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GENEVA

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FOR
AGRICULTURAL CROPS**

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SUMMARIZED RESULTS OF THE ELECTROPHORESIS RINGTEST FOR ESTERASES,
PEROXYDASES AND PATATINS OF POTATO TUBERS

Document prepared by experts from Germany

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1. Participants

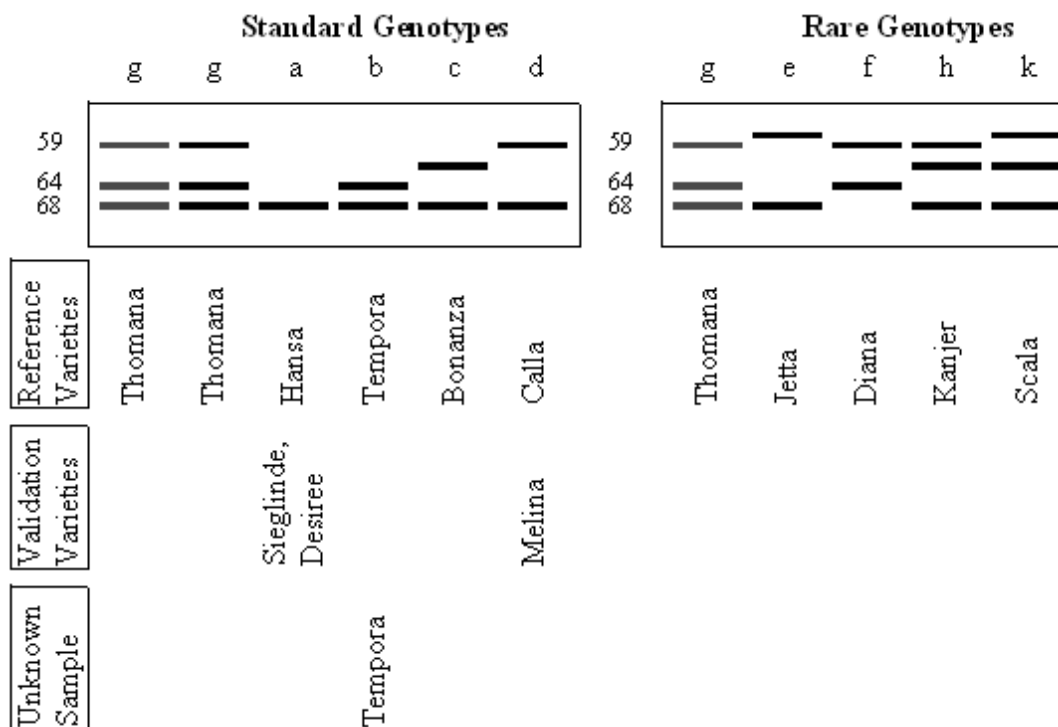
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2. Material and Methods

Fresh potato tubers were sent by Germany to Austria in autumn 2001 in order to ensure that the same plant material was used in both laboratories. The tubers were harvested from the previous DUS trial at the Bundessortenamt. Sample preparation and electrophoresis was carried out by both participants according to the Draft Test Guidelines TWA/30/3 for Peroxydases, Esterases and Patatins. In total 13 varieties were included in the ringtest. In one part of the ringtest the participants had to analyze for all proteins a set of varieties with known expressions (reference varieties) to verify the descriptions. In a second part the participants had to describe varieties with unknown expressions (validation varieties), including one sample without variety name (unknown sample). The analyzed varieties represented the different states as follows:

Peroxidases



The zymogramms produced in Austria and Germany were interpreted by the same specialist in one or both laboratories as shown in the following table:

	Interpretation of gels	Performance of electrophoresis	
		Austria	Germany
Peroxidases	Austria	+	+
	Germany	+	+
Esterases	Austria	+	-
	Germany	+	+
Patatins	Austria	-	-
	Germany	+	+

3. Results

Peroxidases

The genotypes a, b, c, d, e, f and k could be verified after performance of electrophoresis and crosswise interpretation by both laboratories. For genotype h no clear discrimination was possible from genotype d after analysis of the reference varieties. The same difficulty was found in the set of validation varieties. The variety Melina could not clearly be assigned to genotype d or h. Therefore genotype h is not included in the table of characteristics in TG/23/6(proj.2) as a separate state of expression. Genotype d and h have to be considered the same.

Genotype k could be verified in the ringtest but it is not included in the table of characteristics in TG/23/6(proj.2) because currently no living example variety is known (Scala was withdrawn in 1987).

Esterases

All genotypes which were analyzed in the ringtest could be verified by both laboratories. For the ringtest the most frequent genotypes occurring in the collection of potato varieties were selected. But not all genotypes known were covered in the ringtest. The following table summarizes the result of the ringtest in relation to all genotypes listed in TG/23/6(proj.). In the case of ringtest varieties the whole line is highlighted. Single cells are highlighted in the case of band positions which were not covered by the ring test.

Genotype	- → Band position → +																Ringtest variety	Note
	66	68	70	72	73	74	75	76	77	79	83	85	87	88	89	92		
a + o	66								79								Desiree	4
b + o				72						83								18
c + o		68				75												22
d + o						75				83							Secura	5
e + o										83				89				20
f + o			70			74												12
h + o					73				77								Jetta, Diana	6
i + o						75			79									8
j + o										79	83						Hansa, Melina	1
k + o										83		87						13

Genotype	- → Band position → +														Ringtest variety	Note		
	66	68	70	72	73	74	75	76	77	79	83	85	87	88			89	92
l + o						75		77										16
o + o																		11
d + b						75				83	85							23
g + b				72			76				85							26
i + b						75			79		85							7
j + b									79	83	85							9
d + c						75				83				88			Tempora, Calla	19
i + c						75			79					88				15
j + c									79	83				88			Thomana, Kanjer	3
l + c						75		77						88			Sieglinde	2
k + d										83	87				92			17

Patatins

All genotypes which were analyzed in the ringtest could be verified after electrophoresis in both laboratories. For the ringtest the most frequent genotypes occurring in the collection of potato varieties were selected. But not all genotypes known were covered in the ringtest. The following table summarizes the result of the ringtest in relation to all genotypes listed in TG/23/6(proj.). In the case of ringtest varieties the whole line is highlighted. Single cells are highlighted in the case of band positions which were not covered by the ring test.

Genotype	- → Band position → +																	Ringtest variety	Note		
	13	15	17	21	22	26	31	33	36	42	43	46	49	50	51	52	58			59	60
1.01	15					26	31				43									Secura	6
2.02	15	21				26	31				43							59		Desiree	11
2.03	15	21			26					43	46							60			77
2.04	15					26	31				43							59			16
3.01	15						31				43			50							19
3.02	15					26	31				43			50							21
3.03	15					26	31				43			50	51					Tempora	47
3.04	15					26					43			50	51						49
3.05	15						31				43			50	51						52
3.06	15					26	31				43					52					61
3.07	15					26					43					52					58
3.09	15				22						43			50	51						50
4.01	15	21				26	31				43			50						Jetta, Scala	31
4.03	15	21				26	31				43			50	51						54
4.05	15	21				26	31				43					52					65
4.07	15				22						43			50				60			43
4.08	15				22						43			50				59			40
4.09	15				22						43			50	52	59					57
4.11	15					26	31				43			50			59	60			45
4.12	15						31				43			50				60			42
4.14	15					26	31				43			50	51			59			73
4.15	15					26					43			50	51			59	60		75
4.16	15					26					43					52		59			85

Genotype	Band position																Ringtest variety	Note								
	-	→	13	15	17	21	22	26	31	33	36	42	43	46	49	50			51	52	58	59	60	→	+	
4.17			15			22						43						52		59	60				87	
5.01			15		21		26		33			43								59					Bonanza	13
5.02			15						33			43										60				14
6.01			15						33		42															2
6.02			15			26		33				43													Sieglinde, Diana	7
7.01			15		22			33				43			49											17
7.02			15		22			33			42					50										86
7.03			15		22			33				43				50										25
7.04			15					33				43				50										20
7.05			15			26		33				43				50										23
7.06		13							33			43			50	51										4
7.07			15					33				43			50	51										51
7.08			15					33				43						52								60
7.09			15			26		33				43						52								62
8.02			15		21		26		33			43			50					59					Hansa	35
8.04			15		21		26		33			43			50	51				59						55
8.05			15		21		26		33			43						52		59						68
8.06			15					33			42				50					59						28
8.07		13		17				33				43			50				58							30
8.08			15					33				43			51	52				59						74
8.09			15					33				43							58	59					Thomana	76
8.10						22		33				43			50				58	59					Kanjer	29
8.12							26	33				43			50					59						12
8.13					21		26	33				43			50					59						37
8.14					21			33				43			50	51				59						36
8.15					21		26	33				43			50	51				59						70
8.16					21		26	31	33			43			50	51				59						72
9.01						22		33							50										Calla	1
10.01			15						36			43			50	51										63
10.02			15			26		36				43								52					Melina	80

The ringtest has shown that the methods presented in the Annex of the Draft Test Guidelines TWA/30/3 are appropriate to analyze the electrophoretic pattern of peroxidases, esterases and patatins in potato tubers. The characteristics are useful to describe the genotypes of potato varieties.

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