

A DIAGNOSTIC KEY FOR THE IDENTIFICATION OF PHYSIOLOGIC RACES OF
PUCCINIA RUBIGO-VERA TRITICI GROUPED
ACCORDING TO A UNIFIED NUMERATION SCHEME

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Johnston (1) recently proposed the consolidation of closely related physiologic races of *Puccinia rubigo-vera* (DC.) Wint.² f.sp. *tritici* (Erikss.) Carl. (= *P. triticina* Erikss.) into unified groups. Under this scheme, each of the unified groups would embrace those physiologic races which produce identical or similar infection types on five of the standard differential varieties. These critical varieties are: Malakof (C.I. 4898), Webster (C.I. 3780), Loros (C.I. 3779), Mediterranean (C.I. 3332), and Democrat (C.I. 3384).

A diagnostic key has been prepared to facilitate the identification of the unified groups on the basis of the above five varieties. The key, which follows, includes the 163 races described by Johnston and Levine (2) as well as 18 new races identified for the first time in Italy. The key was constructed on a dichotomous basis, providing for the differentiation of the varietal reactions into the following two classes: R, indicating resistance as expressed by the infection types 0, 1, 2; and S, indicating susceptibility as expressed by the infection types X, 3, 4. This is in accord with the scheme already used by Levine, Ausemus, and Stakman (3) for leaf rust of wheat; and by Levine and Cherewick (4) for leaf rust of barley.

Key -- Diagnostic key for the identification of unified groups encompassing physiologic races of *Puccinia rubigo-vera tritici*.

	Unified group Numbers
Malakof resistant	
Webster resistant	
Loros resistant	
Mediterranean resistant	
Democrat resistant	1
Democrat susceptible	23
Mediterranean susceptible	
Democrat resistant	20
Democrat susceptible	2
Loros susceptible	
Mediterranean resistant	
Democrat resistant	10
Democrat susceptible	16
Mediterranean susceptible	
Democrat resistant	4
Democrat susceptible	3
Webster susceptible	
Loros resistant	
Mediterranean resistant	
Democrat resistant	22
Democrat susceptible	26
Mediterranean susceptible	25
Loros susceptible	
Mediterranean resistant	
Democrat resistant	12
Democrat susceptible	27
Mediterranean susceptible	
Democrat resistant	19
Democrat susceptible	17

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² [Properly designated *P. recondita* Rob. ex Desm.]

Key -- (Continued).

Malakof susceptible	
Webster resistant	
Loros resistant	
Mediterranean resistant	
Democrat resistant	11
Democrat susceptible	21
Mediterranean susceptible	5
Loros susceptible	
Mediterranean resistant	14
Mediterranean susceptible	
Democrat resistant	24
Democrat susceptible	6
Webster susceptible	
Loros resistant	
Mediterranean resistant	18
Mediterranean susceptible	7
Loros susceptible	
Mediterranean resistant	
Democrat resistant	9
Democrat susceptible	15
Mediterranean susceptible	
Democrat resistant	8
Democrat susceptible	13

The reactions of the five differential varieties to each of the unified groups are given in Table 1. The right hand column of this table lists the physiologic races comprising each of the unified groups.

Table 1. Reaction of the five varieties of wheat used to differentiate the unified groups of physiologic races of Puccinia rubigo-vera tritici.

Unified group number	Reactions of 5 differential varieties ^a						Internationally registered physiologic races and newly identified Italian races incorporated in the unified group numbers listed in the first column.
	Malakof	Webster	Loros	Mediterranean	Democrat		
1	R	R	R	R	R		1, 16, 53, 63, 120, 123.
2	R	R	R	S	S		2, 15, 25, 34, 59, 62, 127, 151, 153.
3	R	R	S	S	S		3, 12, 32, 44, 58, 61, 78, 84, 98, 102, 111, 141, 161.
4	R	R	R	S	R		4, 156, 163.
5	S	R	R	S	S		5, 52, 100.
6	S	R	S	S	S		6, 28, 39, 40, 83, 103, 105, 126, 144.
7	S	S	R	S	S		7, 60.
8	S	S	S	S	R		8, 48, 172(R26) ^b

Table 1. (Continued).

Unified group number	Reactions of 5 differential varieties ^a					Internationally registered physiologic races and newly identified Italian races incorporated in the unified group numbers listed in the first column.
	Malakof	Webster	Loros	Mediterranean	Democrat	
9	S	S	S	R	R	9, 10, 13, 19, 20, 23, 29, 31, 70, 108, 146, 147, 148.
10	R	R	S	R	R	11, 14, 26, 38, 74, 95, 131, 132, 133, 154, 155.
11	S	R	R	R	R	17, 36, 93.
12	R	S	S	R	R	18, 66, 68, 72, 96, 97, 106, 107, 134, 135, 138, 139, 164(R18), 166(R20), 168(R22).
13	S	S	S	S	S	21, 30, 35, 42, 54, 65, 77, 80, 82, 89, 94, 101, 104, 112, 113, 114, 115, 116, 122, 130, 145, 149, 150.
14	S	R	S	R	R	22, 37, 43, 49, 50, 64, 69, 110, 128.
15	S	S	S	R	S	24, 27, 41, 99, 117, 152.
16	R	R	S	R	S	33, 46, 51, 79, 158, 178(R32).
17	R	S	S	S	S	45, 57, 67, 76, 81, 85, 87, 88, 90, 136, 140, 142, 143, 162, 167(R21), 176(R30).
18	S	S	R	R	R	47, 91, 119, 121, 125.
19	R	S	S	S	R	55, 71, 73, 75, 86, 137, 157.
20	R	R	R	S	R	56, 92, 165(R19).
21	S	R	R	R	S	109, 160.
22	R	S	R	R	R	118, 174(R28), 177(R31).
23	R	R	R	R	S	124, 169(R23), 179(R33).
24	S	R	S	S	R	129, 180(R34).
25	R	S	R	S	S	159.
26	R	S	R	R	S	170(R24), 171(R25), 173(R27).
27	R	S	S	R	S	175(R29), 181(R35).

^a Malakof (C. I. 4898), Webster (C. I. 3780), Loros (C. I. 3779), Mediterranean (C. I. 3332), Democrat (C. I. 3384).

^b Grateful acknowledgment is made to Prof. C. O. Johnston for his letter of February 14, 1957 in which he furnished the international numbers from 164 to 181 for the new Italian races which had been provisionally designated as R18 to R35, inclusive.

Literature Cited

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