

Physiological specialization of *Puccinia triticina* on wheat in Argentina in 2013

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INTRODUCTION

Leaf rust is the most important wheat disease in Argentina; 4.2 M ha of wheat were grown in 2014. The objective of the study was to identify virulence phenotypes of the Pr population in leaf rusted samples collected in the wheat areas during 2013

MATERIALS Y METHODS

Single uredinal isolates were taken from samples and tested for infection type on Thatcher near-isogenic lines and some local varieties. The genes included Lr1, Lr2a, Lr2c, Lr3, Lr9, Lr16, Lr24, Lr3ka, Lr11, Lr17, Lr30, Lr10, Lr14a, Lr19, Lr20, Lr21, Lr23, Lr25, Lr26, Lr27+31, Lr29, Lr36, Lr39/41, Lr42, Lr43, Lr44 and Lr47. Race designations was based on the first three sets of four genotypes proposed by Long and Kolmer and the gene designations Lr10 and/or Lr20 are appended to indicate virulence on lines with those genes.

Table 1: Lr genes and genotypes tested

Lr Genes	Genotypes	Lr Genes	Genotypes
1	Centenario / 6* Thatcher	23	Lee FL 310 / 6* Thatcher
2 a	Webster / 6* Thatcher	24	Agent
2c	Thatcher *6 / Loros	25	Transec RL6084
3 a	Democrat / 6* Thatcher	26	ProINTA Pigüe
3 ka	Klein Aniversario / 6* Thatcher	27+31, 10	Gatcher
9	Thatcher *6 / Transfer	29	CS7D-Ag#11 RL6080
10	Exchange / 6* Thatcher	30	Thatcher*6/Terenzio
11	Hussar (W976)	36	NEP/Ae. Speltooides2-9-W//5*N
14 a	Selkirk / 6* Thatcher	41/39	TAM107*2/TA2460
16	Exchange / 6* Thatcher	42	Century*3/T.tauschii TA2
17	Klein Lucero / 6* Thatcher	"43"	Triumph64/3/Ks8010-71/TA2470/TAM200
19	Tc*6/ Agatha	44	RL6147 (T. spelta)
20	Thew	47	Oasis 50658
21	Thatcher*6/RL5406		

RESULTS AND DISCUSSION

One hundred and forty one single uredinal isolates were assessed. Eighteen races were identified. Race MFP, was the most frequent; accounting for 27% of isolates. Race MDP was second, with 22.7% frequency. Both were isolated for the first time in 2005. The first three races were the same as in 2012. Two new races were found, MKJ 10 and MGJ 10. Virulence was not found for genes Lr19, Lr21, Lr25, Lr29, Lr36, "Lr43", Lr44 and Lr47. DBB 10,20 race, was main race in Durum wheat. Virulence to Lr16 was increasing.

Table 3: Frequency of virulence of isolates on Lr genes in 2013

Lr genes	% virulence	Lr genes	% virulence
1	97,2	21	0
2a	21,2	23	95,8
2c	23,3	24	95,1
3	97,9	25	0
3ka	92,3	29	0
9	1,4	30	92,3
10	46,6	36	0
11	27,5	39/41	1,4
14a	97,9	42	16,2
16	6,3	43	0
17	97,2	44	0
19	0	47	0
20	36,7		

Table 2: Nomenclature and frequency of races found in 2013

Races	Genes Effectives / Genes Ineffective	Frequency of races found
MFP	Lr10, 19, 20, 21, 25, Gatcher, 29, 36, 39/41, 42, "43", 44, 47 / Lr14a, 23	27,0
MDP	Lr10, 19, 20, 21, 25, Gatcher, 29, 36, 39/41, 42, "43", 44, 47 / Lr14a, 23	22,7
TDI 10-20	Lr19, 21, 25, 29, 36, 39/41, 43, 44, 47 / Lr10, 14a, 20, 23, Gatcher, 42	10,6
TFT 10-20	Lr19, 21, 25, 29, 36, 39/41, 42, 43, 44, 47 / 10, 14a, 20, 23, Gatcher	8,5
MDP 10	Lr19, 20, 21, 25, Gatcher, 29, 36, 39/41, 42, 43, 44, 47 / Lr 10, 14a	7,1
MDP 10-20	Lr19, 21, 25, 29, 36, 39/41, 42, 43, 44, 47 / 10, 14a, 20, 23, Gatcher	5,7
MKJ 10	Lr19, 20, 21, 23, 25, 29, 36, 41, 42, "43", 44, 47 / 14a, 10, Gatcher	2,8
DBB 10-20	Lr14a, 19, 21, 25, Gatcher, 29, 36, 42, "43", 44, 47 / 10, 20, 23, 39/41	2,1
MDT 10-20	Lr19, 21, 25, 29, 36, 39/41, 42, 43, 44, 47 / Lr10, 14a, 20, 23, Gatcher	2,1
MFP 10	Lr19, 20, 21, 25, 29, 36, 39/41, 43, 44, 47 / Lr10, 14a, 23, Gatcher, 42	2,1
MFP 20	Lr10, 19, 21, 25, Gatcher, 29, 36, 39/41, 43, 44, 47 / Lr14a, 20, 23, 42	2,1
MDP 20	Lr10, 19, 21, 25, Gatcher, 29, 36, 39/41, 42, 43, 44, 47 / Lr14a, 20, 23	1,4
MFT 10-20	Lr19, 21, 25, 29, 36, 39/41, 43, 44, 47 / 10, 14a, 20, 23, Gatcher, 42	1,4
TRD 10-20	Lr19, 21, 25, 29, Gatcher, 36, 42, 43, 44, 47 / Lr10, 14a, 20, 23, 39/41	1,4
MCP 10	Lr19, 20, 21, 23, 25, 29, 36, 39/41, 42, "43", 44, 47 / 10, 14a, Gatcher	0,7
MGJ 10	Lr19, 20, 21, 23, 25, 29, 36, 39/41, 42, "43", 44, 47 / 10, 14a, Gatcher	0,7
MKT 10-20	Lr19, 21, 25, 29, 36, 39/41, 42, 43, 44, 47 / 10, 14a, 20, 23, Gatcher	0,7
KJG 10-20	Lr19, 21, 25, 29, 36, 39/41, 42, 43, 44, 47 / 10, 14a, 20, 23, Gatcher	0,7