr	w	Ob	Fb	w
50	Se	narrow	"	Dorsal upper sparse, lower rare, ventral rare, basal marginal hair	nhr	br	Fusi	Fb	br
61	Se	narrow	dark green auricle coloured	Fine upper dorsal hair, no lower hair, fine upper ventral hair, no marginal hair	hr	w	Fusi	Fb	W
64 "	Er	narrow	dark green	Dorsal upper and lower hair, no marginal and ventral hair	nhr	br	Fusi	Fb	br
65 "	Se	narrow	"	Dorsal upper and lower hair rare, ventral very rare, basal marginal hair.	nhr	w	Fusi	Fb	w
76 "	Se	narrow	"	No dorsal and ventral hair	hr	br	Fusi	Fb	br
$KS \times (timo \times KS)^3$									

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Parents pedigree & Derivatives (PTD No.)	Habit	Shape	Leaf Colour	Hair caracter	Glume		Ear	Awn	
					hair	colour	type	type	colour
83	Se	narrow	"	Dorsal upper, sparse lower rare ventral non, ebasal marginal	nhr	w	Fusi	Fb	w
Kalyansona (Fn-k 58-nTh × N 10B) × Gabo 55	Se	narrow	"	Dorsal tip rare, ventral tip still less, margin serated, no hair	nhr	br	Ob	Fb	br
CM 108-31 Induced Mutant of C 306	Se	broad	"	Dorsal upper more lower rare, ventral upper sparce, margin serated, basal hair	hr	w	Ob	Fb	bl
N.I Vavilov Institute & plant Industry, Lenin grad. var. viticulosum									
T. timopheevi	Spr	narrow	green	Ventral hair profuse large, marginal large hair, dorsal hair less profuse large	hr	w	Adpressed flat	Fb	w

Er : erect, Se : semi-erect, spr : spreading, hr : hairy, nh : non-hairy; w : white, br : brown, bl : black; Fusi : fusiform, Ob : oblong, Fb : full-bearded

type ear. Majority of PTD lines had non-hairy glume, only a few lines had glume hairs intermediate between CM 108-31 and *timopheevi*. *T. timopheevi* has characteristically long pitted kernals. PTD lines had mostly ovate, long ovate to small ovate kernels similar to *aestivum* type. While getting the PTD lines stabilised, selection pressure was applied for *aestivum* like plant type with semi-dwarf habit, early to medium early maturity, *aestivum* like long ear, good seed fertility, yield and resistance to stem, leaf and/or stripe rusts. So it is quite likely that the PTD lines will have predominantly *aestivum* like characters alongwith resistance to rusts.

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